APPENDIX A

DPEIS Comments and Responses

APPENDIX A
DPEIS COMMENTS AND RESPONSES

The Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Subbasin was filed with the Washington State Environmental Policy Act (SEPA) Register on May 31, 2018. A Notice of Availability and Public Hearings appeared in the *Wenatchee World* and *Leavenworth Echo* on May 31, 2018. The Washington State Department of Ecology (Ecology) sent a news release announcing the availability of the DPEIS and the date, time, and location of the public meetings to area media. The 60-day comment period ended July 30, 2018.

Ecology and Chelan County distributed 35 copies of the DPEIS to members of the Icicle Work Group; Federal, State and local agencies; Native American Tribes; irrigation districts; interested members of organizations and entities; and the general public. The DPEIS and supporting materials were also available online at Chelan County's website.

A public hearing was held in Leavenworth on June 27, 2018 to provide information on the DPEIS and solicit comments. The hearing was attended by 82 people, and 7 people provided comments that were transcribed by the court reporter.

A total of 9,981 comments were submitted via email, letter, comment form, or court reporter on the DPEIS. Of these, 8,825 were considered. Comments not considered included comments submitted before or after the comment period, duplicate comments (same commenter, same comment was only counted once), and emails from the co-leads with "test" included in the subject line. In total, there were 203 late/early comments, 943 duplicate comments, and 10 "test" comments not considered. Ten comments were catalogued and responded to, and later determined to be late comments. However, because responses were already developed, these comments were considered.

Copies of comment letters and the public hearing transcripts are reproduced in this Appendix to the FPEIS. Responses to the individual comments follow. For clarity and concision, comments from different senders with the same content are only provided once, with a list of commenters following the comment. In that same vein, responses are only provided once on these comments.

The following table provides a list of those who commented on the DPEIS, the number of the comment letter, and the page number where the comment letter and the responses appear.

Table A-1
List of those commenting

Letter Number	Commenter	Page Number	
		Comment	Response
Icicle Work Group (IWG) Members			
001	Bureau of Reclamation	A-23	A-363
002	U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office	A-24	A-363
003	U.S. Fish and Wildlife Service, Leavenworth Fisheries Complex	A-25	A-363
004	U.S. Forest Service	A-26	A-363
005	Washington State Department of Fish and Wildlife, North Central Region	A-26	A-363
006	Icicle Creek Watershed Council	A-31	A-366
	Trout Unlimited – Washington Water Project		
007	Washington Water Trust	A-35	A-368
008	Daryl Harnden, IWG Agricultural Representative & Local Farmer	A-36	A-368
009	Yakama Nation	A-37	A-368
State Agencies			
010	Washington State Department of Agriculture	A-38	A-369
011	Washington State Department of Health, Department of Drinking Water	A-38	A-369
Other Organizations			
012	Alpine Lakes Protection Society	A-39	A-369
	The Wilderness Society		
	American Whitewater		
	Aqua Permanente		
	Center for Environmental Law & Policy		
	Conservation Congress		
	Doug Scott Wilderness Consulting		
	El Sendero Backcountry Ski & Snowshoe Club		
	Federation of Western Outdoor Clubs		
	Friends of Bumping Lake		
	Friends of Clearwater		
	Friends of Enchantments		
	Friends of Lake Kachess		

Letter Number	Commenter	Page Number	
		Comment	Response
Other Organizations (cont.)			
012 (cont.)	Friends of Wild Sky	A-39	A-369
	Great Old Broads for Wilderness		
	Icicle Creek Watershed Council		
	Issaquah Alps Trails Club		
	Kittitas Audubon Society		
	The Mazamas		
	Middle Fork Recreation Coalition (MidFORC)		
	North Cascades Conservation Council		
	North Central Washington Audubon Society		
	River Runners For Wilderness		
	Save Our Sky Blue Waters		
	Seattle Audubon Society		
	Sierra Club		
	Spokane Mountaineers		
	Spring Family Trust for Trails		
	Washington Wild		
	Wild Fish Conservancy		
	Wilderness Watch		
013	Washington Trails Association	A-49	A-375
	The Mountaineers		
	Access Fund		
014	Alpine Lakes Foundation	A-52	A-376
015	Chelan-Douglas Land Trust	A-53	A-377
016	Great Old Broads for Wilderness	A-54	A-377
017	North Central Washington Audubon Society	A-54	A-377
018	Olympic Park Associates	A-56	A-378
019	Pacific Crest Trail Association	A-56	A-378
020	Pacifica Law Group	A-57	A-379
021	Washington Native Plant Society	A-64	A-380
022	Wise Use Movement	A-65	A-380
Public Hearing Comment Forms			
023	Anne Bridges	A-66	A-381
024	Kathleen Ward (Fromm)	A-67	A-381
025	Natalie Williams	A-68	A-382

Letter Number	Commenter	Page Number	
		Comment	Response
Public Hearing Transcript			
026	Chad Spies	A-68	A-382
027	Jan Petrie	A-69	A-382
028	Jerome “Jerry” Schneider	A-69	A-382
029	Will Henson	A-70	A-382
030	Gro Buer	A-71	A-383
031	Norm Stoddard	A-72	A-383
032	Greg Shannon	A-72	A-383
Individuals			
033	Alan Hunt	A-73	A-383
034	Bill Burwell	A-74	A-384
035	Dick Rieman	A-74	A-385
036	Dick Rieman (2)	A-75	A-385
037	Drew Meyers	A-76	A-385
038	Edward Henderson	A-77	A-386
039	James Woods	A-78	A-387
040	Janet Thompson	A-79	A-387
041	Janiese Loeken	A-79	A-389
042	Jeffrey Currier	A-80	A-389
043	Julia Beebs	A-80	A-389
044	Julianne Lamsek	A-81	A-389
045	Laurie Colacurcio	A-82	A-389
046	Ryan Jones	A-82	A-390
047	William and Margaret Byers	A-83	A-390
048	Allison Oster	A-83	A-390
049	Ansel Wald	A-84	A-390
050	Brynne Koscianski	A-84	A-390
051	Chris Murray	A-85	A-390
052	Darrel Martin	A-85	A-391
053	Deanna Pumplin	A-86	A-391
054	Richard Fiddler	A-86	A-391
055	Jeff Lambert	A-87	A-392
056	John Russell	A-87	A-392
057	M Johnson	A-88	A-392
058	Mark Shipman	A-88	A-392
059	Matt Parker	A-89	A-392
060	Michelle Bright	A-89	A-392

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
061	Natalie Williams	A-90	A-393
062	Peter Fiddler	A-91	A-393
063	Sam Smith	A-91	A-393
064	Thor Thompson	A-92	A-393
065	Timothy Gartland	A-92	A-393
066	Will Henson	A-93	A-395
067	Will Henson (2)	A-94	A-395
068	Andrea Fisher	A-94	A-395
069	Charles Bagley	A-95	A-395
070	Christopher Barchet	A-96	A-395
071	James Donaldson	A-97	A-395
072	Mark Curtis	A-97	A-396
073	Melinda Mueller	A-98	A-396
074	Pete Fry	A-98	A-397
075	Rebecca Caulfield	A-99	A-397
076	Allison Kutz	A-99	A-398
077	Anastasia Christman	A-100	A-398
078	Barbara Gamrath	A-100	A-398
079	Brian Telfner	A-101	A-398
080	Brianne Vanderlinden	A-101	A-398
081	Brittany Granger	A-102	A-398
082	William All	A-102	A-398
083	Carol Sund	A-103	A-398
084	Carolyn Graham	A-103	A-399
085	Cedar Hyde	A-104	A-399
086	Christian Chabot	A-104	A-399
087	CJ Beegle	A-105	A-399
088	Constance Anderton	A-105	A-399
089	Craig Mabie	A-106	A-399
090	Danielle Graham	A-106	A-399
091	David Panozzo	A-107	A-399
092	David Van Cleve	A-107	A-400
093	Deanna Gill	A-109	A-400
094	Deloa Dalby	A-110	A-400
095	Elizabeth Vu	A-110	A-400
096	Gabriel Houle	A-111	A-400
097	Greg Wellman	A-111	A-400

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
098	Harvey Halpern	A-112	A-401
099	Jane Erickson	A-112	A-401
100	Jeanne Poirier	A-113	A-401
101	Jeffrey Whittall	A-113	A-401
102	Juliet Maurer	A-114	A-401
103	Karen Thomas	A-114	A-401
104	Kathleen and Robert Nerenberg	A-115	A-402
105	Katrina Kok	A-115	A-402
106	Kendra Stegner	A-116	A-402
107	Kimberly Stachowski	A-116	A-402
108	Lane Aasen	A-117	A-402
109	Laura Shauger	A-117	A-402
110	Lawrence Lewin	A-118	A-402
111	Leann Arend	A-118	A-402
112	Louise Suhr	A-119	A-402
113	Mary Eve	A-119	A-403
114	Matthew Busch	A-120	A-403
115	Mattias Huhta	A-120	A-403
116	Michael Schemmel	A-121	A-403
117	Michael Wyant	A-121	A-403
118	Michelle Privat Obermeyer	A-122	A-404
119	Mike Gundlach	A-122	A-404
120	Misa Heater	A-123	A-404
121	Pat Siggs	A-123	A-404
122	Patrick Podenski	A-124	A-404
123	Peter Dunau	A-124	A-405
124	Peter Polson	A-125	A-405
125	Philip Evans	A-125	A-405
126	Prithvi Shylendra	A-126	A-405
127	Rebecca Walton	A-126	A-405
128	Rebeccah Leiter	A-127	A-406
129	Robert Werth	A-128	A-406
130	Robert Yates	A-129	A-406
131	Roberta de Regt	A-129	A-406
132	Robin Buxton	A-130	A-406
133	Ronald Harden	A-130	A-406

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
134	Sandra Ciske	A-131	A-406
135	Sara Papanikolaou	A-131	A-407
136	Sarah Leyrer	A-132	A-407
137	Stefanie Dirks	A-132	A-407
138	Steve Swenson	A-133	A-407
139	Steven Cox	A-133	A-408
140	Steven Jones	A-134	A-408
141	Timothy Hall	A-134	A-408
142	Tina Thompson	A-135	A-408
143	Alan Moen	A-135	A-408
144	Alex Bond	A-136	A-409
145	Alexander Phillips	A-137	A-409
146	Allison Shaw	A-137	A-409
147	Andrea Riley	A-138	A-409
148	Ann Crosby	A-138	A-409
149	Bruce Williams	A-140	A-411
150	Carina Wedel	A-141	A-411
151	Carolyn Waldow	A-141	A-411
152	Cathy Craver	A-142	A-411
153	Charles Raymond	A-142	A-412
154	Chris Lish	A-144	A-413
155	Claire Giordano	A-146	A-414
156	Cliff Leight	A-146	A-415
157	David Foster	A-147	A-415
158	Diana Rosenberg	A-147	A-415
159	Diana Timpson	A-148	A-415
160	Donald Mazzola	A-148	A-415
161	Donald Potter	A-149	A-415
162	Edward Henderson	A-149	A-416
163	Elaine Badejo	A-151	A-416
164	Erik Hagstrom	A-152	A-416
165	Evan Schelter	A-152	A-416
166	Fabian Frank	A-153	A-416
167	Francis and Gerald Conley	A-153	A-417
168	Greg Shannon	A-154	A-417
169	Gregory Sheehan	A-155	A-418
170	Heather Heffner	A-155	A-418

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
171	Howard Nebeck	A-156	A-418
172	Isaac Gundersen	A-156	A-418
173	Jacqueline Shin	A-157	A-419
174	Jana Hobbs	A-157	A-419
175	Janna Treisman	A-158	A-420
176	Jena Gilman	A-159	A-421
177	Jeremy Jostad	A-160	A-422
178	Jessica O'Sell	A-160	A-422
179	Jim Perkins	A-161	A-422
180	Joan Frazee	A-161	A-422
181	John Pollock	A-162	A-422
182	Kathleen Hurley	A-162	A-423
183	Kathleen Shannon	A-163	A-423
184	Kathleen Ward	A-163	A-423
185	Kathy Haviland	A-164	A-423
186	Kelsie Maney	A-164	A-424
187	Kevin Farrell	A-165	A-424
188	Kyle Kohlwes	A-166	A-424
189	Lael White	A-166	A-424
190	Laurence Leveen	A-167	A-425
191	Lisa Bellefond	A-167	A-425
192	Marjorie Fields	A-168	A-425
193	Mathias Ricken	A-168	A-425
194	Megan Johnson	A-169	A-425
195	Meghan Young	A-169	A-426
196	Michael Weinberg	A-170	A-426
197	Mitchelll McCommons	A-170	A-426
198	Monica Charpentier	A-171	A-426
199	Nancy Zahn	A-171	A-426
200	Nete Olsen	A-172	A-428
201	Patrick Conn	A-174	A-429
202	Rachel Nunez	A-175	A-429
203	Rachel Youngberg	A-175	A-429
204	Richard Curtis	A-176	A-430
205	Richard Forbes	A-177	A-430
206	Richard Forbes (2)	A-177	A-431

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
207	Richard Haydon	A-178	A-431
208	Richard Korry	A-179	A-431
209	Richard Noll	A-179	A-432
210	Richard Rutz	A-180	A-432
211	Robert Metzger	A-182	A-434
212	Scott Presho	A-182	A-434
213	Steve Uyenishi	A-183	A-434
214	Tami Rust	A-183	A-434
215	Teresa Catford	A-184	A-434
216	Terri and Ronald Jones	A-184	A-434
217	Tessa Rue	A-185	A-434
218	Bill Burwell	A-185	A-434
219	Antje Fray	A-186	A-434
220	Christine Clum	A-187	A-435
221	Dawn Serra	A-188	A-435
222	Jennifer Schultz	A-189	A-435
223	Joe McPhee	A-190	A-435
224	LD Anderson	A-191	A-435
225	Linda Berd	A-192	A-436
226	Linda Yow	A-193	A-436
227	M Lou Orr	A-194	A-436
228	N Refes	A-195	A-436
229	Noel Orr	A-196	A-436
230	Sherry Olson	A-197	A-436
231	Singgih Tan	A-198	A-437
232	Aimee Polekoff	A-199	A-437
233	Al Kisner	A-200	A-437
234	Alice Nguyen	A-201	A-437
235	Amy Davis	A-202	A-437
236	Andrew Fisher	A-203	A-437
237	Ann Rogers	A-204	A-438
238	Antje Fray (2)	A-205	A-438
239	Arrie Hammel	A-206	A-438
240	Barbara Trudell	A-207	A-438
241	Beth Stanberry	A-208	A-438
242	Bill Parker	A-209	A-438
243	Billy Angus	A-210	A-438

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
244	Bonnie Macraith	A-211	A-438
245	Carol Ann Brady	A-212	A-439
246	Carol Hatfield	A-213	A-439
247	Carol Hatfield (2)	A-214	A-439
248	Carol Jackson	A-215	A-439
249	Carolyn Wacaser	A-216	A-439
250	Cheryl Lechtanski	A-217	A-439
251	Cris Smith	A-218	A-440
252	Darlene Marley	A-219	A-440
253	Donna Greathouse-Neel	A-220	A-440
254	Echo Mitchell	A-221	A-440
255	Edson Rood	A-222	A-440
256	Elizabeth Lynch	A-223	A-440
257	Gayle Areheart	A-224	A-440
258	George Wuerthner	A-225	A-441
259	Gita Barbezat	A-226	A-441
260	Helga Oestreicher	A-227	A-441
261	Jeffrey Christo	A-228	A-441
262	Jessica McGeary	A-229	A-441
263	Joseph Breazeale	A-230	A-441
264	Joy Keithline	A-231	A-442
265	Kathy, Mark, Chris, & Jessie Groth	A-232	A-442
266	Kevin Spelts	A-233	A-442
267	Lisa Dahill	A-234	A-442
268	Loren Amelang	A-235	A-442
269	Louise Wallace	A-236	A-442
270	Lynn Welch	A-237	A-442
271	Maggie Frazier	A-238	A-442
272	Maija Dravnieks	A-239	A-443
273	Martha Jo Willard	A-240	A-443
274	Martha Stevens	A-241	A-443
275	Mary Leon	A-242	A-443
276	Marya Bradley	A-243	A-443
277	Maryann Foss	A-244	A-443
278	Maureen Knutsen	A-245	A-444
279	Michael and Barbara Hill	A-246	A-444

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
280	Michelle Rice	A-247	A-444
281	Mike Hemphill	A-248	A-444
282	Nina Council	A-249	A-444
283	Pamela Nelson	A-250	A-445
284	Patricia Always	2-251	A-445
285	Randall Potts	A-252	A-445
286	Robert Bauer	A-253	A-445
287	Robert Fritsch	A-254	A-445
288	Rose Jenkins	A-255	A-446
289	Ruth Parcell	A-256	A-446
290	Scott Elliott	A-257	A-446
291	Teresa Hayes	A-258	A-446
292	Thelma Nelson	A-259	A-446
293	Theo Giesy	A-260	A-446
294	Amy Derocher	A-261	A-447
295	Larry Oneil	A-262	A-447
296	Catherine Buchanan	A-262	A-447
297	Cheyenne Lively	A-263	A-447
298	Christina Durtschi	A-263	A-447
299	Courtney Carlisle	A-264	A-448
300	Jace Bylenga	A-264	A-448
301	Mary Gallagher	A-265	A-448
302	Nicole Marcotte	A-265	A-448
303	Carlie Miller	A-266	A-449
304	David Johnhoy	A-266	A-449
305	Douglas Hedrick	A-267	A-449
306	Fit Cahall	A-267	A-449
307	Inga Walker	A-268	A-449
308	Jacob Gunn	A-268	A-450
309	Jean Coy	A-269	A-450
310	Judy Knold	A-269	A-450
311	Kevin Shipe	A-270	A-450
312	Manuela Giese	A-270	A-450
313	Mark Salser	A-271	A-450
314	Michaela Mansfield	A-271	A-451
315	Robert Pasko	A-272	A-451
316	Robert Schutzner	A-272	A-451

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
317	Rachel Swerdlow	A-273	A-451
318	Roberta Daniels	A-273	A-451
319	Alyssa Barton	A-274	A-451
320	Andrea Carter	A-274	A-452
321	Aylin Llona	A-275	A-452
322	Barry Truman	A-275	A-452
323	Chris Gnehm	A-276	A-452
324	Daniel Erickson	A-276	A-452
325	Denise Mahnke	A-277	A-452
326	Dorothy Hiestand	A-277	A-452
327	Ellen Lyons	A-278	A-453
328	Gerry Smith	A-278	A-453
329	James Davis	A-279	A-453
330	Janet Way	A-279	A-453
331	Kate Butt	A-280	A-453
332	Kevin Jones	A-280	A-453
333	Kristeen Penrod	A-281	A-453
334	Kristen Long	A-281	A-453
335	Kristina Fury	A-282	A-454
336	Mark Stewart	A-282	A-454
337	Matt Knox	A-283	A-454
338	Mayellen Henry	A-283	A-454
339	Menno Sennesael	A-284	A-454
340	Niels and Susan Andersen	A-284	A-454
341	Oliver Dunn	A-285	A-454
342	Patrick Conn	A-285	A-454
343	Paul Fior	A-286	A-455
344	Paul Granquist	A-286	A-455
345	Rachel Thomas	A-287	A-455
346	Rose Lagerberg	A-287	A-455
347	Shanna Sierra	A-288	A-455
348	Sigrid Asmus	A-288	A-455
349	Sue Tiffany	A-289	A-455
350	Suzanne Davis	A-289	A-455
351	Tanya Lawson	A-290	A-455
352	Venard Trevisanut	A-290	A-456

Letter Number	Commenter	Page Number	
		Comment	Response
Individuals (cont.)			
353	Barbara Cunningham	A-291	A-456
354	Barbara Cunningham (2)	A-292	A-456
355	Cassandra Bufano	A-293	A-456
356	Jennifer Schultz (2)	A-293	A-456
357	Mark and Susan Vossler	A-294	A-456
358	Mark and Susan Vossler (2)	A-295	A-456
359	Mary Johnson	A-296	A-456
360	Nancy Anderson	A-297	A-456
361	Robert Havrilla	A-298	A-456
362	Robert Havrilla (2)	A-299	A-457
363	Edith Lie	A-300	A-457
364	Linda Carroll	A-301	A-457
365	Bruce Turcott	A-302	A-457
366	Tim McNulty	A-302	A-457
367	Thom Peters	A-303	A-457
368	Susan Cuturilo	A-303	A-457
369	Shirley Sonnichsen	A-304	A-458
370	Seth Rolland	A-304	A-458
371	Scott Elliott	A-305	A-458
372	Peter Carskaddan	A-305	A-458
373	Mr. Shelley Dahlgren, PhD	A-306	A-458
374	Michael Siptroth	A-306	A-458
375	Julie Stohlman	A-307	A-458
376	Emily Myette	A-307	A-459
377	Denise Harnly	A-308	A-459
378	Bob Aegerter	A-308	A-459
Form Letters			
379	Wilderness Watch email message submitted by 5,616 individuals. For the list of submitters, see page A-272.	A-309	A-459
380	Sierra Club email message submitted by 1,572 individuals. For the list of submitters, see page A-305.	A-342	A-460
381	Washington Wild email message submitted by 234 individuals. For the list of submitters, see page A- 308.	A-352	A-460
382	The Wilderness Society email message submitted by 227 individuals. For the list of submitters, see page A-310.	A-354	A-461

Letter Number	Commenter	Page Number	
		Comment	Response
Form Letters (cont.)			
383	Washington Trails Association email message submitted by 773 individuals. For the list of submitters, see page A-312.	A-356	A-461
384	Email message submitted by 23 individuals. For the list of submitters, see page A-318.	A-361	A-462
385	Mailed message submitted by 2 individuals: Gena Di Labio and Teresa Dix.	A-362	A-462

Responses to Common Issues

Several commenters identified themes or issues that were repeated in numerous comments. The most commonly-raised issues are summarized below, with an accompanying response.

Programmatic EIS

ISSUE: Many comments received stated that the DPEIS did not contain enough detail or analysis of potential impacts. There were also comments stating that several projects were not described in enough detail or were not developed enough to provide sufficiently detailed analysis. Some also commented that the DPEIS is part of phased review without clearly stating such.

RESPONSE: This is a programmatic evaluation that complies with SEPA rules. Programmatic review occurs on broader actions, such as plans, policies, or programs, rather than on specific, single-site projects. As a result, there is generally more flexibility in preparing a PEIS because there is less detailed information available on the environmental impacts. A programmatic EIS will provide discussion in more general terms, with subsequent review providing more detailed review once specific projects and details are identified. A programmatic EIS is inherently a phased review. The programmatic EIS provides a comprehensive understanding of impacts, so that the broader consequences and tradeoffs associated with the Icicle Strategy can be evaluated. This provides general types and magnitude of potential impacts.

This PEIS included detailed review when available. The amount of detail varied by Alternative based on the level of information available or development of projects making up the various alternatives. Once projects and elements within the Preferred Alternative are more refined, project level environmental review will occur. Project level environmental review may be satisfied by adoption of the programmatic EIS or supplemental EISs depending on the threshold determinations of individual permitting agencies, and will include more specific impacts analysis and mitigation measures where appropriate. NEPA must also be completed for projects with a federal nexus.

In response to comments about project detail and development, a programmatic SEPA review was launched at the earliest possible point in programmatic development to allow decision-making to be guided by the environmental review process. Because of this, some projects contained within the action alternatives were somewhat conceptual in nature, and less detailed analysis was conducted as a result. Projects and impacts were described in as much detail as possible based on information available at the time of writing.

Alternatives

ISSUE: Several comments discussed the alternatives considered in the DPEIS. These comments included a desire to see alternatives not considered (i.e. dam removal or LNFH removal) included as a Program Alternative, concern about a "true" No-action Alternative where no projects are completed, and a desire to see an alternative that did not include projects within the ALWA.

RESPONSE: The development of the alternatives considered in the PEIS is detailed in Chapter 2. The co-leads relied heavily on comments received during the SEPA scoping to develop several different alternatives. Each alternative can achieve the goals established in the Guiding Principles, as described in section 1.5. Several alternatives were recommended during the SEPA scoping phase that were not considered for further analysis. These are described in section 2.11. These include reservoir removal, findings of water right relinquishment as part of environmental review, and removing the LNFH.

Per WAC 197-11-786, a reasonable alternative is one that could feasibly attain or approximate the proposal's objective. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives of increasing instream flow or improving agricultural reliability. More detail is provided in Section 2.11. One commenter noted that in the Uinta Wilderness, dam removal occurred. However, the project in the Uinta Wilderness is not analogous because of water storage lower in the basin that was used to substitute high lake storage. Replacement storage does not exist in the Icicle Creek Subbasin. Chelan County has evaluated a multitude of new storage sites throughout the Wenatchee basin as part of watershed planning, which did not prove to be feasible.

The removal of LNFH did not receive additional consideration because it was determined that the goal of protecting tribal fish harvest and improving sustainability of LNFH could not be reached through LNFH removal. Additionally, LFNH provides mitigation for Grand Coulee Dam. An alternatives analysis was conducted by USFWS to determine the best means of continuing hatchery production to mitigate fish impacts of the Grand Coulee Dam. That analysis reviewed the option of removing LNFH and found that upgrades and improving operation of the current facility was preferred. More detail is provided in Section 2.11.

Water right relinquishment for IWG water right holders was also not considered as a Program Alternative in the DPEIS. There were also several comments received about the DPEIS not including a relinquishment analysis. Relinquishment was not considered as an alternative or as part of the DPEIS because a relinquishment analysis is conducted during water right permitting, not during environmental

review. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are also numerous exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.

In response to concerns over projects being included in the No-action Alternative, the purpose of the No Action Alternative is to describe what would likely occur if the proposed program or plan did not proceed, not what would occur if no projects were pursued within the Icicle Creek Subbasin. Those projects could proceed more slowly, for different purposes than the Icicle Strategy, or not optimized or integrated with one another. However, a No Action Alternative that ignores likely project development is not a true baseline for comparison of other alternatives. Based on discussions with Icicle Work Group members, the co-leads believe several projects would likely be pursued should the Icicle Strategy not proceed. The description of the No-action Alternative was the co-leads attempt to accurately describe likely actions that may occur should no action be taken on the Icicle Strategy.

Regarding comments that there was no alternative that focused on projects outside the ALWA, Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads included information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. In that event Eightmile Lake would only meet irrigation district agricultural reliability, without regard to instream flow or domestic use benefits outlined in the Guiding Principles. This is discussed in section 2.3.1 of the PEIS. Finally, including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.

Conservation

ISSUE: Many comments stated a desire for increased conservation measures to be included in the Program Alternatives.

RESPONSE: Each Program Alternative includes conservation elements. These include canal and lateral piping as part of the COIC Irrigation Efficiencies and Pump Exchange project, up to 10 cfs of conservation improvements within IPID in accordance with the IPID CWCP, up to 20 cfs of conservation improvements at LNFH, and funding dedicated to domestic conservation improvements.

More detail regarding the specific domestic conservation improvement projects will be

developed once this element moves to project planning. However, to help address concerns raised by commenters regarding lawn watering, the domestic conservation element of the Preferred Alternative will include water conservation opportunities for lawn reduction that can extend domestic and agricultural irrigation supplies, consistent with the Guiding Principles. More detail regarding this was provided in Chapter 2.

Supplemental or Revised DPEIS

ISSUE: The co-leads received several comments that indicated a desire for the co-leads to revise or issue a supplemental DPEIS prior to issuing the FPEIS. The reasons listed for this ranged from a desire for more information, to the removal of Alternative 4 or other specific elements from the DPEIS, and an additional opportunity to review prior to the issuance of the FPEIS.

RESPONSE: Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating a proposal's probable significant adverse environmental impacts. While there has been some modification in the document between the draft and final stages of this document, the proposal has not changed in a significant way, and new information has not been found indicating that new probable significant adverse environmental impacts are likely.

The co-leads have also addressed comments concerning level of detail in the previous section describing the programmatic nature of this PEIS, including future project-level and NEPA review as appropriate.

Some commenters recommended narrowing the scope of the PEIS by removing specific projects/elements or Alternative 4 from consideration and re-releasing the DPEIS. However, the co-leads elected not to limit the number of alternatives considered in the PEIS which were all developed in response to scoping comments. Some commenters desired increased storage in the basin, which was the genesis for Alternative 4, and indeed Alternative 4 is the most adaptable to climate change. The co-leads analyzed a range of alternatives in the PEIS that all meet the objectives of the Icicle Strategy. Including this range of alternatives is required by SEPA. While the co-leads reviewed several Alternatives, a Preferred Alternative was selected that balanced objectives and impacts.

NEPA Integration

ISSUE: Many comments were received regarding NEPA. Several comments sought to point out that NEPA and SEPA are separate processes with different requirements, some were concerned the NEPA would not be performed on projects within the ALWA, and several stated that the USFS should be lead agency on projects within the ALWA.

RESPONSE: The co-leads met with the USFS, USFWS, and Bureau of Reclamation before launching SEPA scoping for the PEIS to develop a NEPA/SEPA integration strategy. The co-leads understand the NEPA requirements are not met through this PEIS. NEPA lead agencies will determine what additional analysis may be required to meet NEPA rules. An appropriate lead agency will be determined based on NEPA rules.

The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions, land ownership, or funding. The co-leads envision that project-level NEPA will occur for projects with such a nexus. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2.

The lead agency for NEPA review will depend on permitting requirements and NEPA rules. The USFS will likely serve as lead agency for projects within the ALWA that require a USFS permit. Per the USFS comment letter, coordination will occur at the project level for any projects that may have permitting actions required by USFS. Project-level detail regarding permitting and NEPA integration will also be provided during project-level SEPA review.

Wilderness

ISSUE: Numerous comments were received that expressed support for wilderness, wilderness values, and public land. Several also expressed concern with wilderness impacts or Wilderness Act compliance. The primary concern related to Wilderness Act compliance was that the IPID easements are not valid and projects cannot be built in the ALWA.

RESPONSE: The co-leads recognize the importance of the ALWA to the Icicle Creek Subbasin and understand that many care deeply about the wilderness area. Because of this, the co-leads analyzed the impacts of the alternatives on the wilderness character of the ALWA. The co-leads generally found the impacts of the Preferred Alternative would be less than significant at the programmatic environmental review stage. Specific details are provided in Section 4.17.

The FPEIS provides general language from the IPID easements and applicable wilderness regulations to provide a comprehensive understanding of the proposal and issues. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID, not as a part of programmatic environmental review. Per USFS's comment letter (Letter 4), this will occur during project level planning.

The IWG and co-leads will work with the USFS on this issue as they move to project-level review and implementation on the Preferred Alternative to ensure compliance with all applicable rules and regulations. This will likely include a minimum tools analysis and potentially other mitigation measures to minimize wilderness impacts.

Alternative 4

ISSUE: Several commenters expressed blanket opposition to Alternative 4 or opposition to storage enhancement elements included in Alternative 4. The reasons for this opposition included concern about recreation, wilderness, and aesthetic values.

RESPONSE: The co-leads understand the concerns listed by commenters. Alternative 4 was not selected as the Preferred Alternative in the FPEIS.

Comment Letters

Comment Letter 001

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
Columbia-Cascades Area Office
1917 Marsh Road
Yakima, WA 98901-2058

IN REPLY REFER TO:

CCA-1604
2.1.4.17

JUL 3 0 2018

VIA ELECTRONIC MAIL AND U.S. MAIL

Mr. Mike Kaputa
Director, Natural Resource Department
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801

Subject: Bureau of Reclamation Comments on the Draft Programmatic Environmental Impact Statement for the Icicle Creek Water Resource Management Strategy, Chelan County, Washington

Dear Mr. Kaputa:

The Bureau of Reclamation is responding to your letter inviting comments of the Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Water Resource Management Strategy (Icicle Strategy). Reclamation thanks you for the opportunity to review and comment on the DPEIS.

1-1 As a result of our review, Reclamation requests that Leavenworth National Fish Hatchery (LNFH) projects be removed from the five action alternatives presented in the DPEIS. Those actions are the responsibility of federal agencies that are not participating in the preparation of the DPEIS as co-lead agencies. For those federal agencies, the National Environmental Policy Act (NEPA) provides one of the most essential and powerful tools for informed decision making to avoid a premature, arbitrary, or preordained outcome. Reclamation wants to ensure NEPA is implemented in a manner that properly fulfills its purpose of providing informed decision making for the LNFH. To date, of the federal actions identified in the DPEIS alternatives, Reclamation has only initiated NEPA for the Snow Lake Water Control Valve Replacement Project (https://www.usbr.gov/pn/programs/ea/wash/snowlake/index.html).

Nevertheless, Chelan County and the Washington State Department of Ecology included LNFH projects in each alternative with an unreliable assumption that those LNFH projects will be approved through the federal NEPA process. Because NEPA has not been initiated on other projects listed, but those projects are still included in the DPEIS, the public could mistakenly assume Reclamation and the U.S. Fish and Wildlife Service (Service) have already decided what projects move forward to implementation. It is possible that through the NEPA process, Reclamation and the Service will choose not to implement a project or find an alternative that is

Comment Letter 001

1-1 as good as or better than the proposed project. If this were to be the case, the analysis in the DPEIS could be rendered unreliable.

1-2 We would also like to note that LNFH is owned and operated by the Service, and Reclamation has operation and maintenance funding responsibility. Therefore, Reclamation and the Service are co-lead agencies for any proposed undertakings affecting LNFH.

Thank you for your time and consideration of our comments. Should you have any questions or concerns with our comments, please contact Ms. Christina Davis-Kernan, Technical Projects Program Manager, at 509-575-5848, extension 284, or by email at cdaviskernan@usbr.gov, or Ms. Elizabeth Heether, Environmental Protection Specialist, at 509-575-5848, extension 341, or by email at eheether@usbr.gov.

Sincerely,

Dawn A. Wiedmeier
Columbia-Cascades Area Manager

cc: Mr. Dave Irving
Leavenworth Fisheries Complex Manager
12790 Fish Hatchery Road
Leavenworth, WA 98826

dave_irving@fws.gov

Comment Letter 002

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
Central Washington Field Office
215 Melody Lane Suite 103
Wenatchee, WA 98801-8122

JUL 2 6 2018

In Reply Refer To:
01EWFW00-2018-TA-1437
X Ref: 0IEWFW00-2016-TA-0800
Hydrologic Unit Code: 17-02-00-11-04

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, Washington 98801

Dear Mr. Kaputa:

This responds to your request for scoping comments on the State Environmental Policy Act (SEPA) Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Strategy. The DPEIS evaluated the potential environmental impacts of implementing a comprehensive water resource management plan for the Icicle watershed. Potential projects are identified in five alternatives which were evaluated at a programmatic level along with a no-action alternative. The DPEIS is intended to serve as the basis for future project-level environmental review and analysis.

2-1 The U.S. Fish and Wildlife Service's (Service) Central Washington Field Office submitted a letter on May 11, 2016, in response to a scoping request for developing the DPEIS. In that letter, we expressed our support for developing the DPEIS to assess projects that could provide a more secure water supply for agricultural and municipal uses while also advancing the conservation of Endangered Species Act (ESA) listed species. Additionally our letter recommended that the Chelan County Natural Resources Department, Washington Department of Ecology, Washington Department of Fish and Wildlife and the Service collaborate under the Fish and Wildlife Coordination Act (FWCA), as amended (16 U.S. C. 661 *et seq.*), to produce a single Coordination Act Report (CAR) that assesses the effects of the Icicle Strategy, considers the fish and wildlife resources at risk, and recommends measures to protect, develop, and improve these habitats.

Due to the large number of projects in the DPEIS that have a federal nexus, the Service again recommends that a single CAR be prepared, this time concurrent with the preparation of the Final Environmental Impact Statement or a subsequent draft. Efficiencies can be gained through a comprehensive planning and reporting effort that satisfies the requirements of both SEPA and

Comment Letter 002

2-1 FWCA. Although not binding, federal agencies involved in water resource development projects must strongly consider the recommendations of the CAR to prevent loss or damage to fish and wildlife resources and to mitigate any unavoidable impacts. We look forward to future discussions regarding this possibility.

2-2 The Service also encourages continued coordination and collaboration with federal stakeholders as site-specific projects are developed and packaged for National Environmental Policy Act (NEPA) review and consultations in accordance with section 7(a)(2) and for implementation of priority recovery actions associated with section 7 (a)(1)of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Thank you for your assistance in the conservation of listed species. If you have questions about this letter or your responsibilities under the Act, please contact Cindy Raekes at the Central Washington Field Office in Wenatchee at (509) 665-3508, extension 2009 (e-mail: cynthia_raekes@fws.gov) or Sierra Franks at (509) 665-3508, extension 1880, of this office.

Sincerely,

for

Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

Comment Letter 003

United States Department of the Interior
U.S. Fish and Wildlife Service
Leavenworth Fisheries Complex
12790 Fish Hatchery Rd.
Leavenworth, Washington 98826
509 548-7641

July 30, 2018

Mr. Mike Kaputa, Director
Chelan County Natural Resources Dept.
411 Washington St, Suite 201
Wenatchee, WA 98801

Dear Mr Kaputa:

This letter is in response to your request for comments and input regarding the draft Programmatic Environmental Impact Statement (PEIS) evaluating alternatives that would meet the Icicle Work Group's (IWG) Guiding Principles. Please note that this memo is intended to complement earlier comments provided by the Service's Central Washington Field Office (dated July 26, 2018).

3-1 The Guiding Principles are a list of shared goals to 1) improve instream flow in Icicle Creek, 2) Improve sustainability of Leavenworth National fish hatchery (LNFH), 3) Protect Tribal Harvest Opportunities, 4) Improve domestic water supplies, 5) Improve agricultural reliability, 6) Enhance Icicle Creek habitat, and 7) Comply with State and Federal Laws and Regulations. After reviewing the draft PEIS we believe that it serves as good faith effort by all of the water users and other interested parties in Icicle Creek to work collaboratively and develop solutions together that help address these shared goals. As such the Fish and Wildlife Service continues to support the Icicle Strategy and the work of the IWG. We are committed to continued engagement and coordination between the projects being considered within the IWG and projects and activities planned to renovate and improve the sustainability of LNFH.

3-2 Our review of the alternatives reveals a suite of possible solutions that are comprehensive and do a good job of describing the breadth of possible actions that could be implemented. We are impressed by the detail provided in the document and are confident that it is a rigorous and thorough treatment of the pertinent environmental and project level issues. A number of the projects described in the four action alternatives are projects focused on LNFH infrastructure and operations. These LNFH specific projects are largely focused on reducing surface water use at the hatchery, evaluation of new rearing methods, improved effluent treatment facilities, addressing fish passage and screening issues at LNFH, and improving access to ground water

Comment Letter 003

3-2 resources. These project are all subject to evaluation under a separate federal NEPA process that is currently ongoing. As such it would be inappropriate for the FWS to advocate for a particular action or no action alternative until conclusion of the federal NEPA process is complete. For this reason, we are refraining from making detailed or specific comments to the draft PEIS.

If you have additional questions or concerns, please don't hesitate to contact me at your earliest convenience.

Sincerely,

David Irving
Complex Manager

Comment Letter 004

USDA United States Department of Agriculture Forest Service Okanogan-Wenatchee National Forest 215 Melody Lane Wenatchee, WA 98801 509-664-9200 Fax: 509-664-9280

File Code: 1950; 2320; 2670
Date: July 30, 2018

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Dear Mr. Kaputa,

The Okanogan-Wenatchee National Forest (Forest) has completed an initial review of the Icicle Creek Water Resource Management Strategy Programmatic Environmental Impact Statement (PEIS) that was prepared pursuant to the Washington State Environmental Policy Act (SEPA).

4-1 The PEIS describes a number of projects that are proposed to occur on National Forest System (NFS) lands, including within the congressionally designated Alpine Lakes Wilderness (Wilderness). Any actions proposed on NFS lands will require coordination with the Okanogan-Wenatchee National Forest to ensure that all applicable legal, regulatory, policy and Forest Plan requirements are met.

This includes, but is not limited to review pursuant to the Wilderness Act, National Forest Management Act, National Environmental Policy Act and Endangered Species Act. This would also include review for consistency with the Wenatchee National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan. Implementation actions located on NFS lands will require prior authorization from the Forest before proceeding.

Activities within the areas covered by a Special Warranty Deed (SWD) or a Ditch Act Authorization (PL 9999PL99-545) such as automation, in kind dam replacements, Klonaqua tunnels, geotechnical analysis, and other activities proposed within these reserved areas would need to be reviewed on a project specific basis. Given the complexity of these proposed projects, I recommend that the IWG engage the Forest early in the planning process for project level implementation. The earlier you engage on planning for implementation level projects the more time we will have to collaborate on the proposed project and develop and necessary mitigation.

We look forward to working with you to clarify next steps in the planning and coordination process. If you have additional questions please feel free to contact Erick Walker, Deputy Forest Supervisor at (509) 664-9308 or ewalker02@fs.fed.usewalker02@fs.fed.us

Sincerely,

MICHAEL R. WILLIAMS
Forest Supervisor

Caring for the Land and Serving People

Printed on Recycled Paper

Comment Letter 005

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
North Central Region • Region 2 • 1550 Alder Street NE, Ephrata, WA 98823
Telephone: (509) 754-4624 • Fax: (509) 754-5257

July 27th, 2018

Mike Kaputa, Director
Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: WDFW Comments – State Environmental Policy Act Draft Programmatic Environmental Impact Statement for the *Icicle Creek Water Resource Management Strategy*

Dear Mr. Kaputa,

Since 2012, the Washington Department of Fish and Wildlife (WDFW) has been an active member of the Icicle Work Group (Work Group). Within this forum, we work to ensure that the development and execution of the *Icicle Creek Water Resource Management Icicle Strategy* (Icicle Strategy) adequately addresses the needs of resident and anadromous fish and wildlife, and optimizes ecological function. In addition to our role within the Work Group, WDFW works to support Ecology's Office of Columbia River (OCR) mandate under RCW 90.90.005(2) to, "*aggressively pursue development of new water supplies for instream and out-of-stream uses*."

WDFW appreciates the deference provided by the Work Group and OCR to date, and the opportunity to provide comments on this Draft Programmatic Environmental Impact Statement (PEIS). WDFW would also like to acknowledge the value that OCR and the Chelan County Natural Resources Department bring to managing water resources in Icicle Creek. Our Agency strongly supports the integrated approach to water management exemplified by efforts such as the Icicle Strategy; indeed, it is often difficult to make progress on water management issues absent such an approach. We look forward to working with you to hone a final package of actions that best meets the Strategy's multiple benefit objectives.

WDFW promotes developing the Final PEIS in a way that clearly assesses positive and negative impacts from the following actions and different combinations thereof:

- Icicle Peshastin Irrigation District (IPID) Irrigation Efficiencies, Dryden Pump Exchange, and Full Pump Exchange
- Cascade Orchards Irrigation Company (COIC) Irrigation Efficiencies and Pump Exchange
- Domestic Conservation Efficiencies
- Leavenworth National Fish Hatchery Conservation and Water Quality Improvements
- Alpine Lakes Reservoir Optimization, Modernization, and Automation
- Eightmile Lake Storage Restoration

Comment Letter 005

Page 2

- Eightmile Lake Storage Enhancement
- Upper Klonaqua Lake Storage Enhancement
- Upper and Lower Snow Lakes Storage Enhancement
- Tribal Fishery Protection
- Habitat Protection, Enhancement, and Mitigation
- Fish Passage and Screening
- Water Markets
- Instream Flow Rule Amendment (WAC 173-545)
- Legislative Change to Overriding Consideration of Public Interest (OCPI)

General Comments

5-1 1. It is clear that water made available through the Icicle Strategy will be employed to bolster instream flows within Icicle Creek and provide a reliable source for out-of-stream uses within the Wenatchee Basin. This said, the specific allocations, management, and legal protection of water produced through the various iterations of actions is not clear. Further, there are questions pertaining to how this water will be managed for instream and out-of-stream uses downstream of Icicle Creek's confluence with the Wenatchee River. Given that OCR is a co-lead and the primary funder of the Icicle Strategy, WDFW suggests that project water flowing beyond the Wenatchee confluence follow the two-thirds out-of-stream, one-third instream, allocation mandated through RCW 90.90.010. Doing so would aid in achieving minimum instream flow targets established through WACs 173-545-050 & 060.

5-2 2. Water availability and corresponding allocations, e.g. reservoir refill reliability, should be attended to adaptively, as the benefits built upon these assumptions may erode over time. WDFW is concerned that potential, unforeseen, decreases in annual supply will be manifested in a corresponding decrease in instream flow given that out-of-stream uses typically receive preference. WDFW recommends that the Final PEIS ensure that supply assumptions and corresponding actions promote adaptive and phased management, and protect instream resources in perpetuity.

5-3 3. As per our comment letter submitted to the U.S. Bureau of Reclamation on January 8, 2018 (*Snow Lake Valve Control Structure Draft EA*), the timing and execution of construction may adversely affect resident terrestrial species. WDFW biologists recognize potential impacts affecting black bear (Ursus americanus), mountain goat (Oreamnos americanus), and wolverine (Gulo luscus). For example, the fall work window overlaps with wolverine and black bear denning periods. Impacts to mountain goats are to seasonal habitat use areas via disturbance and potential for direct interaction through human habituation and food conditioning (minerals accessed through urine, and loss of fear of humans).

5-4 In addition, claims that ESA-listed species are rarely documented in the area and that resident species will avoid adverse impacts by dispersing throughout the project area during construction are conclusory and insufficiently documented. The lack of documented observations likely indicates the level of surveying efforts, versus a verification of absence. The default approach by implementing parties should revolve

Comment Letter 005

Page 3

5-4 around the assumption that these species are present. Care must be taken to limit the amount of noise and potential interaction. WDFW looks forward to, and appreciates, the opportunity to help guide Best Management Practices (BMPs) and mitigating measures in future project-level environmental assessments.

5-5 4. WDFW recommends that, before project-level EAs/EISs are developed, the Icicle Strategy process include and fund pre- and post-project fish and wildlife surveying, along with monitoring during project implementation. Much of the data informing the presence and abundance of wildlife in the project areas is in need of being updated and expanded relative to the proposals within this Draft PEIS. Data gathered from these efforts should be incorporated into the project-level proposals to inform timing, location, BMPs, and mitigation. WDFW proposes that these efforts attend to the presence, distribution, and behaviors of at least the following:

- Northern Spotted Owls
- Amphibians
- Mollusks
- Mountain goats
- Black bears
- Wolverines
- Raptors
- Fishes

5-6 5. While the Icicle Strategy and Draft PEIS primarily attends to actions within the Icicle Creek Subbasin, the footprint of effects extends throughout the Wenatchee Basin. This applies to terrestrial as well as aquatic impacts. WDFW understands the challenges and complexities associated with meeting competing needs within the context of future development and protecting natural resources. Accordingly, we request that the co-leads consider and attend to the cumulative impacts resulting from the developments facilitated by Icicle Strategy actions.

Forest and shrub steppe resources will be impacted by future development within the Wenatchee Basin as a result of Icicle Strategy actions. History has repeatedly shown that development, regardless of mitigating efforts, will reduce and fragment habitat available to resident species. From a cumulative effects standpoint, reductions in habitat are correlated with reductions in species presence, complexity, health, and abundance. For example, development within low-lying habitat can diminish food source accessibility, particularly during the winter. Limiting accessibility to proper nourishment will result in weaker, less productive, populations throughout the food chain. Development also results in habitat losses beyond the boundaries of the direct habitat alteration. This is especially true if development occurs within a previously undisturbed area. New development adjacent to existing development has a lower impact than development within and surrounded by native habitat, e.g. fragmentation in addition to direct loss.

WDFW requests that the co-leads provide information pertaining to how water supplies developed through the Icicle Strategy will correspond to future development on an

Page 4

acreage and geographic basis.

6. WDFW would like to see additional information attending to project benefits, new project combinations, long and short-term impacts, resource management, and mitigation actions incorporated into the Final PEIS and supporting documentation. One way to accomplish this could be to issue a supplemental Draft PEIS once the scope and combination of prospective actions have been refined. This process may best allow interested parties to understand and comment on the implications of different incarnations of the Icicle Strategy. These issues could also be resolved through careful consideration of comments on this Draft PEIS especially if accompanied by collaborative development of the final document.

7. Given the implications and challenges of modifying flows within Icicle Creek for instream and out-of-stream uses, WDFW recommends the expansion of the Instream Flow Subcommittee (IFS). Monitoring and adaptive management within this context is paramount to ensuring instream habitat is not only protected, but enhanced. The IFS and its operations should receive additional resources as the Icicle Strategy moves towards implementation and include tribal, federal, and NGO representatives.

Irrigation District Efficiencies and Upgrades

1. WDFW supports infrastructure upgrades and corresponding efficiencies implemented by IPID and COIC. Depending on funding source, there may be implications pertaining to how 'saved' water is reallocated amongst instream and out-of-stream uses. In regard to both IPID and COIC pump-back projects, WDFW favors the pump station locations residing within the Wenatchee River, preferably downstream of the confluence with Icicle Creek. In the event that the latter is infeasible, an assessment of impacts to the bypass reach should be conducted and mitigated for in the event that it adversely impacts instream flow and associated habitat.

2. It is unlikely that IPID would remove the diversion structures located on Icicle Creek, as they would likely reside as a contingency. This narrative has been consistent throughout the Work Group. That said, WDFW encourages exploration of eventual replacement of the existing diversion structure with a roughened channel that allows sufficient water diversions and improves fish passage, recreational opportunities, and aesthetics.

Domestic Conservation Efficiencies

1. Information on land use trends should be incorporated into the long-term cost and feasibility analyses guiding large-scale infrastructure upgrades, along with supply allocation. Stakeholders in and outside of the Work Group have raised valid concerns about these trends, as some have already become evident. This is exemplified where productive croplands transition to amenity-based landscapes. In adhering to the 2050 planning horizon and the prospective change in land use, the cities of Leavenworth, Peshastin, and Cashmere should bring forth a strategy for reducing water consumption. A community-driven approach to move toward BMPs for residential water use should be part of the Icicle Strategy, as illustrated within Yakima Basin Integrated Plan.

Comment Letter 005

Page 5

Alpine Lakes Reservoir Optimization, Modernization, and Automation

1. WDFW acknowledges the many benefits associated with modernizing storage infrastructure, particularly the improved capabilities of optimizing the timing and volume of releases. Thorough monitoring of aquatic and terrestrial habitats and associated species affected by the increased drawdown frequency will be needed as these projects move forward. Fluctuations in lake levels can alternately make available and/or reduce fish, amphibian, and wildlife habitat, leading to potential adverse impacts through drying or flooding habitat at the "wrong" times. WDFW expects and requests that resources are made available to ascertain baseline habitat conditions and monitor changes affecting aquatic and terrestrial species. In addition, changes in flow regimes will also require monitoring. The public funding proposed to improve these private facilities adds to the argument for strong monitoring and mitigation of environmental impacts.

2. As mentioned in our 2016 Draft PEIS scoping comments, storage water releases should be prioritized and balance to maximize benefits to aquatic species' various life stages. Specifically, critical species and pertinent life stages include: steelhead (adult, rearing); rainbow trout (adult, rearing); bull trout (adult/sub-adult, rearing); cutthroat trout (adult, rearing); and lamprey (adult). We look forward to working with the co-leads and Work Group members in developing storage release scenarios in a manner that meets the needs for both instream and out-of-stream uses.

Eightmile Lake Storage Restoration

1. WDFW's comments above touch on some expectations related to restoring infrastructure at Eightmile Lake. Of particular concern is how water will be managed in the event that both the infrastructure and Ecology's water right determination allow for the full utilization of IPID's 2,500 AF storage right, providing an additional 900 AF for out-of-stream uses. The consistent narrative heard within the Work Group is that this volume will be donated, or transferred, to the Department of Ecology. While this volume of water may not be considered a "new" supply as per RCW 90.90.010, WDFW would like to see at least one-third of this volume permanently protected instream from the outlet at Eightmile to the Columbia River mouth.

2. The Draft PEIS states at p. 63 that, "[b]ecause releases will be utilized to mitigate consumptive domestic use when the instream flow rule is not met, the quantity made available for domestic use will be stretched to 3,600 acre-feet when accounting for natural flow availability." This statement is opaque and reinforces the concerns WDFW staff have already expressed about the accounting of current and prospective water use within WRIA 45. Please explain how IPID's paper water right of 2,500 AF would be "stretched" to 3,600 AF.

3. The Draft PEIS indicates that the aforementioned 900 AF will be repurposed for domestic use. Historically, and currently, this entire volume of water has not been utilized for consumptive uses. How does Ecology plan to employ non-consumptive water for consumptive purposes?

Comment Letter 005

Page 6

5-17 4. Calculations on p. 65 indicates 1,125 AF, not 900 AF, of additional water is associated with this action. What is the reason for the difference?

5-18 5. On May 9, 2018, WDFW gave verbal authorization for an Emergency Hydraulic Project Approval (HPA) permit to IPID to perform work needed to prevent a catastrophic failure at the dam due to high spring runoff flows and projected impacts from the 2017 Jack Creek fire. Catastrophic failure could result in loss of life and/or property in Icicle Canyon and an evacuation warning system is currently in place until the emergency work is completed and the dam temporarily stabilized. The Emergency HPA requires mitigation for unavoidable impacts because of the emergency actions; the IPID will be required to address these impacts after the emergency condition has passed. This is a separate action, with separate mitigation from that proposed in the Draft PEIS.

Alpine Lakes Storage Enhancement

5-19 1. WDFW recommends that the co-leads choose not to pursue these projects. The increased lake levels, drawdown amounts, and invasive nature proposed by these actions are highly impactful and come with substantial legal uncertainty and litigation risk. There are other projects within the Icicle Strategy that can significantly improve in- and out-of-stream water supply through efficiencies, automation, pump-backs and other improvements; we recommend that these options be exhausted. Should alternatives eventually prove insufficient, these projects could be considered anew.

Habitat Protection, Enhancement, and Mitigation

5-20 1. It is unclear how habitat projects in the lower reaches of Icicle Creek would compensate for short- and long-term construction impacts in the headwaters or for the cumulative impacts of these projects. Habitat mitigation is intended to compensate for unavoidable impacts. Accordingly, there must be a robust analysis illuminating how habitat protections and enhancements proposed within the lower reaches will provide 'equal or better' habitat function relative to project impacts upstream. If a clear connection cannot be developed, restoration within lower reaches may be better viewed as additional to mitigation required upstream. We look forward to working with you to develop appropriate mitigation in terms of scale, location, and type.

5-21 2. WDFW disagrees with the assertion that land acquisitions proposed within the Upper Wenatchee Community Plan (UWCP), "will be sufficient to provide 'commensurate compensation for impacts to fish and wildlife resources' in the Icicle Creek basin" given that all lands specified within the UWCP reside outside of the Icicle Creek Subbasin. WDFW encourages this action within the context of additionally. That is, acquisition and subsequent protection/restoration of lands adjacent to the Icicle Subbasin would be additional to any required mitigation.

5-22 3. The UWCP map on page 65 is not legible. Please provide a better map.

5-23 4. Project level EA/EISs will be necessary to determine specific mitigation needs, which may or may not be met through compliance with local, state and federal permitting as is stated in the Draft PEIS. Specific, project-level information will be required to evaluate

6

Comment Letter 005

Page 7

5-23 the actions necessary to avoid and minimize adverse impacts, and may necessitate additional mitigation.

Fish Passage and Screening

5-24 1. WDFW views the fish screen upgrades as mandatory, compliance-driven actions. Our Agency continues to work in concert with the Work Group and outside entities in forwarding fish screen compliance in concert with anadromous passage at the boulder field. WDFW is concerned about how the interplay between screening and fish passage is being characterized. Specifically, the Draft PEIS claims that screens must be brought into compliance before passage is implemented. To the contrary, federal and state biologists have indicated that 1) there will be a lag in upstream migration that could take up to two years, 2) anadromous passage, while infrequent, has already been recorded, and 3) potential funding entities have stipulated that passage at the boulder field must be assured before the funding for screen construction is made available. The claim in the Draft PEIS that the Work Group, as a whole, insists that the screens are updated before there is passage at the boulder field does not reflect the perspective of WDFW.

5-25 2. Due to the presence of non-native species such as eastern brook trout and lake trout in Eightmile, Nada, Lower and Upper Snow Lakes, WDFW does not recommend up- or downstream passage from these lakes in order to protect bull trout and other native fish from these non-native species introduced decades ago. The presence of non-native fish should be considered when planning construction projects at these lakes and the operation of their dams. Efforts should be made to ensure that the non-native fish species are not passed downstream.

Water Markets

5-26 1. WDFW requests that the co-leads and operators of the proposed water market coordinate with Agency staff. WDFW wants to assure that the movement/transfer of water rights and utilization of wet water benefits instream habitat and aquatic species.

Instream Flow Rule Amendment

5-27 1. It is unclear within the Draft PEIS who the recipients of the 0.5 cfs within the Icicle Subbasin will be. One is left to wonder if this water will be made available to future domestic wells located within the confines of the Subbasin, the City of Leavenworth, or some combination thereof. Please specify how this water will be apportioned amongst its recipients both in terms of consumptive use and total withdrawal.

5-28 2. As evident within the Wenatchee Reserve (Reserve) and the Draft PEIS, the accounting of water under the Reserve may not reflect actual withdrawals from the system. Reserve calculations merely account for consumptive use. Generally speaking, the Department of Ecology assumes that 70-80 percent of water withdrawn for consumptive use is 'returned to the system'. Based upon these assumptions approximately 1.7 – 2.5 cfs would be withdrawn from the Icicle Subbasin with no guarantee that the non-consumptive portion would return within the same Subbasin or in time to offset reductions during critical flow periods. This is particularly true in the event that the City of Leavenworth is the recipient of this water. As stated in our recent water right review attending to the City of

7

Comment Letter 005

5-28 Leavenworth's application to access the Reserve, "[WDFW] propose[s] that the well field be considered the primary source of water, rather than Icicle Creek."

5-29 3. As per WAC 173-545-090 (Wenatchee Reserve):
(1)(iv) "Icicle Creek near Leavenworth: Up to 0.1 cfs. Reservation of an additional 0.4 cfs will be considered after completion of flow restoration efforts targeting habitat between the city of Leavenworth and Icicle Irrigation District's point of diversion and the U.S. Fish and Wildlife Service hatchery return. Rule making will be required to establish this additional reservation."

(3) "All water uses from the reservation must implement water use efficiency and conservation practices, consistent with the watershed plan."

(5) "All water uses relying on the reservation must be measured and reported. The manner and form of such measuring and reporting to support the accounting system for the reservation water uses may be specified by the department, Chelan County, or by a local government, utility, or other public water purveyor in a permit, approval, license, or order. An accounting of all appropriations from the reservation shall be maintained by the department and the Chelan County natural resource department. The accounting shall, at a minimum, include estimated and measured use in gallons per day."

(8) "The department shall notify both Chelan County and the planning unit or its successor, in writing, when it determines that fifty percent, seventy-five percent, and one hundred percent, respectively, of the total reservation is appropriated. The department shall also issue a public notice in a newspaper of general circulation for the region at the same three junctures."

(9) "The department shall require measuring and reporting for permitted surface and groundwater appropriation from the reservation. If more accurate water use data are needed, the department may, after consulting with the planning unit and Chelan County, require measuring and reporting for groundwater withdrawals otherwise exempted from permit requirements under RCW 90.44.050."

Legislative Change to OCPI

5-30 1. Notwithstanding the merits of limiting actions and impacts within the Alpine Lakes Wilderness proposed through Alternative 3, it brings forth a potential fatal flaw. In seeking to, "waive impacts to instream flows when conservation and pump-exchange-based supplies cannot perfectly meet demand required to provide domestic reliability," the co-leads contemplate a precedent with far-reaching implications. Specifically, rulings set forth through *Swinomish* and *Foster/Yelm* reflect the need to protect minimum instream flows in light of development. The establishment of minimum instream flows throughout the State are the direct result of over-allocation and adverse ecological effects, versus an abundance of a water within a given reach. Given that minimum instream flows within Icicle Creek are often unfulfilled, this action arguably conflicts with the Strategy's Guiding Principal to improve instream flow.

5-30 While WDFW understands the desire to provide new and reliable water for development, our Agency cannot support actions that erode policies that protect natural systems from further degradation. Protecting wilderness values is not exclusive of downstream ecological necessity. The out-of-stream interests benefiting from this proposed action and Icicle Strategy in general can and should contribute more to shoring up inefficient use. Such improvements should be realized before seeking a legislative fix that should be used sparingly, if ever.

5-31 **Alternative Portfolio Composition**
Guided by our Agency's Legislative mandate to, "[p]rotect and enhance fish and wildlife and their habitats," WDFW encourages the co-leads to develop a portfolio of actions that provide water for instream and out-of-stream uses while simultaneously limiting ecological impacts, especially within the Alpine Lakes Wilderness. WDFW encourages the development of a new alternative that includes and analyzes following actions, in no particular order of preference. We believe that these actions will maximize in- and out-of-stream benefits, provide significant climate resilience, and best protect upper watershed/Wilderness resources.

- Icicle Peshastin Irrigation District (IPID) Irrigation Efficiencies, Dryden Pump Exchange, and Full Pump Exchange
- Cascade Orchards Irrigation Company (COIC) Irrigation Efficiencies and Pump Exchange
- Domestic Conservation Efficiencies
- Leavenworth National Fish Hatchery (LNFH) Conservation and Water Quality Improvements
- Alpine Lakes Reservoir Optimization, Modernization, and Automation
- Eightmile Lake Storage Restoration
- Tribal Fishery Protection
- Habitat Protection, Enhancement, and Mitigation
- Fish Passage and Screening
- Water Markets

Again, WDFW strongly supports the process that has led to the development of this Draft PEIS, we appreciate the opportunity to provide these comments, and we look forward to working with you to hone and implement a preferred Icicle Strategy alternative.

Sincerely,

Jeff Dengel, Region 2 Environmental Planner

CC: James Brown, Region 2 Director
Carmen Andonaegui, Region 2 Habitat Program Manager
Michael Garrity, Columbia River and Water Policy Manager

Comment Letter 006

Comment Letter 006

July 30, 2018

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201, Wenatchee WA 98801

Dear Director Kaputa,

Please accept this document as the joint comments of the Icicle Creek Watershed Council (ICWC) and Trout Unlimited (TU) on the Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Water Resources Management Strategy (Icicle Strategy).

ICWC is a local non-profit that has been working since 1997 to improve the ecology of Icicle Creek. ICWC is a sub-committee of the Icicle Canyon Coalition, a 501(c)(3), non-profit organization created in 1994 to address environmental issues associated with the Icicle Creek Watershed.

TU is a national organization with more than 50 years of experience working to conserve, protect, and restore North America's coldwater fisheries and their watersheds. We are leaders locally and nationally working with irrigators, cities, ranchers, federal and state agencies and others on projects that enhance habitat and flows for fish and local communities. In addition, the Icicle Creek Basin is the home watershed for the Trout Unlimited Icicle Valley Chapter. All reaches of Icicle Creek offer important recreational fisheries for many of our local members.

The purpose of the DPEIS is to evaluate and review strategies and alternatives designed to meet seven Guiding Principles established by the Icicle Work Group (IWG) by improving water resources management with state, federal and tribal mandates. The Guiding Principles include:

1. Improve Instream Flows
2. Improve sustainability of the Leavenworth National Fish Hatchery
3. Protect tribal and non-tribal harvest
4. Improve domestic water supply
5. Improve agricultural reliability
6. Enhance habitat in Icicle Creek
7. Comply with all state/federal laws and Wilderness Acts

ICWC and TU have been members of the IWG since its inception in 2012. We support collaborative efforts to develop a holistic water resources management strategy for Icicle Creek and applaud the work of IWG member groups and other participating stakeholders. The needs of fish, farms, and families must be balanced. It is imperative a comprehensive Icicle Creek water resources management strategy ensure healthy ecosystems, a robust economy, and shared costs of the Icicle Strategy among the various users.

6-1 We also appreciate the work of Chelan County and the Washington State Department of Ecology (Ecology) Office of the Columbia River (OCR), the IWG co-conveners, and their consultants to develop the DPEIS which lays out the alternatives and background information for the Icicle Strategy. Unfortunately, despite its 1600 plus pages and 5 years of planning efforts we believe the document lacks sufficient information. We offer the following comments to convey our concerns with the DPEIS, request additional information, and suggest a revised draft be provided for a second round of public comments before Chelan County and OCR develop a preferred option.

GENERAL COMMENTS

6-2
1. **Clarification on what can and cannot happen within the Alpine Lakes Wilderness is essential before we know what projects can or even should move ahead for further environmental review or be included in a potential Alternative.** All the Alternatives (except the No-Action Alternative) rely on projects that require close collaboration and legal interpretation from the United States Forest Service to ensure that the projects comply with all federal laws, thus satisfying the Guiding Principles. These include all projects within the Alpine Lakes Wilderness. The May 25, 2018 letter from Pacifica Group to Ecology Director Bellon and OCR Director Tebb outlines many of these concerns.

6-3
2. **We do not want to see any delayed compliance-related upgrades at the hatchery as a result of being a project element of the DPEIS.** We fully support the Guiding Principle to improve sustainability of the Leavenworth National Fish Hatchery (LNFH) and have continued to support requests for federal funding to allow hatchery infrastructure improvements. To-date, we have not seen signs of sufficient federal support to ensure important projects such as screening, fish passage and water efficiencies will take place. Without some funding assurance the LNFH sustainability goal cannot be satisfied.

6-4
3. **Projects considered for early implementation need to be clearly identified and evaluated to understand costs/benefits as a function of project sequencing.** It has been suggested by one IWG consultant (Aspect Consulting) and co-conveners that some projects might be ready for implementation without additional environmental review, but information about specific projects and sequencing of implementation from IWG consultant and co-conveners have been vague. This comment reiterates of one of the recommendations that we and numerous other entities proposed during the public scoping process for the DPEIS.

6-5
4. **Changes to Icicle-Peshastin Irrigation District (IPID) water use and water rights will rely on a tentative determination of the water rights including a beneficial use analysis.** Since all the Alternatives rely on an IPID water right change and approval by their Board

of Directors, without a tentative determination and associated beneficial use analysis it remains impossible for us to understand what options exist for IPID-related projects. 6-5

5. **The DPEIS should provide clarity or a time-scale for what "short-term" and "long-term" mean with respect to the 60 cfs/100 cfs short-term and 250 cfs long-term instream flow Guiding Principle goals for discharge in lower Icicle Creek.** The DPEIS provides data as far in the future as the 2080s – is this long-term? Furthermore, the DPEIS should provide direction for what projects/actions may be implemented long-term that would help achieve the 250 cfs goal. 6-6

6. **The DPEIS incorrectly used non-drought and drought "scenario" data derived from exceedance probabilities using recent discharge observations to evaluate instream flow impacts resulting from proposed actions, both for current conditions and projected future conditions.** It should instead use 2014 and 2015 indicator years (2014 for non-drought conditions and 2015 for drought conditions) as stated in Chapter 2, pages 2-17 to 2-18. Using average exceedance scenarios effectively washes out (under-predicts) low flow conditions, a fact recognized by the DPEIS, and is not appropriate for demonstrating satisfaction of the instream flow Guiding Principle. The indicator year method should also be used to evaluate the impacts of each Alternative under future climate conditions using the University of Washington Climate Impacts Group report (Appendix F). 6-7

7. **Potential environmental impacts associated with flow augmentation using Wilderness lakes are not adequately evaluated.** We commend the methodology applied by Washington Department of Fish and Wildlife (WDFW) in their Icicle Creek Tributary Monitoring Report and agree with identified data gaps. We recommend more observations and additional affected creeks should be included, as well as analysis of the lakes themselves, to ensure protection of aquatic ecosystems and recreational fisheries. Documents that may be useful when determining how to assess current conditions and potential impacts include *Multi-Metric Index Development for Biological Monitoring in Washington State Streams* (Ecology, 2003) and *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration* (USGS and USEPA, 2016). 6-8

8. **The DPEIS does not include an adequate range of alternatives, and it is premature to select a preferred alternative.** We suggest the addition of a pure conservation Alternative to a revised DPEIS. Rigorous conservation measures could enable satisfaction of the Guiding Principles and meet future water needs while minimizing impacts to Wilderness by eliminating the need for other expensive and controversial projects. A new pure conservation Alternative should include the IPID Full Piping and Pump Exchange and would not necessitate the OCPI legislative fix. Including information about ag land conversion and the accompanying water conservation opportunities is appropriate and should be included in any suite of actions. 6-9

Comment Letter 006

DETAILED COMMENTS

Water Rights

TU and ICWC applaud the willingness of IPID to participate in the IWG despite what will require an open, public conversation about their water rights. However, we have also been clear through our IWG participation that certainty about IPID water rights is key to understanding what options might be available under the IWG. Changes to IPID water use and water rights will rely on a tentative determination of the water rights including a beneficial use analysis. In addition, the DPEIS proposes to convert IPID's historical irrigation water right to include instream flow and municipal use by obtaining a new secondary use permit to authorize the re-operated water uses. Since all DPEIS Alternatives rely on a change to IPID water rights, approval by Ecology (and potentially USFS), and approval by IPID's Board of Directors, it remains impossible for us to understand what options exist until these uncertainties are addressed. TU and ICWC are concerned that nearly all Alternatives rely on proposed but unconfirmed quantities of water. 6-10

Instream Flow, Non-Drought and Drought Conditions/Scenarios, and Climate Change

1. The IWG Guiding Principles include instream flow goals for non-drought and drought conditions. The description of how the DPEIS defines these conditions is found in Chapter 2, pages 2-17 to 2-18. The DPEIS states that both 'indicator' years (i.e., observations from specific years – 2014 for non-drought and 2015 for drought) as well as exceedance probabilities (50% for non-drought and 80% for drought) were used. Exceedance probabilities can be difficult to understand. It would be helpful if these non-drought and drought exceedance scenarios were more explicitly defined, particularly for interested members of the public with less technical backgrounds. Furthermore, the years of observation for each exceedance probability scenario (50%/non-drought and 80%/drought) should be provided along with the associated discharge data. Discharge data for indicator years should also be provided. An explanation of and justification for the decision to evaluate Alternatives using discharge data on a weekly time step (rather than daily) should be provided. Finally, historic lake augmentation and Icicle Creek diversions are difficult or impossible to account in discharge observations collected by the United States Geological Survey (USGS) Icicle Creek Gaging Station #12458000, so the DPEIS should be explicit about the discharge data used when evaluating the effects of proposed Alternatives on instream flow. 6-11

2. In Chapter 2, pages 2-17 to 2-18, the DPEIS indicates that exceedance probabilities, which were used to develop non-drought and drought "scenarios" by averaging discharge observations across drought years and non-drought years, under-predict weekly low flows under both scenarios as a result of the averaging technique (low flows do not necessarily occur at the same time in any given set of years). The DPEIS also states that it is insufficient to consider the instream flow Guiding Principle met if the 6-12

Comment Letter 006

6-12 annual quantities meet "average" drought or non-drought year conditions (i.e., exceedance probability scenarios). TU and ICWC agree with the DPEIS's assertion that the instream flow Guiding Principle can only be satisfied if instream flow goals are met when the indicator non-drought and drought years are applied. We also agree that 2014 is a suitable indicator non-drought year and 2015 is a suitable indicator drought year.

6-13 **3.** DPEIS Chapter 2, page 2-17 states that when evaluating the effect of each Alternative on instream flow under non-drought and drought conditions, the evaluation used the indicator years of 2014 (representative non-drought) and 2015 (representative drought) for each Alternative and the exceedance probabilities (50%/non-drought scenario and 80%/drought scenario) as a comparison with indicator year conditions for Alternative 1 only. In fact, it appears the DPEIS instead used exceedance scenarios for each Alternative and applied the indicator years for comparison with exceedance scenarios for Alternative 1 only. TU and ICWC suggest that the DPEIS correct this error and provide the amended version for additional comment so the public can adequately review how proposed actions will impact streamflow conditions under observed flow regimes.

6-14 **4.** TU and ICWC appreciate inclusion of the University of Washington Climate Impacts Group (UW-CIG) report on *Changing Streamflow in Icicle, Peshastin, and Mission Creeks*. The report acknowledges that climate and hydrologic models were not specifically calibrated to each individual basin, and that hydrologic models assumed no change in land cover, which present some data uncertainties. The report also states that the purpose of the analysis was to provide a preliminary estimate of climate change impacts and implications of the preliminary evaluation will help determine if more detailed, site-specific modeling is warranted. TU and ICWC suggest the DPEIS discuss how information provided in the UW-CIG report is integrated with the effects of proposed actions on streamflow and the environment, and whether the results of this necessitate a more in-depth (site-calibrated) climate and hydrologic investigation.

6-15 **5.** With respect to the effects of proposed actions on instream flows under climate change conditions, TU and ICWC appreciate the application of 2080s projections to each Alternative found in the bar graphs in Appendix F that follow the UW-CIG report on *Changing Streamflow in Icicle, Peshastin, and Mission Creeks*, but we are curious why 2030s and 2050s information are not also included and applied to each Alternative. We also found that the DPEIS does not clarify what baseline data were used to develop the aforementioned bar graphs and after calling Aspect Consulting to obtain this information we learned the exceedance probability scenarios for recent discharge data (50%/average non-drought; 80%/average drought) were utilized. TU and ICWC strongly recommend the DPEIS remain consistent by following its assertion that it is insufficient to consider the instream flow Guiding Principle met using "average" non-drought and drought conditions when considering the effects of changing climate conditions on Icicle Creek discharge. TU and ICWC suggest the indicator year method for assessing the instream flow Guiding Principle for non-drought and drought climate change conditions be applied. Potential indicator year methods include:

6-15 **a.** Applying the modeled percent change values from the UW-CIG report to the 2014 and 2015 indicator years identified in Chapter 2 of the DPEIS. This should include information about which model (or models, or average across models) is/are applied along with the associated percent change values.

b. Using 2015 data as a proxy for non-drought conditions under 2080 climate change conditions. The UW-CIG report states that, on average, models project 2015 discharge conditions will become routine by the 2070s. The report also illustrates that hydrologic models for the 2080s forecast a percent change in Icicle Creek discharge that aligns with observed percent change in discharge during 2015, where percent change represents a departure from modeled historic normal (1970-2000). This methodology would require selection of suitable proxies for 2030s and 2050s non-drought conditions, as well as an appropriate technique for simulating drought discharge conditions for each future period.

c. No matter what approach is taken, TU and ICWC recommend consultation with UW-CIG for appropriate data selection/application, and a thorough discussion of the methodology and justification within the DPEIS.

6-16 **6.** The bar graphs provided in DPEIS Chapter 2 and Appendix F illustrate the effects of each Alternative on instream flow when applied to recent discharge conditions and future climate conditions, respectively. While many Alternatives appear to (mostly) satisfy the 60 cfs/100 cfs short-term goals for drought and non-drought, respectively, Alternative 5 appears to be the only package where the 250 cfs long-term instream flow Guiding Principle goal may be met when applied to recent discharge conditions. There is no Alternative that appears to meet the 250 cfs goal for more than one week during the early August-early October low flow period under 2080s climate projections. TU and ICWC suggest the DPEIS provide a time scale to specify "short-term" and "long-term" and discuss if there are additional projects/actions that may be considered in future planning and management decision-making to achieve 250 cfs. We also reiterate our concurrence with the DPEIS assertion that the indicator year method must be used for evaluating the effects of each Alternative under specific flow scenarios to satisfy the instream flow Guiding Principle and again suggest the DPEIS be revised and resubmitted for public comment with the indicator year method applied.

Water Conservation and Changing Land Use

6-17 Robust conservation measures can greatly reduce diversions from Icicle Creek and augmentation of Icicle Creek flows using the Wilderness lakes. While there are many excellent conservation projects included in the DPEIS, it does not adequately examine the potential of additional conservation and efficiency measures for all users, and more information is

Comment Letter 006

6-17 necessary to confirm proposed actions and conservation benefits. Furthermore, the DPEIS fails to adequately consider/discuss changing land use over time and potential future opportunities for water conservation as orchards are converted to residential land use.

6-18 1. The DPEIS does not include a full analysis of IPID actual water needs, but rather relies on the stated paper water rights. A tentative determination and beneficial use analysis by Ecology is needed before the full conservation potential can be accurately calculated.

6-19 2. The IPID Full Piping and Pump Exchange is a key conservation project option to include in a pure conservation Alternative. It provides the greatest conservation benefit - only the water that is actually needed by irrigators is taken out of the river. Its high projected cost would better align with other Alternatives if implementation of this project was included with other conservation projects and without expensive, impactful, and controversial Wilderness projects.

6-20 3. The DPEIS does not consider conversion of agricultural lands to residential use. When orchards are taken out and replaced with houses, water demand sharply decreases. Could future land use conversion and associated water conservation provide an opportunity to help reach the long-term goal of 250 cfs? Can a mechanism be put in place to transfer some water rights to instream flow? The Wenatchee Valley has and continues to experience orchard-to-residential conversion, and with few homes available in a market of many interested buyers, development pressure on agricultural lands is not expected to change in the foreseeable future. We understand the DPEIS cannot predict exact acreages and locations for agricultural-to-residential conversion but suggest discussion of the trend and implications for Icicle Creek water management strategies is warranted.

Hydrologic Alteration of Natural Stream, Lake, and Riparian Conditions

6-21 **1.** Discharge, temperature, and chemical effects of augmentation flow releases described in the Alpine Lakes Optimization and Automation Feasibility Study were analyzed by the Washington Department of Fish and Wildlife (WDFW) in their Icicle Creek Tributary Monitoring Report. The WDFW analysis, which included French Creek and Leland Creek during the 2017 augmentation season, found at least a doubling of natural flow conditions in each stream and temperature alteration that exceeded spawning and rearing conditions for ESA-listed bull trout. WDFW identified information gaps, such as travel time of augmentation flows and the natural hydrograph in Leland Creek, source of temperature increases approaching 5 degrees Celsius in Leland Creek during peak augmentation, and changes in water chemistry/dissolved oxygen of Prospect Creek and French Creek associated with augmentation flows. TU and ICWC concur with the WDFW conclusion that additional data and analysis are required. We strongly advise filling these identified data gaps and more comprehensive evaluation of the potential effect on aquatic ecosystems receiving augmentation flows. While we support improving the health of the lowest reaches of Icicle Creek, we suggest the health of 42 miles of mostly Wilderness stream and riparian ecosystems not be damaged as a result.

6-22 **2.** The effects of flow augmentation releases and lake drawdown on the temperature, chemistry, biology, and general ecology of the lake ecosystems are not evaluated in the DPEIS. TU and ICWC suggest potential environmental impacts on the Wilderness lakes should be included for the DPEIS to comprehensively cover all environmental impacts associated with proposed actions. Again, while we support restoration of lower Icicle Creek we suggest the health of the Wilderness lakes not be impaired as a result.

6-23 **3.** Potential effects of discharge, temperature, and water chemistry alterations resulting from flow augmentation using the Wilderness lakes on specific organisms such as ESA-listed species, resident and anadromous salmonids, and other flora/fauna should be included in the DPEIS (e.g., how might flow augmentation impact bull trout, steelhead/rainbow trout, aquatic macroinvertebrates, etc.). Maintaining healthy, intact, unimpaired reaches throughout Icicle Creek and its tributaries is critical for ecological health and robust recreational fisheries.

6-24 **4.** TU and ICWC suggest additional investigation of proposed action impacts to the affected aquatic ecosystems be completed and incorporated in a revised DPEIS submitted for additional public comment. Documents that may be useful when determining how to assess current conditions and potential impacts include *Multi-Metric Index Development for Biological Monitoring in Washington State Streams* (Ecology, 2003) and *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration* (USGS and USEPA, 2016).

Please do not hesitate to follow up with us for further discussion or clarification of our comments. We hope they are useful for crafting a revised DPEIS for additional public comment that will ensure the best possible long-term management of Icicle Creek water resources.

Sincerely,

Sharon Lunz, President
Icicle Creek Watershed Council

Lisa Pelly, Director
Trout Unlimited-Washington Water Project

Comment Letter 007

Comment Letter 007

Washington Water Trust | 2018
Icicle Cr Flow Restoration – PEIS Comments

7-1 OVERALL COMMENT: The following represent comments by Washington Water Trust to the proposed Programmatic Environmental Impact Statement of projects of the Icicle Work Group. As a founding, and continuing, member of the Icicle Work Group, Washington Water Trust has maintained support for the overall approach of identifying suites of projects to restore flows to Icicle Creek, and therefore supports IWG approach and processes identified in the PEIS. Additional comments below are substantive edits as to the accuracy and detail of information provided in the PEIS regarding projects with which WWT has specific knowledge as a project sponsor.

General Comments

7-2 • Throughout the document, the project refers to a canal, but not the lateral distribution system. COIC includes a shared intake with LNFH, a main canal, and several laterals.

7-3 • Overall the document did a good job capturing the benefits from the COIC project. WWT attests to the environmental benefits of this project, which will improve flows in the most flow-limited reaches of Icicle Creek by adding up to 11.9 cfs of flow below the current COIC diversion.

Comments by Page

7-4 • **P. 2-58** – Please add the following language: During May-June of 2016, an alternative for a 6-8 cfs pump station was chosen by over 70% of the vote from COIC shareholders. The advisory group recommended additional contingencies including an additional shareholder vote to approve selection of a preferred pump station site. In January of 2017, COIC shareholders gave preliminary approval to up to 3 alternatives for a pump station site.

7-5 • **P. 2-59 -** The map can be updated with a final pump site – additional information can be provided by WWT once a final site is chosen.

7-6 • **P. 2-60 -** WWT cost estimates for the project are currently at $4.7 million for an up to 8 cfs system.

7-7 • **P. 2-86 –** WWT can attest to the project benefits described here. The SEPA document correctly explains that a new COIC POD would have a compliant fish screen and that moving COIC's diversion would also enable LNFH to site and design their own diversion and screen improvements in a way that only required consideration of the operational needs of LNFH.

7-8 • **P. 2-90 -** Regarding quantities and costs, WWT will have more refined estimates (cfs, AC/ft, cost, cost per acre feet) as the project develops in successive design and construction. This statement also applies to information regarding the COIC project on p. 2-97, p. 2-101, p. 2-112, and p. 2-119 of the PEIS.

7-9 • **P. 3-41 –** Regarding the table analyzing the number of parcels served, as they relate to COIC, this is a dynamic quantity that can change over time with management decisions. Numbers of parcels served may change during the course of the PEIS and EIS processes.

7-10 • **P. 4-20 -** Also conform this to the instream benefits described on p. 3-14. The water right for COIC, in it's original documentation, lists its season of use as "during the irrigation season", so both references should restate as "during the irrigation season, as specified by the water right, historically between April and October." Pump station sites on both the Wenatchee River and Icicle Creek are being considered. In the event the pump station is built on the Wenatchee River, it would be located about .3 miles upstream from the Icicle Creek confluence. The resulting reduction in flows in this reach of the Wenatchee River would be equal to the actual quantity of water diverted by COIC, currently estimated at up to 8 cfs at peak demand, but usually much less than this..

7-11 • **P. 4-41 -** In both pump station locations, the full 11.9 cfs of the COIC water right would likely be protected instream below the diversion and in the natural channel of Icicle Creek to a point below LNFH. Below LNFH, up to 8 cfs of flow would be protected further downstream to the new point of diversion in Icicle Creek, or to the confluence of Icicle Creek with the Wenatchee River in the event the pump station is built on the Wenatchee River. All of these quantities are subject to final review of the proposed change by the Washington Department Ecology, as the writers of this PEIS are not arbiters of water rights and/or have not passed the water rights through a Washington State water rights change process.

7-12 • **P. 4-24 –** Check the language here: The slight upstream move on the Wenatchee River would likely be permissible, but any any case, as in 4-41, would be subject to state law, as determined by the Report of Examination by the Washington Department of Ecology.

7-13 • **P. 4-50 –** There is a typo in the sentence, "In addition, relocating the COIC diversion would conserve water and potentially increase instream flow downstream of RM 5.7 to the Wenatchee River." The correct RM is 4.5.

7-14 • **P. 4-85 – *EDIT* - "**In the long term, this project would contribute to beneficial increases in instream flows in Icicle Creek from RM 4.5 to its confluence with the Wenatchee River, *or to the Icicle Creek Pump Station near RM .75 in the event this pump station site is used*."

7-15 • **P. 4-86 – "**however, this would present a negligible impact to fish that are already adapted to naturally elevated flow during this time of year." You should clarify that the creation of rearing habitat is just one function provided by flow. Increased flow at this time would also be expected in improve outmigration conditions.

7-16 • **P. 4-153 -** Irrigation season as May through September should be corrected to "during the irrigation season, as specified by the water right, historically between April and October." Also, "COIC is considering relocating their point of diversion from Icicle Creek to a location on the Wenatchee River. Construction-related activities would include installing a new diversionary structure near or on the Wenatchee River, installing conveyance piping, and decommissioning COIC-specific diversionary works on Icicle Creek." Change to: COIC is considering relocating their point of diversion from Icicle Creek to a point either on the Wenatchee River or Icicle Creek, near the confluence. Construction-related activities would include installing a new diversionary structure at these downstream sites and installing conveyance piping, (there are no COIC-specific diversionary works to decommission).

7-17 • **P. 4-270 – "**Impacts from work at the existing COIC diversion on Icicle Creek would be limited to kayaking and fishing. Based upon the small footprint of these projects and the temporary nature of the disturbance, meaningful impacts to existing water-dependent recreational activities are unlikely." No work is planned on the existing COIC diversion as part of the COIC project.

7-18 • **P. 4-283 –** Correct this sentence: Under the COIC Irrigation Efficiencies and Pump Exchange Project, construction-related activities would include installing a new diversionary structure on the Wenatchee River to: Under the COIC Irrigation Efficiencies and Pump Exchange Project, construction-related activities would include installing a new diversionary structure on the Wenatchee River *or on Icicle Creek*.

7-19 • **P. 4-320 – "**The COIC pump station on the Wenatchee River would likely use solar power to operate; thus, there are no anticipated impacts to electrical utilities." Need to add "or Icicle Creek." This statement is not accurate. The pump station will use PUD power, actually, and

Comment Letter 007

7-19 tie into 3-phase power systems. Appropriate coordination with the PUD will take place to facilitate this.

- **P. 4-327 – "**Under the COIC Irrigation Efficiencies and Pump Exchange and Pump Exchange Project, construction activities, such as canal piping and building a pump station, would impact transportation by increasing traffic from construction worker commuter trips and slowing traffic from heavy equipment transport. No roadway closures are anticipated and standard safety procedures would be followed for transport of heavy equipment." I don't think we can say that no roadway closures are anticipated, particularly since the conveyance structures cross some roads. Perhaps better characterized that road access may be limited to single lane closures and would include consultation with local public utilities and transportation authorities in accordance with state and local laws"

7-20

Comment Letter 008

From: Daryl Harnden <deharnden@gmail.com>
Sent: Saturday, July 14, 2018 5:43 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Strategy

8-1 I support Alternative One as presented by the Icicle Working Group at the public meeting on June 27. As a member of the Icicle working Group I have been involved in developing this alternative and I believe it will achieve all the goals set by the working group. Daryl Harnden

Sent from Mail for Windows 10

1

Comment Letter 009

Confederated Tribes and Bands of the Yakama Nation

Established by the Treaty of June 9, 1855

July 30, 2018

Mr. Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801

Re: Icicle Water Strategy PEIS

Dear Mr. Kaputa,

9-1 I am writing on behalf of the Yakama Nation to offer our comments on the captioned subject. The Confederated Tribes and Bands of the Yakama Nation is a federally-recognized Indian tribe with certain rights that were reserved in the Treaty of June 9, 1855 with the United States (12 Stat. 951). Among these reserved rights, Article III reserved the right to fish at "all usual and accustomed fishing places" in perpetuity. One such place near present-day Leavenworth was so important to certain tribes at the Walla Walla treaty grounds that it was specifically identified as the "Wenatshapam Fishery" and reserved, along with a six square-mile parcel of land, in Article X of the Yakama Treaty. Both the land and the fishery were subsequently lost when federal surveyors found that the Northern Pacific Railroad and the town of Leavenworth were built within the intended Article X reservation. A remnant of that historical tribal fishery was resurrected in 1987 and continues to this day in Icicle Creek. This fishery is one of few remaining opportunities for tribal members having ancestral ties to that area to harvest the prized spring chinook salmon that return to Icicle Creek.

The Yakama Nation maintains a continuing and vital interest in the Treaty trust resources potentially affected by water management decisions in Icicle Creek, particularly those affecting ESA-listed fish and the spring chinook salmon produced at Leavenworth National Fish Hatchery. Pursuant to our responsibilities under traditional law and custom, and in the interests of our fisheries, we must work to preserve and enhance these resources wherever possible. Tribal fisheries on the lower Columbia River are regulated to a great extent by the abundance of ESA-listed spring chinook and steelhead, some of which originate in the streams and rivers of the upper Columbia River including Icicle Creek. Leavenworth NFH was constructed as partial mitigation for salmon losses associated with the construction of Grand Coulee Dam, which was built without fish ladders and blocks access to roughly one-third of the salmon-producing watersheds in the Columbia Basin. Accordingly, the Yakama Nation regards Leavenworth NFH as a promise by the United States to replace, in small measure, the damage incurred by tribal fishers from construction of Grand Coulee. We believe the United States should keep its promises; accordingly, we expect that the hatchery mitigation program will persist as long as the dam for which it was created still stands.

Post Office Box 151, Fort Road, Toppenish, WA 98948 (509) 865-5121

Comment Letter 009

9-2 The Yakama Nation recognized the proposed Icicle watershed planning process as both a potential opportunity and a potential threat to our resource interests at its inception in 2012. As a member since inception, we have witnessed a diverse coalition of stakeholders, assembled as the Icicle Watershed Group (IWG), invest considerable time and effort to describe, consider, and address the effects of climate change that already challenge the conservation and management of our trust resources in the Icicle watershed. The result of this investment and these efforts is the so-called "Base Package" of actions presented as Alternative 1 in the PEIS. Alternative 1 is the product of extensive analysis, negotiation, compromise, and general acceptance by the members of the IWG. As such, it represents a defensible, broadly-supported, and cost-effective climate change adaptation plan that should be selected in the ROD for this SEPA review.

Sincerely,

Gerald Lewis

Gerald Lewis, Chairman
Fish and Wildlife Committee
Yakama Tribal Council

cc: Fish and Wildlife Committee
Yakama Nation DNR
Fisheries Resource Management Program
OLC – Ethan Jones
Tribal Attorney Tom Zeilman
NOAA-Fisheries – Dale Bambrick
USFWS – Dave Irving
WDFW – Jim Brown
CCT – Randy Friedlander

2

Comment Letter 010

STATE OF WASHINGTON
DEPARTMENT OF AGRICULTURE
P.O. Box 42560 • Olympia, Washington 98504-2560 • (360) 902-1800

July 26, 2018

Mr. Mike Kaputa
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801

RE: Programmatic Environmental Impact Statement for Icicle Water Strategy, Chelan County, WA

Dear Mr. Kaputa:

10-1 The Washington State Department of Agriculture (WSDA) has reviewed the May 2018 Programmatic Environmental Impact Statement (PEIS) for the Icicle Water Strategy in Chelan County, Washington. WSDA supports the Base Package, Alternative 1, given that it represents the best balance for all water needs in the basin after four years of intensive study by the working group.

Alternative 1 includes recommendations that meet all seven of the Icicle Working Group Guiding Principles; these objectives were agreed upon by all working group members in December 2012 and include goals focused on improving ecological function in Icicle Creek as well as the need to provide reliable water resources for agriculture and domestic water users.

This alternative seeks to improve water availability by modernizing and automating the outlet works and gate infrastructure at seven lakes in the Alpine Lakes Wilderness Area, improving irrigation water delivery and on-farm efficiencies in the Icicle-Peshastin Irrigation District, augmenting streamflow by moving a diversion and improving water delivery for Cascade Orchard Irrigation Company, and rebuilding the Eightmile Lake dam to restore usable storage. Many other improvements are included and focus on conserving and protecting water resources for tribal and non-tribal fisheries and future domestic water needs. As proposed, Alternative 1 would result in providing 89 cfs and 31,958 acre-feet of total water benefit, exceeding the minimums needed in low water years for fish and wildlife, agriculture, and domestic uses. Ultimately, this provides resource managers with tools to balance water needs in the face of a changing climate and aligns with state and Federal laws.

WSDA appreciates the efforts of Chelan County, the Department of Ecology's Office of the Columbia River, and Icicle Working Group members in addressing the water needs in this sub-basin. Again, we support implementation of Alternative 1 (Base Package) as a means of meeting the 7 Guiding Principles of the Working Group and appreciate the opportunity to provide comment on the PEIS.

Sincerely,

Derek I. Sandison
Director

cc: Tom Tebb

Comment Letter 011

Will Guyton

From: Mike Kaputa
Sent: Tuesday, July 31, 2018 9:43 AM
To: Mary Jo Sanborn
Subject: FW: Comments - DPEIS for Icicle Creek WRMS

From: Johnson, Deborah L (DOH) [mailto:deborah.johnson@doh.wa.gov]
Sent: Monday, July 30, 2018 7:31 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Cc: Tebb, G. Thomas (ECY) <GTEB461@ecy.wa.gov>
Subject: Comments - DPEIS for Icicle Creek WRMS

Thank you for the opportunity to review and comment upon the Draft Programmatic Environmental Impact Statement for the Icicle Creek Water Resource Management Strategy. While this office focuses on drinking water, we recognize that it is challenging to adequately balance water resources allocations and planning between domestic supply, fish, and
11-1 irrigation and to address the needs of numerous stakeholders who may have competing interests. We strongly support this endeavor to address Icicle Creek's ecological functions and evaluate future supply through a sustainability & climate change lens.

11-2 **1.5.1.4 Improve Domestic Supply**. The 2006 Wenatchee Watershed Plan is cited as projecting 31 new homes in the Icicle Creek Subbasin through 2014, with additional development demand at 4.7 homes per year; from 2014 through 2050, approximately 169 new homes were anticipated. Since the plan is now 12 years old, & it's currently four years past the initial projection period, it would be possible to include a measure of these projections. From 2006 through 2014, how many new housing starts occurred in the area? Whether 2006-14 growth did not meet, just met, or exceeds the estimate of 31 might offer a better idea of how on-target these estimates are & could potentially offer a basis for reevaluation.

11-3 The 2011 City of Leavenworth Water System Plan (WSP) is cited in this section as well ("future demand through 2050"). Leavenworth's WSP update has been adopted & was approved by DOH on June 21, 2018 – see http://cityofleavenworth.com/col-assets/uploads/2018/02/14-10-01-Leavenworth-WSP-final-2018.pdf . This is noted in Chapter 3 (p. 3-147). Targeted reanalysis would be appropriate where the 2011 version is cited. If they differ, data from the 2018 update should be used. (This should also be updated in 1.11 Documents Adopted under SEPA, which refers to the 2011 version. The consultant is the same.) The 2011 version is also referenced in 3.4.3 (p. 3-24).

11-4 **1.10.23 Critical Areas Review**. The Chelan County regulations cited would apply only to unincorporated areas. Within incorporated areas (Cashmere, Leavenworth, & Wenatchee), the cities' own comprehensive plans & regulations for critical areas & zoning would apply. This same comment is applicable to 1.10.22, 1.10.24, & 3.16.1.3. It may apply to other sections within the document where exclusively the County's code is discussed, such as 3.2.4 & 3.2.4.3.

11-5 **1.10.25 Water System Plan Update**. Suggest modifying the section title to read "Water System Plans." WAC 246-290-100 deals with basic content of WSPs overall (both new & updates). You may wish to reference "Part 2 of Chapter 246-290 WAC" (which encompasses WAC 246-290-100 through -140) which addresses all planning/engineering documents.

11-6 I believe the reference to "any new group" was probably meant to say any "new Group A system." At the same time, a Group A system isn't defined as one serving "1,000 or more connections or [meeting] other requirements." That language is drawn from WAC 246-290-100(2)(a), with "other requirements" referring to ss. (b) through (g), describing the categories of community public water systems that must submit a WSP to DOH for review. It would probably be

1

Comment Letter 011

11-6 most accurate to modify this sentence to say: "Water system planning is required under Part 2 of Chapter 246-290 WAC for any community public water system meeting certain thresholds set forth in WAC 249-290-100."

11-7 The sentence about updates is partially correct; a WSP update would be triggered by any of the listed items, which come from WAC 246-290-100(2)(e). But regardless, a WSP must be updated at least every ten years (or less, depending on the DOH approval period – see WAC 249-290-100(9)).

11-8 **2.3.1 Domestic Conservation**. Municipal Water Law was the common name of 2003 state legislation. Today, it would be more accurate to refer to RCW 70.119A.180 (the complementary rule is Part 8 of Chapter 246-290 WAC).

11-9 **Chapter 3 (generally)**. Dryden, Monitor, Peshastin, and Sunnyslope are variously called cities or towns throughout Chapter 3. On p. 3-133, Dryden is said to have its own comprehensive plan. These are not incorporated areas with their own governance structure but instead are part of unincorporated Chelan County. None should have its own comp plan unless the County has prepared a subarea plan for that specific area.

11-10 **3.16.1 Regulatory Setting**. Suggest substituting "State Growth Management Act & local planning/regulations thereunder" for the last 3 bullets, to be consistent with the initial part of the list & also how it is presented in 3.16.1.2. Also, "The Forest Practices Act" should probably say "State" for clarity.

11-11 **3.19.1 Water Purveyors**. While City of Leavenworth may be the largest purveyor within the area, it is not the only Group A system. If a full list of purveyors is desired, see https://fortress.wa.gov/doh/eh/maps/SWAP/index.html (includes wellhead protection area depictions).

11-12 **Chapter 4 (generally)**. The evaluation of domestic conservation efficiencies (repeated for each alternative & differing impact scenarios by environmental element throughout this chapter) refers to City of Leavenworth but sometimes also Chelan County, although Chelan County isn't a water purveyor. Is this meant to refer to the Chelan Co. PUD?

This concludes our comments. Please let me know if you have any follow-up questions or need additional information.

DEBORAH JOHNSON
Wellhead Protection Specialist
Office of Drinking Water
Environmental Public Health Division
Washington State Department of Health
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Comment Letter 012

Alpine Lakes Protection Society ● The Wilderness Society
American Whitewater ● Aqua Permanente ● Center for Environmental Law & Policy
Conservation Congress ● Doug Scott Wilderness Consulting
El Sendero Backcountry Ski & Snowshoe Club ● Federation of Western Outdoor Clubs
Friends of Bumping Lake ● Friends of the Clearwater ● Friends of Enchantments
Friends of Lake Kachess ● Friends of Wild Sky ● Great Old Broads for Wilderness
Icicle Creek Watershed Council ● Issaquah Alps Trails Club ● Kittitas Audubon Society
The Mazamas ● Middle Fork Recreation Coalition (MidFORC)
North Cascades Conservation Council ● North Central Washington Audubon Society
River Runners For Wilderness ● Save Our Sky Blue Waters ● Seattle Audubon Society
Sierra Club ● Spokane Mountaineers ● Spring Family Trust for Trails
Washington Wild ● Wild Fish Conservancy ● Wilderness Watch

July 30, 2018

Submitted via email to: nr.iciclesepa@co.chelan.wa.us

Tom Tebb
Director, Office of Columbia River
Washington Department of Ecology
1250 Alder Street
Union Gap, WA 98903

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: **Comments on Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Water Resource Management Strategy**

Dear Directors Tebb and Kaputa:

Thank you for the opportunity to provide comments on the Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Water Resource Management Strategy. Many of the undersigned organizations provided comments in 2016 during the scoping period for the DPEIS. As you will see below, many of the concerns highlighted during the scoping period still remain despite the efforts of the Icicle Work Group (IWG) to scope and refine the range of

12-1 alternatives presented in the DPEIS. **Because of the range of deficiencies in the DPEIS outlined below, the Washington State Department of Ecology (Ecology) and Chelan County should withdraw, revise, and re-release the DPEIS once the deficiencies are addressed.**

12-2 With multiple demands, and a changing climate, it will be challenging to meet instream flow targets, ensure agricultural reliability, enhance hydrologic function of the basin, and protect wilderness values. But that is the task taken on by this DPEIS. We believe there is a package

Comment Letter 012

12-2 based in strong conservation measures that can accomplish those goals, but the current alternatives in the DPEIS do not.

Wilderness Values

The undersigned organizations have come together out of our concern and respect for the Alpine Lakes Wilderness and its Enchantment basin. This area is one of the most iconic and treasured natural resources in the entire National Wilderness Preservation System. These are national interest lands, owned by everyone in the nation and protected by Congress to preserve their wilderness character. As detailed in the DPEIS, thousands of hikers explore and visit this area each year and a myriad of wildlife species depend on the critical habitat it provides. Our organizations and members have great interest in the management and stewardship of these lands, and are committed to working to ensure wilderness, recreation, scenic, and other natural resource values are protected into the future.

Tribal Treaty Rights

We recognize and respect the importance of the salmon in the Wenatchee River watershed to the Treaty Rights of the Yakama Nation and Colville Confederated Tribes and both the wild stocks and the hatchery stocks developed to mitigate for the construction of the Grand Coulee Dam, which eliminated spawning habitat for huge numbers of wild salmon and other fish species.

Valid Existing Water Rights

We also recognize valid, prior existing water rights in the Wenatchee River basin for agriculture, and the importance of that local source of food and the economic benefits to Chelan County and the region.

12-3 **Positive Project Elements**

There are some project elements presented in the DPEIS that the undersigned organizations could support as part of a comprehensive plan that meets the requirements for fish, agriculture and wilderness preservation while simultaneously reducing water diversions and making meaningful investments in domestic and agricultural water conservation. Favorable elements in the DPEIS include: piping and pumping systems, additional domestic conservation, critical upgrades (such as circular ponds) of outdated hatchery infrastructure, fish passage and habitat improvements, and telemetric control of valves at the existing dams. However, there are fundamental flaws in the DPEIS as discussed below that must be addressed before this process moves forward.

Improper Constraints of IWG Guiding Principles

12-4 IWG does not have broad-based support. Chelan County defines IWG as "made up of a diverse set of stakeholders representing local, state and federal agencies, tribes, irrigation and agricultural interests and environmental organizations." While at IWG's inception it included

12-4 more nonprofit environmental organizations, today only three remain. Important environmental groups have departed IWG, including the Center for Environmental Law and Policy and Wild Fish Conservancy—groups that capture broad environmental values. The Icicle Creek Watershed Council also announced its departure last year, but the group has since rejoined IWG albeit on a provisional basis due to outstanding concerns related to the limited investment in water conservation and the degradation of the beauty and ecology of the Alpine Lakes Wilderness.

Furthermore, many groups who have been invited to the table have declined to join, including the Alpine Lakes Protection Society, The Wilderness Society, and Chelan-Douglas Land Trust, due to concerns about scope of the projects, IWG unwillingness to make adjustments to the proposal, IWG's prohibition on public criticism, IWG refusal to treat westside owners of these public lands the same as eastside owners of these public lands, or for other reasons. While this "broad-based coalition" of IWG involves federal agencies, municipalities, tribes, and irrigation districts, it falls short in representation from the conservation and recreation community. Consequently, for this non-representative, self-selected group to create "guiding principles" that then become the purpose and need of the DPEIS is self-serving and problematic.

Deficiencies of DPEIS

12-5 At present, the range of alternatives currently presented in the DPEIS includes actions unprecedented in a federally designated wilderness area and threatens to exploit one resource (i.e., the wilderness and the water it provides) under the guise of protecting another (i.e., fish in Icicle Creek). Chelan County and Ecology can and should do better to meet instream flow targets, ensure agricultural reliability, enhance hydrologic function of the basin, and protect wilderness values. As proposed, the alternatives analyzed in the DPEIS fail to do so.

SEPA expressly requires an EIS to contain a detailed discussion of alternatives to the proposed action. RCW 43.21C.030. "The required discussion of alternatives to a proposed project is of major importance, because it provides a basis for a reasoned decision among alternatives having differing environmental impacts. Pursuant to WAC 197-11-440(5)(b), the reasonable alternatives which must be considered are those which could 'feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation.'" *Weyerhauser v. Pierce County*, 124 Wn.2d 26, 38, 873 P.2d 498 (1994). When, as in this case, the proposal is for public projects, "the EIS must contain a sufficient discussion of offsite alternative proposals." *Id.* at 39. Also, "there must be a reasonably detailed analysis of a reasonable number and range of alternatives." *Id*. at 41.

The DPEIS lacks a sufficient discussion of offsite (i.e. non-wilderness) alternative proposals and does not analyze a reasonable range of alternatives, as the *Weyerhauser* decision requires. Although the DPEIS does list five alternatives plus a no-action alternative, only one of these alternatives (Alternative 5) relies primarily on an off-site proposal (Full IPID Pump Station). Furthermore, all of the alternatives repeat the same Eightmile dam "Restoration" project (construction of a dam in a wilderness area), and thus the DPEIS cannot fulfill SEPA's requirement for analysis of off-site projects. The alternatives are mere variations on the theme of

Comment Letter 012

12-5 building dams, pumps, and pipes inside a wilderness area. As discussed below, it is likely that such construction will be unlawful under the Wilderness Act, a problem the DPEIS does not even acknowledge. Because all of the alternatives involve construction in the wilderness, they do not represent "a reasonable range of alternatives," as required by the *Weyerhauser* decision.

Our specific concerns and recommendations for moving forward with the DPEIS process include:

12-6 **1. The entirety of the DPEIS rests on a flawed assumption of "paper water," not "real water" based on the actual water usage by the primary water rights holders in the Icicle basin. Ecology must perform an extent and validity determination for the three primary water rights holders in the basin before a new DPEIS and alternatives are developed and released for public comment.**

One thing is clear in the DPEIS: the Icicle Peshastin Irrigation District (IPID) has a paper right to an extraordinary amount of water relative to other water rights holders in the basin, and Chelan County, Ecology, and the City of Leavenworth all want a portion of it to meet their needs. It is also clear that under Western water law, water rights holders must use the water or risk to lose it, simply phrased as "use it or lose it." *See* RCW 90.14.170-190 (water rights relinquished if not actually used for five consecutive years). *See also Dept. of Ecology v. Theodoratus*, 135 Wn.2d 582, 592–597, 957 P.2d 1241 (1998) (water rights are based on actual, beneficial water use, not installed capacity of water systems).

The condition of IPID's water infrastructure in the Icicle basin shows that in its near 80 years of operation, IPID has not maintained its facilities to actually store and use its full water right. This was recently demonstrated in the 2018 Eightmile dam emergency, where the risk of heightened spring flows led to emergency stabilization efforts at the delapidated dam. At Eightmile Lake, a portion of the earthen dam washed away in a 1990 flood event, and IPID did not take steps to restore the dam at that time. Since then—for the last 28 years—IPID has annually released approximately 1,400 (and up to 1,600 acre-feet) at Eightmile Lake (DPEIS, 2-63). The DPEIS states that the condition of the existing facilities at Eightmile Lake has limited the active storage volume to 1,370 acre-feet with an operational range of 23 feet (DPEIS, 3-48).

It is clear, therefore, that IPID has relinquished at least part of its paper water rights. How much of its water rights have been relinquished is precisely the question that a proper PEIS must answer. Yet the DPEIS specifically fails to account for IPID's potential relinquishment of part of its water rights at Eightmile Lake, despite consistent questions and concerns raised by many groups since the genesis of the Icicle Work Group efforts. The DPEIS and all of its alternatives—including the No Action Alternative—assume that IPID has a right to its full paper right at all of the wilderness lakes, including 3,500 acre-feet at Eightmile Lake (as described in Alternative 4, DPEIS, p. 2-103). IPID has never utilized this much water in the entire history of
12-7 its operation. Water that IPID has not used now belongs to the federal government under the

12-7 federal reserved water right doctrine.[1] If the Eightmile Lake dam is rebuilt, it should remain at its current elevation, where it has been since at least 1990, because that elevation is the largest necessary to support whatever remains of IPID's relinquished water right. In addition, as discussed below, any dam rebuilding must be approved by the U.S. Forest Service and must
12-8 comply with the National Environmental Policy Act (NEPA) and other federal and state laws. These points also apply to the U.S. Bureau of Reclamation and the U.S. Fish & Wildlife Service in connection with new storage proposed at Snow and Nada Lakes.

12-9 The most egregious misinterpretation of IPID's water rights is represented in Alternative 4, where massive storage projects are analyzed that result in far more water storage than is needed, at the expense of wilderness values and natural hydrologic function of the basin. Alternative 4 also includes the false assumption that IPID has a right to water at Upper Klonaqua Lake, to which the IPID has no right.

12-10 Finally, Ecology has confirmed that it has not made an extent and validity determination of either IPID or the Leavenworth Fish Hatchery, as stated in a letter to The Wilderness Society on June 14, 2018:

> *"The IPID and the Leavenworth National Fish Hatchery both have storage water rights that originate within the Alpine Lakes Wilderness… At this time, Ecology has not made an extent and validity determination of either IPID or the Leavenworth National Fish Hatchery's diversionary or storage water rights."*

In other words, the issue of how much water is legally available is not known and has not been addressed.

12-11 Failure to revise the DPEIS to account for IPID's possible relinquishment of some of its water rights would constitute a violation of SEPA. SEPA requires an EIS to analyze reasonable project alternatives. "SEPA rules define 'reasonable alternatives' as less environmentally costly action that 'could feasibly attain or approximate a proposal's objectives.'" *King County v. Central Puget Sound Growth Management Bd.*, 138 Wn.2d 161, 183, 979 P.2d 374 (1999) (citing WAC 197–11–786). Here, a less environmentally costly action that still achieves the proposal's objectives would be to limit the dam repair work to the minimum necessary to support IPID's post-relinquishment water rights, not IPID's paper water rights or its installed water system capacity. There is no justification to "overbuild" the dams to support a water right that no longer exists.

[1] *See U.S. v. New Mexico*, 438 U.S. 696, 698–700, 98 S.Ct. 3012, 57 L.Ed.2d 1052 (1978). The reserved federal water rights apply only if the federal land reservation pre-dates the state-law claim, and only to the extent necessary to accomplish the primary purpose of the federal reservation. In this case, the National Forest reservation occurred in 1897, according to USFS's website, which pre-dates IPID's 1927 water rights adjudication. The purposes of the National Forest reservation, per *U.S. v. New Mexico*, are to "improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber" (citing 16 U.S.C. § 475). Thus, the federal government in this case has reserved rights to any water from the Alpine Lakes Wilderness necessary to accomplish these purposes.

Comment Letter 012

12-11 Instead, the DPEIS should analyze how much of IPID's water rights remain and should analyze the impact of building the dams to support that level of service. It is necessary to conduct this analysis because, if IPID has relinquished some of its rights, then *none* of the alternatives analyzed in detail in the DPEIS will be feasible anymore, since all rely on the assumption of un-relinquished rights.

It is alarming that Ecology, the co-convener of IWG and co-lead agency of the Icicle DPEIS, has allowed the IWG process to consume significant time and public funding since 2013 without determining such a fundamental question, especially since groups such as the Alpine Lakes Protection Society and The Wilderness Society have been bringing this specific issue to Ecology's attention for years. Ecology must perform that determination now to inform a revised DPEIS before more public money is spent on the Icicle watershed management planning process.

12-12 The public cannot comment upon the merits of Ecology's determination until after Ecology makes it and discloses it. This is a fundamental reason why the preparation of a Final PEIS would be premature; the DPEIS should be revised to address its deficiencies, and a revised DPEIS should be released for public comment, before a final EIS is prepared.

12-13 **2. The alternatives and range of projects identified in the DPEIS do not currently comply with the Guiding Principles of the Icicle Work Group, including compliance with federal laws such as the Wilderness Act. The perfunctory checklist in the DPEIS is clearly inadequate. A revised DPEIS needs to analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals; acknowledge areas of non-compliance; and identify the appropriate path forward to ensure complete compliance with federal law.**

One of the seven IWG guiding principles cited in the Icicle DPEIS is to "comply with State and Federal Law, and Wilderness Acts." Several layers of law are relevant to the projects and actions described in the DPEIS, and the interpretation of those laws will determine the viability of the projects proposed, specifically the construction of new dams at Eightmile and Snow Lakes and a tunnel between the Upper and Lower Klonaqua lakes, as well as automation and optimization efforts throughout the wilderness lake system. At present, the DPEIS fails to meaningfully consider fundamental legal issues that will determine which projects can and cannot be built, including federal wilderness law and state water law.

The DPEIS is insufficient because the lead agencies have declined to consider what they are legally permitted to do in the first place, under the "minimum necessary" standard of the Wilderness Act. The time to make that determination is during SEPA review to daylight the government's decision-making process and facilitate meaningful public comment (which are two of the main purposes of SEPA), not afterward. It is nonsensical to suggest that years of effort and significant taxpayer dollars should be expended to evaluate alternatives that are likely to be unlawful in the first instance. The agencies here appear to be procrastinating their resolution of issues that are difficult but necessary to resolve. Two glaring examples include: (1) the DPEIS

12-14 erroneously assumes that IPID's easements supersede federal wilderness law; and (2) the DPEIS

12-15 fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals (as discussed above).

On March 30, 2018, the U.S. Forest Service wrote to IPID that its dam repair/replacement proposal "contains elements that are beyond the scope of the rights reserved by IPID in the Special Warranty Deed." The Forest Service requested IPID to "submit a detailed proposal" for both the emergency abatement and any long-term actions to replace the dam, and stated:

> *"Any modification to the dam and ground disturbance (equipment operation, road construction, etc.) of the surrounding lands may require a Special Use Authorization from the Forest. The federal action of authorizing activities on National Forest Lands is subject to a wide variety of laws including (but not limited to): Wilderness Act, National Environmental Policy Act (NEPA), National Historic Preservation Act, and Endangered Species Act (ESA)."*

12-16 As the DPEIS Purpose and Need section acknowledges, the U.S. Forest Service manages 87 percent of the land in the Icicle sub-basin, 74 percent of which is located within the Alpine Lakes Wilderness. All of the lakes discussed in the DPEIS are located within the Alpine Lakes Wilderness, which adds multiple layers of federal law to consider for all actions proposed on federal land, most notably the 1964 Wilderness Act, 1976 Alpine Lakes Area Management Act, and the 1981 Alpine Lakes Wilderness Management Plan (ALWMP). Relevant direction from these laws is cited below and requires federal interpretation and development of guidance for federal actions in relation to the Icicle DPEIS, which has not been completed despite recommendations for such analyses during the 2016 scoping period for this DPEIS.

12-17 The DPEIS fails to address the Wilderness Act requirement of federal approval of facilities that are not compliant with wilderness regulations. Furthermore, Section 4(c) of the Wilderness Act relates to the concept of minimum tool requirements, applicable to activities such as access to inholdings and maintenance of water developments in wilderness:

> *Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.* [emphasis added]

This provision sets such a high bar for the utilization of these nonconforming uses that these uses are unlikely to be available for the wilderness projects described in the DPEIS.

Specific management guidance for water resources in the Alpine Lakes Wilderness is provided in the 1981 ALWMP:

> *Management Objective: to preserve water bodies and stream courses in a natural state with minimal modification or human-caused contaminants. . .*

Comment Letter 012

Management Direction: (1) except as provided for in Section 4(d)(4) of the Wilderness Act, watershed will not be altered or managed to provide increased water quantity, quality or timing of discharge. . . [emphasis added]

12-18 Interpretation and guidance from the U.S. Forest Service regarding the myriad elements of the Icicle DPEIS relevant to the agency's land management authority is imperative and should happen as a part of the SEPA process. IPID currently maintains agreements and easements with the U.S. Forest Service for IPID facilities at Eightmile, Colchuck, Square and Klonaqua lakes, which require consultation with the Forest Service. At present, the DPEIS takes IPID's interpretation of its rights at face value, but the DPEIS needs to take a harder look. Ultimately the range of projects described in the Icicle DPEIS on National Forest lands will require Forest Service consultation and approval. Most of the projects proposed are unprecedented in the National Wilderness System and run afoul of wilderness law and, as noted above, state water

12-19 law. Many of these projects would unreasonably cause significant harm to wilderness and its purposes, including recreation (by damaging trails, campsites, changing aesthetics, etc.) and scenic and conservation values.

12-20 Because the projects are in wilderness, non-motorized access and non-motorized equipment (i.e. hand tools) and traditional skills should be required whenever feasible. Since the dams were originally built that way, the exceptions should be rare. *See Wilderness Watch, Inc. v. USFWS*, 629 F.3d 1024 (9th Cir. 2010) (requiring site-specific, comparative analysis of options to determine if an action that violates the Wilderness Act's activity limitations is indeed the "minimum necessary").

12-21 Some of the most egregious projects are included in Alternative 4 of the DPEIS, including: (1) drilling a tunnel between two lakes (Upper and Lower Klonaqua); (2) building a higher dam at Upper Snow Lake (enlarging that lake and submerging designated wilderness lands); and (3) increasing the height of the Eightmile Lake dam (making that lake bigger than it has ever been and submerging designated wilderness lands). The DPEIS utterly fails to consider the issue of

12-22 compliance with federal law. *See, e.g.,* Tables 2-9 through 2-12, which state that each alternative "complies with federal law" — this claim is simply false, given the lack of analysis of IPID's water right and federal wilderness law. Furthermore, these projects were not part of the

12-23 proposed action in the SEPA scoping conducted by the IWG in 2016, so the public was not asked to comment on them during scoping. It should also be noted that IPID has no right to enlarge Eightmile Lake and has no water rights or infrastructure at Upper Klonaqua Lake.

12-24 Finally, the DPEIS fails to account for the necessity of conducting project-level NEPA processes with the U.S. Forest Service as the lead agency regarding dams and tunnels in wilderness on National Forest lands. As one of many examples of this huge omission, DPEIS Table 5-2 of "Permits/Approvals and Relevant Triggers" (pages 5-8 through 5-13) repeatedly states, erroneously, that a U.S. Army Corps of Engineers National Permit and NEPA Categorical Exclusion "are the likely level of regulatory compliance for this project" – for Optimization/Automation, for Eightmile "Restoration," and for the "Enhancement" (expansion)

12-24 projects at Eightmile, Upper Klonaqua, and Snow Lakes. The necessity of U.S. Forest Service NEPA analysis is conspicuous by its absence throughout the DPEIS.

12-25 Again, these huge gaps in the DPEIS mean that preparation of a Final PEIS would be premature; the DPEIS should be revised to address its deficiencies, and a Revised Draft PEIS should be released for public comment, before a Final EIS is prepared.

12-26 The failure to consider the restrictions imposed on the proposal by the Wilderness Act constitutes a violation of SEPA. As noted above, SEPA requires reasonable alternatives to be explored in an EIS. However, each of the alternatives, except alternative 5 (which the DPEIS gave only "a very cursory review," DPEIS at 2-35), treats the wilderness lakes as if the lakes are subject to essentially unrestricted development of new infrastructure, including the installation of higher dams, additional dams, mechanical pumps, and underground pipes. The installation of any of this new infrastructure would constitute a violation of the Wilderness Act, so the alternatives analyzed in the DPEIS are not actually "reasonable." While it is true that not every alternative analyzed in an EIS must be legally certain, the alternatives analyzed in the EIS must nonetheless be feasible. *King County*, 138 Wn.2d at 184.

Here, there has *only* been analysis of the proposal under the legally uncertain assumption that IPID may install all of the infrastructure. There has been *no* analysis of what the proposal might look like if some of the infrastructure cannot be installed. A proper DPEIS would have at least considered the possibility that IPID might have to make do with less infrastructure at the lakes due to the restrictions of the Wilderness Act, and state water law.

12-27 **3. The DPEIS presents an inadequate range of alternatives, since every alternative would significantly impact and harm wilderness values. A revised DPEIS needs to include an alternative that minimizes wilderness impacts, respects wilderness values, and is informed by the extent and validity determination of water rights as discussed above.**

At present, every alternative in the DPEIS—including the No Action Alternative—includes actions that would significantly harm wilderness values. As discussed above, the DPEIS should be withdrawn, revised, and re-released with a new range of alternatives that are informed by the validity determination of the primary water rights holders in the Icicle basin as well as compliance with federal laws such as the Wilderness Act. The DPEIS currently includes the

12-28 "Eightmile Restoration" project in every alternative, which would "restore usable storage to the historical and permitted high water storage elevation" (DPEIS, p. 2-15) requiring construction of a new dam approximately four feet higher than the current dam. If the dam cannot be raised due to water rights relinquishment and/or Wilderness Act constraints, then it is hardly "reasonable" to suggest a raised dam as a component of every one of the proposed alternatives. A revised DPEIS should include an alternative that includes restoration of the dam to its current height and not any higher. The failure to analyze that scenario means that the DPEIS fails to present an adequate range of alternatives. That is not allowed under NEPA and is an important consideration if the U.S. Forest Service were to adopt, in full or in part, this DPEIS.

Comment Letter 012

12-29 **4. The DPEIS improperly phases (and therefore evades) environmental review of the project components of each alternative, which avoids meaningful analysis of the cumulative impacts of each alternative. A revised DPEIS should include a meaningful and appropriate cumulative impacts analysis that provides more substantive and detailed information for each alternative, such as the number of helicopter flights required for all project components in designated wilderness of each alternative.**

12-30 "When a lead agency knows it is using phased review, it shall so state in its environmental document." WAC 197-11-060(5)(e). Here, although the DPEIS calls itself a "programmatic" EIS, there is no discussion of what phases the project will proceed in, or what additional environmental reviews will be done during each phase. The level of detail in the DPEIS is not sufficient to conduct a site-specific review of each project (required by WAC 197-11-060(5)(c)), yet there is no indication that subsequent phases of review will address this deficiency. Thus, the DPEIS appears to be engaged in phased review without disclosing the phases as required under WAC 197-11-060(5)(e).

The DPEIS's failure to disclose and discuss the project's phases is not some picayune, technical violation of SEPA; it has real-world consequences. As Washington courts have noted, the failure to properly tier the phases of a project can lead to a failure to analyze cumulative impacts. *See East County Reclamation Co. v. Bjornsen*, 125 Wn App. 432, 441 105 P.3d 94 (2005). Indeed, this DPEIS suffers from exactly such a failure—for example, there is no analysis of the cumulative impact of the helicopter flights needed for each phase of the project, or the combined visual impacts of the various new pieces of infrastructure that will be installed by the end of the project.

12-31 Since this project appears to be operating under phased review, the DPEIS must disclose what the phases are and what additional review will be forthcoming. Failing to do so is both a technical violation of SEPA and leads to a failure to analyze cumulative impacts, which is another, separate violation of SEPA.

12-32 **5. The DPEIS presents inadequate cost estimates for project proposals, skewing alternatives away from Alternative 5, which presents a pragmatic and thoughtful solution to these complex issues (e.g., the full IPID pump exchange). A revised DPEIS needs to accurately scope the potential cost of infrastructure proposals in federally designated wilderness, including consideration of the "minimum tool requirements" (as required by section 4(c) of the Wilderness Act) for federal actions in a wilderness area.**

12-33 The cost estimates and timelines for projects proposed for construction within the Alpine Lakes Wilderness are questionable because the DPEIS fails to properly account for the protections of the Wilderness Act, the land management role and authority of the U.S. Forest Service, and the requirement for NEPA analysis and compliance. Cost estimates are an important facet of assessing the reasonableness of alternatives. Analyzing cost-prohibitive alternatives does not help address the mandate to analyze a range of reasonable alternatives; nor does omitting the

12-34 additional costs of operating under the restrictive Wilderness Act limitations. While a cost-benefit analysis need not be included in an EIS, WAC 197-11-455, if the agency chooses to include cost information, it must do so in an unbiased and accurate manner.

12-35 The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5. Alternative 5 includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek, especially in future decades when climate change will reduce flows in the Icicle watershed. As evidenced by the cost of the recent emergency dam repair at Eightmile Lake, which required an estimated $100,000 to fly a piece of heavy construction equipment (an excavator) to the site—after IPID had expected to spend a mere $2,000 to "walk" it on the ground through the Wilderness to the dam (i.e., a cost overrun of five thousand percent on that one item)—cost estimates such as $1.6 million for "Restoration" of the Eightmile dam and $3.9 million for the "Eightmile Dam Enhancement" seem woefully low.

12-36 **6. The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed unnaturally timed releases of water from the wilderness lakes, which will significantly alter stream hydrology. The DPEIS fails to recognize that altering the natural flow regime can degrade a stream's physical and chemical properties, leading to loss of aquatic life and reduced aquatic biodiversity. A revised DPEIS requires proper documentation and analysis of the riparian ecosystem and the potential cumulative impacts of the suite of infrastructure projects on that ecosystem to ensure no harm to wilderness streams or lakes.**

The current DPEIS proposes a range of projects that will alter the natural hydrologic function of wilderness lakes and streams in the Icicle basin. To date, the IWG has not adequately invested in monitoring activities across the basin to fully understand and evaluate the potential impacts to the health of wilderness streams and lakes. Usually, Ecology would be the lead agency to ensure no harm when discharging water from Square, Klonaqua, Eightmile, Colchuck and Snow lakes. Ecology developed an advanced multi-metric index model of biotic integrity in 2012 for the Cascades Region which allowed Ecology to determine the health of reaches along the Wenatchee River and the health of Icicle Creek up as far as Ida Creek Campground.

12-37 That same level of detailed analysis has not been applied in the DPEIS, either by Ecology or by any other agency. Appendix A of the DPEIS does identify the Washington State Department of Fish and Wildlife as gathering base-line data for the proposed projects. However, the results from 2016 and 2017 analyze only two wilderness streams (Leland Creek and French Creek) of the five streams of concern, and that analysis was not detailed enough to determine the health of either Leland Creek or French Creek. No analysis was completed at the wilderness lakes. We are concerned that IWG has not done adequate sampling and monitoring of impacts from past releases into these wilderness streams, including cumulative impacts, as it is required under WAC 197-11-080 (requiring agencies to obtain missing information regarding significant adverse impacts, if the cost of obtaining information will not be exorbitant). The cost and delay

Comment Letter 012

of obtaining the missing data would not be exorbitant, yet the absence of such data is leading IWG to make environmentally harmful decisions.

12-38 The DPEIS describes impacts on a stream resulting from the release of water from a wilderness lake (to improve the historic channel in lower Icicle Creek) as "insignificant" or they are found to be within the naturally occurring flow range of the stream. The DPEIS goes on to identify the release of water as a benefit for the affected riverine system. This simple analysis is faulty and ignores the natural flow regimes of each stream as having a characteristic pattern of flow magnitude, timing, duration, frequency, and rate of change. All of these patterns play a critical role in supporting the chemical, physical, and biological integrity of each receiving stream, which collectively form the foundation of a healthy Icicle system supporting robust fisheries.

12-39 Changes to stream chemical and physical conditions following flow alteration can lead to the reduction, elimination, or disconnection of optimal habitat for aquatic biota. The DPEIS fails to recognize that "human-induced alteration of the natural flow regime can degrade a stream's physical and chemical properties, leading to loss of aquatic life and reduced aquatic biodiversity. Protecting aquatic life from the effects of flow alteration involves maintaining multiple components of the flow regime within their typical range of hydrologic variation." See *Final EPA-USGS Technical Report: Protecting Aquatic Live from Effects of Hydrologic Alteration.*

12-40 Altered flows can fail to provide the cues needed for aquatic species to complete their life cycles. For example, Pale Morning Duns (Order *Ephemera Danica*) will not emerge until stream water temperatures reach 60 degrees Fahrenheit. Timing is also a factor, as they will also avoid emerging until the month of July has arrived. Alteration of the quantity and timing of river or

12-41 stream flows can also significantly affect fisheries resources by introducing competing non-native fishes.

12-42 Furthermore, the ability of a stream to support aquatic life is linked to the maintenance of key flow-regime components. For example, altering the regime by increasing flows brought about by releasing relatively high water velocities from a lake during mid-summer causes stream surface water, rich in oxygen, to bypass the sub-surface environment. The typically low summer flows and corresponding low velocity allow oxygen to be pulled into the sub-surface environment, which needs oxygenated water this time of year to support invertebrates living in sub-surface environments. Invertebrates are a source of food for other aquatic life, including fish, and tend to live in a subsurface zone (hyporheic zone).

12-43 In addition to the impacts of unnaturally timed increases in discharge rates, the DPEIS also needs to examine the impacts of unnaturally reduced discharge during the period when storage is recovered, as well as lake shoreline (edge) effects.

12-44 Further complicating these challenges are the expected changes to historic hydrologic conditions resulting from climate change, which adds additional complexity to the task of estimating acceptable levels of hydrologic variation.

12-45 If the projects described in the current DPEIS move forward, water will be discharged from wilderness lakes to improve the last four miles of Icicle Creek. The health of Prospect Creek, the last mile of Leland Creek, the last five miles of French Creek, all of Eightmile Creek, the last five miles of Mountaineer Creek and the upper 20 miles of Icicle Creek are all affected by the proposed projects and must be adequately analyzed. The DPEIS ignores lake ecology and how it

12-46 might affect he streams below the lakes that are discharging water from the hypolimnetic zone, particularly Eightmile, Square and Upper Snow lakes. Since Ecology has developed a model to

12-47 determine stream health, Ecology should take the lead and determine the health of both lakes and streams that are part of the proposed project.

12-48 With this summary of hydrological alteration in mind, and the importance of stream and lake health, it would be prudent to avoid implementing any of the DPEIS action alternatives until a team of scientists, educated in matters associated with stream and lake health, are ready to share their findings. Such a study would help assure that the Alpine Lakes Wilderness remains a healthy wilderness, and that none of the targeted wilderness streams and lakes are harmed.

12-49 **7. Conservation components in the DPEIS are insufficient. A revised DPEIS must expand these conservation actions to significantly reduce demands on Icicle Creek's water, thereby allowing its watershed to function more naturally. This will better support our region's livability and economy over the long-term.**

12-50 Water conservation methods have the potential to meet City of Leavenworth and IPID consumptive demand in the Icicle watershed. A fundamental premise of this approach is that water users are entitled only to the amount of water they need, and must exercise reasonable efficiency in their water use. From a pragmatic standpoint, reducing demand and obtaining new

12-51 supply through water conservation and efficiency measures and practices is good policy and will be more palatable to the public than projects that manipulate and increase diversions from the Enchantment Lakes region of the Alpine Lakes Wilderness.

12-52 From review of documents and field sites, it is clear that significant water savings can be obtained through tightening up water delivery and consumption infrastructure in the Leavenworth area, and through demand management efforts. Further, with respect to the City of

12-53 Leavenworth, re-calculation of future demand is appropriate.

12-54 It appears feasible that water conservation and efficiency measures, combined with a transfer of water and service duties from IPID to the City of Leavenworth, could meet the consumptive use needs of both entities.

Here are more specific comments on water efficiency and conservation:

12-55 (a) Incorrect Legal Assumptions. The DPEIS is incorrect and inadequate in its assumptions regarding necessary water efficiency and conservation. As is established by state statute and court decisions, reasonable efficiency in the use of water is not an option for water right holders. It is a requirement. The DPEIS offers various combinations of water efficiency and conservation projects on the assumption that achieving water efficiency is optional. However, achieving reasonable efficiency for Icicle Creek diverters, i.e., City

Comment Letter 012

12-55 of Leavenworth, the Leavenworth National Fish Hatchery, and IPID must be a baseline for all alternatives, and not a bargaining chip for achieving other objectives. This is how the Cascade Orchard Irrigation Company's efficiency upgrades are treated in the DPEIS, and this treatment should extend to all other Icicle Creek water users.

12-56 (b) Applied Conservation Analysis. The DPEIS should contain analysis of Washington State water conservation laws, policies and requirements as they apply to each of the Icicle
12-57 Creek water users. This is particularly appropriate given that this is a "programmatic" EIS, and should be included as part of the extent and validity analysis of water rights as
12-58 discussed above. To the extent these users do not meet state requirements, projects to improve efficiencies should be established as baseline projects that will be applicable across all of the DPEIS alternatives.

12-59 (c) Applied Water Waste Analysis. To the extent water users are wasting water, they are not entitled to maintain and use their rights. An evaluation of the extent of water waste committed by Icicle Creek water diverters, particularly IPID, should include review of conveyance loss and efficiencies from the point of release of water in the Alpine Lakes Wilderness, the canal system, operational spills and any other particulars of the water delivery system. This analysis is particularly important to understand the benefits and appropriate allocation of costs associated with the IPID Full Piping and IPID Pump Exchange alternatives. A water waste analysis is particularly appropriate given that this is a "programmatic" EIS, and should be included as part of the extent and validity analysis of water rights as discussed above.

12-60 (d) IPID Irrigation Efficiencies Project (Section 2.5.2). This DPEIS section contains no discussion of actual efficiencies of the system (i.e., consumed water vs. transportation loss and waste). It is rife with vague, unquantified, and anecdotal information about
12-61 actual conservation activities (i.e., "some farmers have complained'; only "small portions" of canals remain unlined). It lacks discussion about wasteful water use on converted residential properties. For more information and photographs of IPID's inefficient water use, see R.P. Osborn, Center for Environmental Law & Policy, Memo re "Water conservation potential for consumptive demand reduction and supply for City of Leavenworth and Icicle-Peshastin Irrigation Districts" (July 9, 2015), incorporated herein by reference.

12-62 (e) Domestic Conservation (Section 2.5.4) – City of Leavenworth. The DPEIS confuses wants and needs. The City of Leavenworth and Ecology need to come to agreement regarding water rights for the City of Leavenworth, including to resolve an outstanding court case. The DPEIS does not provide resolution to this issue but instead proposes to provide additional water rights (i.e., wants) to the City of Leavenworth without requiring the City to implement anything other than an inadequate water conservation plan that provides for water conservation in name only. More specifically:

12-63 a. The City of Leavenworth's future water use demand projections are overly aggressive. The City's Water System Plan states that population will grow by

12-63 0.47% per year while its water use will grow by 2.2% per year. The projected growth in water use of 2.2% is not supported by the historic growth of water demands for the City of Leavenworth.

12-64 b. Since 1990, water demands have varied from 850 to 1,165 acre-feet per year without a corresponding upward trend in water demand. At the same time, the City's population has increased from 1,692 to 1,990. Essentially, for 27 years water use has not grown while the City's population has increased. The City of Leavenworth's projections state that water use will begin to grow at a pace which is not supported by historical data.

12-65 c. If water use growth for the City of Leavenworth is estimated at 1% per year (rather than the 2.2% shown in the City's Water Plan) it will take until 2056 to exceed the temporary water right limitation of 1,465 acre-feet as imposed by the court ruling of Leavenworth vs. Ecology (Water System Plan, Figure B, p. 45).

12-66 d. The DPEIS states that the City of Leavenworth is considering reclaimed water to meet its demands. The City of Leavenworth's Water System Plan specifically states that it is not going to utilize reclaimed water. These statements are contradictory. Failure to plan for use of reclaimed water indicates the City's water plan is not aggressive.

e. The City of Leavenworth should not receive additional water supply until its water conservation plan in the City's Water System Plan aggressively promotes conservation as determined by the following factors:

12-67
   i. The City of Leavenworth is currently allocating only $1,000 per year for water conservation.
   ii. The City of Leavenworth's unaccounted water (lost water) is 24%, grossly in excess of the statutory 10% mandate.
   iii. The City of Leavenworth's water conservation plan does not included leak detection to determine where unaccounted for water is going.
   iv. Approximately 70% of all water used is during the summer months. The City decided not to impose a conservation-based water rate due to the possible financial hardships imposed on its customers. While we understand this is politically difficult to do, the City could gradually impose a conservation-based rate over many years to minimize the shock of a sudden rate increase.
   v. The City of Leavenworth water plan is designed to meet only the minimum Department of Health guidelines. This is very disappointing and should have been resolved prior to release of the DPEIS.
   vi. With a more aggressive conservation program, the City of Leavenworth will not need as much additional water by 2050. The Water System Plan guideline of 1,750 acre-feet of additional domestic supply should be revised to a lower number and the associated project(s) that is required to reach this goal should not be funded.

12-68 (f) Domestic Conservation (Section 2.5.4) – Rural Water Use. The DPEIS allocates 74 acre-feet of domestic water for the growth of 199 additional households in the watershed in Chelan County.

Comment Letter 012

Comment Letter 012

12-69 a. Because Icicle Creek is over-appropriated, the basin should be closed for new growth. If new growth is to occur, new households should be required to purchase existing water rights via water right exchanges and water banks. This approach is similar to what is occurring in Kittitas and Yakima counties. Growth should pay for growth.

12-70 b. Growth should occur in cities and towns according to the Growth Management Act. The guidelines in the DPEIS for water usage in Chelan County should be changed to reflect this.

12-71 (g) Leavenworth National Fish Hatchery Conservation and Water Quality Projects (Section 2.5.9). The LNFH projects provide a good example of the flawed foundation of the Icicle Strategy. Virtually all of the LNFH projects identified in the DPEIS are required to be completed by other laws and on the initiative of the federal agencies that own and operate the Hatchery in order to meet Endangered Species Act, Clean Water Act, and U.S. treaty obligations. Using LNFH upgrades as a bargaining chip to justify other elements of the DPEIS projects is inappropriate. It is evident from the DPEIS that many LNFH projects have been or will be implemented by the Hatchery, including water supply piping, effluent pumpback, fish screening, streamflow augmentation, circular tanks and fish passage.

12-72 (h) Water Markets (Section 2.5.12). The water market proposal artificially limits itself to discussion solely of providing water to interruptible water markets in the basin. If the City of Leavenworth or other municipalities do in fact require additional water supply for future growth, water markets could serve that purpose. One obvious example would involve transfer of water from IPID to Leavenworth for residences in the Ski Hill area. There appears to substantial waste of water in that neighborhood (see RP Osborn, Conservation Memorandum, cited above, including photos), which largely converted from orchards at some time in the past. Bringing those properties into reasonably efficient water duties for residential properties could free up water to serve properties elsewhere in the City of Leavenworth water system. This is an example of how a water market might operate to serve new demand. The DPEIS should be amended to evaluate a larger range of options for this tool.

8. Miscellaneous comments.

12-73 (a) Inadequate Instream Flow Goals. The proposed non-drought year 100 cfs flow target does not meet basic needs of Icicle Creek wild fisheries. Further, the 60 cfs drought goal is inconsistent with scientific consensus that fish must have adequate cold water in drought periods to avoid significant impacts caused by high water temperatures. The appropriate flow goal is 250 cfs, which represents not an "every year" flow, but the high water year flow that is necessary to ensure survival and healthy populations of wild fish. For more information, see "Analysis of Icicle Creek Instream Flow Benefits of Three 'Base Projects' During Low Flow Months" prepared by Mark Hersh, Wild Fish Conservancy, and Dick Reiman, Icicle Creek Project (16 pp., July 2013), transmitted to

12-73 the Icicle Work Group, and letter from Wild Fish Conservancy to Tom Tebb (14 pp., 12/19/13). These documents are incorporated herein by reference.

12-74 (b) IPID Full Piping & Pump Exchange Project. As is evident in Figures 2-6, 2-7 and 2-8, the Alternative 1, 2, 3 and 4 "Base Package" projects are unable to meet even the inadequate 100/60 cfs flow goals. Only the IPID full piping and pump exchange scenario (in Alternative 5) is able to come close to achieving the pre-development natural flows in Icicle Creek that are necessary to support healthy fisheries.

12-75 (c) Junior Water Users. The DPEIS sets forth as a "guiding principle" agricultural reliability, with a specific goal of providing full water rights to the 56 interruptible water rights holders in the basin. While this principle is compassionate, it fails to recognize that these water users took their rights with an understanding that they were interruptible, and indeed the prior appropriation doctrine operates on the principle that junior users will be curtailed during low water years. The predicament of these users was deliberately created by Ecology when it chose to issue more water rights than there is sufficient water to fulfill each year, and by the water users when they chose to accept such rights. Because Ecology has not closed the basin, what is to prevent this cycle from repeating itself? As specifically contemplated in the DPEIS alternatives, Ecology will continue to issue junior water rights, which are then curtailed, leading to future water projects to make these juniors "whole." The DPEIS fails to discuss the implications of this open-ended water management.

12-76 (d) Easement Map. The description of IPID's easements in the Alpine Lakes Wilderness (DPEIS p. 2-44) should include maps, including the map that shows that IPID does not hold an easement for the entirety of Eightmile Lake.

12-77 (e) Section 2.5.7 Habitat Protection. The discussion of land acquisitions through the Upper Wenatchee Community Land Plan appears to target lands outside the Icicle Creek basin. The DPEIS does not provide a basis for understanding how these land acquisitions benefit Icicle Creek. It appears the Icicle Work Group has evaded an issue by simply adopting the goals and priorities of another group. This approach does not support expansion of the Wenatchee basin instream flow reserve for the Icicle sub-basin.

12-78 (f) Section 2.5.7 Instream Flow Amendment. As noted in discussion of City of Leavenworth water conservation above, the City has significantly overestimated future demand, and is underperforming on state mandated water conservation requirements. Expansion of the instream flow rule domestic reserve based on City demand and planning is not justified. The DPEIS fails to discuss this.

12-79 (a) Section 2.5.9 LNFH Groundwater Augmentation. The DPEIS fails to identify or analyze the problem of utilizing groundwater collectors to pump groundwater in direct hydraulic continuity with Icicle Creek. This proposal appears to propose improving reliability of LNFH groundwater supply at the expense of depleting flows in Icicle Creek.

Comment Letter 012

12-80 (b) The Cost of Water. The DPEIS provides a misleading and inappropriate comparison for developing water. Chapter 2 states five times that the cost of water in the Columbia Basin is $500/acre-foot for projects developed by the Office of the Columbia River (OCR). OCR projects such as the Lake Roosevelt Drawdown or Sullivan Lake transfer represent heavily subsidized projects that were developed as "low hanging fruit," and are not appropriate for comparison in the DPEIS. One problem is that this number does not appear to include infrastructure costs, thus creating an apples-to-oranges comparison. In contrast, the costs associated with providing water to, for example, the Odessa Subarea have been astronomical, but covered by programs such as the ARRA and other grants. We suspect these numbers are not included in the $500/acre-foot "baseline." The DPEIS at page 2-57 does, however, identify the previously completed IPID Canal to Pipeline Conversion as costing $2 million to obtain 360 acre-feet of water, i.e., a $5,555/acre-foot cost. The DPEIS is deficient in failing to provide appropriate and realistic cost comparisons for Columbia Basin water development.

Conclusion

Thank you for the opportunity to provide comments on the Icicle DPEIS. Our organizations support collaborative efforts to develop innovative and sound approaches to water and natural resource management for Icicle Creek and the greater Wenatchee River basin, and we appreciate the commitment of organizations, tribes, agencies, and individuals to this important endeavor. As we face a certain future of increased demands on limited water resources, such collaborative efforts will be required to balance the range of competing needs. Broad-based community involvement and support as well as transparency and trust are critical ingredients for success.

For all reasons described above, we request the Icicle DPEIS be withdrawn, revised, and re-released as a Revised Draft PEIS for public comment once the deficiencies detailed here are addressed.

Sincerely,

Rick McGuire, President
Alpine Lakes Protection Society

Kitty Craig, Washington State Deputy Director
The Wilderness Society

Trish Rolfe, Executive Director
Center for Environmental Law & Policy

George Nickas, Executive Director
Wilderness Watch

Gary Macfarlane, Ecosystem Defense Director
Friends of the Clearwater

Sharon Lunz, President
Icicle Creek Watershed Council

Kurt Beardslee, Executive Director
Wild Fish Conservancy

Art Campbell, President
North Central Washington Audubon Society

Gus Bekker, President
El Sendero Backcountry Ski & Snowshoe Club

John Spring, President
Spring Family Trust for Trails

Mark Boyar, President
MidFORC

Mike Town, President
Friends of Wild Sky

Tom Uniack, Executive Director
Washington Wild

Annie Cubberly, Broadband Leader
Polly Dyer Cascadia Chapter
Great Old Broads for Wilderness

Tom Hammond, President
North Cascades Conservation Council

George Milne, President
Federation of Western Outdoor Clubs

Doug Scott, Principal
Doug Scott Wilderness Consulting

Lee Davis, Executive Director
The Mazamas

William Campbell, President
Friends of Lake Kachess

Tom Martin, Council Member
River Runners For Wilderness

Comment Letter 012

John Brosnan, Executive Director
Seattle Audubon Society

Kathi & Greg Shannon, Steering Committee members
Friends of Enchantments

Lori Andresen, President
Save Our Sky Blue Waters

Melissa Bates, President
Aqua Permanente

Kirt Lenard, President
Issaquah Alps Trails Club

Brian Hoots, President
Spokane Mountaineers

Harry Romberg, National Forests Co-Chair
Washington State Chapter
Sierra Club

Chris Maykut, President
Friends of Bumping Lake

Judy Hallisey, President
Kittitas Audubon Society

Thomas O'Keefe, PhD
Pacific Northwest Stewardship Director
American Whitewater

Denise Boggs, Executive Director
Conservation Congress

cc: Governor Jay Inslee
U.S. Senator Patty Murray
U.S. Senator Maria Cantwell
U.S. Representative Dave Reichert
Okanogan-Wenatchee National Forest Supervisor Mike Williams
Wenatchee River District Ranger Jeff Rivera

Comment Letter 013

July 30, 2018

Tom Tebb
Director, Office of Columbia River
Washington Department of Ecology
1250 Alder Street
Union Gap, WA 98903

Mike Kaputa, Director, Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Icicle Strategy Programmatic Environmental Impact Statement
Submitted via email to: nr.icicleseпa@co.chelan.wa.us

Dear Directors Tebb and Kaputa,

Thank you for the opportunity to comment on the Draft Programmatic Environmental Impact Statement (PEIS) for the Icicle Strategy. Access Fund, The Mountaineers and Washington Trails Association (WTA) - all human-powered recreation organizations in Washington State - come together to work on issues relating to recreation, access and conservation.

The Icicle Strategy is an expansive undertaking, aiming to implement a comprehensive water resource management plan in the Icicle Creek Subbasin. Its guiding principles are designed to create healthy streamflow, a sustainable Leavenworth National Fish Hatchery (LNFH), meet municipal demand for additional water, improve agricultural reliability, enhance the Icicle Creek habitat, and comply with state, federal, and tribal treaty rights. As organizations that represent hikers, climbers and mountain bikers in Washington state, our interest lies in ensuring that those who recreate in the Icicle Creek Subbasin can enjoy its trails and outdoor opportunities. This includes ensuring that any project's long and short-term impacts are analyzed and take effective steps to mitigate alterations to these outdoor opportunities. Furthermore, the PEIS should meet all of the guiding principles set forth for the Icicle Workgroup.

The Enchantments are a valued landscape to our organization's nearly 30,000 members. For example, since 1998, WTA has contributed 7,471 volunteer hours to trail work in the Enchantment Area Permit

Zone. Collectively, hikers and climbers have filed over 1,100 trip reports for trails impacted by the Icicle Strategy, including the Enchantments Trail, Snow Lakes Trail, Eightmile Lake Trail and Klonaqua Lakes Trail. This equates to more than 11,500 miles hiked on these trails alone.

The vast lands of the Alpine Lakes Wilderness are of immense value to hikers and climbers in Washington state. This area is widely considered to be one of the most beautiful and cherished areas by those who recreate outdoors. Individuals from all walks of life and from areas of the Northwest travel to visit these lands each year. Changes proposed in this plan to this area could cause closures or permanently impair its environment, riparian ecosystem, and popular recreation areas.

13-1 Our organizations support projects within the Icicle Strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. These projects could support the LNFH in meetings its goals and fall within the guiding principles of the Icicle Strategy. These conservation elements of the plan are foundational to the protection of this area and the outdoor experiences hikers and climbers enjoy.

13-2 **Recommendations**

We suggest that the following projects be removed from the Icicle Strategy:

- Eightmile Lake Storage Enhancement
- Upper Klonaqua Lake Storage Enhancement
- Upper and Lower Snow Lake Storage Enhancement

13-3 We also suggest the following measures be taken to ensure all projects included in the Icicle Strategy meet its guiding principles:

- Conduct a formal NEPA for all projects taking place in the Alpine Lakes Wilderness

13-4
- Ecology must perform a "Extent and Validity" determination for the three primary water rights holders in the Icicle Creek Subbasin

Our organizations are concerned about the following projects:

13-5 Eightmile Lake Enhancement: We are concerned that the projects listed at Eightmile Lake could flood the trail and surrounding campsites. These projects could also create significant physical and visual impacts to the trail and area immediately surrounding it.

13-6 Appendix B of the DPEIS title, "The Eightmile Lake Storage Restoration Feasibility Study", discusses possible strategies for accessing Eightmile Lake during construction of the projects. Table 5-1 on Page 55 indicates that excavators would be used. Their use could create lasting negative impact on this heavily popular trail and wilderness area. This study does not address mitigation strategies for these impacts.

13-7 The feasibility study also discusses the Eightmile Lake Trail as between the Eightmile Lake Trailhead and Eightmile Lake itself, but does not discuss the trail surrounding the lake, or campsites immediately surrounding it. These areas would likely be flooded if these projects are undertaken.

Comment Letter 013

13-8 Due to the possible permanent negative impacts to Eightmile Lake, we request the Eightmile Lake Enhancement project be removed from the Icicle Strategy. This project lacks key mitigation strategies for eliminating negative impacts to the trail, implementation and outdoor recreation and the wilderness.

13-9 Upper and Lower Snow Lake Storage Enhancement: Chapter 4 of the PEIS document outlines impacts and mitigation strategies for Icicle Strategy projects. Section 4.2.5.1 discusses the short-term impacts, which at Snow Lakes would require heavy construction equipment. As noted in section 4.2.5.2, *Long-Term Impacts*, the Upper and Lower Snow Lakes Storage Enhancement Project "would result in water levels that are higher than historical levels." As this lake is popular with campers and the trail follows around the lake itself, this project could flood the surrounding trail. The steep, rocky terrain surrounding this lake would make this trail difficult and costly to relocate.

Without proper NEPA analysis or mitigation strategies for construction and given the possibility of trail flooding due to higher water levels, our organizations oppose this project and request it be removed from the Icicle Strategy.

13-10 Upper Klonaqua Lake Storage Enhancement: At the Klonaqua Lakes, the PEIS (Chapter 4, Section 4.2.5.1) notes that the Upper Klonaqua Lake Storage Enhancement project is still at a conceptual stage. Given that, the impacts to these lakes remains unclear. Without a clear indication of the impacts to the trail and shoreline, this project should not continue. The long-term impacts from this particular project would "result in lake levels that are drawn down below the historical range." Not only would this create lasting negative visual impacts to the lakes, but they could result in increased natural resource erosion. As written in the PEIS, the impacts to the Upper and Lower Klonaqua Lakes are inadequately described and missing key information pertaining to construction, maintenance and impacts to trail.

Without further information regarding this project and its implementation and impacts, this project is an incomplete proposal. Our organizations are concerned with the information provided on this project, its possibility for lasting negative visual and physical impacts and request it be removed from the Icicle Strategy.

13-11 **Conduct a formal NEPA for all projects taking place in the Alpine Lakes Wilderness**

Without sufficient NEPA provided, the range of alternatives presented in the Draft PEIS includes actions unprecedented in the Alpine Lakes Wilderness. These actions could set a model that allows for further new actions in wilderness area; an undesirable outcome for all those working to protect the beauty of these lands.

13-12 Section 1.5.2.7 of the PEIS outlines the guiding principles of the IWG to "Comply with State and Federal Law, and Wilderness Acts". This section notes that the IWG actively identified and engaged with the US Bureau of Reclamation (USBR) and US Fish and Wildlife Service (USFWS) to create projects and alternatives for the Icicle Strategy. Yet the United State Forest Service (USFS) has jurisdiction over much of the land impacted by the aforementioned projects. Therefore, the USFS would be required to conduct a NEPA analysis before any projects could commence.

Comment Letter 013

Comment Letter 013

13-13 According to section 1.9.3.2 of the PEIS, the USBR and USFWS are reviewing "proposals on Snow Lake valve replacement and automation, screening and upgrading the intake structure, water conservation measures at LNFH and groundwater development." This section states that the USBR is considering additional EA and EIS work for the other projects, however does not provide further information about which projects are being considered for further EA and EIS work, nor does it provide a timeline for the dissemination of this information to community partners and members of the IWG.

A revised PEIS should provide further information regarding the NEPA status and process of all projects proposed to take place in the Alpine Lakes Wilderness.

Ecology must perform an "Extent and Validity" determination for the three primary water rights holders in the Icicle Creek Subbasin

13-14 To date, Ecology has made no extent and validity determination of either IPID or LNFH diversionary or storage water rights. Given the amounts of storage that are proposed to be diverted and the implementation of these projects, an extent and validity determination must be performed to certify IPID's correct amounts for any Storage and Diversion rights for primary water rights holders, which would determine the feasibility of the projects outlined in the Draft PEIS.

Conclusion

As a protected wilderness area, each project in the Alpine Lakes Wilderness must be carefully considered to follow the federal Wilderness Act of 1964. They also must follow the guiding principles as outlined in the Icicle Strategy documents and as determined by the IWG.

The Icicle Strategy's proposed Eightmile Lake Enhancement, Upper Klonaqua Lake Storage Enhancement and Upper and Lower Snow Lake Storage Enhancement projects should be removed from the draft PEIS provided by Chelan County. As they take place in a designated wilderness area, each project requires a sufficient NEPA analysis. As written, these projects could flood surrounding trail, campsites and create adverse wilderness area impacts -- while the Draft PEIS documents do not provide adequate measures to avoid these circumstances or mitigate these negative impacts.

Furthermore, IPID and LNFH's diversion and storage water rights are in question. An extent and validity determination must be performed by Ecology prior to subsequent actions on the Icicle Strategy.

While we recognize the need for enhanced water storage and increased efforts to support fish population and habitat in the Alpine Lakes Wilderness, these problems can also be solved without direct significant impacts to popular areas for the outdoor recreation community.

13-15 We appreciate the opportunity to comment on this process. As the Icicle Strategy continues, we hope that all stakeholders involved are actively included in planning and decision-making processes. Please add our organizations to further communications regarding this strategy.

Sincerely,

Andrea Imler
Advocacy Director
Washington Trails Association

Katherine Hollis
Conservation & Advocacy Director
The Mountaineers

Joe Sambataro
Northwest Regional Director
Access Fund

Comment Letter 014

Comment Letter 014

July 25, 2018

Mr. Mike Kaputa
Director, Chelan County Natural Resource Department
411 Washington Street, Suite 201,
Wenatchee, WA 98801

Re: Icicle Strategy DPEIS – comments

Dear Mr. Kaputa:

The Alpine Lakes Foundation is pleased to submit these comments on the Icicle Strategy Draft Programmatic Environmental Impact Statement (DPEIS).

Who we are. The Alpine Lakes Foundation is a duly-registered non-profit Washington corporation, that has been active for 25 years. Our mission is to educate the public, through information, study, advocacy and otherwise, on the Alpine Lakes Wilderness and surrounding lands, and to aid and support their preservation and stewardship. We are a separate organization from the Alpine Lakes Protection Society, although we share similar goals.

Comments – Lack of legal authority The DPEIS describes alternatives proposed by a working group of many organizations, but the only member of that group with any primary water rights is the Icicle Peshastin Irrigation District. All the alternatives assume that the irrigation district can exercise those rights or make its water available to the extent necessary to carry out the alternatives. Yet, the DPEIS assumes without discussion that the irrigation district has the legal right to do this, when in fact, for the following reasons, it does not:

14-1 1. The irrigation district has forfeited, relinquished, or never acquired the right to store or release more water from the lakes identified in the DPEIS than it has historically stored or released. The irrigation district never held or no longer holds the right to store or use the additional quantities of water envisioned by the various alternatives. Revised Code of Washington 90.14.160. Okanogan Wilderness League v. Town of Twisp and Department of Ecology, 133 Wn.2d 769, 947 P.2d 732 (1997). This decision is based on common law abandonment, which is independent of the foregoing statute.

14-2 2. Any water within the Alpine Lakes Wilderness that the irrigation district has not historically used now belongs to the federal government under the federal reserved water right doctrine. This doctrine stems from Winters v. United States, 207 U.S. 564 (1908). The U.S. Supreme Court has applied it more recently in U.S. v. New Mexico, 438 U.S. 696, 702 (1978); Cappaert v. U.S., 426 U.S. 128 (1976); and Arizona v. California, 373 U.S. 546, 601 (1963).

14-3 3. Any attempt by the irrigation district to store or release more water than it historically has used within the Alpine Lakes Wilderness would violate section 4 of the Wilderness Act, the Alpine Lakes Area Management Act of 1976, and the Alpine Lakes Wilderness Management Plan, pp 162-64 (1981).

14-3 4. These foregoing points also apply to the US Bureau of Reclamation and the US Fish & Wildlife Service with respect to Snow and Nada Lakes.

14-4 5. The easements, permits, or deeds granted by the US Forest Service to the irrigation district do not override the foregoing laws, nor do they address or affect the extent of the irrigation district's water rights.

14-5 6. The irrigation district has never had and currently does not hold any water rights at Upper Klonaqua Lake.

For the foregoing reasons, all the alternatives in the DPEIS are wishful thinking because they lack any legal basis.

Comments – How the Icicle Strategy could be improved.

14-6 1. The Strategy should be revised to rely only on those quantities of water at specific lakes that the irrigation district has historically used and therefore has the right to use.

14-7 2. Moving the irrigation district's point of diversion downstream to the Wenatchee River, as proposed in Alternative 5, would greatly improve stream flows in Icicle Creek. However, the rest of Alternative 5 should be dropped. It suffers from the same lack of legal authority as already discussed.

14-8 3. Water conservation proposals in the DPEIS should be significantly expanded to reduce demands on Icicle Creek's water. This would allow the Icicle watershed to function more naturally, including enhanced stream flows.

14-9 4. The DPEIS should acknowledge the land management role and authority of the U.S. Forest Service on national forest lands, its special responsibilities to protect the wilderness character of the Alpine Lakes Wilderness, and the application of numerous federal laws to many of the actions proposed in the Icicle Strategy.

Thank you for the opportunity to submit these comments.

Very truly,

ALPINE LAKES FOUNDATION
s/David G. Knibb
By David G. Knibb, Vice President
100 98th Avenue NE #E-6
Bellevue, WA 98004-5461
iciclenetwork1@gmail.com

Comment Letter 015

CHELAN~DOUGLAS
LAND TRUST
Our Land, Our Water, Our Future

July 26, 2018

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Comment on Icicle Strategy Draft PEIS

Dear Mike,

The Chelan-Douglas Land Trust (CDLT) is a conservation-based non-profit representing over 1,700 households and 2,500 members (mainly local). The Land Trust strives to conserve, care for, and deliver access to the natural lands and waters that sustain North Central Washington. We focus first and foremost on preserving the ecological value of native habitats and natural lands.

Because of our focus as an organization and due to the breadth and broad scope of the PEIS, CDLT will limit its comments to the Habitat Protection section of the Alternatives. CDLT has worked for decades to protect the salmon streams and floodplain habitats of the most important tributaries in the Wenatchee and Entiat River watersheds. The Land Trust has successfully protected some 290 acres of important riparian salmon habitat on Icicle Creek, but there is much more to do. CDLT has developed relationships with a number of significant landowners who are willing to protect land along Icicle Creek and near the confluence with the Wenatchee River, if sufficient funds were available to pay them a reasonable portion of fair market value. Protection actions such as this should be the highest priority action in the Upper Columbia; it is always less expensive to protect in situ quality habitat than to try to restore altered habitat and mitigate for its loss.

15-1 CDLT strongly supports inclusion of a substantial budget for fee or conservation easement acquisition near the Wenatchee/Icicle confluence and along Icicle Creek between the confluence and the fish hatchery. The Natural Systems Design report discussed in Section 2-5-7 and incorporated into subsequent alternatives recommends protection for the benefit of endangered Chinook salmon, threatened steelhead and threatened bull trout throughout the lower reach, which is also used by sockeye salmon. Furthermore, once the land is acquired for conservation, restoration work can be facilitated with partners.

CHELAN~DOUGLAS LAND TRUST
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Comment Letter 015

15-1 The proposed budget of $2.5 million is definitely inadequate, however. Based on CDLT experience in the area, we recommend no less than $8 million be allocated for acquisition actions. This would be funding well spent to protect over 200 acres and much of the riverfront on the lower Icicle.

Thank you for the opportunity to comment on the Icicle Strategy Draft PEIS. We understand the complex nature of this document and the challenges associated with the management of land and water in Icicle Creek. We also stand ready to assist with the implementation of permanent conservation measures in the future.

Sincerely Yours,

Curt Soper, Executive Director

Comment Letter 016

Great Old Broads For Wilderness
Get Into The Wild

July 16, 2018

Mike Kaputa,
Chelan County National Resource Dept,
411 Washington St, Ste 201, Wenatchee, WA 98802

I am writing you as a leader of the Polly Dyer Cascadia Great Old Broads for Wilderness. We are part of a national grass roots organization, led by women that engages and inspires activism to preserve and protect wilderness and wild lands. In Washington alone we have over 300 members.

We are writing in staunch opposition to the "Farm Bill" as it is currently proposed. The bill will completely destroy environmental protections of our precious public forests. The bill falsely asserts that logging will reduce fires and reduce carbon losses from forests (**in fact it increases them!**) Science tells us that logging does not stop native beetles or disease and dead trees or snags do not burn more intensely than a green forest. The areas that burn more intensely are areas that are heavily logged!

Public forest lands are essential ecosystems which provide, clean water, clean air, and habitat for native species. These forests are also one of nature's best carbon storage and sequestration systems on the planet. They provide extraordinary opportunities for the multi-billion dollar recreation economy valuable to our Evergreen state economy. Protecting public forestlands from logging will also help diminish the effects of climate change.

The projects this bill is proposing to exempt from the Endangered Species Act (ESA) and the National Environmental Policy Act (NEPA) are short sighted and hazardous to our forests and native species. The most egregious provisions of Title VIII (Forestry) found on pages 464 thru 526 of the House Republican's Farm Bill. Please read closely and prevent this devastation.

We urge you to vociferously oppose these sections of the bill and resist any attempt to make any deal which includes these or any other similar provisions. **The time to stand up for our forests and the environment is now.**

Broad Regards,

Annie Cubberly

Annie Cubberly Polly Dyer Cascadia Broad Band Leader
Anniecubberly@gmail.com
4039 Rainwood Drive NW Olympia, WA

Comment Letter 017

North Central Washington Audubon Society
P.O. Box 2934
Wenatchee, WA 98807
www.ncwaudubon.org

July 29, 2018

Mike Kaputa
Director
Natural Resource Department, Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Draft Programmatic Environmental Impact Statement for the Icicle Creek Water Resource Management Strategy, Chelan County, Washington

Dear Mr. Kaputa:

The North Central Washington Audubon Society appreciates the opportunity to provide comments to the DPEIS for the Icicle Creek Water Resource Management Strategy.

Minimizing impacts to in-stream and lake habitat in the Icicle watershed is necessary to preserve the healthy environment that underpins our region's economy and way of life.

17-1 To minimize habitat impacts, the amount of water drawn from the Icicle must be minimized. To minimize water withdrawals while also providing sufficient water for downstream users, water use by all users must be as efficient as possible. This would require implementation of aggressive conservation measures, which should include conveyance infrastructure improvements to minimize water loss, increased metering, and pricing of water in combination with issuance of bonds to finance a substantial buy-down of agricultural water rights in the area served by the Icicle's water. Unfortunately, none of the alternatives under consideration appears to include this level of aggressive conservation. WAC 197-11-440(5)(b) states "Reasonable alternatives shall include actions that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation." An alternative with aggressive conservation measures would be a reasonable alternative under SEPA as it could attain the proposal's objectives while resulting in less overall environmental impact than any of the alternatives analyzed in the DPEIS.

17-2 The introduction to Section 1.1 contains the statement "Additionally, the PEIS will serve as the basis for future project-level environmental review that may be required if additional adverse impacts not identified in this document are probable." Future project-level actions that are not exempt will require environmental review and a threshold determination as stated in WAC 197-11-310(1). The question is not whether review would be required but whether additional documentation will be required or whether the PFEIS can be adopted under WAC 197-11-630. The text should be modified to clarify this point.

The introduction of Section 3.6 of the DPEIS states that the description of water rights in that section "does not represent an extent and validity review and is not intended to determine the validity of quantities of water available under these water rights". We appreciate this acknowledgement, as we believe some of the water rights originally granted haven't been tapped for decades and are now likely invalid.

17-3 Section 3.6 is titled Water Use whereas the entire section describes water rights. This highlights a semantic issue that propagates throughout the document and reveals a substantive underlying issue. In the DPEIS, the terms "use" and "demand" appear to be synonyms for water right rather than actual water use, the assumption apparently being that each user is actually using or has an actual demand for the full quantity of water allowed in the user's presumed water right. For example, Table 3.10 lists claimed surface water rights on Icicle Creek, some of which apparently authorize only instantaneous quantities. The total annual quantities needed for the beneficial uses of water claimed under water rights authorizing maximum instantaneous withdrawals are not, but should be, provided.

Also, the apparent assumption of actual water use or demand equaling a presumed water right, which is almost certainly invalid, highlights the need for comprehensive metering to understand actual water use. An understanding of actual water use would facilitate a rational system-wide water allocation that provides sufficient water to downstream water users while minimizing the amount of water extracted from the Icicle and minimizing or avoiding modifications to lakes in the upper Icicle drainage.

17-4 The extent to which claimed existing water rights would be used or new water rights obtained under each alternative is unclear. For example, Table 3.9 lists a water storage right for Eightmile Lake with an adjudicated annual quantity of 2,500 acre-feet. Section 2.3.5 describes Alternative 4 involving "increasing the useable storage [of Eightmile Lake] to approximately 3,500 acre-feet". This increase in storage would presumably require acquisition of a water storage right for an additional 1,000 acre-feet assuming that the original water storage right remains valid. There is also a lack of clarity with respect to water rights claimed by the City of Leavenworth in relation to the amount of water that would be provided to the City under the various alternatives. Tables 3.9 and 3.10 provide

17-5 a clear listing of claimed water rights. A similarly clear tabulation of new water rights required under the various alternatives, assuming claimed water rights are valid, would be useful to the reader.

17-6 Section 3.6.1.2 describes groundwater rights held by the City of Leavenworth with "points of diversion near RM 27.2 of the Wenatchee River". This section further states: "the City of Leavenworth may be amenable to exercising water made available through the Icicle Strategy from their Wenatchee River well field rather than their Icicle Creek diversion." Impacts and implications for reduced modification to the Icicle system as a result of using this groundwater by the City should be analyzed in the EIS. The statement that the City "may be amenable" is ambiguous as to the City's actual willingness to draw from that groundwater source. The EIS should therefore also clarify under what conditions the City would use that source.

Comment Letter 017

17-7 The DPEIS is unclear regarding to what extent actions implemented under the eventual approved Icicle Creek Water Resource Management Strategy would facilitate projected development of the City of Leavenworth to 2050. The text should be clarified on this point, and the impacts resulting from development that could not otherwise occur but for implementation of the Management Strategy described as indirect impacts in the PEIS as required under WAC 197-11-060(4).

17-8 We disagree with several conclusions reached in Section 4.28 regarding unavoidable adverse impacts. For example, impacts to Earth, Surface Water, Water Quality, Shorelines, and Fish and to Aesthetics, Recreation, and Wilderness from modifications to lakes in the upper Icicle drainage, for example, late summer drawdowns of Eightmile Lake under Alternative 4, would be significant. Sufficient detail is available at this programmatic stage of analysis to reach appropriate conclusions regarding significance of unavoidable impacts. Adequate consideration of environmental impacts during finalization of the management strategy requires that these conclusions be available to decisionmakers. If conclusions regarding the significance of unavoidable impacts are nonetheless postponed, project-level environmental review should be a supplemental environmental impact statement to adequately assess impacts.

Sincerely,

Arthur Campbell

Arthur Campbell
President

Comment Letter 018

From: Donna Osseward <osseward@gmail.com>
Sent: Monday, July 30, 2018 5:01 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on Icicle Creek Watershed Water Resources Management Strategy

Olympic Park Associates (OPA) appreciates this opportunity to comment on the Draft Programmatic Environmental Impact Statement (DPEIS) for the "Icicle Creek Watershed Water Resources Management Strategy."
While our mission is "to protect the wilderness and ecological integrity of Olympic National Park", OPA feels that harm to any American wilderness creates a precedence for harm to all wilderness areas. OPA considers wilderness to be the highest form of the multiple use of our lands.

18-1 In looking at the proposed Draft Programmatic Environmental Impact Statement (DPEIS) for the "Icicle Creek Watershed Water Resources Management Strategy", OPA considers the proposal, as written, would violate NEPA and the Wilderness Act of 1964.

18-2 Specifically, any actions that will change the flow of water within the Alpine Lakes Wilderness is a violation of the Wilderness Act. The Colchuck, Eightmile, Upper and Lower Snow, Nada, Lower Klonaqua, and Square lakes, and the Eightmile, French, Icicle, Klonaqua, Leland, Mountaineer, Prospect, and Snow creeks could all be negatively impacted by actions described in the DPEIS. Also, OPA contends IPID's easements do not supersede the Wilderness Act. OPA feels the

18-3 DPEIS must be revised to address NEPA and Wilderness Act misunderstandings in its current version. OPA concurs with the North Cascades Conservation Council's concerns on the Icicle project's effects on the Alpine Lakes Wilderness.
From wilderness we get clean air and water. Both move beyond the wilderness area boundaries. Properly used wilderness provides a recreational sanctuary that can be enjoyed by many. Wilderness provides a place for wildlife far better than a zoo. It protects ecosystems that hold genes that have and will provide the basis for a great percentage of our medicines. Genes that have helped and will help to provide cures for agricultural ills. As environmental conditions change, new plant and animal genes may be needed to strengthen agricultural crops and animals. Wilderness is a library and laboratory for our Creator's genetic wonders. Wonders our scientists discover, not create.
The use of wilderness must be such that none of its gifts are sacrificed to one use or group of people. These federal lands belong to all the people of the United States. Their value belongs to all the people of the United States. With coming climate change, protecting these gifts will require our efforts to preserve and protect them for future generations. Without wilderness there will be less clean water, air, and its other gifts. Will this generation take from future generations or will it keep the benefits that cannot be bought later for any amount of money?

18-4 Before we, everywhere, use short term methods to increase water availability, we must conserve the water we take. We must develop methods for using water that:

- better holds it in the ground to produce our crops;
- allows less evaporation in holding it, using it, and transporting it;
- and keep it clean - not filling it with pollutants for the next user.

Taking wilderness and not cleaning the water we pollute is not a responsible use of water. We all must take more responsibility in using water wisely.

Sincerely,
Donna Osseward, President
Olympic Park Associates
13000 Linden Ave N, Apt 433
Seattle, WA 98133

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Donna Osseward

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Comment Letter 019

Pacific Crest Trail Association

July 30, 2018

Mike Kaputa, director
Chelan County Natural Resource Department
411 Washington Street., Suite 201
Wenatchee, WA 98801

Dear Mr. Kaputa,

19-1 I am writing today to voice the Pacific Crest Trail Association's opposition to Chelan County's water resource management plan in the Icicle Creek Strategy. Please include this letter in your public comments.

19-2 While we have no comments on the project's goals, merits or various options, we are deeply concerned about its impact on the Alpine Lakes Wilderness and the precedent-setting potential it would have to weaken our nation's wilderness preservation system.

19-3 We voice these concerns because the Pacific Crest Trail crosses the Alpine Lakes Wilderness for 65.4 miles. While the proposed project would not directly affect the trail tread, it would significantly affect the experience of trail users.

As the longest hiking and equestrian trail in the United States, the 2,650-mile Pacific Crest Trail is often referred to as the crown jewel of the National Trails System. Designated as a National Scenic Trail by Congress with the passage of the 1968 National Trails System Act, the PCT passes through more federally designated wilderness than any of the country's 11 National Scenic Trails.

From the south, PCT hikers and horseback riders enter the Alpine Lakes Wilderness from Snoqualmie Pass, a popular recreation jumping off point for millions of annual visitors. The PCT is one of the primary ways into this great wilderness, and thousands of day hikers and weekend backpackers use the trail to fan out across the wilderness area's nearly 700 lakes. It is the character of these lakes in particular that is threatened by the proposed action.

Congress has designated 765 wilderness areas partly to ensure that they remain untrammeled, so generations can visit and experience them. For the thousands of Pacific Crest Trail Association members and volunteers who give their time and money to maintain and protect the trail, publicly owned wilderness areas are a great inherited treasure that should not be disturbed.

That's why the PCTA believes that any encroachment on designated wilderness would be a dangerous move. Wilderness protections ensure the longevity of places that provide clean air and water, preserve biological diversity and offer people much needed refuge from crowded cities.

19-4 The Wilderness Act is as clear as a mountain stream. It states: "...there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport..."

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Comment Letter 019

Pacific Crest Trail Association

19-4 There is no way to do the work proposed in the Alpine Lakes Wilderness without violating this basic tenant of the Wilderness Act. The disturbance to the landscape, to wildlife and to the experiences of those seeking quiet recreation would be significant.

Opening up a beloved wilderness area for any development puts the entire wilderness preservation system in a compromised position. We ask that you eliminate parts of your proposed action that are incompatible with careful wilderness management. These actions have the potential to set dangerous precedents. For example, the proposed boring of a tunnel from Upper Klonaqua Lake to Lower Klonaqua Lake cannot be implemented in a manner that conforms to the intent of the Wilderness Act nor the Alpine Lakes Area Management Act of 1976. This action must be reconsidered.

Wilderness is the highest form of protection for our nation's public lands. This proposal, as written, would be a severe blow to what should be sacrosanct.

Sincerely,

Michael Hanley
PCTA North Cascades Regional Representative

CC:
Beth Boyst, U.S. Forest Service, Pacific Crest Trail Program Administrator
Justin Kooyman, PCTA, Associate Director of Trail Operations

Comment Letter 020

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July 30, 2018

VIA EMAIL

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Mike Kaputa
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Re: Icicle Creek Water Resource Management Strategy
Comments on Draft Programmatic Environmental Impact Statement

Dear Directors Tebb and Kaputa:

We represent The Wilderness Society with regard to the Icicle Creek Watershed Water Resources Management Strategy ("Icicle Strategy"). The Wilderness Society has joined with other environmental organizations to submit comments highlighting the land and water conservation concerns raised by the Draft Programmatic Environmental Impact Statement ("DPEIS") for the Icicle Strategy. We write separately to identify legal issues raised by the DPEIS and to recommend how those issues should be addressed in a revised DPEIS. We appreciate the opportunity to comment on the DPEIS and look forward to working with you to ensure that the PEIS proposes a sustainable, lawful, and comprehensive solution to the complex and demanding issues the Icicle Strategy was convened to address.

20-1 As a general matter, the legal deficiencies identified in this letter require that the DPEIS be revised and re-issued. Although there is a wealth of information in the DPEIS, its significant ambiguities and inadequate or nonexistent analysis of critical issues call into question whether the DPEIS is sufficient to ~~m~~eaningfully guide the government decision-making process and facilitate public engagement. In its current form, the DPEIS is suitable to serve only as an

Comment Letter 020

20-2 improper "ex post facto justification" for government action, depriving the public of a meaningful opportunity to comment on and improve the important government decisions at issue.[1] We identify below the legal deficiencies in the DPEIS and suggest ways that those deficiencies can be remedied to move the decision-making process forward.

Consideration of Wilderness and Water Law Issues. As environmental groups have noted throughout this process and we reiterated in our May 24, 2018 letter, the DPEIS must confront the critical federal wilderness and water law issues posed by the Icicle Strategy to ensure that it proposes and evaluates only alternatives that are lawful. As we described in our letter (attached as Exhibit A and incorporated by reference), the Icicle Strategy poses two main
20-3 issues: (1) the scope and validity of the Icicle Irrigation District's (the "District") water rights, which determines if and how the Icicle Strategy may involve the dams in the Alpine Lakes Wilderness, and (2) if and how the District's easements with the Forest Service impact federal wilderness protections. Those issues must be resolved now, before action is taken, not later, when it becomes difficult or impossible to change course. Although the DPEIS states that "[a]ll members of the Work Group agreed that a project cannot move forward if it is out of compliance with laws,"[2] the DPEIS does not analyze compliance with applicable laws and instead improperly punts these issues to project-level review.

20-4 First, the DPEIS should be revised to evaluate the scope and validity of the District's water rights, including whether all or part of those rights have been relinquished. Consistent with basic principles of water law, this analysis must be premised on data regarding the District's use of its rights over time, not the scope of those rights when first certificated or adjudicated.[3] Although the DPEIS acknowledges that water rights must be put to beneficial use and may be relinquished otherwise,[4] it does not state the measure of the District's rights here, nor does it include basic information about the District's usage over time. Instead, the DPEIS notes only the rights that were adjudicated or certificated.[5] We are aware of neither a legal presumption in favor of certificated rights nor of a legal prerequisite for a third party to first submit a request before Ecology can conduct an extent and validity determination. It is unreasonable to propose and purport to analyze projects which involve the dams in the Alpine Lakes Wilderness without first determining the extent and validity of the water rights upon which those projects are premised. As the co-lead agency for this proposal under the State Environmental Policy Act ("SEPA") and the agency with jurisdiction to determine water rights, Ecology must conduct that analysis now before moving forward with the decision-making process.

20-5 Second, the DPEIS should not just summarize wilderness law and the terms of the easements and other agreements, but should also apply those principles to the alternatives proposed. Here, the DPEIS summarily concludes that "[n]on-wilderness uses that are authorized

[1] *See Mentor v. Kitsap Cty.*, 22 Wn. App. 285, 291, 588 P.2d 1226 (1978) (internal citation omitted).
[2] DPEIS, p. 1-22.
[3] "Under both state and federal law, beneficial use is 'the basis, the measure and the limit' of the right to the use of water." *State, Dep't of Ecology v. Acquavella*, 131 Wn.2d 746, 755-56, 935 P.2d 595 (1997).
[4] DPEIS, p. 1-47.
[5] *Id*. at p. 2-105.

20-5 and do occur within the boundaries of the [Alpine Lakes Wilderness] include reservoir operations and use of motorized equipment for maintenance of these reservoirs and helicopter transport to and from the reservoirs" and notes that "[t]hese non-wilderness uses are permissible under various ownership structure and agreements, easements, and permits . . ."[6] As noted in our May 24, 2018 letter, that is simply not the case. The actions proposed in the DPEIS—including blasting a tunnel between two wilderness lakes, mechanizing infrastructure, and relying on regular and frequent helicopter flights to perform a widespread and significant construction project—are unprecedented intrusions into a protected wilderness area that are inconsistent with and go far beyond the limited rights granted in the easements.

20-6 We also note a few discrepancies in your description and limited analysis of federal wilderness protections. In your description of the Wilderness Act, you state that "certain nonconforming uses are permitted as described within the act, including access to non-federal inholdings and for the maintenance and reconstruction of existing water infrastructure, such as dams."[7] That is incorrect. Instead, the Wilderness Act permits only the President to authorize additional water resources and reservoirs to be constructed in wilderness.[8] Congress may also authorize nonconforming uses in designated wilderness areas but, although Congress has explicitly grandfathered in existing water rights and infrastructure in several acts designating wilderness areas, it did not do so here.[9] The DPEIS also fails to evaluate the impacts of the
20-7 hundreds, if not thousands, of helicopter flights required for this proposal, based only on the fact that a 1981 Environmental Assessment found the District's helicopter use then to be "permissible."[10] That the District's limited emergency helicopter usage almost 40 years ago was found permissible is irrelevant to whether the unprecedented and expanded helicopter use required for the projects proposed in the DPEIS would also be. Particularly where even just a couple of helicopter flights have been the subject of wilderness litigation,[11] it is imperative that those impacts be scrutinized here.

20-8 The lead agencies committed to this level of analysis in response to scoping comments, including by reassuring stakeholders that "the PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws," "[e]xisting easements, in-holder agreements, and State water rights will be reviewed," and "[t]he PEIS will include narrative of the current state of water rights in the basin."[12] This thorough analysis must be done in a revised DPEIS, not just the final PEIS, to permit the public a meaningful opportunity to comment on it. Revising the DPEIS to address these deficiencies is necessary

[6] *Id*. at p. 3-139.
[7] *Id*. at p. 1-45, 3-139.
[8] 16 U.S.C. § 1133(d)(4).
[9] *See, e.g.*, Colorado Wilderness Act of Dec. 22, 1980, Pub. L. No. 96-560, §102(a)(5), 94 Stat. 3265, 3266; California Wilderness Act of 1984, Pub. L. No. 98-425, §101(a)(25), 98 Stat. 1619, 1622; Wyoming Wilderness Act of 1984, Pub. L. No. 98-550, §201(c), 98 Stat. 2807, 2809-10.
[10] DPEIS, p. 3-148.
[11] *See, e.g., Olympic Park Assocs. v. Mainella*, No. C04-5732FDB, 2005 WL 1871114, at *8 (W.D. Wash. Aug. 1, 2005) (rejecting proposal to airlift two deteriorated shelters out of wilderness by helicopter because "it is in direct contradiction of the mandate to preserve the wilderness character of the Olympic Wilderness").
[12] *See, e.g.*, DPEIS, Appendix A, p. 2.

also to fulfill SEPA's stated purpose "to encourage the resolution of potential concerns or problems **prior to** issuing the final statement."[13]

20-8 In summary, the DPEIS identifies but does not analyze important legal constraints that impact the range of alternatives that should be considered. That analysis should be done at the programmatic level. It cannot be punted to the project level after determinative scoping decisions have already been made.

Scope and Analysis of Alternatives. The DPEIS also fails to appropriately select and analyze alternatives for the Icicle Strategy. SEPA requires that the DPEIS evaluate "reasonable alternatives," which "shall include actions that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation."[14] At the very least, the alternatives considered must "be representative of the range of choices to permit intelligent comparative evaluation."[15] SEPA also requires that the DPEIS identify and evaluate a no-action alternative to serve as a benchmark from which the impacts of the other 20-9 alternatives can be measured.[16] As described below, the scope of alternatives is improperly 20-10 narrow, the amorphous descriptions of the selected alternatives preclude meaningful analysis or comment, and the DPEIS fails to properly identify and evaluate a true no-action alternative.

20-11 First, the DPEIS improperly limits the range of alternatives because it declines to consider any alternatives which include decommissioning or removing the dams.[17] The offered reasons for doing so are that removing the dams would (1) impede the operations of the District and the fish hatchery, (2) "reduce streamflow, decrease domestic and agricultural reliability," and make it "impossible" to meet the Guiding Principles for the Icicle Strategy due to climate change, and (3) impact private property rights.[18] The DPEIS does not offer the factual or legal basis for those unsubstantiated conclusions. Indeed, decommissioning dams in wilderness has proven to be an effective way to balance wilderness and federal protections in the Uinta wilderness, where similar concerns to those noted in this DPEIS were adequately addressed by moving water rights to a diversion point downstream and modifying other infrastructure outside wilderness.[19] Where the purpose of the Icicle Strategy is to "find collaborative solutions for water management within the Icicle Creek drainage," dam removal could feasibly achieve that goal (and indeed has proven to do so in the Uinta) and should be evaluated. The three reasons

[13] WAC 197-11-400(4) (emphasis added).
[14] WAC 197-11-786; *see also* RCW 43.21C.030(2)(e) (requiring government agencies to "[s]tudy, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources").
[15] Richard Settle, The Wash. State Envt'l Policy Act: A Legal and Policy Analysis, § 14.01(2)(b) (2015); *see also Toandos Peninsula Ass'n v. Jefferson Cty.*, 32 Wn. App. 473, 483, 648 P.2d 448 (1982) (an EIS must "present[] sufficient information for a reasoned choice of alternatives.").
[16] *See* WAC 197-11-440(5)(b)(ii); Ecology, SEPA Handbook, Publication #98-114, at *55 (2003), https://fortress.wa.gov/ecy/publications/documents/98114.pdf.
[17] *See* DPEIS, p. 2-120.
[18] *Id.*
[19] High Uinta Wilderness Area, High Mountain Lakes Stabilization Project, https://www.mitigationcommission.gov/hmls/hmls_home.htm (last accessed July 10, 2018).

20-11 the DPEIS offers should more appropriately be included and expanded upon in the DPEIS to facilitate intelligent comparative evaluation of alternatives, not offered as a rationale for declining to evaluate dam removal in the first instance.

Second, the DPEIS should be revised to offer and evaluate a true "no-action alternative" 20-12 to serve as a "benchmark" for evaluating the other alternatives proposed, as SEPA requires.[20] The no-action alternative is "typically defined as what would be most likely to happen if the proposal did not occur."[21] The no-action alternative here is far from a "benchmark" and is instead defined to include a significant amount of the "action" proposed by the Icicle Strategy. The DPEIS appears to distinguish the no-action alternative primarily on the basis that it would not be part of a coordinated effort, but argues that much of the activities proposed in the alternatives would still move forward independently.[22] For example, the DPEIS states that the no-action alternative could include "upgrading irrigation infrastructure at the Alpine Lakes and constructing diversion improvements, irrigation system upgrades, LNFH improvements, and fish passage work,"[23] and that "[the District] and USFWS would likely maintain and upgrade their storage facilities . . . and construction level impacts could be similar to those discussed in the Program Alternatives."[24] In comparing the benefit and impacts of the no-action alternative to the other alternatives, the DPEIS suggests that the no-action alternative would be less beneficial because there would be "no coordinated and integrated effort to ensure that the projects move forward in a well planned manner."[25] Puzzlingly, it also suggests that the no-action alternative may have **more** significant adverse impacts because the "project proponents may have less input or coordination with other stakeholders[.]"[26] By improperly conflating and confusing the no-action alternative with the other alternatives, the DPEIS obscures and precludes meaningful analysis of the impacts of its proposed actions. It also prejudges the alternatives analysis by assuming action will take place regardless of the DPEIS. Instead, the no-action alternative should include only those actions that are foreseeable with current zoning and approvals, not hypothetical actions which require extensive study, permitting, and approvals to move forward and are the subject of the government action being evaluated.

20-13 Third, the proposed alternatives are inadequately and amorphously described, which makes it almost impossible to comment on them, much less identify a preferred alternative. The DPEIS presents each alternative as a "package" of projects, but fails to identify the complete slate of projects each alternative will include. Specifically, each alternative lists its components, but qualifies that list with the statement that "[a]dditional projects may be pursued[.]"[27] The

[20] *See* WAC 197-11-440(5)(b)(ii); SEPA Handbook, at *55.
[21] SEPA Handbook, at *55.
[22] *See, e.g.*, DPEIS, p. 4-168 ("Under the No-action Alternative, various agencies and other entities would continue to undertake individual actions to restore and enhance fish and aquatic resources in the Icicle project area and maintain existing infrastructure, but those actions would not be part of a coordinated program implemented with the support of the Icicle Work Group.").
[23] *Id.*
[24] *Id.* at p. 4-391, ES-28.
[25] *Id.* at p. 4-380.
[26] *Id.* at p. 4-169.
[27] *Id.* at p. ES-9-12, 2-16, 2-23, 2-27, 2-32.

Comment Letter 020

20-13 other projects that the qualification encompasses are significant and, in some instances, change completely the nature of the alternative. For example, the DPEIS characterizes Alternative 3 as a "response to SEPA scoping comments that expressed a desire for an alternative that excluded projects within the Alpine Lakes Wilderness Area," and the description of that alternative explicitly "**except[s]**" the Eightmile Lake Storage Restoration Project.[28] However, it also ambiguously and contrarily states that "[a]dditional projects may be pursued outside of the Icicle Strategy if Alternative 3 is selected as the preferred alternative, such as the **Eightmile Lake Storage Restoration Project**," but that "project beneficiaries may be different and project timelines are unknown."[29] For the DPEIS to be more than just a "discarded hypothetical exercise," it must clearly describe the parameters of each alternative.[30]

20-14 Finally, if the lead agencies wish to consider emergency work at Eightmile Lake, that action must be identified and analyzed in the DPEIS, not just in the final PEIS. SEPA directs that "an environmental impact statement should not merely be an ex post facto justification of official action but should serve to inform lawmakers of the environmental consequences of the proposal before them."[31] Here, the DPEIS states "[b]ecause of the timing of [the District's] s emergency declaration, the draft PIES [sic] does not contemplate this action's impacts on the proposed alternatives . . . [t]his may be evaluated further in the final PEIS."[32] By deferring "contemplat[ion]" of this action until the final PEIS, the lead agencies are providing only the "ex post facto justification" that SEPA prohibits and precluding meaningful analysis and public comment. The DPEIS should be revised to identify and evaluate the emergency work at Eightmile.

20-15 **Phased Review and Cumulative Impacts.** Punting to project-level review any meaningful analysis of the project components of the proposed alternatives is improperly piecemeal, precludes analysis of cumulative impacts, and threatens to create administrative inertia for the Icicle Strategy before its impacts are fully understood.

SEPA requires that "[p]roposals or parts of proposals that are related to each other closely enough to be, in effect, a single course of action shall be evaluated in the same environmental document."[33] Proposals are closely related if they: (i) "[c]annot or will not proceed unless the other proposals (or parts of proposals) are implemented simultaneously with them; or (ii) [a]re interdependent parts of a larger proposal and depend on the larger proposal as their justification or for their implementation."[34] Because the project components are interdependent parts of and depend on the Icicle Strategy for their implementation, phased review is inappropriate and they must be evaluated together. Further, "[p]hased review is not appropriate when: . . . [i]t would . . .

[28] DPEIS, at p. ES-101-11.
[29] *Id.* (emphasis added).
[30] *Lands Counc. v. Wash. State Parks Recreation Comm'n*, 176 Wn. App. 787, 803, 309 P.3d 734 (2013).
[31] *See Mentor v. Kitsap Cty.*, 22 Wn. App. 285, 291, 588 P.2d 1226 (1978) (internal citation omitted).
[32] DPEIS, p. 2-65.
[33] WAC 197-11-060(3)(b).
[34] *Id.*

20-15 avoid discussion of cumulative impacts . . ."[35] The conclusory and limited discussion of cumulative impacts in the DPEIS underscores the importance of meaningfully evaluating the project-level impacts now.

The impacts of the project components can and should be evaluated now because there is sufficient information to do so and any later environmental review of an individual project will be futile after an alternative is selected. Environmental review is required when "the principal features of a proposal and its environmental impacts can be reasonably identified" and "meaningfully evaluated."[36] Importantly, SEPA requires agencies to complete environmental review "prior to the go-no go stage of the project, which is to say before any irreversible and irretrievable commitment of resources."[37] In other words, environmental review must be completed early enough to inform and guide decision-makers, rather than to "rationalize or justify decisions already made."[38] The concern is that permitting such piecemeal review "may begin a process of government action which can 'snowball' and acquire virtually unstoppable administrative inertia," creating a situation where "[e]ven if adverse environmental effects are discovered later, the inertia generated by the initial government decisions . . . may carry the project forward regardless."[39] Here, the selection of a preferred alternative at the culmination of years of effort and millions of dollars in resources is the prototypical "snowball," and thus the DPEIS must be revised to evaluate project-level impacts now before its momentum becomes inexorable.

20-16 **Mitigation.** The DPEIS's discussion of proposed mitigation measures is insufficient and incomplete. Although the DPEIS suggests vague mitigation measures for specific projects—such as designing structures to blend in to the surrounding environment, using local construction materials, and using an architect to design certain dam structures[40]–it explicitly declines to identify how those mitigation measures will be implemented or to address how mitigation measures can or will be coordinated across projects.[41] A thorough discussion of the extent and manner in which the DPEIS proposes to mitigate adverse environmental impacts of the alternatives is critical to determining if those impacts will be significant, and the DPEIS must be revised to include that discussion.

20-17 These critical issues (in addition to those identified in the comment letter submitted by The Wilderness Society and other environmental stakeholders) must be addressed now, not in the final PEIS, to daylight government decision-making process and facilitate meaningful public

[35] WAC 197-11-060(5).
[36] WAC 197-11-055(2).
[37] *Int'l Longshore & Warehouse Union, Local 19 v. City of Seattle*, 176 Wn. App. 512, 522, 525, 309 P.3d 654 (2013) (internal citation omitted) ("The snowballing metaphor is powerful because it embodies the fundamental ideal of SEPA: to prevent government agencies from approving projects and plans before the environmental impacts of doing so are understood.").
[38] WAC 197-11-406.
[39] *King Cty. v. Wash. State Boundary Review Bd.*, 122 Wn.2d 648, 664, 860 P.2d 1024 (1993).
[40] DPEIS, at ES 30-31.
[41] *Id.* (noting that "[t]hese impacts and specific mitigation measures would be addressed in project-level environmental review.").

Comment Letter 020

20-17 comment. Although it is impracticable to provide further comments on the alternatives or to identify which we prefer, we look forward to providing more detailed comments once the DPEIS has been revised and re-issued. If you have any questions or if we can be of any assistance to you as you move through the revision process, please let us know.

Thank you.

Sincerely,

PACIFICA LAW GROUP LLP

Paul J. Lawrence
Alanna Peterson

Attachment

EXHIBIT A

PACIFICA LAW GROUP

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May 25, 2018

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Re: Icicle Creek Watershed Water Resource Management Strategy

Dear Directors Bellon and Tebb:

We represent The Wilderness Society, which for the last five years has been involved in the Icicle Work Group's ("IWG") efforts to develop a water resource management strategy for the Icicle Creek watershed (the "Icicle Strategy"). In the five years since the Department of Ecology ("Ecology") convened the IWG to address a variety of regional issues, including improving instream flows and increasing water supply for irrigation and municipal use, the IWG has focused on replacing, modernizing, and expanding several deteriorated, earthen dams on remote lakes in the Alpine Lakes Wilderness as its preferred solution, to the exclusion of all other alternatives. Despite the repeated and emphatic concerns voiced by The Wilderness Society and others in the conservation community about that solution, the IWG has not meaningfully considered whether that solution is consistent with and supported by applicable state and federal law. Those concerns are heightened now that the Icicle Irrigation District (the "District") seeks to potentially misuse the emergency situation at Eightmile Lake to not just stabilize, but to enlarge and completely reconstruct that dam. As the co-lead agency for the Icicle Strategy under the State Environmental Policy Act and the primary funder of the IWG, Ecology has an independent legal obligation to ensure that the actions IWG proposes are lawful. To assist Ecology in that effort, we write to provide an overview of the principles of federal wilderness law and Washington water law to which the Icicle Strategy must conform.

Comment Letter 020

Specifically, the IWG has failed to meaningfully consider two fundamental legal issues. First, the IWG has assumed without question that the District's easements with the Forest Service supersede and render irrelevant federal wilderness protections. That assumption is wrong. Federal wilderness protection must be considered. Second, it has failed to inquire into the scope and validity of the District's water rights. The limited nature of the District's water rights restricts what proposals are appropriate. As described below, the law requires that consideration of these issues be a guiding principle of the Icicle Strategy. Instead, it has been an afterthought, despite consistent advocacy by groups like The Wilderness Society.

Consideration of federal wilderness law is essential in determining the legality of the activities that the IWG proposes to do in designated wilderness. The activities at the heart of the Icicle Strategy—expanding and modernizing water infrastructure, using mechanized equipment and transport, and possibly building a road—are "strong[ly] prohibit[ed]" by the Wilderness Act.[1] There are only three relevant exceptions to that strong prohibition, which are strictly construed and none of which are applicable here. First, additional water resources and reservoirs may be constructed in wilderness if authorized by the President, which has never been done.[2] Second, federal agencies may allow exceptions "as necessary to meet minimum requirements for the administration of the area for the purposes of" the Wilderness Act, which include **only** the "public purposes of recreational, scenic, scientific, educational, conservation, and historical use."[3] IWG has never argued that the Icicle Strategy furthers the purposes of wilderness, and it is unclear on what basis it could do so. And third, Congress may authorize nonconforming uses in designated wilderness areas. Although Congress has explicitly grandfathered in existing water rights and infrastructure in several acts designating wilderness areas, it did not do so here.[4] Regardless of the "merits" or "validity" of a goal, the "mandatory language" of the Wilderness Act precludes any prohibited activities that do not fit within those exceptions.[5]

In granting easements to the District, the Forest Service did not broadly except the District from the Wilderness Act, nor did Congress authorize it to do so. At most, the Forest

[1] 16 U.S.C. § 1133(c); *see also Wilderness Watch, Inc. v. U.S. Fish & Wildlife Serv.*, 629 F.3d 1024, 1039 (9th Cir. 2010).
[2] *Id.* at § (d)(4).
[3] *Id.* at §§ (b),(c).
[4] *See, e.g.*, Colorado Wilderness Act of Dec. 22, 1980, Pub. L. No. 96-560, §102(a)(5), 94 Stat. 3265, 3266 ("That no right, or claim of right, to the diversion and use of conditional water rights for the Homestake development projects by the cities of Aurora and Colorado Springs shall be prejudiced, expanded, diminished, altered, or affected by this Act."); California Wilderness Act of 1984, Pub. L. No. 98-425, §101(a)(25), 98 Stat. 1619, 1622 ("nothing in this title shall be construed to prejudice, alter, or affect in any way, any rights or claims of right to the diversion and use of waters from the North Fork of the San Joaquin River, or in any way to interfere with the construction, maintenance, repair, or operation of a hydroelectric project similar in scope to the Jackass-Chiquito hydroelectric power project (or the Granite Creek-Jackass alternative project) as initially proposed by the Upper San Joaquin River Water and Power Authority."); Wyoming Wilderness Act of 1984, Pub. L. No. 98-550, §201(c), 98 Stat. 2807, 2809-10 (protecting rights for water diversion and use, including construction, operation, maintenance, and modification, of specific water development projects).
[5] *Wilderness Soc'y v. U.S. Fish & Wildlife Serv.*, 353 F.3d 1051, 1067 (9th Cir. 2003); *Wilderness Watch, Inc. v. U.S. Fish & Wildlife Serv.*, 629 F.3d 1024, 1039 (9th Cir. 2010).

Service agreed to permit the District to continue to use and maintain its existing earthen dams under specific and limited circumstances, and only in a "reasonable" manner "as not unreasonably to interfere with [the land's] use by the United States . . . or cause substantial injury thereto." A later easement related to the dams at Colchuck and Square Lakes "authorizes only the right-of-way and water conveyance facilities as constructed and operated on October 21, 1976," when the Alpine Lakes Management Act was passed, and "does not authorize extensions or enlargements."[6] Importantly, these rights are limited to use for agriculture and irrigation purposes only. The scope of those limited and specific rights—including the reasonableness of the District's actions and the extent to which they injure or interfere with wilderness—must be construed with respect to, not in disregard of, federal wilderness protections.

This is consistent with the Forest Service's management plan for the Alpine Lakes Wilderness (the "Plan"), which was adopted before the easements were granted. Although the Plan mentions the existence of several "unimposing," "substantially unnoticeable" dams "constructed primarily of native materials," it states that those structures "will not be expanded" and must "continue to be maintained by primitive means unless an environmental analysis indicates that the work cannot be accomplished without motorized equipment."[7] The Plan also directs that, aside from Presidential authorization, "watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge."[8] Contrary to those directives, the IWG has invested considerable time and resources in exploring alternatives that significantly expand, enlarge, and modernize the District's existing and significantly deteriorated water infrastructure in wilderness, and has until recently declined to consider other alternatives to achieve its goals that do not interfere with or injure wilderness.[9]

The IWG has also improperly placed the cart before the horse in spending years and hundreds of thousands of dollars to determine how to help the District store and divert water without first determining the scope or validity of the District's water rights. IWG has relied on and cited to the District's water rights certificates, issued and adjudicated almost a century ago, in determining what the District's rights are now. But that is not the law. Instead, "[u]nder both state and federal law, beneficial use is 'the basis, the measure and the limit' of the right to the use of water."[10] If water rights are not used in whole or in part over any five-year period, they are relinquished to the state.[11] It is beyond dispute that the District is now seeking to, and the

[6] Agriculture Irrigation and Livestock Watering Easement, No. 1203-03, between the U.S. Department of Agriculture, Forest Service, and the Icicle Irrigation District (Jan. 6, 2000).
[7] Alpine Lakes Land Area Management Plan, 54-57 (1981).
[8] *Id*. at 57.
[9] *See, e.g.*, *Wilderness Watch, Inc. v. U.S. Fish & Wildlife Serv.*, 629 F.3d 1024, 1039 (9th Cir. 2010) ("There is little question that improvements to the water supply likely will help the sheep recover. But, when the issue is a new *structure,* that conclusion is not good enough under this statute . . . It is beyond dispute that, if addressing other variables will lead to satisfactory sheep recovery, then a new structure is not "necessary." The Service's complete failure to address that key question is fatal to its conclusion.").
[10] *State, Dep't of Ecology v. Acquavella*, 131 Wn.2d 746, 755-56, 935 P.2d 595 (1997) (reversing the trial court's decision to quantify a water right based upon the amount the irrigation district "could potentially divert, without requiring past beneficial use of that water.").
[11] RCW 90.14.160

Comment Letter 020

alternatives in the Icicle Strategy would permit it to, store and divert more water than it ever has before.

To the extent the District argues that it had a statutory "good cause" for nonuse because the rights at issue are standby/reserve water rights, that argument is unsupported by the facts and would not justify using those rights to serve the primary and ongoing water needs of its constituents. The use of water for "standby/reserve rights" only provides "good cause" for nonuse where the "withdrawal or diversion facilities are maintained in good operating condition for the use of such reserve or standby water supply."[12] The District's dilapidated and deteriorating dams for decades have not (and likely have never) been in a condition to store or divert the full amount of the water right it was initially granted. Moreover, standby/reserve rights are characterized by intermittent use and may only be used to the extent a primary water right is unavailable in times of drought or low flow. Here, the District seeks to improperly convert a standby/reserve right to a primary water right, to be used to serve the ongoing, not merely reserve, needs of its constituents. The District cannot have it both ways.

The scope and validity of the District's rights aside, there are equitable, efficient, and cost-effective options to ensure that the District is able to obtain that water without interfering with or injuring wilderness.[13] To that end, The Wilderness Society appreciates and encourages the IWG's recent decision to consider moving the point of diversion for the District's water rights outside of wilderness. This is appropriate because water rights run appurtenant to the land the rights are intended to benefit, **not** the point of diversion.[14] This strategy has successfully addressed similar issues in the Uinta Wilderness, in which state and federal agencies and water rights holders worked together to stabilize similarly deteriorated earthen dams that pre-existed wilderness designation.[15] They balanced stringent wilderness protections with public safety and water management issues by transferring the water rights to a diversion point downstream, removing and stabilizing the dams, and modifying other infrastructure outside wilderness, including constructing a new pipeline and enlarging another reservoir.

Meaningful consideration of applicable federal wilderness law and state water law is essential to developing a sustainable and enduring solution to the water resource management issues in the Icicle Creek watershed. While we appreciate the urgency and complexity of the issues that Ecology convened the IWG to address, the requirements of state and federal law are not open to compromise. We look forward to working with Ecology and other stakeholders to

[12] RCW 90.14.140(b).
[13] *See* RCW 90.03.380(1) ("The point of diversion of water for beneficial use or the purpose of use may be changed, if such change can be made without detriment or injury to existing rights. A change in the place of use, point of diversion, and/or purpose of use of a water right to enable irrigation of additional acreage or the addition of new uses may be permitted if such change results in no increase in the annual consumptive quantity of water used under the water right.").
[14] *See* RCW 90.03.380(1) ("The point of diversion of water for beneficial use or the purpose of use may be changed, if such change can be made without detriment or injury to existing rights").
[15] High Uinta Wilderness Area, High Mountain Lakes Stabilization Project, https://www.mitigationcommission.gov/hmls/hmls_home.htm (last accessed May 10, 2018).

Comment Letter 020

ensure that these state and federal laws serve as a guiding principle for the IWG's work going forward, not a mere afterthought.

Please do not hesitate to contact me if you would like to discuss these issues further.

Sincerely,

PACIFICA LAW GROUP LLP

Paul Lawrence
Alanna Peterson

Cc:
The Office of Governor Jay Inslee
The Office of Senator Patty Murray
The Office of Senator Maria Cantwell
The Office of Representative Dave Reichert
Jim Peña, Regional Forester, United States Department of Agriculture, Forest Service, Pacific Northwest Region
Mike Williams, Forest Supervisor, Okanogan-Wenatchee National Forest
Keith Goehner, Commissioner, Chelan County and Icicle Work Group Co-lead
Tony Jantzer, Icicle and Peshastin Irrigation Districts

Comment Letter 021

Washington Native Plant Society
Appreciate, Conserve, and Study Our Native Flora

6310 NE 74th St., Ste. 215E, Seattle, Washington 98115
(206) 527-3210

July 25, 2018

To:

G. Thomas Tebb, L.H.g., L.E.G.
Director, Office of Columbia River
Washington State Department of Ecology
1250 West Alder Street
Union Gap, WA 98903-0009

Mike Kaputa
Director, Natural Resource Department
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Draft Programmatic Environmental Impact Statement for the Icicle Creek Water Resource Management Strategy, Chelan County, Washington (PEIS)

Dear Directors,

21-1 Plants are a fundamental and essential part of the human environment. NEPA requires evaluation of all environmental impacts that significantly affect the quality of the human environment. Consequently, NEPA requires evaluation of impacts to plants as part of planning for all projects subject to NEPA, such as those described in the PEIS.

Professional plant scientists must use current best plant science to determine these impacts. Any project that failed to professionally evaluate impacts to plants would fail to properly evaluate the impact on the quality of the human environment.

As part of its ongoing conservation program, the Washington Native Plant Society (WNPS) will evaluate subsequent environmental documents for these projects to ensure that impacts to plants are properly evaluated.

Please add the WNPS to the notification lists for all projects subsequently conducted pursuant to the PEIS.

Sincerely,

Don Schaecthel
WNPS President

Becky Chaney, Chair
WNPS State Conservation Committee

Comment Letter 022

Naturam Expellas Furca *Tamen Usque Recurret*

WISE USE MOVEMENT
P.O. Box 17804, Seattle, WA 98127

VIA EMAIL

July 30, 2018

Mike Kaputa
Director, NRD
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801
nr.iciclesepa@co.chelan.wa.us

Dear Mr. Kaputa:

GENERAL COMMENTS

The Department of Ecology-Office of Columbia River (Ecology-OCR) professes to operate under RCW 90.38.005 (2013) "to promote the aggressive pursuit of water supply solutions."

22-1 Since 2006, when the Washington State Legislature gave Ecology-OCR $200 million to "aggressively pursue" new water supplies, Ecology-OCR has continued to waste taxpayer money. The failure of Ecology-OCR has been amply documented in the attached Power Consulting, Inc., report "Department of Ecology Office of Columbia River: The Last Ten Years," (December 3, 2016). We request that this report be included along with these comments in any FPEIS.

22-2 The Wise Use Movement continues to strongly oppose any further storage alternatives within the Alpine Lakes Wilderness, when water conservation remains to be carried out, and other alternatives such as shutting the Leavenworth National Fish Hatchery (LNFH) have not been included. The Alpine Lakes Wilderness is a national treasure and it is shocking that Ecology-OCR does not view any area as off-limits to its aggressive and relentless pursuit of new environmentally damaging water supplies for dubious economic gain.

More Specific DPEIS Comments Are As Follows:

22-3 **Sec. 1.2 (p. 1-2+) Purpose and Need for Action.**
Ecology-OCR has issued the DPEIS under the State Environmental Policy Act (SEPA). Under RCW 43.21C.030(c)(iii), agencies must include in a detailed statement for major actions significantly affecting the quality of the environment alternatives to the proposed action. WAC 197-11-440(5)(c) requires agencies to describe reasonable alternatives. Instead, the DPEIS, considered only an "Icicle Political Bargain" obtained from a small group of Ecology-OCR and Chelan County handpicked organizations engaged in political tradeoffs in the Icicle Basin. This "Icicle Political Bargain" stands out as the real "objective" of Ecology-OCR and Chelan County, not the purported purpose and need that is given to provide political cover for the impacts on the physical and human environment of the Icicle Basin and the Alpine Lakes Wilderness, demanded by the parties who negotiated the "Icicle Political Bargain" without consideration of a full range of alternatives. As the Executive Summary says, the Icicle Strategy was developed by a small stakeholders group, which determined "Guiding Principles," from which no deviation is allowed. This is not the SEPA process. The SEPA process is designed to provide information on potential significant adverse impacts of proposals to decisionmakers. Here, selected "stakeholders" determined that

Comment Letter 022

22-3 the Alpine Lakes Wilderness should be assaulted and then designed "Guiding Principles" to make it happen. The DPEIS is merely the justification to carry out decisions that have already been agreed. *See page ES-3.*

22-4 **Sec. 2.5.2 IPID Irrigation Efficiencies Project; Sec. 2.5.3 COIC Irrigation Efficiencies and Pump Exchange Project; and Sec. 2.5.4 Domestic Conservation (pp. 2-55 through 2-61).** The Wise Use Movement supports irrigation efficiencies and domestic conservation. The figures given on page 2-61 for equivalent residential use of 304 gallon per day is shockingly high. By comparison, a two-story residence in Seattle housing four persons uses an average of 12-26 gallons per day. No further action should be taken to provide the City of Leavenworth any additional Icicle Basin water until the City has implemented an aggressive water conservation program.

22-5 **Sec. 2.11.2 (page 2-121) Removing Leavenworth National Fish Hatchery**
The DPEIS does not adequately describe the failure of the LNFH at providing mitigation for the loss of natural fish production from the construction and operation of Grand Coulee Dam. In addition, this section straight out states that this alternative was rejected because it "does not align with the Guiding Principles." Again, SEPA does not recognize "guiding principles" set by an "Icicle Political Bargain," as a reason to reject an alternative from SEPA review. More specifically, Ecology-OCR is actively working to implement fish passage over Cle Elum dam in the Yakima Basin using Whooshh technology.
https://www.whooshh.com/
https://www.usbr.gov/pn/programs/eis/cle-elum/index.html

22-6 The WUM requests that the PEIS include an alternative of using Whoosh technology to provide upstream passage over Grand Coulee Dam. If successful, it could result in the removal of the problem plagued and problematic LNFH.

22-7 In summary the DPEIS fails to comply with SEPA, by failing to provide a range of alternatives because Ecology-OCR and Chelan County are already compromised by an Icicle Political Bargain. This failure to comply with the central mandate of SEPA will lead to adverse environmental impacts because alternatives were not included and not analyzed. WAC 197-11-442(4) provides that the lead agency is not required under SEPA to examine all conceivable policies, designations, or implementation measures as part of an EIS's discussion of alternatives for a comprehensive plan, community plan, or other areawide zoning or for shoreline or land use plans. However, the "Icicle Political Bargain" is none of these things. Rather, WAC 197-11-442(2) requires Ecology to:

> . . .discuss impacts and alternatives in the level of detail appropriate to the scope of the nonproject proposal and to the level of planning for the proposal. Alternatives should be emphasized. In particular, agencies are encouraged to describe the proposal in terms of alternative means of accomplishing a stated objective (see WAC 197-11-060(3). Alternatives including the proposed action should be analyzed at roughly comparable level of detail, sufficient to evaluate their comparative merits (this does not require devoting the same number of pages in an EIS to each alternative). [underline added]

22-8 The DPEIS does not of this. The Washington Supreme Court has found that "The environmental significance of the nonproject action creates the obligation to examine alternatives to the nonproject action. . . SEPA requires an examination of reasonable alternatives to the nonproject action." *Citizens Alliance to Protect Our Wetlands v. City of Auburn,* 126 Wn.2d 356, 366 (1995). In *Blair et. al. v. City of Monroe,* CPSMHB 14-3-0006c, Final Decision and Order (Sept. 19, 2014), the Central Puget Sound Regional Growth Management Hearings Board considered the scope of review under WAC 197-11-442(4). There the Board found that the City of Monroe had failed to adequately comply with SEPA review requirements (SEPA is to function "as an environmental full disclosure law," *Blair* at 22. "[t]he range of alternatives considered in an EIS must be sufficient to permit a reasoned choice." *SWAP v. Okanogan County,* 66 Wn. App. 439, 444 (1992). For the FEIS to be adequate, the City must consider alternative designations for the Property and/or alternative locations within the City for additional GC development. *Citizens Alliance v. City of Auburn,* 126 Wn.2d 356, 365 (1995). *Blair at 23.*

22-9 In *City of Shoreline et. al. v. Snohomish County,* CPSMHB Coordinated Case Nos. 09-3-0013c and 10-3-0011c, Corrected Final Decision and Order (May 17, 2011), the Board entered a determination of invalidity due to an inadequate analysis of reasonable alternatives to a proposed action. The Board found that "The record provided in this case contains a number of plans which, though not perhaps formally proposed, might have formed the basis for one or more EIS alternatives resulting in lower environmental costs." *City of Shoreline at 56-57.* ("[L]imiting the

Comment Letter 022

22-9 analysis only to (a) the land use and zoning requested by the Intervenor and (b) the no action alternative, without considering any alternative scenarios, deprived County officials of the information necessary to determine whether a reasonable change in use of Point Wells could be achieved with less environmental impact." *City of Shoreline at 57 (emphasis added).* SEPA does not excuse failing to consider alternatives beyond the Icicle Grand Bargain itself.

In this DPEIS, Ecology-OCR (and Chelan County) considers the decision (to proceed with the single Icicle Political Bargain) to have already been made.

CONCLUSION

22-10 This DPEIS is inadequate because it fails to provide a range of alternatives and should be withdrawn. An EIS should include a range of reasonable alternatives that meet the stated purpose and need for the project and that are responsive to the issues identified during the scoping process. This will ensure that the EIS provides the public and the decisionmaker with information that sharply defines the issues and identifies a clear basis for choice among alternatives as required by SEPA. This applies even if some of them could be outside the capability of the applicant or the jurisdiction of the agency preparing the EIS for the proposed actions.

Finally, Ecology-OCR, Chelan County, and Governor Inslee would be well advised to keep new storage projects out of the Alpine Lakes Wilderness. Please send us a copy of any FEIS that is released.

Sincerely,

John de Yonge
John de Yonge
President
540 Main St, Apartment 5C
Chatham NJ 07928
jdeyonge@gmail.com

Attachment – "Department of Ecology Office of Columbia River: The Last Ten Years," Power Consulting Incorporated, December 3, 2016

Comment Letter 023

Written Comment Sheet
Icicle Strategy Draft Programmatic Environmental Impact Statement(PEIS) Public Hearing

DEPARTMENT OF ECOLOGY
State of Washington

June 27, 2018; 4-8pm

Leavenworth, WA

Please provide comments on the Icicle Strategy Draft PEIS, including content and what you support as a preferred alternative.

Comments will be accepted through July 30, 2018. Witten comments can be submitted with this form or sent to Mike Kaputa at 411 Washington Street, Suite 201, Wenatchee, WA 98801, nr.icicleseпa@co.chelan.wa.us

Oral comments can also be submitted to the Court Reporter at this meeting.

Contact Info (required)

Name: Anne Bridges Date: 6/28/18

Address: 2119 Sunrise Circle, Wenatchee WA 98801

Telephone: 802-291-3008 Email: aabridges@comcast.net

23-1 **Your Comments**

We learned of the Icicle Strategy public meeting by way of a Sierra Club notification. (We are members).

The information at this meeting was clearly and thoroughly presented, showing the options in understandable detail.

Upon returning home I read the brief, but slanted summary of the situation in THE CREST, the publication of the Washington State Sierra Club.

The concern was all about preserving the Alpine Lakes area for hiking, climbing,

Comment Letter 023

23-1 and backpacking for tourists from "around the world." No opinions were stated regarding LOCAL needs or issues such as fish preservation, native American treaties, or better water management for human consumption and irrigation for agriculture.

Planning for climate change in water strategy was not addressed either.

I was embarrassed that I had signed Sierra Club after my name yesterday. I have no arguments with any of the options presented.

Anne Bridges

Comment Letter 024

Written Comment Sheet
Icicle Strategy Draft Programmatic Environmental Impact Statement(PEIS) Public Hearing

DEPARTMENT OF ECOLOGY
State of Washington

June 27, 2018; 4-8pm

Leavenworth, WA

Please provide comments on the Icicle Strategy Draft PEIS, including content and what you support as a preferred alternative.

Comments will be accepted through July 30, 2018. Witten comments can be submitted with this form or sent to Mike Kaputa at 411 Washington Street, Suite 201, Wenatchee, WA 98801, nr.iciclesepa@co.chelan.wa.us

Oral comments can also be submitted to the Court Reporter at this meeting.

Contact Info (required)

Name: Kathleen Ward (Framm) Date: June 27, 2018

Address: 7544 E. Leavenworth Rd Leavenworth

Telephone: 509 433-8970 Email: Kathywardsmail@gmail.com

Your Comments

24-1 I applaud the collaboration. Many thank to many people. Yes, would be good to get the wilderness advocates on board. Important voice. (Not that there aren't many wilderness advocates in the group. ☺)

24-2 Some concern about loss of seasonal heavy recreational use.

24-3 Interested in all inputs on bank erosion. Appreciate

24-4 Dan's insight on value of storage. "Habitat Protection +

24-5 Enhancement" is major interest.

Comment Letter 025

Written Comment Sheet
Icicle Strategy Draft Programmatic Environmental Impact Statement(PEIS) Public Hearing

DEPARTMENT OF ECOLOGY
State of Washington

June 27, 2018; 4-8pm

Leavenworth, WA

Please provide comments on the Icicle Strategy Draft PEIS, including content and what you support as a preferred alternative.

Comments will be accepted through July 30, 2018. Witten comments can be submitted with this form or sent to Mike Kaputa at 411 Washington Street, Suite 201, Wenatchee, WA 98801, nr.icicleseпa@co.chelan.wa.us

Oral comments can also be submitted to the Court Reporter at this meeting.

Contact Info (required)

Name: Natalie Williams Date: 6/27/18

Address: 5927 47th Ave SW

Telephone: 206-937-1166 Email: nataliesecs@gmail.com

Your Comments

25-1 1) A legal alternative needs to be offered. Either Alt-3 with Full Pump added, or Alt-5 without Alpine Lakes Wilderness violations.

25-2 2) Bureau of Reclamation is in a Critical risk situation and should declare an emergency to get priority funding for (1) deferred maintenance (which has already caused treaty non-compliance), and (2) Cirmbar tank upgrades to achieve treaty compliance.

Comment Letter 026

STATEMENT ON RECORD CHAD SPIES, 6/27/18

(STATEMENT ON RECORD NO. 1 - 6/27/18)

* * *

MR. SPIES: Okay. I just wanted to say that I've been hiking the Icicle Valley for 40 years of my life and hiked specifically a lot, several hundred trips in the Eightmile and Stewart Lake and Colchuck drainages and Snow Lakes drainages, and that there's no downside to any of these proposals for water storage; that they're all upside

26-1 benefits that are going to improve instream flows and improve water for fish, and with no downside that's going to impact in any negative way anything in these areas that are going to have the extra water flow, and that the Eightmile Lake would in no way impact any of the campsites or the trail.

I've hiked this 40 years, and these trails and campsites are well above any water level that would ever be from a dam. They're all high and dry. So I just want to say that I think it's a good proposal, and I think they all should be continued.

26-2 Alternative 4 is my choice.

* * * * *

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www.affiliatedcourtreporters.com 3

Comment Letter 027

STATEMENT ON RECORD JAN PETRIE, 6/27/18

(STATEMENT ON RECORD NO. 2 - 6/27/18)

* * *

MS. PETRIE: I just want to say that I think a
27-1 whole lot of thought has gone into this plan. And I'm from the area, and I appreciate everything that is trying to be accomplished to satisfy the needs of the area. That's all I'm going to say.

I think Alternative 4 seems to cover everything,
27-2 and depending on how efficient or expensive it is, that would be my vote.

* * * * *

Comment Letter 028

STATEMENT ON RECORD JEROME "JERRY" SCHNEIDER, 6/27/18

(STATEMENT ON RECORD NO. 3 - 6/27/18)

* * *

MR. SCHNEIDER: I live on Wilson Street. I will be part of this Cascade Orchard Irrigation Company irrigation project, the new pumping project that's going to add about 12 cubic feet of water to Icicle Creek, to the lower reaches of Icicle Creek.

What happens now -- I don't know if you know, but what happens now is we're taking water from Icicle Creek up above the hatchery, and it comes down our canal and down our
28-1 laterals, and the overflow spills into the Wenatchee River. But in order to increase the flow in Icicle Creek, we're going to take our water from Lower Icicle or the Wenatchee, preferably the Wenatchee River, and pump it up so that water that we've been taking from up there won't be taken from up there and it increases that streamflow, which is really good for the fish mostly, and we get a nice irrigation system, and that's great. Everybody wins for a change, you know. And that's about it.

* * * * *

(STATEMENT ON RECORD NO. 4 - 6/27/18)

* * *

MR. HENSON: My biggest worry about this whole adding water and all this is the creek used to be a

29-1 nonnavigable stream in 1889 when Washington became a state. When Washington became a state the creek used to dry up, and in 1920 they added lake reservoirs to add flow of water to the stream. And this is exactly what they're doing right now, but they did this back in 1920.

They're adding more water to the creek for fish hatchery, salmon, and by doing that they've taken the land away from the people that are living on the river. We used to own the river to the thread of the river, and now the state, because they've added more water -- the ordinary high-water mark is what they're going by, but there is no ordinary high-water mark because there is no ordinary river. Everything's reservoirs and enhanced waterway. It's all been altered. It's all unnatural, every bit of it.

So by adding more water, they're creating more of a

29-2 problem for me on the lower reach because they're adding more people. By adding more water adds more tubing activity, which is pollution, because there's no bathrooms on the river, there's no facilities whatsoever to dump garbage, and so these fish are not going to get any better because they're just adding more garbage and more pollution.

Comment Letter 029

And what killed the fish in the river originally

29-3 was the fish hatchery. They dumped their pollutants in the river, their antibiotics, and that's what killed all the bull trout and the rainbow trout back in the seventies or eighties.

And so I don't know if this whole -- I think they

29-4 just ought to leave it as it is, rebuild the dams just like it was back when they built it originally. There's seven dams up there, and they built them all between the twenties and the forties, and by doing that, there is no ordinary high-water mark. There is nothing ordinary.

29-5 They need to leave it as it is. People need to start drilling wells, maybe eliminate a lot of shareholders that use the irrigation water that don't really need it, you know.

And the biggest concern to me is just the amount of

29-6 people that are going on the river now, the lower reach, on a private river that was nonnavigable at one time but now the state thinks it's navigable. And so now everybody has a right to use it and, like I said, there's no facilities to control pollution, bathrooms, defecating everywhere, garbage, sunken beer bottles, cans.

If they want to save the fish, they need to start thinking about that, the amount of people that are on the river, that they're allowing on the river. And that's all

Comment Letter 029

STATEMENT ON RECORD WILL HENSON, 6/27/18

I've got to say.

I think they need to bring the dams up to code so
29-7 they're safe and leave it at that; no extra water in the creek; control the tubing. That's what most people want. Control the pollution on the river, not so much adding more water, because if you add more water, you're going to add more people.

* * * * *

Comment Letter 030

STATEMENT ON RECORD GRO BUER, 6/27/18

(STATEMENT ON RECORD NO. 5 - 6/27/18)

* * *

MS. BUER: So I have a considerable concern
30-1 about the IWG, because there's to be 75 to $100 million of taxpayer money and there doesn't seem to be a focus on how it's going to be spent and whether it's well spent.

It seems like conservation is low priority to most of the remaining members, especially since the
30-2 conservationists have left, environmentalists have left, because they feel like the group isn't being honest about what they can do.

So I'd like to know what conservation efforts or plans is the Icicle Peshastin Irrigation District proposing, and where is it written? Have the County and city of Leavenworth written a conservation plan that they agreed earlier to write?

I'm with the Cascade Orchard Irrigation District, and we are encouraged to use our water so that we don't lose our right, so conservation is not an issue. We're told to use as much water as possible. I think we need an independent, outside expert panel to look at possible options, including conservation, for spending money to enhance the streamflow in Icicle.

* * * * *

Comment Letter 031

STATEMENT ON RECORD NORM STODDARD, 6/27/18

(STATEMENT ON RECORD NO. 6 - 6/27/18)

* * *

31-1 MR. STODDARD: I'd like to see them go with the no action alternative except adding storage. That would increase water, make it a lot more stable through the whole season if you do that, and that's the best option.

That's my comment.

* * * * *

Comment Letter 032

STATEMENT ON RECORD GREG SHANNON, 6/27/18

(STATEMENT ON RECORD NO. 7 - 6/27/18)

* * *

32-1 MR. SHANNON: My only comment is that I think the response period of 60 days is too short. It should be at least 90 days for a response period to examine a long document. That's it.

* * * * *

Comment Letter 033

July 29, 2018

Mr. Mike Kaputa
Director, Chelan County Natural Resource Department
411 Washington Street, Suite 201,
Wenatchee, WA 98801

Re: Icicle Strategy DPEIS – comments

From:
Alan F Hunt July 29, 2018
510 Dempsey Road, Leavenworth, WA 98226
509-470-8587 a_f_hunt@hotmail.com

Dear Mr. Kaputa,

33-1 I support the option of No Action in your DPEIS.

33-2 The city has some control and influence over the growth rate in ERU's. At this point, ERU's for commercial demand are twice that for residential demand. Since the city's only industry is tourism, that demand can be influenced by the level of promotion of tourism. ATP, the City receives millions of dollars in lodging tax and spends at least 80% of it on promotion of tourism. The level of demand that is forecast is more speculative than for many cities in that the economy of the city is not diversified and is essentially completely dependent on tourism. The underlying assumption in projecting the growth rate in ERU's is that the Bavarian tourist town concept will have growing appeal indefinitely into the future. The growth rate may be less than forecast if that assumption is not true or if the city changes its current policy of growing as fast as it possibly can.

33-3 Another consideration is that the Seattle area has enjoyed unprecedented growth in the past 20 years due to growth in the tech industries in the area. Historically, such growth does not carry forward at high rates into the indefinite future. That growth has had a tremendous influence on tourism in Leavenworth. Inevitably, lower growth in the Puget Sound region will lower the growth of tourism in Leavenworth.

Comment Letter 033

33-4 Leavenworth's Water System Plan shows that the city will have enough water rights, at the current growth rate to meet demand for another 50 years. It is not reasonable to encroach upon the Alpine Lakes Wilderness at this time in order to meet speculative demand 50 years into the future.

33-5 In addition to my discussion of economic reasons for my position, I fully accept the Alpine Lakes Foundation's arguments that all of the suggested plans for using more water from the Alpine Lakes Wilderness or regulating the flows of the water in the Wilderness to enhance usability of said water are illegal.

There are alternatives, as specified in the comment letter dated July 25, 2018 from the Alpine Lakes Foundation, that would not require degradation of the Icicle Creek drainage.

33-6 1. The Strategy should be revised to rely only on those quantities of water at specific lakes that the irrigation district has historically used and therefore has the right to use.

33-7 2. Moving the irrigation district's point of diversion downstream to the Wenatchee River, as proposed in Alternative 5, would greatly improve stream flows in Icicle Creek. However, the rest of Alternative 5 should be dropped. It lacks legal authority.

33-8 3. Water conservation proposals in the DPEIS should be significantly expanded to reduce demands on Icicle Creek's water. This would allow the Icicle watershed to function more naturally, including enhanced stream flows.

33-9 4. The DPEIS should acknowledge the land management role and authority of the U.S. Forest Service on national forest lands, its special responsibilities to protect the wilderness character of the Alpine Lakes Wilderness, and the application of numerous federal laws to many of the actions proposed in the Icicle Strategy.

Thank you for the opportunity to submit these comments.

Alan F. Hunt
510 Dempsey Road
Leavenworth, WA 98226
509-470-8587
a_f_hunt@hotmail.com

Comment Letter 034

From: **Bill Burwell** bburwell@riousa.com
Subject: Fwd: Icicle Creek Watershed Water Resources Management Study, Draft PEIS
Date: July 25, 2018 at 4:41 PM
To:

July 25, 2018

Dear Chelan County and Washington State Department of Ecology,

Thank you for the opportunity to comment on the Icicle Creek Work Group Draft Programmatic Environmental Impact Statement (DPEIS) know as the Icicle Creek Watershed Water Resources Management Strategy. Considerable effort has gone into the work over the past several years with significant input by the Icicle Peshastin Irrigation District (IPID).

Review of the document develops of number of concerns:

34-1 1. The document assumes IPID has current water rights on Eightmile Lake with the current dam and water rights to raise the dam. There are indication that IPID has not put into use the water behind the current dam on the Lake for decades. Washington water law has a fundamental "use it or lose it" requirement. Looks like IPID likely has relinquished part of the water rights. Raising Eightmile Lake dam would require added water rights and these have not been demonstrated. Increasing the dam hight will require
34-2 approval by the US Forest Service and likely extensive permitting and a NEPA process, which will be problematic as the land is
34-3 designated wilderness. Use of such wilderness public lands for the benefit of a few irrigators takes away from the citizens of this
34-4 country that own the wilderness. Use of the Lake as a bowl to fill and flush by the district seems not in the public interest. The filling and flushing also has negative impact on downstream fisheries.

34-5 2. The dam raising neglects the statutory authority of US Forest Service on these National Lands maintained for use by the people
34-6 as designated Wilderness. The water rights on the Lake belong to the Federal Government under the federal reserved water rights
34-7 doctrine. The DPEIS does not include maintaining the current dam height as the only current legal basis, a significant document omission in range of alternatives..

34-8 3. IPID has water rights for irrigation purposes. The DPEIS implying the District has rights for domestic water use and for fish
34-9 hatchery use, which it does not. Alternative 4, has even worst invasions of water rights and public domain of Wilderness with
34-10 tunneling the Klonaqua Lakes, high dam on Snow Lake, Eightmile high dam and other intrusions into water right and Wilderness use. *The citizens were not allowed to comment on these actions during the scoping in 2016 and was not a part of the proposed* actions. Alternative 4 should reset the process back blocking the Draft PEIS until fully scoped and citizen input on Alternative 4.

34-11 4. The IPID Pump Station found in Alternative 5 seems the best solution will greatly improve flow in Icicle Creek resolving a problem. An alternative should be added looking at more fundamental improvements since the concerns are water availability and
34-12 global warming. This added alternative would push hard on water conservation with irrigators since the crop lands are the vast users of the basin's water and push to control CO2 and methane emission. Reducing global warming emissions is the most fundamental need. Rearranging water withdrawals does not solve the fundamental problem of global warming.

34-13 5. Public input could be improved. The vast number of Washington owners (citizens) and users of the Alpine Lakes Wilderness live on the Puget Sound side of the Cascades. No formal hearing was set where these people live. The only formal hearing was in Leavenworth. Yes, a hearing in Leavenworth in the basin with a small population was appropriate. Missing a formal hearing on the West Side of the Cascades was a fundamental flaw in public input.

34-14 6. My Great Grand Parents, the Hatfields, homestead in Central Washington in 1874, obtaining one of the first water rights to their farm. At that time, the Territory of Washington was a vast wilderness with a few islands of farms and towns within the wilderness. We now have a few island of wilderness among the vast farms and cities in the State. The Alpine Lakes Wilderness give a place for my Grandchildren and Great Grandchildren to see a beautiful gift that could endure seven generations and more. Much of the proposals tear apart and damage the beautiful gift of the Wilderness. The wilderness basis being maintaining the land by non-motorized access and use of hand tools. Building dams in the Alpine Lakes Wilderness is fundamental destruction of the gift and the responsibility we have to future generations.

34-15 Please go back and redevelop the PEIs addressing these and concerns of others.

Sincerely,

Bill Burwell

Comment Letter 035

July 25, 2018

Mike Kaputa
Director, Natural Resource Department
Chelan County
411 Washington Street
Suite 201
Wenatchee, WA 98801

Dear Mike,

I have read all of the PEIS Impacts and Mitigation Chapters from Chapter 1 through Chapter 7.0. I have also read the Appendixes from Appendix (A), to the Appendix C followed with another Appendix (A) in a new series of Appendix's extending to Appendix F. The chapters and Appendix's are full of detailed information which I fully appreciate. However, there are PEIS actions that can
35-1 be improved, one of which is to ensure that the streams and lakes will not be harmed as a result of the proposed wilderness action.

The PEIS fails to adequately assure the public that the proposed projects will not harm wilderness streams and lakes. When discharging water from Square Lake, Klonaqua Lake, Eightmile Lake, Colchuck Lake and both Snow Lakes, the task of assuring no harm would normally rest with the Department of Ecology (DOE). DOE developed an advanced multi-metric index model of biotic integrity in 2012 for the Cascades Region which allowed DOE to determine the health of reaches along the Wenatchee River up to South of Plain and ending at the Railroad Bridge. DOE also determined the health of Icicle Creek up as far as Ida Creek Campground.

Appendix A of the PEIS does identify the Washington Department of Fish and Wildlife (WDFW) to gather base-line data for the proposed project. However, the results from 2016 and 2017 analyze only two wilderness streams (Leland Creek and French Creek). "Grab" samples were taken once at each creek. The analysis of both streams is not detailed enough to determine the health of either Leland Creek or French Creek. There was no analysis's of the Wilderness lakes.

When releasing water from a Wilderness lake to improve the Historic Channel in lower Icicle Creek, the language used in the PEIS to describe impacts on a stream resulting from the release of water from a lake is either that impacts on the stream are found to be insignificant or are found to be within the naturally occurring flow range of the stream. The language usually goes on to identify the release of water as a benefit for the affected riverine system.

The PEIS ignores the natural flow regimes of each stream as having a characteristic pattern of flow magnitude, timing, duration, frequency, and rate of change. All of these patterns play a critical role in supporting the chemical, physical, and biological integrity of each receiving stream.

Changes to stream chemical and physical conditions following flow alteration can lead to the reduction, elimination, or disconnection of optimal habitat for aquatic biota. The PEIS fails to recognize that "human-induced alteration of the natural flow regime can degrade a stream's physical and chemical properties, leading to loss of aquatic life and reduced aquatic

Comment Letter 035

35-1 biodiversity. Protecting aquatic life from the effects of flow alteration involves maintaining multiple components of the flow regime within their typical range of variation". (*Refer to (Final EPA-USGS Technical Report: Protecting Aquatic Live from Effects of Hydrologic Alteration)*

Altered flows can fail to provide the cues needed for aquatic species to complete their life cycles. For example, Pale Morning Dun (Order Ephemera Danica) will not emerge until stream water temperatures reach 60 degrees Fahrenheit. The emergence will also avoid emerging until July when timing gives the signal.

Altered Flows can also encourage the invasion and establishment of non-native aquatic species. Alteration of the quantity and timing of river or stream flows can significantly affect fisheries resources.

The ability of a stream to support aquatic life is attached to the maintenance of key flow-regime components. For example, altering the regime by increasing flows brought about by releasing relatively high water velocities from a lake during mid-summer causes stream surface water, rich in oxygen, to bypass the sub-surface environment. The typically low summer flows and corresponding low velocity allow oxygen to be pulled into the sub-surface environment. The typically low summer flows and corresponding low velocities allow oxygen to be pulled into the sub-surface environment which is in need of oxygenated water this time of year to support invertebrates living in sub-surface environments. Invertebrates are a source of food for other aquatic life, including fish, and tend to live in a subsurface zone (hyporheic Zone).

Complicating these challenges further is the expected changes to historic hydrologic conditions as a result of climate change, which adds additional complexity to the task of estimating acceptable levels of hydrologic variation.

DOE chairs the Icicle Working Group. If the proposed project moves forward, DOE will discharge water from wilderness lakes to improve the last four miles of Icicle Creek. The health of Prospect Creek, the last mile of Leland Creek, the last five miles of French Creek, all of Eightmile Creek, the last five miles of Mountaineer Creek and the Upper 20 miles of Icicle Creek are all affected by the proposed project, and since DOE has developed a model to determine stream health, DOE is the department to take the lead and determine the health of both lakes and streams that are part of the proposed project.

With this scant summary of hydrological alteration in mind, and the importance of stream and lake health, it would be prudent to avoid activating Alternatives 1, 2, 3, 4 or 5, until a team of scientists, educated in matters associated with stream and lake health, are ready to share their findings. A study of this quality would hopefully assure that the Alpine Lakes Wilderness would remain a healthy wilderness. It would hopefully assure that if one of the proposed Alternatives was activated, none of the targeted wilderness streams and lakes would be harmed.

Sincerely,

Dick Rieman

Comment Letter 036

July 30, 2018

Mike Kaputa
Director, Natural Resource Department
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801

Hello Mike,

36-1 I have just become aware of the ramifications of outlet streams from Eightmile, Snow and Square Lakes. Eightmile lake engineers, if I am reading the PEIS correctly, are planning to discharge water from Eightmile Lake 50 feet below Lake Surface which places the inlet pipe in the Hypolimnion strata. Square lake discharge remains where it always has,(at 30 feet below surface of the lake) which places it in the upper part of the hypolimnion in Square Lake and Snow Lake discharges water from lake bottom via a tunnel at 150 feet below the surface.

My research indicates that, "when water is released from the hypolimnion in stratified reservoirs/lakes, anoxic water can result in poor water quality since it might contain dissolved iron, manganese, sulfide, ammonium and phosphate (Dortch 1997)".

A recognized disadvantage of hypolimnetic withdrawal is the impact on downstream waters, temperature increase, and oxygen depletion. It appears that, "the most controversial and problematic effect of hypolimnetic withdrawals is the impact on downstream water and stream habitat" (Gertrud K. Nurnberg, Freshwater Research)".

An example of what could happen to outlet streams when Eightmile dam is in full operation is what happened in Southwest Wisconsin. Numerous earthen dams were built in Southwest Wisconsin during the 1960's and early 1970's. Hypolimnetic water was released from two of the lakes (White Mound Lake and Twin Valley Lake) to create downstream trout habitat. However, the organic loads from the discharges overwhelmed the assimilative capacities of the streams while de-stratification and

Comment Letter 036

36-1 entrainment fueled algal blooms in both lakes. Even a small hypolimnetic release was enough organic loading to stimulate abundant filamentous bacteria below the dam. Continuous bottom-water releases destabilized thermal stratification and phosphorous entrainment resulted. "The organic loading from the bottom discharges were likely the reason that trout stream habitat was not successfully created below the dams as originally intended". Hypolimnetic withdrawal issues were not limited to White Mound and Twin Valley Lakes.

My concern is that the DEIS completely ignores lake ecology and how it might affect outlet streams from lakes that are discharging water from the hypolimnetic zone. The focus is mostly aimed at discharging 100 cfs of water from five Wilderness Lakes with the goal to increase flow at Dam 2 as soon as possible to improve lower Icicle Creek habitat.

I would think it would be important to evaluate hypolimnetic lake withdrawal water residing in Upper Snow, Eightmile and Square Lakes. The three lakes are targeted because the infrastructure built in all three lakes was designed to withdraw hypolimnetic water from each lake. An analysis of each lake's hypolimnetic water would be informative before committing these lakes to any of the proposed DEIS projects.

I am aware that Snow Lakes have been operating since 1939. All of the water in Snow Creek is hypolimnetic water from a depth of 150 feet usually at a flow rate of 50 cfs. I am also aware that Snow Lake water is in Icicle Creek for only one mile before it is diverted to the Hatchery. A small amount of Snow Lake water flows over Dam 1 to flow into the Wenatchee River, most of which, is hypolimnetic water from Snow Lake. Once below the Hatchery, Snow Lake water is discharged into lower Icicle Creek along with hatchery well water. This situation occurs in mid-summer and early fall and could be one of the reasons why lower Icicle Creek below the Hatchery retains poor fish habitat and large amounts of phosphorous.)

Sincerely

Dick Rieman

Comment Letter 037

Director Kaputa
Chelan County Natural Resource Department and State Department of Ecology
411 Washington Street, Suite 201, Wenatchee, WA 98801

Drew Meyers
5908 SE 20th St
Mercer Island, WA 98040

Hi Mike,

37-1 I write to you in hope that you reconsider the implementation of the State Environmental Policy Act and the Enchantments water resource management plan. The proposals negative implications simply out way the positives. Having grown up in these mountains and now raising my kids in them, I am devastated to hear that Chelan County is considering disrupting such an extraordinarily beautiful and unique ecosystem. I felt compelled to write the message for the sake of my kids having the opportunity to connect with nature the same way I did.

37-2 I'll keep it brief but restricting the natural flow of the river has numerous potentially harmful outcomes that I'm sure you're aware of but encourage you to remind yourself of. One of the most worrying issues is the organic materials that collect from inside and out of the river that would usually naturally get washed down the river… don't. This creates oxygen starved dead zones which kill and then restrict any river life from ever growing in for my kids to enjoy. I'm sure the science will be brought up but it's the untouched

37-3 beauty that I worry about, the Enchantments are one of the most competitive areas to get a permit in the country for a reason. As one of the last untouched wilderness areas it offers an experience nowhere else in the country can, I plead with you to not disrupt any further the natural balance of both wilderness areas.

My family appreciates you listening to comments and concerns and we hope you reconsider your new energy strategy. Families across Washington deeply care about the health of these areas and keeping them pristine for generations to come.

Thanks so much,

Comment Letter 038

Edward M. Henderson, Jr.
407 Smith Street
Seattle, Washington 98109
edhenderson57@comcast.net
(206) 283-6497

July 28, 2018

Mike Kaputs
Director, Natural Resource Department
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801
nr.icciclesepa@co.chelan.wa.us

G. Thomas Tebb
Director, Office of the Columbia River
Washington Department of Ecology
1250 West Alder Street
Union Gap, Washington 98903-0009
thomas.tebb@ecy.wa.gov

RE: Comments on the Draft Programmatic Environmental Impact Statement (DPEIS) for Icicle Creek Watershed Resources Management Strategies.

Dear Misters Kaputs and Tebb,

I am a hiker, backpacker and climber. I have been enjoying recreation in the Alpine Lakes since the early 1980's, shortly after this spectacular mountain region was designated a Congressionally protected Wilderness in 1976. I count myself extremely lucky to live in Washington State with close and easy access to the Alpine Lakes. Many of my fellow citizens are not so fortunate and travel many miles to visit these wonders. Recreational visitation to the Alpine Lakes is a major economic godsend to the surrounding mountain communities. I have relaxed and enjoyed many cold beers and Ortega Burgers at Gustav's in Leavenworth after a hike down from the Enchantments or a hot dusty day's rock practice on the granite slabs up Icicle Creek.

I am shocked and appalled by the sloppy, self-serving DPEIS that you are attempting to pass off on a gullible public. The DPEIS is incomplete and fails utterly to adequately address many important issues raised by anticipated work in protected Wilderness. The missing issues include but are not limited to: enumeration of the necessary permits and waivers which may be required; relationship with the Forest Service, the administrator of this public land; how the physical work will be carried out in the Wilderness. The DPEIS should be withdrawn until you can answer these and many other questions.

38-1
38-2
38-3

38-4 I am aware that the Icicle Peshastin Irrigation District (IPID) has water rights in the Icicle Creek watershed that pre-exist designation of the Alpine Lakes Wilderness in 1976. The IPID has a right and indeed an obligation to maintain the facilities associated with those rights. However those rights do not extend to increasing withdrawal of water for purposes not originally specified. IPID's water rights were granted for the designated purpose of irrigation. The DPEIS now proposes to use IPID water for other purposes, such as the fish hatchery and real estate development in Leavenworth, but IPID has no right to use water for these additional purposes. The DPEIS also fails to fully analyze limitations on
38-5 the scope and validity of IPID's remaining water rights, which limit several proposals.

38-6 The DPEIS must be revised to eliminate proposals to raise the height of the dams at Upper Snow Lake and Eight Mile Lake thus increasing the size of these Lakes in the Wilderness and draining Upper Klonaqua Lake into Lower Klonaqua Lake.

Comment Letter 038

38-7 The DPEIS fails to address the means and methods of construction in the Wilderness. For the multitude of projects proposed in the Alpine Lakes Wilderness, what construction activity can be expected to complete the proposed projects? How many helicopter flights
38-8 will be required for all of the projects proposed in each alternative? How will that impact wilderness values, including the opportunity for solitude, recreational access and
38-9 infrastructure? How will automation and optimization and proposed changes to the natural hydrology of the basin impact the invertebrate community? The Wilderness Act limits the use of power mechanical tools and requires the use of manual powered hand
38-10 tools. The original irrigation structures, the dams and spillways at Upper Snow and Eight Mile Lakes were built with non-mechanized tools in the early twentieth century. Such restoration work as required for safety and necessary operations should be carried out with the same hand tools.

38-11 The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which will alter stream hydrology.

38-12 The Alpine Lakes Wilderness is one of the most iconic and treasured natural resources in the entire National Wilderness Preservation System. These lands are of national interest, owned by everyone in the nation and protected by Congress to preserve their wilderness character. As detailed in the DPEIS, thousands of hikers explore and visit this area each year and a myriad of wildlife species depend on the critical habitat it provides. I have great personal interest in the management and stewardship of these lands, and am committed to working to ensure wilderness, recreation, scenic, and other natural resource values are protected into the future.

38-13 The DPEIS is woefully inadequate and must be withdrawn. It fails to address many important issues and lacks sufficient details on many others. Because of these and many other deficiencies an evaluation can't be reasonably made of the probable environmental impacts. Because many of the projects proposed in the DPEIS occur in the National
38-14 Forest, i.e. on federal land, I believe a NEPA evaluation is required.

38-15 Thank you for this opportunity to make these comments. Please inform me when a new, revised and corrected DPEIS is ready and available for public scrutiny and comment.

Sincerely,

Edward M. Henderson

Edward M. Henderson, Jr. P.E.

cc: Governor Jay Inslee
U. S. Senator Patty Murray
U. S. Senator Maria Cantwell
U.S. Representative Pramila Jayapal
Okanogan-Wenatchee National Forest Supervisor Mike Williams
Wenatchee River District Ranger Jeff Rivera

Comment Letter 039

Comment Letter 039

Mike Kaputa, Director
Chelan County
211 Washington St. Suite 201
Wenatchee, WA 98801

James Woods
P.O. Box 1837
Penn Valley, CA
95946

Friday, July 27, 2018

7-27-2018

Dear Mr. Mike Kaputa:

39-1 Concerning the Alpine Lakes Wilderness, Chelan County and Washington State Department of Ecology Draft Programmatic Environmental Impact Statement (DPEIS), proposed Icicle Creek watershed strategy and accompanying alternatives. Consider suspending this DPEIS. Please make every effort to better understand Wilderness Act law and National Environmental Policy Act NEPA) full discloser requirements before proceeding.

39-2 I strongly oppose Chelan County water resource planning that would in any way manipulate the natural flow of water within and without Alpine Lakes Wilderness. Doing so would significantly alter and harm treasured wilderness characteristic in ways large and small.

39-3 Avoid all proposals that reduce or increase the watershed's natural historic flow pattern and overall water table depth so critically important to plant, fish and wildlife survival.

39-4 Please consider revising or withdrawing the current DPEIS.

39-5 On a separate note we must recognize climate change is happening. Wildfires, record breaking heat waves and drought are commonplace events. The United States west is experiencing rapid desertification. Today's efforts in water management may be an exercise in futility? Priorities will change.

Thank you for reading this letter and carrying out the above request.

Sincerely,

James Woods
PO Box 1837
Penn Valley, CA 95946

Phone: 530 432 1969

jwoods1945@yahoo.com

Comment Letter 040

July 27, 2018

Mike Kaputa
Director, Natural Resource Department Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: Icicle Creek Watershed Resource Management strategy DPEIS

Dear Mr. Kaputa,

40-1 As a US citizen and long-term Washington resident, I am disappointed with the DPEIS as released in its current form; it needs radical revision. Many of the alternatives do not appear to have a legal way to be implemented. This is a cause for grave concern; any Watershed strategy developed must comply with all State and Federal Laws and in particular water rights law; at the present only some elements across alternatives maybe feasible, which contributes to this effort as a flawed strategy.

40-2 The Alpine Lakes Wilderness (ALW) is a priceless resource. The Alpine Lakes is the largest wilderness area near the population centers of Puget Sound (414,161 acres following the 2014 expansion) is an important contributor to the regional economy likely to become more important judging from the increased number of recreational enthusiasts in the Cascades. The expectation of Washington citizens is that the values of the Alpine Lakes Wilderness, protected since 19767 will be held in perpetuity. The ALW has seen increased pressure from both population growth and climate change. These pressures will continue to grow.

40-3 I support repairing/replacing in-kind of existing structures; any repairs and replacements should have sound justifications with a full analysis of the environmental impacts. However, there should be no expansion, increased withdrawal or impoundment of water as a result of these maintenance activities.

40-4 Therefore, I do not support any of the alternatives as presented. None are acceptable. The DPEIS fails to even have a valid No-Action because it includes actions that could be pending. It is questionable if the No-Action alternative complies with SEPA or NEPA in its current form. I am particularly concern about

40-5 the proposed water storage and use for which there are no rights. Specifically, the IPID relinquished its right to store more water than is historically taken. Relinquished water rights are exactly that; the right is

40-6 no longer available to exercise and it is my understanding that the water rights now belongs to the Federal

40-7 Government. Water conservation proposals in the DPEIS should be significantly expanded. The

40-8 watershed's ability to maintain a functional ecosystem is required.

40-9 Finally, after reviewing the members of the Icicle WG I find it very interesting that all of the stakeholders are well represented with one exception. I could not find a representative from recognized environmental organizations involved with the Alpine Lake Wilderness Area on the list of IWG membership. This is an alarming oversight given the experience that both Chelan County and the Department of Ecology have in pulling together stakeholder groups to work on tough issues. It would be my hope that this oversight be corrected.

Please keep me apprised of this process.

Best Regards,

Janet Thompson
11331 Alton Ave NE
Seattle, WA 98125
thomp527@yahoo.com

Comment Letter 041

July 24, 2018

Chelan County Natural Resources
411 Washington Street
Suite 201
Wenatchee, WA 98801

RE: Icicle Strategy

To Whom It Concerns:

41-1 My first backpacking trip was to the Enchantments. The beauty of this part of the Alpine Lakes Wilderness was beyond my comprehension but led me to a deep love of our earth.

Subsequently, I hiked and climbed in many parts of the world. However, the natural beauty of the Enchantments was unmatched in any of the backpacking trips I have taken in Europe, Asia North and South America.

Please do not in any way alter the magnificent beauty of the Enchantments which I have visited on numerous occasions and can only hope that it will be visited my many others in the future and continue to engender a love for the beauty of our earth.

Sincerely,

Jamiese A. Loeken, MD
6535 Seaview Ave NW
#605B
Seattle, WA 98117

Comment Letter 042

Mike Kaputa

Chelan County Natural Resource Department and State Department of Ecology

411 Washington Street., Suite 201, Wenatchee, WA 98801

Dear Mike,

42-1 I am writing to urge you against the implementation of the State Environmental Policy Act and to reconsider the new water resource management plan for the Icicle Creek Sub basin. Generations upon generations have enjoyed the trails in the enchantments and we hope many more will. My passion first started when I learned about the alpine lakes there, amazed by their complexity and diversity I knew I wanted to spend my life doing this.

42-2 Something I've worked on in the past and an everlasting passion of mine is marine life. To keep it simple, natural temperature cycling plays a huge role in the life of marine animals. As reservoirs are built the temperatures begin to differ greatly between the surface and depths, this can change mating seasons and threaten the food sources of many of these animals. On top of that when the water is then released downstream it has been oxygen deprived and further induces unnatural temperatures through the stream and disrupts the ecosystems down streams. Dammed rivers lack the natural transport of sediment crucial to maintaining healthy organic riparian channels. Throughout the years as the Olympics have been damned, hundreds of species have suffered.

I plan to share the same passion with my children one day and want to teach them to care about the animals that inhabit our earth. These are incredibly delicate ecosystems and so much can be learned from them!

Thank you for reading this through and I hope you reconsider your decision.

All the best,
Jeffrey Currier
4450 46th Ave SW Seattle, WA 98122

Comment Letter 043

Dear Mike,

43-1 I have heard that you are a part of a team of people making a decision on altering the Enchantments for public gain. I'd like to try to persuade you otherwise.

It has taken millions of years to create The Enchantments and other areas of beauty, solice & thousands of life forms — many of which we can not see. As more people populate the earth, areas like these are getting smaller & smaller every day. To disturb land and water ways in such fragile areas like these is to destroy what has taken millions of years to create.

There must be better alternatives — where will the next generations go to see our world the way it was made without our interence?

We do not even know all of the life forms that would be disturbed or altered - only God can know that.

Comment Letter 043

I plead with you Mike, to please consider other alternatives that do not disturb such fragile areas and do not take away the ability to experience God's world as he made it.

Best to you and your family!
Julie Bays

917 Pine st
Seattle WA 98101

SEATTLE WA 980
18 JUL 2018 PM 7

Comment Letter 044

350 NW 82nd Street
Seattle WA 98117

Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee WA 98801

Public Comment: Icicle Strategy

July 28, 2018

Dear Director Kaputa,

44-1 I would like to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands of outdoor enthusiasts each year. As a lifelong Washington resident who has thoroughly enjoyed her hikes and climbs in the Enchantments and other parts of the Alpine Lakes Wilderness during the past 25 years, I ask that elements of the strategy that threaten wilderness be removed from the draft plan.

44-2 The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trails and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua
44-3 Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them. I ask that Chelan County and the Washington State Department of Ecology
44-4 revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers and climbers who gain solace from time spent in this treasured alpine valley.

Thank you for your consideration.

Julianne Lamsek

Comment Letter 045

Dear Mr. Kaputa,

45-1

I am very concerned about the proposed dams within the Alpine Lake Wilderness.

The Enchantment Basin is a world class tourist & wilderness destination. The area is much loved by recreationist & is an important draw to the regional economy. It has been protected since 1976 & I strongly oppose building plans.

Sincerely

Laurie Colaneri
1700 15th Ave # 405
Seattle WA 98122

Comment Letter 046

Mike Kaputa

Chelan County Natural Resource Department and State Department of Ecology

411 Washington Street., Suite 201, Wenatchee, WA 98801

Dear Mr. Kaputa,

46-1

My name is Ryan Jones, I'm a 20 year old college student living abroad and am writing to tell you that there is no place like the PNW and specifically its crown jewel, the Icicle Creek Sub Basin Area. I grew up in the evergreens and would travel hours out just to spend a single moment hanging my body off Icicle creeks rocks. I speak for my friends and the generation who were shaped by these mountains when I say that we support the quest for more sustainable sources of energy but the resources used to create such a project could be put to much better use.

The trip down to Leavenworth is made worth it not by the climbing and hiking but when I can stop for a second just to take in the silence. Stop by the river for lunch and share the rock with whatever wild life might be skirting on by. I miss these moments desperately. It's hard to truly appreciate the natural beauty until you leave, what the enchantments and all of Icicle Creek has is something special. Spending time in nature and the back country teaches you to care about our earth, how to be preserve it and what's truly important. You feel against your skin just how powerful the breeze and sun can be for one person as well as providing for all of us. The moments, that these damns run the risk of destroying, teach us what it means to be human and see everything in perspective. The ecosystems that make up the peaks ad valleys are incredibly unique and can't be found everywhere, it's hard to appreciate just how incredible they are. You may be numb to just what these animals, ecosystems and areas can offer and might have forgotten just how beautiful the views are but that's not why I'm writing you. I'm writing to remind you the incredible impact they can all have on a young boy.

Again, I speak for my friends and the generation that gained meaning in their lives from the moments spent near the mountain lakes. We support the quest for more sustainable sources of energy but the resources used to create such a project could be put to much better use where they don't put so much beauty in danger.

I genuinely appreciate you taking the time to read through this as this issue is incredibly close to so many of our hearts. We look forward to hearing your response.

All the best,

Ryan Jones
07/10/2018

Comment Letter 047

William B. and Margaret L. Beyers
7159 Beach Drive SW
Seattle WA 98136

(206) 935 6282

Mr. Mike Kaputa
Director, Natural Resource Department
Chelan County
411 Washington St., Suite 201
Wenatchee WA 98801

Dear Mr. Kaputa:

05

47-1 We strongly support the letter dated July 25, 2018 from David Knibb, Vice President, of the Alpine Lakes Foundation, with regard to the Icicle Strategy Draft Programmatic Environmental Impact Statement (DPEIS). This document fails to establish a basis for water rights related to the various proposals in the DPEIS.

As also suggested by Karl Forsgaard of ALPS, this DPEIS must be replaced with another document that speaks to these fundamental issues of water rights, and another period of public comment needs to be offered on it.

47-2 Please officially withdraw this DPEIS as inadequately drafted under SEPA, and after issuance of a revised DPEIS that has appropriate water rights defined, please publish the required public comment period on this revised document.

Sincerely,

William B. and Margaret L. Beyers

William B & Margaret L Beyers

Comment Letter 048

From: Allison Ostrer <aostrer21@gmail.com>
Sent: Friday, June 22, 2018 8:51 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Project

48-1 I am a taxpayer and I OPPOSE any new or larger dams in the Alpine Lakes Wilderness.

Allison Ostrer
Seattle, WA

Sent from my iPhone

1

Comment Letter 049

From: Ansel Wald <anselwald@gmail.com>
Sent: Tuesday, June 26, 2018 9:47 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Public comments- Alpine lakes water piracy

Dear Chelan County,

49-1 You guys can jolly well keep your long tentacles out of the Alpine Lakes. This area was set aside for preservation and as it is there is so much pressure on it that one has to get a permit just to visit it the area from which Chelan County proposes to steal- that's right, steal- the water: The Enchantment Lakes and certain nearby lakes.

How dare Chelan County try to steal water out of an area which the people have worked for decades to preserve, which was finally set aside by the Congress of the USA. I have been up there many times and I have an intimate knowledge of the area. It can barely serve it's purpose- preservation of an alpine ecosystem- and still provide for the recreational needs of people on both sides of the Cascades. Recreation is putting enough pressure on this wilderness preserve, and the water pirates have no business up there. One of the tenets of the Wilderness act is that no permanent developments, including dams, which are essentially commercial developments, are allowed to be built.

49-2 If Chelan county has any humility, they can stay out of the alpine lakes and manage the water after it has left the boundaries of the wilderness. If that isn't enough water for rich folks to water their lawns and farmers to irrigate their crops then they can jolly well pump water out of the Columbia river. It has plenty to go around.

Sincerely, Ansel Wald

P.S.: Similar letter also sent to Mary Jo Sanborn.

1

Comment Letter 050

From: brynne koscianski <brynne.koscianski@gmail.com>
Sent: Monday, June 25, 2018 5:58 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] DPEOS Icicle Creek

Chelan county,

50-1 I am writing to express strong concern for the DPEIS. All alternatives seek to construct dams and related structures on lakes within the Alpine Lakes Wilderness. In my family, each member has a favorite area of our beautiful PNW. Mine is the Apline Lakes Regional Wilderness. In my mind, this land is some of the most beautiful in our entire nation. We must do everything in our power to protect and preserve these beautiful wild places. The annual enchantments permit process is a great indication of how many others love this place too. Please enforce the protections that keep the Alpine Lakes beautiful. I stand with the Seirra Club, and all who stand with our wild places.

Sincerely,

Brynne koscianski

1

Comment Letter 051

From: Chris Murray <chrismurray92@gmail.com>
Sent: Wednesday, June 27, 2018 1:54 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Water Resource Management Strategy

To Whom it May Concern,

51-1 I'd like to register my opposition to the proposed Icicle Creek Water Resource Management Strategy, especially as it impacts the Alpine Lakes Wilderness. I live in Central Washington, and my wife and I thoroughly enjoyed our hikes in the Alpine Lakes wilderness area. During our visits, we stay in hotels in the Leavenworth area and eat in the restaurants there, so our visits contribute to the vibrant tourism and outdoor recreation economy of the area.

I am very concerned about any activity that is going to jeopardize the Alpine Lakes Wilderness, and the proposed alternatives in the Management Strategy look likely to have a significant impact. I strongly encourage the working group to give greater weight to wilderness preservation in the EIS and the final plan. I think much greater weight also needs to
51-2 be given to water conservation and trading of water rights in taking care of the legitimate water needs of irrigators and the public before any activities that will modify the water budget in the Alpine Lakes Wilderness, let alone lead to construction activities there.

Thanks for your consideration.

Chris Murray /s/

--
Chris Murray
1909 Dogwood Place
Richland, WA 99354

Comment Letter 052

From: Darrel Martin (dsence@hotmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Wednesday, June 27, 2018 11:52 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Damming Alpine Lakes Wilderness?

Dear WA Department of Ecology and Chelan County Officials,

52-1 Many of the DPEIS proposals for Icicle Creek do not conform to the fundamental ideal that Wilderness should remain undeveloped.

The Wilderness Act defines wilderness as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."

If these standards are not upheld, you will be violating a legal designation and undermining a crucial and sensitive mountain habitat where tens of thousands of like minded people recreate each year.

Please uphold higher standards of Wilderness preservation, even at the expense of whatever economical benefit it may provide. With over 300 million and counting, Homo Sapiens have done enough damage to this beautiful country.

Thank you,
Darrel Martin

Sincerely,

Darrel Martin
517 Pine Ave Apt 2
Snohomish, WA 98290
dsence@hotmail.com
(425) 387-8813

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 053

From: Deanna Pumplin <deepumplin@gmail.com>
Sent: Tuesday, June 26, 2018 11:58 AM
To: NR Icicle SEPA
Cc: Deanna Pumplin
Subject: [Icicle SEPA] Draft Icicle Strategy EIS

Mike Kaputa, Director, Chelan County Natural Resource Department

Dear Mr. Kaputa,

53-1 I'm opposed to the Icicle Creek watershed project being proposed to enhance water flow in the summer for fish, agriculture, human consumption, for all the reasons stated in the letter to you available at: http://www.waterplanet.ws/pdf/Icicle_SEPA_scoping_comments_5-11-16.pdf.

53-2 I am a resident of Washington and have lived in this state since 1975. I have backpacked in the Alpine Lakes Wilderness area, particularly in The Enchantments. It is wilderness. It is sacred. The Icicle Creek strategy will adversely impact this Wilderness area.

53-3 I implore you, on behalf of generations to come, on behalf of the rest of the living world, to oppose this EIS. We humans should be exercising a united effort to conserve water as the first and most important step in dealing with water flow for fish, with water for agriculture, with water for people. Climate change requires that we as a people change our ways, change our habits, change our mistaken belief in the supremacy of humans. Water flow for fish should be the priority. Let the orchards and farms find more ways to improve their care of their soil, of its water holding capacity. Let's not turn to the technologies of dams, which we should be removing, not building, to solve a problem of human misuse of the living systems that make our world.

Sincerely,

Deanna Pumplin
400 35th Street
Port Townsend, WA 98368
(360) 379-1553
deepumplin@gmail.com

Comment Letter 054

From: Dick Fiddler <fiddler.dick@gmail.com>
Sent: Wednesday, June 27, 2018 9:49 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on Icicle Strategy PEIS

Mike Kaputa
Director, Chelan County Natural Resource Department

Dear Mr. Kaputa:

The Icicle watershed is a major portion of the Alpine Lakes Wilderness, an area greatly valued by citizens of Chelan County, Washington State, and the entire nation. In my view, the PEIS does not adequately consider the wilderness values which inspired the successful campaign to enact Wilderness legislation in 1976, it does not adequately discuss the conflicts in the Working Group which caused several major environmental groups to be forced out of the Working Group, and it does not include a full range of practical alternatives which could do a better job of protecting all the environmental and water supply values in play.

54-1 The PEIS seems to assume that mere compliance with the Wilderness legislation serves to do the job of assessing wilderness values. This is simply wrong. The legislation provides for a management framework to protect certain wilderness values but is not dispositive as to future decisions. The discussions leading up to the 1976 Act did include an understanding that existing dams within the wilderness boundaries would not have to be removed. As a participant in those discussions, I know that there was no detailed consideration of future changes to the management of lake levels or of dam upgrades or repairs. These issues were not definitively decided and alternate approaches to protecting and enhancing wilderness values must be analyzed in an open manner today. This can only be done by a detailed assessment of additional alternatives. Asserting simply that the alternatives considered are sufficient because they comply with the wording of the legislation does not even begin to suffice.

54-2 The PEIS implies that the Working Group was a consensus process including environmental groups. This is far from adequate as a discussion. While a few groups were included which might claim some right to the term 'environmental', the simple fact is that the major environmental groups who have long been stakeholders in Alpine Lakes issues were forced out by the process. The document is misleading on this point.

54-3 Finally, a full range of alternatives, including water conservation alternatives and alternatives which do a more rigorous job of wilderness protection, must be considered in depth.

The PEIS is inadequate.

Sincerely,

Richard Fiddler
1708 N 35th St
Seattle, WA 98103
206-420-8865

Comment Letter 055

From: Jeff Lambert <ecojeff@me.com>
Sent: Monday, June 25, 2018 7:04 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Project

To Whom it May Concern:

55-1 ***I recommend that projects to increase the dam size and adding a tunnel should be removed from the Icicle Strategy. The adverse effects to the ecosystems in this sensitive area will not recover. The harm to recreation use will also be harmed.***

55-2 ***As a licensed civil engineer who has considerable experience on large and small hydroelectric projects, the ecological and recreation costs far outweigh the benefits of this project.***

55-3 ***I endorse the proposed habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies.***

Jeff Lambert, PE
16 E 39th Avenue
Spokane, WA 99203
(509) 999-5100

Comment Letter 056

From: John Russell (jvrussell85@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Wednesday, June 27, 2018 10:07 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

56-1 These dams should be removed. Let wilderness be wilderness. We build dams and dikes to control nature, and when things fall apart, we build more. Take the dams out!

Sincerely,

John Russell
818 32nd Ave
Seattle, WA 98122
jvrussell85@gmail.com
(206) 329-7489

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Comment Letter 057

From: Snow Cat <kristikt7@gmail.com>
Sent: Monday, June 25, 2018 6:30 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Project

57-1 Great project idea go for it. It wont effect the area enough to destroy the environment. Looks like a very well thought out idea.

Sincerely, M. Johnson

Comment Letter 058

From: Mark Shipman (shipman@nwi.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 5:32 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Dams in the Alpine Lakes

Dear WA Department of Ecology and Chelan County Officials,

58-1 The Sierra Club, Alpine Lakes Protection Society, and several other environmental organizations are dead wrong on this one! I personally live in Chelan County, and I have recreated in the Alpine Lakes probably more than most other environmentalists....and I do consider myself an environmentalist.
Eight Mile Lake is a good example. There are no beaches at Eight Mile Lake, nor are there any camp grounds along the shore. Raising the lake level even ten feet would make little difference to those who recreate there including myself.
With environmental warming, we will need to hold more water in the Alpine Lakes than in previous years do to decreasing snow pack.
Please consider me strongly in favor of repairing and enhancing the existing dams in the Alpine Lakes Wilderness. I am happy to provide much more discussion on this issue!

Sincerely,

Mark Shipman
1221 Madison St
Wenatchee, WA 98801
shipman@nwi.net
(509) 670-4606

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 059

From: mattparker770@gmail.com on behalf of Matt Parker <mattparker@kw.com>
Sent: Friday, June 22, 2018 2:09 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Watershed Public Comment

Hello,

59-1 WV I wanted to let you know I am against damning anything in the Enchantments, a truly one-of-a-kind natural treasure. Please take my thoughts into consideration.

Sincerely,

Matt Parker, Burien, WA

(206) 226-8323 - 455 SW 152nd, Seattle, WA 98166
Keller Williams Puget Sound - Luxury Site - Residential Site
Amazon - LinkedIn - Facebook - Zillow

Comment Letter 060

From: be <brightm33@gmail.com>
Sent: Wednesday, June 20, 2018 2:38 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Alpine Wilderness

Categories: EIS Comment

60-1 As a frequent visitor to the pristine Alpine Wilderness area, I implore you to leave the area untouched. We are no struggling with holding onto areas such as this where no industry has tread. I have hiked extensively throughout the region for 48 years. Water taken from this area to support tourist trade in Leavenworth is a ridiculous venture.

60-2 As for as agriculture, the lack of water can't be addressed by this venture for long. It is Climate warming that is to blame, over use of land for agriculture, dense developments of recreational homes in the area...these are the culprits.

60-3 This plan is not going to solve the deeper problems. You are opening a Pandora's box by removing waters coming from snow packs and glaciers, building larger dams, drilling between lakes and reconstruction in a very fragile and pristine environment...in the long run, it is going to cascade into more problems. It is this sort of impact that drives the acceleration of climate warming.

60-4 Learn how to clean up the larger rivers that have been polluted by bad planning and over use and use them for human consumption.

60-5 We need to protect our wilderness areas not open them up for water sales.

Michelle Bright
321 W Niagara Ave
Astoria OR 97103

Comment Letter 060

503 298 0929

--

"Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop away from you like the leaves of Autumn."

- John Muir

2

Comment Letter 061

From: Natalie Williams <nataliesees@gmail.com>
Sent: Monday, June 25, 2018 9:57 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Strategy Draft PEIS

61-1 The alternatives are packaged in such a way, that even the moderate conservationist is pushed to choose the 'No Action'
61-2 alternative. The BEST solution is the *long term* solution, and that includes the Full IPID Pump Station. The BEST solution
61-3 must be compliant with the Wilderness Act, and so must not include Modernization or Enhancement. So why not offer an Alt3 with the Full Pump Station? Or an Alt 5 without the illegal Lake/Dam mechanization?

61-4 It may not be the cheapest or fastest path, but it will be a LOT cheaper if we can avoid lawsuits.
Best wishes to all who are working this problem/solution.

-- Natalie Williams
"The best way to predict the future is to create it." -Peter Drucker

1

Comment Letter 062

From: Peter Fiddler <eprfiddler@q.com>
Sent: Tuesday, June 26, 2018 8:05 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please do not build dams or divert water from Alpine Lakes Wilderness

To: Mike Kaputa, Director, Chelan County Natural Resource Department

Subject: Draft Programmatic Environmental Impact Statement for the Icicle Creek Basin

Dear Mr. Kaputa,

62-1 I believe that the Alpine Lakes Wilderness, including the Icicle Creek, should be preserved as wilderness.

Therefore please consider including a "Wilderness Preservation" option that would prevent dams and water diversion in this important natural area.

Thank you for your consideration.

Sincerely yours,

Peter Fiddler
5744 28th Ave. NE
Seattle, WA 98105
206-779-0309

1

Comment Letter 063

From: smiths1946@outlook.com
Sent: Tuesday, June 26, 2018 9:21 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] lake name error

63-1 In chapter 3, affected environment, Figure 3-1 map) the labeling of Eight Mile Lake and Colchuck Lake is backwards or reversed.

63-2 Also, is there an illustration of what changes are being proposed for the lakes in and around the Alpine Lakes Wilderness?

Thank you,
Sam Smith
Sent from Mail for Windows 10

1

Comment Letter 064

From: Thor Thompson (tthompsonseattle@aol.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Sunday, June 24, 2018 7:32 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

64-1 Please leave the wilderness and lakes alone.

Sincerely,

Thor Thompson
10302 14th Ave NW
Seattle, WA 98177
tthompsonseattle@aol.com
(206) 679-7574

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 065

From: Timothy R. Gartland <timgartland@centurytel.net>
Sent: Monday, June 25, 2018 5:08 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Draft Programmatic Environmental Impact Statement (PEIS) for the Icicle Strategy

Dear Mike Kaputa, Chelan County Natural Resource Department,

65-1 Please receive our message that I and my family being property owners on the Icicle River will stand with the Alpine Lakes Wilderness Society in their opposition to the Icicle Strategy as outlined in the Society's first edition of the 2018 newsletter. The summary of its text is included as follows:

• …The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. It is one of the nation's more popular wilderness destinations and attracts people from around the world, particularly to the Enchantments Basin, known for its competitive permit lottery.

65-2 • The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes IPID's easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

65-3 • Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. These projects are unprecedented in
the National Wilderness System. These projects were not part of the proposed action in the SEPA scoping conducted by IWG in 2016, so the public was not provided an opportunity to comment on them during scoping. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

65-4 • Alternative 5 is the least harmful alternative. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek, especially in future decades when climate change will reduce flows in the Icicle watershed. However, Alternative 5 also includes the defective Eightmile
"Restoration" project to make Eightmile dam higher than it has been since 1990, i.e., to enlarge Eightmile Lake.

65-5 • The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal
65-6 reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been
65-7 since at least 1990. Any dam rebuilding must be approved by the U.S. Forest
Service and must comply with the National Environmental Policy Act (NEPA) and other federal and state laws.

65-8 • The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the DPEIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the DPEIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides. IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such
65-9 as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

65-10 • For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land

Comment Letter 065

65-10 management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National
65-11 Environmental Policy Act (NEPA). SEPA is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.
65-12 • Because the projects are in Wilderness, non-motorized access and non-motorized equipment (i.e. hand tools) and traditional skills should be required whenever feasible. Since the dams were originally built that way, the exceptions should be rare.
65-13 • The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed unnaturally timed releases of water from lakes, which alters stream hydrology. The DPEIS generally fails to recognize that altering the natural flow regime can degrade a stream's physical and chemical properties, leading to loss of aquatic life and reduced aquatic biodiversity. We are concerned that IWG has not done adequate sampling and monitoring of impacts from past releases into these wilderness streams, including cumulative impacts.
65-14 • Conservation components in the DPEIS are simply insufficient. They need to be expanded to significantly reduce demands on Icicle Creek's water, thereby allowing its watershed to function more naturally. This will better support our region's livability and economy over the long-term.• While
65-15 we appreciate the goal to improve instream flows in Icicle Creek, it is contradictory to exploit one natural area under the guise of enhancing another, particularly when other options are available.
65-16 • The DPEIS should be revised to address the above deficiencies. A Revised Draft PEIS should be released for public comment.

Very sincerely,
Tim Gartland and the Gartland Family, 86 Mountaineering Creek Lane, Leavenworth WA 98826

Comment Letter 066

From: Will Henson (willtcrane@yahoo.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 7:46 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

66-1 take the dams out, not needed anymore, take out the fish hatchery as well let the river go back to normal before 1928
66-2 let the creek rebuild itself from commissioners that rely on the benefit, icicle creek use to dry up in late summer the
66-3 creek is non navigable owned by to people that have property next to the creek, if you want to help the fish ! Stop the commercial river tubing, floating, it's like a drunk water park, people pissing and shiting everywhere, garbage,
66-4 trespassing, underage drinking, it's out of control

Sincerely,

Will Henson
12386 shore st Leavenworth WA 98826-9324 United States Leavenworth, WA 98826 willtcrane@yahoo.com
(907) 230-9341

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 067

From: Will T Henson <willtcrane@yahoo.com>
Sent: Wednesday, June 20, 2018 8:05 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle creek

Categories: EIS Comment

To whom it concerns

67-1 Need to put regulations on the commercial tubing industry the thousand people a day floating walking on private property stepping all over baby reds, drinking getting drunk in public in front of families, sinking beer cans and bottles ,defecating all over in the river and on private property, dumping garbage screaming and yelling has disrupted the community neighborhoods, commercial tubing is violating my property rights, degrading my property values and creating a nuisance and hurting the environment, where do all these people go to the bathroom? We can't even use our property in the summer days because we have drunk trespassers on our property every day, Sheriff's department needs to patrol the icicle creek and ticket people for breaking Washington laws including drinking in public and trespassing Will henson property owner tax payer

Sent from my iPhone

Comment Letter 068

From: Fisher (US), Andrea M <Andrea.M.Fisher@boeing.com>
Sent: Friday, July 06, 2018 1:11 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] PEIS comment for the Icicle Strategy

68-1 No DAMS!

Comment Letter 069

From: Charles and Nancy Bagley <c12n35.h.bagley@comcast.net>
Sent: Monday, July 09, 2018 3:23 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] DPEIS Icicle Creek Project 120045
Attachments: COMMENTS -- DPEIS Icicle Creek Project.docx

Thank you for your and your staff's work on preparing this thorough DPEIS, a massive document. I have studied it extensively and prepared the above comments.

69-1 I have endorsed Alternative 2, as having the greatest chance of providing water security for the Icicle Creek, Leavenworth and Dryden areas, and avoiding the serious wilderness impacts that the Alpine Lakes Optimization ... Project would cause, especially Alts. 4 and 5.

69-2 What legacy does your Department and Staff want to look back at? Surely it must be that water supply was assured, taking of Icicle Creek water was reduced, and the majestic Wilderness around Icicle Creek remains beautiful and enjoyed by your grandchildren and their descendants.

Thank you,

Charles Bagley
Seattle
206-282-1578

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Comment Letter 069

COMMENTS ON THE:

Draft Programmatic Environmental Impact Statement for the Icicle Creek Water Resource Management Strategy, Chelan County, Washington
Project 120045

SUBMISSION DATE JULY 9, 2018

69-3 I prefer **Alternative 2.**

As shown in the report by the University of Washington Climate Impacts Group, May 12, 2017, Alternative Two will supply adequate minimum water flow of 100 cfs under all climate forecast and drought conditions scenarios (see CIG report Appendix).
The Dryden Pump in low water months will be able to remove water directly from the Wenatchee River. Thus, Dryden will be happy, always having enough water, and removals from Icicle Creek will never be needed when flows are low.
Further, Alternative Two will not require installation in the Alpine Lakes Wilderness of Optimization equipment, which despite its small footprint will be obvious to the hikers.
The cost of Alt. Two at $91 million is only 11% more that Alt. One, a modest extra cost considering the much greater security it provides to the fish and irrigators.

69-4 I oppose Alternatives 4 and 5.

We must never forget that these federal Wilderness lands belong to ALL Americans. Americans flock to the Leavenworth region -- 150,000 visitors in 2017, "... to enjoy the wilderness" (3.11.1). Backcountry camping in the Enchantment Lakes area is famous nation-wide. In 2015 there were 12,034 applications for camping permits, but only 1946 permits were available! (See tables 3-24 and 3-25) The USFS must restrict camping to preserve the quality of the experience now and for future generations, as mandated by the Wilderness Act. So, getting backcountry camping permits is a matter of luck; most applicants reapply yearly until lightning strikes, as it finally did for my wife and me at the ranger station one morning decades ago, resulting in one of the most memorable hikng trips we every shared
.

69-5 What would be the impacts of Alpine Lakes optimization on visitors' experience in the Enchantments? The view impacts would be stunning! In Section 4.11, Aesthetics, Alt. One figures show thousands of acres of land from which the "bathtub rings" of the fluctuating reservoirs would be visible. The DPEIS deceptively shows these effects as seen from selected "viewpoints", but actually, all of the lake shores are viewpoints. E.G.: the diagram for Upper Snow Lake (Fig 4-4) is faulty, as the entire south shore trail will also reveal the ring.
For Alt. 4 and 5, section 4.11.5.2 reveals that the water level in Upper Snow Lake may vary by up to 8 feet, (!) creating a massive ring of dead trees and mud in peak hiking season of late July to early September, when hiking season peaks. What a tourist attraction for the thousands of hiker visitors to the Leavenworth area! The supposed "existing and proposed" photos of Upper Snow Lake (fig 4-64) actually are the same. Deceptive!

Comment Letter 069

69-6 Also, for Alt 4 and 5 peak water levels are expected to create "seasonal inundation of existing trails, campsites ... at maximum capacity." And of course, "maximum capacity" will be the plan for every spring. This not only blocks access in the early summer, but will leave a layer of silty mud all over the beautiful campsites by the Lake outlet for the rest of the year.

69-7 AN ADDITIONAL IDEA:
There was a suggestion that the Fish Hatchery could be moved. This was not analyzed. But given the importance of the Hatchery, water piped from the Wenatchee should by considered. This will assure perpetual water supply, and further reduce demand from Icicle Creek.

Comment Letter 070

From: Mike Kaputa
Sent: Wednesday, June 27, 2018 9:56 AM
To: Mary Jo Sanborn
Subject: FW: Environmental Review Comments

From: Christopher Barchet [mailto:christopherbarchet@gmail.com]
Sent: Wednesday, June 27, 2018 9:41 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Environmental Review Comments

Dear Mike Kaputa -

I realize that the water management of the Icicle Creek is complicated and difficult. I can also see that a huge effort has gone into sorting out how to allocate a limited resource. Thank you for your work in finding solutions.

70-1 Please understand that myself and so many others in the Puget Sound believe that the wilderness is a an equally valuable resource and infringing on it is unacceptable. The Alpine Lakes is to be "untrammeled by man, where man himself is a visitor who does not remain." Surely any infrastructure built in the wilderness violates the definition described in the Wilderness Act.

70-2 Please consider alternative solutions proposed in the 40-organization comment letter. http://www.waterplanet.ws/pdf/Icicle_SEPA_scoping_comments_5-11-16.pdf

Thank you for your consideration.

Chris Barchet

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Comment Letter 071

From: James Donaldson <olyaqua@gmail.com>
Sent: Wednesday, July 04, 2018 1:02 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Water project DPEIS

71-1 I am very concerned that there could be further water project development in the Icicle Creek watershed. I have hiked this area many times and it is a truly special place that should not be developed in any way that harms the wilderness character of this area.

Thank you for allowing me to comment.

James Donaldson
740 Quincy street
Port Townsend, WA 98368

Sent from Mail for Windows 10

Comment Letter 072

From: Mark Curtis <Mark.Curtis@mossadams.com>
Sent: Tuesday, July 10, 2018 8:53 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comment – Icicle Strategy Draft PEIS

72-1 Long before settlers were in the Icicle Valley, the natural stream flows were adequate to support large number of salmon. I believe this was possible in part to the large number of beavers and beaver dams in the Icicle watershed. These beaver dams slowed the down stream flow of water, shifting the time of the water flows. The work of these natural dam builders allowed greater stream flows in mid to late summer and into the fall. More flow than we see today.

Of course the beaver population in the Icicle watershed was decimated by hunters seeking their valuable fur.

All the alternatives presented in the draft PEIS are expensive human-made alternatives. Perhaps we need to be more humble about our wisdom and abilities and look to nature for the answer.

I suggest we investigate reintroducing breeding pairs of beavers throughout the Icicle watershed, in an attempt to return it to its pre-settler state, and thus support the ecosystem outcomes we desire – more stream flows in summer and early fall to support fish.

I believe this approach would be dramatically less expensive, and more sustainable than the other alternatives presented, and poses no conflicts with the Wilderness Act

Sincerely,

Mark Curtis
Issaquah, WA

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Comment Letter 073

From: Melinda Mueller [mailto:mmueller@seattleacademy.org]
Sent: Tuesday, July 10, 2018 7:59 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: EIS for Alpine Lakes Wilderness projects

To: Mike Kaputa, Director, Chelan County Natural Resources

Sir:

I am a Washington State resident (since 1960), a biology teacher, and a long-time hiker and backpacker. I am deeply concerned about the draft EIS regarding proposed dam and tunnel projects within the Alpine Lakes Wilderness Area.

As outlined by *Washington Wild*, the draft EIS has the following serious issues:

- 73-1 ◦ Contains projects that are illegal and do not comply with either federal or state laws
- 73-2 ◦ Contains many elements that are in direct conflict with the Wilderness Act and set a dangerous precedent for all wilderness areas in the nation
- 73-3 ◦ Has wildly inaccurate cost estimates and timelines for projects, ignoring the National Environmental Policy Act
- 73-4 ◦ Does not include nearly enough water conservation elements
- 73-5 ◦ Ignores the fact that the water rights to the areas involved do not belong to the group
- 73-6 ◦ Does not provide a sufficient range of alternatives. For example, the EIS does not include a "No Action"alternative with no new dam construction
- 73-7 ◦ Has projects that would have negative impacts to watersheds natural functions.

73-8 Alpine Lakes Wilderness Area is one of our State's greatest treasures. The draft EIS does not show the care this resource deserves.

Sincerely,
Melinda Mueller

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Comment Letter 074

From: Pete Fry <petefry@gmail.com>
Sent: Monday, July 09, 2018 12:45 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on Draft Programmatic Environmental Impact Statement for Icicle Creek Watershed Water Resources Mangement Strategy

My Name: Peter Fry

My Address: 2013 NE Rainbow Drive, Ridgefield, WA 98642

My Comments

74-1 Having investigated the options that your department is offering it seems that only "no change"offers a future without additional dams and structures, notwithstanding the apparent bias in the report which suggests that "no change" is a bad option.

74-2 Any dams and structures will have environmental impacts that will not be reversible. Much of this area is pristine wilderness which should not be exploited for short term financial gain at the expense of the long term.

74-3 The problem with developments for short term financial gain is that they don't take into account the long term impacts and costs of development. The interests of parties that seek financial gain that will externalize the costs of their activities should not be given any great weight in the decision.

On a recent hiking vacation in the Redwoods Region of Northern California what struck me was not so much the beauty and majesty of the surviving trees but the the large areas that had been deforested. Plenty of people had, in the past, made money from destroying the forests - but at what long term cost?

74-3 Don't pick an option that will have a deleterious effect on the environment in the long term. Don't let the Icicle Creek Watershed be yet another region that is destroyed by unnecessary development.

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Comment Letter 075

From: Rebecca Caulfield <caulfier@gmail.com>
Sent: Monday, July 09, 2018 7:36 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comment on Icicle Strategy

Good evening,

As a concerned Washington citizen, I would like to provide a comment on the DPEIS written by the Icicle Work Group (IWG) for the Icicle Creek Watershed Water Resources Management Strategy. Even though I do not live or work in Chelan County, I know that any minor or major altercation to the environment has far reaching effects on the planet as a whole. Our wild lands must be treated with the utmost care and respect. I would sincerely hope that IWG will take all possible steps to thoroughly examine this strategy and consider alternative options that have no negative impact on the Alpine Lakes Wilderness. There are three points that I would like IWG to consider: 75-1

Point one: What practices have been exercised to attempt water conversation in Chelan County? Before building higher dams and drilling tunnels, what can this region do to reduce demands on Icicle Creek's water? For example, in the Ski Hill area of Leavenworth former orchard lands have converted to residential areas but are still afforded irrigation water duties for their lawns. Policy around this needs to change first. Even if projects within the DPEIS are implemented, it will only be a matter of time before drought becomes a repeated issue with the imminent effects of climate change. We must take steps to conserve water starting now. 75-2

Point two: What research has been done to address fundamental legal issues that will determine which proposals can and cannot be built? For example, how does increasing storage in Eightmile Lake meet regulations under the Wilderness Act and land management authority of the U.S. Forest Service? The Icicle and Peshastin Irrigation District's easements do not supersede federal wilderness law. An updated DPEIS would be required with these considerations since they would greatly impact the scope and validity of the proposals within. 75-3

Point three: Alternative four should be nixed as an option altogether. Building a tunnel between Upper and Lower Klonaqua Lakes and building a higher dam at Upper Snow Lake and Eightmile Lake are egregious attacks on our wilderness. The damage created by transporting and using heavy duty equipment, habitat loss, and major impacts to riparian ecosystems would be irreversible. Again, we must do everything we can to protect what we have left of our wilderness. If water cannot be conserved, it is concerning that Chelan County wants to build even more homes where water is already over-appropriated and the impacts of climate change are taking their toll. 75-4 75-5

Thank you very much for taking the time to read my feedback about the IWG's DPEIS. I look forward to hearing about the next steps taken on this resources management strategy. I hope that the IWG will strongly consider environmental, conservation, and legal ramifications of their project proposals and develop an DPEIS that will better reflect these ramifications. 75-6

Best regards,

Rebecca Caulfield

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Comment Letter 076

From: Allison Kutz <Allison.Kutz.123967723@p2a.co>
Sent: Friday, July 20, 2018 8:12 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

Last week, my brother and I were experiencing one of the most incredible places in our state. The Alpine Lakes Wilderness is awe-inspiring. It is truly a breathtaking, unique place. To negatively alter this area would be stealing this experience from everyone who has dreamed of hiking/backpacking this area since laying eyes on the pictures shared by many who have had the privilege to walk amongst the majestic granite peaks and stunningly clear lake waters. 76-1

I attempted to read through the Icicle Creek strategies. Environmental impact is not a topic I understand to any great degree. However, I can speak to my recent trip passed the Colchuck Lake area and through to Snow Lakes Trailhead. A good portion of the trail along the lakes would be effected by a change in the level of the lake waters. Higher water of only a few feet would place sections under water. Quite a few of the Snow Lakes campsites would find themselves under water or greatly encroached upon by the lake water. It is imperative that recreationalists like myself impact the areas we visit in a manner which preserves the environment in as natural a state as possible. Changes to the lake water levels would force reroutes, planning of new camp sites, or could result in the loss of this recreation area entirely in order to protect it. 76-2

Please consider finding an alternative to your areas water concerns.

Regards,
Allison Kutz

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Comment Letter 077

From: Anastasia Christman <Anastasia.Christman.93336538@p2a.co>
Sent: Monday, July 23, 2018 9:48 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

77-1 I am deeply distressed to learn of the proposals to flood Eightmile, Upper Snow, and Lower Snow lakes as part of the Icicle Creek water strategy. Having just spent last week hiking on these very trails in the Enchantments, I believe it is critical to preserve these resources. Please remove the detrimental projects from the draft plan.

77-2 My concerns are two-fold. On the one hand, I believe that now more than ever it is important to save access to our natural lands for future generations. Climate change and the removal of other protections mean that future generations could grow up never experiencing the awe of a clear glacial lake, the beauty of delicate and improbable mountain wildflowers, or the power that comes with moving one's own body up a steep trail in clean crisp air. These lands are our patrimony, and they tell a critical story about our region and our landscape. Our children, and their children, deserve to have access to these lands.

77-3 On the other, outdoor recreation is a critical economic contributor and by flooding trails and campsites you are proposing to diminish that revenue stream. More than $21 billion is spent in our state annually on outdoor recreation, and the non-economic benefits of land conservation are estimated to be another $134 to $238 billion (see this: https://www.rco.wa.gov/documents/ORTF/OutdoorEconomicsFactSheet.pdf). It supports tens of thousands of jobs. Last week, we paid for a camp site at the EightMile Campground, which goes to the Forest Service, but which employs people for maintenance and operations. I bought food and supplies at a local grocery store. I purchased gas and ice from a local gas station. I bought sunscreen and other incidentals at a local pharmacy. I spent one night in a hotel in Leavenworth before leaving the area, and in conjunction with that my partner and I ate three meals in local restaurants. We paid to do a float down Icicle Creek. I estimate that we spent roughly $600 while in the area, and we had intended to make another trip in the Fall. Our visit contributed consumer dollars and tourist tax dollars, and supported jobs in retail, hospitality, food service, farming, logistics, construction, and outdoor maintenance. As of March, 2018, Chelan County still had an unemployment rate of 6%, significantly higher than the 4.8% of Washington State as a whole. It seems critical for you to protect the economic benefits of outdoor recreation using all means at your disposal.

Please reconsider these damaging parts of your plan, and protect the beauty and magnificence of the Enchantments for generations to come.

Regards,
Anastasia Christman

Comment Letter 078

From: barbaragamrath@everyactioncustom.com on behalf of Barbara Gamrath <barbaragamrath@everyactioncustom.com>
Sent: Sunday, July 22, 2018 6:58 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:
78-1 I oppose it.
Barbara Gamrath

Sincerely,
Ms Barbara Gamrath
15001 59th Pl NE Kenmore, WA 98028-4355 barbaragamrath@frontier.com

Comment Letter 079

From: Brian Telfer <brian.telfer@gmail.com>
Sent: Thursday, July 19, 2018 6:11 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on proposed Icicle Creek water strategy

Director Kaputa,

As a active recreational backcountry user, I wanted to express my opinion with the proposed Icicle Creek water strategy. I've visited every lake mentioned in this report, and I was just at Upper and Lower Klonaqua Lakes on Jun 6th of this year.

79-1 While I understand the need to improve water access for the area, I am opposed to the projects proposed at Eightmile, Snow, and Klonaqua lakes. I've traveled to wilderness areas all over the world, and what we have preserved in the Pacific North West, specifically the area around the Icicle Basin and the Alpine Wilderness, is unique in a way that is hard to quantify. Expanding the existing man made structures that these lakes, especially the proposed tunnel at Kolonaqua, would permanently change that.

Thank you for your time.

Brian Telfer
brian.telfer@gmail.com
1321 Seneca St #1103,
Seattle WA 98101
6198503281

Comment Letter 080

From: blvanderlinden@everyactioncustom.com on behalf of Brianne Vanderlinden <blvanderlinden@everyactioncustom.com>
Sent: Monday, July 23, 2018 11:46 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

80-1 I oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

80-2 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Ms. Brianne Vanderlinden
2410 NW 63rd St Apt 2 Seattle, WA 98107-2481 blvanderlinden@gmail.com

Comment Letter 081

From: brittany.granger@everyactioncustom.com on behalf of Brittany Granger <brittany.granger@everyactioncustom.com>
Sent: Sunday, July 22, 2018 11:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

81-1 Please consider the negative impacts that implementing this plan could have on the environment, plants, and animals surrounding the Enchantments.

Sincerely,
Ms. Brittany Granger
701 15th Ave E Seattle, WA 98112-4525
brittany.granger@icloud.com

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Comment Letter 082

From: thealls@everyactioncustom.com on behalf of William All <thealls@everyactioncustom.com>
Sent: Sunday, July 22, 2018 10:12 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

82-1 Please vote no on the proposed changes to dams and the creation of a tunnel to transfer water in the Enchantments. I have hiked and camped in this watershed and the preservation of this precious resource is critical to the enjoyment of future generations.

Sincerely,
Mr William All
1452 Woodland Dr Port Townsend, WA 98368-2590 thealls@hotmail.com

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Comment Letter 083

From: Carol A. Sund <carolasund@hotmail.com>
Sent: Sunday, July 22, 2018 12:04 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Strategy proposal

83-1 Please note, myself, along with other people are STRONGLY against the actions proposed.
Please do NOT proceed – it's very detrimental to our health, well-being, and our earth.
Thank you,
Carol A. Sund
Seattle, WA

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Comment Letter 084

From: graham_carolyn@everyactioncustom.com on behalf of Carolyn Graham <graham_carolyn@everyactioncustom.com>
Sent: Tuesday, July 24, 2018 7:14 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

84-1 The Alpine Lakes Wilderness, specifically the Enchantments, includes some of my most beloved areas for hiking, climbing, scrambling, and backcountry skiing. The wilderness designation protects the wildlife habitat that makes outdoor adventures so special for me and many many other people who recreate in the outdoors.

84-2 I oppose increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
I oppose increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
I oppose boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

New, enlarged dams and water diversions, which could flood nearby trails and campsites, are not appropriate actions in a protected wilderness area.

Sincerely,
Ms. Carolyn Graham
3045 127th Pl SE Bellevue, WA 98005-5141 graham_carolyn@hotmail.com

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Comment Letter 085

From: Administrator <cedarhyde44@gmail.com>
Sent: Saturday, July 21, 2018 8:31 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposals for Dams in Alpine Lakes Wilderness

Dear People in Charge of this Proposal,

85-1 I am distressed, appalled and deeply concerned about placing dams on several lakes in the designated wilderness and most especially in the Enchantment Lakes .

For the sake of this spectacular land, the enjoyment of the people hiking there, and the flora and fauna whose home this is, I beg you to not move forward on this plan!

85-2 Please consider other alternatives that are not in Designated Wilderness!

Thank you for considering my comments.

Sincerely,

Cedar Hyde
747 N 135thSt #715
Seattle, Wa. 98133

Comment Letter 086

From: cnchabot@everyactioncustom.com on behalf of Christian Chabot <cnchabot@everyactioncustom.com>
Sent: Monday, July 23, 2018 9:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

86-1 We oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

86-2 We support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Mr. Christian Chabot
2517 E Helen St Seattle, WA 98112-3617
cnchabot@gmail.com

Comment Letter 087

From: seajai_mermaid@everyactioncustom.com on behalf of CJ Beegle <seajai_mermaid@everyactioncustom.com>
Sent: Sunday, July 22, 2018 11:47 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

87-1 I ooppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts like my family:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

87-2 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. I believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Ms CJ Beegle
1246 NW 120th St Seattle, WA 98177-4637 seajai_mermaid@hotmail.com

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Comment Letter 088

From: conny.anderton@everyactioncustom.com on behalf of Constance Anderton <conny.anderton@everyactioncustom.com>
Sent: Sunday, July 22, 2018 8:44 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

88-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: The enchantments is a beautiful area that should not be ruined by more dams and more building. There has
88-2 to be an alternative over changing and possibly destroying a protected area. Do not alter the landscape in any way.

Sincerely,
Ms Constance Anderton
13522 SE 173rd Pl Renton, WA 98058-7024 conny.anderton@gmail.com

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Comment Letter 089

From: CRAIG MABIE <craigdoug15@msn.com>
Sent: Wednesday, July 18, 2018 8:35 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comment on proposed Icicle Strategy

Dear Mr. Kaputa:

89-1 I **oppose** the following projects included in the proposed Icicle Strategy:

- Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
- Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
- Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

Thank you,

Craig Mabie
Cle Elum, WA

Comment Letter 090

From: pedergraham@everyactioncustom.com on behalf of Danielle Graham <pedergraham@everyactioncustom.com>
Sent: Tuesday, July 24, 2018 8:03 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

90-1 I oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

90-2 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Ms. Danielle Graham
2181 NE Natalie Way Issaquah, WA 98029-3669 pedergraham@gmail.com

Comment Letter 091

From: David Panozzo <david.panozzo@gmail.com>
Sent: Thursday, July 19, 2018 11:01 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Strategy

Wanted to voice my concern regarding the proposed icicle strategy. A few of my concerns are below.

91-1

- **Flood the trail and some campsites around the Eightmile Lake**.
- **Raise the water levels at Upper and Lower Snow Lakes and flood the surrounding trail and campsites.**
- **Have significant negative impacts to Upper to Lower Klonaqua Lakes because of the proposed tunnel connecting the two.**

91-2 I am against this and hope enough negative feedback is presented to change your minds.

David Panozzo
xxx xxxx xxx Road
xxxxxxxxxx, IL 60565

(xxx) xxx-xxxx

Address and Telephone Number have been redacted to avoid being made public via FOIA requests. Thanks.

Comment Letter 092

From: David Van Cleve <dvancleve100@gmail.com>
Sent: Sunday, July 22, 2018 1:33 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] PEIS Comments
Attachments: Domestic Comment Letter.docx

Dear Sir

Attached are my comments for the Icicle Creek PEIS document.

David Van Cleve

Comment Letter 092

July 22, 2018

Mike Kaputa: Director,
Chelan County Natural Resource Department.
411 Washington Street., Suite 201,
Wenatchee, WA 98801

Dear Sir,

This letter contains comments regarding the Icicle Strategy Programmatic Environmental Impact Statement (PEIS). These comments concern the domestic supply portion of the plan.

The PEIS states that one of the goals of the Strategy is to improve domestic supply for the City of Leavenworth and Chelan County by supplying 1,750 acre-feet of reliable year-round supply with 2.5 to 5 cubic feed per second (cfs) for peaking. To accomplish this goal the plan intends to utilize the projects of an Instream Flow Rule Amendment and the Eightmile Lake Storage Restoration.

The first four comments in this letter are based on my review of the City of Leavenworth's 2018 Water System Plan in conjunction with the PEIS. I am a Professional Civil Engineer with 22 years experience in developing water system plans for cities in Central and Eastern Washington.

92-1 Comment 1: A new project should be added to the PEIS, which is to replace the existing City's diversion and water treatment plant with a ground water well located in the City. This project would add 1.5 CFS of flow to the lower 5.7 miles of Icicle Creek. This project would be similar to the pump exchange projects for the irrigation districts. Based on the 2018 water system plan this project is feasible as follows:

- The City's existing three wells can supply the ultimate build out demands (existing well capacity 3,250 gallons per minute (gpm) is greater than ultimate build out maximum day demands of 2,860 gpm).
- The existing wells are in the sands and gravels next to the Wenatchee River and existing water rights should be able to be transferred downstream to the existing wells.
- To meet reliability requirements (meet maximum day demands with the largest source out of service), the City would need to drill a new well of approximately 1,000 gpm. The new well can also be added as an additional point of withdrawal for the existing wells water rights.
- A typical cost of a new municipal well of this size is in the range of $1.5 to 3 million dollars.
- The Water System Plan indicated that the City is going to complete an engineering study of the water treatment plant because the water treatment plant requires many improvements. Twenty year total costs for a new well is typically less expensive than operating a Water Treatment Plant for twenty years. The City should include the well alternative in the engineering report for the water treatment plant.
- A new well will not require the improvement to the City's fish screen.

92-1 This improvement will not require raising the Eightmile Lake water level and the associated negative environmental impacts on the Alpine Lake Wilderness.

92-2 Comment 2: The PEIS states that the City is considering reclaimed water to meet its demands. The Water System Plan specifically states that the City is not going to utilize reclaimed water. These statements are contradictory; remove the reclaimed water statement from the PEIS.

92-3 Comment 3: The City of Leavenworth's future water use projections are very aggressive. The City's Water System Plan states that population will grow by 0.47% per year while its water use will grow by 2.2% per year. This projected water use growth, in turn, will cause a higher demand on water from Icicle Creek.

The projected growth in water use is not supported by the historic growth of water demands in the City of Leavenworth. Since 1990, water demands have varied from 850 to 1,165 acre-feet per year without a positive upward trend in water demand. At the same time, the City's population has increased from 1,692 to 1,990. Essentially, for 27 years water use has not grown while population has been increasing. Now the City of Leavenworth's projections state that water use will start to grow at a fast pace. Historical data does not support this projection.

If water-use growth is estimated at 1% per year (rather than the 2.2% shown in the City's Water Plan) then it will take until 2056 to exceed the temporary water right limitation of 1,465 acre-feet as imposed by the court ruling of Leavenworth vs. Ecology (Figure B page 45 Water System Plan).

The City will not need as much additional water as shown per the City's Water System Plan by 2050 and the guideline of 1,750 acre-feet of additional domestic supply should, in-turn, be revised lower. Also the associated project that is required to reach this goal should not be funded. Because of this, the Eightmile Lake Storage Restoration should not be funded.

92-4 Comment 4: The City's water conservation plan in the Water System Plan does not promote conservation aggressively as determined by the following factors:

- The City is only allocating $1,000 per year for water conservation.
- The City's unaccounted water (lost water) is 24%.
- The City's water conservation plan does not included leak detection to determine where the unaccounted for water is going.

Comment Letter 092

92-4

- Approximately 70% of all water used is during the summer months, most likely for irrigation. The City decided not to impose a conservation-based water rate due to the possible financial hardships imposed on its customers. I understand that this is politically difficult to do. However, the City could gradually impose a conservation-based rate over many years to minimize the shock of a sudden rate increase.
- I have written many water conservation plans for cities in Central and Eastern Washington and this conservation plan is designed to meet only the minimum Department of Health guidelines.

With a more aggressive conservation program, the City will not need as much additional water by 2050. The guideline of 1,750 acre-feet of additional domestic supply should be revised to a lower number and the associated project that is required to reach this goal should not be funded. Specifically the Eightmile Lake Storage Restoration should not be funded.

92-5

Comment 5: The PEIS is allocating 74 acre-feet of domestic water for the growth of 199 additional households in the watershed in Chelan County. The main reason for the PEIS is that the Icicle Creek basin is over allocated and Icicle Creek does not have sufficient water flows. Since the Icicle Creek basin is over allocated, the basin should be closed for new growth. If new growth is to occur, new household(s) should buy existing water rights. This is similar to what is currently being done in Kittitas and Yakima counties. Growth should pay for growth. Also, growth should occur in cities and towns according to the Growth Management Act. The guidelines in the PEIS for water usage in Chelan County should be changed to reflect this.

Sincerely Yours

David Van Cleve P.E.
Dvancleve100@gmail.com

Comment Letter 093

From: dlgill1@everyactioncustom.com on behalf of Deanna Gill <dlgill1@everyactioncustom.com>
Sent: Sunday, July 22, 2018 9:13 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

93-1

Please do not let this pass. We need to preserve our lands for future generations. Once the damage is done it can never be repaired. Too many people are enjoying this area.

Sincerely,
Ms Deanna Gill
6012 48th St NE Marysville, WA 98270-7525 dlgill1@yahoo.com

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Comment Letter 094

From: deloaparrish@everyactioncustom.com on behalf of Deloa Dalby <deloaparrish@everyactioncustom.com>
Sent: Monday, July 23, 2018 9:01 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

94-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: I oppose this plan and it's wilderness impacts.

Sincerely,
Ms Deloa Dalby
19915 330th Ave NE Duvall, WA 98019-9751 deloaparrish@hotmail.com

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Comment Letter 095

From: Elizabeth Vu <Elizabeth.Vu.123966733@p2a.co>
Sent: Friday, July 20, 2018 7:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

I would like to submit my concerns about the proposed Icicle Creek water strategy. I understand that there are many factors and voices in this conversation, and I am a regular citizen who would like to speak on behalf of hikers and hopeful hikers to the area. We must protect our natural resources so they may last many generations into the future.

95-1 I understand according to the WTA, the proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them. Chelan County and Ecology
95-2 should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Elizabeth Vu

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Comment Letter 096

From: ghoule636@everyactioncustom.com on behalf of Gabriel Houle <ghoule636@everyactioncustom.com>
Sent: Monday, July 23, 2018 10:49 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

96-1 Please don't proceed with these plans! I love the icicle creek area as it is. I have many fond memories backpacking and climbing from this area that I hope I can share with my children and their children someday. This environment is only special when it is a wilderness area as it is right now.

Sincerely,
Mr. Gabriel Houle
3555 Market Pl W Apt 207 Tacoma, WA 98466-4480 ghoule636@gmail.com

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Comment Letter 097

From: Greg Wellman <Greg.Wellman.124164985@p2a.co>
Sent: Tuesday, July 24, 2018 4:42 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

97-1 The Alpine Lakes are a Wilderness area. There's no point in having wilderness areas if as soon as non-wilderness areas need water we go and flood the wilderness. I get that there are important uses for that water. I certainly want the fish hatchery to have enough and the farmers in the area to get as much as they have historically. It seems to me the problem is the growth of Leavenworth. If there's not enough water, then Leavenworth needs to stop growing. We need to preserve the wilderness more than we need Bavarian-themed restaurants.

97-2 Chelan County and Ecology should revise and re-release the PEIS to remove the projects at Eightmile Lake, Upper and Lower Snow Lakes, and Upper and Lower Klonaqua Lakes. The new PEIS should provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this beloved alpine valley.

Regards,
Greg Wellman

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Comment Letter 098

From: hhalpern1@everyactioncustom.com on behalf of Harvey Halpern <hhalpern1@everyactioncustom.com>
Sent: Sunday, July 22, 2018 7:51 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

98-1 You should be leaving Wilderness alone, that's why it's designated Wilderness. Don't increase the size of the dam at 8 Mile lake, or Upper an d Lower Snow lakes. Certainly do NOT bore a tunnel from Upper to Lower KLONAQUA LAKE!

Sincerely,
Mr. Harvey Halpern
73 Tremont St Cambridge, MA 02139-1345
hhalpern1@gmail.com

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Comment Letter 099

From: janeyerickson@everyactioncustom.com on behalf of Jane Erickson <janeyerickson@everyactioncustom.com>
Sent: Sunday, July 22, 2018 10:40 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

99-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:Leave the Enchantments enchanting.b

Sincerely,
Ms Jane Erickson
241 Dungeness Mdws Sequim, WA 98382-7715 janeyerickson@yahoo.com

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Comment Letter 100

From: Jeanne Poirier <jeannepoirier@yahoo.com>
Sent: Friday, July 20, 2018 11:03 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Water EIS comment

100-1 Water is one of the most important resources in our world.
Areas of such beauty as the Alpine Lakes and Icicle Creek Watershed are valuable.
We need to learn to live with less water in the future.
I seriously question the value of impacting such sensitive areas for irrigation.
While you have worked long on this, please try alternatives.

Comment Letter 101

From: jeffwhittall@everyactioncustom.com on behalf of Jeffrey Whittall <jeffwhittall@everyactioncustom.com>
Sent: Sunday, July 22, 2018 9:33 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

101-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: The Enchantments area is one of the most stunning landscapes in our country. I would encourage you to hike from the Snow Lake Trailhead to the Stuart Lake Trailhead to see for yourself. If you allow this proposal to go thru without seeing the area for yourself, you cannot in good conscience appreciate the impact it would have.

Sincerely,
Dr. Jeffrey Whittall
1166 Hyak Pl Fox Island, WA 98333-9648
jeffwhittall@gmail.com

Comment Letter 102

From: julietlina7@everyactioncustom.com on behalf of Juliet Maurer <julietlina7@everyactioncustom.com>
Sent: Sunday, July 22, 2018 10:17 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

I am writing to you in deep concern over the terms of the Icicle Strategy being proposed within the boundaries of the Enchantments wilderness zone.

102-1 The Enchantments are one of the most serene, magical, and still accessible areas of pure wilderness in Washington State. They are already under tight management as protected wilderness with limited visitors during the busy season. Entering the lottery for a pass is a huge part of my year, every year. The Enchantments changed my life as my first ever backpacking trip after years of bed rest after a back injury. A huge part of my heart lives there, and I know that MANY other people feel the same way.

102-2 I am concerned that the dam enlargement being proposed will flood trails in this area, destroying back country access and natural habitat for protected wildlife. I urge you to consider other natural resource options that will not be of hazard to the symbiotic eco system that includes us humans that are passionate about outdoor access.

102-3 Please, please do not allow this bill to be passed. It will forever change the landscape and the access to this magical realm within our state. The Enchantments are literally our alps, lets please not throw that away.

Sincerely,
Ms Juliet Maurer
2548 Gravelly Beach Loop NW Olympia, WA 98502-8825 julietlina7@gmail.com

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Comment Letter 103

From: Karen P. Thomas <karen.p.thomas@gmail.com>
Sent: Thursday, July 19, 2018 11:02 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Strategy

Regarding the proposed Icicle Strategy:

103-1 As a user of the Icicle Creek area and Stuart range hiking, I oppose the following projects included in the proposed strategy:

- Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
- Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
- Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

103-2 I do support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies.

Thank you,

Karen Thomas
Seattle, WA 98117

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Comment Letter 104

From: KR Nerenberg <gardenrow@gmail.com>
Sent: Saturday, July 21, 2018 5:50 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Strategy

Mr Kaputa

104-1 We are writing to register our opposition to the proposed Icicle Strategy. As frequent hikers in the Alpine Lakes area, we are opposed to any action under any of the Alternatives that would have negative impact on existing trails and campsites, or would allow any new facility construction, or modification to existing water systems within the Wilderness area.

Thank you

Kathleen and Robert Nerenberg

2032 179th CT NE, Redmond, WA 98052

425 747 0627

gardenrow@gmail.com

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Comment Letter 105

From: Katrina Kok <Katrina.Kok.124034222@p2a.co>
Sent: Saturday, July 21, 2018 3:16 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

I am writing to you to regarding the proposed Icicle Strategy in the alpine lakes wilderness of the Enchantments. Please remove the detrimental projects from the draft plan.

105-1 The proposed projects will alter this iconic landscape in a way that cannot be repaired. People from all over the world travel to see, experience and photograph this landscape and bring tourist business to the state. Taking away the trails and camp sites will severely restrict access to what should be protected wilderness.

The proposal should be revised to alternate solutions that preserve trails, campsites and accessibility to this popular and iconic area for all to enjoy.

Regards,
Katrina Kok

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Comment Letter 106

From: kstegner@everyactioncustom.com on behalf of Kendra Stegner <kstegner@everyactioncustom.com>
Sent: Sunday, July 22, 2018 7:00 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

I oppose the following projects included in the proposed strategy:

106-1 1. Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.

2. Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.

3. Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

106-2 However, I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening, and water conservation efficiencies. I wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Mrs. Kendra Stegner
6860 Holly Park Dr S Seattle, WA 98118-3501 kstegner@comcast.net

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Comment Letter 107

From: kimberly.stachowski@everyactioncustom.com on behalf of Kimberly Stachowski <kimberly.stachowski@everyactioncustom.com>
Sent: Tuesday, July 24, 2018 4:27 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.

107-1 Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.

Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

Sincerely,
Ms. Kimberly Stachowski
408 19th Ave SE Puyallup, WA 98372-4526 kimberly.stachowski@outlook.com

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Comment Letter 108

From: laneaasen@everyactioncustom.com on behalf of Lane Aasen <laneaasen@everyactioncustom.com>
Sent: Monday, July 23, 2018 10:11 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

108-1 The dam on Upper Snow Lake already feels out of place in an otherwise pristine area of the Cascades. When the water level is low, it is a scar on the landscape easily visible from Lake Viviane in the Enchantments. Please do not enlarge the Upper Snow Lake dam or any other dams in the vicinity. This is one of the most majestic areas of the Cascades, and its relative accessibility makes it an excellent place for people to bond with nature. Preserving its wild character is vital.

Sincerely,
Mr. Lane Aasen
1715 32nd Ave Seattle, WA 98122-3319
laneaasen@gmail.com

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Comment Letter 109

From: lshauger@everyactioncustom.com on behalf of Laura Shauger <lshauger@everyactioncustom.com>
Sent: Tuesday, July 24, 2018 9:35 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

109-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy. Wilderness areas are precious places that the harried citizens of the overpopulated Puget Sound region need as a place to clear their minds. Building more dams and/or enlarging existing dams is unacceptable. Haven't we already altered the environment enough as a species?

I wholeheartedly support protections that encourage healthy environments for fish. However, I do not think that we should pursue several proposed projects in this water management proposal.

Sincerely,
Ms. Laura Shauger
617 Thomas St NW Olympia, WA 98502-4783 lshauger@gmail.com

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Comment Letter 110

From: folkie1@everyactioncustom.com on behalf of Lawrence Lewin <folkie1@everyactioncustom.com>
Sent: Sunday, July 22, 2018 12:22 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

110-1 I oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:

1. Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.

2. Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.

3. Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

110-2 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Dr. Lawrence Lewin
11545 16th Ave NE Seattle, WA 98125-5101 folkie1@earthlink.net

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Comment Letter 111

From: leannarend@everyactioncustom.com on behalf of Leann Arend <leannarend@everyactioncustom.com>
Sent: Sunday, July 22, 2018 8:48 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

111-1 I oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

111-2 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
ms Leann Arend
3828 Interlake Ave N # A Seattle, WA 98103-8130 leannarend@gmail.com

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Comment Letter 112

From: ldsuhr@everyactioncustom.com on behalf of Louise Suhr <ldsuhr@everyactioncustom.com>
Sent: Sunday, July 22, 2018 9:16 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

112-1 Please do not approve this proposal. It's effects on the surrounding wilderness are too detrimental for the small benefits that it would bring.
Thank you, Louise Suhr

Sincerely,
Ms. Louise Suhr
4033 47th Ave SW Seattle, WA 98116-3731 ldsuhr@gmail.com

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Comment Letter 113

From: rentonrph@everyactioncustom.com on behalf of Mary Eve <rentonrph@everyactioncustom.com>
Sent: Sunday, July 22, 2018 4:50 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

113-1 Due to longer summers, dryer years and the expanding population I think we need to start using water conservation techniques in agricultural irrigation. Moving more water out of the mountains and forest leads to more wildfires, erosion and a dryer mountain climate with less spring snow available for irrigation. The US policy of building more dams for agriculture is not working. The Southwest now has many irrigation projects where storage capacity greatly exceeds recharge ability leading to low water pool levels, dry rivers and sinking ground.

Sincerely,
Ms. Mary Eve
15621 SE 178th St Renton, WA 98058-9003 rentonrph@hotmail.com

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Comment Letter 114

From: mlbusch@everyactioncustom.com on behalf of Matthew Busch <mlbusch@everyactioncustom.com>
Sent: Monday, July 23, 2018 8:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: Please see the following reasons why building damns in the enchantment areas would be so devastating for myself, the students I work with and the general population.

114-1 Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

It makes me sick to think about losing what little recreational space we have in Washington,

Matt

Sincerely,
Dr. Matthew Busch
18115 Campus Way NE Bothell, WA 98011-8246 mlbusch@uw.edu

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Comment Letter 115

From: Mattias Huhta <Mattias.Huhta.124022928@p2a.co>
Sent: Saturday, July 21, 2018 8:34 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

115-1 Please reject the Icicle Creek Strategy. Tired of politicians and corporations putting their noses in. Leave the untouched untouched. The land is more important than the idiots that live near it. You are not doing the greater good.

Regards,
Mattias Huhta

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Comment Letter 116

From: Michael Schemmel <Michael.Schemmel.94096930@p2a.co>
Sent: Saturday, July 21, 2018 7:47 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

Hi Sir-

116-1 I have issues with your office's proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is a special place for my family and I where we hike and camp annually. I'd hate to see it changed for the worse and to see trail access lost and camping access decreased for all of us now and for those who have not had a chance to visit yet. Please think about the detrimental projects from this plan.

116-2 I would like Chelan County and Ecology to revise and re-release the PEIS to remove any projects, like the boring between Klonaqua lakes and increasing dam size on Snow Lakes and Eightmile, and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Thank you for your time and consideration!

Regards,
Michael Schemmel

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Comment Letter 117

From: Carol or Mike Wyant <cmwyant@charter.net>
Sent: Thursday, July 19, 2018 5:11 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Public Comment Regarding Icicle Strategy Draft PEIS

Comment submitted by:

Michael Wyant
12125 Emig Drive, Leavenworth, WA 98836
(509) 548-7747
cmwyant@charter.net

117-1 I support Alternative 1 from the Icicle Strategy PEIS draft document. My second choice is to support Alternative 2. I am
117-2 adamantly opposed to Alternative 4 because it appears to suggest violating the Wilderness Act by adding new
117-3 infrastructure to the existing wilderness dams. I believe Alternative 4 would result in prompt and vigorous legal challenge, a measure that I would fully support.

117-4 In addition to supporting Alternative 1, I would like to see effort put into changing the diversion point for some or all of
117-5 the Icicle/Peshastin Irrigation water. Additionally I support a vigorous effort to implement conservation measures for the irrigation diversions, particularly in the form of canal lining or piping.

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Comment Letter 118

From: m.obermeyer@everyactioncustom.com on behalf of Michelle Privat Obermeyer <m.obermeyer@everyactioncustom.com>
Sent: Sunday, July 22, 2018 8:02 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle
118-1 Strategy: I am in alignment with WTA and the mountaineers in their concerns about aspects of the icicle plan. Please consider the strong economic voice of the outdoor industry and impacts on recreational locations in the alpine wilderness and remove related portions of the plan.

Sincerely,
Ms. Michelle Privat Obermeyer
12815 NE 4th Pl Bellevue, WA 98005-3310 m.obermeyer@hotmail.com

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Comment Letter 119

From: mitakuoyasinn@everyactioncustom.com on behalf of mike Gundlach <mitakuoyasinn@everyactioncustom.com>
Sent: Sunday, July 22, 2018 9:01 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

I oppose the following projects in the proposed strategy, as they would negatively impact the environment, the eco-system and landscapes valued by outdoor enthusiasts.

119-1 1) Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.

2) Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.

3) Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

119-2 It's very likely the above actions will impact trails and campsites and more importantly they would also have a negative impact on the environment and eco-system. Over decades of history we have hundreds of examples of damage that dams cause to the environment and surrounding eco-system. The damage that has already been done in this area will be increased by the proposed project. The fundamental problem we need to address is finding ways to live within the limits of what the environment provides for us already instead of trying to manipulate it and take more from it and in the process continue to damage the environment that we need to support all life. Simply building bigger dams is only a stop-gap measure for people's insatiable desire for taking more than the surrounding land can provide.

119-3 There are a plethora of other options to address the need for additional water. First and foremost is conservation. While some water conservation measures are in place, this is only the tip of the iceberg. Secondly, the Pacific NW receives high
119-4 levels of precipitation. Although the Eastern area of the state doesn't receive as much as the West, it does receive plenty to have water collection on roofs and open areas that would not cause additional impact to these beautiful mountain areas.

119-5 I do support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. I wholeheartedly believe that these conservation elements are critical to protecting these landscapes.

Sincerely,
Mr. mike Gundlach
122 Upper Lakeview Rd White Salmon, WA 98672-8103 mitakuoyasinn@gmail.com

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Comment Letter 120

From: misaheat@everyactioncustom.com on behalf of Misa Heater <misaheat@everyactioncustom.com>
Sent: Tuesday, July 24, 2018 9:09 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

120-1 As a hiker and climber, I would be very disappointed if the campsites and trails along Eight Mile and Snow lakes were rendered unusable. It would also be a great tragedy if Snow Creek Wall or Pearly Gates (rock climbing areas) were rendered inaccessible by your proposed water management strategy. Please do not ruin our recreation environment! Thank you.

Sincerely,
Mrs. Misa Heater
816 NE 53rd St Seattle, WA 98105-3607
misaheat@gmail.com

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Comment Letter 121

From: psandjt@everyactioncustom.com on behalf of Pat Siggs <psandjt@everyactioncustom.com>
Sent: Monday, July 23, 2018 1:27 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

121-1 The Enchantments are a famous and world renowned part of the Alpine Lakes Wilderness. It s very important to keep this area free of construction and alteration projects. This is the people's wilderness, I oppose raising three dams and boring a tunnel in our wilderness.

121-2 There are adequate water resources in the Cascade Mountains and Chelan County that are not part of a wilderness area. Please consider other water sources.

Sincerely,
Ms Pat Siggs
233 14th Ave E Apt 403 Seattle, WA 98112-5259 psandjt@comcast.net

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Comment Letter 122

From: podenski@everyactioncustom.com on behalf of Patrick Podenski <podenski@everyactioncustom.com>
Sent: Sunday, July 22, 2018 6:17 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

122-1 Let's keep the Enchantments Wilderness wild. Do not pursue non-wilderness compliant construction projects in the Enchantments.

Sincerely,
Mr. Patrick Podenski
3802 NE 91st St Seattle, WA 98115-3747
podenski@me.com

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Comment Letter 123

From: peterd@everyactioncustom.com on behalf of Peter Dunau <peterd@everyactioncustom.com>
Sent: Friday, July 20, 2018 5:05 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

123-1 I am opposed to any action that would raise the level of lakes in the Enchantments. Changing the water level would hurt
123-2 recreation, and it's not compatible with management practices in a Wilderness area.

Sincerely,
Mr. Peter Dunau
3606 Woodland Park Ave N Seattle, WA 98103-7948 peterd@mountaineers.org

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Comment Letter 124

From: Peter Polson <peter@polsons.com>
Sent: Monday, July 23, 2018 7:07 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Water Project

124-1 The Alpine Lakes is a wilderness area we love, we enjoy with our family, and we look forward to sharing for future
124-2 generations. Please do not proceed with the project to increase the size of the dams on Eightmile Lake and both Snow
124-3 Lakes, as well as the tunnel project. This land is too unique to tamper with. I appreciate the water needs of the county, but conservation combined with other sources are a better answer.

Peter Polson
206.669.0130
PO Box 727, Winthrop, WA 98862

Comment Letter 125

From: pevans@everyactioncustom.com on behalf of Philip Evans <pevans@everyactioncustom.com>
Sent: Sunday, July 22, 2018 8:04 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

125-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: The proposed plan includes alterations in water levels of lakes that are very important to me and thousand of other hikers and backpackers who love this area. These higher water levels will affect trails and campsites as well as further worsen the already unsightly bathtub rings when water is drawn off. Please reconsider this aspect of the proposal as it is potentially devastating to recreation in this wilderness area, and also to the income hikers and backpackers bring to the Leavenworth area.

Sincerely,
Mr. Philip Evans
100 Ski Blick Strasse # D-203 Leavenworth, WA 98826 pevans@nwi.net

Comment Letter 126

From: sprithvi@everyactioncustom.com on behalf of Prithvi Shylendra <sprithvi@everyactioncustom.com>
Sent: Monday, July 23, 2018 1:04 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

126-1 I am with the outdoor enthusiasts and community in their opposition to certain sub projects under the broader proposal, like,

1. Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
2. Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
3. Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

126-2 I am with them in supporting the following sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Mr. Prithvi Shylendra
ALKI Ave SW Seattle, WA 98116
sprithvi@hotmail.com

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Comment Letter 127

From: razw14@everyactioncustom.com on behalf of Rebecca Walton <razw14@everyactioncustom.com>
Sent: Sunday, July 22, 2018 1:05 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

127-1 Increasing dam sizes for the Eightmile Lake, and Upper and Lower Snow Lakes dams will flood acres of land important for its recreational and ecological value. Please do not increase the sizes of these dams.

127-2 Tunnel boring and other practices similar to mining have proven negative effects on water quality and ecosystem health. Please do not bore a tunnel from the Upper to Lower Klonaqua Lakes.

127-3 Continue to support wildlife protection through habitat enhancement and protection, including fish passage opportunities. Conservation of our remaining wild places is important in an era where ecosystems are already stressed by climate changes. Preserving the natural systems of adaptation and maintaining large areas of uninterrupted habitat are critical for the survival of many species as weather and climate affect their habitats and lives.

Sincerely,
Ms. Rebecca Walton
15849 34th Ave NE Lake Forest Park, WA 98155-6542 razw14@hotmail.com

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From: Rebeccah <leiterbec@gmail.com>
Sent: Thursday, July 19, 2018 10:45 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Wilderness Areas | Washington State Parks and Recreation Commission

128-1 The time is past to alter the preservation of designated wildernesses!

128-2 Conservation of water usage starting with the individual, moving into home water conservation, moving up to commercial conservation is the key to wise water abundance for all of our state, for all of our country, for all of the World that is all of Our's!

Take a hike, take a cool drink from the streams, take in the fresh air, take a moment in a wilderness that you may believe you are the first to have discovered it, then leave, leaving no trace behind for the next explorer.

128-3 You have the power to do the most wonderful act of upholding the designation already given this area, this WILDERNESS!

https://parks.state.wa.us/144/Wilderness-Areas

Wilderness Areas

To protect untouched areas of our wild lands, Congress passed the Wilderness Act, creating designated Wilderness Areas within national forests, national parks, and certain other federal lands. Motorized equipment is prohibited in these areas.

Established by Congress through the Wilderness Act of 1964, "Wilderness" is a special land designation within USDA National Forests and certain other federal lands. These areas were designated so that an untouched area of our wild lands could be maintained in a natural state. Also, they were set aside as places where people could get away from the sights and sounds of modern civilization and where elements of our cultural history could be preserved.

Snowmobiles

Wilderness, as defined by the act, "has outstanding opportunities for solitude or a primitive and unconfined type of recreation." The law prohibits the use of mechanized or motorized

Comment Letter 128

equipment, including snowmobiles, in Wilderness Areas (36CFR261.16a). Local managers have no latitude in this matter, except in emergencies. The law states that possession or use of motorized equipment in Wilderness Areas is punishable by up to $500 and/or six months in jail (36CFR261.1b). Unfortunately, each year more and more people are riding snowmobiles into designated Wilderness Areas, which is a major concern for land managers, the public, and many snowmobile groups. This may be for a variety of reasons; many snowmobile riders may not know where the Wilderness boundaries are or may not realize that an area is closed.

Invasive plants

Invasive plants, including noxious weeds, are a serious threat to natural areas. They out-compete native plants, degrade wildlife habitat, and reduce soil and water quality. They also cause economic losses in natural areas by reducing aesthetics and recreational opportunities. While these weeds can be extremely difficult to remove once they've established anywhere - cropland, rangeland, yards, abandoned lots - they are especially hard to detect and then eradicate in Wilderness Areas. The Forest Service passed an order [36 CFR 261.58(t)] to help prevent the introduction of new weed seeds into designated Wilderness Areas. Effective January 1, 2007, forage transported into all Wilderness Areas and adjacent trailheads in a national forest is required to be commercially processed feed pellets or certified weed-free hay or straw. Recreational stock users, dog-sledders, cross-country skiers, and road contractors must be aware of the requirements and of Wilderness boundaries. For additional information, visit the Washington State Noxious Weed Control Board website.

Join us in safeguarding winter recreation

Respecting Wilderness boundaries helps everyone. When recreationists take responsibility, they help ensure continued support of winter recreation programs and opportunities, rather than potential closures and stronger enforcement. Here is how you can help:

- Familiarize yourself with National Forest Service and Wilderness boundaries.
- When snowmobiling, obtain a map and don't cross Wilderness boundaries.
- Know the laws and requirements related to your recreational activity.
- Do not trespass on privately owned property or gated areas.

Comment Letter 128

- Pack it in - pack it out. Keep our forests clean!
- Carry these messages to clubs, groups and friends.

Wilderness boundaries

Maps showing Wilderness Areas are posted on bulletin boards at trailheads in all snowmobile Sno-Parks.

For information on how to volunteer to put up / maintain Wilderness Area boundary markers, call your local U.S. Forest Service Ranger District.

This information is made available through the USDA Forest Service, Washington State Parks and Recreation Commission, and the Washington State Snowmobile Association.

Contact information

For more information about snowmobiling opportunities or Wilderness Areas, please contact:

- Colville National Forest: (509) 684-7000
- Gifford Pinchot National Forest: (360) 891-5000
- Mount Baker-Snoqualmie National Forest: (425) 783-6000
- Mount Rainier National Park: (877) 270-7155
- North Cascades National Park: (360) 854-7245
- Okanogan-Wenatchee National Forest: (509) 664-9200
- Olympic National Forest: (360) 956-2402
- Umatilla National Forest: (541) 278-3716
- Washington State Parks and Recreation Commission: (360) 902-8500
- Washington State Snowmobile Association: (800) 784-9772

Sent from my iPad

Comment Letter 129

From: Robert Werth <robwerth@gmail.com>
Sent: Saturday, July 14, 2018 9:28 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] DPEIS Icicle Creek Watershed

Please accept my comment on this matter, as follows:

129-1 I am deeply concerned that the subject DPEIS will allow construction of dams and other man made structures in the Alpine Lakes WIlderness and the Enchantments. Please reject all such intrusions into these areas, which should instead be preserved as they are for the future.

Thanks you,

Robert Werth
PO Box 3073
Leavenworth, WA 98826

Comment Letter 130

From: rby2@everyactioncustom.com on behalf of Robert Yates <rby2@everyactioncustom.com>
Sent: Sunday, July 22, 2018 11:07 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

130-1 As a frequent patron of the amazing wilderness that WA state has to offer, I would be incredibly disappointed if the plan to change the current water management is implemented. This plan will have devastating effects on the wilderness that we all enjoy. Earlier this summer, I was in the Enchantments and covered the entire region from Snow Lakes trailhead to Colchuk lake in one day -- it is an amazing region, and it should not be negatively impacted by this water management plan.

Sincerely,
Dr. Robert Yates
8519 14th Ave NW Seattle, WA 98117-3431 rby2@uw.edu

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Comment Letter 131

From: rderegt@everyactioncustom.com on behalf of Roberta de Regt <rderegt@everyactioncustom.com>
Sent: Sunday, July 22, 2018 8:12 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:
I support The Mountaineers and Washington Trails Association concerns about the proposed Icicle Strategy water plans.
131-1 Enlargement of the dams would have far reaching effects on a pristine wilderness that needs to remain protected. The proposals sound extremely expensive in terms of the concrete changes but my concern is that the effect will be priceless
131-2 upon lands that can never be brought back to Wilderness state. I strongly oppose this Strategy.

Sincerely,
Dr. Roberta de Regt
10930 250th Ave NE Redmond, WA 98053-6236 rderegt@eastsidemfm.com

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Comment Letter 132

From: robinb411@everyactioncustom.com on behalf of Robin Buxton <robinb411@everyactioncustom.com>
Sent: Monday, July 23, 2018 8:10 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

132-1 I whole-heartedly concur with the statement that designated Wilderness is a core tool in protecting pristine natural habitat and the outdoor experience. What this means is "hands-off" in terms of development, habitat disruption, or changes in the natural order of these areas, as well as "hands-off" in terms of any mechanized or motorized access to these areas.

132-2 Instead, to enhance water levels for fish passage, and provide needed water for agriculture and homes in the Leavenworth area, concerted conservation that protects habitat and emphasizes water conservation efficiencies should be employed. These conservation should be foundational in protecting the outdoor experience.

132-3 II am adamantly opposed to any action that would negatively impact the Alpine Lakes wilderness area.

Sincerely,
Ms. Robin Buxton
19825 SE 296th St Kent, WA 98042-5912
robinb411@comcast.net

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Comment Letter 133

From: hardenrr@everyactioncustom.com on behalf of Ronald Harden <hardenrr@everyactioncustom.com>
Sent: Sunday, July 22, 2018 4:02 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

133-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Basin Strategy: The water management plan proposed, for the Enchantments in Washington state, is inappropriate. It would mean the extreme loss of the natural values of the area, It is is not way a compromise, it would just be a compromising away of the values that should be preserved. Its only valid measures are those that provide for habitat conservation a restoration. I urge the plan's make over, or barring that, its rejection.

Sincerely,
Dr. Ronald Harden
3125 Elevado Ct Loveland, CO 80538-9482 hardenrr@msn.com

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Comment Letter 134

From: sciske@everyactioncustom.com on behalf of Sandra Ciske <sciske@everyactioncustom.com>
Sent: Sunday, July 22, 2018 3:51 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy.

134-1 I am opposed to the following elements of the draft:
- Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
- Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
- Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

134-2 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening, and water conservation efficiencies. In my opinion and many other, these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Ms Sandra Ciske
1717 Sunset Ave SW Seattle, WA 98116-1943 sciske@drizzle.com

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Comment Letter 135

From: sara.papanikolaou@everyactioncustom.com on behalf of Sara Papanikolaou <sara.papanikolaou@everyactioncustom.com>
Sent: Saturday, July 21, 2018 9:38 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

135-1 As someone who has enjoyed the Enchantments and Icicle River valley for over 3 decades, and now bring my children to enjoy them as well, I find it deeply troubling that such disregard is being taken in considering these projects in such a fragile area. I strongly urge you to maintain the existing dams and not bore a hole between the Klonaqua Lakes. This is protected lands, and these actions are wholly inappropriate. The essence of wildnerness will be lost in these locations if
135-2 the construction projects are undertaken, and there is no getting it back. Please, for future generations, keep these wild places wild, and look to resources elsewhere to fill gaps.

Sincerely,
Mrs Sara Papanikolaou
23024 57th Ave SE Woodinville, WA 98072-8640 sara.papanikolaou@gmail.com

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Comment Letter 136

From: sarahleyrer@everyactioncustom.com on behalf of Sarah Leyrer <sarahleyrer@everyactioncustom.com>
Sent: Sunday, July 22, 2018 9:58 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle
136-1 Strategy: protecting our most unique and precious wilderness areas must be a priority. Do not adopt a strategy that will harm the Enchantments, Washington's most prized gem in the Cascades.

Sincerely,
Ms. Sarah Leyrer
2216 13th Ave S Seattle, WA 98144-4119
sarahleyrer@gmail.com

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Comment Letter 137

From: Stefanie Dirks <Stefanie.Dirks.96391093@p2a.co>
Sent: Sunday, July 22, 2018 10:56 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

137-1 I am writing to you regarding the proposed Icicle Creek water strategy, which proposes to flood the trail and campsites around Eightmile Lake and Upper/ Lower Snow Lakes and to bore a tunnel between Upper and Lower Klonaqua Lakes. This seems to be a hastily composed plan that would have lasting effects on a The Alpine Lakes Wilderness area. There must be a better solution that achieves the same intent but that does not involve marring such a pristine, undeveloped natural region. These areas are frequently used by backpackers, through hikers, climbers, and skiers, people who pay for
137-2 recreation permits. It's reasonable to assume this revenue stream could be negatively affected by the proposed projects.
137-3 Once these wilderness areas are opened for development of any kind, they are permanently changed, and once one project is begun, many more typically follow. This could permanently alter the beauty of the Alpine Lakes Wilderness, which I have personally enjoyed many times. What drew me to the Northwest is how cities and towns are very close to wild areas. I only need to drive 30-60 minutes to feel reconnected to nature and to escape the urban environment. Please do not take this key component of the region away from us.

137-4 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that
137-5 don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley. There are already numerous studies of how dams negatively affect wildlife and the natural environment. In other parts of the Northwest, dams are even being removed to restore habitat. Why would this new understanding be embraced in parts of the Northwest, and completely ignored in others?

Regards,
Stefanie Dirks

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Comment Letter 138

From: swenson.s@everyactioncustom.com on behalf of Steve Swenson <swenson.s@everyactioncustom.com>
Sent: Monday, July 23, 2018 9:47 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

138-1 | It's inappropriate to be raising the dams on lakes within a designated wilderness area. I'm very opposed to this idea and
138-2 | the negative imp;acts it would have on recreation in this stunningly beautiful area of the Cascade Mountains.

Sincerely,
Mr. Steve Swenson
6407 Brooklyn Ave NE Seattle, WA 98115-6732 swenson.s@comcast.net

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Comment Letter 139

From: stevecox68114@everyactioncustom.com on behalf of Steven Cox <stevecox68114@everyactioncustom.com>
Sent: Sunday, July 22, 2018 11:32 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

139-1 | I oppose increasing the dams on Eightmile Lake and Upper and Lower Snow Lakes and boring a tunnel from Upper to Lower Klonaqua Lakes. Thank you for considering my comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

Sincerely,
Mr. Steven Cox
607 21st Ave Seattle, WA 98122-5909
stevecox68114@gmail.com

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Comment Letter 140

From: Steven Jones <stdojo@gmail.com>
Sent: Sunday, July 15, 2018 2:52 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Aline Lakes & Icicle Creek

140-1 Please save this valuable natural resource from development, destruction and any other changes which would alter it's natural state and incredible beauty.
Thank you!
Steven Jones

Comment Letter 141

From: scribones@everyactioncustom.com on behalf of Timothy Hall <scribones@everyactioncustom.com>
Sent: Sunday, July 22, 2018 11:06 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: The Alpine Lakes Wilderness and in particular Icicle Creek and Enchantment area have been special to me for over 50 years of visits (as permits allow now). Human influx and the endless cycle of more people=more development (water etc.)= allowing more people=more development (water, floral and fauna disruption)= etc., has to be limited. Yes, limits must be set as much as people think we can keep drawing down Nature's resources. Get a backbone, take a deep breath and disappoint a few "more development" people for the sake of the natural world and future generations' enjoyment of the small bits that can be saved. 141-1

Sincerely,
Mr. Timothy Hall
6811 21st Ave NE Seattle, WA 98115-6949 scribones@earthlink.net

Comment Letter 142

From: Tina Thompson <Tina.Thompson.123971737@p2a.co>
Sent: Friday, July 20, 2018 9:38 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

As a multi-time hiker of the Eightmile, Upper, and Lower Snow Lakes I beg you NOT to proceed as planned with the proposed projects which will flood the trail and campsites. I often cajole friends from the West side of the mountains and as far away as California to come hike the awesome Alpine Lakes Wilderness, and this trail in particular. One of my fondest hiking memories is having a cup of tea at a Lower Snow Lakes campsite and watching a bear swim across the lake to an island, walk over the rocky resting spot, and continue swimming to the other shore. It was amazing. Please work hard to find other alternatives to your proposal. Don't rob future generations of these kinds of magical experiences.

142-1
142-2

142-3 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this TREASURED alpine valley.

Regards,
Tina Thompson

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Comment Letter 143

From: alanmoen@nwi.net
Sent: Saturday, July 28, 2018 10:37 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Wenatchee Watershed Plan

Hi Mike,

143-1 Id like to comment on Chelan County's plan to dam and otherwise augment streamflow from seven lakes in the Alpine Lakes Wilderness to make more water available for irrigation.

I've lived in the Wenatchee region for over 25 years, and operate a small winery in the Entiat Valley. Having my own vineyard, I realize the importance of irrigation, especially as hotter summers and lower stream flows from snowmelt due to climate change reduce the amount of water available to farmers here. So seven years ago, we worked out a deal with the Cascadia Conservation District to stop taking our irrigation water from the Entiat River in exchange for a well. This has made more water available for fish when stream flows are low, helping to restore fish habitat.

143-2 However, I have also seen how much water is simply wasted by orchardists here, such as overhead spraying for 12 hours on 90-degree days, when so much water evaporates before it even gets to tree roots. The easy availability of river water has encouraged this common abuse.

I believe the same practice certainly goes on in the Wenatchee watershed.
While orchardists have drawn water from some alpine lakes for nearly 100 years, now several of these lakes have been included within the Alpine Lakes Wilderness, which is, by definition, a place "where man is a visitor and does not remain." As you know, this a very special region, one where I have been hiking and climbing for over 50 years. I was involved in the fight to protect this area at the outset, and I think public involvement helped save one of the state's true environmental treasures from human development.

143-3 And so, I don't believe the current Wenatchee watershed plan adequately addresses the intrinsic value of this wilderness. I think that enlarging or adding new dams in the wilderness would significantly damage the land and its value - recreationally, ecologically, and spiritually.

143-4 Furthermore, water resources in the plan should be earmarked for irrigation only, not development of any kind. Realtors here typically use "water rights" as bait for home sales and suburban development. Although water use by people in the county will inevitably increase in the future as our population grows, it should not be at the exoense of the very areas
143-5 we ought to protect - in fact, those area are why many of us live here in the first place. Conservation of our water
143-6 resources should be a paramount issue in this plan. and preservation of our widerness areas as well.

143-7 Like the Entiat watershed plan - an excellent model for the region - monitoring water use is vitally important as we look to the future. I hope the county will serously consider no further action to interfere with the lakes in the Alpine Lakes
143-8 Wilderness simply in order to obtain more irrigation water from them. These lakes are much more than current and potential reservoirs; they are an essential part of the wilderness that surrounds them.

Thank you for your attention to my comments.

Sincerely,

Alan Moen

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Comment Letter 143

Snowgrass Winery
6701 Entiat River Road
Entiat, WA 98822
509-784-5101

Comment Letter 144

From: Alex Bond <Alex.Bond.14797264@p2a.co>
Sent: Monday, July 30, 2018 12:57 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

144-1 The Enchantments and the Alpine Lakes Wilderness are iconic and beautiful parts of Washington state that bring joy to many thousands of people every year. A water plan that impacts recreation opportunities in the Icicle area would have colossal impacts on many categories of outdoor enthusiasts and the local Leavenworth economy they support. You must not take action that could cause permanent negative impacts on recreation in the ALW. Thank you for reading.

Regards,
Alex Bond

Comment Letter 145

From: Zandercharles@everyactioncustom.com on behalf of Alexander Phillips <Zandercharles@everyactioncustom.com>
Sent: Friday, July 27, 2018 9:31 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

145-1 | Cut the junk and let my backyard thrive. Get a job

Sincerely,
Mr. Alexander Phillips
11930 30th Ave SW Burien, WA 98146-2421 Zandercharles@gmail.com

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Comment Letter 146

From: Alison Shaw <Alison.Shaw.124233230@p2a.co>
Sent: Thursday, July 26, 2018 9:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Don't sacrifice wilderness for flawed Icicle Strategy

Dear Director, Chelan County Natural Resource Dept. Mike Kaputa,

My family frequently hikes in the Alpine Lakes Wilderness.

I am sick and tired of trying to protect valuable nature preservers, used and enjoyed by thousands of taxpayers, from industrial exploitation.

146-1 |

Sufficient, pristine water is a challenge that the entire country will face as our climate changes, but let's not leap to the most destructive policies as our first course of action, ignoring the value of our wilderness areas for recreation, personal serenity, and - it apparently has to be pointed out - the economic value of the tourism and recreation industries.

Regards,
Alison Shaw
328 9th Ave
Kirkland, WA 98033

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Comment Letter 147

From: Andrea Riley <andrearile y@hotmail.com>
Sent: Thursday, July 26, 2018 10:09 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Project

147-1 Millions have been spent tearing down dams and you these public officials want to spend millions more building new ones. Idiocy prevails. Hope to vote all of you developers out of office

Sent from my iPad

Comment Letter 148

From: Ann Crosby <seasmilecros@gmail.com>
Sent: Monday, July 30, 2018 10:29 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comment on DPEIS released May 30, 2018

148-1 The DPEIS is a start, but only the beginning, of exploring the complexities that occur when a shared public Wilderness Area is proposed to provide and serve as an on-demand reservoir system, in effect becoming a public water utility in order to build new private homes downstream.

148-2 The five Alternatives would dramatically change eight lakes within the Alpine Lakes Wilderness Area and the streams they feed – causing fluctuating water levels, dead zones along the shore and negative impacts on the riparian ecosystems downstream.

148-3 The proposed projects in the five Alternatives are unprecedented in the National Wilderness System.

148-4 Underlying all these complexities is the more fundamental question of whether it would be cheaper and more sustainable to adopt conservation measures rather than further damming and diverting the Alphine Wilderness lakes.

148-5 There are many procedural issues, fundamental legal issues, historic and existing water storage rights, and conservation issues that must be addressed but are not considered in the DPEIS. For example there is little or no consideration of fundamental legal issues arising from federal wilderness law, from state water law, from the

148-5 protections of the Wilderness Act, from the land management role and authority of the U.S. Forest Service on these National Forest lands, from the National Environmental Policy Act (NEPA), from the Endangered Species Act, and finally from the total lack of legal precedent of turning a protected wilderness area into an on-demand public utility.

Until these deficiencies and inadequacies are thoroughly researched and transparently presented in a revised DPEIS, this current DPEIS (released May 30, 2018) is a useless document and a useless expense of public funds. It does not begin to provide the extensive information needed to consider the legality or environmental consequences of the five Alternatives. It does not begin to consider the enormous consequences of plundering protected, wild public lands for the sheer economic benefit of a few private parties.

148-6 We urge that a Revised Draft PEIS that addresses all the above issues should be released for public comment.

148-7 We further recommend that instead of draining these protected, beautiful alpine lakes which thousands of visitors enjoy and contribute to our economies – that we adopt reasonable conservation alternatives instead.

Sincerely,

Comment Letter 148

The Crosby Family

Cascade St., Leavenworth 98826

509-548-1544

Comment Letter 149

From: Bruce Williams <bwseattle@gmail.com>
Sent: Monday, July 30, 2018 11:47 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle PEIS

My name is Bruce Williams. I live on Icicle Creek. I began attending Icicle Work Group meetings in July 2017.

149-1 Regretfully, I am writing to oppose all of the alternatives proposed and I am requesting that this process be done over. I know that many well-meaning people have put a lot of time into this. However, based on my attendance at the IWG meetings and reading of documents it appears to me that there are fundamental flaws in the process which have led to fundamental flaws in the proposals.

In summary, the fundamental flaws in the process are:

1. lack of methodical, rigorous focus on wise use of the public's money (either taxpayer or ratepayer);
2. lack of methodical, rigorous and objective focus on the best ways in which to conserve water;
3. lack of a priority to minimize additional intrusions into the Alpine Lakes Wilderness.

149-2 Lack of methodical rigorous focus on wise use of the public's money

It is my perception that all or almost all of the money proposed to be spent is public money, funded either by taxpayers or ratepayers. In general, those proposing how the public's money will be spent should view themselves as having a fiduciary duty to ensure that the public's money is spent in the most cost effective ways to best serve the public's interest and to not spend any more than is reasonably necessary. Unfortunately, sitting in the meetings did not give me the sense that the participants had that perspective.

The first time I heard that the IWG was contemplating spending in the order of $100 million of public money I was astounded. When I mentioned that to an IWG member he replied that at first he also had thought it was an enormous amount of money but now he was used to the idea of spending that much. I am concerned that getting "used to" the idea of spending that much of someone else's money results in less care than one would have in spending one's own money. I didn't hear anyone voicing concerns about this, or raising questions as to the amount that should be spent.

149-3 Lack of methodical, rigorous and objective focus on the best ways in which to conserve water

In a project contemplating $100+ million dollars of public money on water projects, I would have expected a methodical, rigorous, objective, and world-class focus on conservation: ways in which existing users of Icicle water could achieve their purposes while using less water. The goals of such a focus would include reducing use of water from the Icicle and possibly reducing the amount of public money to be spent.

Such an approach would be consistent with government funding in general. Those who benefit from government funding usually have to meet criteria developed to insure that public objectives are achieved.

149-4 Of course, if the main users of the water, including the Icicle Peshastin Irrigation District ("IPID") and the Leavenworth National Fish Hatchery ("LNFH"), were using their own money to fund these projects, there would be an argument that they could spend their own money as they wanted and needn't consider spending it on conservation or an outside expert's view of appropriate conservation. But for a publicly funded project, a strong, rigorous and objective review of conservation opportunities would be an obvious starting point.

But that wasn't at all what I observed. Instead, I saw:

149-5
- The IWG seemed to think it was fine to only consider conservation projects that the users suggested they were interested in. For example, rather than an objective look at IPID's use of water, the IWG seemed content to let IPID decide what conservation projects were on the table. I don't recall ever hearing an IWG member suggest that IPID should consider other alternatives.

149-6
- When I started attending the meetings in the summer of 2017, the IWG process had been going 5 years. But it appeared that IPID had not yet developed their conservation plan. That certainly gave the impression conservation wasn't a high priority.

149-7
- Similarly, I heard at an IWG meeting that the City of Leavenworth and Chelan County had agreed to jointly consider conservation. But 5 years into the IWG process, they hadn't started yet.

149-8
- The longest discussion in an IWG meeting regarding conservation was about how to increase the public's perception that the IWG was serious about conservation, not about actual efforts to conserve.

149-9
- There is no alternative that is focused on what is possible with just conservation.

Lack of a priority to minimize additional intrusions into the Alpine Lakes Wilderness:

149-10 I expected that because of the legal, policy and political concerns about protecting wilderness areas, a project like this would have put a high priority on coming up with alternatives that would not increase impacts on the Alpine Lakes Wilderness. But I didn't sense that was a priority in the meetings I attended and I don't see that as a priority in the alternatives proposed.

149-11 After observing those fundamental flaw in the process, I believe that the proposed alternatives are not the best options for spending public money, for conservation or for avoiding unnecessary impacts to the wilderness.

The process needs to be done over in a way that addresses and eliminates these fundamental flaws.

Thank you.

Bruce Williams
bwseattle@gmail.com

Comment Letter 150

From: cwedel@everyactioncustom.com on behalf of Carina Wedel <cwedel@everyactioncustom.com>
Sent: Friday, July 27, 2018 12:50 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

150-1 I am a recent outdoor recreation graduate from Eastern Washington University. I love the state of WA and often recreate in it whenever I get the chance. Please keep the Enchantments wild, rugged, and beautiful without the advancement of dams and other water constrictors.

Sincerely,
Ms Carina Wedel
2528 N Normandie St Spokane, WA 99205-3152 cwedel@eagles.ewu.edu

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Comment Letter 151

From: Carolyn Waldow <waldow.carolyn@gmail.com>
Sent: Sunday, July 29, 2018 10:10 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Public Comment - Draft Programmatic Environmental Impact Statement (PEIS) for the Icicle Strategy

Dear Sir,

151-1 No dams in the Alpine Lakes Wilderness. The Icicle Creek Watershed Water Resources Management Strategy should improve protections for this world class wilderness. The Enchantments and the greater Alpine Lakes Wilderness is an attraction for outdoor enthusiasts from around the world.

151-2 I fell in love in the wild and majestic beauty of this pristine wilderness. Pristine wildness is an asset in which we should continue to invest as a return in which the heart and soul may be renewed and flourish. Please help me to save this amazing place for my children and future generations.

Sincerely,
Carolyn Waldow (98136)

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Comment Letter 152

From: ccraver15@everyactioncustom.com on behalf of Cathy Craver <ccraver15@everyactioncustom.com>
Sent: Monday, July 30, 2018 3:32 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy. I support the position outlined by the Mountaineers, as follows:

152-1 "We oppose the following projects included in the proposed strategy:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

152-2 The Mountaineers supports the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening, and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes."

Sincerely,
Ms. Cathy Craver
2828 Franklin St Bellingham, WA 98225-2604 ccraver15@gmail.com

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Comment Letter 153

From: Charles Raymond <cfr98115@gmail.com>
Sent: Monday, July 30, 2018 4:57 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on DPEIS for Icicle
Attachments: Icicle_DPEIS_comments-Raymond.pdf

Please accept the attached comments concerning the Icicle DPEIS. Thanks for the opportunity to comment.

Charles Raymond

--
Charles Raymond

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Comment Letter 153

Comment Letter 153

30 July, 2018

Tom Tebb
Director, Office of Columbia River
Washington Department of Ecology
1250 Alder Street
Union Gap, WA 98903

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

*Submitted via email to:*nr.iciclesepa@co.chelan.wa.us

Comments on the Icicle Creek Water Resource Management SEPA-DPEIS

Dear Directors Tebb and Kaputa,

I appreciate the opportunity to comment on the Draft Programmatic Environmental Impact Statement (DPEIS) concerning Icicle Creek Water Resource Management.

153-1 I have been visiting the Alpine Lakes on a regular basis since 1969. Over these decades I have been to all of the lakes modified for storage except Square Lake. The Alpine Lakes have been an important refuge for me both summer and winter and a focal point for recreation in a peaceful, quiet setting. The Alpine Lakes Wilderness Area presents an extraordinary landscape of national importance, and is one of the most heavily visited Wilderness Areas. It can't be replaced or rebuilt.

I recognize the importance for fish, agriculture and domestic uses that longstanding management of the Icicle watershed has afforded to a diverse range of stakeholders in the local Icicle drainage, the Wenatchee Valley and the Columbia River. As well I recognize that management and related infrastructure needs to be improved.

153-2 The concern that I would most like to highlight is that all new actions comply with the 1964 Wilderness Act, 1976 Alpine Lakes Area Management Act, and the 1981 Alpine Lakes Wilderness Management Plan without engaging unprecedented exceptions. These legal requirements are mentioned as part of the "Guiding Principles", but all of the offered Alternatives have project components that are not clearly established to be consistent with these laws. Important issues include constraints on access for new
153-3 construction / maintenance in the Wilderness. Furthermore, the planing has proceeded
153-4 with out legal findings about present-time, actual water rights with regard to amount of storage and purpose of use for those rights.

I would like to start my comments focusing on specific "Projects" without regard to how they combine in the various Alternatives.

I **definitely oppose the** following components of Projects:

153-5
- **New Storage** in the ALWA beyond traditional, actual use (as in the Eightmile Lake, Upper Klonaqua Lake and Upper/Lower Snow Lakes Storage Enhancements and some aspects of the Eightmile Lake Storage Restoration), which are inconsistent with recognized water rights and wilderness management.

153-6 Furthermore, I oppose maintenance/operation of existing dams using methods incompatible with wilderness requirements.

153-7 I **support** the following components of Projects:
- **Pump Exchange** (as in IPID Full Piping and Pump Exchange, IPID Dryden Pump Exchange, COIC Irrigation Efficiencies and Pump Exchange) that shift the positions of water withdrawal downstream of critical sections of Icicle Creek where in-stream flow is identified as most problematic with present management practices. These shifts in withdrawal location should be highest priority with regard to maintaining in-stream flow of Icicle Creek. They provide double use for providing in-stream and out-stream use.

153-8
- **Conservation measures** (as in IPID Irrigation Efficiencies, COIC Irrigation Efficiencies Pump Exchange, Domestic Conservation Efficiencies and LNFH Conservation and Water Quality Improvements). They should be general practice in the real world of limited water and are already, in part, required by Municipal water law. These conservation measures should be highest priority for any expectation of long-term success.

I could **provisionally support** some elements of the following Projects:

153-9
- **Modification/Restoration of Existing Storage** (as in Alpine Lakes Reservoirs Optimization, Modernization, and Automation,) as long as design max/min lake levels are consistent with recent practice and that all actions including means of implementation and on-going maintenance are compatible with requirements of the National Wilderness Act and other relevant law in a spirit that holds impacts on wilderness values to a minimum. Subject to that reservation, I support

153-10 installation of remote-control valves, which could provide beneficial fine tuning for water release and retention. I am concerned that the impact on the lakes and

153-11 creeks that drain them receive little mention, as if they are only reservoirs and supply lines. There note mention that the high discharges during the discharge phases (late summer when down-stream water needs are highest) do not cause erosion in the creeks. There is a lot more to think about. I have not seen discussion of the beheading of creek drainages when valves are closed for lake recharge (fall and winter until lakes refill). In fact both valve open and closed phases impose very large, unnatural seasonal fluctuations that must affect ecological balance of the lakes, creeks and potentially the Icicle that they feed.

Comment Letter 153

153-12 I find it difficult to comment on Alternatives. **I firmly oppose Alternative 4,** because of large impacts in the ALWA. **Alternative 5 is least problematic**, given that it
153-13 includes Full IPID Pump Station along with the COIC Pump Exchange without new storage. However, all Alternatives include project elements that are based on un-
153-14 founded legal assumptions about water rights and to some extent ignore wilderness law and the critical role and authority of the US Forest Service that apply where water is
153-15 stored. I believe that a the DPEIS needs revision in the context of clear legal findings concerning actual water rights and recognition of already clear constraints from the National Wilderness Act.

Sincerely,

Charles Raymond
3798 NE 97th St.
Seattle, WA 98115

Comment Letter 154

From: Chris Lish <lishchris@yahoo.com>
Sent: Sunday, July 29, 2018 8:24 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Protect the Alpine Lakes Wilderness. Revise the DPEIS for the Icicle Creek Watershed Water Resources Management Strategy.

Sunday, July 29, 2018

Mike Kaputa
Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Subject: Protect the Alpine Lakes Wilderness. Revise the DPEIS for the Icicle Creek Watershed Water Resources Management Strategy.

Dear Mr. Kaputa,

154-1 *I strongly urge the Chelan County Natural Resource Department to revise the Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Watershed Water Resources Management Strategy to address the following deficiencies and then release a revised DPEIS for public comment.*

> *"Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method."*
> *-- Theodore Roosevelt*

154-2 *The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must also be protected.*

> *"If future generations are to remember us with gratitude rather than contempt, we must leave them with more than the miracles of technology. We must leave them with a glimpse of the world as it was in the beginning, not just after we got through with it."*
> *-- Lyndon B. Johnson, upon signing the Wilderness Act in 1964*

154-3 *The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes the Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of the IPID's water rights, which would limit several proposals.*

1

"Wilderness is a resource that can shrink but not grow--the creation of new wilderness in the full sense of the word is impossible"
-- Aldo Leopold

154-4 *I strongly object to Alternative 4. It includes: drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. The IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.*

"I hope the United States of America is not so rich that she can afford to let these wildernesses pass by, or so poor that she cannot afford to keep them."
-- Margaret "Mardy" Murie

154-5 *Of the five alternatives presented in the DPEIS, Alternative 5 is best. It includes the "Full IPID Pump Station," which would move the IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.*

"It is imperative to maintain portions of the wilderness untouched so that a tree will rot where it falls, a waterfall will pour its curve without generating electricity, a trumpeter swan may float on uncontaminated water—and moderns may at least see what their ancestors knew in their nerves and blood."
-- Bernand De Voto

154-6 *The IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use the IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but the IPID has no right to use water for these additional purposes.*

"Something will have gone out of us as a people if we ever let the remaining wilderness be destroyed. Without any remaining wilderness, we are committed wholly, without chance of even momentary reflection and rest, to a headlong drive into our technological termite-life, the Brave New World of a completely man-controlled environment."
-- Wallace Stegner

154-7 *For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal*
154-8 *actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely to be much higher than the DPEIS estimates, and closer to the cost of Alternative 5.*

"As we peer into society's future, we—you and I, and our government—must avoid the impulse to live only for today, plundering for our own ease and convenience the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without risking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not

Comment Letter 154

to become the insolvent phantom of tomorrow."
-- Dwight D. Eisenhower

154-9 *The DPEIS also repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.*

"Every man who appreciates the majesty and beauty of the wilderness and of wild life, should strike hands with the farsighted men who wish to preserve our material resources, in the effort to keep our forests and our game beasts, game-birds, and game-fish—indeed, all the living creatures of prairie and woodland and seashore—from wanton destruction. Above all, we should realize that the effort toward this end is essentially a democratic movement."
-- Theodore Roosevelt

154-10 *Again, I strongly urge the Chelan County NRD to revise the DPEIS for the Icicle Creek Watershed Water Resources Management Strategy to address the above deficiencies and then release a revised DPEIS for public comment.*

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."
-- Aldo Leopold

Thank you for your consideration of my comments. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,
Christopher Lish
San Rafael, CA

Comment Letter 155

From: Claire Giordano <clairegio9@gmail.com>
Sent: Sunday, July 29, 2018 9:49 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comment on the Icicle Creek DPEIS

Dear Department of Ecology,

The Alpine Lakes Wilderness is a treasured and area that deserves our protection and care. As a hiker, the Enchantments region of the wilderness is one of the most spectacular and most popular. I attended the information session in Bellevue and appreciated all the information and the professionalism of everyone involved.

155-1 While I recognize the complexity of the issue facing the valley with water shortages and the variety of stakeholders, I am deeply concerned that some of the alternatives presented in the DPEIS for the Icicle Creek Strategy either violate the wilderness act and/or will have very significant impacts on the landscape.

155-2 Specifically, I strongly oppose Alternative four due to the irreprable damage the new scontruction would cause at Upper Klonoqua lake, Snow Lakes, and Eightmile lake.

155-3 In addition, I would prefer that the dam at Eightmile is fixed but not expanded, as expanding the dam (even to it's original height) would sink and eliminate some of the key recreation areas around the lake.

155-4 Of the alternatives present, I advocate that you choose options that do not involve any new storage and have minimal modification or modernization to the existing dams. (Of the alternatives, this support extends to the no action alternative and to Alternative 3, if the Eightmile dam was fixed but not increased in height).

155-5 Thank you for taking the time to read my letter, and for taking my feedback into consideration. The few wilderness areas we have preserved need our protection and stewardship so they can continue to inspire people for generations to come.

I look forward to following along with the rest of the process!
Claire Giordano

Comment Letter 156

From: Cliff Leight <cliffleight@gmail.com>
Sent: Friday, July 27, 2018 9:05 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Project

Hi,

I am a backcountry user and have been hiking, camping in the proposed areas that are being considered for dam expansion. I have recreated in these areas for 45 years. They have also been important areas to photograph for my photography business. As you may know The Enchanment Lakes region is world renown and atracks visitors world wide.
156-1 Please do not alter these very unique lakes and surrounding land with any new construction.

Sincerley

Cliff Leight
Bow WA

Comment Letter 157

From: dave.foster@everyactioncustom.com on behalf of David Foster <dave.foster@everyactioncustom.com>
Sent: Monday, July 30, 2018 8:44 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle
157-1 Strategy: I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage,
fish screening and water conservation efficiencies. I wholeheartedly believe that these conservation elements are
157-2 foundational to the outdoor experience and in protecting these landscapes. I do NOT support larger dams and water
diversion

Sincerely,
Mr. David Foster
8306 Sunset Vista Ln Clinton, WA 98236-8925 dave.foster@northdesignllc.com

Comment Letter 158

From: dianalrosenberg@everyactioncustom.com on behalf of Diana Rosenberg <dianalrosenberg@everyactioncustom.com>
Sent: Monday, July 30, 2018 4:40 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle
158-1 Strategy: I discovered my love of the greater Leavenworth and Icicle areas due to this amazing wilderness. Over my time
living in Seattle, I must have visited the area nearly every single weekend for months. My day through-hiking the trail is
forever one of my most treasured memories. This is one of the most wild, most accessible areas imaginable. Please help
it remain so.

Sincerely,
Diana Rosenberg

Sincerely,
Ms. Diana Rosenberg
329 41st St Oakland, CA 94609-2610
dianalrosenberg@gmail.com

Comment Letter 159

From: diana.timpson@everyactioncustom.com on behalf of Diana Timpson <diana.timpson@everyactioncustom.com>
Sent: Friday, July 27, 2018 11:29 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

159-1 UNACCEPTABLE AND DISGRACEFUL.

UNDER NO CIRCUMSTANCES SHOULD THE WATERS WITHIN THIS DELICATE AND UNIQUE ECOLOGICAL SYSTEM BE DAMMED DRAINED DRILLED OR OTHERWISE MANIPULATED. THANK YOU MOUNTAINEERS FOR BRINGING THIS TO MY ATTENTION. I WILL READ THE REPORTS AND PROVIDE ADDITIONAL COMMENTS

Sincerely,
M Diana Timpson
1507 Western Ave Apt 103 Seattle, WA 98101-1504 diana.timpson@gmail.com

Comment Letter 160

From: Donald Mazzola <dmazz1952@gmail.com>
Sent: Monday, July 30, 2018 5:05 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Alpine Lakes DPEIS comments

Mike Kaputa: Director, Chelan County Natural Resource Department

411 Washington Street., Suite 201, Wenatchee, WA 98801

I have backpacked and day hiked in Wilderness Areas for over 40 years. I spent many years in Montana as a volunteer for Wilderness designation and protection organizations and was employed as a Federal Wilderness advocate for 10 years.

160-1 The Alpine Lakes Wilderness Area is protected by Federal Law. The DPEIS is flawed in that it fails to meaningfully consider fundamental legalities. There are no easements that supersede Federal Wilderness Act protections. The fact
160-2 that Alternative 4 includes drilling a tunnel between Upper and Lower Klonaqua Lakes and a bigger dam at Eightmile Lake is incredulous.

160-3 According to the Wilderness Act, Federally protected Wilderness Areas are “untrammeled by man” and should remain so. The Wilderness character of the Alpine Lakes Wilderness Area must be protected and respected. For this reason alone I am opposed to any and all dam construction, lake draining, etc. Any man-made structures that were present
160-4 when the area was designated Wilderness should be removed rather than enhanced or reconstructed so as to re-create as closely as possible, natural, unaltered Wilderness characteristics.

160-5 I am in favor of “no action” in the Alpine Lakes Wilderness Area.

Donald Mazzola
543 Q Street
Port Townsend, WA 98368
360.344.2946 (home)
406.220.1707 (cell)

Comment Letter 161

From: Donald Potter <donpotter@earthlink.net>
Sent: Monday, July 30, 2018 10:25 AM
To: NR Icicle SEPA; donpotter@earthlink.net
Subject: [Icicle SEPA] Icicle Strategy Draft PEIS

Mike Kaputa
Director, Natural Resource Department
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Icicle Strategy Draft PEIS

Dear Mr. Kaputa

161-1 I would like to comment on the Icicle Strategy Draft PEIS. I have been studying this issue for some time, and I did attend the full meeting at the Department of Ecology on the evening of 27 June 2018. Chelan County and the Washington State Department of Ecology nicely gave a detailed presentation of the plan, the meeting lasting a full 2 hours or a bit more. Thanks for that informative meeting. But I am disappointed that this was not an official Public Hearing, with ability to have Oral Comments accepted, such as was held at the Leavenworth Festhalle 2 nights later

161-2 I am mostly concerned that Chelan County and the Washington State Department of Ecology do not seem to recognize and acknowledge that much of the plan actions occur within the Alpine Lakes Wilderness, which has inherent/legislated rights which seem to be violated as a result of the DPEIS (specifically building the Eight Mile Dam higher). The Draft

161-3 DPEIS should be revised, taking Wilderness into account

161-4 Also, water conservation should be an increased factor in the plan. I was a water rights owner in a small irrigation district, the DeWeese-Dye Ditch in Canon City, Colorado for a number of years. So I know the potential causes of waste of water, and the need to improve the system with water conserving solutions

I have other grave concerns about this plan, but I know others will be bringing these issues forth

Thank you for your time and consideration in receiving and taking into account these comments and recommendations

Donald Potter, MD
3823 140th Ave NE
Bellevue, WA 98005
Phone: 425-885-9269
E-mail: donpotter@earthlink. net

Comment Letter 162

From: Edward Henderson <edhenderson57@comcast.net>
Sent: Saturday, July 28, 2018 9:53 PM
To: NR Icicle SEPA; thomas.tebb@ecy.wa.gov
Subject: [Icicle SEPA] Comments on IWG DPEIS
Attachments: Icicle DPEIS.docx

Attached please find my comments on the IWG DPEIS.

Edward M. Henderson, Jr.
407 Smith Street
Seattle, Washington 98109
edhenderson57@comcast.net
(206) 283-6497

July 28, 2018

Mike Kaputs
Director, Natural Resource Department
Chelan County
411 Washington Street, Suite 201
Wenatchee, WA 98801
nr.iciclesepa@co.chelan.wa.us

G. Thomas Tebb
Director, Office of the Columbia River
Washington Department of Ecology
1250 West Alder Street
Union Gap, Washington 98903-0009
thomas.tebb@ecy.wa.gov

RE: Comments on the Draft Programmatic Environmental Impact Statement (DPEIS) for Icicle Creek Watershed Resources Management Strategies.

Dear Misters Kaputs and Tebb,

I am a hiker, backpacker and climber. I have been enjoying recreation in the Alpine Lakes since the early 1980's, shortly after this spectacular mountain region was designated a Congressionally protected Wilderness in 1976. I count myself extremely lucky to live in Washington State with close and easy access to the Alpine Lakes. Many of my fellow citizens are not so fortunate and travel many miles to visit these wonders. Recreational visitation to the Alpine Lakes is a major economic godsend to the surrounding mountain communities. I have relaxed and enjoyed many cold beers and Ortega Burgers at Gustav's in Leavenworth after a hike down from the Enchantments or a hot dusty day's rock practice on the granite slabs up Icicle Creek.

I am shocked and appalled by the sloppy, self-serving DPEIS that you are attempting to pass off on a gullible public. The DPEIS is incomplete and fails utterly to adequately address many important issues raised by anticipated work in protected Wilderness. The missing issues include but are not limited to: enumeration of the necessary permits and waivers which may be required; relationship with the Forest Service, the administrator of this public land; how the physical work will be carried out in the Wilderness. The DPEIS should be withdrawn until you can answer these and many other questions.

I am aware that the Icicle Peshastin Irrigation District (IPID) has water rights in the Icicle Creek watershed that pre-exist designation of the Alpine Lakes Wilderness in 1976. The IPID has a right and indeed an obligation to maintain the facilities associated with those rights. However those rights do not extend to increasing withdrawal of water for purposes not originally specified. IPID's water rights were granted for the designated purpose of irrigation. The DPEIS now proposes to use IPID water for other purposes, such as the fish hatchery and real estate development in Leavenworth, but IPID has no right to use water for these additional purposes. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's remaining water rights, which limit several proposals.

The DPEIS must be revised to eliminate proposals to raise the height of the dams at Upper Snow Lake and Eight Mile Lake thus increasing the size of these Lakes in the Wilderness and draining Upper Klonaqua Lake into Lower Klonaqua Lake.

The DPEIS fails to address the means and methods of construction in the Wilderness. For the multitude of projects proposed in the Alpine Lakes Wilderness, what construction activity can be expected to complete the proposed projects? How many helicopter flights will be required for all of the projects proposed in each alternative? How will that impact wilderness values, including the opportunity for solitude, recreational access and infrastructure? How will automation and optimization and proposed changes to the natural hydrology of the basin impact the invertebrate community? The Wilderness Act limits the use of power mechanical tools and requires the use of manual powered hand tools. The original irrigation structures, the dams and spillways at Upper Snow and Eight Mile Lakes were built with non-mechanized tools in the early twentieth century. Such restoration work as required for safety and necessary operations should be carried out with the same hand tools.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which will alter stream hydrology.

The Alpine Lakes Wilderness is one of the most iconic and treasured natural resources in the entire National Wilderness Preservation System. These lands are of national interest, owned by everyone in the nation and protected by Congress to preserve their wilderness character. As detailed in the DPEIS, thousands of hikers explore and visit this area each year and a myriad of wildlife species depend on the critical habitat it provides. I have great personal interest in the management and stewardship of these lands, and am committed to working to ensure wilderness, recreation, scenic, and other natural resource values are protected into the future.

The DPEIS is woefully inadequate and must be withdrawn. It fails to address many important issues and lacks sufficient details on many others. Because of these and many other deficiencies an evaluation can't be reasonably made of the probable environmental impacts. Because many of the projects proposed in the DPEIS occur in the National Forest, i.e. on federal land, I believe a NEPA evaluation is required.

Thank you for this opportunity to make these comments. Please inform me when a new, revised and corrected DPEIS is ready and available for public scrutiny and comment.

Sincerely,

/s/ Ed Henderson

Edward M. Henderson, Jr. P.E.

cc: Governor Jay Inslee
U. S. Senator Patty Murray
U. S. Senator Maria Cantwell
U.S. Representative Pramila Jayapal
Okanogan-Wenatchee National Forest Supervisor Mike Williams

Comment Letter 162

Wenatchee River District Ranger Jeff Rivera

Comment Letter 163

From: elaine.badejo@everyactioncustom.com on behalf of ELAINE BADEJO <elaine.badejo@everyactioncustom.com>
Sent: Monday, July 30, 2018 5:07 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

163-1 I would like you to leave the Enchantments the way they are. It is such a beautiful and unique place to be able to visit. I would be as numerous people will be devastated if this land is transformed and not approachable. Please consider preserving this beautiful piece of our state.

Sincerely,
Mrs. ELAINE BADEJO
21717 104th Ave E Graham, WA 98338-7718 elaine.badejo@gmail.com

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Comment Letter 164

From: ehagstrom13@everyactioncustom.com on behalf of Erik Hagstrom <ehagstrom13@everyactioncustom.com>
Sent: Saturday, July 28, 2018 10:31 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

164-1 The enchantments and Icicle drainage are one the few higher elevation watershed/high mountain environments to be found in the state of Washington that offer unparalleled recreational experiences as well as unique ecological life-zones to be found. I can't conceive of any reason to alter this priceless area which serves all of the citizens of Washington state in order to benefit a select few.

The pressures upon the limited resources of our country continue to be subject to over-use, exploitation, and short term monitization with destructive results. Wild lands like the Icicle should continue to be protected, preserved and treated as the special priceless properties for ALL citizens. Studies have shown time and again that the public wants more areas to experience what nature has to offer. Flooding campgrounds, draining water courses and daming rivers is not conducive to the public's wishes.

Please, do not proceed with the proposed water plans in the Icicle Basin.

Sincerely,
Mr. Erik Hagstrom
23515 82nd Ave SE Woodinville, WA 98072-9565 ehagstrom13@gmail.com

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Comment Letter 165

From: ourstuff3@everyactioncustom.com on behalf of Evan Schelter <ourstuff3@everyactioncustom.com>
Sent: Saturday, July 28, 2018 12:00 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

165-1 I have backpacked all through the Enchantment Lakes area over the decades and love it just as it is. I do not want new or
165-2 bigger dams, no tunnels. The problem is too many people living there, not a lack of resources.

Sincerely,
Mr. Evan Schelter
2017 166th Ave SE Bellevue, WA 98008-5321 ourstuff3@hotmail.com

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Comment Letter 166

From: Fabian Frank (fabian.m.frank@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Monday, July 30, 2018 3:03 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

166-1 Alpine Lakes Wilderness is one of the most valuable environments in the washington natural resources, and the damage done by these projects will be irreversible. It is a wilderness, and should be treated as such - not developed. It
166-2 significantly detracts from the recreational value of an environment when dams, pipes, and other devices are used. We
166-3 must preserve this wilderness for generations to come, and therefore we cannot allow "just one little change" every so often... eventually that will end up completely changing the environment.
-Fabian Frank

Sincerely,

Fabian Frank
6002 147th Ave SE
Bellevue, WA 98006
fabian.m.frank@gmail.com
(425) 614-8712

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 167

From: Frances and Gerald Conley (fran@roanokecap.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, July 27, 2018 5:59 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Stop effort to Undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

Alpine Lakes Wilderness is one of the state's most iconic landscapes, and because of its ease of access to Seattle and
167-1 major highways is a highly used wilderness area. It already has great pressure from such use. Wilderness rules should be adhered to and there should be no expansion of dam building or dam expansion, or further violation of Wilderness limited access and use regulations.
Please halt this proposed adverse use of the current state of Enchantment basin!
167-2 Don't sacrifice this wilderness area to commercial use of any type. Do not manipulate water flows or otherwise tamper with watershed runoff. Flows will be declining anyway and other solutions will need to be found. Leave the Wilderness area alone! No expansion of any lakes in the Wilderness Area period.

Sincerely,

Frances and Gerald Conley
2636 10th Ave E
Seattle, WA 98102
fran@roanokecap.com
(206) 322-0427

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 168

From: GW Shannon <gwshannon@gmail.com>
Sent: Monday, July 30, 2018 8:44 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on Icicle Strategy Draft PEIS

July 30, 2018

Mike Kaputa
411 Washington St., Ste. 201
Wenatchee, WA 98801
% nr.iciclesepa@co.chelan.wa.us

Re: Icicle Strategy Draft Programmatic EIS Comments

Dear Mr. Kaputa:

168-1 In reviewing the limited number of alternatives that were presented in the Icicle Strategy Draft PEIS, I find that wilderness issues and values, including ecosystem overviews in the Alpine Lakes Wilderness were not
168-2 adequately reviewed and discussed, including the U.S. Forest Service's role and laws for proposals in wilderness.

168-3 Those proposals include dam optimization, modernization and automation, storage enhancement at Eightmile Lake, Upper Klonaqua Lake and Upper/Lower Snow Lakes, all in wilderness that the U.S. Forest Service manages and must follow certain wilderness laws. For example, Section 4(c) of the 1964 Wilderness Act relates to the concept of minimum tool requirements, as far as I know that issue was not addressed in the DPEIS.

168-4 Furthermore, IPID Irrigation District has never had or at least not used water rights at Upper Klonaqua Lake; and as pointed out by others, the current water rights at Eightmile Lake based on historical use have not even been ruled on yet by the Department of Ecology.

The DPEIS does not consider basic issues (legal) in regard to federal wilderness laws in the Alpine Lakes
168-5 Wilderness and state water law. It seems that the document is pushing the cart in front of the horse. It appears costs associated with wilderness area projects are not adequately addressed for most alternatives (note the exorbitant cost to fly the small piece of equipment into Eightmile Lake this spring), and for that
168-6 reason I would support Alternative 5 with the full IPID pump station without dam optimization, modernization and automation.

168-7 Other issues not fully addressed include changes in stream flow and those impacts to the riparian ecosystems;
168-8 climate change and overall effect on the lower Icicle drainage; alternatives that address aggressive
168-9 conservation measures for the City of Leavenworth and their water rates for residents and commercial
168-10 businesses; and finally impacts to recreation users in the Alpine Lakes Wilderness.

Thank you for this opportunity to comment on the Icicle Strategy Draft Programmatic EIS.

Sincerely,

Greg Shannon
313 Olive Street
Cashmere, WA 98815

Comment Letter 169

From: sheehangregory@everyactioncustom.com on behalf of Gregory Sheehan <sheehangregory@everyactioncustom.com>
Sent: Tuesday, July 31, 2018 7:54 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: I oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts: 169-1

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

Sincerely,
Mr. Gregory Sheehan
6045 3rd Ave NW Apt 5 Seattle, WA 98107-2103 sheehangregory@gmail.com

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Comment Letter 170

From: heffneh@everyactioncustom.com on behalf of Heather Heffner <heffneh@everyactioncustom.com>
Sent: Saturday, July 28, 2018 12:12 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

We oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts: 170-1

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.
We support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes. 170-2

Sincerely,
Mrs. Heather Heffner
13307 117Th Street Ct E Puyallup, WA 98374-5049 heffneh@gmail.com

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Comment Letter 171

From: Howard Nebeck <henebeck@uw.edu>
Sent: Monday, July 30, 2018 5:01 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Draft Programmatic Environmental Impact Statement (PEIS) for the Icicle Strategy

Dear Director Kaputa,

171-1 I would like to express my strong support for maintaining the wilderness and recreational aspects of the Icicle Creek Subbasin as Chelan County evaluates water resource projects in this area.

I appreciate the need of the county to utilize the water resources of the area and to construct sound infrastructure to access these resources. I hope proposed projects will preserve the beautiful wilderness and recreational access to it.

Thank you,
Howard Nebeck
henebeck@uw.edu
14921 NE 72nd Ct.
Redmond, Wa 98052
425-881-1280

Comment Letter 172

From: Isaac Gundersen <Isaac.Gundersen.124208986@p2a.co>
Sent: Wednesday, July 25, 2018 3:10 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

172-1 I know that most of this email is a form letter, I used to work in government. These trails are one of the great wonders of our state. Please don't move forward with a project that would change that. Please remove the detrimental projects from the draft plan.

172-2 The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

172-3 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Isaac Gundersen

Comment Letter 173

From: aengdoo.shin@everyactioncustom.com on behalf of Jacqueline Shin <aengdoo.shin@everyactioncustom.com>
Sent: Monday, July 30, 2018 6:15 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

173-1 Please don't do this! Please help preserve the wildlife as it is!!! Please reconsider an alternative to what you are trying to achieve! There has to be a different way.

Sincerely,
Ms. Jacqueline Shin
2200 E Ball Rd Anaheim, CA 92806-5201
aengdoo.shin@gmail.com

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Comment Letter 174

From: Janka Hobbs <urtica@frontier.com>
Sent: Thursday, July 26, 2018 8:32 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] [Possible Spam] Icicle Creek DPEIS

Dear Director Kaputa,

174-1 There are several aspects of the Icicle Creek DPEIS that I find disturbing. One is its cavalier disregard for protection of the Alpine Lakes Wilderness, especially in Alternative 4. In a time of increasing water scarcity, this proposal is based on a wish-list expansion of water rights, mostly to junior irrigation permits and to presumed municipal expansion.

174-2 The proposal to raise Eightmile Lake (and increase its drawdown) will essentially destroy any riparian habitat along its banks, and ensure that it becomes a lifeless reservoir. The Snow Lake and Klonaqua proposals are equally egregious.
174-3 Modernization of existing facilities also needs to happen with habitat impacts in the forefront.

174-4 While Chelan County has conveniently failed to list any plant or invertebrate species on its priority species list, (have
174-5 vegetation surveys even been done for the affected areas?) amphibians, fish and waterfowl are dependent on riparian habitat.

174-6 In this time of water shortages, I understand the irrigation district's wish for reliable sources, but damming and drilling in
174-7 a protected wilderness is both unlawful, and counterproductive. The town of Leavenworth prides itself on being a gateway to the Alpine Lakes, and has many tourism dependent businesses.

174-8 If the area's water needs cannot be met with water conservation strategies (which are barely given a hand wave in the
174-9 DPEIS), then look into building the full IPD pump station.

174-10 People come from around the world to visit the Alpine Lakes. Salmon depend on water from up stream, quality,
174-11 quantity, and timing. Icicle creek deserves better than being treated as an irrigation canal.

Thank you for your consideration,

Jana Hobbs
13506 NE 66th St
Kirkland, WA 98033

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From: Janna Treisman <janna.treisman@gmail.com>
Sent: Monday, July 30, 2018 9:58 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments: Icicle Strategy PEIS Alternatives

Box 1167
Fall City, WA 98024
janna.treisman@gmail.com
30 July 2018

Mike Kaputa
Director, Natural Resource Department Chelan County
411 Washington St, Ste. 201
Wenatchee, WA 98801
(509) 670-6935/ nr.iciclesepa@co.chelan.wa.us

Dear Mr. Kaputa:

I attended the informational meeting in Bellevue and the June 27 Public Hearing in Leavenworth, asked questions, studied exhibits at the Festhalle and read through IWG information online as well as the Draft PEIS.

I live and work on a 60 acre farm in the Snoqualmie Valley. I have a grasp of the complexity and thorniness of water issues and fish issues. I am an avid hiker and backpacker and over the years (I am 71) have spent many weeks in the Alpine Lakes Wilderness. I've camped at many lakes in the Icicle Creek basin, including Upper Snow Lake, Eightmile and a week at Lower Klonaqua (also hiking to Upper Klonaqua). I am a user of the resource and familiar with it.

175-1 I'd like to preface my comments with my puzzlement: storage water rights originate within the Alpine Lakes Wilderness, but I am not finding a clear determination by Ecology of the extent and validity of diversionary or storage water rights for the IPID or the Leavenworth National Fish Hatchery. Wilderness is a very special type of public land, and the extent
175-2 and validity of water rights is the heart of the issue at hand. Ecology needs to make the determination, public comment should then be taken on a revised PEIS.

175-3 It is misleading to refer to the lakes - lakes in the Alpine Lakes Wilderness!!! - as resevoirs. They are lakes within a national treasure of public lands, and must be considered as such, with protection for riparian areas and respect for Wilderness, which makes a huge contribution to the economy of the area.

175-4 Federal Wilderness law likely supersedes and may even extinguish certain IPID easements. State water law will play a
175-5 role in determining what proposed projects can and cannot be built. As it stands the PEIS does not adequately analyze limitations on the scope and validity of IPID's water rights. It is my understanding that IPID's water right were granted for irrigation. IPID does not have the right to use the water for other purposes such as the fish hatchery and Leavenworth's domestic and commercial needs due to projected growth.

175-6 The proposals in Alternative 4 are unacceptable, given that all of the lakes are inside the Alpine Lakes Wilderness (Upper and Lower Klonaqua - no tunnel!!) (Upper Snow Lake an Eightmile- no higher dams to artificially enlarge the lakes!!) I've walked across the old yet functional dam on Lower Klonaqua, but the idea of a tunnel or connection to Upper Klonaqua Lake is nuts - for starters, the IPID has no water rights on the upper lake, it would detrimentally alter the integrity of the lake environment... and the view! the incredible view in the heart of the Alpine Lakes Wilderness! no tunnel, no siphon, no drawdown!!

Comment Letter 175

175-7 Optimizing releases from the lakes, which also function as resevoirs because of being dammed, is a great idea, and I support modernization and automation, use of remote sensors and controlled seasonal releases. Because the projects
175-8 are in Wilderness, they are required to be done with the least impact to the Wilderness (not the least expensive way). This includes non-motorized access and largely non-motorized equipment. Hiring hiker/runners or scheduling volunteers to regularly visit the dams and make adjustments to release and monitor water levels and conditions is feasible. I was told that such a plan is being piloted this year. Good idea.

175-9 The cumulative impact of altering natural flow regimes of the riparian ecosystems in the Alpine Lakes Wilderness has not been adequately addressed and needs further study.

175-10 Aside from the plan to make the dam at Eightmile Lake higher and thus unnaturally enlarge the lake, I support the projects outlined in Alternative 5, the Full IPID Pump Station. For the long term it is the best solution. With the costs on
175-11 the other alternatives likely underestimated (given restrictions of Wilderness) and the bright future of cheaper alternative energy that could run the project, this one clearly makes sense.

175-12 Additionally, it was interesting to learn of efficiencies in hatchery management, the round pens and other innovations. Since the hatchery is such a huge user of the water, these changes are critical to meeting future water needs in the basin.

Thank you for your consideration.

Janna Treisman

--
Janna M. Treisman

"We simply need that wild country available to us, even if we never do more than drive to its edge and look in. For it can be a means of reassuring ourselves of our sanity as creatures, a part of the geography of hope."
- Wallace Stegner, the Wilderness Letter

Comment Letter 176

From: Jena Gilman <jena.gilman1@gmail.com>
Sent: Saturday, July 28, 2018 10:01 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Water Resources Management Strategy Draft Programmatic Environmental Impact Statement
Attachments: PastedGraphic-1.tiff

Mike Kaputa: Director
Chelan County Natural Resource Department
411 Washington Street., Suite 201
Wenatchee, WA 98801

Dear Mike,
I would like to offer the following comments on the Icicle Creek Water Resources Management Strategy (Icicle Strategy) Draft Programmatic Environmental Impact Statement (DPEIS):

176-1
- The fundamental problem with the DPEIS is that the Icicle Peshastin Irrigation District (IPID) simply does not retain the water rights necessary for implementing most of the projects listed in the DPEIS. By failing to exercise water rights over and above that which are already being used at places like Snow Lake, the irrigation district has forfeited the right to store or release more water from the Wilderness Area.

176-2
- With regard to the Eightmile Lake Storage Restoration impacts, the DPEIS pretty much skips over what will be the habitat, biological, recreation and aesthetic impacts from mobilizing heavy equipment to the site via a route parallel to Eightmile Trail. This must be addressed in the DPEIS because of the implications that allowing haul roads to be built in designated Federal Wilderness has for other projects in the DPEIS.

176-3
- With regard to Aesthetics, I object to the following statement in the DPEIS: "For example, if the Alpine Lakes Optimization, Modernization, and Automation project or the Eightmile Lake Storage Restoration project were to move forward as individual projects without input from a coordinated IWG, there might be less emphasis placed on making sure the infrastructure blends in aesthetically with the environment." Why would an individual agency's projects or actions be subject to any less professional execution AND public scrutiny as the projects envisioned by the IWG? You have made absolutely no case for this, thus there is no negative impact associated with the No Action alternative with regard to the Aesthetics criterion.

176-4
- In Alternative 1 - Eightmile Lake Storage Restoration, the statement that "….long-term aesthetic impacts associated with lake level changes are considered to be moderate but not significant." is just ridiculous. Whether the IPID still retains the right to raise the lake to "historical" highs is one thing, but the resulting re-established bathtub ring up to the "historical" high water mark and down to the new low water mark proposed will be aesthetically displeasing to recreational users of the lake and surrounding mountains. This is also true for Snow Lake in Alternative 4 where the desertifed lakefront will be increased by eight feet overall (plus five and minus three feet over existing conditions). I find the statement, "….the view would largely remain intact and have the same natural character." to be highly questionable. How does the Snow Lake bathtub ring have any "natural character"? Even at 30,000 ft. the bathtub ring around Upper Snow Lake is just plain ugly. And the IWG proposes to make it uglier.

176-5
- The aesthetics issue should also be addressed in the Recreation section, since obvious artificially-induced features such as the bathtub rings will reinforce to hikers that they are not making their way through a true wilderness, as envisioned in the Wilderness Act.

176-6
- As a global comment on the proposed mitigation measures for alternatives, you cannot include compliance with the terms and conditions of local, state, and federal regulations as mitigation. Regulations are established baseline requirements, not something to be counted as mitigation to justify the Icicle Strategy.

Comment Letter 176

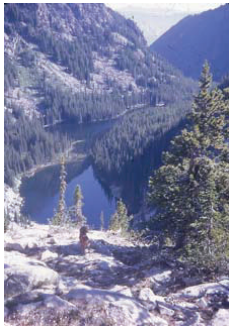
176-7
- Finally, the DPEIS Chapter 4.0 Impacts and Mitigation Measures is very difficult to read and poorly organized. Rather than organizing the impacts by category (i.e. Earth, Water Quality, etc) this chapter should be organized by Alternative and project/program within that alternative. In that way, the reader can more easily assess the overall and cumulative impacts of each of those projects/programs to Earth, Water Quality, etc. This would still be in compliance with SEPA and be more transparent.

176-8
- Because so much of the Icicle Strategy is focused on future domestic water supply for the City of Leavenworth and rural residents, it would make sense in a Programmatic EIS to address some fundamental questions about why a Federal Wilderness area, with significant national recreation and habitat values, should be negatively impacted when the local governments (Chelan County, in particular) have done such a poor job of land use and water resources planning. By allowing the proliferation of residential development in what were heretofore valuable timber and agricultural production areas, the County has engaged in rural sprawl to the detriment of the timber and agricultural industries as well as to the ability of local, State and Federal agencies to prevent and control wildfires. The Icicle Strategy is a formula for the rest of the state to subsidize the rural and suburban sprawl of Chelan County. It is not too late for Chelan County to address these problems, thus significantly reducing the 2050 residential water useage projections at the heart of the Icicle Strategy.

176-9
In conclusion, the best alternative by far is the No Action alternative. Under the No-action Alternative, various agencies and other entities may continue to undertake individual actions to restore and enhance fish and aquatic resources in the Icicle Creek Watershed project area, and those actions would not have to be part of an unwieldy over-sized program sponsored by the IWG. Actions implemented by individual agencies and entities could include construction of diversion improvements, irrigation system upgrades, LNFH improvements, and fish passage work and would be subjected to knowledgeable and enthusiastic public-spirited examination.

Thank you,
Jena F. Gilman
1480 SW 10th Street
North Bend, WA 98045

Larry the Dog enjoying a view of Nada and Hart Lakes, July 1970



Comment Letter 177

From: jjostad@everyactioncustom.com on behalf of Jeremy Jostad <jjostad@everyactioncustom.com>
Sent: Thursday, July 26, 2018 5:21 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

177-1 Please do not increase the size of any dams that would affect the Enchantment Wilderness. Increasing the size of these dams will not solve the ultimate problem in which you are proposing to try and solve. People need these lands for much more valuable assets. Thank you!

Sincerely,
Mr. Jeremy Jostad
211 W 6th St Cheney, WA 99004-1426
jjostad@ewu.edu

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Comment Letter 178

From: lilwolfj@everyactioncustom.com on behalf of Jessica O'Sell <lilwolfj@everyactioncustom.com>
Sent: Tuesday, July 31, 2018 7:42 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

178-1 I do not support this plan. The enchantments are an invaluable natural area that need to be preserved for future generations.

Sincerely,
Ms Jessica O'Sell
7602 NE 197th Ct Kenmore, WA 98028-2076 lilwolfj@yahoo.com

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Comment Letter 179

From: james.michael.perkins@everyactioncustom.com on behalf of Jim Perkins <james.michael.perkins@everyactioncustom.com>
Sent: Friday, July 27, 2018 2:10 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

179-1 The Alpine Lakes Wilderness is a unique and fragile wilderness area. Infrastructure development is vital to the growth of our nation, but we need to be judicious about how and where those projects take place. The current proposal does not appear to balance the needs of the public with the protection, management, and recreational use of the important wilderness area at the Enchantments.

179-2 I strongly encourage you to thoroughly explore other options.

Sincerely,
Mr. Jim Perkins
9058 Eagle Point Loop Rd SW Lakewood, WA 98498-1055 james.michael.perkins@gmail.com

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Comment Letter 180

From: Joan Frazee <je_frazee@hotmail.com>
Sent: Monday, July 30, 2018 1:01 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] comment on Draft PEIS for the Icicle Strategy

180-1 After reviewing the Draft PEIS, I am concerned that these proposed projects reflect the bias of demand for water and are less responsive to the natural resource side of the equation.

180-2 Certainly, there are efficiencies to be gained by proposed upgrades to antiquated systems e.g. installing pump stations and operating head gates remotely. However, it is a bit naive to assume that humans would no longer be needed for in situ trouble-shooting and quality control.

180-3 I am alarmed at the proposals in Alternative 4 which include construction of a new dam at Eightmile Lake, resulting in larger storage capacity and the inundation of 13.6 acres of wilderness with water, impacting shoreline vegetation and more at Eightmile Lake. This inundation would only occur for 1 month of the year but it seems the impacts would be longer lasting. The proposed enhancements for Snow Lakes, Square Lake, Colchuck Lake, Klonaqua Lakes — all in wilderness do not seem respectful to wilderness character.

180-4 The sections on wildlife and vegetation make no mention of noxious weeds which is a huge omission. The SEPA checklist under 4. Plants e. reads, "List all noxious weeds and invasive species known to be on or near the site." The response to this suggests that the PEIS includes the issue of noxious weeds, "The PEIS will provide information from Ecology's Aquatic Plant Monitoring GIS datasets and Chelan County's Noxious Weed Control Board's weed list."

Working as a professional botanist for the U.S. Forest Service for 18 years has made me painfully aware of the threat posed to native ecosystems by the invasion of noxious weeds. To analyze impacts of further disturbance to vegetation and wildlife habitat without mention of this threat seems radically remiss. My 9.5 years on the Wenatchee River District included partnering with the Wilderness Manager to address infestations of Canada thistle present in the Eightmile Lake area, likely spread/and perhaps introduced after the fires of 1994.

Thank you for this opportunity to comment.

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Comment Letter 181

From: budgetcyclerepairs@everyactioncustom.com on behalf of John Pollock <budgetcyclerepairs@everyactioncustom.com>
Sent: Tuesday, July 31, 2018 7:49 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

181-1 I think this project can have wide ranging impacts on the wilderness areas. Please consider an alternative, or just leaving it be.

Sincerely,
Mr John Pollock
1919 Rucker Ave Everett, WA 98201-2215
budgetcyclerepairs@yahoo.com

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Comment Letter 182

From: mkathleenhurley@everyactioncustom.com on behalf of Kathleen Hurley <mkathleenhurley@everyactioncustom.com>
Sent: Monday, July 30, 2018 7:41 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

182-1 The size and scope of these projects contraindicates the Wilderness Act of 1964, which prohibits roads, vehicles or
182-2 permanent structures are allowed in designated wilderness. The proposed activities will undermine the recreational value of this unique place in the Cascades.

182-3 We oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:
- Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
- Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
- Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

182-4 We support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes.

Sincerely,
Ms. Kathleen Hurley
5329 46th Ave S Seattle, WA 98118-2315
mkathleenhurley@gmail.com

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Comment Letter 183

From: Kathi Rivers Shannon <kathirshannon@gmail.com>
Sent: Monday, July 30, 2018 7:13 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Comments on Icicle Strategy Draft EIS

Thank you for the opportunity to comment on the alternatives proposed by the Icicle Work Group concerning dams in the Alpine Lakes Wilderness.

183-1 I have attended several meetings during the course of the group's work, including the public meeting in Leavenworth that presented five alternatives. From input the group has received, I had expected at least one alternative that seriously addressed wilderness concerns. Protecting wilderness should be part of the guiding principles, not just a statement stating work should comply with wilderness acts. The environmental review, as presented at the public meeting, does not include an assessment of how any of the alternatives will affect wilderness. Legal questions remain, as noted in comments submitted by conservation groups.

183-2 Alternative 4 is the least acceptable, as it includes drilling a tunnel to drain water from Upper Klonoqua Lake and enhancements to Eightmile Lake, the Snow Lakes, and upper Klonaqua Lake.

183-3 Because there is not a viable alternative, no action should be taken until a full review has been completed and legal questions addressed.

Kathleen Shannon
313 Olive Street
Cashmere, WA 98815

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Comment Letter 184

From: Mike Kaputa
Sent: Friday, July 27, 2018 10:29 AM
To: Mary Jo Sanborn
Subject: FW: Public comment

From: Kathleen Ward [mailto:kathywardsmail@gmail.com]
Sent: Thursday, July 26, 2018 11:48 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Public comment

184-1 It's quite a challenge for the average citizen to get a thoughtful handle on IWG's proposed alternatives. The benefits of more water in the Icicle are numerous and compelling; not as clear are potential negative outcomes. Particularly, just what would be the "costs" to the wilderness areas? How valid are the objections of the ALPS? What would it take for the good minds in that group to work with the good minds in IWG?
I feel certain you have not failed to consider the many state and federal regulations, agencies, hoops, etc., as suggested by ALPS, but also suspect some of their concerns are legitimate. My overall view is that the public needs more assurance of "no harm done" to the Alpine Lakes and involved waterways before backing any of the alternatives.

184-2 It is difficult for me to support any alternative that makes way for more tourism buildup in Leavenworth. What would having access to more water mean? I'm sure there is a tipping point at which "bigger and more" reduce the appeal and economic success of our community. Perhaps we are already there. Even with traffic problems managed--and we are a long way from that--Leavenworth decision-makers would be wise to focus on quality over quantity. (And they could talk to Dick Rieman about a fascinating idea he once had for growth management.)

Best wishes. Kathleen Ward

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Comment Letter 185

From: Kathy Haviland <kmhaviland@fastmail.com>
Sent: Friday, July 27, 2018 8:40 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] DPEIS Icicle Creek

185-1 I am opposed to any alteration of the wilderness area addressed on the DPEIS in question.

185-2 The Alpine Lakes – particularly the Enchantments Basin, is one of the nation's more popular wilderness destinations and attracts people from around the world. With 615 miles of trail (including a section of the Pacific Crest Trail), world-class climbing, hiking and backpacking, and 400,000 acres of spectacular mountain scenery and lakes, the area is beloved by recreationists and is an important contributor to the regional recreation economy.

It is essential we keep this wilderness area preserved as it is.

I am not a user of the wilderness as many of my friends are yet I understand the importance of keeping this area as a preserved natural wilderness that contributes to the health of the eco-system and the wildlife in the region. Once the area is altered, the consequences will be multiple to health of the landscape over time.

Thank you,

Kathy Haviland

Olympia, WA

Comment Letter 186

From: kelsiemaney@everyactioncustom.com on behalf of Kelsie Maney <kelsiemaney@everyactioncustom.com>
Sent: Monday, July 30, 2018 9:47 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

186-1 Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: Please maintain a wild and scenic alpine in the Enchantments and abort dam proposals that would impact this Washington State recreation treasure.

Sincerely,
Ms Kelsie Maney
1401 SW 120th St Burien, WA 98146-2626
kelsiemaney@gmail.com

Comment Letter 187

From: kevin@team-farrell.com
Sent: Friday, July 27, 2018 1:17 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Written Comments: Icicle Strategy PEIS

From:
Kevin Farrell
July-27, 2018
7496 Icicle Rd, Leavenworth, WA 98826
509-548-0815
kevin@team-farrell.com

Comments:

187-1 The goal of the Icicle Creek sub basin strategy should be to prioritize optimal in-stream flow for the benefit of aquatic and riparian habitat so the natural state of flora and fauna remain healthy for years to come. A side benefit is that recreation would benefit from reliable flow, though recreation is less important than creek health. It is okay for out-of-stream water use to suffer occasionally to ensure the creek itself remains vitally healthy.

I live on 5 acres on Icicle Road, near the fish hatchery, and I visit Icicle Creek year-round. I'm aware of the diversion dams, water mains, and irrigation ditches that crisscross this area. Like my neighbors, I get all my water from a private well even though city water main and irrigation water are only about 100 feet from my house. I consider myself a stakeholder in this environmental review, and I've followed issues with domestic water, irrigation, and dams in the Icicle Creek basin for a long time. My interest in the footprint areas of this environmental review goes back decades. Also, my dad helped design the Wenatchee River irrigation dam at Dryden, and we've discussed the perspectives and traditions from his era and before.

187-2 Many traditions are based on people's memories, beliefs, and customs, and they aren't always correct. It's worthwhile to understand those traditions, but for the sake of this environmental review, it's necessary to break from tradition in order to ensure the future water draw on the Icicle watershed is sustainable. The changes need to be done with purpose and care and backed by science, not tradition.

187-3 At this time, I do not favor or oppose any of the 5 alternatives, with the exception of alternative 4, which I completely oppose.

187-4 I support Alpine Lakes reservoir automation, but only if implemented with hand tools. It makes sense to add modern remote equipment that will allow efficient release of water, but only if it can be done in the same ethic that all other wilderness work is done, without bringing in mechanized construction equipment or making dramatic changes in the wilderness.

187-5 The Alpine Lakes Wilderness (or any designated wilderness lands) should not be used as a source for additional (new) water storage in keeping with the purpose for lands that have been set aside to remain wild. Thousands of people hike up there every summer and are completely unaware that the lakes are altered. Let's not ruin their experience. These lakes are in the heart of a very desirable wilderness, so whatever happens there will get a lot of attention. It is a place where nature is supposed to take its own course. A bulldozer there would make everyone agitated, as the excavator did in the Spring of 2018 at Eight Mile Lake. Additional water volumes can be taken elsewhere.

187-6 Furthermore, it is not necessary to increase reservoir volumes in the Alpine Lakes Wilderness. The reports show other ways to increase domestic and agricultural water supplies. Pumping water up and into the irrigation ditches is an example.

Comment Letter 187

187-7 The plan to draw from downstream rivers and pump water to the irrigation canals seems good, however, that plan needs further development. I would like to see a developed plan that identifies the fine details about where, when, and how the water will be moved. The plan shouldn't add new dams because that would defeat the purpose of the project,

187-8 which is to increase in-stream flow. Removing existing dams needs to be considered, because removing dams is in-line with the purpose of the project.

187-9 The effects of global warming and increasing domestic water demand will come slowly, so there is no need to construct in haste. It is more beneficial to wait for more data to arrive and vindicate the alternatives than to rush into construction. I am delighted to see the environmental data, and I hope there is ongoing data collection. Ongoing

187-10 studies would confirm the baselines and justify the changes that are occurring to water volumes and habitat. Efforts to share this data with the laymen (public outreach) is beneficial for community appreciation of the creek and fosters a culture of understanding in the project.

Comment Letter 188

From: kylekohlwes@everyactioncustom.com on behalf of Kyle Kohlwes <kylekohlwes@everyactioncustom.com>
Sent: Saturday, July 28, 2018 10:58 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

188-1 Don't touch The Enchantments or it's water! Wilderness areas are special and further human actions in them perminately alters the landscape and the animals that live in it. We need to look at other solutions to the water problem in the area.

Sincerely,
Mr Kyle Kohlwes
7345 NE 175th St Kenmore, WA 98028-3560 kylekohlwes@gmail.com

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Comment Letter 189

From: Lael White <laelcwhite@gmail.com>
Sent: Monday, July 30, 2018 12:43 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] PROTECT ALPINE LAKES

189-1 Please protect the Alpine Lakes Wilderness area. Best option: Leave it alone. This area is a shared natural resource that must be protected. It is one of our nation's popular wilderness destinations and attracts people form around the world, especially to the Enchantments Basin.
Lael White
WA State
32nd LD
Environment and Climate Caucus

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Comment Letter 190

From: Laurence Leveen <Laurence.Leveen.92535961@p2a.co>
Sent: Friday, July 27, 2018 6:42 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

190-1 Please remove the projects from the Icicle Creek water strategy plan that might harm the Alpine Lakes Wilderness.

190-2 Specifically, the plan's projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake, and projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

190-3 Everything practical should be done to reduce water consumption rather than rely on projects to increase the water
190-4 supply. Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Laurence Leveen

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Comment Letter 191

From: Lisa Bellefond <Lisa.Bellefond.124312115@p2a.co>
Sent: Friday, July 27, 2018 4:02 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

191-1 Please re-evaluate and later this project to not impact the Enchantments and wilderness areas I visit Chelan County for vacations and to engage in outdoor reaction including the areas in the Enchantments that could be affected by this water project. I visit friends, shop and dine in Chelan which brings income to local businesses. Please value the input of visitors like me when you make decisions for this project.

Regards,
Lisa Bellefond

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Comment Letter 192

From: Marjorie Fields <mvfields@me.com>
Sent: Monday, July 30, 2018 5:14 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] protect Alpine Lakes and the Enchantments

192-1 PLEASE protect this special place. Do NOT let the lakes be damaged for any reason.
Marjorie Fields

Comment Letter 193

From: mgricken@everyactioncustom.com on behalf of Mathias Ricken <mgricken@everyactioncustom.com>
Sent: Sunday, July 29, 2018 8:23 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

193-1 I am concerned about the large changes being proposed for the Enchantments area. This area is a true gem for thoughtful outdoor recreation. It needs to be managed carefully, and I wholeheartedly support the protections already in place, as part of being a Wilderness, as well as the sections of the proposed strategy pertaining to habitat protection
193-2 and enhancement projects, fish passage, fish screening, and water conservation efficiencies.

193-3 The increased sizes of the Eight Mile and Snow Lakes dams trouble me, though. The camp sites and trails along these lakes are gateways to the experiences of the Core zone, an area of unparalleled beauty; and provide a reprieve from the highly trafficked trails in the state.

193-4 I cannot support actions that put these trails and camp sites at risk. I urge you to reconsider those destructive portions of your plan.

Sincerely,
Dr. Mathias Ricken
407 B NW 101st St Seattle, WA 98177-4936 mgricken@gmail.com

Comment Letter 194

From: meg.johnson815@everyactioncustom.com on behalf of Megan Johnson <meg.johnson815@everyactioncustom.com>
Sent: Monday, July 30, 2018 5:52 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

194-1 This is a wilderness area and should be protected as such. Increasing the size of the dams will alter the landscape significantly, which is an unprecedented action in a wilderness area. Why designate something as wilderness if the protections mean nothing? I'm sure another solution can be reached to get enough water to the Leavenworth area without destroying the protections of a wilderness area. I've camped on the shore of Upper Snow Lake and it was one of the most beautiful places I've ever been. I would hate for it to be gone in the near future.

Sincerely,
Mrs. Megan Johnson
1344 SE Boise St Portland, OR 97202-3945 meg.johnson815@gmail.com

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Comment Letter 195

From: missmeghanyoung@everyactioncustom.com on behalf of Meghan Young <missmeghanyoung@everyactioncustom.com>
Sent: Monday, July 30, 2018 4:15 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

195-1 I urge against this plan. It will destroy pristine sites that allow folks to experience this wild place in a unique way. It has the potential to damage the local habitat beyond repair. It will set a dangerous precedent. We can't let this happen here.

Sincerely,
Ms Meghan Young
4430 Phinney Ave N Seattle, WA 98103-7104 missmeghanyoung@gmail.com

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Comment Letter 196

From: weinberg4@everyactioncustom.com on behalf of Michael Weinberg <weinberg4@everyactioncustom.com>
Sent: Monday, July 30, 2018 11:05 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

196-1 The Enchantment lakes region is one of the most iconic and incredible natural places in the Pacific Northwest. Any plan to alter or destroy this area would be terrible for the generations to come who will be robbed of the chance to enjoy this beautiful area.

Please do not execute any plan to alter or destroy this area. Please consider other solutions to this issue that would not include further flooding of the enchantment lakes area.

Sincerely,
Mr Michael Weinberg
813 N Steele St Tacoma, WA 98406-7813
weinberg4@gmail.com

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Comment Letter 197

From: crimbo19@everyactioncustom.com on behalf of Mitchell McCommons <crimbo19@everyactioncustom.com>
Sent: Saturday, July 28, 2018 8:06 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

197-1 As resident of this state, an avid user of our public lands, and a lover of designated wilderness areas I believe this proposals to be very much in the wrong direction. I understand the need for water supplies tongrowing communities, especially during this period of climactic uncertainty, but imperialling the single most popular wilderness in the state is the wrong solution. I urge you to consider alternate means of achieving the desired water planning. Thanks for your time.

Sincerely,
Mr Mitchell McCommons
9715 S 248th St Kent, WA 98030-4834
crimbo19@excite.com

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Comment Letter 198

From: mcharpentier@everyactioncustom.com on behalf of Monica Charpentier <mcharpentier@everyactioncustom.com>
Sent: Monday, July 30, 2018 5:40 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

198-1 I am concerned that several of these measures could have a horrific and lasting impact on this pristine environment:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.

Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.

Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

Please do NOT allow the above measures to pass.

Sincerely,
Dr. Monica Charpentier
436 NE Maple Leaf Pl Unit C Seattle, WA 98115-8615 mcharpentier@gmail.com

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Comment Letter 199

From: Nancy Zahn <zahngoat@gmail.com>
Sent: Tuesday, July 31, 2018 10:45 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] alpine lakes wilderness area

199-1 I am writing to insure that the Apine Lakes Wilderness is maintained in its current, beautiful condition. There should be no further damming or water removal from any of these valuable lakes.

The Alpine Lakes Wilderness is a region of unparalleled beauty that must be protected. It is one of Washington's most popular wilderness areas and attracts people from all around the world, this is particularly of the Enchantments Basin, known for its competitive permit lottery system. This popularity supports the strong tourism and outdoor recreation industries that support the economies of communities throughout the region.

199-2 The DPEIS does not consider legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes IPID's easements supersede federal wilderness law, which is incorrect. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

199-3 Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. These projects are unprecedented in the National Wilderness System. These projects were not part of the proposed action in the SEPA scoping conducted by IWG in 2016, so the public was not provided an opportunity to comment on them during scoping. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to ALPINE enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

199-4 All of the proposals are too harmful, even the least harmful (alternative 5) includes the harmful and defective "Eightmile Restoration Project". An alternative needs to be included that includes the good parts of alternative 5 (the full IPID pump station) and discards the " Eightmile Restoration Project"

199-5 The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by
199-6 the U.S. Forest Service and must comply with the National Environmental Policy Act (NEPA) and other federal and state laws.

199-7 The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the DPEIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the DPEIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides. An alternative should also be included that includes the complete removal of the Eightmile dam.

199-8 IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

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Comment Letter 199

199-9 For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). SEPA is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

199-10 Because the projects are in Wilderness, non-motorized access and non-motorized equipment (i.e. hand tools) and traditional skills should be required. Since the dams were originally built that way, no motorized equipment or access methods should be used.

199-11 The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed unnaturally timed releases of water from lakes, which alters stream hydrology. The DPEIS generally fails to recognize that altering the natural flow regime can degrade a stream's physical and chemical properties, leading to loss of aquatic life and reduced aquatic biodiversity. I am concerned that IWG has not done adequate sampling and monitoring of impacts from past releases into these wilderness streams, including cumulative impacts.

199-12 Conservation components in the DPEIS are insufficient. They need to be expanded to significantly reduce demands on Icicle Creek's water, thereby allowing its watershed to function more naturally. This will better support our region's livability and economy over the long-term.

199-13 an alternative should be added that includes the complete removal of removal of structures at the lakes so that they can be restored to a completely natural state.

199-14 The DPEIS should be revised to address the above deficiencies. A Revised Draft PEIS should be released for public comment.

Comment Letter 200

From: neteolsen@olsenviolins.com
Sent: Sunday, July 29, 2018 11:59 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Water Resource DPEIS Comment
Attachments: IWG DPEIS Comment Letter 072918 Olsen.pdf

Director Kaputa,

Please see my attached comment letter regarding the Icicle Creek Water Resource DPEIS.

Regards,

Nete Olsen

Comment Letter 200

Comment Letter 200

Nete Olsen
836 NW 61st St
Seattle, WA 98107

July 29, 2018

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: **Comments on Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Water Resource Management Strategy**

Dear Director Kaputa:

Thank you for the opportunity to provide comments on the Draft Programmatic Environmental Impact Statement (DPEIS) for the Icicle Creek Water Resource Management Strategy. Having followed this process since the scoping process in 2016, I am disappointed to see that the concerns that were brought up in the scoping process have not been suitably addressed in this stage of the process, and that additional (and more egregiously damaging) elements have been introduced since scoping that were specifically and deliberately not included in the scoping process. My specific comments are presented below.

200-1

The Alpine Lakes Wilderness Area is a natural treasure for Washington State residents. The Alpine Lakes are a travel destination for people on a local, national, and international scale. They are protected through federal law, to be managed for the benefits of future generations to continue to experience and enjoy. I have been an avid hiker into the Alpine Lakes Wilderness throughout my entire life, and have spent an innumerable amount of time in the Icicle Creek valley: hiking, camping, backpacking, and spending my travel dollars in the cities in the area, particularly Leavenworth. This place is precious, unique, and irreplaceable. Changes made through human impacts are clearly seen and felt, and losses of the wild lands due to these impacts are irreversible. The arrogance of man to make changes to this natural system has led to the challenges currently encountered in the basin, and it is only with a clear and fully developed plan that we should be considering additional changes. The DPEIS in it's current form is not a clear and fully developed plan.

200-2

Water Rights: It is not clear how the Icicle Working Group thinks that they have the rights to reallocate water rights within the Icicle Creek basin from the IPID to other water users in the area, or even to increase the water "take" after a clear relinquishment of unused water. Under Western water law, water rights holders must use the water or risk to lose it, simply phrased as "use it or lose it." The condition of IPID's water infrastructure in the Icicle basin shows that in its near 80 years of operation, IPID has not maintained its facilities to actually store and use its full water right. Therefore, if the Eightmile Lake dam is rebuilt, it should remain at its current elevation, where it has been since at least 1990. Furthermore, any dam rebuilding must be approved by the U.S. Forest Service and must comply with the National Environmental Policy Act (NEPA) and other federal and state laws. These points also apply to the U.S. Bureau of Reclamation and the U.S. Fish & Wildlife Service in connection with new storage proposed at Snow and Nada Lakes.

200-3

200-4

Additionally, it is unclear how these water rights are something that IPID can alter and/or "hand off" to other users. The IPID has water rights for irrigation—they can't just change the water rights from irrigation water to residential water, let alone hand it off to the City of Leavenworth or the Hatchery.

200-5

It is clear for these exact same reasons that IPID has no rights to the water in the Upper Klonaqua Lake, and it is ridiculous for the DPEIS to even present this as a valid alternative. And as a matter of fact, during the initial presentations given to concerned citizens in the Seattle area on March 30, 2016, I specifically asked about the inclusion of the Upper Klonaqua into the project as well as the raising of the dam at Eightmile Lake, and the presenters told the group that NEITHER of these elements were going to be included in the project. For that reason, the Upper Klonaqua and the increase in dam height of Eighmile were not included in any of the objections that I presented during the scoping phase of the project. This illustrates the absolute inadequate (and potentially deliberately misleading) process that this project has undergone, and that the DPEIS process is wholly insufficient to this point.

200-6

Alternatives Inadequate: The alternatives presented in the DPEIS are inadequate, and do not present a wide enough range of valid alternatives from which to draw from.

200-7

Alternative 4 is not a valid alternative. For the reasons described above (Water Rights), the act of drilling a tunnel between Lower and Upper Klonaqua Lakes absolutely invalidates this as a reasonable alternative. The additional consideration of increasing the height of the dam at Eightmile only reinforces this position. Again, as discussed above, the IPID has never maintained its facilities to use the water rights to Eightmile, relinquishing their rights by this time. Additionally, IPID has no rights to hand off this water to other users in the basin.

200-8

None of the alternatives include the alternative scenario where a new dam built at Eightmile remains the same height as the current dam. This lack of a reasonable consideration of such a concept illustrates that the alternatives presented were not fully developed. This option of "restoration" at Eightmile must be included in the alternatives.

200-9

Comment Letter 200

200-10 **Costs:** The alternatives presented in the DPEIS do not fully consider the associated costs. Clearly, construction work within a Wilderness Area will be expensive and time-consuming. Non-motorized access and equipment should be the norm, and these methods generally cost more and take longer time. The costs presented also do not take into account any potential litigation costs associated with the most egregious alternatives. There is a strong sense of protectionism that is evident in the environmental community towards this area, and any alternative that does not take this into strong consideration is barreling towards litigation. This takes time and money as well.

200-11 **Conservation:** The conservation components in the DPEIS are absolutely insufficient. The water usages of the basin, both in irrigation but specifically in residential use, needs to be metered, measured, and reduced. What are the current daily uses in the district? What are the targets? How will these targets be met?

200-12 **Conclusions**: The DPEIS in it's current condition is insufficient. For all reasons described above, I would request the Icicle DPEIS be withdrawn, revised, and re-released as a Revised Draft PEIS for public comment once the deficiencies detailed here are addressed.

Sincerely,

Nete Olsen

Comment Letter 201

From: Patrick Conn <Patrick.Conn.31569736@p2a.co>
Sent: Thursday, July 26, 2018 2:36 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Don't sacrifice wilderness for flawed Icicle Strategy

Dear Director, Chelan County Natural Resource Dept. Mike Kaputa,

201-1 This "TRUMP-FACED-REPUBLICAN PARTY CULTISH FRAUD OF AN "ADMINISTRATION" continues its UNCONSCIONABLE, SYSTEMATIC ASSAULT ON AMERICA'S PUBLIC PARKS, WILDERNESS, LANDS, WATERS, and AIR BY ITS UNRELENTING RAPING, PILLAGING, PLUNDERING, and OUTRIGHT THEFT BY 1%'er PRIVATE PARTIES AND CORPORATIONS IS SOCIALLY SICK and OUTRIGHT DOMESTIC TERRORISM, IF NOT TREASONOUS.
DO NOT CONTINUE TO ALLOW THIS SELF-SERVING REPUBLICAN ANTI-SOCIAL, ANTI-AMERICAN, ANTI-ANYTHING THAT AIN'T WHITE, RICH, AND ALREADY THEIRS.

Regards,
Patrick Conn
22018 126th Ct SE
Kent, WA 98031

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Comment Letter 202

From: re.re.heitz@everyactioncustom.com on behalf of Rachel Nunez <re.re.heitz@everyactioncustom.com>
Sent: Monday, July 30, 2018 5:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

202-1 I believe designated Wilderness is a core tool in protecting the outdoor experience. Wilderness areas include some of our most beloved areas for hiking, climbing, scrambling, and backcountry skiing. The designation protects the wildlife habitat that makes our outdoor adventures so special.

202-2 I oppose the following projects in the proposed strategy, as they would impact landscapes valued by outdoor enthusiasts:

Increasing the size of the dam on Eightmile Lake, which could flood the Eightmile Lake trail and some campsites around the lake.
Increasing the size of the dams on Upper and Lower Snow Lakes, which would raise the level of the lakes and will likely flood the trail and campsites around the lake.
Boring a tunnel from Upper to Lower Klonaqua Lakes, which would likely have significant negative impacts to the land surrounding the lakes.

202-3 I support the sections of the strategy pertaining to habitat protection and enhancement projects, fish passage, fish screening and water conservation efficiencies. We wholeheartedly believe that these conservation elements are foundational to the outdoor experience and in protecting these landscapes

Sincerely,
Mrs. Rachel Nunez
9205 139th Ave NE Lake Stevens, WA 98258-8855 re.re.heitz@gmail.com

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Comment Letter 203

From: raechel.youngberg@everyactioncustom.com on behalf of Rachel Youngberg <raechel.youngberg@everyactioncustom.com>
Sent: Monday, July 30, 2018 1:24 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

203-1 I do not believe that the proposed expansion of dams on Eightmile, and Lower and Upper Snow Lakes should occur. I also do not believe that the tunnel between upper and lower Klonaqua lake should take place. These operations would
203-2 negatively impact the flora, fauna and water quality of the area. These operations would also negatively damage the
203-3 North Central Washington economy that is largely dependent upon wilderness tourism. The expansion of the dam system and the tunnel in the Enchantments would negatively impact the Leavenworth and Wenatchee economy. I live in the Methow Valley and our economy is intricately intertwined with Leavenworth, Wenatchee and Chelan. These dams and the tunnel system would devastate our economy.

Sincerely,
Hon. Rachel Youngberg
291 MARMOT BENCH Ln Twisp, WA 98856
raechel.youngberg@gmail.com

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Comment Letter 204

From: Richard Curtis <rlc314@peoplepc.com>
Sent: Sunday, July 29, 2018 10:29 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Alpine Lake Wilderness and the Enchantment Lakes

Mike Kaputa
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801

Dear Mr. Kaputa:

The Enchantment Lakes and the Alpine Lakes Wilderness Area are one of the most spectacular natural areas in Washington State. In fact the area is so popular with tourists and heavily visited that the number of visitors in the backcountry is controlled by a permit system. The area is graced with outstanding scenic and compelling natural features that rival those anywhere on earth. There are pristine crystal clear blue lakes with a spectrum of colors only hoped for by the most creative artists. The lakes are surrounded by sheer walls of granite and snow filled couloirs. The forests are composed of fir, pine and larch, the latter turning to golden towers in the fall. The streams and waterfalls are unmatched and provide a peaceful oasis for anyone who visits this magnificent Wilderness Area.

204-1 The Alpine Lakes Wilderness is a very special place created by God and can not be improved by installing an unsightly man made plumbing system to serve a remote industrial/agricultural complex, golf courses and residential development. The Enchantment Lakes and the Alpine Lakes Wilderness were preserved for a reason and that was to specifically protect the area from development. Wilderness areas were set aside to remain "untrammeled" by civilization. However the once beautiful Snow Lakes are now an eyesore and the poster child for careless development due to the dams and tunneling activities. Replacing the natural Wilderness characteristics with concrete dams, rebar and spillways, fluctuating water levels and devastated shorelines, alternating drowned or mud flat landscapes and tunnels and pipes that create hazards and scar the land is a Faustian fantasy that has no place in Wilderness Areas. The resulting drained lakes are not only ugly but impact fish, birds and other wildlife and are an abomination to the observer and have no place in Wilderness Areas.

204-2 The very real outcome of developing the Alpine Lakes Wilderness and Enchantments will be to kill the goose that lays the golden egg of tourism. No one travels miles just to see another man made concrete hulk blocking or diverting a natural waterway. While tourism is increasing and becoming more economically rewarding every year, agriculture and development are limited by the resources available to support them. For example when all the lakes are drained to support agriculture and development, where will more lakes be found to support continued agriculture and development growth. If we are unable to live within the available resources, how will we survive when those resources are used up?

204-3 Climate change is already having a detrimental effect on the existing natural resources and we cannot plan on those resources being replenished once they are depleted. We must start looking forward to the future with thoughtful minds and put away the dream of yesterday's unending frontiers. We are unlikely to find Nirvana on earth with unlimited resources for never ending growth and development simply by tapping into and draining the small lakes and streams in our Wilderness Areas. Just like cancer, growth on a finite planet must and will come to an end. It is up to us to ensure we live within the bounds of our environment and surroundings and use wisely the resources with which we are blessed if we hope to be successful in fulfilling not only our dreams but those of our children and all future generations of humans. It is unconscionable for our generation to despoil

204-3 one of God's finest creations to satisfy our greed. Industrializing the Enchantment Lakes and the Alpine Wilderness Area is not just killing the goose but destroying the eggs and the nesting habit to ensure that it will never again produce another golden egg. Leavenworth will be just another tourist trap once the surrounding Wilderness is plundered and reshaped to conform to the desires of greedy developers.

204-4 While I support habitat protection, fish passage, screening and water conservation projects, I am strongly
204-5 opposed to more and larger dams and tunneling projects in the Alpine Lakes Wilderness on Snow, Eightmile and Klonaqua Lakes. The adverse environmental impact of previous projects is clearly visible to the most casual observer. However these areas are far more valuable to support the economy based on tourism and
204-6 recreation than a limited source of irrigation water continued urban development.

Thank you for considering my comments.

Richard Curtis
PO Box 451
Ethel, WA 98542

This email has been checked for viruses by Avast antivirus software.
www.avast.com

Comment Letter 205

From: Richard Forbes (rhforbes24@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Monday, July 30, 2018 8:20 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Save the Alpine Lakes Wilderness!

Dear WA Department of Ecology and Chelan County Officials,

205-1 In response to the potential plans to in the Enchantment Basin and greater Alpine Lakes Wilderness - I understand that Icicle Creek's flows need to addressed, but we cannot degrade or undermine our public lands in any way.

205-2 I treasure the Alpine Lakes Wilderness as a precious part of the greater Cascades, and I urge you to avoid, if at all possible, any actions that would damage it. The draft Environmental Impact Statement lays out five options for dam repair and operation in the established Wilderness area, and I urge you to revise these options until there are none that impact the functioning of the watershed, enlarge wilderness lakes, or involve invasive tunneling/large- scale construction.

205-3 I also would like to call into question the Leavenworth Hatchery, which has been cited as a reason for the increased water flow - hatcheries have been empirically proven to be pseudoscientific and contribute to native fish population decline. Let's look there before we start talking about messing with our Wilderness areas.

205-4 We must continue to protect the Alpine Lakes Wilderness, as it is an essential part of our American heritage and provides important wildlife habitat and essential ecosystem services. Please contact me if you have any questions.

Sincerely,

Richard Forbes
1613 N 54th St
Seattle, WA 98103
rhforbes24@gmail.com
(719) 231-4868

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 206

From: Richard Forbes <rhforbes24@gmail.com>
Sent: Monday, July 30, 2018 8:27 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] In response to the Enchantment Basin plans

Dear Mike Kaputa,

In response to the potential plans in the Enchantment Basin and greater Alpine Lakes Wilderness - I understand that Icicle Creek's flows need to addressed, but we cannot degrade or undermine our public lands in any way.

I treasure the Alpine Lakes Wilderness as a precious part of the greater Cascades, and I urge you to avoid, if at all possible, any actions that would damage it. The draft Environmental Impact Statement lays out five options for dam repair and operation in the established Wilderness area, and I urge you to revise these options until there are none that impact the functioning of the watershed, enlarge wilderness lakes, or involve invasive tunneling/large- scale construction.

I also would like to call into question the Leavenworth Hatchery, which has been cited as a reason for the increased water flow - hatcheries have been empirically proven to be pseudoscientific and contribute to native fish population decline. And to top it off, the Leavenworth Hatchery has been formally found in violation of unlawfully discharging pollutants, and whose facilities have not been updated in decades. Let's address those concerns (and potentially decrease the Hatchery's water use) before we look to the Wilderness areas to put extra water into a flawed system.

We must continue to protect the Alpine Lakes Wilderness, as it is an essential part of our American heritage and provides important wildlife habitat and essential ecosystem services. Please contact me if you have any questions.

Best,
Richard Forbes

Comment Letter 207

From: Rich Haydon <richhaydon@hotmail.com>
Sent: Sunday, July 29, 2018 10:07 AM
To: NR Icicle SEPA
Cc: wild@wildernesswatch.org
Subject: [Icicle SEPA] RE: Comment on DPEIS

To: Mike Kaputa, Director
Chelan County Natural Resource Department.

Mr. Kaputa:

I am writing in regards to the proposed actions in the Icicle Creek drainage.

As a resident of Chelan County and the Wenatchee River Watershed, as a person who recreates in the Alpine Lakes Wilderness, and as someone who has personally visited and camped at Snow, Nada, Colchuck, Eightmile, Klonaqua, and Square Lakes, I am a person directly impacted by the proposed action.

207-1 The DPEIS as written is clearly inadequate and only superficially addresses potential impacts of the proposed action, and is therefore insufficient as an analysis under the requirements of the National Environmental Policy Act.

207-2 (1) The DPEIS should be revised and greatly expanded in scope and detail to address its deficiencies as an environmental impact analysis. An adequate analysis must include actual field surveys and the backing of data and analysis done to a professional scientific standard not met by the draft document as released. Impacts to wildlife, forest health, riparian health, and impacts to the wilderness character of the area as defined by federal law are all lacking in necessary site specific detail.

207-3 (2) The document is also fundamentally flawed in the vagueness of the proposed action: until more detailed geotechnical surveys and concrete engineering designs are

207-3 completed, it is impossible to adequately assess the potential impacts of this proposed action in terms of long term public safety and environmental consequences.

207-4 (3) The DPEIS fails to conform with the Alpine Lakes Area Land Management Plan of 1980, and therefore conflicts with a completed Environmental Impact Statement which did fully meet the established standards of NEPA and all other applicable Federal and State laws. It also broadly fails to meaningfully consider fundamental legal issues that should determine which proposals can and cannot be pursued, including Federal wilderness, environmental policy, and forest management law. The draft analysis also

207-5 fails to conform to state water right laws and to established legal rights held by the Yakama and Wenatchee tribes.

207-6 (4) As written, only Alternative 5 is somewhat legally defensible, and the Alternatives in the current document can hardly be considered to constitute consideration of a full range of alternatives as required under NEPA. Even Alternative 5 would need modification were it to be considered for implementation, as it is erroneous in its consideration of historic water levels, established water rights, and Federal wilderness legislation relative to Eightmile Lake.

207-7 I urge you to withdraw the current DPEIS, and to develop a proposed action and analysis that conforms to Federal and State law and properly addresses the environmental, social, and public safety issues that such a project is legally required to consider.

Thank you.

Richard J. Haydon
PO Box 632
Leavenworth, WA 98826

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Comment Letter 208

From: Richard Korry <Richard.Korry.98192317@p2a.co>
Sent: Monday, July 30, 2018 10:19 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

208-1 I want to make raise concerns with the sections of the proposal that irrevocably impact and degrade the iconic areas of wilderness in the Central Cascades. The Enchantments is an amazing and unique high alpine area that I've been hiking since 1983. This is not just another forested area that you one can find anywhere. The other areas affected: 8 Mile Lake and Upper and Lower Klonaqua Lakes are also very special locations. Please remove the projects that degrade these treasures from the draft plan.

208-2 The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

208-3 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Richard Korry

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Comment Letter 209

From: Richard Noll <Richard.Noll.53600024@p2a.co>
Sent: Friday, July 27, 2018 10:58 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Don't sacrifice wilderness for flawed Icicle Strategy

Dear Director, Chelan County Natural Resource Dept. Mike Kaputa,

209-1 9543

Regards,
Richard Noll
124 Trafalgar Dr
Port Townsend, WA 98368

1

From: RICHARD RUTZ <richardr1066@comcast.net>
Sent: Friday, July 27, 2018 10:19 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] comments on the Icicle Strategy DPEIS

Richard Rutz

6121 NE 175th Street, #A303

Kenmore, WA 98028

July 27, 2018

Mike Kaputa, Director

Chelan County Natural Resource Department

411 Washington Street., Suite 201

Wenatchee, WA 98801

RE: Comments on the Icicle Strategy (Icicle Creek Water Resource Management Strategy) draft Programmatic EIS

Sir:

I visit and use the Alpine Lakes Wilderness, and lands in the Alpine Lakes Management Unit and other nearby lands. I have also worked with land use and environmental review, and the protection of the Alpine Lakes Wilderness and its surrounding lands from adverse developments of various sorts. I wish to comment on the Icicle Strategy DPEIS.

210-1 The Alpine Lakes Wilderness is one of Washington State's most scenic areas, and an extremely valuable and irreplaceable fish and wildlife and recreational area. I can understand the goal to improve instream flows in

210-1 Icicle Creek, but I cannot accept doing this at the expense of this unique and irreplaceable local, state, and national resource, wilderness and public land.

210-2 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek. The goals in developing the alternatives leave out most environmental considerations: they only address downstream fisheries and compliance with existing laws. There is no goal, and nothing said, about protecting the integrity of the Alpine Lakes Wilderness, and reducing the impact of nonconforming uses. Even though this is one of the highest responsibilities for lands protected under the Wilderness Act. No wonder that all of the alternatives greatly increase the significant environmental impacts of the existing irrigation facilities in the wilderness.

210-3 In Chapter 2, section 2.11.1, for example, "Reservoir Removal", the DPEIS states that:

During the SEPA scoping, some commenters recommended removing all of the reservoirs within the Icicle Creek Subbasin to restore the area to a more natural state. The IWG did not further consider this proposal in the DPEIS for several reasons.

The reservoirs in the Alpine Lake Wilderness Area support LNFH and IPID operations. IPID serves approximately 85 percent of the irrigated land in the Wenatchee Valley from Cashmere up to the Cascade Range (USFS, 1981). These lands are primarily in commercial orchard production and are the foundation of the local economy. Without the drought year supply provided by these reservoirs, orchard production would likely be significantly impacted. Additionally, this proposal does not align with the Guiding Principles. Removing the reservoirs from the Alpine Lakes Wilderness would reduce streamflow, decrease domestic and agricultural reliability, and would make meeting the Guiding Principles nearly impossible in the future as climate change predictions call for less snowfall and more rainfall in the Icicle Subbasin. Additionally, taking away private property rights would not align with the Guiding Principle that calls for complying with state and federal laws.

"Property rights" is a term that has been used many times to attempt to override all manner of other rights and legalities. It is improperly being used in the DPEIS to summarily dismiss this legitimate concern and valid alternative for reducing or removing the existing facilities. By so abjectly dismissing this proposal to reduce or remove projects and facilities, the DPEIS is completely fails the responsibilities of the State Environmental Policy Act to fully evaluate alternatives and to consider full the impacts of proposed actions.

210-4 Moreover, the DPEIS does not properly evaluate significant adverse environmental impacts to the wilderness resource, the significant adverse impacts to the water resources of the wilderness and to the fish and wildlife and recreational and scenic resources and values that depend on them.

210-4 I do not see how significant adverse impacts to these and other resources could have been missed by the developers of this DPEIS. The Alpine Lakes Management Act, Section 5, includes:

the Enchantment Area of the Alpine Lakes Wilderness, taking into consideration its especially fragile nature, its ease of accessibility, its unusual attractiveness, and its resultant heavy recreational usage. (90 Stat. 908, Sec. 5)

And yet it is missed by this DPEIS. The document materially fails to address significant impacts to fragile resources specifically identified in the Alpine Lakes Management Act.

210-5 There is no proper "No Action" alternative. The alternative posed as such is more like a "Current Direction" alternative, with many additional projects added on as if they are a foregone conclusion. Again, the DPEIS fails to meet the basic requirements of a SEPA analysis.

210-6 Regarding the DPEIS and the whole "Icicle Strategy", the wilderness was established subject to valid existing rights. That consists of the projects as they existed in 1976. Any expansion or extension is not an existing right. And under the Wilderness Act, such expansions or extensions are prohibited. I see no discussion of this overriding legal compliance issue in the DPEIS. Before this, "property rights" fades away.

210-7 Clearly, the DPEIS is designed to cause significant adverse environmental impact to the wilderness and the public, to benefit a select few people. The DPEIS fails to disclose this, and seeks to hide it behind "property rights".

210-8 Also behind this is apparently another attempt to use water rights to do any and every thing that someone wants to do, regardless of laws or rights of others. There is no proper evaluation of this topic, and no proper discussion of the limits on water rights at each lake.

210-9 Of the many proposed improvements and expansions, three proposed projects in particular are of concern:

- Increasing the size of the dam on Eightmile Lake, which could flood the trail and campsites around the lake.

- Increasing the size of the dams on Upper and Lower Snow lakes, which would raise the level of the lake and will likely flood the trail and campsites around the lake.

Comment Letter 210

210-9 - Boring a tunnel from Upper to Lower Klonaqua lakes, which would likely have significant negative impacts to the land surrounding the lakes.

These projects should be removed from the Icicle Strategy.

210-10 Several elements of the strategy, including habitat protection, fish passage, fish screening and especially water conservation efficiencies, all fit with the requirements and should be implemented.

210-11 The DPEIS reads like a document that has been prepared to support a previously decided approach. It should be revised to properly include all significant impacts, and to properly discuss them. It must discuss how it shall properly comply with all state and federal laws. It must properly ensure that there is no impact on watershed
210-12 function, offer aggressive water conservation options, and fully recognize, describe and discuss the limits on water rights at each lake. It should offer additional alternatives that do not enlarge any wilderness lakes, and
210-13 that fully consider removal of some or all of the existing nonconforming facilities. And a proper No-Action alternative must be prepared, which only repairs/replaces in-kind the current facilities, with no expansion or increased withdrawal or impoundment.

210-14 Again, not all reasonable and feasible alternatives have been considered. A full alternative must be developed that proposes and evaluates reduction of operations, and/or removal of some or all of the facilities: this absolutely must be developed and considered. Failure to do so is a violation of the responsibilities required for the protection of the lands and resources of wilderness areas under the Wilderness Act.

210-15 The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. As required by the Wilderness Act, we must not allow one natural area to be exploited under the guise of enhancing
210-16 another. This DPEIS does not meet its responsibilities under SEPA, the Alpine Lakes Management Act, the Wilderness Act, and in protecting our public heritage, which is the responsibility of every citizen.

Sincerely,

(s)

Richard Rutz

Comment Letter 211

From: rmetzger7@everyactioncustom.com on behalf of robert metzger <rmetzger7@everyactioncustom.com>
Sent: Friday, July 27, 2018 10:31 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle
211-01 Strategy. I am strongly opposed to any new dams, enlargement of dams, or water diversions that would impact the Alpine Lakes Wilderness. I value the Federally designated wilderness and oppose any developments that would alter or create negative impacts to the designated wilderness area.

Sincerely,
Mr. robert metzger
7106 Foothill Loop SW Olympia, WA 98512-2028 rmetzger7@aol.com

Comment Letter 212

From: spresho@everyactioncustom.com on behalf of Scott Presho <spresho@everyactioncustom.com>
Sent: Monday, July 30, 2018 3:07 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

Everyone agrees that the irrigation district is entitled to as much water for irrigation purposes as it was using for those
212-01 purposes when Congress created the wilderness in 1976. But this does not mean the district can use more now than it used before--even if it claims that its water right gave it more. No matter what the original water right said, the irrigation district cannot take more water now than it did in the past. The Wilderness Act protects existing private rights, but that does not grant permission to expand those rights.

212-02 The Icicle Strategy is an effort to solve water-supply problems with new and/or extended structures. This is the traditional supply-side answer to water shortages, but doesn't take into account the potential for conservation efforts to reduce the need for water, and therefore these new/additional structures being built in a wilderness zone.

212-03 The work group has been asked to consider conservation measures, such as restrictions on watering lawns, which have worked in the Seattle area to reduce total water consumption even as the population grew. But the work group offers no analysis of how much water could be saved by various conservation measures or by promoting water markets that facilitate selling and trading water rights. Domestic water conservation efforts are mentioned in the IWG plan, but such phrases as "if funding were available" and "funding may be more limited if not included as part of an integrated water resource management plan" speak to the lack of effort in finding these funds as part of the plan.

The Icicle Strategy is preoccupied with new structures designed to produce more water, rather than conservatively using available resources, and seems ignorant of what the existing water rights provide.

Sincerely,
Mr. Scott Presho
3361 224th Pl SW Brier, WA 98036-8017
spresho@comcast.net

Comment Letter 213

From: Steve Uyenishi <Steve.Uyenishi.16447891@p2a.co>
Sent: Thursday, July 26, 2018 4:09 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Don't sacrifice wilderness for flawed Icicle Strategy

Dear Director, Chelan County Natural Resource Dept. Mike Kaputa,

213-1 | 4327

Regards,
Steve Uyenishi
12425 74th Ln S
Seattle, WA 98178

1

Comment Letter 214

From: tamirust@everyactioncustom.com on behalf of Tami Rust <tamirust@everyactioncustom.com>
Sent: Sunday, July 29, 2018 8:04 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

214-1 | Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy: please keep The Enchantments pristine for our children and grandchildren. Let that be your legacy.

Sincerely,
Ms Tami Rust
1006 N Washington St Tacoma, WA 98406-5523 tamirust@icloud.com

1

Comment Letter 215

From: Teresa Catford <teresacatford@gmail.com>
Sent: Monday, July 30, 2018 2:01 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please protect the Alpines Lake Wilderness Area

Dear Mr. Kaputa,

I have enjoyed many beautiful hikes in this area and am so concerned that this wilderness is threatened.

215-1 The Alpine Lakes Wilderness is a shared natural resource that must be respected. This area is very popular - not just with me - and it would be a devasting loss for Washington State, the mountain lakes and streams ecosystems, and the outdoor recreation economy if the lakes' water levels were manipulated.

Leave the wilderness alone.

Teresa Catford
Shoreline, WA

Comment Letter 216

From: Terri Jones <terrijoneswatercolors@gmail.com>
Sent: Monday, July 30, 2018 3:26 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Watershed Water Resources Management Strategy

216-1 We strongly oppose the proposal to construct dams and related structures on seven lakes within the Alpine Lakes Wilderness. This pristine national treasure is valued world wide as a recreational wonder. We have hiked and back packed in the Enchantments Basin and Alpine Lakes multiple times. Its unparalleled beauty must be preserved for our future generations and the economic welfare of the region.

Teresa and Ronald Jones

Comment Letter 217

From: Tessa Rue (tessarue@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, July 28, 2018 7:36 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Protect Alpine Lakes Wilderness

Dear WA Department of Ecology and Chelan County Officials,

To Washington State DOE and Chelan County,

217-1 I have a life goal of through hiking the enchantments. Imagine my dismay on learning this area is under threat. I have two daughters, ages 2 and 5. Will I or my daughters be able to experience this special place? Please, preserve this area for all Washington residents for now and for future generations.

Thank you,
Tessa Rue

Sincerely,

Tessa Rue
5116 27th Ave NE
Seattle, WA 98105
tessarue@gmail.com
(206) 331-9118

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 218

From: Bill Burwell <bburwell@riousa.com>
Sent: Wednesday, July 25, 2018 4:38 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Creek Watershed Water Resources Management Study, Draft PEIS

Dear Chelan County and Washington State Department of Ecology,

Thank you for the opportunity to comment on the Icicle Creek Work Group Draft Programmatic Environmental Impact Statement (DPEIS) know as the Icicle Creek Watershed Water Resources Management Strategy. Considerable effort has gone into the work over the past several years with significant input by the Icicle Peshastin Irrigation District (IPID).

Review of the document develops of number of concerns:

1. The document assumes IPID has current water rights on Eightmile Lake with the current dam and water rights to raise the dam. There are indication that IPID has not put into use the water behind the current dam on the Lake for decades. Washington water law has a fundamental "use it or lose it" requirement. Looks like IPID likely has relinquished part of the water rights. Raising Eightmile Lake dam would require added water rights and these have not been demonstrated. Increasing the dam hight will require approval by the US Forest Service and likely extensive permitting and a NEPA process, which will be problematic as the land is designated wilderness. Use of such wilderness public lands for the benefit of a few irrigators takes away from the citizens of this country that own the wilderness. Use of the Lake as a bowl to fill and flush by the district seems not in the public interest. The filling and flushing also has negative impact on downstream fisheries.

2. The dam raising neglects the statutory authority of US Forest Service on these National Lands maintained for use by the people as designated Wilderness. The water rights on the Lake belong to the Federal Government under the federal reserved water rights doctrine. The DPEIS does not include maintaining the current dam height as the only current legal basis, a significant document omission in range of alternatives..

3. IPID has water rights for irrigation purposes. The DPEIS implying the District has rights for domestic water use and for fish hatchery use, which it does not. Alternative 4, has even worst invasions of water rights and public domain of Wilderness with tunneling the Klonaqua Lakes, high dam on Snow Lake, Eightmile high dam and other intrusions into water right and Wilderness use. The citizens were not allowed to comment on these actions during the scoping in 2016 and was not a part of the proposed actions. Alternative 4 should reset the process back blocking the Draft PEIS until fully scoped and citizen input on Alternative 4.

4. The IPID Pump Station found in Alternative 5 seems the best solution will greatly improve flow in Icicle Creek resolving a problem. An alternative should be added looking a more fundamental improvements since the concerns are water availability and global warming. This added alternative would push hard on water conservation with irrigators since the crop lands are the vast users of the basin's water and push to control CO2 and methane emission. Reducing global warming emissions is the most fundamental need. Rearranging water withdrawals does not solve the fundamental problem of global warming.

5. Public input could be improved. The vast number of Washington owners (citizens) and users of the Alpine Lakes Wilderness live on the Puget Sound side of the Cascades. No formal hearing was set where these people live. The only formal hearing was in Leavenworth. Yes, a hearing in Leavenworth in the basin with a small population was appropriate. Missing a formal hearing on the West Side of the Cascades was a fundamental flaw in public input.

Comment Letter 218

6. My Great Grand Parents, the Hatfields, homestead in Central Washington in 1874, obtaining one of the first water rights to their farm. At that time, the Territory of Washington was a vast wilderness with a few islands of farms and towns within the wilderness. We now have a few island of wilderness among the vast farms and cities in the State. The Alpine Lakes Wilderness give a place for my Grandchildren and Great Grandchildren to see a beautiful gift that could endure seven generations and more. Much of the proposals tear apart and damage the beautiful gift of the Wilderness. The wilderness basis being maintaining the land by non-motorized access and use of hand tools. Building dams in the Alpine Lakes Wilderness is fundamental destruction of the gift and the responsibility we have to future generations.

Please go back and redevelop the PEIs addressing these and concerns of others.

Sincerely,

Henry William Burwell

Comment Letter 219

From: antje fray <elaan2@yahoo.com>
Sent: Monday, July 23, 2018 9:09 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

219-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Add a personalized message.
219-2 Why do you want to put UP dams when the movement has been to TAKE DOWN dams??? A possibility could be a

Comment Letter 219

219-2 MODIFIED dam system with salmon LADDERS so fish can still go upstream to spawn.

219-3 Don't ruin this beautiful wilderness

Sincerely,
antje fray

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Comment Letter 220

From: Christine Clum <nalugirl07@yahoo.com>
Sent: Monday, July 23, 2018 1:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

220-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

220-2 Dams, especially large ones, have the potential to cause a lot of problems for the surrounding area, especially the area behind the dam where the water flows toward the blockage. There are disadvantages for both the nature and any

Comment Letter 220

220-2 people living in the area.
There are many negative effects on nature. Since dams block up flowing bodies of water, such as rivers, any animals that depend on the flow to reproduce or as part of their life cycle are put in danger. Migratory fish that mate in a different location than they live the rest of their lives, for example, are unable to mate and may decline in population. The buildup of water is also dangerous for plant life that grows on the natural shoreline of the water. The plant life is submerged and dies. In addition, the beneficial sediment that normally is washed down the river is blocked, which decreases the fertility of the soil downriver from the dam.
Many humans are displaced due to dams. Humans who live in an area that is to be flooded due to a new dam have to relocate and lose their homes to the rising water.

Sincerely,
Christine Clum

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Comment Letter 221

From: Dawn Serra <dawn_serra@hotmail.com>
Sent: Monday, July 23, 2018 12:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

221-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

221-2 I support finding new water sources and improving stream flows outside the Wilderness. Chelan County should facilitate buy-back of private water rights so dams and other]other structures could be removed and the Wilderness restored.

Comment Letter 221

Thank you.

Sincerely,
Dawn Serra

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Comment Letter 222

From: jennifer schultz <firls4eva@roadrunner.com>
Sent: Tuesday, July 24, 2018 1:18 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

222-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

222-2 It is extremely important to protect waterways especially those that are important ones that provide safe drinking water for various communities.

Comment Letter 222

Sincerely,
jennifer schultz

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Comment Letter 223

From: Joe McPhee <jgmcphee8750@yahoo.com>
Sent: Tuesday, July 24, 2018 8:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

223-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

223-2 Such a beautiful area should be left alone. That is what Wilderness is all about. Building dams means roads and big heavy machinery. You need to enact water conservation measures and uses and live with what you have.

Comment Letter 223

J. G. McPhee

Sincerely,
Joe McPhee

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Comment Letter 224

From: LD Anderson <linda@ucsc.edu>
Sent: Monday, July 23, 2018 1:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

224-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

224-1 The west is always going to be in a water deficit. We need to think of creative strategies such as increased wetland recharge and waste water recycling that do not change the critical ecological functions of our rivers.

Comment Letter 224

Sincerely,
LD Anderson

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Comment Letter 225

From: linda berd <lberd@cox.net>
Sent: Monday, July 23, 2018 1:38 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

225-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

225-2 First of all, NO MORE DAMN DAMS! In fact, we need to demolish most of the old dams that exist and DO DAMAGE.

Comment Letter 225

225-3 Secondly, you have no sure way to evaluate CLIMATE CHANGE.

224-4 Just stop, think, re-evaluate...and remember NEPA & the Wilderness Act.

Sincerely,
linda berd

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Comment Letter 226

From: Linda Yow <jandlyow@gmail.com>
Sent: Thursday, July 26, 2018 10:29 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

226-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

226-2 The cabins on the islands in the river should be required to have septic systems, rather than releasing raw sewage into
226-3 the river. Please repair/improve enough dams to prevent the river going dry in summer thus killing all of the fish, etc.

Comment Letter 226

Sincerely,
Linda Yow

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Comment Letter 227

From: M. Lou Orr <youandmekid@comcast.net>
Sent: Thursday, July 26, 2018 10:08 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

227-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

227-2 This plan goes against the fishing rights of the Wenatchi Tribe (part of Colville Confederated). Have they been notified? Treaty rights!!

Comment Letter 227

Sincerely,
M. Lou Orr

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Comment Letter 228

From: N Refes <maughter2@gmail.com>
Sent: Saturday, July 28, 2018 6:47 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

228-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

228-2 Dams have are known at a threat to both living beings and the land. An in depth study must be done along with research of all dams created along with the dangers inherent therein.

Comment Letter 228

Sincerely,
N Refes

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Comment Letter 229

From: Noel Orr <tepeefortwo@comcast.net>
Sent: Thursday, July 26, 2018 11:10 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

229-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

229-2 The Wenatchi Tribe (Colville Confederated) has treaty rights for fishing in the Icicle so great care has to be taken! Were tribes notified? Don't destroy the natural wonders of Mother Earth!

Comment Letter 229

Sincerely,
Noel Orr

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Comment Letter 230

From: Sherry L. Olson, Ph.D. <olson_shery@hotmail.com>
Sent: Monday, July 23, 2018 8:55 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

230-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

230-2 Please re-analyze the plan for the use of the water that the DPEIS has submitted. It fails to fully analyze limitations on the scope and validity of IPID's water rights.

Comment Letter 230

Sincerely,
Sherry L. Olson, Ph.D.

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Comment Letter 231

From: singgih tan <unojodelacara@gmail.com>
Sent: Friday, July 27, 2018 11:47 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

231-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

231-2 The DPEIS must also address future flows, considering climate change impacts on weather patterns & the snow pack.

Comment Letter 231

Sincerely,
singgih tan

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Comment Letter 232

From: Aimee Polekoff <aimeechan.polekoff@gmail.com>
Sent: Monday, July 23, 2018 8:42 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

232-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

232-2 Is irrigation even necessary? If the state encouraged greater water efficiency strategies in agriculture, maybe no dam would be needed at all.

Comment Letter 232

Sincerely,
Aimee Polekoff

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Comment Letter 233

From: Al Kisner <alkisnerforthewild@gmail.com>
Sent: Monday, July 23, 2018 2:23 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

233-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

233-2 The only dam construction in this area should be carried out by beavers. Their ecological engineers are superior to ours and thousands of other creatures benefit from their expertise.

Comment Letter 233

Sincerely,
Al Kisner

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Comment Letter 234

From: alice nguyen <medicilorenzo@yahoo.com>
Sent: Wednesday, July 25, 2018 2:43 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

234-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

234-2 Dam construction and maintenance harm the area's wilderness character, in contradiction to the Wilderness Act. Reduction of flow would place additional stresses on already seriously affected species.

Comment Letter 234

Sincerely,
alice nguyen

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Comment Letter 235

From: Amy Davis <a_jdavis@yahoo.com>
Sent: Tuesday, July 24, 2018 10:34 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

235-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

235-2 As a now informed adult about the unbelievable damage that dams do, I am adamantly opposed to any dam project. Period. Even more so when the land is public land and should be preserved in its natural state in perpetuity for future

Comment Letter 235

generations.

Sincerely,
Amy Davis

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Comment Letter 236

From: Andrew Fisher <fanof2012@gmail.com>
Sent: Monday, July 23, 2018 6:54 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

236-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

236-2 The video "Secrets Police Don't Want You To Know" at http://youtu.be/B3nok7Cby28 is 2.5 hours long but it's totally worth your time to watch the whole entire thing because it exposes how the cops, judges, prosecution attorneys,

Comment Letter 236

236-2 politicians, and car insurance salesmen have stolen BILLIONS from the common people as well as the secrets that anyone can follow to prevent them from stealing that money. Also check out the scripts related to the video at http://logosradionetwork.com/tao/
This video can help put a stop to tyranny and in turn bring freedom and higher consciousness to all! So please help me in my crusade to spread this info like wildfire on a global scale.

Sincerely,
Andrew Fisher

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Comment Letter 237

From: Ann Rogers <a-rogers@charter.net>
Sent: Monday, July 23, 2018 1:15 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

237-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

237-2 We, in Grand Traverse County , are taking out our dams on the Boardman River.
Dams serve no purpose anymore. Grenn Renewable energy should replace hydro.

Comment Letter 237

Sincerely,
Ann Rogers

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2

Comment Letter 238

From: antje fray <elaan2@yahoo.com>
Sent: Thursday, July 26, 2018 7:17 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

238-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

238-2 I think you are going backwards.... Other groups are taking dams DOWN to improve river HEALTH and allow salmon and other fish to go back to their breeding grounds.

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Comment Letter 238

Sincerely,
antje fray

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Comment Letter 239

From: Arrie Hammel <mykabird@gmail.com>
Sent: Monday, July 23, 2018 5:17 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

239-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

239-2 I'm no expert but it seems to me anything that degrades our environment or the wildlife or human security or ownership needs to be struck down.

Comment Letter 239

Sincerely,
Arrie Hammel

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Comment Letter 240

From: Barbara Trudell <bltrudell@comcast.net>
Sent: Monday, July 23, 2018 1:27 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

240-1 The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

240-2 No dams. Period.

Comment Letter 240

Sincerely,
Barbara Trudell

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Comment Letter 241

From: Beth Stanberry <rdtrtle@gmail.com>
Sent: Tuesday, July 24, 2018 5:03 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

241-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

241-2 Please do not build the dam! It ruins things that will never be the same once the folly of building it is realized.

Comment Letter 241

Sincerely,
Beth Stanberry

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Comment Letter 242

From: BILL PARKER <stigausa@aol.com>
Sent: Monday, July 23, 2018 8:15 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

242-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

242-2 No dams or tunnels ....please.

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Comment Letter 242

Sincerely,
BILL PARKER

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Comment Letter 243

From: Billy Angus <wizardofhamilton@hotmail.com>
Sent: Monday, July 23, 2018 6:19 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

243-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

243-2 NO DAMS.....PERIOD!!!
WATER IS LIFE!!!!

Comment Letter 243

Sincerely,
Billy Angus

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Comment Letter 244

From: Bonnie Macraith <bmacraith@reninet.com>
Sent: Tuesday, July 24, 2018 11:32 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

244-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

244-2 The dams on the Klamath River in northern CA where I live are going to be dismantled because they are blocking salmon spawning, and impacting riparian ecosystems- take note!

Comment Letter 244

Sincerely,
Bonnie Macraith

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Comment Letter 245

From: Carol Ann Brady,R.N. <carolannbrady@comcast.net>
Sent: Wednesday, July 25, 2018 3:15 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

245-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

245-2 Add a personalized message As nurse, I ask that you protect the health of our waterway which needs to flow freely.

Comment Letter 245

Sincerely,
Carol Ann Brady,R.N.

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Comment Letter 246

From: Carol Hatfield <chatfield@uindy.edu>
Sent: Monday, July 23, 2018 12:55 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

246-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

246-2 We most certainly do not survive without protected waterways. Protection of life, health, and our ecosystems (wilderness, wildlife, water, air, land) is paramount! We cannot survive without these intact.

Comment Letter 246

Sincerely,
Carol Hatfield

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Comment Letter 247

From: Carol Hatfield <chatfield@uindy.edu>
Sent: Tuesday, July 24, 2018 5:37 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

247-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

247-2 The protection of our waterways, our ecosystems, and our wildlife comes first! Stop the plans for such devastating destruction!

Comment Letter 247

Sincerely,
Carol Hatfield

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Comment Letter 248

From: Carol Jackson <cjackson@lanterngroup.org>
Sent: Tuesday, July 24, 2018 1:48 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

248-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

248-2 DAMS ON UPPER RIVERS AND LAKES BURST AND KILL THOUSANDS OF PEOPLE LIVING OR WORKING DOWNSTREAM; WITH CLIMATE CHANGE FLOODS ARE WORSE.

Comment Letter 248

248-2 BUILDING DAMS IN MOUNTAINOUS AREAS CONDEMNS THE RESIDENTS OF THE VALLEYS AND LOWLANDS TO CONTINUOUS THREAT.

Sincerely,
Carol Jackson

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Comment Letter 249

From: Carolyn Wacaser <cjspirit2000@yahoo.com>
Sent: Tuesday, July 24, 2018 6:32 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

249-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

249-2 We'll have all the water we need if we leave it alone! Protecting wildlife, wilderness and the integrity of the earth is important. Quit trying to manipulate everything natural.

Comment Letter 249

Sincerely,
Carolyn Wacaser

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Comment Letter 250

From: Cheryl Lechtanski <paboxies@hotmail.com>
Sent: Wednesday, July 25, 2018 10:37 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

250-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

250-2 I believe the proposed projects have the ability to seriously affect the integrity of this watershed area.

Comment Letter 250

Sincerely,
Cheryl Lechtanski

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Comment Letter 251

From: Cris Smith <xtynita_sonoma@earthlink.net>
Sent: Monday, July 23, 2018 5:15 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

251-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

251-2 From around the world we have already learned of the destructive effects of dams. We no longer see them as a desirable sign of "progress." Please don't build another environmentally destructive dam.

Comment Letter 251

Sincerely,
Cris Smith

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Comment Letter 252

From: Darlene Marley <djmarley@gmail.com>
Sent: Monday, July 23, 2018 12:55 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

252-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

252-2 As a tax-paying US citizen, I demand that national water resources be governed by long-term and sustainable water management practices.

Comment Letter 252

Sincerely,
Darlene Marley

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Comment Letter 253

From: Donna Greathouse-Neel <deegeemail@comcast.net>
Sent: Monday, July 23, 2018 9:33 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

253-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

253-2 I support the information as stated herein so well by Wilderness Watch. They have the expertise to be followed and the best interests of the area as a priority.

Comment Letter 253

253-3 We are supposed to be removing and reducing dams not adding and increasing them.

Sincerely,
Donna Greathouse-Neel

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Comment Letter 254

From: Echo Mitchell <shortyegm@comcast.net>
Sent: Tuesday, July 24, 2018 1:16 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

254-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

254-2 It eems that dam building has passed its usefullness in this country. We no longer need to use it for electrical power and it damages the water supply in the entire course of rivers. Silting makes these dams limited in their lifetime of healthy

Comment Letter 254

254-2 eff

Sincerely,
Echo Mitchell

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Comment Letter 255

From: Edson Rood <perkybeer2@gmail.com>
Sent: Monday, July 23, 2018 9:03 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

255-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

255-2 The construction of dams to manipulate water levels often has unintended consequences. Always take the least intrusive means to accomplish ends, especially in areas near our wilderness reserves.

Comment Letter 255

Sincerely,
Edson Rood

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Comment Letter 256

From: Elizabeth Lynch <lizybabe127@yahoo.com>
Sent: Monday, July 23, 2018 12:46 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] [Possible Spam] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

256-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

256-2 Why and I would like a very good answer to this ! Are you doing this ???????

Comment Letter 256

Sincerely,
Elizabeth Lynch

,

Comment Letter 257

From: Gayle Areheart <gareheart@comcast.net>
Sent: Tuesday, July 24, 2018 1:11 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

257-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

257-2 We do not need anymore damn dams!!! Please consider solar & wind power to meet the regions electrical needs. :/

Comment Letter 257

Sincerely,
Gayle Areheart

,

Comment Letter 258

From: George Wuerthner <gwuerthner@gmail.com>
Sent: Monday, July 23, 2018 1:17 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

258-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

258-2 All water in Washington is owned by the people of the state. It does not belong to the irrigation company. Removing water from streams, rivers, and lakes is a privilege. Washington has a legal obligation under Public Trust to protect

Comment Letter 258

258-2 public interest

Sincerely,
George Wuerthner

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Comment Letter 259

From: gita barbezat <gita_barbezat@yahoo.com>
Sent: Monday, July 23, 2018 1:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

259-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

259-2 All manipulations of nature, like dam constructions, widening of water ways etc will inevitably cause changes, environmental and ecological, which cause a chain of reactions that are often unexpected. It is best not to perturb

Comment Letter 259

259-2 nature.

Sincerely,
gita barbezat

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Comment Letter 260

From: Helga Oestreicher <helga420@att.net>
Sent: Tuesday, July 24, 2018 6:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

260-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

260-2 Please do not do this. There has to be an alternative for the dam. Like the the Cooley Dam there will be unintended consequences for years to come that will affect everything in that area and beyond. Please re-think this.

Comment Letter 260

Sincerely,
Helga Oestreicher

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Comment Letter 261

From: Jeffrey Christo <jeffreychristo@yahoo.com>
Sent: Thursday, July 26, 2018 8:10 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

261-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Sincerely,
Jeffrey Christo

Comment Letter 261

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Comment Letter 262

From: Jessica McGeary <camwyn@megaloceros.net>
Sent: Monday, July 23, 2018 12:43 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

262-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

262-2 The plan as stated is wide open to more federal litigation than I think this or any other administration really wants to deal with. Please give serious consideration to revision before implementation. Thank you.

Comment Letter 262

Sincerely,
Jessica McGeary

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Comment Letter 263

From: Joseph Breazeale <brezebra@yahoo.com>
Sent: Monday, July 23, 2018 1:20 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

263-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Dear Mr. Kaputa,

Comment Letter 263

263-2 Please pause and consider that the trend as been, for good reasons, the removal of dams, not the construction of more.

Thank You

Joseph H. Breazeale

Sincerely,
Joseph Breazeale

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Comment Letter 264

From: Joy Keithline <jkeithline@msn.com>
Sent: Monday, July 23, 2018 3:59 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

264-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

264-2 Nature and habitat first especially
amidst global warming.

Comment Letter 264

Sincerely,
Joy Keithline

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Comment Letter 265

From: Kathy, Mark, Chris & Jessie Groth <kgroth@comcast.net>
Sent: Tuesday, July 24, 2018 11:08 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

265-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

265-2 Dams have already been shown to be an outdated, destructive and inefficient way to manage resources.

Comment Letter 265

Sincerely,
Kathy, Mark, Chris & Jessie Groth

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Comment Letter 266

From: Kevin Spelts <kevinspelts@live.com>
Sent: Tuesday, July 24, 2018 7:40 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

266-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

266-2 I oppose any man made changes that adversely affect the natural operation of water in most watersheds.

Comment Letter 266

Sincerely,
Kevin Spelts

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Comment Letter 267

From: Lisa Dahill <ldahill@gmail.com>
Sent: Monday, July 23, 2018 2:18 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

267-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

267-2 Please act to minimize impact on the surrounding watershed and water flow.

Comment Letter 267

Sincerely,
Lisa Dahill

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Comment Letter 268

From: Loren Amelang <loren@pacific.net>
Sent: Monday, July 23, 2018 4:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

268-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

268-2 I'm not familiar with this issue, but I am part owner of a regulated dam in California. The legal and safety issues are now so complex as to be prohibitive. Removing our dam would cost even more. But it is probably the future. Best not to build

Comment Letter 268

268-2 them!

Sincerely,
Loren Amelang

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Comment Letter 269

From: Louise Wallace <lfdw4@aol.com>
Sent: Monday, July 23, 2018 1:40 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

269-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

269-2 It is way past the time to remove all dams. They do more damage than good and are no longer needed. We do need healthy rivers,which means removing all dams. Please don't build any more or enlarge any. That is like thinking in the

Comment Letter 269

269-2 dark ages.

Sincerely,
Louise Wallace

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Comment Letter 270

From: Lynn Welch <lwelch1990@comcast.net>
Sent: Monday, July 23, 2018 6:12 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

270-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

270-2 Natural water systems left unaltered create the most abundance for us, the environment, and wildlife. There are volumes of documentation on the adverse effects of dams on the environment and ecosystems. The best approach is

Comment Letter 270

270-2 preservation.

Sincerely,
Lynn Welch

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Comment Letter 271

From: Maggie Frazier <mfrazier74@hotmail.com>
Sent: Wednesday, July 25, 2018 7:03 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

271-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

271-2 It appears theres still much ignorance as to the damage that dams cause! Seems to me since many have had to be destroyed due to their limiting salmon spawning & creating problems where none existed before - the people in

Comment Letter 271

271-2 "charge" would do research.

Sincerely,
Maggie Frazier

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Comment Letter 272

From: Maija Dravnieks <ladeekittee@aol.com>
Sent: Monday, July 23, 2018 7:00 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

272-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

272-2 I will suggest you keep your trees and stop sprawl instead of damaging the ecosystem with a dam.

Comment Letter 272

Sincerely,
Maija Dravnieks

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Comment Letter 273

From: Martha Jo Willard DVM MD <mjw@ctlca.com>
Sent: Tuesday, July 31, 2018 9:39 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

273-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

273-1 We must maintain biodiversity for the survival of the human species. Ecosystem health is just that important. Stop burning dinosaurs. Use the sun and the wind as these provide better jobs, with a future. Dinosaurs gave us the start,

Comment Letter 273

273-1 now change.

Sincerely,
Martha Jo Willard DVM MD

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Comment Letter 274

From: Martha Stevens <martystevens.55@gmail.com>
Sent: Monday, July 23, 2018 9:18 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

274-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

274-2 Putting in more dams isn't progress, it is moving backwards. Choose better alternatives.

Comment Letter 274

Sincerely,
Martha Stevens

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Comment Letter 275

From: Mary A Leon <leon3@twc.com>
Sent: Sunday, July 29, 2018 3:05 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

275-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

275-2 Building dams has caused more problems with water flow than almost anything.

Comment Letter 275

Sincerely,
Mary A Leon

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Comment Letter 276

From: Marya Bradley <mabstream@gmail.com>
Sent: Wednesday, July 25, 2018 1:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

276-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

276-2 I am very concerned about the effort to exclude the public from these decisions that will effect our land and water and all future generations. Such exclusion is a violation of the basis of our democracy. The least harm is the best plan.

Comment Letter 276

Sincerely,
Marya Bradley

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Comment Letter 277

From: Maryann Foss <mobf1118@yahoo.com>
Sent: Wednesday, July 25, 2018 3:23 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

277-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

277-2 Older dams have proven harmful to the ecosystem and destructive to the land and waterways around and below.

Comment Letter 277

Sincerely,
Maryann Foss

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Comment Letter 278

From: Maureen Knutsen <maureen.knutsen@gmail.com>
Sent: Tuesday, July 24, 2018 12:10 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

278-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

278-2 Clean water is a most precious, irreplaceable resource and needs the highest level of protection. We cannot continue compromising our pristine sources of water if we want to have a planet that is livable for future generations.

Comment Letter 278

Sincerely,
Maureen Knutsen

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Comment Letter 279

From: Michael and Barbara Hill <theelbehills@gmail.com>
Sent: Monday, July 23, 2018 1:12 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

279-2 NO DAMN DAMS! SOLAR AND WIND INSTEAD.

Comment Letter 279

Sincerely,
Michael and Barbara Hill

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Comment Letter 280

From: Michelle Rice <shellaroo@yahoo.com>
Sent: Tuesday, July 24, 2018 9:26 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

280-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

280-2 Dams are adversely affecting the salmon runs and Orca's are starving. We need less dams, not more.

Comment Letter 280

Sincerely,
Michelle Rice

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Comment Letter 281

From: Mike Hemphill <mikehempmjc@yahoo.com>
Sent: Wednesday, July 25, 2018 2:23 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

281-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

281-2 Let's correct the legion of mistakes made in the past by taking the action that is the best fit for everyone for the future.

Comment Letter 281

Sincerely,
Mike Hemphill

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Comment Letter 282

From: Nina Council <babunina10@mind.net>
Sent: Monday, July 23, 2018 9:34 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

282-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

282-2 Some dams in Oregon have come down, and that greatly improves the fish situation. Man and our so called progress too often destroys rather than enhances situations or productions and so on.

Comment Letter 282

Sincerely,
Nina Council

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Comment Letter 283

From: Pamela Nelson <pamela05n@yahoo.com>
Sent: Friday, July 27, 2018 11:30 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

283-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

283-2 Destructive dam construction over the last century has shown that this method of flood control and water storage is detrimental to all. Americans expect that Wilderness should be a refuge, permanently; don't create more apathy by

Comment Letter 283

283-2 changing the rules.

Sincerely,
Pamela Nelson

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Comment Letter 284

From: Patricia Always <bikerpat@mindspring.com>
Sent: Monday, July 23, 2018 9:52 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

284-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

284-2 Dams are often more destructive than helpful & often flood native lands & sacred areas.

Comment Letter 284

Sincerely,
Patricia Always

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Comment Letter 285

From: randall potts <randallpotts@hotmail.com>
Sent: Monday, July 23, 2018 1:09 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

285-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

285-2 The DPEIS must act lawfully and to the benefit of wilderness ecosystems that belong to the people not the DPEIS. There is a huge body of scientific evidence that shows the negative impact of dams on waterways, fish, wildlife and

Comment Letter 285

285-2 ecosystems.

Sincerely,
randall potts

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Comment Letter 286

From: Robert Bauer <backfrdead@yahoo.com>
Sent: Monday, July 23, 2018 6:12 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

286-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

286-2 Isn't our history of making terrible decisions about manipulating the environment enough to make us look much deeper into the realities of ecosystems beofre we start imposing our usual wrong thinking. THIS IS OUR HOME AND WE DON'T

Comment Letter 286

286-2 TAKE PROPER CARE!

Sincerely,
Robert Bauer

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Comment Letter 287

From: Robert Fritsch <rfritsch1@myfairpoint.net>
Sent: Monday, July 23, 2018 5:22 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

287-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

287-2 Dams and tunnels built to mitigate or alter the containment or movement of water are the dreams of engineers and over the long term rarely, if ever solve hydrology problems. And they are exceedingly destructive in their

Comment Letter 287

287-2 implementation.

Sincerely,
Robert Fritsch

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Comment Letter 288

From: Rose Jenkins <plasma@brick.net>
Sent: Tuesday, July 24, 2018 3:54 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

288-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

288-2 While some damaging dams have been scheduled for demolition, allowing the earth's riparian system to do its job, here is another damaging proposal for another dam -- to repeat all the errors of the past with NO saving "grace." I say NO! to

Comment Letter 288

288-2 this one.

Sincerely,
Rose Jenkins

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Comment Letter 289

From: Ruth Parcell <raparcell@ucdavis.edu>
Sent: Monday, July 23, 2018 12:52 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

289-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

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The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

289-2 I was raised fishing in this area and would hate to see it destroyed by dams.

Comment Letter 289

Sincerely,
Ruth Parcell

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Comment Letter 290

From: Scott Elliott <scott@mountainlogic.com>
Sent: Monday, July 23, 2018 1:13 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

290-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

290-2 Wilderness is a key driver of the outdoor recreation economy in the state of Washington. Please do not take the proposed actions that will destroy our local, state and national jobs by directly or indirectly impinge on the wilderness.

Comment Letter 290

Sincerely,
Scott Elliott

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Comment Letter 291

From: Teresa Hayes <anyahayes@aol.com>
Sent: Thursday, July 26, 2018 6:23 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

291-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

291-2 Haven't we seen enough of the more serious problems caused by human interference with the water systems that took nature milennia to evolve? Water dammed and diverted now would come at the price of worse and more widespread

Comment Letter 291

291-2 drought in the future.

Sincerely,
Teresa Hayes

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Comment Letter 292

From: Thelma Nelson <teriwn@optimum.net>
Sent: Tuesday, July 24, 2018 8:27 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

292-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

292-2 dams have been proven to provide no really lasting benefit. Please reconsider your plans for building more of them

Comment Letter 292

Sincerely,
Thelma Nelson

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Comment Letter 293

From: Theo Giesy <tedslioness@yahoo.com>
Sent: Monday, July 23, 2018 7:46 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

293-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

293-2 We must be very careful to protect our resources so that we still have them in the future. Ignoring or hiding negative effects form an assessment to gain a favorable ruling is not a practice that can be allowed.

Comment Letter 293

Sincerely,
Theo Giesy

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Comment Letter 294

From: Amy Derocher (amyderocher@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, July 27, 2018 4:54 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

294-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

294-2 The proposed Eight mile lake storage restoration (chapter 2.5.5) is particularly onerous. This lake is in a wilderness area. Replacing the existing small dam with a structure that allows a 50 foot change in the lake water level is fundamentally incompatible with its wilderness designation.

294-1 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Amy Derocher
1409 237th Pl SW
Bothell, WA 98021
amyderocher@gmail.com
(425) 736-4489

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 295

From: Larry Oneil (wa.native1@juno.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, July 27, 2018 8:01 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

295-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

295-2 Realize and adapt to the fact that changing climate will continue to give us less snow pack, less rain, thirstier soils; we need to learn to adapt to living with what we have and sacrificing additional wants, you can't win against mother nature!

295-1 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Larry Oneil
321 NW 51st St
Seattle, WA 98107
wa.native1@juno.com
(206) 784-4303

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 296

From: Catherine Buchanan <cathie.clbuch@gmail.com>
Sent: Sunday, July 22, 2018 1:19 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

296-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

296-2 Please address all of these concerns in accordance with the NEPA requirements.

Sincerely,
Catherine Buchanan

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Comment Letter 297

From: Cheyenne Lively <cheyenne.r.dennis52@gmail.com>
Sent: Monday, July 23, 2018 11:56 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

297-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

297-2 The majestic Columbia river, the middle fork Nooksack, the Skagit, Baker River, these are just a tiny fraction of the areas that are already dammed. Fish already are inhibited, tribes have already been flooded out of ancient homes. Please, no more.

Sincerely,
Cheyenne Lively

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Comment Letter 298

From: christina Durtschi <christinadurtschi@yahoo.com>
Sent: Wednesday, July 25, 2018 10:36 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

298-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

298-2 Before any decisions are made I'd like a thorough environmental impact study that covers everything from how this will impact the Alpine Lakes Wilderness area to Salmon runs. I'd also like to see projections on water usage and how it could be reduce

Sincerely,
christina Durtschi

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Comment Letter 299

From: Courtney Carlisle <carlisle1396@yahoo.com>
Sent: Sunday, July 22, 2018 7:52 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

299-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

299-2 As an economics student, I've learned that public lands and associated activities contribute billions of dollars to our country's GDP each year. Public lands also protect unique natural features, which make WA, WA. Protect the Enchantments.

Sincerely,
Courtney Carlisle

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Comment Letter 300

From: Jace Bylenga <jace.b27@gmail.com>
Sent: Monday, July 23, 2018 12:06 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

300-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

300-2 Please follow the law, and avoid the courts.

Sincerely,
Jace Bylenga

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Comment Letter 301

From: Mary Gallagher <marywillardgallagher@live.com>
Sent: Wednesday, July 25, 2018 10:45 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

301-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

301-2 We moved to Chelan County because of the bounty of recreational areas, especially Wilderness areas. Please do everything in your power to not weaken Wilderness.
Please let me know what I and other concerned residents can do to stop this.

Sincerely,
Mary Gallagher

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Comment Letter 302

From: Nicole Marcotte <6nicolemarie6@gmail.com>
Sent: Sunday, July 22, 2018 10:10 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

302-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

302-2 These beautiful places like the alpine lakes wilderness are keystones to our region. They don't only provide a place for people to enjoy and recreate, but they are critical in holding our ecosystems entact, and curbing the effects of climate change.

Sincerely,
Nicole Marcotte

,

Comment Letter 303

From: Carlie Miller <Carlie.Miller.124157596@p2a.co>
Sent: Tuesday, July 24, 2018 3:00 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

303-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. I recently drove through the Leavenworth area and was deeply concerned with the amount of wasteful water practices I witnessed. What is needed is not simply more water, but a more sustainable approach wirh mandatory water conservation projects and educational programs. More importantly, the proposed Icicle Creek project should be tabled until further environmental studies have been conducted.

303-2 The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Carlie Miller

1

Comment Letter 304

From: David Johnshoy <David.Johnshoy.101361260@p2a.co>
Sent: Saturday, July 28, 2018 11:01 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

304-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

304-2 Other water saving opportunities exist, e.g., reduce golf course water usage, mandatory low flow toilets in every residence and hotel, minimize occupancy expansion through stricter developmental rules, closely evaluate agricultural use for wasteful practices that could be changed...

Thanks,

Regards,
David Johnshoy

1

Comment Letter 305

From: Douglas Hedrick <Douglas.Hedrick.98264821@p2a.co>
Sent: Friday, July 20, 2018 7:00 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

305-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

305-2 Unless these projects are removed, the damage will be twofold - the impact to the natural resource as detailed above AND the negative economic impact to the area. Within my office of only 65 people, I estimate that there are at least 2 trips/year to the enchantment area. Often with family members, these trips include visiting and staying in the local area for a day or two before or after the hike. I've been to the Enchantments and will go back. If your proposed changes go through, I won't bother to come out to see the impact, I'll just plan trips to other areas.

Regards,
Douglas Hedrick

1

Comment Letter 306

From: Fit cahall <Fit.cahall.54747175@p2a.co>
Sent: Friday, July 20, 2018 10:16 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

306-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

306-2 This plan feels like robbing peter to pay paul. I understand the need for water for the fish and the community, but altering one ecosystem (bringing in heavy machinery to what is essentially a wilderness area) to restore another that is almost completely broken, seems short sited. I have no doubt that this probably feels like an intractable problem, but this doesn't seem like the proper solution.

Regards,
Fit cahall

1

Comment Letter 307

From: Inga Walker <Inga.Walker.90289741@p2a.co>
Sent: Saturday, July 28, 2018 10:12 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

307-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

307-2 I have camped along the shore of Eightmile Lake and it was a true gift. I still remember the awe and majesty that the area filled me with. Please, do not continue with a dam expansion that would threaten this area. As we move forward with new research and information, dams are being removed, not built. Please do not threaten this beautiful area with an arrogant plan that would alter its ecosystem and leave it the way it is. Thanks you.

Regards,
Inga Walker

1

Comment Letter 308

From: Jacob Gunn <Jacob.Gunn.124383603@p2a.co>
Sent: Sunday, July 29, 2018 1:09 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

308-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

308-2 On a personal level, the Enchantments area of the Alpine Lakes Wilderness is one of the most unique and beautiful places to which I have had privilege to experience, and I feel strongly in the protection of this area so that future generations may be as fortunate as we are to experience such a special place.

Regards,
Jacob Gunn

1

Comment Letter 309

From: Jean Coy <Jean.Coy.13909044@p2a.co>
Sent: Thursday, July 19, 2018 11:00 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

309-1 I don't understand why you want to ruin the enchantments Don't you understand that it can never be replaced? People come from all over to see the beauty of the area. Don't you want tourists? I thought that the Leavenworth area thrived on the tourist economy. I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The
309-2 Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Jean Coy

1

Comment Letter 310

From: Judy Knold <Judy.Knold.92310708@p2a.co>
Sent: Monday, July 30, 2018 7:08 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

310-1 God is watching.....
We must save the Alpine Lakes Wilderness for hikers, campers, wildlife and nature lovers.
We must take care of God's planet...

310-2 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Judy Knold

1

Comment Letter 311

From: Kevin Shipe <Kevin.Shipe.117566860@p2a.co>
Sent: Friday, July 20, 2018 8:48 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

311-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

311-2 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley. Hikers come from all over the world to hike the enchantments and they contribute more to the economy than a dam would.

Regards,
Kevin Shipe

1

Comment Letter 312

From: Manuela Giese <Manuela.Giese.124477050@p2a.co>
Sent: Monday, July 30, 2018 4:32 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

312-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan and take a close read of the excellent book on water management called Cadillac Desert. This is a terrible
312-2 idea.

312-1 The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Manuela Giese

1

Comment Letter 313

From: Mark Salser <Mark.Salser.90400313@p2a.co>
Sent: Monday, July 23, 2018 6:32 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

313-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

313-2 As someone who has camped a number of times at both Eightmile Lake and Upper Snow Lake, I can honestly tell you that the proposed projects at Eightmile Lake and Upper and Lower Snow Lakes would drastically harm the experience of backpackers and hikers. Those outdoor recreation people contribute a huge amount to the economy in the local area. When friends visit from out of town and they ask me where they should go backpacking or hiking, the Enchantments is always top on my list of places to recommend in all of Washington - that's what an incredible natural resource it is.

313-1 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Mark Salser

1

Comment Letter 314

From: MICHAELA MANSFIELD <MICHAELA.MANSFIELD.124398337@p2a.co>
Sent: Sunday, July 29, 2018 11:31 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

314-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy.

314-2 The text below this paragraph is scripted from WTA, and while I stand behind every word, I would like to include my own story as well. I backpacked The Enchantments with 7 family members two years ago, in September 2016. While on this trip, we enjoyed views and the geography on the way up Aasgard Pass, and awoke the first morning to a [undesired] snow storm which continued the entire day during our time in the Core Zone - we opted to spend the second night at Snow Lake and fortunately, the weather had cleared when we got there. This trip is one my family deemed "Type 2 Fun," the type of activity that is not necessarily fun while you're doing it, but is fun to look back on. We often recall fondly (and sometimes not so fondly) many portions of the backpack, and look forward to another shot, sometime when we aren't in a near-white out, so can see the lakes-a big reason we went into The Enchantments. The proposed project could jeopardize this second shot for my family and countless other groups planning to do this thru-hike in the future. It would be heartbreaking to lose the opportunity to spend time in this beautiful area due to the needless creation of dams. I do not use the word "needless" lightly; I am a Professional Water Resources Engineer. Having been in industry for six years, I quickly learned the immense benefits of preserving natural systems to the greatest extent we can. We must be stewards of our environment and the future of species that depend on people to fight for them, when they obviously cannot do so for themselves. We should be removing hydraulic controls to restore natural hydrology, not building new ones. It may seem silly that I recommend the documentary "Damnation" as a resource, but in my opinion, and that of my Civil Engineer peers, and my father (also a Civil Engineer), is a good simplified explanation for why localized dams are an oftentimes non-functioning thing of the past. We should not be building these types of structures in the fragile area of The Enchantments, or elsewhere on freshwater bodies. I support the habitat enhancement measures listed in this proposal but PLEASE reconsider the proposed construction of hydraulic controls in the form of unnatural tunnels AND dams in this special area.

314-1 The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
MICHAELA MANSFIELD

1

Comment Letter 315

From: Robert Pasko <Robert.Pasko.94441558@p2a.co>
Sent: Monday, July 30, 2018 4:19 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

315-1 The WTA wrote the following comments but I would like to add mine. I recommend that you reconsider the proposed water project. It is a very high price to pay for the water in terms of dollars and in terms of irreplacable natural resources. Undoubtly you realize the unmatched nature in the area of the proposed project. It is the most desired backpacking location in the whole state. So much so that i have never been able to get an overnight permit so that my visits have been single day trips to the enchantments. Very strenuous but very much worth the effort. A large project such as this is not compatable with the pristine and scenic location such as it is. It would make more sense to find a different source for the water. We will never recover if it proceeds- please replan for another location.

315-2 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Robert Pasko

Comment Letter 316

From: Robert Schutzner <Robert.Schutzner.123983437@p2a.co>
Sent: Friday, July 20, 2018 2:05 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

316-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

316-2 It is counter to everything the Alpine Lakes Wilderness stands for to allow this project to proceed. To allow it to happen to to destroy a part of this magnificent area forever. We CANNOT let this happen!!!!!!

Regards,
Robert Schutzner

Comment Letter 317

From: Rachel Swerdlow (rswerdlow@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 8:36 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

317-1 Do not touch the Alpine Lakes region for dams or anything to do with dams.

Sincerely,

Rachel Swerdlow
2819 10th Pl W
Seattle, WA 98119
rswerdlow@gmail.com
(206) 789-3568

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 318

From: Roberta Daniels <Famleafair@aol.com>
Sent: Friday, June 22, 2018 4:24 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Icicle Project

318-1 As a local and a hiker/backpacker, if the lake levels have to rise to preserve our water source then certainly new campsites or trails can be developed. WTA on Gace Book indicates losing campsites might be a deal breaker but I respectfully disagree.

Sent from my iPhone,
Roberta Daniels
Wenatchee

Comment Letter 319

From: ben murray <benjideniro@yahoo.ca>
Sent: Tuesday, July 31, 2018 1:55 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

319-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

319-2 The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

319-3 The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

319-4 Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

319-5 Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

319-6 IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

319-7 For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

319-8 The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 320

From: Baiss Eric Magnusson (baiss@comcast.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, July 31, 2018 2:02 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

320-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

320-2 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

320-3 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Baiss Eric Magnusson
11540 Alton Ave NE
Seattle, WA 98125
baiss@comcast.net
(206) 361-0718

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 321

From: Aylin Llona (aylin.llona@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 10:16 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

321-1 What in God's name are you thinking? Obviously you are not. This earth is not for ours to rape. We must learn to live in cooperation with our nature, not destroy it. We as humans have minds, to be used creatively to nourish our environment and ourselves. Get your heads out of your asses and use the gift of thought that is yours to create something that does not destroy our beautiful nature.

321-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Aylin Llona
11605 488th Ave SE
North Bend, WA 98045
aylin.llona@gmail.com
(206) 601-2688

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 322

From: Barry Truman (brtruman@yahoo.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, June 23, 2018 8:41 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

322-1 DUMB IDEA.
BETTER IDEA - DAM THE POTOMAC, FLOOD D.C.

322-2 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Barry Truman
PO Box 1558
Monroe, WA 98272
brtruman@yahoo.com
(360) 568-5902

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 323

From: Chris Gnehm (chris@starlightpath.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 6:33 PM
To: nr.icisclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

323-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for
323-2 our public lands in the process. DO NOT REMOVE -ANY- TREES LAWSUITS WILL RESULT

323-3 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Chris Gnehm
506 Pitner Dr
Lynnwood, WA 98087
chris@starlightpath.com
(206) 412-8170

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 324

From: Daniel Erickson (seattles2r800@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, June 23, 2018 3:10 PM
To: nr.icisclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

324-1 The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. Stop tampering with nature in this protected areas!

Sincerely,

Daniel Erickson
1011 NW 122nd St
Seattle, WA 98177
seattles2r800@gmail.com
(206) 555-6666

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 325

From: Denise Mahnke (dcmank@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 9:42 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

325-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

325-2 This region in the high alpine fosters native plant growth that cannot be lost by drowning. High mountain habitats are important to our native system here in the NW, from summit to sea. Please consider what this region needs to remain a viable habitat for this planet, as essential to the future.

325-1 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Denise Mahnke
PO Box 14
Carnation, WA 98014
dcmank@gmail.com
(206) 551-6321

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 326

From: Dorothy Hiestand (dorothyhiestand@gmail.com) Sent You a PersonalMessage <automail@knowwho.com>
Sent: Saturday, June 23, 2018 11:23 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

326-1 Wilderness means wilderness! If an area has been designated wilderness, it needs to stay that way! That's WHY it was designated wilderness!

326-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Dorothy Hiestand
1006 Bluff Ave Unit 1
Snohomish, WA 98290
dorothyhiestand@gmail.com
(425) 408-1824

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 327

From: Ellen Lyons (ellenlyonsdesigns@hotmail.com) Sent You a PersonalMessage <automail@knowwho.com>
Sent: Wednesday, June 27, 2018 6:32 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

327-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

327-2 All life on this planet is connected. Protecting natural habitats for birds, fish and other wildlife is as important for them as it is for all sentient life.

Sincerely,

Ellen Lyons
2144 5th Ave W
Seattle, WA 98119
ellenlyonsdesigns@hotmail.com
(206) 854-3155

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 328

From: Gerry Smith (gsmith@fhcrc.org) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, June 23, 2018 1:34 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

328-1 Wilderness should remain wilderness, meaning that the entire designated area is protected from motors, building (other than maintaining trails), or leaving evidence of humans' being there. I think this is the meaning of the Wilderness Act. It should be respected and maintained.

The Alpine Lake Wilderness Area, from east to west, from north to south, is a source of rejuvenation for me and countless people I know. We are obliged to keep this for our children, their children, and on and on, just as others, consciously or unconsciously, kept it for us.

328-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Gerry Smith
606 17th Ave East
Seattle, WA 98112
gsmith@fhcrc.org
(206) 667-4438

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 329

From: James Davis (davisje@nwi.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 7:02 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

329-1 What the hell are you thinking? Was this one of Trumps's hair-brained ideas?

329-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

James Davis
1314 Welch Ave
Wenatchee, WA 98801
davisje@nwi.net
(509) 662-0804

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 330

From: Janet Way (janetway@yahoo.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Thursday, June 28, 2018 6:47 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

330-1 It is crucial that you protect all areas related to Alpine Lakes to protect this precious ecosystem. Protect all streams leading to it and prevent any actions that will lead to damage to groundwater, habitat and water quality.

330-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Janet Way
940 NE 147th St
Shoreline, WA 98155
janetway@yahoo.com
(206) 734-5545

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 331

From: Kate Butt (kateabutt@hotmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 7:44 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

331-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

331-2 For the love of God and Country, quit tinkering with Mother Nature. MAKE A BETTER PLAN FOR THE ALPINE LAKES!!!

Sincerely,

Kate Butt
8845 166th Ave NE Apt B206
Redmond, WA 98052
kateabutt@hotmail.com
(425) 881-3185

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 332

From: Kevin Jones (kevinjonvash@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 9:37 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

332-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

332-2 A tremendous amount of work and support was behind the wilderness designation in the Alpine Lakes area. That accomplishment must be respected and this area must be protected from water infrastructure projects that deface the landscape.

Sincerely,

Kevin Jones
PO Box 2607
Vashon, WA 98070
kevinjonvash@gmail.com
(206) 463-1766

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 333

From: Kristeen Penrod (kristeen@scwildlands.org) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 5:53 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

333-1 Keep it Wild! We should be removing dams, not repairing them. This is Washington State for goodness sakes!

333-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Kristeen Penrod
3816 31st Ave W
Seattle, WA 98199
kristeen@scwildlands.org
(206) 285-1916

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 334

From: Kristen Long (kjlong20@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 8:24 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

334-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

334-2 I am devastated by this photo alone. Billions in tech money in Seattle, and we can't come up with a single way to do these repairs without destroying wildlife? There must be a better way.

334-1 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Kristen Long
703 N I St #3
Tacoma, WA 98177
kjlong20@gmail.com
(206) 218-5022

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 335

From: Kristina Fury (kfuryus@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 5:43 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

335-1 This cannot be undone. Your children, their children, and theirs-they will all suffer and pay in reduction in health and climate at minimum. Do you want to create those conditions?

335-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Kristina Fury
2525 NE 195th St Apt 101
Lake Forest Park, WA 98155
kfuryus@gmail.com
(925) 477-1257

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 336

From: Mark Stewart (stewart.carrie@comcast.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Sunday, June 24, 2018 10:37 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

336-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

336-2 I have enjoyed multiple trips into the Alpine Lakes Wilderness and the Enchantments in the past, and plan to spend more time there in the future. I would hate to see this amazing wilderness area affected by this type of activity in the area. We need to save these precious places for our enjoyment, and the enjoyment of many generations to come. Don't sacrifice our wilderness!!

Sincerely,

Mark Stewart
1537 NE 95th St
Seattle, WA 98115
stewart.carrie@comcast.net
(206) 523-9108

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 337

From: Matt Knox (mknox5764@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 5:00 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

337-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

337-2 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another. Please look for other alternatives to enhance flows in the creek!

Sincerely,

Matt Knox
12021 SE 209th St
Kent, WA 98031
mknox5764@gmail.com
(253) 797-6487

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 338

From: Mayellen Henry (mayellen@comcast.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 10:34 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

338-1 Please, please, do not damage our beautiful Alpine Lakes to help another place. Our family has hiked this area and cannot think that anyone who has ever seen it could in good conscience harm it in any way.

338-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Mayellen Henry
16651 SE 17th St
Bellevue, WA 98008
mayellen@comcast.net
(425) 746-5959

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 339

From: Menno Sennesael (mennosennesael@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 9:54 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

339-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

339-2 Please do the right thing, listen to the people, and think of future generations.

Thank you for your work

Sincerely,

Menno Sennesael
7222 Linden Ave N Apt C
Seattle, WA 98103
mennosennesael@gmail.com
(206) 356-7801

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 340

From: Niels and Susan Andersen (andersen@chem.washington.edu) Sent You aPersonal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 5:24 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

340-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. It has been one our favorites for decades and always a highlight. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process. These lakes are jewels,
340-2 not just reserves of water.

340-1 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Niels and Susan Andersen
6529 Greenwood Ave N
Seattle, WA 98103
andersen@chem.washington.edu
(206) 781-1964

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 341

From: Oliver Dunn (dunn.oliver@outlook.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Sunday, July 01, 2018 1:07 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

341-1 I have lived in Washington my entire life and have found my career, calling and passion in life in Washingtons wilderness. Please don't mess it up. Alpinerness is one of the state's most iconic landscapes, and draws untold visitors
341-2 every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Oliver Dunn
10029 61st Ave S
Seattle, WA 98178
dunn.oliver@outlook.com
(206) 612-7452

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 342

From: Patrick Conn (nvr2l82conntactme@comcast.net) Sent You a PersonalMessage <automail@knowwho.com>
Sent: Saturday, June 23, 2018 10:22 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

342-1 I ASK YOU SO-CALLED INTELLIGENT INDIVIDUALS: WHAT IS SO HARD ABOUT LEAVING "NATURE" ALONE AND "LETTING IT TAKE ITS OWN COURSE"? Why continue making the same human idiotic hubris-generated mistakes at trying to "manage" Nature that have failed miserably for centuries past? Think about it?

342-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Patrick Conn
22018 126th Ct SE
Kent, WA 98031
nvr2l82conntactme@comcast.net
(253) 631-9100

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 343

From: Paul Fior (dogsafoot@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 7:15 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

343-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

343-2 Anyone whose visited the stunning landscapes of the Alpine Lakes Enchantment Lakes Basin has seen for themselves what a wilderness gem it is. Offering us a uniquely accessible pristine wilderness area that can only compare to Seven Lakes Basin in the Olympics. It is incumbent upon us to retain this special place, undisturbed, unencumbered, in the public trust for us and future generations. Future water use is a concern for a growing population. It needs to be approached with the utmost care and consideration for all of the varied needs it may be used to support.
Thank You; Paul Fior
Newcastle, WA 98056
dogsafoot@gmail.comm

Sincerely,

Paul Fior
9216 120th Ave SE
Newcastle, WA 98056
dogsafoot@gmail.com
(425) 941-1003

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 344

From: Paul Granquist (paulgranq6439@comcast.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, June 23, 2018 10:35 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

344-1 As a frequent hiker in the Alpine Lakes Wilderness area I am appalled that plans are being made for the use of heavy construction equipment in this wilderness area. This activity would destroy a pristine area. Construction scars would last for decades. Even repairing existing dams while a more acceptable alternative would result in some habitat and ecological degradation. The Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold
344-2 visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Paul Granquist
10109 21st Ave W
Everett, WA 98204
paulgranq6439@comcast.net
(425) 514-8006

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 345

From: Rachel Thomas (inkedsiren@yahoo.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Friday, June 22, 2018 5:46 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

345-1 How could you really and truly be considering this? How can you justify this?!

345-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Rachel Thomas
519 W Roy St Apt 312
Seattle, WA 98119
inkedsiren@yahoo.com
(808) 651-6828

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 346

From: Rose Lagerberg (russlag1@live.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, June 23, 2018 2:52 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

346-1 While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

346-2 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Rose Lagerberg
8513 Madrona Ln
Edmonds, WA 98026
russlag1@live.com
(206) 708-9478

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 347

From: Shanna Sierra (sierramorgan4@msn.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Thursday, June 28, 2018 10:09 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

347-1 We must grow up NOT OUT! We the People want to preserve our amazing outdoors for GENERATIONS to come, not years! We must stop damning of these pristine areas and NOT ALLOW human influence to ruin this area for wildlife or human enjoyment. Short-sightedness is not worth it!

347-2 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Shanna Sierra
819 NE 151st St.
Shoreline, WA 98155
sierramorgan4@msn.com
(206) 856-3980

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 348

From: Sigrid Asmus (essay@nwlink.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Sunday, June 24, 2018 4:03 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

348-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we

348-2 appreciate the goal to improve instream flows in Icicle Creek, we cannot and must not allow the projects currently proposed by the Washington Department of Ecology and Chelan County. These destructive projects, in a precious and irreplaceable wilderness are, would undermine the well-deserved protections for our public lands. They must be stopped, both because -- in this case -- similar past efforts have wasted millions and never worked, and because if they are permitted tbat action would be a bright green light to still more invasive and destructive actions in Washington's wilderness areas.

348-1 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS must be revised to make certain that it complies with all state and federal laws, properly ensures there is NO impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Sigrid Asmus
4009 24th Ave W
Seattle, WA 98199
essay@nwlink.com
(206) 283-1382

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 349

From: Sue Tiffany (sunshine91070@yahoo.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, June 26, 2018 4:52 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

349-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

349-2 I have taken my children hiking in these pristine wilderness areas. No reasonable person would want to see bulldozers trampling ecosystems in these areas. In the last 30 years Washington State has seen much of its open space put under concrete. These lands are lost to the people who visited them and the animals that once called them home.

Reconsider the work on the Alpine Lakes area and use creative and conservation thinking.

Sincerely,

Sue Tiffany
25320 144th Pl SE
Kent, WA 98042
sunshine91070@yahoo.com
(253) 631-0312

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 350

From: Suzanne Davis (gardens2a11@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Monday, June 25, 2018 10:42 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

350-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

350-2 I've spent time in this wilderness and fully appreciate what we might lose. I also used to spend time each summer hosebackpacking in the Pasayten Wilderness. Decades later, I remember that time as some of the most formative of my life. That is where I learned the interconnectedness of life and the importance of taking care of the earth. That is where I learned how many stars there are in the night sky.

Please do not destroy any part of the wilderness area we have left. We can't get it back once it's gone.

Sincerely,

Suzanne Davis
1018 13th St Apt 65
Snohomish, WA 98290
gardens2a11@gmail.com
(360) 563-2672

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 351

From: Tanya Lawson (ovowlart@gmail.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Saturday, July 28, 2018 6:35 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

351-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

351-2 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. Is it right for one natural area to be exploited under the guise of enhancing another? Please find a more suitable and cost effective way to resolve this issue!

Sincerely,

Tanya Lawson
424 Kittitas
Wenathcee, WA 98801
ovowlart@gmail.com
(509) 579-0479

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 352

From: Venard Trevisanut (risanut@yahoo.com) Sent You a Personal Message <automail@knowwho.com>
Sent: Wednesday, June 27, 2018 10:43 AM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

352-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

352-2 save the highlands.

Sincerely,

Venard Trevisanut
24508 229th Ct SE
Maple Valley, WA 98038
risanut@yahoo.com
(425) 458-8165

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

Comment Letter 353

From: Barbara Cunningham <bcunningster@gmail.com>
Sent: Thursday, July 26, 2018 1:56 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

353-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

1

Comment Letter 353

353-2 Since we own this land and it belongs to ALL of us, I forbid you to let a small number of people take it upon themselves to destroy what is a beautiful wilderness!

Sincerely,
Barbara Cunningham

,

2

Comment Letter 354

From: Barbara Cunningham <bcunningster@gmail.com>
Sent: Monday, July 23, 2018 3:09 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

354-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

354-2 I urge you to choose Alternate 5. Don’t destroy land that you are not responsible for! Leave the wilderness area alone!

Sincerely,
Barbara Cunningham

,

Comment Letter 355

From: Cassandra Bufano <Cassandra.Bufano.53459950@p2a.co>
Sent: Tuesday, July 24, 2018 10:15 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

My name is Cassandra Bufano and I am writing to you to express my concerns with the proposed Icicle Creek water strategy.

355-1 I recently moved to Washington from Florida. I relocated to this areas primarily for the untouched and heavily respected Alpine Lakes Wilderness. When visiting in 2015 I felt a sense of wonder and awe as I went of my first hike ever at Snow Lake. Since then my life has completely changed and I then spent a year of my life living in Yellowstone National Park. I cannot explain how happy and at ease I am since I have started my life here. We have the chance to preserve this land and I know that I am not the only one that feels this way about Washington and the PNW in general. You are the voice we need to help this. Please do not let the rest of the country down.

355-2 The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Cassandra Bufano

1

Comment Letter 356

From: jennifer schultz <firls4eva@roadrunner.com>
Sent: Thursday, July 26, 2018 6:41 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

356-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

1

Comment Letter 356

356-2 BUILDING MAN MADE DAMS IS HORRIBLE FOR THIS AREA. SINCE THIS AREA IS FEDERAL LAND IT SHOULD BE PROTECTED FOR AMERICANS.

Sincerely,
jennifer schultz

,

Comment Letter 357

From: Mark and Susan Vossler <vosslerm1@comcast.net>
Sent: Sunday, July 29, 2018 11:33 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

357-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 357

357-2 We oppose new/enlarged dams.
We support minimizing wilderness impact.
Keep our wilderness "wild."
Thank you!

Sincerely,
Mark and Susan Vossler

,

Comment Letter 358

From: Mark and Susan Vossler <vosslerm1@comcast.net>
Sent: Friday, July 27, 2018 11:45 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

358-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 358

358-2 We support keeping our wilderness in it's natural and wild state.....there's already too few of these for future generations to enjoy. No tunnel, no dam in Alpine Lakes Wilderness.

Sincerely,
Mark and Susan Vossler

,

Comment Letter 359

From: Mary Johnson <mekj@earthlink.net>
Sent: Monday, July 23, 2018 2:26 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

359-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 359

359-2 It's very important to protect our wild places and waterways. Please come up with a plan that will do so. Thank you.

Sincerely,
Mary Johnson

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Comment Letter 360

From: Nancy Anderson <buhglady3@yahoo.com>
Sent: Thursday, July 26, 2018 12:42 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

360-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 360

360-2 Please do not ruin our beautiful country. This would definitely do that. And also hurt our wildlife.

Sincerely,
Nancy Anderson

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Comment Letter 361

From: Robert Havrilla <rjhtest@aol.com>
Sent: Sunday, July 29, 2018 5:29 AM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

361-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 361

361-2 I don't know how to be any more straight forward and direct about this project other than to say it is an obvious and blatant violation and affront to the Wilderness Act of 1964 to be building man-made dams in wilderness areas.

Sincerely,
Robert Havrilla

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Comment Letter 362

From: Robert Havrilla <rjhtest@aol.com>
Sent: Thursday, July 26, 2018 9:13 AM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

362-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

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Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

Comment Letter 362

362-2 Please correct me if I'm wrong but when Lewis&Clark explored the Far West, the only dams they may have come across were natural beaver dams; thus, man-made dams are out of character for wilderness areas and not in keeping with the Wilderness Act.

Sincerely,
Robert Havrilla

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Comment Letter 363

From: edie.lie@everyactioncustom.com on behalf of Edith Lie <edie.lie@everyactioncustom.com>
Sent: Sunday, July 22, 2018 9:05 PM
To: nr.iciclesepa@co.chelan.wa.us
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

363-1 These changes would have a negative effect on important trails and campsites in the Enchantments. Our children and their children should have the opportunity to hike to and camp at Eightmile and Snow Lakes. You would be taking away a precious place in Washington, a place where people can appreciate the wild beauty of the land. As it is now, hiking and camping in the Enchantments is already limited, and you were further deny us the experience of spectacular alpine scenery. Please reconsider the increase of the dams and boring the tunnel. These projects' negative effects outweigh the positive.

Sincerely,
Mrs. Edith Lie
18640 103rd Ave NE Bothell, WA 98011-3816 edie.lie@me.com

Comment Letter 364

From: Linda Carroll <lindalouise701184951@yahoo.com>
Sent: Monday, July 23, 2018 9:43 PM
To: Mike Kaputa
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

364-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

1

Comment Letter 364

364-2 As a native of Seattle who knows how much wilderness has been lost in our state in the last 70 years, I urge that the wilderness character of this region be preserved according to the law that governs it for all Americans, to whom it belongs.

Sincerely,
Linda Carroll

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Comment Letter 365

From: Bruce Turcott <turcotts@comcast.net>
Sent: Friday, June 22, 2018 8:20 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

365-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

365-2 I am a Washington native and first backpacked in the Enchantments in 1968. My son has made 3 trips there. We are well familiar with the area.

Bruce Turcott
4308 5th Ave NW
Olympia, WA 98502

Comment Letter 366

From: Tim McNulty <mcmorgan@olypen.com>
Sent: Monday, June 25, 2018 10:02 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

366-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

366-2 My family and I are frequent visitors to Chelan County, the Alpine Lakes Wilderness, and the Leavenworth area where we have good friends. We are dismayed that the County DEIS has proposed irrigation water projects in the Alpine Lakes Wilderness.

Tim McNulty
168 Lost Mountain Ln
Sequim, WA 98382

Comment Letter 367

From: Thom Peters <voice4wild@aol.com>
Sent: Monday, June 25, 2018 12:38 PM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

367-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

367-2 No designated orchard irrigation water for developments.

Thom Peters
7725 Riverview Road
Snohomish, WA 98290

Comment Letter 368

From: Susan Cuturilo <susancuturilo@msn.com>
Sent: Friday, June 22, 2018 12:24 PM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

368-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

368-2 I don’t understand the need for a dam. Can someone explain? It’s pretty outrageous to even consider dams up there.

Susan Cuturilo
1302 Seneca St.
Seattle, WA 98101

Comment Letter 369

From: Shirley Sonnichsen <jssonn.dawgs@charter.net>
Sent: Sunday, July 01, 2018 9:02 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

369-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

369-2 Please do not approve these projects of which many are illegal. This is a treasured wilderness area.

Shirley Sonnichsen
1150 Englewood Dr
Richland, WA 99352

Comment Letter 370

From: Seth Rolland <melseth@olypen.com>
Sent: Saturday, June 30, 2018 7:36 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

370-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

370-2 Please keep any new dams, tunnels or other development out of the Alpine Lakes wilderness. There are few places in the country that approach the beauty and wildness of this area, and it needs to be preserved for future generations.

Seth Rolland
1039 Jackson Street
Port Townsend, WA 98368

Comment Letter 371

From: Scott Elliott <scott@mountainlogic.com>
Sent: Friday, June 22, 2018 11:09 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Follow Up Flag: Follow up
Flag Status: Flagged

Mike Kaputa,

371-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

371-2 The outdoor recreation industry is key to job growth and economic development in our region. Please support jobs by protecting Alpine Lakes Wilderness.

Scott Elliott
PO Box 166
North Bend, WA 98045

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Comment Letter 372

From: Peter Carskaddan <p.carskaddan@centurylink.net>
Sent: Thursday, June 28, 2018 8:19 PM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

372-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

372-2 Director Kaputa, the Wilderness Act is the single best tool for the preservation of wilderness and should not be infringed upon. The Alpine Lakes is a treasure not just for Washington but the entire nation; it should not be chipped apart. Thank you

Peter Carskaddan
331 N 82nd St
Seattle, WA 98103

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Comment Letter 373

From: Mr. Shelley Dahlgren, PhD <shelley@dahlgren.com>
Sent: Friday, June 22, 2018 8:21 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

373-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

373-2 Mr. SDD. Once gone, gone forever. There must be other options that are as good this area. Mr. SDD

Mr. Shelley Dahlgren, PhD
4449 242nd Ave SE
Sammamish, WA 98029

Comment Letter 374

From: Michael Siptroth <flybill2@aol.com>
Sent: Monday, June 25, 2018 6:36 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

374-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

374-2 We need more protections for wilderness, for humans and wildlife; protecting waters crucial for salmon recovery and orcas!

Michael Siptroth
2160 E Trails End Dr
Belfair, WA 98528

Comment Letter 375

From: Julie Stohlman <jubilation@h4consulting.com>
Sent: Friday, June 22, 2018 2:25 PM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

375-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

375-2 This is an area where I love to hike. It is legally protected from development. Do not encroach on this area.

Julie Stohlman
715 Summit Ave E Apt B
Seattle, WA 98102

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Comment Letter 376

From: Emily Myette <emily.myette@gmail.com>
Sent: Friday, June 22, 2018 2:01 PM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

376-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

376-2 Additionally, I was lucky enough to get a permit to camp at Eightmile Lake last month. Not only was it appalling to see construction there at all, but I can only imagine how detrimental a large dam would be to the lake's natural beauty.

Emily Myette
1414 10th Ave
Seattle, WA 98122

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Comment Letter 377

From: Denise Harnly <denise@harnly.net>
Sent: Tuesday, June 26, 2018 1:07 PM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

377-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

377-2 Please- revise the draft EIS. There will be years of litigation if it stands as it is but more importantly this is one of the most pristine areas in the country.

Thank you!

Denise Harnly

Denise Harnly
3302 S Washington St
Seattle, WA 98144

Comment Letter 378

From: Bob Aegerter <Bob_Aegerter@comcast.net>
Sent: Friday, June 22, 2018 8:28 AM
To: Mike Kaputa
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Mike Kaputa,

378-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

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The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

378-2 Please do the legal thing.

Bob Aegerter
78 North Point Dr
Bellingham, WA 98229

Comment Letter 379

From: ben murray <benjideniro@yahoo.ca>
Sent: Tuesday, July 31, 2018 1:55 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] RE: "Icicle Creek Watershed Water Resources Management Strategy."

Dear Mike Kaputa,

379-1 The DPEIS should be revised to address the following deficiencies and a revised Draft PEIS should be released for public comment:

379-2 The Alpine Lakes Wilderness is federal public land that belongs equally to all Americans. As such, it's a shared natural resource that must be respected and protected. The national interest in preserving its wilderness character must be protected.

379-3 The DPEIS fails to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The DPEIS assumes Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The DPEIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals.

379-4 Alternative 4 is the worst. It includes drilling a tunnel between two lakes (Upper and Lower Klonaqua Lakes); building a higher dam at Upper Snow Lake (enlarging that lake); and a higher-than-ever dam at Eightmile Lake (making that lake bigger than it has ever been). All of these lakes are inside the Alpine Lakes Wilderness. The DPEIS analysis of these proposals is grossly inadequate. IPID has no right to enlarge Eightmile Lake, and has never had any water rights at Upper Klonaqua Lake.

379-5 Alternative 5 is best. It includes the "Full IPID Pump Station," which would move IPID's point of diversion downstream to the Wenatchee River, and greatly improve flows in Icicle Creek without building bigger dams in the Wilderness, especially in future decades when climate change will reduce flows in the Icicle watershed.

379-6 IPID's water rights were granted for the designated purpose of irrigation. The DPEIS proposes to use IPID water for other purposes, such as the fish hatchery and domestic use in Leavenworth, but IPID has no right to use water for these additional purposes.

379-7 For new storage, "restoration" storage and "optimization" projects, the timelines and estimated costs stated in the DPEIS are highly suspect, because the DPEIS fails to account for the fact that these lakes are on National Forest lands inside the Alpine Lakes Wilderness. The DPEIS repeatedly ignores protections of the Wilderness Act. It repeatedly ignores the land management role and authority of the U.S. Forest Service on these National Forest lands. It repeatedly ignores the fact that major federal actions require analysis under the National Environmental Policy Act (NEPA). The State Environmental Policy Act (SEPA) is not NEPA. The true costs of Alternatives 1, 2 and 4 are likely much higher than the DPEIS estimates, and closer to the cost of Alternative 5.

379-8 The DPEIS repeatedly ignores the negative impacts on the riparian ecosystems in the Alpine Lakes Wilderness from the proposed off-season releases of water from lakes, which alters stream hydrology.

Thank you.

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Comment Letter 379 Signatures

* Zentura
A A
A Haley
A Krevitz
A Michael Dianich
A Puza
A. Norris
A. S. Evans
A. Todd
A.B. Kovats
A.L. Steiner
a+a+c = 3 voters jhangiani
Aaron Sheiman
Aaron St. John
Aaron Ucko
Abdullah Goldstein
Abigail Corbet
Abigail Gindele
ACE HULL
Adam D'Onofrio
Adam Flogel
Adam Giancarlo
Adam Mead
Adam Sargent
Adele Sposato
Adella Albiani
Adiit Sundarajan
Adina Parsley
Adriana Faraldo
Adriana Micciulla
Adrienne Doherty
Adrienne Frey
Adrienne Strandberg
Aggie Parish
Aida Marina
Aimee Whitman
Aislinn Gagliardi
Al DeRoy
Al Mendelsohn
Al Trutter
Al Werner
Alan Binnie
Alan Carlton
Alan Carter
Alan Cyr
Alan Haggard
Alan Hart
Alan Jasper
Alan Lambert
Alan Robert
Alan Schenck
Alan Stein
Alan Wojtalik
Albert and Marcia Hertz
Albert Gamble
Albert Honican
Albert Marra
Albert Tahhan
Alberto Paquola
Alec Campbell
Aleda Richardson
Aleks Kosowicz
alena jorgensen
Alex Christensen
Alex Harris
Alex Monny
Alex Vollmer
Alexander Grant
Alexander Knopf
Alexandra Gruskos
Alexandra Zarzycka
Alexey Zimenko
Alexia Jandourek
Alfa Santos
Alfred Mancini
Ali Van Zee
Alice Felix
alice jena
Alice Kelly
Alice Mizsak
Alice Petersen
Alice Swan
Alice Tseng
Alicia Deherrera
Alicia Power
Alida Bockino
Alisa Lewis

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Alisa Ocean
Alisha BeGell
Alison Massa
Alison Taylor
Allen Altman
Allen Royer
Allen Salyer
Allen Symonds
Allie Tennant
Allycia Godbee
Alyce Fritch
Alycia Staats
alyson shotz
Alyssa Freeman
Amanda Hostetler
Amanda Petel
Amanda Smock
Amanda Sousa
Amanda Zangara
Amber Davidson
Amelia Linder
Amie Corrado-Babe
Amit Shoham
Amitav Dash
Amy Bright
Amy England
Amy F .
Amy Hansen
Amy Harlib
Amy Heyneman
Amy Kubin
Amy Liebman
Amy Roberts
amy Schumacher
Amy Veloz
Amy Wolfe
Amy Wolff
Ana Herold
Ana Jacques
AnaLisa Crandall
Ananya Boonyarattaphun
Anastasia Devaris
Anastasia Hanifan
Anastasia Ogle
Anders Hengsteler
Andi Lamoreaux
Andra Heide
Andre Gregoire
Andre Meaux
Andrea Alagammai
Andrea and James Gutman
Andrea Bonnett
Andrea Chisari
Andrea Eisenberg
andrea Feig
Andrea Ford
Andrea Kendall
Andrea Lewis
Andrea Neal
Andrea Smith
Andrea Williamson
Andrea Zemel
andres venegas
Andrew Bukovitz
Andrew Burnham
Andrew Fisher
Andrew Hellinger
Andrew Lenz
Andrew Mumford
Andrew Wadsworth
Andy Hughes
Andy Johnson
Andy Lynn
Andy Zahn
anet Gee
Angela Bellacosa
Angela Judy
Angela Leventis
Angela Peters
Angela Ridolfo
Angela Russell
Angela Shadwick
Angela Terranova
Angela West-Piotrowski
Angelina None
Angi Tilley
Angie Dixon
Angie Rhinier
ANGRY VOTER
Angus MacDonald
Anita Brandariz
Anita Gwinn
Anita Hoos
Anita McNamara
Anita Ross
Anita Watkins
Ann Barnes
Ann Barnett
Ann Bartell
Ann Bein
Ann Berndt
Ann Coz
Ann Craig
Ann DeBolt
Ann Downey
Ann Eastabrooks
Ann Frutkin
Ann Hinshaw
Ann Jacobs
Ann James
Ann K Brady
ann kam
Ann King
Ann Klinefelter
Ann Kuter
ann Malyon
Ann Marie
Ann Marie Ross
Ann McCall
Ann Pilcher
Ann Pryich
Ann Sherwood
Ann Sweeten
Ann Vileisis
Ann Waller
Ann White
Ann Wiley
Ann Wiseman
Anna Bengel
Anna Brewer
Anna Engdahl
Anna Janakiraman
Anna Jasiukiewicz
Anna Jones
Anna Louise Fontaine
Anna Mosqueda
Anna Narbutovskih
Anna Stein
Anna Szaszorowska
Anna Tangi
Annabel P
Anne Barker
Anne Dal Vera
Anne Easterling
Anne Ficke
anne hammond
Anne Harbut
Anne Jackson
Anne Jameson
Anne LaBouy
Anne Mathot
Anne Moeller
Anne Montarou
Anne Noire
Anne Phillips
Anne Pinkerton
Anne Spesick
Anne Streeter
anne veraldi
Anneke DeLuycker
Anne-Marie Hewitt
Annette Bork
Annette Frisbie
Annette McMullen
Annette Raible
Annette Tchelka
Annie Bien
Annie McCombs
Annie McCuen
Annie McMahon
Annie P
Annie Winstead
Anthony Albert
Anthony Arcure

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Anthony DeCarlo
Anthony Gilchriest
Anthony Kropovitch
Anthony Mehle
Anthony Miragliotta
Anthony Presutto
Antoinette Gonzales
Antonia Chianis
Antonia Mattthew
Antonio Ruiz
April shame on you Lo
April West
Arden Down
Ariana Saraha
arianna volpi
Ariel Leibowitz
Arlene Aughey
Arlene Dobra
Arlene Dreste
Arlene Forwand
Arlene Goodenough
Arlene Waller
Arlene Zuckerman
arline lohli
Armando Gomez
Art Hanson
Arthur Altree
Arthur Coates
Arthur Fellows
Arthur Hagar
ARTHUR MEINCKE
Artie Schlette
Arturo Beyeler
Asano Fertig
Ashley Lewis
Ashley Wapenski
Aubrey Johnson
Aubrey Lees
Aubrey Wilson
Audrey Arnold
Audrey Higbee
August Abel
August Scheer
Aurea Abrantes
Austin Turney
Avi Okin
Avril Harville
Axel Vogt
B DEmilio
B K
B Nigrini
B. ROSE
BA Mack
Baker Smith
Barb Borah
Barb DeLeone
Barb Hauser
Barb McCarthy
Barbara Amsler
Barbara Anderson
Barbara Andrew
Barbara Blackwood
Barbara Bonfield
Barbara Brockway
Barbara Carr
Barbara Collins
Barbara Conrad
Barbara Consbruck
Barbara Dague
Barbara Damm
Barbara Diederichs
Barbara Dincau
Barbara Fleming
Barbara Gladfelter
Barbara Glassheim
Barbara Graper
Barbara Gross
Barbara Grove
Barbara Hanson
Barbara Hegedus
Barbara Jacobsen
Barbara Jacoby
barbara kruse
Barbara Lasley
barbara maat
Barbara MacAlpine
Barbara Manildi
Barbara Mathes
Barbara McDonald
Barbara McMahan
Barbara Mesa
Barbara Mintz
Barbara Nardone
Barbara Osada
barbara poland
Barbara Rizzo
Barbara Rogers
Barbara Root
Barbara Rosenkotter
Barbara Rubinstein
Barbara Silverman
Barbara Simonds
Barbara Stone
BARBARA SWYDEN
Barbara Tacker
Barbara Tonsberg
Barbara Tountas
Barbara Trypaluk
Barbara Wagner
Barry Adler
Barry Bennett
Barry Cutler
Barry LeBeau
Barry Schwartz
Bart Stegman
Bartley Deason
BARTON COX
Bassam Imam
Beatrice Attier
Beatrix Schramm
Beatriz Pallanes
Beau Ryba
bec marant
Becca Forrest
Becky Anderson
Becky Andrews
Becky Breeding
Becky Daiss
Becky Johnson
Becky Marek
Becky Monger
Bee Wenzer
Beedona Cracium
Belle McMaster
Bellinda Rolf-Jansen
Ben Bryant
Ben Horner-Johnson
Ben Johnson
Ben Martin
ben murray
Ben Ruwe
Benjamin Joannou Jr
Benjamin Martin
Bennie Scott
BENNIE WOODARD
Benton Elliott
Berinda Van Cleave
Bernadette Schein
Bernadine Turner
bernardo alayza mujica
Bernice Van Steenbergen
Beth Bowling
Beth Call
Beth Chao
Beth Drewelow
Beth Flake
Beth Goodhue
Beth Hawes
Beth Levin
Beth Raynis
Beth Yelensky
Bethany Bradshaw
Beti Webb Trauth
Betsey Porter
Betsy Herbert, Ph.D.
Betsy Maestro
Betti Jones
Bettina Bickel
Betty J. Van Wicklen
Betty King
Betty Lee Smith
Betty Peterson-wheeler
Betty Schuessler
Betty Stewart

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Beverly Ann Conroy
Beverly Deering
Beverly Garcia
Beverly Harris
Beverly Herrington
Beverly Janowitz-Price
Beverly Linton
Beverly Minn
Beverly Railsback
beverly rice
Beverly Stickley
Beverly Williams
Bill and Fran Stenberg
Bill Boyd
Bill Brabson
Bill Christie
Bill Engs
Bill Hughes
Bill Leikam
BILL MARCH
Bill Mikulak
Bill Scott
Billie Gordon
BILLY WOODS
Bjoern Mannsfeld
blake wu
Blanca Luz Ross
Blanche Jones
Bo Baggs
BO BREDA
Bo Svensson
Bob Bousquet
Bob Brister
Bob Conrich
Bob Douse
Bob e Burnham
Bob Flagg
Bob Gendron
Bob Hoffman
Bob Justis
Bob M
Bob Miller
Bob Saint
Bob Schildgen
bob senko
Bob Sipe
Bob Steininger
Bob Thomas
bob welch
bob Yancey
BOBBI GOLDIN
Bobbie Flowers
Bobbie Hensley
Bobby Belknap
Bonita Staas
Bonna Mettie
Bonnie Dryer
Bonnie Eden
Bonnie Faith
Bonnie Farmer
Bonnie Fletcher
Bonnie J. Smith
Bonnie Orkow
Bonnie Sadowskas
Bonnie Walsh
Bonnie Wassmer
Bonnie Worden
Brad Jacobsen
Brad Snyder
Bradford Crain
Bradley Houseworth
Brandi McCauley
BRANDI THOMAS
Brandie Deal
Brandon Juhl
Brandon Steiner
Brandt Mannchen
brandy faber
Brandy Parris
Brandy Schumacher
Brant Kotch
Braxton Worth
Brenda Eckberg
Brenda Hartman
Brenda Michaels
Brenda Theus
BrendaLee Lennick
Brent Riggs
Brent Rocks
Bret Smith
Brett Taylor
Bria Wheat
Brian Boortz
Brian Field
Brian Gibbons
Brian Gottejman
Brian Huntley
Brian Kessler
Brian Larson
BRIAN MCSHANE
Brian Moscatello
Brian Paradise
Brian Pierce
Brian Pike
Brian Schwartz
Brian Thorbjornsen
Brian Weatherby
Brian Yanke
Bridget LaNoir
Bridget Nelson
Bridgett Heinly
Brig Larson
brigitte hiller
Brita Mjos
BRITT CLEMM
brittney bergstrom
Brittni Mills
Brooke Kane
Brooke Miltner
Bruce Allen
Bruce Anderson
Bruce Barnbaum
Bruce Bernard
Bruce Carley
Bruce Cohen
Bruce Higgins
Bruce Jackson
Bruce Jensen
Bruce McNally
Bruce Olson
BRUCE OSHABEN
Bruce Ross
Bruce Sadowskas
Bruce Turcott
Bryan Bell
Bryan Bradley
Bryan Hansel
Bryan Wyberg
Bryn Heist
bryna fuchslocher
Burkhard Broecker
Burt Torgan
C Day
c leonard
C Pearson
C. Kasey
C. Mendel
Caephren McKenna
Caitlin Archambault
Caitlin Meyer
Cal and Alice Elshoff
Cal Cole
Calley ONeill
Callie Riley
Callie Stilwell
Camelia Mitu
Camilla Spicer
Camille Gilbert
Cammy Colton
Candace Bassat
Candace Gabriel
Candace Galen
Candace McCann
Candace Rocha
Candy Frantz-Crafton
Cara Busch
CARA lou wicks
Caren Hanson
Carina Ramirez
Carl Pribanic
Carl Stapler
carl tyndall
Carla Behrens
Carla L

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Carla Womack
Carleen Terrano
Carlene Meeker
Carlene Moscatt
Carlos Castro
Carlos Nunez
Carlotta Harrell
Carly Clements Owens
Carly Wilcox
Carmel Parr
carol bartelt
Carol Book
Carol Bostick
Carol Brazee
Carol Chappell
Carol Collins
Carol Cunningham
Carol Dearborn
Carol Doty
Carol Else
carol flatmo
Carol Fletcher
Carol Fly
Carol Freese
Carol Goerke
Carol Gold
Carol Goslant
Carol Hendrie
Carol Hewitt
Carol Hinkelman
Carol Howell
carol jagiello
Carol Jensen
Carol Joan Patterson
Carol King
Carol Knight Watson
Carol Kommerstad-Reiche
Carol Kreck
Carol Kuelper
Carol Laurencell
Carol Lawrence
Carol Lillis
Carol Maghakian
Carol Metzger
Carol Ohlendorf
Carol Rahbari
Carol Ramo
Carol Rue
Carol Ruth
Carol Schaming
Carol Sears
Carol Skowronnek
Carol Smith
Carol Stotmyer
Carol Taggart
Carol Thompson
CAROL VANDEVEIRE
Carol Waggener
Carol Weaver
Carol Weber
Carol Wick
Carol Wiley
Carol Wyndham
Carole Campbell
Carole Ehrhardt
carole klumb
Carole Mathews
Carole Pappas
carole pooler
Carole Stodder
Carolie Booth
Caroline Garland
Caroline Kane
Caroline Kipling
Caroline Mead
Caroline Sévilla
Carolita McGee
Carolyn and Richard Rosenstein
Carolyn Barker
Carolyn Boydston
Carolyn Clark Pierson
Carolyn Dennison
Carolyn Dickson
Carolyn Doty
Carolyn Eden
Carolyn Gann
Carolyn Haupt
Carolyn Knoll
carolyn massey
Carolyn Nieland
Carolyn Poinelli
Carolyn Raasch
Carolyn Ricketts
Carolyn Simon
Carolyn Smith
Carolyn Wood
Carrie Darling
Carrie Thompson
Carrie Walker
carrie west
Carrie Windhorst
Carroll Dartez
Cary Appenzeller
Caryl Speck
Caryn Cowin
casey coates danson
Casey Cochran
Cashin Hunt
Cassandra Browning
Cassie Alford
Cassie Valent
Catherina Pressman
Catherine Anders
Catherine Beauchamp
Catherine Corwin
Catherine Hale
Catherine Houtakker
Catherine Jones
Catherine Keys
Catherine Lambeau
Catherine Loudis
Catherine McNamara
Catherine Nelson
Catherine Nettesheim
Catherine Uchiyama
Catherine Vernon
Catherine Williams
cathie ernst
Cathie Kwasneski
Cathy Adams
Cathy Bledsoe
cathy crum
cathy elizabeth levin
cathy Ellis
Cathy Felix
Cathy Grovenburg
Cathy Hope
Cathy Lambeth
Cathy Marczyk
Cathy Nieman
Cathy Ream
cathy russo
cb michaels
Cecelia Samp
Cecilia Barea
Cecilia Burns
Celeste Anacker
Celeste Hong
Celeste Watt
Celia Wulff
Chad Bowers
Chad Evans
Chad Fuqua
Chad Held
Chadwick Wright
Chandra Hershey-Lear
Charity Moschopoulos
Charleen Steeves
Charleen Strelke
Charlene Boydston
Charlene Ferguson
Charlene Knop
Charlene Rush
charles anderson
Charles Barnard Jr
Charles Bittorf
Charles Casper
Charles Clusen
Charles Davis
Charles Fitze
Charles Hammerstad
Charles Hessler
Charles Hottle

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Charles McRae
Charles Phillips
Charles Tribbey
Charles Wirth
Charles Wolfe
Charles Younger
CHARLOTTE COOK
Charlotte Pirch
Charlotte Read
Charlotte Zitis
Charmaine Pulgados
Chas Martin
Chelsea Smart
Chelsey Stuart
Cheri Haram
Cheri Moore
Cheriel Jensen
Cherri Gilbert
Cheryl Arthur
Cheryl Biale
Cheryl Carney
Cheryl Dzubak
Cheryl Fischer
Cheryl Michalak
Cheryl Nunn
Cheryl Reid
Cheryl Wait
cheryl watters
Cheryl Weiden
Chessa Rae Johnson
Chiimey Lee
Chilton Gregory
Chrid George
Chris Bihler
chris burns
Chris Casper
chris frost
chris gardner
Chris Gulick
Chris Horton
Chris Komiensky
Chris Lavin
Chris Law
Chris Lima
Chris Loo
Chris LOPEZ
chris marquette
Chris Moore
Chris Saia
Chris Stay
Chris Tiedemann
Chris Washington
Chris Young
Christa Hegland
Christain Paul Schneider
Christeen Anderson
Christi Dillon
christiane citron
Christie Hammond
Christina Dickson
Christina Little
Christina Maris
Christina Marx
Christina McKeon
Christina Nillo
christina penrose
Christine Becker
Christine Brazzell
Christine Cummer
Christine Gasco
Christine Goetz
Christine Jones
Christine King
Christine Klunder
Christine M.C. Money
Christine McDowell
Christine Mueller
Christine Newport
Christine Radau
christine Schnebly
Christine V Fink
Christopher Barnes
christopher carbone
Christopher Chatard
Christopher Ecker
Christopher Heuman
Christopher Keefe
Christopher Lepine
Christopher Seymour
Christopher Still
Christopher Toye
Christopher Ware
Christopher Weisel
Christy Bolognani
chrystyne braaten
Chuck Gehling
Chuck Graver
Chuck Wieland
Cigy Cyriac
cindy allison
Cindy Bassham
Cindy Girvani Leerer
Cindy Koch
Cindy Lance
Cindy Marshall
Cindy Parrone
Cinzia Paganuzzi
Ciry Null
Claire Chambers
Claire Cohen
Claire Jackson
Claire Lawrence
Claire Perricelli
Claire Thibault
Clara Blank
Clare Halloran
Clark Shores
Claudia Cannaday
Claudia Greco
Claudia Halsell
Claudia Kaplan
Claudia Miranda
Claudia Vernon-Sabine
Claudia Wornum
Clay Wright
Clayton Cunha Filho
Clayton Daughenbaugh
Cleo Hagen
Clifford Provost
Clifton Ware
Clint Lenard
Clinton Nagel
Clive O'Donoghue
cm daudier
Cody Dolnick
Colene flaherty
Colette Sherrington
Colette Taglieri
Colin Goldie
Colin Kay
Colleen Harrison
Colleen K
Colleen Lobel
Colleen McMullen
Colleen Wysser - Martin
colonel meyer
Connie Burris
Connie Curnow
Connie Devine
Connie Hupperts
Connie Kaye
Connie Murphy
Connie ROUX
Connie Whitson-Forbes
Connie Williams
Connor Harrison
Constance Baughan
constance lorig
Consuelo Larrabee
Consuelo Olivarez
Copley Smoak
Corey Benjamin
Corey Carlson
Corey Schade
Cori Bishop
corine cathala
Corinne Greenberg
Corinne Hollings
Corinne Musy
Correne George
Corrina Parker
Cortney Zaret
COURTLAND HUBER
Courtnay Thunstrom

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Courtney Hough
Courtney Little
craig conn
craig drew
Craig Markson
Craig Murray
Craig Peariso
craig robinson
Craig Warren
Craig Zimmerman
Cristen C.J. Osborne
Cristina Gatti
Cristina Novelo
Cristine Saunders
Crystal Rector
Crystal Wolf
curt johnson
Curtis Bohlen
Curtis Coffer
Cyndi Clough
Cyndi Hunt
Cynthia Arnold
CYNTHIA DICARLO
cynthia edwards
Cynthia Hellmuth
Cynthia Lopreto
Cynthia Marrs
Cynthia McNamara
Cynthia Obyrne
Cynthia Shahan
Cynthia Smith
D Bello
d hipworth
d ng
d robinson
D Rosengrant
D. Fairburn
D. Rex Miller
Dacia Dyer
Daimhin Graves
Dale LaCognata
Dale Peterson
dale riehart
Dale Shero
Dallas Dill
Dameon Hansen
Dameta Robinson
Dan Esposito
Dan Heffernan
Dan McCurdy
Dan Melius
Dan Morgan
dan murray
Dan Nelson
Dan O'Hara
Dan Pepin
Dan Robinhold
Dan Satchell
Dan Sherwood
Dan Struble
Dan VanderVere
Dana Bleckinger
Dana Pierson
Dana Sklar
Daniel and Judith Dickinson
Daniel Aunkst
Daniel Bauer
Daniel Bennett
Daniel Chandler
Daniel Dowdle
Daniel Jordan
Daniel L. Harris
Daniel Mink
Daniel O'Keefe
Daniel Salmen
Daniel Schmidt
Daniel Vallero
Daniel W
Daniel Wilkinson
Daniela Rossi
Daniele Vitalini
Danielle Stanley
Danielle White
Danna Williams
Danny King
D'Arcy Goodrich
Darcy Leach
Darcy Macconnell
darece Swindler
Darius Fattahipour
darius mitchell
Darlene Jakusz
Darrel Lepiane
Darren Mitton
Darren Strain
Darvin Schild
darynne jessler
Dave Frank
Dave Goodlin
Dave Karrmann
Dave Potter
Dave Searles
Dave Taylor
Dave/Rita Cross
Daviann McClurg
David E. White
David A Lawrence
David Addison
David and Sally Mikkelsen
David Balan
David Bauer
David Boyer
David Brewer
DAVID BURNS
David Christman
David Collins
David Drecktrah
David Dzikowski
David Evans
David Fiedler
David Fisher
David Foulger
David G. Laramie
David Giantomasi
david gladstone
David Grant
David Griffith
David Guleke
David Gurarie
David Hall
David Harralson
David Harrison
David Henning
David Hermanns
david j. lafond
David Judd
David K Oberlin Jr
David Kagan
David Katz
David Kehl
david king
David Klass
David Koeller
David Kornreich
David Laing
David Larsen
David LaVerne
David LeRoy
David Linn
David Luboff
David McNiff
David Miller
David Mitchell
David Neal
David Neumann
David Nichols
David Nielsen
David Olson
David Osterhoudt
David Parker
David Porter
david prystal
David Pyle
David Rice
David Rieckmann
David Rockwell
David Rose
David Sandage
David Sanders
David Saperia
David Schommer
David Seaborg
David Sickles
David Smith

Comment Letter 379 Signatures

Comment Letter 379 Signatures

David Stallings
David Stetler
David Taylor
David Thometz
David Todnem
david Trask
David Tvedt
David Whalen
David Ashton
Davinia Bleijenberg
Dawn Albanese
Dawn Cumings
Dawn DiBlasi
Dawn Florio
Dawn Foster
dawn kenyon
dawn king
Dawn Kosec
Dawn Mason
Dawn Pesicka
Dawn Turner
Dayle Carter
DC Katten
Dean Mieras
Dean Pryer
Dean Sherwood
Dean Sigler
deann alex
Deanna W. Bundren
Deanne O'Donnell
Deb Kilgore
Deb Michaels
Deb Staudt
Deb Williamson
Debbi Weiler
Debbie Bonnet
Debbie Bremner
Debbie Burroughs
Debbie Friesen
Debbie Jackson
Debbie Kearns
Debbie McCarthy
Debbie Pinkham-Salt
Debbie Sanders
Debbie Sequichie-Kerchee
Debbie Sierchio
Debbie Spear
Debbie Stephenson
Debbie Sturt
debbie thorn
Debbie Woods
Debi Griepsma
Debi Holt
Debi Wong
Deborah and Johnny Alderson
Deborah Boomhower
Deborah Brown
Deborah Coviello
Deborah Dahlgren
Deborah Dobski
Deborah Doolittle
Deborah Efron
Deborah Finn
DEBORAH FREELAND
Deborah Golembiewski
Deborah Harris
Deborah Hoffmann
Deborah Kassis
Deborah Kenyon
Deborah King
Deborah Labb
Deborah Lipman
Deborah Mangan
Deborah Reeves
Deborah Rollings
Deborah Santone
Deborah Spencer
deborah straker
Deborah Wiley
Deborah Williams
Debra Ashton
Debra Csenge
Debra Evon
Debra Guel
Debra Miller
Debra Murphy
debra poscharscky
Debra Teplin
Debra Thompson
Debra Ashton
Dee Gee
Dee Gee
Deesa Balasingam
Deirdre Morris
Deja Lizer
Delyth Owen
Demelza Costa
Dena Maguire young
Denie English
DENIS HAWKINS
Denise Brennan
Denise Brown
Denise Carmosino
Denise Clarke
Denise Keeton
Denise Lenardson
Denise Lytle
Denise Ress
Denise Romesburg
Denise Szymanski
Denise Ward
Dennis and Susan Kepner
Dennis Bahr
Dennis Edgar
Dennis Feichtinger
Dennis Hartenstine
Dennis Heinzig
Dennis Kreiner
Dennis Ledden
Dennis Manning
Dennis Marceron
Dennis McGee
dennis nagel
Dennis Ruffer
Dennis Trembly
Dennis Wingle
Derald Myers
Derinda Nilsson
Desiree Mendes
Devin McCormick
Devyn Arbogast
Diana Anderson
Diana Bain
Diana Baker
Diana Bohn
Diana Cristina
Diana Dee
Diana Duffy
Diana Franco
diana kekule
diana Keyser
Diana Merson
Diana Saxon
diana schmidt
Diana Ward
Diane Bartkovich
Diane Brandstetter
Diane Brown
Diane Clark
Diane Davis
Diane Dobreuenaski
Diane Ethridge
Diane Fascione
Diane Gentile
Diane Hendricks
Diane Kadomoto
DIANE KASTEL
Diane Kent
Diane Kokowski
Diane Kraynik
Diane Krell-Bates
Diane Lamb
Diane Loughbom
Diane McJunkin
Diane Neale
Diane Nowak
Diane Nunez
DIANE POOLE
Diane Redner
Diane Sadowski
Diane Schwarz
Diane Stroz
Diane Sullivan

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Diane Thomas
Dianna McNair
Dianne Blane
Dianne Douglas
Dianne Ensign
Dina Duffy
Dirk Beving
DJ Wagner
Dobi Dobroslawa
Dolly Marshall
Dolores Graham
Domenico Mastrototaro
Dominique LANG
Don B. Meriwether
Don Bergey
Don Bolanos
Don Cianelli
DON COTE
Don Johnson
Don McKelvey
Don Pew
Don Schapker
Don Thompson
Dona LaSchiava
Dona Pereira
Donald Di Russo
Donald Dybel
Donald Erway
Donald Garlit
Donald Goppert
Donald Shaw
Donald Tayloe
Donald Turken
Donald Walsh
Donald Wilson
Donette Erdmann
Donna Alleyne-Chin
Donna Austin
Donna Barham
Donna Bing
Donna Blue
Donna Bonetti
Donna Bookheimer
Donna Buscemi
Donna Crossman
Donna Curry
Donna D Varcoe
Donna Fabiano
Donna Feirtag
Donna Friedman
Donna Harris
Donna Jones
Donna Kleinert
Donna Leavitt
Donna Lenhart
Donna Lewis
Donna Mandel
Donna Parente
Donna Pemberton
Donna Robin Lippman
Donna Rose Sherman
Donna Selquist
Donna Sharee
Donna Shroyer
Donna Slowik
Donna Smith
Donna Snow
Donna Thelander
Donna Watson
Dorcas Daly
Dorene Randall
Dori Cole
Dorien Zaricor
dorinda kelley
Doris June
Doris Luther
Doris Potter
dorit grunberger
Dorothea Leicher
Dorothea Stephan
Dorothy Anderson
Dorothy Brooks
Dorothy Brown
Dorothy Cardlin
Dorothy Daraio
Dorothy Davis
Dorothy Hamilton
Dorothy Lee
Dorothy Parshall
Dorothy Shelton
Dorothy Wheeler
Dorothy Wyatt
DOTTIE ANKLAM
Dottie Butler
Doug Alderson
Doug and Jan Parker
doug franklin
Doug Gledhill
doug krause
Doug Landau
Doug Schwartz
Doug Thompson
Doug Wittren
Doug Young
Douglas Cooke
Douglas Fater
Douglas Kinney
Douglas McCormick
Douglas Rives
Douglas Rohn
Douglas Sedon
DOUGLASS SWANSON
Dr Lori Ugolik
Dr. Susan Caswell
Dr. Ronald E. and Mrs. Paulette Tatum
Dr. Tammy King
Dr. William 'Skip' Dykoski
Drew Keller
Drew Martin
Drew Reese
Drs. Sher and Randall Todd
Duncan Van Arsdale
Dwight Sanders
Dyan Muse
Dylan Flather
Dylan McCoy
E M Knight
e p
E Scantlebury
E. James Nedeau
Earl Frounfelter
Earl Stevens
Ed Abdool
Ed Bennett
Ed Dobson
Ed Fiedler
Ed Lee
Ed Loosli
Ed Maxedon
Ed Perry
Ed Rowell
Edele Heath
Eden Kennan
Edh Stanley
Edie Bruce
Edith Crowe
Edith Ogella
Edith Yelland
Edmund Attanasio
Edmund Gutierrez
Edna Mullen
Edward Bennett
Edward Butler
Edward Cavasian
Edward Day
Edward DeFrancia
EDWARD G. MRKVICKA
Edward Kush
Edward LeBlanc
Edward McDowell
EDWARD MORALES
Edward Rengers
Edward Savage
Edward Schneider
Edward Souza
Edward Stewart
Edward Thornton
Edwin Quigley
Eileen Easton
Eileen Gerrity
Eileen Gersuk-Byrd
Eileen Massey
Eileen Sonnenberg

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Eileen Stark
Elaine Alfaro
Elaine Blair
Elaine Donovan
Elaine Genasci
Elaine Hughes
Elaine Koffman
Elaine Pinckard
Elaine Sloan
Elan Carlson
Eleanor BACHMANN
Eleanor Dowson
Eleanor Gomez
Eleanor Harding
Eleanor Horneman
Eleanor Liggio
Eleanor Navarro
Eleanor Smithwick
Elena Busani
Elena De Fanis
Elena Knox
Elena Myers
Elena Rumiantseva
Eleonora di Liscia
Eliette Bozzola
Elinor Burnside
elisa francesca Lorenzetti
Elisa Pagan
Elisabeth Bechmann
Elisabeth Olsson
Elisabeth Spaeth
Elise Adibi
Elise Phillips Margulis
Elissa Mericle-Gray
Elissa Wagner
Elizabeth Agren
Elizabeth and Gerritt Baker-Smith
Elizabeth Ashby
Elizabeth Berggren
Elizabeth Bradshaw
Elizabeth Brandt
Elizabeth Brannon
Elizabeth Brown
Elizabeth Burin
Elizabeth Butler
Elizabeth Dahmus
Elizabeth Darovic
Elizabeth De Guise
Elizabeth Garibaldi
Elizabeth Hemzacek
Elizabeth Hickman
Elizabeth Knowlton
Elizabeth Larrison
Elizabeth Lengel
Elizabeth MacKelvie
Elizabeth Milliken
Elizabeth Mooney
Elizabeth Mostov
Elizabeth ODear
Elizabeth Seltzer
Elizabeth Sheppard
elizabeth spragins
Elizabeth Stucki
Elizabeth Veillette
Elizabeth Vitale
Elizabeth Watts
Elizabeth Wroblewski
Elke Hoppenbrouwers
Elke Romer
Ellen Ander
Ellen Atkinson
Ellen Barth
ellen boyle
Ellen Brouillet
Ellen Domke
Ellen Dryer
Ellen Jahos
Ellen McCann
Ellen McNeirney
Ellen Middleditch
Ellen Segal
Ellen Sweeney
ellen walsh
ellie carin
Elliot Daniels
Ellis Woodward
Eloise Robbins
Elsie Wattson Lamb
Elsy Shallman
elyette weinstein
Elżbieta Lis
em Levitt
Emilia Bland
Emilia Wolfova
Emilie Jones
Emily Boliver
Emily D Adams
Emily Haggerty
Emily McDonald
Emily Rothman
Emily van Alyne
Emma Jean Musto
Ena Sroat
Enid Cardinal
enzo mulas
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Eric Bon
Eric Brooker
Eric Dougherty
Eric Edwards
Eric Fosburgh
Eric Meyer
eric naji
eric nylen
eric pash
Eric Pickering
Eric Potter
Eric Reyes
Eric Robson
Eric Schmidt
Eric Schweitzer
Eric Towle
Eric Voorhies
Eric Zdilla
Erica Gasparini
Erica Himes
Erica Johanson
Erica St . John
Erica Tyron
Erik LaRue
Erik Peterson
Erika Boka
Erika Howards
Erika Miller
Erika Seibel
Erika-Jayne Sison
Erin Howard
Erin Karp
Erin Kilpatrick
Erin Maas
Erin McCarty
Erin Znidar
Erma Lewis
Ernest Stromberg
Esther Garvett
Eugene Cahill
Eugene Gourley
Eugene Howard
Eugene LeCouteur
Eugene Majerowicz
eugenie jenkins
Eva Coffee
Eva Hiwan Abraha
Eva Hofberg
Eva Z
Evan Jane Kriss
Evan Oakley
Eve Shapiro
Evelyn Ball
Evelyn Coltman
Evelyn Foster
Evelyn Griffin
Evelyn Lilienfeld
Evelyn McMullen
Evelyn Och
Evelyn Pietrowski-Ciullo
evie hager
EVINNA ENGLEZOU
F Corr
f Fitz
F Hammer
F. Carlene Reuscher
F. Robert Wesley

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Fabio Capelli
Faith Franck
Faith Kirk
Faith Strailey
fallon hume
Fann Harding
fay forman
Faye Gregory
Felicity Devlin
Fiona Nolan
flavia pellizzari
Florence Morris
Florence Sandok
Florie Rothenberg
Forrest Netzel
Fran Delaney
Fran Hormel
Fran Teders
Frances Bell
Frances Crocco
Frances Crouter
Frances Emanuel
Frances Harriman
frances Mostov
Frances O'Neal
Frances Rogovin
Francine Traniello
Francine Ungaro
francis mastri
Francis Schilling
Francisco Gadea
francois verly
Frank Baele
Frank DiGregorio
Frank Fenimore
Frank Fredenburg
Frank Gonzales Jr .
Frank Hartig
Frank K. Thorp
Frank Klug
Frank Marwood
Frank Matalone
Frank Phillips
Frank Sabatini
Frank Wilsey
Franklin Kapustka
Franziska Eber
Fred Coppotelli
Fred Granlund
Fred Karlson
Fred Luke
Fred Martin
Freda karpf
freddie sykes
freddie williams
freddy sall
Frédéric Jaubert
Frederick Weinstein
G Allen Daily
G Claycomb
G Griego
G Van Slyke
G. Austin Smith
G. D.
G. G. Johnson
G. Paxton
G. Trubow
Gabriel Lautaro
Gabriel Neilson
Gaia Cole
Gaia Schubert
Gail and Richard Konopacki
Gail Caswell
GAIL GACHARNA
Gail Goldsmith
Gail Harris
Gail Laurson
Gail Padalino
Gail Veiby
Gail Walter
Gale Espinosa
Gale Rullmann
Galen Hansen
Galloway Allbright
GARRY DASHNER
Garry Jones
Garry LOUGH
GARY BECK
Gary Bowers
Gary Brooker
Gary Christensen
Gary Cobb
Gary Cox
Gary Davis
Gary Gilbert
Gary Goetz
Gary Herwig
Gary Ivey
Gary Kolb
gary kuhn
Gary McCuen
Gary Meredith
Gary Overby
Gary Rejsek
gary schenkel
Gary Wolf Ardito
Gavin Bornholtz
Gay Mikelson
Gaye Georges
Gayle Janzen
Gayle Smith
Geert Vancompernolle
Gena DiLabio
Gene and Dori Peters
GENE AND LIZBETH CASEY
gene chorostecki
Gene Cochran
Gene Tabish
Gene Wheeler
Genevieve Esson
Geoff Regalado
Geoffrey Conrad
Geoffrey Lizotte
George Bourlotos
George Casner
George Craciun
George Dillmann
George Erceg
George Grace
George Hartman
George Lamb
George Latta, M.D., MBA
George Mackison
George Neste
George Ripplinger
George Schaefer
George Schneider
Georgean Goldenberg
Georgeanne Samuelson
Georgia Braithwaite
Georgia Goldfarb
Georgia Mattingly
Georgia Shankel
Georgie Song
Georgina Kazan
Georgina Wright
Gerald Alexander
Gerald and Nancy Wright
Gerald Brookman
gerald gouge
Gerald Hassett
Gerald KOLBE
Gerald Walsh
GERALYN LLOYD
Gerard Billmeier
Gerhard Eckardt
Gerhild Paris
Geri Miller
Geri Ott
gerrit woudstra
Gerry Milliken
Gerry Williams
Gertrude Battaly
Gila Wdowinski
Gilbert & Sonya Leyva
Gilda Fusilier
Gilda Levinson
Gillian Miller
gina anson
Gina Gatto
gina mondazze
Gina Obrien
Gina Paige
Gina Read

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Gina Scarnati
Gina Writz
Ginger Anderson
Ginger Hipszky
Gisela Zech
Gisele Sampson
giustina damiano
Glen Venezio
Glenda Lilling
Glenn Davis
Glenn Gray
Glenn Hopkins
Glenn Hufnagel
Glenn Schlippert
Gloria Clements
gloria czapnik
Gloria Diggle
Gloria Linda Maldonado
Gloria Resa
Gloria Uribe
Gordon Corkrum
Gordon Hait
Gordon Kelly
Gordon Seyfarth
Grace Morsberger
Grace Neff
Grace Padelford
Grace Willard
Graeme Magruder
Grant Barnard
Grayson Henry
Greg Dudley
Greg Gentry
Greg Ratkovsky
Greg Rosas
Greg Singleton
Greg Sweel
Greg Wilson
Greg Zahradnik
Gregg Kolessar
Gregory Crockett
Gregory Esteve
Gregory Fite
Gregory Flower
Gregory Griffin
Gregory Jones
Gregory Morton
Gregory Pais
Gregory Robert
Gregory Skutches
Gretchen Bratvold
Gretchen Wolf
Gretchen Zeiger-May
Grey Larsen
Gudy Terenzio
Guillemette Epailly
gunnar sievert
Guy Merckx
Gwen Hadland
Gwen Stone
Gwen Straub
Gwen Trube
H. Guh
H. Rosenberg
Hal Enerson
Hal Forsen
Hal Glidden
Hali Holmes
Hans-Jürgen Sass-Conradt
Hans-Peter Heinrich
Hariana Días
Harley Pierce
Harold Johnsen
Harold Watson
Harriet Cohen
Harriet Greene
Harriet Grose
harriet hutchinson
Harriet Jernquist
harriet levine
Harriett Cody
Harriett Fazio
Harriette Frank
Harry Cunningham III
Harry Gerecke
harry knapp
Harry Tucci
Harvey Brown
Harvey Metzger
Harvey Rubenstein
Heath Post
Heather Cross
Heather Halvorson
Heather Murawski
Heather Parker
Heather Payne
Heather Tachna
Heide Coppotelli
Heidi Ahlstrand
Heidi Baruch
Heidi Bresilge
Heidi Handsaker
Heidi Hartman
Heidi Hurd
Heidi Lynn
Heidi Mugrauer
Heidi Pringle
Heidi Wacker
helen bacon
Helen Curtis
helen freedman
Helen Greer
Helen Kite
Helen Manning-Brown
Helen Moissant
Helen Rutherford
Helen Strader
Helena Doerr
HELENA HEFINGER HERNANDEZ
helene ly
Helga S .
Helmut Kothbauer
Henry Berkowitz
Henry Coleman
Henry Ewert
Henry Gaudsmith
Henry Kimbell
Henry M .
Henry Martini
Herb Lowrance
Herbert Jeschke
Herman Fletcher
Herman Waetjen
Hermine Willey
HEYWARD NASH
Hilary Capstick
Hilary Lubin Rausher
Hilda Neustadter
Hiroshi Suzuki
HK Khalsa
Holly Crawford
Holly Graves
Holly Hall
Holly Hook
Holly Mooney
holly smallwood
Hope Schnee
Howard Higson
Howard Stein
Howard Whitaker
Howard Young
Hugh Curtler III
Hugh Havlik
Hugh Sutherland
I. ATKINS
I.J. DuBois
Ian Shelley
Ian Wade
Ida Carideo
Ilene Budin
Ilene Cento
Ilona Braune
Ina Kessler
Ingrid Broecker
Ira cOHEN
Ira Weissman
Iraida Capaccio
Irena Franchi
Irene Osten
irene Radke
Irene Saikevych
Irene Schmidt
Irene Willey

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Irini Dieringer
Iris & Patty Yermak
Iris Rochkind
Iris Sinai
Irv and Janet Berlin
Irving Shapiro
Irwin Hoenig
Isabel and Carl Cohen
Ivanka Cresko
Iwona Krzeminska
J Beverly
J Gabriel
j h
J Reed
J. Barry Gurdin
J. Holley Taylor
J. Justice
J.I. Farlow
Jacci McKenna
Jack Dinkmeyer
Jack Gegner
jack hogan
Jack Keyes
Jack Miller
Jack Raby
Jacki Hileman
jackie boucher
Jackie Cole
Jackie Demarais
Jackie Lunz
Jackie Smith
Jackie Tryggeseth
Jacob Anderson
Jacob Nolan
Jacqueline Bobnick
Jacqueline Sgroi
Jacqueline Sweeney
Jacqui Lipschitz
jai parekh
Jaice Cooperrider
Jaime Grimwood
Jak Gray
Jake Hodie
Jamaka Petzak
James & Kay Burde
James & Marsha Turner
James and Virginia Wagner
James Apland
james balder
James Bradley
James Bragg
James Corrigan
james doust
James Flanagan
james gerstley
James Glucroft
James Henriksen
James Herther
James Hinson
James Hoffmann
JAMES HUSE
James Jachimiak
James Kerr
James Klein
James Little
James Littlefield
James Loacker
James McAndrew
James McClure
James Miles
James Moran
James Mulcare
James Neely
James Patton
James Pierson
James Pruitte
James R Monroe
James Rankin
James Roberts
James ropicki
James Rosamilia
James Rutkowski
James Schinnerer
James Sorrells
James Stuhlmacher
James Terrano
James Thomas
James Thrailkill
James Wolcott
Jami Ojala
Jamie Caya
Jamie Fillmore
Jamie Green
Jamie Greer
Jamie Harris
jamie masterson
Jamie Rosenblood
Jamie Shultz
Jamila Garrecht
jamila hadjsalem
Jan Ackerman
Jan Ankerson
Jan Barshis
Jan Clark
Jan Cowan
Jan Emerson
Jan Hadley
Jan Hansen
Jan Hoey
Jan Jackson
Jan Jones
Jan McMichael
jan nelson
Jana Perinchief
jane biggins esq
jane branyan
Jane Butler
Jane Byars
jane deocursey
Jane Edwards
Jane Ellison
Jane Gulley
Jane Herschlag
Jane Hoagfelt
Jane Johnson
Jane Neave
Jane Oldfield
jane reilly
Jane Sawina
Jane Wilken
Janell Cooper
Janell Smith
Janet Carter
Janet Draper
Janet Duran
Janet Falcone
Janet Fotos
Janet Hirschhorn
Janet Hitz
Janet Hoover
Janet Kennington
Janet Lee Beatty
Janet Marineau
Janet McDonough
Janet Monfredini
Janet Moser
Janet Parkins
janet perlman
Janet Roberts
Janet Robinson
Janet Smith
Janet Tice
Janet Walls
Janeth and Gary Mallory
JANEY MCMILLEN
Janice Banks
Janice Bergeron
Janice Durbin
Janice Gams
Janice Hallman
Janice Otis
Janice Pringle
janice shannon
JANINE COMRACK
Janine Vinton
Janis Kinslow
Janis Todd
Jared Kloth
Jared Lai
jarka okreskova
Jason Bowman
Jason Ellis
jason evans
Jason Fish

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Jason Gibson
Jason Steadmon
Jason Waldo
Javier Reza
Javier Rivera
Jay Humphrey
Jay Morren
Jay Russo
Jayne Cerny
Jayne McPherson
JC Corcoran
Jean Ehrman
Jean Genasci
Jean Hall
Jean King
jean le marquand
Jean Mack
Jean Naples
Jean Oakes
Jean Phillips-Calapai
JEAN PUBLIEE
jean publieee
Jean Roberts
Jean Saja
Jean Skiles
Jean SmilingCoyote
Jeanette Brito
jeanette zawacki
jeanie harvey
Jeanine Wilder
Jeanne Bergen
Jeanne Chisholm
Jeanne Doherty
Jeanne Faust
Jeanne Friedman
jeanne hayes
Jeanne Held-Warmkessel
Jeanne Saint-Amour
Jeanne Schlatter
Jeanne Sozio
Jeanneadele Pallen
Jeannette Allan
Jeannette Welling
Jeannie Pollak
Jeannine Lowenkron
Jeff Duncan
jeff frantz
Jeff Fromberg
Jeff Harvey
Jeff Herman
jeff krupnick
Jeff McElveen
JEFF MCHENRY
Jeff Peters
Jeff Pokorny
Jeff Reynolds
Jeff Sluiter
Jeff Smith
Jeff Steenbergen
Jeff Stromgren
Jeff Wells
Jeffery Biss
Jeffery Morgenthaler
Jeffrey Ambrose
Jeffrey Bains
Jeffrey Block
Jeffrey Campbell
Jeffrey Collins
Jeffrey Hemenez
Jeffrey Hurwitz
Jeffrey Jones
Jeffrey Juel
Jeffrey Kreidler
jeffrey lapic
Jeffrey Meyers, MSc
Jeffrey Smith
Jeffrey Stone
Jeffrey White
Jelica Roland
Jen Danner
Jen Hunter
Jen Manders
Jena Hallmark
Jenna Bergeron
Jennie sabato
Jennifer Alden
Jennifer Bissell
Jennifer Bocchino
Jennifer Brandon
Jennifer Brown-Hall
Jennifer Eskridge-Hart
Jennifer Falk
Jennifer Forrest
Jennifer Gitschier
Jennifer Grasso
Jennifer Hayes
Jennifer Hill
Jennifer Lewis
Jennifer McKeel
Jennifer Miller
Jennifer Nelson
Jennifer Nitz
Jennifer Oppenheim
Jennifer Overton
Jennifer Rogers
Jennifer Romans
Jennifer Scott
Jennifer Sellers
Jennifer Staiger
Jennifer Stedman
jennifer valentine
Jennifer Waters
Jennifer Westra
Jenny Wilder
Jerald Vinikoff
Jeremy Ehrlich
Jerily Rushworth
Jerry Castor
Jerry Eskew
Jerry Hillman
Jerry Hudgins
Jerry Hughes
jerry persky
jerry rosen
Jes Ro
Jess Graffell
Jesse Holth
Jesse Kessler
Jesse Taylor
jesse williams
Jessica Black
Jessica Brown
Jessica Burlew
Jessica Card
Jessica Cresseveur
Jessica File
Jessica Gawlik
Jessica Jean Posner
Jessica Koran
Jessica Miracola
Jessica Ramirez
Jessica Rice
Jessica Rocheleau
Jessie Casteel
Jessie Root
Jessie Vosti
Jill Alibrandi
Jill B .
Jill Berkowitz-Berliner
Jill Coffey
Jill Denton
Jill Giencke
Jill McManus
Jill Mossor
Jill Nicholas
Jill Wettersten
Jillian Fiedor
jillian shannon
Jim and Sophie Swirczynski
Jim Bearden
Jim Brunton
Jim Buonocore
JIM CORRIERE
Jim Drevescraft
Jim Freeberg
Jim Geear
jim Gergat
JIM HAJEK
Jim Halbert
Jim Leske
Jim Melton
Jim Notestine
Jim Scarborough
Jim Summers

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Jim Wingate
Jim Yarbrough
Jimmie Lunsford
Jimmy Carrell
Jitka Mencik
JL Angell
JL Charrier
Jo Anna Hebberger
joan armstrong
Joan Bailey
Joan Ellen Mccoy
Joan Farber
Joan Faszczewski
Joan Glasser
Joan Hasselgren
Joan Hebert
Joan Kozlowski
Joan Kyler
Joan Milford
Joan Peter
Joan Scott
joan silaco
Joan Smith
Joan Squires
Joan Stelter
Joan Strickland
Joan Svenson
Joan Walker
Joanie Vigh
JoAnn Alberts
Joann Koch
Jo-Ann Murphy
JoAnn Pedersen
JoAnn Riley
JoAnn Schropp
Joanna Chen
Joanna Kling
Joanna Rindt
Joanna Vintilla
Joanne Brierly
Joanne Britton
JoAnne Cohen
Joanne Doherty
JoAnne Edsall
Joanne Habrecht
Joanne Hesselink
Joanne Kellar
JoAnne Klein
Joanne Lowery
Joanne Nelson
Joanne Peppiatt-Combes
Joanne Rist
Joanne Stephens
Joanne Sulkoske
Jocelyn Blake
Jody Conrad
Jody Dehart
Jody Gibson
Jody Nunez
jody Wier
Joe Brazie
JOE DONOHOE
joe galdo
Joe Ginsburg
Joe Glaston
Joe Quirk
Joe Roy
Joe Salazar
joe shaw
joe sirgo
Joe Stoner
Joe Toigo
Joe Torres
Joe Tutt
Joel Blumert
Joel Clasemann
Joel Leitner
Joel Maguire
Joel Meier
Joel Perkins
Joel Schmidt
Joey Westhead
Johanna Lang
John A Beavers
John Abbott
John Adams
John Altshuler
John and Ellen Woodruff
John Baggenstos
John Barger
John Barrett
John Bernard
John Burridge
John Butler
John Cannon
John Carpenter
John Chapman
John Cole
John Cornely
John Coyier
John Crotty
john daniello
John Day
JOHN DEDDY
John Dervin
John Doucette
John Dulik
John Dunkum
John Dunn
john Ebenal
John Eckler
John Essman
John Geiger
John Gieser
john Haller
John Helland
John Heyneman
John Hinnant
John Howden
John Jumonville
John K Erskine
John Keiser
John Kerschbaum
John Kirchner
John LaMantia
John Lampson
John Laughlin
John Leonard
John Lippiello
John Lorand
John Lundquist
John Madrid
John McLaurin
John Merriman
John Miskelly
John Moss
John Musgrave
John Mutzberg
John P Davis
John Peeters
John Pepple
John Petroni
John R Donaldson
John R. Bartels
John Roche
John Roig
John Ryan
John Scahill
John Schaechter
John Schmittauer
John Schreiber
john seward
John Sparks
JOHN STEENSON
John Sutherland
John Teevan
john thomas
John Uscian
John Varga
John Viacrucis
John Weston
John Wienert
John Wiesner
john Zamos
John Zimmermann
John+M Long
joie winnick
Jolie Misek
Joline Barth
Jon Bazinet
Jon Eden
Jon Hager
Jon Hayenga
Jon Krueger

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Jon Lee
Jon Macy
JON NOGGLE
Jon Piersol
Jon Read
Jon Rosenblatt
Jon Singleton
Jon Van de Grift
Jonathan Boyne
Jonathan Clapp
Jonathan Lee
Jonathan Peter
Jonathan Stillman
Jonathan Wilsnack
jonelle Reynolds
Joni Mulder
Jonn Gordon
Jordan Glass
Jörg Gaiser
Jose de Arteaga
Jose Leroux
Joseph Acosta
Joseph Boone
Joseph DeMarco
Joseph DiMaggio
Joseph Hayes
Joseph Jordan
Joseph Lahm
Joseph O'Sullivan
Joseph Otto
Joseph Schultz
Joseph Shulman
Joseph Slaven
Joseph Vincent
Josh Kaye-Carr
Josh Swink
Joshua Angelus
Joshua Krasnoff
Joslyn Baxter
Joslyn Pine
jovita prinz
Jovita Tieso
Joy Fedele
Joy Massa
Joyce Burk
Joyce Conklin
joyce cotter
Joyce Dixon
Joyce Frohn
Joyce Grajczyk
Joyce Lan-eddy
Joyce Overton
Joyce Pusel
Joyce Schwartz
Joyce Stoffers
Joyce Winslow
Juanita Gonzalez
jud woodard
Jude Todd
Judi Poulson
judith ackerman
Judith Anderson
Judith Elliott
Judith Embry
Judith Fletcher
Judith Fraser
Judith Gordon
Judith Hazelton
JUDITH HOAGLUND
judith hoppe
judith hutchison
judith keeley
Judith Maron-Friend
Judith Marvin
judith morgan
Judith Mueller
Judith Owens-Yamane
Judith Pedersen
Judith Pelletier
Judith Peter
Judith Poxon
judith ramos
Judith Rinesmith
Judith S Anderson
Judith Sandeen
Judith Schneider
Judith Shematek
Judith Smith
judith tuck
Judith Whitcomb
Judith Wright
Judy Allen
Judy Baker
Judy Bradford
judy brown
Judy Clarke
Judy Cohen
Judy Dufficy
Judy Fairless
Judy Hawn
Judy Klafta
Judy Knueven
Judy Krach
Judy Miller-Lyons
JUDY PIZARRO
Judy Rhee
Judy Shively
Judy Sutton
Judy Tyler
Judy Wyeth
juli cooper
Julia Amsler
Julia Bellefontaine
Julia Bohnen
Julia Broad
Julia Cranmer
Julia French
Julia Johnson
Julia N Allen PhD DVM
Julia Stevenson
Julian Huffer
Juliana Baaten
Juliann Pinto
Juliann Rule
Julianne Savage-Boeding
Julie Barger
julie bohnet
Julie Bresciani
Julie Clayman
Julie Eppler
Julie Gengo
Julie Griffith
Julie Harris
Julie Hoerner
Julie Holtzman
julie javrotsky
Julie Martin
Julie Moore
Julie O'Donnell
Julie Ostoich
Julie Ozias
Julie Parcells
Julie Riffle
Julie Singh
Julie Skelton
Julie Svendsen
Julie Takatsch
Julie Watt
Julie Wreford
Juliet Pearson
Julija Merljak
Julio Aviles
june bullied
June Cattell
June Curley
June Egan
Jurissah Naive
jussi gamache
Justin Powell
Justin Small
Justin Stricker
Justin Weisenauer
Justine King
k b schaetzel-hill
k danowski
K G
K H
K Nichols
K. Chung
K. Laurence
Kaatje Adams
Kacey Donston
Karen A Katrak
Karen Ahn

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Karen and Edward Osgood
Karen Berger
Karen Bond
Karen Breny
Karen Collins
Karen Cowen
Karen D. Felts
Karen Davidse
Karen Deora
Karen Espanol
Karen Estel
Karen Fedorov
Karen Gaylin
Karen Geahlen
Karen Hodges
Karen Husocki
Karen Ireland, M.D.
Karen Kawszan
karen kelleher
Karen Kirschling
karen krause
Karen Laakaniemi
Karen Lamitie-King
Karen Lampke
Karen Larsen
Karen Lund
karen meadow
Karen Neubauer
Karen Paul
Karen Profet
Karen Ratzlaff
Karen Rubino
karen Sanders
Karen Schnitzer
Karen Simon
Karen Slote
Karen Steele
Karen Suit
Karen Swistak
Karen Tlusty
Karen Vayda
Karen Watkins
Karen White
Karen Wilson
karen winnubst
Karen Woollams
Karena Wells
Kari Gunderson
Kari King
Kari Miller
Kari Sanderson
Kari Wouk
Karin Boixo
Karin Peck
Karina Black
Karla Devine
Karla Horst
karleen hoggarth
Karlene Gunter
Karol Rice
Karuna Eberl
Karyn Loveless
kat burgess
Kat Ross
Kate Ague
Kate Anderson
Kate Darrigo
Kate Harder
Kate Kenner
Kate Ravenstein
Kate Sims
Kate Skolnick
katharine kehr
Katharine Rosser
Katharine Tussing
Katharine Warner
Kathe Garbrick
Katherine Babiak
Katherine DeAngelis
Katherine Fitch
Katherine Flickinger
Katherine Hinson
Katherine Leahy
Katherine Mouzourakis
Katherine Nelson
Katherine Porter
Katherine sampson
Katherine Tildes
Katherine Werner
Katherine Wright
Kathi Kibbel
Kathi Ridgway
Kathi Woods
Kathie Baumoel
Kathleen Arnold
Kathleen Cafiero
Kathleen Eaton
Kathleen Galligan
KATHLEEN Grantham
Kathleen Hill
Kathleen Kelcey
Kathleen Keske
Kathleen Kiselewich
Kathleen Kuczynski
Kathleen Leister
Kathleen McConnell
Kathleen McLane
Kathleen Mireault
Kathleen Mohning
Kathleen Moraski
Kathleen OConnell
Kathleen O'Sullivan
Kathleen Peters
Kathleen Querner
Kathleen Reifke
Kathleen Sorce
Kathleen Turnbull
kathleen v Adamski
Kathleen Williams
Kathleen Wright
kathryn alexandra
Kathryn Andre
Kathryn Choudhury
Kathryn Johanessen
Kathryn Lemoine
Kathryn Melton
Kathryn Rose
Kathryn Ryan
Kathryn Sugg
Kathy Alter
Kathy Bradley
Kathy Britt
Kathy Bussiere
Kathy Chakoutis
Kathy Day
kathy dowds
Kathy Durrum
Kathy Fullerton
Kathy Gynane
Kathy Hanson
Kathy Harvey
kathy haverkamp
kathy jensen
Kathy Kowalchick
Kathy Newman
Kathy Oppenhuizen
Kathy Rapp
Kathy Silvey
Kathy Stobbe
kathy sugarman
Kathy Watkins
Kathy Watson
Kathy Watt
kathy weber
Kathy Wright
Katie Brady
Katie Connelly
Katie Coonfield
Katie Yu
Katira Tejeda
Katrin Seelbach
Kay Hardy
Kay Koelker
Kay Lipman
Kay Lockridge
Kay Lowe
Kay Reinfried
Kay Von Tress
kaye foltz
Kaye Porter
Kaylah Sterling
Keefe Nghe
keelin brett
Keith Adams

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Keith Albritton
Keith Boyd
Keith Cowan
Keith D'Alessandro
Keith Emery
Keith Fisher
keith heaton
Keith Milligan
Keith Portka
Keith Runion
Kelley Anderson
Kelley Dempsey
Kellie Smith
Kelly Arellanes
Kelly Brannigan
kelly byrnes
Kelly Clark
Kelly Garner
Kelly Haferkamp
Kelly Huynh
Kelly Larkin
Kelly Lyon
Kelly McFadden
Kelly OBrien
Ken (and Louise) Vinciquerra (and Acheson)
Ken Box
Ken Epstein
Ken Greenwald
Ken Maurice
ken Mincin
Ken Morrison
Ken Novak
Ken Reynolds
Ken Schulman
Ken Ward
Ken Wenzer
Kendall Sanford
Kendra Hunter
Kendra Knight
Kenneth Able
Kenneth Bickel
Kenneth Clucas
KENNETH COLEY
Kenneth Fisher
kenneth hill
Kenneth Nahigian
Kenneth Reeves
Kenneth Robertson
Kenneth Ryan
Kenneth Wright
Kent Davies
Kent Minault
Kent Wilson
Kent Wright
Kerby Miller
Kerry Burkhardt
Kerry Dietz
Kerry Kovarik
KEVIN BOLEMBACH
Kevin Bond
Kevin Branstetter
Kevin Chapman
Kevin Costigliolo
Kevin Curtis
Kevin Macdonald
Kevin McKelvie
Kevin Mcnamara
Kevin Moore
Kevin O'Brien
Kevin O'Rourke
Kevin Patterson
Kevin Proescholdt
Kevin Rolfes
Kevin Schmidt
Kevin Schuster
Kevin Watkins
Kevin West
ki paul
Kian Daniel
Kicab Castaneda-Mendez
Kiele Goins
Kiley Newton
Kim Altana
Kim Beeler
Kim Block
Kim Camuso
Kim Duncan
Kim Gentes
Kim George
Kim Keller
Kim McReavy
Kim Perez
Kim Powell
Kim Sellon
Kim Tran
Kim Wells
Kim Wemer
Kimberly Crane
Kimberly Foster
Kimberly Frey
Kimberly Gronemeyer
Kimberly Hurtt
Kimberly McConkey
Kimberly Morse
Kimberly Wiley
Kirsten Lear
Kirstina Whitford
Kit Dugan
Kitrina Lisiewski
Kitty Dantonio
Konstantina Balaska
Kraig and Valerie Schweiss
Krin Asselta
Kris Gata
Kris Nill-Snow
Kris Steinke
Kris Strate
Kristen Conner
Kristen Murray
Kristi Collins
Kristi Hendrickson
Kristi Kelley
Kristi Meier
Kristie Lindgren
Kristin Green
Kristin King
Kristin Klass
Kristin Konstanty
Kristin Lewis
Kristina Heiks
Kristina Mitchell
Kristy Rotermund
Krystal Weilage
Krystina Stark
KURT CRUGER
kurt emmanuele
Kurt Fratzke
Kurt Jenisio
Kurt Simer
Kyle Crocker
Kyle Haines
Kyri Freeman
L A
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L David Waterbury
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L Wayn
L Wilson
L. Helaudais
L. Z.
Lacey Hicks
Lacey Levitt
Lael Bradshaw
Laetitia Petit
Laird Lorenz
Lana Schmitt
Lara Beard
Lara Post
Laraine Bowen
Larisa Long
Larkin Sinnott
Larry Bathgate
Larry Bogolub
Larry Carter
Larry Casey
larry french
Larry Huber
Larry LaPointe
Larry Lewin
Larry Lewis
Larry Orzechowski
LARRY RAZZANO

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LARRY ROD
larua koulish
Lascinda Goetschius
Lasha Wells
Laura Bruess
Laura Chariton
Laura De la Garza
Laura Fake
Laura Grove
Laura Hanks
Laura Herndon
Laura Horton
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Laura M. Ohanian
Laura Manning
Laura Muñoz
Laura Napoleon
Laura Nowack
Laura Pitt Taylor
Laura Prestridge
Laura Rich
Laura Riley
Laura Rose-Fortmueller
Laura Schwartz
Laura Sholtz
Laura St Clair
Laura Staples
Laura Stice
Laura Wetzel
laureen picciani
Laurel Colton
Laurel Marshfield
Laurel Starr
Lauren Devine
Lauren Fenenbock
Lauren Linda
Lauren Moss-Racusin
Lauren Murdock
Laurence Buckingham
Laurence Margolis
Lauren-Michelle Kraft
laurent SEUGNET
lauri DesMarais
Laurie Carr
Laurie Conroy
Laurie Duncan
Laurie Hein
Laurie Lindemulder Harris
Laurie Neill
Laurie Puca
Laurie Rittenberg
Laurie Storm
Laurie Tweedell
Laury Benson
Lavaune Guenther
Lawrence Bojarski
Lawrence Crowley
Lawrence East
Lawrence Gilbert
Lawrence Gioielli
Lawrence Hilf
Lawrence Lintner
Lawrence Magliola
Lawrence Nagel
Lawrence Padilla
Lawrence Thompson
Lea Boyle
Leah Browning
Leanne Yerby
Leda Zimmerman
Lee Basnar
Lee Bhattacharji
Lee Gibson
Lee K
Lee Lambert
Lee Margulies
Lee Musgrave
Lee Winslow
LeeAnn Bennett
LeeAnne Gfroerer
Lehman Holder
Leigh Fabbri
Leigh Norcott
Leilah Yanez
Lela Perkins
Leland Block
Leland Brun
Len Carella
lena maristo
Lenny Cavallaro
Leno Sislin
Lenore Bussing
Lenore Reeves
Lenore Rodah
lenore sorensen
Leo Dyksman
Leo Tobin
Leon Clingman
Leon Paley
Leona Klerer
Leonard Farr
Leonard Thornton
Leonora Xhrouet
les roberts
Lesia Mills
Leslee Eldard
Lesley Jorgensen
lesley Pillsbury
Lesley Schultz
Leslie Bradford
Leslie Burpo
Leslie Cassidy
Leslie Consuegra
leslie danielle brown
Leslie Fellows
Leslie Gold
Leslie Hardyman
Leslie Homan
Leslie Simon
Leslie Smith
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LESLIE SUTLIFF
Leslie Sweeney
Leslie Valentine
Leslie Winston
Letitia Noel
Leuise Crumble
Leyah Fredericks
Liana Moran
LIDA SKRZYPCZAK
Lilia Wood
Liliana fiorinl
Lilli Ross
Lillian Hutchison
Lilly Knuth
Lin Just
Linda Allen
Linda Baker
Linda Bescript
Linda Buckingham
Linda Byrne
Linda Cabanban
Linda Carroll
Linda Covington
Linda Cowgill
Linda Cramer
Linda Dubnick
Linda Elbow
Linda Fair
Linda Ferland
Linda Freeman
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Linda Harrell
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Linda Holasek
Linda Howard
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Linda Kehew
Linda Leckliter
Linda Lemmel
Linda Leonard
linda long
Linda MacLeman
Linda Macpherson
Linda Marble
LINDA MC CAUGHEY

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Linda McKillip
Linda Morgan
Linda Mori-Roberts
Linda Murray
Linda Myers
Linda Oeth
linda paleias
Linda Patzke
Linda Peterson
Linda Petrulias
Linda Phillips
Linda Prostko
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Linda Schimpf
Linda Schrader
Linda Schulz
Linda Sear
Linda Skorheim
Linda Spanski
Linda Sperber
Linda Stead
Linda Sullivan
Linda Tabb
Linda Tabor
Linda Tarantino
Linda Thompsen
Linda Thompson
Linda Townill
Linda Vaughan
Linda Vopicka
Linda Walters
linda williams
Linda Wright
Linda Youngblood
Lindsay Johnson
Lindsay Mugglestone
Lindsey Caudill
Lindy A Von Dohlen
Line Ringgaard
Linnell Krikorian
Lisa Annecone
Lisa Barrett
Lisa Blanck
Lisa Brehm
Lisa Buehler
Lisa Clifton
Lisa Conner
Lisa Cossettini
Lisa Crum-Freund
Lisa Daloia
lisa dunphy
Lisa Fernandes
Lisa FitzGerald
Lisa Gee
Lisa Gold
Lisa Gordon
Lisa Halpern
Lisa Hart
Lisa Hoch
Lisa Hughes
Lisa Hunkler
Lisa Kincannon
Lisa Knight
Lisa Krieger
Lisa Kunsch
Lisa Lashaway
Lisa Lester
Lisa Long
Lisa MacMillan
Lisa Mazzola
Lisa McLain
Lisa Modola
Lisa Montanus
lisa moore
Lisa Neste
Lisa Pedersen
Lisa Perrotta
Lisa Quartararo
Lisa Stimpson
Lisa Stone
lisa vasta
Lisa Whalen
Lisabeth Faller
Lise susi
Lisha Doucet
Lissa Wiley
Litsa Katsarou
Liz Dyer
Liz Field
Liz Reed
Liz Szabo
LJ Harris
lloyd reynolds
Lois Dunn
Lois Fenstemaker
Lois Johnson-Hamerman
Lois Jordan
lois lommel
Lois Shadix
Lois Shubert
Lois White
Lonnette Prather
Lonnie Ward
Lora Leland
Loretta Aja
Loretta Cummings
Loretta Lehman
Loretta Tiefen
Lori Barrie
Lori Beth Kidd
Lori Braden
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Lori Erbs
Lori Girshick
Lori Kegler
Lori Miranda
Lori Mulvey
Lori Rosas
Lori Rosenthal
Loritta Braden
Lorne Beatty
Lorraine Brabham
Lorraine D. Johnson
Lorraine Dumas
Lorraine Foster
Lorraine Kittner
Lorraine Laprade
Lorraine Martinez
Lorraine Small
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Lou Rowan
Louis Anipen
Louis Bubala
Louis Chorba
Louis Fischer
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Louise Eiler
Louise Friedenson
Louise Gross
Louise LaFrancis
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Louise Mann
Louise Rangel
Louise Zimmer
Lowell Young
Luan Pinson
Lucia Dahlstrand
Lucille Sadowski
Lucinda Upton
Lucretia Jevne
Lucy Schneider
Luisa Cox
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Lumarion Conklin
Lyle Collins
Lyn Burns
lyn du mont
Lynda Giuliani
Lynda Pauling
Lynell Withers
Lynette Ridder
Lynette Rynders
Lynn Alley
Lynn Bengston
Lynn C. Lang
Lynn Colson
Lynn Costa
Lynn Kamm
Lynn Killam
Lynn Longan
Lynn Nease
Lynn Sayers
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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lynn snyder
Lynne Glaeske
Lynne Gordon-Watson
Lynne Hargett
Lynne Jeffries
Lynne Teplin
Lynne Van Ness
Lynne Weiske
m c kubiak
m komisar
M Langelan
m palowoda
M Spadafora
M. L. Parrino
M. Moran
M. S.
M. Veazey
M.C. Corvalan
M.E. Scullard
Ma. Elena Guillermo
Mac Donofrio
Mac Miller
Mace Clarridge
Madalyn Benoit
Madeleine Drake
Madeline Amalphy
Madonna Giamberdino
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Maeve Callaghan
MAGALI FEUGIER
Magdalena Szaszorowska
Maggie Alk
Maggie Davidson
Maggie Hawk
Maggie Reid
Maia Van Pelt
Maija Schaefer
Malcolm Fordham
Malcolm Groome
malcolm simpson
Malgo Schmidt
Manfred Zanger
Maralyn James
Marc Conrad
Marc Draper
Marc Maloney
Marc Melinkoff
marc meshekow
Marc van de Waarsenburg
Marcela Resa
MARCELLA CRANE
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Marcia Flannery
Marcia Henning
Marcia Hoodwin
Marcia Krull
Marcia Migdal
Marcia Sherman
Marcia Weare
Marco Aguilera
Marcus Kronau
Marcus Lanskey
Marcy Moyer
mardy weinstein
Marga Gili
Margaret Cathey
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margaret cooney
Margaret Dodge
Margaret Eells
Margaret Fularczyk
Margaret Haas
Margaret Jensen
Margaret Lohr
Margaret MONAHAN
margaret muirhead
MARGARET MURRAY
Margaret Polino
Margaret Rangnow
Margaret Schulenberg
margaret scripp
Margaret spak
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Margaret Weimer
Margaret Woll
Margaret Wood
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Margarita Ruiz
Marge Dakouzlian
Marge Schwartz
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Margretta Miller
Marguerite Shuster
Marguerite Smukler
Marguerite Winkel
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Mari Dominguez
Maria Borges
Maria Botello
Maria Cybyk
Maria Gonzalez
maria kavvoura
Maria Kjaerulff
Maria Magana
Maria Nowicki
Maria Sousa
Maria Sturchler
Maria White
Mariam Noorai
Marian Hoblitt
Marian Huq
Marian Kauffman
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Marianne Bentley
Marianne Frusteri
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Marianne Nelson
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Marie Dickenson
Marie Michl
Marie Perkins
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Marie Snavely
marie spaulding
Marie Wakefield
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Marie Young
Marie-Ange Berchem
Marie-Anne Phillips
Marietta Bala
Marietta Scaltrito
Mariko Wheeler
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Marilyn Costamagna
Marilyn Evenson
marilyn gockowski
Marilyn Hill
Marilyn Jasper
Marilyn King
Marilyn Lee
Marilyn Levine
Marilyn Martin
Marilyn Mueller
Marilyn Olson
Marilyn Scott
Marilyn Shepherd
Marilyn Stachenfeld
Marilyn Waltasti
Marilyn Webb
Marilyn Weber
MariLynn Herman
Marina Barry
Marina Cappas
MARINA OMAÑA
marina sagardua
mario giannone
Marion Bennett
Marion Menna
Marisa Landsberg
Marisa Strange
marjorie angelo
Marjorie Browning
Marjorie Clisson
marjorie curci
Marjorie McNae
Marjorie Monteleon
Marjorie Streeter
marjorie Xavier
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Comment Letter 379 Signatures

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Mark Alderman
Mark Anthony Wood
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Mark Bartleman
Mark Bastian
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Mark Betti
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MARK BRADLEY
Mark Canright
Mark Davis
Mark Elman
Mark Feldman
Mark Fraser
Mark Gillono
Mark Glasser
Mark Gotvald
Mark Haggerty
Mark Hallett
Mark Hargraves
Mark Hollinrake
Mark Jordan
Mark Kantor
Mark Kidd
Mark Mansfield
Mark Meeks
Mark Peltan
Mark Porter
Mark Reback
mark Rist
Mark Rynearson
Mark Strauss
Mark Weeks
Mark Wheeler
Mark White
Mark Wirth
Mark Zuefeldt
Markus Opel
marla maleski
Marla Meehl
Marla West
Marlena Lange
Marlena Lovewell
Marlene Barrett
Marlene Borton
Marlene Miller
marlene powers
Marlene Schwarz
Marlene Stalter
Marlene Tendler
Marliese Bonk
Marsha Adams
Marsha Heinrich
MARSHA HUNTER
Marsha Jarvis
Marsha Lyon
Marsha Seeley
Marsha Warren
Marsha Whitty
Marsha Wiseltier
MARTA HAWKINS
Martha Arreguin
Martha Barnes
Martha Boltares
martha burton
Martha Carrington
Martha Durham
Martha Fitzpatrick
Martha Gorak
Martha Horter
martha jones
Martha Krikava
Martha Lyons
Martha Mullens
Martha Munger
Martha Sharkin
Martha Spencer
Martha Vennes
Martha Williamson
Martin Albert
Martin Diedrich
Martin Fox
Martin Judd
Martin Lupowitz
Martin Reifinger
Martina Clark
Martina Martens
Marty Crowley
Martyn Roberts
Marvin J Ward
Mary Almendarez
Mary Ann and Frank Graffagnino
Mary Ann Barrett
Mary Ann Cernak
Mary Ann Leitch
Mary Ann Smith
Mary Axle
Mary Barbezat
Mary Beckman
mary beth first
Mary Beth OConnor
Mary Bissell
Mary Bowen
Mary Brayton
mary camardo
Mary Cato
Mary Davis
Mary Degon
Mary Derengowski
Mary Dosch
Mary Eldredge
Mary Ellingwood
Mary Fahey
Mary Gregory
Mary Gronholt
Mary Guard
Mary Haan
Mary Harte
Mary Hayes
MARY JO LOPEZ
Mary Jo Masters
Mary Keithler
Mary Klein
Mary Kraeszig
Mary Levan
Mary Louise Wooldridge
Mary Madeco
Mary Mansfield
Mary Masters
Mary McCoy
Mary Metcalf
Mary Miller
Mary Mutch
Mary Neumann
Mary Owens
mary p williams
Mary Pivarnik
Mary Randolph-Frye
Mary Reed
Mary Reilly
Mary Shabbott
Mary Shea
Mary Sue Baker
Mary tanoury
Mary Walls
Mary Wellington
Mary Wiener
mary williams
Mary Wolney
Mary Workman
Marya Zanders
Maryann Haller
Maryann Piccione
MaryAnna Foskett
MaryAnne Muller
MaryAnne Romito
Maryjo & Edward Osowski
MaryJo Andrews
Marylyn Stroup
Maryrose Cimino
Matea Leon
Mathew Vipond
Matt Meier
Matt Otto
Matt Reola
Matt Stedman
Matt Woolery
Matthew Ashmore
Matthew Boruta
Matthew Franck
Matthew Genaze
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

Matthew Lipschik
Matthew O'Brien
Matthew Schaut
Matthew Tarpley
Matthieu Brillet
mattie goodwin
Matty Giuliano
Maura Leus
Maureen Collins
Maureen Finlon
Maureen Gibson
Maureen McGee
Maureen O'Neal
Maureen Ouellette
Maureen Parriott
Maureen Pisani
Maureen Powers
Maureen Vanderbosch
Mauria McClay
Maurice robinson
Maurice Rosenstraus
Max Burg
Max Salt
Max Sampson
Maxine Cannon
Maxine Clark
Maxine Goodyear
Maxine Zylberberg
Maya Robinson
Maylin Fisher
Mayumi Knox
MC Hagerty
Meagan Fastuca
Meg Doyle
Meg Gilman
Meg Seltzer
Megan Gnekow
Megan Martinez
Megan Warren
Meghan's Quillen
Melanie Ann Ersson
Melanie B Goldman
Melanie Hlavacka
Melanie Waleski
Melba Dlugonski
Melinda Michael
Melinda Moros
Melinda Parke
Melissa Bauer
Melissa Elbrecht
Melissa Elder
Melissa Grondin
Melissa Grush
Melissa Hanmer
Melissa Heithaus
Melissa K
Melissa McCool
Melissa Pappas
Melissa S
Melissa Suarez
Melodie Huffman
Mercedes Benet
Mercy Drake
Meredith Buck
Meredith Needham
Merikay Garrett
Merlin and Diana Emrys-Lightmoon
Merlin Hay
Mernbish Bish
Merrie Thornburg
Meryl Pinque
Mha Atma S Khalsa
mia wyatt
Michael Bennett
Michael Braude
Michael Cecil
Michael Chutich
Michael Cloud
Michael Coe
Michael Collier
Michael Comstock
Michael Desi
Michael Dutton
Michael Ehmke
Michael Eisenberg
Michael Ellison
Michael Essex
Michael Frank
Michael Garitty
Michael Gary
Michael Gillett
Michael Gordon
Michael Gorr
Michael Gotmer
Michael Gumpert
Michael Herzog
Michael Hogan
Michael Iltis
Michael K. Hampu
Michael Kavanaugh
Michael Kendall
Michael Klausing
Michael Lawrence
Michael Lee
Michael Letendre
Michael Lombardi
Michael MacPherson
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Michael Marr
MICHAEL McCARTHY
Michael McLaughlin
Michael McMahan
Michael Norden
Michael Ott
michael phipps
Michael Price
Michael Rees
Michael Renfrow
Michael Rosa
Michael Rynes
Michael short
Michael Sklar
michael sordill
Michael Stewart
michael stocker
Michael Stuart
michael sullivan
Michael T Williams
Michael Terry
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Michael W Evans
michael waters
Michael Weaver
Michael Wichman
Michael Yowell
Michael Zeller
Michaela Rohr
Michaela Treffil
Michel and Sonja
Michel Collin
Michele Bacher
Michele Balfour
Michele Biggane
Michele Busler
Michele Johnson
Michele Kowalski
Michele Labrie
Michele LaPorte
Michele Morris
Michele Nihipali
Michele Reynolds
Michelle Benes
Michelle Carter
Michelle Dail
MICHELLE DAVIS
Michelle Diss
Michelle Dudeck
Michelle Freedman
Michelle Fuller
michelle grabowski
Michelle Hayward
MICHELLE HOFF
Michelle Kehm
Michelle Kopteros
Michelle MacKenzie
Michelle Macy
Michelle Mondragon
Michelle Oroz
Michelle Rivers
Michelle Sewald
Mick Alderman
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

Mihail Bancu
Miia Suuronen
Mija Gentes
Mike Bridschge
Mike Brinkley
Mike Conlan
Mike Couch
Mike Decook
Mike Ferguson
Mike Hudak
Mike LeHew
MIKE LYMAN
Mike Mahler
Mike Mattox
Mike McCormick
Mike Mutchler
Mike O'Connell
Mike Peale
mike schuster
Mike Van dyne
Mike Winget
Mikki Chalker
Mildred Gittinger
Miles Patterson
Miles Roscher
millie bush
Millie Magner
Minivere Wenzer
Miriam Angress
Miriam Sexton
Miriam van Santen
Miro Krajnc
Misha Askren
Missy Kendrick
Misti Schneider
Mo Kafka
Modell McEntire
Mollie Vreeland
Molly Brent
Molly Campbell
Molly Hauck
Molly Mendez
Molly Walker
Mona Sangesland
Monica Firely
Monica Gilman
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Monica McKeown Gallicho
Monica Raymond
Monica Russo
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Myra Aronow
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Myron Klos
N Burrows
N Houghton
n jackson
N Murray
N. Coyle
Nadine Kouba
Nadine LaVonne
Nadine Wolff
nady corvers
namita dalal
Nan Wollman
Nancy L. Anderson
Nancy Anderson
Nancy Arbuckle
Nancy Archibald
Nancy Beavers
nancY bird
Nancy Bowsher
Nancy Byers
Nancy Byrum
NANCY CAREY
Nancy Cencula
nancy coffey
Nancy Cormia
Nancy Crider
nancy ellestad
Nancy Fifer
Nancy Fox
Nancy Gates
Nancy Hanson
Nancy Hartman
Nancy Hauer
Nancy Heck
Nancy Hiestand
Nancy Huntington
Nancy James
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Nancy Kmonk
Nancy L Reynolds
Nancy L. Roll
Nancy McLean
Nancy Meute
Nancy Miller
Nancy Moore
Nancy Newbury
NANCY OR
nancy Pearson
Nancy Richard
Nancy Riggleman
Nancy Roberts-Moneir
nancy sadowsky
Nancy Sagatelian
Nancy Schweiger
Nancy Stamm
Nancy Taylor
Nancy Telese
Nancy Ward
Nancy White
Nancy Woolley
Nancy Young
nanette cronk
Nanette Mosiman
Nannette Taylor
Naomi Avissar
Naomi Klass
Naomi Zurcher
Nasrin Mazuji
Natalie Clay
Natalie Hall
Natalie Mannering
Natalie Stephens
Natalie Van Leekwijck
Natasha Saravanja
nathalie camus
Nathan Allen
nathan pate
Nathan Tompkins
Nathan Van Velson
Nathan Vogel
Nathaniel Hansen
Navarre Bartz
Neal Feuerman
Neil Illiano
Neil Resico
Nelson Baker
Nelson Pena
Nena Cook
Nicholas Cartabona
Nicholas Coleman
Nicholas Falletta
Nicholas Feda
Nicholas Frederick
Nicholas Mouzourakis
Nicholas Prychodko
Nick Barcott
Nick Hood
Nicola Nicolai
Nicolaas Strik
Nicolás Altamirano
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Nicole Mikals
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Nicole Rosa
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Nikhil Bahl
Nikki Martin
Nikki Nafziger
Nikki Wojtalik
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Nina Garfinkel
Nina Mcnitzky
Nina Miller
Nina Perino
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Noel Crim
Noel Smith
Nora Lewis
Norda Gromoll
Noreen Weeden
Norm Stanley
Norm Wilmes
NORMA CAMPBELL
Norma Kafer
Norma McCulloch
Norma McNeill
Norma WASHBURN
Norman Baker
Norman Bishop
Norman Howell
Norman Ives
Norman Thornton
O. Youmans
Oksana Brodie
Olive Ayhens
Oly Bravo
Omar Siddique
Onur Agirseven
Oscar Gutierrez
Owen Gustafson
P A Paye
P NUNEZ
p perron
P Sticha
Pablo Bobe
Paige Ziehlermartin
Pam Clark
Pam Evans
Pam Fletcher
Pam Millett
pam neely
Pam Rensch
Pam Roth
Pam Scoville
Pam Tezza
pam ward
Pam Wetzels
Pam Wilbourn
Pamela Brocious
Pamela Check
Pamela Chipman
Pamela Clark
Pamela cote
Pamela Hamilton
Pamela Hamulak
Pamela Harper-Smith
Pamela Hendricks
Pamela Jiranek
Pamela Joan Olsen
Pamela Miller
Pamela Rhodes
Pamela Scott
Pamela Sullivan
Pamela Vasquez
Pamylle Greinke
Paola Maino
Pat Albertson
Pat and Gary Gover
Pat Blackwell-Marchant
Pat Bryan
Pat Foster
Pat Johnson
pat matz
Pat Rose
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Patrice Aiello
Patrice Capan
Patrice Lamariana
Patrice Roberts
Patricia Auer
Patricia Baley
Patricia Benjamin
Patricia Blochowiak
Patricia Borri
Patricia Cardoso
patricia carlton
Patricia Chamberlain
Patricia Chelmecki
Patricia Clucas
Patricia Copenhaver
Patricia Davenport
Patricia DeLuca
Patricia Dion
Patricia Dishman
Patricia Fiedler
Patricia Forrest
Patricia Frederick
Patricia Giles
Patricia Gregory
Patricia Harlow
Patricia Heiden
Patricia Kay Youngson
Patricia Lauer
Patricia Law
Patricia McCain
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Patricia Nadreau
PATRICIA NARDONE
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Patricia R. Wendell
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Patricia Smith
Patricia Traub
Patricia Vineski
Patricia Williamson
Patricia Young
Patrick Aitchison
Patrick Annabel
Patrick Bak
Patrick Beaudry
Patrick D'Annunzio
Patrick McGuffin
Patrick Uhtoff
PATRICK WATSON
Patsy Di Leo
Patsy Shafchuk
Patti Fink
Patti Johnson
Patti Martin
Patti Packer
Patti Schultze
Patti Wright
Pattie Meade
Patty Bonney
Patty Ridenour
Patty Traube
Patty Viers
Paul & Tiina Oker
Paul Allen
Paul Bettelheim
Paul Borcherding
Paul Daly
Paul Daniello
Paul Eisenberg
Paul Emerson
Paul Grove
Paul Haskins
Paul Hefferon
Paul Hunrichs
Paul Jarzembinski
Paul Johnson
Paul Kalka
PAUL KINSLOW
Paul Komishock Jr .
Paul Kripli
paul Lambergr
Paul Lau
Paul M. Deauville, DVM
Paul Moss
Paul Moyer
Paul Novak
Paul Palla
Paul Ramos
Paul Rasmussen
Paul Riley

Comment Letter 379 Signatures

Comment Letter 379 Signatures

Paul Rinear
Paul Rosen
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Paul Russell
Paul Schmalzer
Paul Torrence
Paul Verzosa
Paul Vesper
Paul West
Paula Carrier
Paula Eppler
Paula Grande
Paula keisler
Paula Minklei
Paula Myles
Paula Neville
Paula Shafransky
Paula Zerzan
Paulette Kaplan
Paulette Schindele
Pauline Berkeley
Pauline Burak
Pauline Faye
peg bradley
PEG HENDERSON MILLS
Peggy Acosta
Peggy Bergen
Peggy Detmers
Peggy England
Peggy Fugate
Peggy Furminger-Haist
Peggy Kocoras
Peggy La Point
Peggy Mahle
PEGGY MORRIS
Peggy Tribble
Peggy Yeargain
Penelope Prochazka
Penny and Bob Greenboam
Penny Morrow
Penny Platt
Pepper Trail
Percy Hicks-Severn
Perolina Fernandes
Perry Chapdelaine
Pete DeLorenzo
Pete Ferraro
Peter Altman
Peter Ayres
Peter Beves
Peter Clemo
Peter Coleman
Peter Cox
Peter D'Luhosch
Peter Dramer
Peter Evans
Peter Haroutian
Peter Harris
Peter Lee
Peter Lockwood
Peter Mathews
Peter Rawlings
Peter Roche
Peter Ware
Peter Wilsnack
Peter Wood
Peter/ R4 CH
Petra Jones
Phil Hanson
Phil Pennock
Phil Rockey
Philip Dennany
Philip Hult
Philip Kritzman
Philip Maloney
philip RANDALL
Philip Ratcliff
Philip Rohr
Philip Schuster
Philip Shook
Philip Simon
Philip Young
phillip gagliardi
Phillip McMurray
Phillippa Hilsden
Phyl Newbeck
Phyllis Acadia
phyllis attanasio
Phyllis Erwin
Phyllis Gregory
Phyllis Holzworth
Phyllis Schmidt
Phyllis Stanbury
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Sam Catron
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Sam Dratch
Sam Mead
Sam Stearns
Sam Todd
Samantha Hanks
Samantha Rosa-Re
Samantha Solomon
Samantha Steigerwaldt
Samantha Turetsky
Sammia Panciocco
Sammy Low
Samuel Eaton
Samuel Rametta Jr
Sanand Dilip
Sandi Aden
Sandi Cornez
Sandi Covell
Sandi Crist
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Sandra Angelini

Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Sandra Beemer
Sandra Christopher
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Sara Avery
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Sarah Stewart
Sarah Townsend
Sarah Valentine
Sarah Volpe
Sarah Wiebenson
Saran K .
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Savannah Green
Savannah Scarborough
SAVERIA GARCIA-MACRI
SAWATDEE SANLAVUN
Scott Britton-Mehlisch
Scott Deering
Scott Duncan, M.D.
scott finamore
Scott Greenblatt
Scott Harrison
scott jung
Scott Kunkler
Scott Messick
Scott Myers
Scott Nelson
Scott Pace
Scott Pingel
Scott Ploger
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Scott Rubel
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Scott Zellner
Sean Corrigan
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Sean O'Dell
Seana Graham
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SG Hurlburt
Shandra Bell
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SHANNON BUDDES
Shannon Griffin
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Sherri Fryer
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Silvia Bertano
Silvia De Los Santos
Silvia Hall
Sima Cooperman
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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Comment Letter 379 Signatures

Comment Letter 379 Signatures

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Comment Letter 379 Signatures

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William Sneiderwine
William Steele
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William Wilson
William Young
Wingate Steitz
Winifred Riester
Wolfgang Loera
Wyman Whipple
Xavier O'Mack
Ya Hui Shih
Yazmin Gonzalez
Yee Yean Lim
Yelerna Katsen
YING COOPER
Yma Corrales
Yolani Moratz
Yvonne Irvin
Yvonne Marley
Yvonne White
Zandra Talbert
Zara Ivanova
zee Fisher
zelma taylor
zod schultz

Comment Letter 380

From: Baiss Eric Magnusson (baiss@comcast.net) Sent You a Personal Message <automail@knowwho.com>
Sent: Tuesday, July 31, 2018 2:02 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Do not undermine Alpine Lakes Wilderness protections

Dear WA Department of Ecology and Chelan County Officials,

380-1 Alpine Lakes Wilderness is one of the state's most iconic landscapes, and draws untold visitors every year. While we appreciate the goal to improve instream flows in Icicle Creek, we cannot undermine the well-deserved protections for our public lands in the process.

380-2 The DPEIS lays out five alternatives to address instream flows in the Icicle Creek, ranging from workable to egregious. The DPEIS should be revised to make sure it complies with all state and federal laws, properly ensures there is no impact on watershed function, offers water conservation options, does not enlarge any wilderness lakes, and fully recognizes the limits on water rights at each lake.

380-3 Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. We cannot allow one natural area to be exploited under the guise of enhancing another.

Sincerely,

Baiss Eric Magnusson
11540 Alton Ave NE
Seattle, WA 98125
baiss@comcast.net
(206) 361-0718

This message was sent by KnowWho, as a service provider only, on behalf of the individual noted in the sender information.

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Adam Levine
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Addison Klinke
Al and Anne Bridges
Alaina Miller
Alan and Joann Riley
Alan Nechols
Alana Rogers
Alanna Taylor
Aldora Perez
Aleece Mann
Alex and Pauline Nakamura
Alex Berger
Alex Lim
Alex Pinkerton
Alexander Brenner
Alexander Craven
Alexandra Tufnell
Alfred Higgins
Alice Burr
Alice Pfister
Alisha Leviten
Alison Archer
Alison Eckels
Alissa A
Allan Hendrix
Allen Olson
Allison Cox
Allison Mccoy
Allison Ostrer
Allison Phares
Ally Jones
Alycia Staats
Amanda Battles
Amanda Huppert
Amanda Reynolds
Amanda Sorell
Ambre Olsen
Amelia Apfel
Amelia Brower
Amelia Roberts
Amorah Ross
Amy Cihak
Amy Dyanne Phillips
Amy Graham
Amy Hixon
Anand Naik
Anand Parikh
Andrea Fisher
Andrea Hanses
Andrea Loewen
Andres Rivera
Andrew Brinkhaus
Andrew Daday
Andrew Griego
Andrew Martin
Andrew Rosenthal
Anett Young
Angela Amdur
Angela Atkins
Angela Bellacosa
Angela Merges
Angela Modelski
Angela Romano
Angeleah Dolfay
Animae Chi
Anita Das
Anita Keiter Jahns
Ann Becherer
Ann Crosby
Ann Daigle
Ann Darlington
Ann Horwitt
Ann Staley
Anna Hauksdottir
Anna Liljegren
Anna Schier
Annabel Kirschner
Anne Durbin
Anne Hepfer
Anne Huckins
Anne Ihnen

Comment Letter 380 Signatures

Comment Letter 380 Signatures

Anne Lapora
Anne Mann
Anne O'Leary
Anne Quirk Chafee
Anne Sherwood
Annetta Ezelle
Annie Alvord
Annie Duggan
Annie Dwyer
Annie May
Annie Spear
Annie Szeliski
Annika Horlings
Annika Horlings
Anthony Buch
Anthony Jongejan
Antoinette Bonsignore
April Sims
Ari Schwartz
Arieh Stolar
Arlene Roth
Arthur Kaufman
Arti Chandra
Ashley Howisey-Turiya
Asphodel Denning
Audrey Meade
August Easton-Calabria
Barbara and Charles Staab
Barbara and John Goldthwait
Barbara Bouche
Barbara Boyle
Barbara Cardarelli
Barbara Delgiudice
Barbara Goldoftas
Barbara Gross
Barbara Hirsch
Barbara Kirkevold
Barbara Lau
Barbara Luniuck-Rakita
Barbara O'Steen
Barbara Tomlinson
Barbara Vigars
Barbara Whitson
Barbara Wight
Barbara Woo
Barry Bermet
Barry Chernick
Barry Hollander
Bartholda Manderville
Beate Funke
Benjamin Fisher
Benjamin H.
Benjamin Spurgeon
Benjamin Tromly
Bernadette Gero
Beth Daynes
Beth Lanie
Betsy Gudz
Beverly Brandt
Bianca Reich
Bibi Powell
Bill Arthur
Bill Phillips
Billie Rain-Shadid
Bita Baker
Blair Kangley
Blythe Horman
Bob Boyce
Bob Breeden
Bob Farrell
Bobette Plendl
Bonnie Ashleman
Bonnie Dewitt
Bonnie Faith-Smith
Bonnie Lawlor
Bonnie Lynn MacKinnon
Bonnie Mandell-Rice
Bonnie Storm
Bonny Jean Austin
Brad Hudson
Brandie Deal
Brandon Juhl
Brandon Juhl
Brandy Parris
Brenda Lewis
Brent Howell
Brett Perry
Brett Tanis-Likkel
Brian Graham
Brian Larson
Brian O'Dell
Brie Gyncild
Brita Horlings
Brittany Dibenedetti
Brock Smith
Bruce and Jill Sanchez
Bruce Barnbaum
Bruce Micklewright
Bruce Sillers
Bruce Tipton
C. David Cook
Cailin Trimble
Caleb Wrege
Callie LeVina
Callise Janikula
Camille Blanchette
Camille Roberts
Candace Ammons
Cara Alderson
Carl Malmfeldt
Carl Woestwin
Carla Carroll
Carlene Cole-Embree
Carol Ann
Carol Ellis
Carol Erickson
Carol Hawthorne
Carol Long
Carol Mariano
Carol Olivier
Carol Root
Carol Sibley
Carol Stanley
Carol Thompson
Carol Verga
Carol White
Caroline Ackerlund
Caroline Goulding
Caroline Poulas
Carolyn and David Kummerlowe
Carolyn And Robert Fletcher
Carolyn Finch
Carolyn Marquardt
Carolyn Treadway
Carolyn Vaughan
Carrie and Marc Flexer
Carrie Foster Campbell
Carrie Heron
Carrie Schonwald
Carrie Shriver
Cary Given
Caryn Smith
Casey Wagner
Cass Newell
Cassie Koomjian
Cate Menting
Catherine Chaney
Catherine Keys
Cathy Bangerter
Cathy Cleghorn
Cathy Lindsay
Cathy Sherwood
Cece Paltep
Chad Evans
Charleen Dalmeida
Charlene Finn
CHarles and Barbara Staab
Charles and Carol Ogden
Charles Caswell
Charles Collier
Charles Ellenberger
Charles Karr
Charles Mac Laren
Charles Riddle
Charles Soncrant
Charlie Comnick-Dammand
Charlie Wallblom
Charlotte Vandyke
Cheri Smith
Cheryl Galt
Chip Burrows
Chris Christensen
Chris Meder

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Comment Letter 380 Signatures

Chris Moore
Chris Olafson
Chris Turvey
Christa Carpentiere
Christian Giuffre
Christie Bradley
Christina Dysonfarrell
Christina Mccluskey
Christine Hoggatt
Christine Kindle
Christine Landon
Christine Martin
Christine Merrill
Christine Morgan
Christine Zomorodian
Christopher Bain
Christopher Burke
Chuck Lennox
Cigdem Capan
Cindy Cole
Cindy Leadenham
Cj Livingston
Claire Giordano
Claire Meisel
Claire Newman
Clayton Vollan
Cleo Faraone
Cody Bay
Coleen George
Colette Lilly
Colin Waller
Colleen Johnson
Colleen Mohn
Constance Anderton
Constance Corrick
Courtney Canavera
Courtney Stoker
Craig Anderson
Craig Mccord
Craig Michaelis
Craig Swanson
Cynthia Calhoun
Cynthia Calkins
Cynthia Lachance
Cynthia Otto
D Kocher
Dale Russ
Dan Mcguire
Dan Ritzman
Dan Schneider
Dan Shoe
Dan Thanh Nguyen
Daniel Burnstein
Daniel Henling
Daniel Herman
Daniel Neish
Daniel Rosenfeld
Daniel Sandvig
Daniela Leon
Danielle Baehm
Danielle Cataline
Danielle Mottley
Danielle Rogers
Danielle Wilburn
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Danny Kim
Danny O'Keefe
Darcia Hurst
Darin Jones
Dariusz Kowalczyk
Darlene Johnston
Darlene Maurer
Dave Eddy
Dave Russell
Dave Shaver
David Baine
David Chambers
David Dunneback
David Fall
David Gordon
David Grimmer
David Gross
David Habib
David Hall
David Halsell
David Harte
David Joel Thornton
David Kipnis
David Peha
David Penhallegon
David Ramsay
David Scheer
David Sielaff
David Stetler
David Vonmoos
David Wilbur
David Yao
Dawn Chapel
Dawn Marie Pares
Deanna Armstrong
Debbi Pratt
Debbie Bremner
Debbie Rowe
Debby Jackson
Deborah Anderson
Deborah Efron
Deborah Ellman
Deborah Gandolfo
Deborah Hunt
Deborah Merrill
Deborah Voves
Deborah Walker
Deborah Wolf
Debra Fixman
Debra Rogers
Deena Sadek
Deja Linet
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Delfino Cornali
Delia Gerhard
Delores Sanford
Delorse Lovelady
Denee Scribner
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Dennis Bahr
Dennis Heller
Dennis Marceron
Denny Onslow
Derek Benedict
Derek Gendvil
Derek Newkirk
Diana Frawley
Diana Johnson
Diana Klug
Diane Adam
Diane Deno
Diane Dixon
Diane Horn
Diane Kent
Diane Langgin
Diane Nixon
Diane O'brien
Diane Rose
Diane Rudnick
Diane Weinstein
Diane Weyer
Dixie Lee Hawkins
Don Barnett
Don Kahler
Don Silverman
Don Stutheit
Dona Costello
Donal Murphy
Donald Barrie
Donald Beard
Donald Kunkle
Donald Stobbe
Donna Gelder
Donna Hamilton
Donna Hartwell
Donna Larson
Donna Lipsky
Donna Musgrove
Donna Stonecipher
Donni Mccray
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DorÃ¯s Richman
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dorinda kelley
Doris
Doris Carey
Dorothy Michaelson
Doug Guillot
Dru Druzianich

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Dushani Taleyratne
E. Mcsorley
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Ed Gallo
Ed Hare
Ed Kiniry
Ed Sobey
Edie Lackland
Edith Kusnic
Edward Andrews
Edward Elvy
Elaine Packard
Elaine Woo
Elana Kupor
Eleanor Dowson
Elena Conforti
Elena Rumiantseva
Eli Tayrien
Elise Baldwin
Elizabeth Berggren
Elizabeth Beuthel
Elizabeth Boutin
Elizabeth Derooy
Elizabeth Nedeff
Elizabeth Weber
Elizabeth Weyer
Elizabeth Wise
Ellen Leary
Ellen Zarter
Ellesa Hunter
Elmer Berger
Elyssa Dixon
Emelia Nevers
Emily Bandy
Emily Bjork
Emily Willoughby
Emma Sullivan
Eric and Elisabeth Krauss
Eric Drozdov
Eric Holst
Eric Weidaw
Eric Zimdars
Erich Rau
Erik Myklestad
Erika Anderson
Erin Kilpatrick
Erin Neubauer
Ethan Miedema
Ethel Renner
Eva Cosgrove
Eva Dusek
Eva Tyler
Eve McClure
Eve-Marie Lucerne
Felicia Bentham
Felicia Dale
Finley Tevlin
Fiona Pakiam
Florie Rothenberg
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Frances Paley
Frances Parson
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Frank Valenti
Fred Zapf
Gabriel Webster
Gail Chism
Gail McDonough
Gail McMullen
Gail Stevens
Gajus Miknaitis
Garth Hockersmith
Gary Andolina
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Gary Beckham
Gary Brill
Gary Schaefer
Gavin Tierney
Gaye Detzer
Gayle Robey
Gayle St. Luise
Gena Shapiro
Gene And Betty Strickland
Geoff Lowery
George Fuller
Gerald Eller
Gerald Kessinger
Giana paz
Gianina Graham
Giles Sydnor
Ginny Haver
Ginny Mitchell
Giselle Wyers
Gj Price
Glen Peterson
Glenda Carper
Glenda Jenkins
Gloria Mann
Grace Padelford
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Greg Armstrong
Greg Carriere
Greg Gausewitz
Greg Glassman
Greg Leege
Greg Meyer
Greg Stamolis
Greg Steuck
Greg Wingard
Gregory Armstrong
Gregory Espe
Gregory Penchoen
Gregory Severson
Gretchen Miller-Carpenter
Gudrun Murti
Guy Chan
Gwen Hadland
Gwen Straley
Hafidha Acuay
Hal Enerson
Hal Trufan
Haley Mateen
Hallie Sloan
Hanifah Murfin
Harout Meguerditchian
Harrie Kessler
Harrison Davignon
Heather Herrera
Heinke Clark
Helen Barler
Helen Gutierrez
Helena Fantin
Helene Steinhardt
Hillary Sanders
Hing Wong
Hoa Bullock
Hoa Pantastico
Holden Holdings LLC Investments
Holger Mathews
Holli Smith
Holly Anderson
Holly Taylor
Howard Mizuta
Howard Mizuta DDS
Howard Nebeck
Ian Breaser
Ilse Kluge
Ines Decastro
Ingrid Eisenman
Iris Sin
ISABEL CERVERA
Ivy Sacks
J B West
J D
J Ochsner
J Williamson
Jack Lofton
Jack Putnam
Jack Stansfield
Jacob Masen-Smith
Jacqueline Williamson
Jaime Pardo
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James Arrigoni
James Bates
James French
James Haas
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James Julien
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Jane Dejarnatt
Jane Millard
Janet Bird
JANET CALLIS
Janet Feifel
Janet Hada
Janet Hedgepath
Janet Kempf
Janet Riordan
Janet Sutton
Janet Triplet
Janice Brookshier
Janice Erdman
Janice Holkup
Janice Lonergan
Janice Pollard
Janine Cleland
Janis Keller
Janna Treisman
Jared Howe
Jared Macrobb
Jason Brown
Jason De Bruler
Javier Rivera
Jayna Cole
Jb Brooks
Jd Li
Jean Darsie
Jean Gorecki
Jean Marie Lehtinen
Jean Pauley
Jeanene Lorey
Jeanne Brown
Jeanne Deller
Jeanne Erdahl
Jeanne Poirier
Jeannette Halverson
Jeannine Sielinski
Jeannine Wilmes
Jeff Lane
Jeff Perzynski
Jeff Welsh
Jen Smoose
Jenefer Mcsharry
Jennifer Davison
Jennifer Durrie
Jennifer Hydrick
Jennifer Kardiah
Jennifer Mcclure
Jennifer Nelson
Jennifer Pflum
Jennifer Pittman
Jennifer Pletcher
Jennifer Pope
Jennifer Riker
Jennifer Robbins
Jennifer Rudinsky
Jennifer Straniti Schmolz
Jennifer Sturm
Jennifer Vining
Jennifer Wheeler
Jennifer Wyatt
Jenny Adams
Jeremiah Alexander
Jeremiah Allen
Jeremy Luscher
Jerry Brees
Jerry D'Addio
Jerry Kessinger
Jerry Legas
Jerry Stansfield
Jerry Thompson
Jessalyn Pinneo
Jesse Gore
Jessica Hopkins
Jessica Levin
Jessica Ostfeld
Jill Blaisdell
Jill Kinkade
Jill Seipel
Jill Wollman
Jill Yetter
Jim Ploger
Jingwei He
Jo Burnstein
Jo Harvey
Jo Napier
Joan Hunt
Joan Kurtz
Joan Shelby
JoAnn Riley
Joann Zugel
Joanna Redman-Smith
Joanna Vintilla
Joanne Watchie
Jodi Taylor
Joe Ginsburg
Joe Terrenzio
Joel Flank
Johan Luchsinger
John Backes
John Bliss
John Edison
John Fiddler
John Flynn
John Goodman
John Guros
John Iki
John Kenyon
John Lambert
John Larson
john mackay
John Mixon
John Mudd
John O'Halloran
JOHN PASQUA
John Paul Kemmick
John Ringler
John Vogt
John Walenta
Jon Chouinard
Jonas Carson
Jonathan Loeffler
Jordan Robbins
Jose Garcia
Joseph Diate
Joseph Yencich
Josh Huisenga
Josh Kato
Joshua Brown-White
Joshua Lieberman
Josie Hazen
Joy Gardner
Joy Huffine
Joyce Ramee
Joyce Schulte
Juanita J. Cozart
Judith Adams
Judith Laik
Judith Mayotte
judith milner
Judy Beach
Judy Brennan
Judy Chapman
Judy Hedstrom
Judy Honican
Judy Jensen
Judy Prudhon
Judy Swanson
Julia Buck
Julia Camp
Julia Heggen
Julia Larsen
Julia Rankin
Julie Biggs
Julie Buck
Julie Carmen
Julie Holtzman
Julie Lawell
Julie Pierce
Julie Slocum Bennani
Julie Starkel
Julie Urvater
June M
Justas Vilgalys
Justin Richey
K Keiser

Comment Letter 380 Signatures

K Kikawa
k m keiser
K Otto
K White
K. Youmans
Kadri Linask Goode
Kara Harms
Karen Barnes
Karen Bukis
Karen Fortier
Karen Gielgens
Karen Grabo
Karen Jones
Karen Joy
Karen Loeser
Karen Meadows-Hills
Karen Richards
Karen Sauve
Karen Smith
Karen Thomas
karen Wang
Kari Fiore
Kari Westphal
Karl Forsgaard
Karl Scholze
Karrie Sanderson
Karris Grumm
Kat Thomas
Kate Blessing
Kate Hourihan
Kate Ionina
Kate Lenthall
Katelyn Kenderish
Katerine Chesick
Katharine Harkins
Katherine Alice Tylczak
KATHERINE JOHNSON
Katherine Nelson
Kathleen Costinett
Kathleen Gylland
Kathleen Kemper
Kathleen Lange
Kathleen Matson
Kathleen Mcbeth
Kathleen Mcmurray
Kathleen Melin
Kathleen Schmidt
Kathleen Steyaert
Kathleen Thomas
Kathlene Croasdale
Kathryn Bromley
Kathryn Davis
Kathryn Haupt
Kathryn Lambros
Kathryn Lee
Kathryn Matti-Spickard
Kathryn Potter
Kathryn Umbarger
Kathy Albert
Kathy Corella
Kathy Sparks
Katie Hopper
Katie Klahn
Katie Kuhl
Katie Poinier
Katie Scherrer
Kay Kite
Kay Lakey
Kayla Thompson
Kc Young
Keith Cowan
Keith Ervin
Keith Horton
Kelley Guiney
Kelly Soderberg
Kelsey Almendariz
Kelsey Colliander
Ken Gersten
Ken Realmuto
Kendall Mclean
Kendra Williams
Kenneth Apostol
Kenneth Carlson
Kent Daniels
Kergan Street
Kerry Knight
Kerstin Rogers

Comment Letter 380 Signatures

Kevin Chiu
Kevin Ducoing
Kevin Filocamo
Kevin Gallagher
Kevin Kane
Kim Altenburg
Kim Gowrie
Kim Hanke
Kim Josund
Kim Mitchell
Kim Seater
Kimberly Crane
Kimberly Grass
Kimberly Vacchiery
Kimberly Wiley
Kirk Warburton
Kirsten Taeuber
Klouise Cook
Kristen Parton
Kristin Michael
Kristina Rohder
Kristine Kriner
Kristine Trumbo
Kurt Krusinski
Kyle Tunstall
Kylee Kuest
L A Heberlein
Lacy Linney
Lance Powell
Lao Kemper
Lara Backman
Larisa Moore
Larry La Caille
Larry Mahlis
Larry Werner
Laura Arrigoni
Laura Boss
Laura Corcoran
Laura Crow
Laura Delmas
Laura Huddlestone
Laura Livingston
Laura Ray
Laura Sagen-Hughes
Laura Weiden
Laura Zerr
Laurel Hughes
Lauren Biddle
Lauren Fountain
Lauren Holzer
Lauren Mendez
Lauren Rutherford
Lauren Sewell
Lauren Wilson
Laurie Chinn
Laurie Ketron
Laurie Nichols
Laurie Tucker
Leah Klein
Lenore Meyer
Leo Butzel
Leon Kos
Leon Robert
Leonard Elliott
Leonard Obert
Leroy Farmer
Leslie Bedell
Leslie Bernhardt
Leslie Bontecou
Leslie Elison
Leslie Fleming
Leslie Keenan
Leslie Milstein
Libby Erie
Lily Ulmer
Lin Provost
Linda A Carrolll
Linda and Alan Murray
Linda Andersson
Linda Chung
Linda Givler
Linda Jenkins
Linda Kroeger
Linda Maki
Linda Massey
Linda Murray
Linda Newman

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Linda Story
Linda Studley
Linda White
Linda Wright
Lindsay Ward
Lindsey Zuercher
Lisa Goldstein
Lisa Karas
Lisa Love
Lisa Messinger
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Lisa Symonds
Lisa Winters
Lisa Wright
Liz Cunningham
Liz Fallin
Liz Field
Liz Wallace
Liza Comtois
Liza Martin
Liza Sheehan
Lloyd Johnston
Lloyd Weller
Lois Fenstemaker
Lon Levalley
Lona Sepessy
Lorelei Seifert
Lorelette Knowles
Loretta and Gerard Jancoski
lorey donaldson
Lori Woodbury
Lorraine Johnson
Lorraine Read
Lou Orr
Louann Ballew
Lozz Starseed
Lozz Starseed
Lucille Holmes-Anderson
Lucinda Gilbrough
Lyla Medeiros
Lynda Beets
Lynette Ching
Lynette Currier
Lynette Petrie
Lynn Emerson
Lynn Erckmann
Lynn Ireland
Lynn Johnston
Lynn Lichtenberg
Lynn Patterson
Lynne and Arthur Olson
Lynne Bannerman
Lyssa Mercier
M Charles
Madalyn Chevallier
Madelaine Ramey
Madeleine Shachat
Madora Lawson
Mara Price
Marcia Mckinzie
Marcia Rutan
Marcia Smith
Marco de la Rosa
Marcy Golde
Maren Culter
Margaret Bradford
Margaret Fostee
Margaret Graham
Margaret Johnson
Margaret Rinaldi
Margot Haggard
Margot Mott-Smith
Mari Declements
Mariah Mitchell
Marian Hackl
Marian Hayes
Marian Wineman
Marianne Carlin
Marie Steffens
Marilyn Leblond
Marilyn Webb
Marin Anderson
Marina Ruiz
Marion Moat
Marjorie Cogan
Marjorie Fields
Marjorie Thoman
Mark Cramer
Mark Daniels
Mark Ferraz
Mark Lewandowski
Mark Lucianna
Mark Pawlosky
Mark Scott
Mark Staub
Mark Stocker
Marta Janer
Marta Janer Villanueva
Marta Kosaly
Martha Jacobs
Martha K Koester
Martha Norwalk
Martin and Teresa Strelecky
Martin Kaplan
Marty Westerman
Mary Anderson
Mary Ann Gonzales
Mary Childs
Mary Cutrera
Mary Dinino
Mary Emmons
Mary Forrester
Mary Gallagher
Mary Holland
Mary Jeffrey
Mary Knight
Mary Kudo
Mary Lambert
Mary Lou Sumioka
Mary Moloney
Mary Onufer
Mary Part DiLeva
Mary Scherer
Mary Schreifels
Mary Sebring
Mary Shackelford
Mary Shanley
Mary Sprute
Mary Stevens
Mary Wickwire
Mary-Jane Brown
Maryjane Gasdick
MaryLynn Michaelis
Matt Lennon
Matthew Boguske
Matthew Hart
Matthew Smitherman
Maureen Kill
Maureen Traxler
Mccree Williams
Mechthild Rast
Meegan Mckiernan
Melanie Coerver
Melanie Henry
Melissa Eriksen
Melissa Roberts
Melissa Young
Melodi Crowley
Melodie Martin
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Melvin Belding
Meredith Armstrong
Meredith Berlin
Meta Chessin
Michael Adams
Michael Bianco
Michael Blizniak
Michael Cosgrove
Michael Czuczak
Michael Dabrowski
Michael Dillon
Michael Erickson
Michael Faoro
Michael Hoffman
Michael J. Dabrowski
Michael Lampi
Michael Longpockets
Michael Mcconaghy
Michael Rosen
Michael Weatherby
Michele Kneram
Michelle Baker
Michelle Huelmann
Michelle Levey

Comment Letter 380 Signatures

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Michelle Mcrae
Michelle Pavcovich
Michelle Reed
Michelle Taylor
Michelle Terril
Mike And Kathy Sherman
Mike Conlan
Mike Eddy
Mike King
Mike Macguire
Mike Schuhow
Mike Sciarra
Mike Sherman
Millie Magner
Milton Bullion
Mimi Perrin
Miranda Fischer
Miranda Joebgen
Miriam Stone
Mitch Mellors
Mitchell Dover
Mollie Twidale
Mona Steinach
Monica Mcdowell
Monika Holm
Monique Morgan
Morris Mutal
Morris Williams
Mr. Shelley Dahlgren, PhD
Nadine He
Nadine LaVonne
Nancy Alice
Nancy Blackadder
Nancy Brajtbord
Nancy Easterberg
Nancy Hines
Nancy Hutto
Nancy Johnson
Nancy Little
Nancy Peacock
Nancy Peters
Nancy Shah
Nancy Shimeall
Nancy Vandenberg
Nancy Vollmar
Nancy Wagner
Nanna Taralesca
Natasha Lozano
Nathan Bledsoe
Nathaniel Feyma
Neil Gest
Nellie Diaz
Neva Donalds
Nick Barcott
Nicole Hopkins
Nicole Jekich
Nicole Moreland
Niele Gillooly
Nigel Rudra
Nina Bohn
Noel Barnes
Noel Orr
Ola Edwards
Oleg Varanitsa
Oleksii Bilous
Ovina Feldman
P.M. Benjamin
Paige Garberding
Pam Adams
Pam Williamson
Pamela Barber
Pamela Dhanapal
Pamela Johnson
Pamela Morgan
Pamela Pogemiller
Pamela Pule
Pamela Rains
Pamela Telkamp
Pamela Weeks
Pati An
Patrice Collet
Patricia and Randall Jackson
Patricia Burton
Patricia Carroll
Patricia Dawson
Patricia Garrison
Patricia Grenfell
Patricia Henderson
Patricia Parsley
Patricia Pickering
Patricia Turnberg
Patti Dilg
Patti Hoyopatubbi
Patti Rader
Patty Bowen
Patty Teubner
Paul Allen
Paul Nehring
Paul Pierot
Paul Roberts
Paul Sampson
Paul Talbert
paul vanzwalenburg
Paula Rose
Peggy Mckasy
Peggy Rita
Peter and Alix Van Zant
Peter Dahl
Peter Graham
Peter Mikkelsen
Peter Rimbos
Peter Tracy
Peter van Der Ven
Phil Myers
Philip And Terra Duggan
Phillip Wood
Polly Parson
Priscilla Krueger
Priscilla Nunez
R Digiacom0
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Rachael LeValley
Rachel Ben-Shmuel
Rachel Freund
Rachel G
Rachel Minnery
Rachel Sadri
Rachel Stewart
Rae Ann Engdahl
Rafe Dimmitt
RALEIGH KORITZ
Ralph Jenkins
Rand Guthrie
Randal Jeter
Randi Bernhardt
Randi Freeman
Raven Alder
Raymond Ensign
Raymond Huey
Rebecca Caulfield
Rebecca Dare
Rebecca Davis
Rebecca Deardorff
Rebecca Degeorge
Rebecca Glass
Rebecca Harris
Rebecca Hunter
Rebecca Mehringer
Rebecca Moore
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Ref Lindmark
Reidar Dittmann
Renee Duprel
Renee Lashua
Rev. Lauren Cannon
Revital Ever
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Robert Corpus
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Robert Kniestedt
Robert Lowe
Robert McBride
Robert Meyer
Robert Osrowske
Robert Sanders
Robert Stier
Robert Walling Walling
Robert Wildman
Robert Yates
Robert Young
Roberta Nestaas
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Robin Booth
Robyn Scola
Robyn Smith
Roger Nelson
Roger Nystrom
Romi Mahajan
Ron Slosky
Ronald Ratner
Ronald Snell
Ronna Scott
Rosa Gimson
Rosa Vissers
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Rosemary Bertucci
Roxanne Dubarry
Rozenn Lemaitre
Rusty West
Ruth Ann Lorentzen
Ruth Darden
Ruth Maule
Ruth Rogers
Ruth Sarvis
Ruth Thorpe
ryan Grant
Ryan Sleight
RYDER LANIER
S Jitreun
Sabina Astete
Sabine Bestier
Sabrina Rasmussen
Sally Bartow
Sally Eastey
Sally King
Sally Stroud
Samantha Blake
Sammy Low
Sandi Bond
Sandra Ciske
Sandra Perkins
Sandra Ryder
Sandra Smith
Sandra Thatcher
Sandra Tomlinson
Sandra Wiggins-Woolf
Sandra Wiggins-Woolf
Sandra Woods
Sandy Nichols
Sanja Futterman
Sara Strickland
Sara Zeglin
Sarah Cassidy
Sarah Kavage
Sarah Lynch
Sarah Mcdonald
Sarah Salter
Sarah Sears
Sarah Shields
Saralee Kane
Saundra White
Scott Carroll
Scott Duncan
Scott Dungan
Scott Hilsen
Scott Mallard
Scott Minner
Scott Patterson
Sean M Huff Huff
Sean O'Dell
Selim Uzuner
Shakira Todd
Shane Mitchell
Shannon Markley
Sharon Abreu
Sharon Leishman
Sharon Parshall
Sharon Wilson
Shary Bozied
Sharyn Pennington
Shawn O'Grady
Shawn Tuthill
Sheila Desmond
Sheila Sutton
Shelley Brodersen
Sherrie Chatzkel
Sherril Gerell
Sherry Daniel
Sherry Eiswald
Sherry Henshaw
Sherry Walters
Shirley Konizeski
Shirley Nelsen
Shreeraj Sutaria
Skye Stoury
Sonia Cobo
Sonja Weaver
Sravan Gondipalli
Srijan Chakraborty
Stacey Lissit
Stacey Mckinley
Stacia Haley
Stacy Parr
Stacy Winnick
Stefanie Durbin
Stella Day
Stephanie Breiding
Stephanie Cook
Stephanie Dunnewind
Stephanie Marshall
Stephanie Peron
Stephen Garratt
Stephen Rosenman
Stephen Schafer
Stephen Williamson
Steve Foss
Steve Jacobs
Steve Prince
Steve Schneider
Steven Thompson
Steven Uyenishi
Steven Woods
Stuart Blum
Stuart Mork
Sue Harris
Sue Little
Sue Pfeiffer-Johnson
Summer Spinks-Marasco
Susan And Mark Vossler
Susan Arnold
Susan Ball
Susan Beckham
Susan Davis
Susan Doederlein
Susan Hovey
Susan Irwin
Susan Johnston
Susan Latter
Susan Macgregor
Susan Nelson
Susan Osborne-Garrison
Susan Rohder
Susan Rolfe
Susan Scanlon
Susan Seniuk
Susan Vennerholm
Susan Wilson
Susann Leroy
Susanne Berlin
Suzan Bobette
Suzann Daley
Suzanne Phillips
Suzanne Rettenmier
Suzanne Stockton
Sybil Davis

Comment Letter 380 Signatures

Comment Letter 380 Signatures

Sylas Wright
T Johnston
Taen Scherer
Tamara Lange
Tamara Morillas
Tami Palacky
Tammi Turner
Tammi Turner-Franklin
Tara Iacolucci
Tara Leigh
Tatyana Galushko
Terence Mcgee
Teresa Bzdek
Teresa Neff
Teresa O'Connor
Teri Fox
Teri Scheuer
Terie-Lee Taylor-Smith
Terri Jones
Terry Arnhold
Terry Sullivan
Tess Morgan
Theresa Dougherty
Theresa Horstman
Theresa Neylon
Theresa Nix
Thom Peters
Thomas Cox
Thomas Hammond
Thomas Mcwhinnie
Thomas Padrick
Thomas Quinn
Thomas Wettengel
Tiffany Dinh
Tiffany Welton
Tika Bordelon
tim nelsen
Tina Huang
Tina Urso
Todd Milazzo
Tom Lang
Toni Jacks
Toni Penton
Toniann Reading
Tony Buch
Tony Girolami
Tonya Stiffler
Tracy Nishimoto
Tracy Wang
Travis Vandervort
Trish Fernstrom
Trish Reed
Tristin Gower
Tyler Hall
Udayan Shukla
Valentina Warner
Valeria Aizen
Valerie Allen
Valerie Mehring
Vanassa Lundheim
Vanessa Jamison
Vanessa Ruelas
Vanessa Skantze
Vickey Baker
Victoira Hall
Victor Dimascio
Victoria Grayland
Victoria Peyser
Vince Stenton
Vincent Duffy
Virginia DeForest
Virginia James
Wally Bubelis
Walter Kuciej
walter stawicki
Wendy And Dan Peterson
Wendy Heiman
Wendy Livesley
Wendy Lucio
Werner Bergman
Wesley Rogers
Wilder Kingsley
William Davison
William Enochs
William Hanson
William Jarcho
William O'Gorman
William Palmeri
William Phillips
William Winship
Wolfram Krieger
Yohanna Briscoe
Yvonne Leach
Zachary Johnson
Zaira Huskinson
Zak Nelson

Comment Letter 381

From: Theresa Dougherty <treeka80@gmail.com>
Sent: Monday, July 30, 2018 10:58 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Oppose New Dam Reconstruction, Illegal Projects in the Alpine Lakes Wilderness

Dear Mike Kaputa,

381-1 I am writing in concern to the Draft Environmental Impact Statement (EIS) for the Icicle Strategy. Many of the projects proposed take place inside the Alpine Lakes Wilderness, one of the most popular National Forest wilderness areas in the country. Furthermore, the Enchantment Lakes Basin and surrounding area is one of the most treasured areas in the Alpine Lakes, renowned for its rugged beauty, enchanting lakes, and breadth of recreational opportunities. This is an area where management decisions require the utmost scrutiny and adherence to sustaining wilderness values. All alternatives include projects that are illegal within wilderness, including raising the Snow Lake Dam and building tunnel between two lakes. The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

381-2 The Draft EIS is not compliant with federal or state laws, failing to meaningfully consider fundamental legal issues that will determine which proposals can and cannot be built, including federal wilderness law and state water law. The draft EIS assumes that Icicle Peshastin Irrigation District's (IPID) easements supersede federal wilderness law, which is wrong. The draft EIS also fails to fully analyze limitations on the scope and validity of IPID's water rights, which would limit several proposals. In addition, The DPEIS fails to account for IPID's relinquishment of part of its water rights at Eightmile Lake. Water that IPID has not used now belongs to the federal government under the federal reserved water right doctrine. If the dam is rebuilt it should remain at its current elevation, where it has been since at least 1990. Any dam rebuilding must be approved by the USFS and comply with the National Environmental Policy Act and the Wilderness Act of 1964.

381-3 The draft EIS also does not provide an adequate range of alternatives. The Eightmile "Restoration" project assumes a new dam will be higher than the current one, and fails to analyze the alternative scenario where IPID is not allowed to build a new dam any higher than the current one. That alternative is missing, and thus the draft EIS fails to present an adequate range of alternatives. The wilderness protection community has repeatedly told the draft EIS authors that there will be litigation to enjoin any effort to make the dam higher. Litigation takes time and money on both sides.

381-4 The draft EIS should be revised to address the above deficiencies. A revised Draft EIS should be released for public comment.

Sincerely,
Theresa Dougherty

,

Comment Letter 381 Signatures

Adam Deer
adam Magnuson
Aidan Schmitt
Alicia Klein
Alyssa Street
Amanda Albright
Amanda Mosiniak
Amy Anderson
Amy Dearborn
Amy Mower
Andrew Salter
Angella Mickowski
Ann Bradshaw
Anna Santo
Annie Cubberly
Anthony Anderson
Anthony Colosimo
Ariel West
Ashley Ernst
Avio Brooklyn
Barbara Sna
Barbara Wilhite
Beatrice Greenwald
Becky Shaddox
Ben Curran
Beth Easton
Bethany Fowler
Bethany Moss
Blaine Snow
Bre Kiser
Brenna Bolinger
Brian Ervin
Brian Slick
Bryan Carroll
Callie Wontor
Caroline Brown
Cheryl Schuelke
Cheryl Woodruff
Chris Prowell
Christian Rodriguez
Christopher Young
Clare Cloutier
Cody Brooke
Constance Eichenlaub
Cristina Hawkes
Crystal Olden
Curtis Kukal
Curtis von Trapp
Cynthia Cannon
Dameon Hansen
Dan Bitterman
Dan Finn
Dan Huntington
Daniel Schuetz
Dara Fredericksen
Darcey Hughes
David & Elinor Vandegrift
David Dunneback
david gladstone
David Gould
David Hanig
David Neevel
David Town
David Wilson
Dennis Fisher
Dennis Pearce
Diane Weinstein
Donald Stobbe
Donna Snow
Dorothy Jordan
Duncan Stevenson
Ed Draper
Edward Whitesell
Edward Wolfe
Elizabeth Smith
eric knesz
Erick Flores
Erin Kinneen
Erinn Zavaglia
Freida Fenn
Fritz Wollett
Gail Bohnhoff-Hlavacek
Gail McDonough
Garrett Waiss
Gay Fawcett
Geoff Cole
Gerald Wheeler

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Gina Hart
Greg Giboney
Gregry Loomis
Gwen Straley
Hailey Solvey
Harrison Davignon
Harry Oesterreicher
Heath Lawson
Heather Kirwan
Hilary Groh
Isaiah Scheel
Jake Ross
James Anest
James Donaldson
James Durett
James Norman
Jane Beaven
Janet Millard
Jared Carvitto
Jasmine Goodnow
Jason Stariwat
Jean Lanz
Jeffrey Williams
Jenelle Findley
Jennie Scheerer
Jennifer Fairchild
Jennifer Goodwin
Jennifer Kardiak
Jill Oldham
Jill Roseen-Czaplicki
Joanna Muench
Joe Arenales
Joe Rutter
Joel Aiken
John Lovie
Jonathan Loeffler
Joseph Rettenmaier
Joshua Sienkiewich
judith cohen
Judy Chapman
Julie O'Donald
Katelynn Manz
Katherine Erickson
Kayleigh Faulhaber
Kerry Field
Kestrel Rundle
Kim Goddu
Kim Saunders
Kirsten Randall
Kristine De Guzman
Kyle Collins
Laura Keegan
Laura Lehtola
Laverne Will
Leslie Sandage
Linda Broun
Liz Wurster
Lori Erbs
Lou Ann Lomax
lucy flanagan
Luisa Lopez
Lyle Collins
Lynnette Eldredge
Madison Ellington
Marcus Hendrickson
Margaret Sandvig
Maria Vishnyakova
Marian Hennings
Mark Blitzer
Mark Swanson
Marlee Fiacher
Mary Beinner
Mary Ratermann
Mary Teesdale
matthew Penny
Maxime Nouet
McCree Williams
Melissa Thirloway
Menno Sennesael
Mikayla Melton
Millie Magner
Mitchell McCommons
Molly Graham
Molly Ware
Monica Dunn
Monica Reinoso
Mont Livermore
Nancy Matlock
Nancy White
Nanette Boileau
Nelson Bell
Nic Plemel
Nicholas Ueland
Nicole Marble
Noah Brenowitz
Noelle Sun
Pam Spier
Patrick Tschetter
Paul Crane
Paul Fitzgerald
Paula Waltner
Peter Guerrero
Peter Holman
Peter Rimbos
Peter Wilsnack
Polly Taylor
Ricky Taylor
Robert Garlow
Robin Day
Roger Lippman
Ryan Beachy
Ryan Davis
Samantha Burse
Samantha Garlow
Sarah Therrien-Power
scott raudebaugh
Seraphina Gordon
Shannon Polson
Sherry Antoniak
Stanley Holmes
Stephanie Blakey
Stephen Semansky
Steven Dailey
Steven Erwood
Susan Fitch
Susan Heywood
Susan Juhre
Susan Vennerholm
Suzanne Bess Wollborg
Tanner Jones
Teresa Castner
teresa dix
Theresa Dougherty
Thomas Cokeley
Thomas Deardorff
Todd Penke
Tony Russo
Travis Hammond
Trina Rohrer
Vafa Ghazi-Moghadam
vanna haniff
Vicki McMullin
Virginia White
Vivian Korneliussen
Wendy Cooper
Zach Wilcox
zachary mclellan

Comment Letter 382

From: Brian Baltin <Brian.Baltin.26321646@p2a.co>
Sent: Monday, July 30, 2018 10:09 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Don't sacrifice wilderness for flawed Icicle Strategy

Dear Director, Chelan County Natural Resource Dept. Mike Kaputa,

382-1 The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands each year. The wilderness lakes and surrounding public lands in the Icicle basin support a diversity of wildlife species, recreation tourism and nature enjoyment that require careful stewardship and management into the future. The Icicle Strategy proposes drastic and unprecedented actions such as new dams, a tunnel between two wilderness lakes and other major infrastructure in a federally designated wilderness area—all of which will require unprecedented industrial activity in this truly wild place. As proposed, the Icicle Strategy threatens to exploit one resource (i.e., the wilderness and the water it provides) under the guise of protecting another (i.e., water in Icicle Creek). This is simply wrong.

382-2 Chelan County and Ecology can and should do better to meet instream flow targets, ensure agricultural reliability, enhance hydrologic function of the basin, and protect wilderness values. The Icicle Strategy fails to do so. Furthermore, the current proposal is based on the flawed assumption that the Icicle-Peshastin Irrigation District has a right to more water than it has ever used before, and that its rights supersede federal law. This is also wrong.

382-3 Chelan County and Ecology should withdraw, revise and re-release the Draft Plan with an adequate range of alternatives that doesn't sacrifice wilderness values for new dams and unprecedented infrastructure in this treasured alpine valley.

Regards,
Brian Baltin
500 13th Ave E
Seattle, WA 98102

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Comment Letter 382 Signatures

Adam Kaufman
Addison Barrett
AILISH DALY-WALKER
Alexandra Forin
Alexandra Griffith
Alice Pfister
Alicia Watras
Allycia Godbee
Alycia Staats
Amber Hall
Amy Gulick
Amy Heyneman
Amy Tappen
Andrea Riley
Angela Bellacosa
Anita Woodruff
Ann Pryich
ANN WALES
Ann White
Anne Hepfer
B Whitson
Barbara Cornwall
Barbara Rosenkotter
Barbara Tountas
Barbara Wight
Berinda Van Cleave
Beverly Gilyeart
Boni Biery
Brandie Deal
Brenda Bachman
Bruce Dobson
Bruce York
Camille von Eberstein
Candace LaPorte
Carol Papworth
Carole H
Cecilia Alvarez
Charlene Lauzon
Charles Ballard
Charles Wilfing
Cheri Thompson
CHRIS BATTIS
Chris Stay
CHRISTOPHER BURKE
Cindy Ambrosius
Clay Cook-Mowery
Clayton Jones
Coleman Larson
Courtney Straight
Cyndi Cross
Cynthia Rose
Daniel Newell
Dave Baine
David Pearson
David Stetler
david vican
debbie thorn
Dennis Marceron
Dennnis Lengel
Diane Dishion
Diane Puckett
Diane Rose
Diane Sullivan
Diane Weinstein
Diann Sheldon
Dianna MacLeod
Don Ely
Don Huling
Don Watt
donald munn
Doris Acosta
Dorothy Knudson
EJ Norgard
Eldon Leuning
Eleanor Dowson
Eliot Kaplan
elyette weinstein
Emily van Alyne
Erica Harzewski
Erik LaRue
Ethel Adams
f h
Forest Payne
Garry Nakayama
Gary Beckham
Gene Wheeler
Gilbert Ward

Comment Letter 382 Signatures

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Heather Blakely
Irina Doronin
J. Justice
James Andersson
James Giles
James Mulcare
Jan DeGrandchamp
Janne Abullarade
Jay Russo
JENNIFER TITILAH
Jeremy Luscher
Jessica Adams
Jill Gustafson
Jill Hawtrey
Jim Gutterman
JoAnn Hill
JoAnn Riley
John Boblett
John Gimbel
Joni Dennison
Joyce Grajczyk
judith cohen
Judith Schwab
Judy McDonald
Judy Palmer
Julia McLaughlin
Julie Holtzman
Katherine Elliott
Kathleen Wheeler
Kathryn Tomas
Kathryn Tominey
KATHY SCHAEFFER
Kay Abraamson
Ken Weeks
Kenton Wilcox
Lanie Cox
Laura Ackerman
Laurette Culbert
Laverne Will
Leanne Welch
Leo Egashira
Linda Bassett
Liza Martin
Lloyd Hedger
Luan Pinson
Lynn Offutt
Lynne Bannerman
M h
Marc Daniel
Marcia McKinzie
Marcy Lynn
Margo Robinson
Maria Magana
Mark Downey
Mark Wolf-Armstrong
Marlyn Mosley
Mary Gibson
Mary Robinson
Mary Wilkins
Matthew Boguske
Maxine Clark
McCree Williams
Melissa McDonough
Michael Bowler
Michael Deak
Michael Faoro
Michael Lampi
Michael Mendiola
Michelle Pavcovich
Mike Schuster
Miranda scalzo
Monika Holm
Moriah Barton
Mr. Dahlgren
Nancy Miller
Nate Brown
nate marino
Nolan Foss
Ovina Feldman
Owen Curtsinger
Pamela Adams
Patricia Miller
Patrick Annabel
Paula Shafransky
Peggy Willis
Percy Hilo
Peter Holcomb
Peter Miller
Priscilla Martinez
R. Larson
Raeann Scott
Ralph Miner
Ray Couture
Rebecca Dierst
Ref Lindmark
Rene Fuentes
Renee Gagnon
Richard Plancich
Richard Ress
Rick Hatten
Robert Adamson
Robert Bamford
Robert Farrell
Robert Kaplan
Robin Harper
Sandra Smith
Scott Duncan
Selim Uzuner
Shary B
Steven Sanders
Stuart Vazquez
Sue Stoeckel
Susan Bradford
Susan Durnell
Susan Hampel
Susan McDowell
Susanne Murray
Suzanne Hamer
Ted Atjubs
Terry Karro
Theressa Carey
Thomas Dolese
Thomas Gilmore
Tika Bordelon
Tim Adams
Tim Durnell
Tom Rarey
Travis Miller
Trevor Malakowsky
Trina Leaf
Vanessa Jamison
Vicki Martz
Victoria Grayland
Virgene Link-New
Washington Resident
Wehner Ronald
Wesley Banks
William McGunagle
YVETTE GOULD
Zachary Nelson

Comment Letter 383

From: Victoria Baier <Victoria.Baier.124408416@p2a.co>
Sent: Monday, July 30, 2018 7:50 AM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Please Protect the Enchantments and Alpine Lakes Wilderness

Dear Director Mike Kaputa,

383-1 I am writing to you to express my concerns with the proposed Icicle Creek water strategy. The Alpine Lakes Wilderness is an iconic and treasured natural resource enjoyed by thousands annually. Please remove the detrimental projects from the draft plan.

383-2 The proposed projects at Eightmile Lake and Upper and Lower Snow Lakes threaten to flood the trail and popular campsites around the lake. Other projects at the Upper and Lower Klonaqua Lakes could cause permanent negative impacts due to the proposed tunnel being bored between them.

383-3 Chelan County and Ecology should revise and re-release the PEIS to remove these projects and provide alternatives that don't sacrifice the experience of hikers for more water and new dams in this treasured alpine valley.

Regards,
Victoria Baier

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Comment Letter 383 Signatures

Aaron Rinn
Aaron Stock
Aaron Terrazas
Abigail Caldwell
Adam Elkington
Adam Faherty
Adam Rynd
Adam Wilson
Al Anderson
Alex Blackmur
Alexander Carrell
Alexander Lim
Alexandra Dodge
Allison King
Alyson Indrunas
AMANDA AYLING
Amanda kraft
Amanda Nguyen
Amanda Pille
Amanda Sorensen
Amanda Spiegel
Amanda Summers
Amanda Tose
Amelia Petersen
Amit Gupta
Amy Bader
Amy Borgmeyer
Amy Diehl
Amy Sutton
Anastasia Christman
Andrea Baines
Andrea Imler
Andrea Russell
andreea gagiu
Andrew Bowman
ANDREW DALTON
Andrew Dunford
Andrew Henningsen
Andrew Knox
Andrew Wurdeman
Andy Walford
Angela Rumsey
Angelette Gunderson
Angelika Hagen-Breaux
Angelina Shell
Anhar Mohamed
ann carlile
Ann Milhorn
Anna Batie
Annalise Wille
Anne Bergsma
Anne Kelly
Anne McDermott
Anne Theibert
Annie Chih
Annie Han
Annika Seaver
Anthony Consiglio
Anthony Elarth
Anthony Ferrara
Anthony Marquez
Anthony Munden
Antoinette Angulo
Ardith Feroglia
Arjayne Evangelista
Arlene DENNISTOUN
Arlene Oglove
Ashlee Davis
Ashleigh Flowers
Ashley Derum
Ashley Gardner
Ashley Gossens
Ashley McBee
Ashley Olson
Austin Eddington
Ava LARSEN
Bailey Rahn
Barbara Espejo
Barbara Saulie
Barbara Willey
Ben Jones
Ben Rall
Ben Warren
Benjamin Smith
Bertha Hanson
Beth Macinko
Betty Lucas

Comment Letter 383 Signatures

Comment Letter 383 Signatures

Bhavna Chauhan
Billy Tipke
BIRGITTA HUGHES
Bob Blair
Bob Hoyle
Bob Wicks
Brais Alonso
Brandi Hansen
Brandon Budd
Brandon Wiese
Brandon Workman
Brett Aniballi
Brian Besand
Brian Peterman
Brian Smith
Brian Vrsalovich
Britt McCracken
Britta Bowman
Britta Mueller
Brittney Neidhardt-Gruhl
Britton Green
Bruce Burger
Bryan Lee
Caileigh Robertson
Caitlin Moore
Carl Baker (cbaker@uw.edu) Sent You a Personal Message
Carl Barner
Carl Petterson
Carl Stieglitz
Carl Swedberg
Carly Reed
Carol Charles
Carol Hering-Phillips
Carole Biasotti
Caroline Ptaszynski
Carrie Kahler
Casey McDonnell
Cassandra Burgess
Cassandra Swank
Cassidy Walker
Cassie Taylor
Catalina Bazaldua
Catherine Pottinger
Catie Plourde
Cavan hender
Celina Carros
Chancellor Cramer
Charles Bpwers
Charles Fredricks
Charles Gustafson
Charles Hurt
Chas DeLong
Chelsea Peterson
Chelsea Shearer
Cheryl Tsuhako
Chris Bailey
Chris Marks
Chris Spurlock
Chris Tabor
Chris Turner
Christa Gerard
Christian Frink
Christian Jacobsen
Christina Bjarvin
Christina Cuenca
christina hickman
Christina Nichols
Christine Sanders
Christopher Cornwell
christopher hill
Christopher Popek
Christopher Rossi
Christopher Stover
CJ Bowles
claire bunney
Clara Hall
Clare Cloutier
Claudia Elliott
Cliff Grant
Colleen Chupik
Connie Olinde
Corinne Shubin
Corinne Spero
Cormac Diggins
Cory Curtis
Cory Zanker
Courtney Holleman
Craig Schoenberg
Crissondra doxey
Crystal Gartner
Crystal kaya
crystal lester
Cynthia Holt
Dan Miller
Dan Nevill
Dan Ryen
Dane Brooks
Dani Repp
Daniel Doran
Daniel Newell
Daniel Singleton
Danielle Bock
Danny Arguetty
Darren Cohen
David Eastwood
David Hall
David Huneryager
David Laws
David Lee
David Puhrmann
David Roche
David Smith
David Swedin
David Toop
David Weinfeld
Dawid Pol
Dawn Bustanoby
Debbie Kirstein
Debbie Thorne
Deborah Hanes
Deborah Wolf
Deena Penhale
Delita due
Denise Templeman
Diane Dakin
Diane Davis
Diane Falk
Diane Lewis
Diann Sheldon
Doane Rising
Dominick Reale
Donald MacLaren
Donald Maynard
Donald McIntyre
Dorothy McBride
Douglas Park
Drew McDermott
DYLAN BAILEY
DYLAN RHYS
Dyllan Freeburg
Eamonn Kress
Ed Draper
Edie Lie
Edward Reinsel
Elisabeth Dekker
Elise Murphy
Elizabeth Nucci
Ellie Long
Ellie M
Emie Lamping
Emily Gunn
Emily Haney
Emily Hill
Emily larson
Emily Thomas
Emily Watkins
Emma Wilson
Eric Adler
Eric Gehner
Eric Heinitz
Erica Diede
Erich Rau
Erik Antonelli
Erin Amicucci
Erin OConnell
Eva Cosgrove
Evan Malina
Evan Manderbach
Fawzi Mhemedi
FIONA BENNITT
Fiona Hatfield
Frank Stieber
Frank Strobel

Comment Letter 383 Signatures

Comment Letter 383 Signatures

Fransing Daisy
Fred DeHaven
Frederick Moulton
Gary Wiles
Gayle Austin
Gayle Grything
Gemina Garland-Lewis
Gene Church
Gene McConnachie
GENE WISEMILLER
Geneva sullivan
Genevieve Levin
George Jensen
Gilia Angell
Gizela Berreth
Glen Acord
Glenn Eriksen
Glenn Robinson
Grace Huang
Grace Padelford
Grant Sutherland
Gratianne Daum
Greg Grimes
Greg Wentzell
Gregory Miller
Gregory Schrupp
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Harry Bell
Harry Gerecke
Heather Cabal
Heather Grehan
Heather Ivarsen
Heather Lisagor
Heidi Barnes
Heidi Greenwood
Heidi Morales
Heidi Perry
Heidi Venturine
Helen Worthington
Holly Berneking
Holly Johnson
Holly McBride
Holly McDonough
Howard Haemmerle
Howard Mason
Ian Lindell
Ian Sullivan
Ina Ross
Ivy Jin
Jack Bochsler
Jack DVM
Jack Gillette
Jackson Lindeke
Jacky Sabin
Jake Miller
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James Cronin
James DiNatale
James Epes
James Harsh
James McClung
James Schmidt
James Sterling
Jamie Clayton
Jamie Osborn
Jamie Power
Janee Romesberg
Janette Cunningham
Janiene Licciardi
Janine griggs
Jasmin Avendano
Jason Bubolz
Jason Gardner
Jay Schober
Jay Schram
Jay Weden
Jayne Misko
Jazlyn Dukatz
JB Brooks
Jeff Fennell
Jeff Girtz
Jeff Goble
Jeff Rodriguez
Jeffrey DeWitt
Jeffrey Jacka
Jeffrey Stevenson
Jeffrey Vazquez
Jena Winger
Jenessa Osteen
Jennifer Divine
Jennifer Froscher
JENNIFER GARDNER
Jennifer Grant
Jennifer Grasso
Jennifer Lyne
Jennifer Mahaffey
Jennifer Oriordan
Jennifer Rozler
Jennifer Siembor
Jenny Pascal
Jennylynn Vidas
Jera Vincelli
Jerry D'Addio
Jesse Miller
Jessica Brown
Jessica DeBoer
Jessica Howard
Jessica Logan
Jessica Rosebaugh
Jessica Simpson
Jill Cano
Joann Moe
Joanna Dittemore
Jodi Brill
Jodi Robin
Joe Crandall
John Alley
John Bock
John Borgmeyer
John Kerwin
John Kilpatrick
John Peterson
John Quattrocchi
John Ringler
john trousdale
John Van Eenwyk
Johnathan Texidor
Jon Peterman
Jonathan Allred
Jonathan Balsley
Jonathan Lee
Jonathan Olver
Jonathan Rily
Jordan Hinton
Jordan Sell
Joseph Beback
Joseph Knapik
Joseph Smith
Joseph Yencich
Joshua Farris
Joshua Flynn
Joshua Hubbard
Joshua Plotkin
Joshua Watson
Judith Akins
Judy Talarico
Judy West
Julia Hobbs
Julia Hodges
Julia Marks
Julia Yang
Julie Cloninger
Julie Lutovsky
Juryann Vallejo
justas Vilgalys
Justin Brown
Justin Jones
Justin Yale
Justine Bormann
Kaci Darsow
Kaelie Coleman
Kahrin Cadwell
Kaitlin Bailey
Kara Ziegler
Kari Hoover
Kate Tokareva
Katharine Clements
Katherine Morrison
Katherine Traczyk
Katherine Wade-Easley
Kathi Pickett
Kathleen Holloway

Comment Letter 383 Signatures

Comment Letter 383 Signatures

Kathryn Parks
Kathy Forgrave
Kathy Schneider
Katie Giuliano
Katie Sutterman
Katy Shaw
Keith Schackmuth
Keith Stobie
Kellee Keegan
Kelly Burchardt
Kelly Dona
Kelly Robbins
Kelty Allen
Ken Benoit
Kenny Chou
Keri Young
Kerry Martin
Kerry Ragain
Kerry Schlund
Kevin Clark
Kevin Killeen
Kevin Povey
Kevin Yangas
Kim Jones
Kim Kalina
Kimberly Kuhne
Kirk Stallman
Kirsten Rue
Kjersten Gmeiner
Krishna Tummeti
Kristin Austin
Kristina Caselman
Kristine wigley
Kristopher Pomeroy
Kyle Griggs
Kyle Peckham
L Grayum
Lacey Johnson
Lacie DeBoer
Lara Gwaltney
Larisa Maxwell
Laura Barnoski
Laura Baron
Laura Gibbons
Laura murahashi
Laura Nash
Laura Norsen
Laura Snoddy
Laura Webster
Laureen France
Lauren Heine
Lauren philliPh
Lauren sattely
Lawrence Highton
Lawrence Magliola
Leah Harari
Leah Hughes
Lee Gekas
Leilani Sommers
Lennon Aldort
Leslie Strickland
Leya Barr
Lin Provost
Linda Niedbalski
Lindsey Falkenburg
Liz McGehee
Liz Wurster
Lori Welby
Louise McNerney
Luan Pinson
Luann Berman
LuAnne Swainson
Lucas Fernandez
Lucille Uhlig
Luke Daining
Lyucy Chase
Madison Dyckman
Malorie Yerbey
Mamie Bolender
Marc Lower
Marc Manzo
Margaret Bomber
Margaret Mann
Margaret Rosner
Maria Drewing
Maria Jouravleva
Marian Wineman
Marina Smith
Marion Ellis
Marit Jensen
Marius Constantinescu
Marjorie Sullivan
Mark Gerber
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Mark Noll
Mark Uhart
Marta McCreary
Martha McCaffrey
Martin Alfaro
Marty Eckrem
Marty Pompermayer
Mary Carlson
Mary Christensen
Mary Gibson
Mary Jeffrey
Mary McCray
MARY ONUFER
Mary Ratermann
Mary Rozance
Mary Smith
MaryAnn Mabbott
Maryanna Brown
Matt Woodward
Matt Yanchek
Matt Yukubousky
Matthew Crawford
Matthew Gebert
Matthew Griffin
Matthew Koosmann
Matthew Logalbo
Maureen Kostyack
Meagan Ledbetter
Melanie Dunn
Melissa Ferrell
Melissa Frye
Melissa Washko
MELODY OVARD
Merilyn Moss
Michael Abu
Michael Ailion
Michael Davis
Michael Harvey
Michael Kovacs
Michael Malencia
Michael Miller
Michael Scholl
Michael Schultz
Michael Sousa
Michael Weekly
Michael Wiseman
Michele Boderck
Michele Manning
Michelle Forrest
Michelle Mizuki
Michelle Whitney
Mike Sancrant
Mike Sandefur
Miki Boisjolie
Milo Heiret
Mitchell Pohlkamp
Molly Wilmoth
Morgan Battrell
Mr. Cook
Nadine Snyder
Nancy Zwicker
Naomi Hansen
Natalie Franz
Natalie Koncz
Natalie Shirley
Nathan Starr
Nicholas Evans
Nicholas Iverson
Nick Clute-Reinig
Nick Seidler
Nicole Calvert
NICOLE CISNEROS
Nicole Schoen
Nina Mesihovic
Noah Overby
Noelle Marchesini
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Comment Letter 383 Signatures

Comment Letter 383 Signatures

Pacheena Shuen-Mitchell
Paige Robidoux
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pamela bouchard
Pamela Winter
Patricia Friedman
Patrick Klein
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Paul Tuck
Paul Woolsey
Pauline Bruce
Peter Christensen
Peter Gonda
Petr Horak
Petr Sokolo
Phil Bebbington
Phil Lewis
Phill Ramey
Polina Sharabarina
Priscilla Shaw
Rachel Churchward
Rachel Covault
Rachel Holland
Rachel Lyell
Rachel McNulty
Rachel Ogrodowski
Rachel Silverman
Rachel Spence
Raina Ratcheson
Ramaswamy Narayana
Randall Hoover
Randall Oglesby
Raymond Anderson
Rayna Weth
Rebecca Collins
Rebecca Mazahreh
Reed Braden
Renae Porter
Renee Buell
Riah Buchanan
Richard Lipsky
Rita Reitz
Rob Salvino
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Robert Lamb
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Rory Brennan
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Roy McMurtrey
Ruby Geballe
Ruthanne Leishman
Ryan Beachy
Ryan Howard
Ryan Perrault
Sally McCray
Sam Cutler
Sam Nofziger
Sam Rucks
Samanta Pugh
Samantha Wellington
Sandra Carlson
Sandro Squadrito
Sandy Robinson
Sara Blackmur
Sara shook
Sarah Elliott
Sarah Kepa
Sarah Lee
Sarah Michel
Sarah Patterson
Sarah Tesar
Scott Fortman
Scott Klein
Sean Kennedy
Shaun Vinyard
Shauna Clark
Shawna dhaenens
Shea Harris
Shelby Griffith
Sherrie Crow
Sibylle Kamdar
Siobhan Costello
SM Duntz
Sondra Yancey
Stacey Silver
Stella Kiehn
Stephanie Luck
Steve Garcia
Steve Hindman
Steve logan
Steve Roguski
Steven Bell
Steven Cragar
Steven Schenk
Stuart Jones
Susanna Smith
Suzanne Arellano
Suzanne Gagnet
Suzanne Kraus
Sydney Miyahara
Taianna Jesus
Tammie jorgensen
Tara Fulton
Taylor Greene
Teresa Nemeth
Teresa Tam
Terry Wood
Tesa Brewer
Thao Hoang
Theodore Day
Theresa Burlingame
Thomas Brigham
Thomas Dancs
Thomas Doggett
Thomas Robinson
Tim Russell
Timothy Carr
Todd Dunfield
Todd Gerson
Todd Vlastnik
Topher Ostendorf
Tory Burns
Tova Alexandra
Tracy Petragallo
Travis Abram
Travis Miller
Trinell Carpenter
Troy Keene
Tyanne Faulkes
Tyler Cleveland
Tyler Herman
Valerie Doerrfeld
Vanessa Woo
Victoria Clarke
Virginia Bell
Vladimir Gole
Walter Allen
Walter Croshaw
Warren Kagarise
Webster Chang
Wenda Millee
Wendy Chamberlin
William Betz
William carson
William Crowley
William Dudley
William Marks
William Westbrook
Xanthe Denning
Xavier Martinez
Yu-chin Chen
Yvonne Poole
Zane Madinger
Zdenek Dohnalek
Zeke Barger

Comment Letter 384

From: questionz@everyactioncustom.com on behalf of Katherine Scheulen <questionz@everyactioncustom.com>
Sent: Monday, July 30, 2018 9:19 PM
To: NR Icicle SEPA
Subject: [Icicle SEPA] Proposed Water Plans in the Icicle Basin

Dear Director Mike Kaputa,

Thank you for considering the following comments on the Draft Programmatic Environmental Statement for the Icicle Strategy:

Sincerely,
Ms Katherine Scheulen
5803 43rd Ave NE Seattle, WA 98105-2226 questionz@gmail.com

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Comment Letter 384 Signatures

Anna Santo
Arland Swanson
Austin Johnson
Brian Falkner
Cheryk Perazzoli
Dennis Bahr
Doug Adams
Doug Cole
Doug Day
Emily Wing
Judy Dougherty
Katherine Scheulen
Maribeth Spencer
Meghan Falkner
Michelle Garcia
Noelle Dwarzski
PETER SEIDMAN
Phoebe Smith
Rosanna Cartwright
Surya Jakhotia
Susan Heath
Thom Peters
Thomas Fred Boyd

Comment Letter 385

I have read the PEIS for the Icicle Strategy/ Alpine Lakes Wilderness proposal for damming seven lakes and would like first and foremost a complete review of the following.

385-1 1. Please consider the Impacts of Climate Change.

385-2 2. Analyze the impacts of water diversion on the beauty of this most beloved place and the impacts on plant and animal species.

385-3 3. Consider the decades long history of the thousands of people and the mainly 40 conservation groups who worked for the Wilderness designation of this place. These people and their work must be respected and considered.

385-4 4. Make sure all laws, The Wilderness Act of 1964, The Alpine Lakes Management Act of 1967, The Wenatchee Forest Plan of 1990 and any further protection acts thereafter be considered.

385-5 5. Consider the uses of modern technology (pumping and piping) so that water will not have to be diverted from the lakes and cause negative impacts to this pristine environment.

385-6 6. Water Conservation should be considered at the top of the list! Many Westside cities like Seattle have initiated Water Conservation Rules and they proven to be effective.

385-7 I have a great investment in The Alpine Lakes Wilderness Area. I worked for years with thousands of other people to make sure this jewel of the state and nation would be protected for future generations to enjoy. I care about wildlife and about the habitat they need to survive, this area is not just a recreation area for people but a home for other species.
I also eat apples and other fruits that are grown in the beautiful Wenatchee Valley. I know these orchards and farms put food on my table and provide jobs for many people. I am grateful for the work these people do. It is a difficult challenge to provide instream flow and water supply for the agri-businesses, but I believe that all parties working together in the best interests of the Wilderness and Agri-business must find a non-destructive alternative to the damming and any negative environmental footprint in The Alpine Lakes Wilderness. Please make Water Conservation a priority.

Respectfully,

Gena Di Labio, Mount Vernon, WA

Ms. Gena Di Labio
3124 Dakota Dr.
Mount Vernon, WA 98274-8802

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Comment Responses

Comment Letter No. 001 - United States Bureau of Reclamation	
1-1	The co-leads recognize that SEPA does not supersede NEPA. If a project does not receive federal authorization or funding due to NEPA analysis, that project will be replaced by another project to meet the Guiding Principles. Should this occur, additional SEPA review would be conducted as required under Chapter 197-11 WAC. This information is included in the FPEIS in Section 1.9.
1-2	The co-leads recognize USFWS and USBOR will serve as co-lead agencies on any NEPA actions related to LNFH operations and maintenance. This information is included in the FPEIS in Section 1.9.
Comment Letter No. 002 - United States Fish and Wildlife Service, Washington Fish and Wildlife Office	
2-1	The co-leads have coordinated with USFWS, WDFW, the Yakama Nation, and the Confederated Tribes of the Colville Reservation throughout the development of the Icicle Strategy, meeting the requirements of the FWCA. The co-leads will work with the Instream Flow Subcommittee (IFS), which all these entities are members of, to determine if the preparation of a CAR would be beneficial as part of project level environmental review. The co-leads look forward to continued coordination with USFWS.
2-2	The co-leads look forward to continued coordination and collaboration with federal stakeholders.
Comment Letter No. 003 - United States Fish and Wildlife Service, Leavenworth Fisheries Complex	
3-1	Your comment indicating general support for the process is noted.
3-2	Your comment that it would be inappropriate for USFWS to advocate for any alternative until the conclusion of NEPA review is noted.
Comment Letter No. 004 - United States Forest Service	
4-1	The co-leads appreciate the USFS input as part of the IWG for the past 5 years. Your comment regarding coordination is noted. Prior to project level implementation the co-leads will coordinate with USFS on proposed actions on NFS lands.
Comment Letter No. 005 - Washington Department of Fish and Wildlife, North Central Region	
5-1	OCR manages the two-third/one-third statutory responsibility at the program level, not project level, and only applies to new storage allocations. At the program level, the Icicle Strategy instream flow allocation is over 90-percent instream flow benefit. Water supply generated from the Icicle Strategy that accrues downstream of the Icicle Creek/Wenatchee River confluence will either be managed for instream flow only, or for uses with no increase in consumptive use.
5-2	The FPEIS evaluates climate change impacts and efficacy in Section 4.13. OCR and Chelan County evaluated climate change impacts associated with each alternative to address adaptation issues raised by WDFW. The co-leads included storage projects that are better able to adapt to climate change in the Preferred Alternative. The co-leads envision long-term monitoring and adaptation to evaluate performance of the Preferred Alternative.

5-3	Our programmatic analysis found construction windows that could impact fish and wildlife are likely to be short and of limited extent for the Preferred Alternative. The co-leads welcome WDFW input as further BMPs and mitigation measures are developed during project level review.
5-4	See response to comment 5-3.
5-5	See response to comment 5-3.
5-6	Long term growth in the Icicle Subbasin and Wenatchee Basin, and the environmental impacts thereof are addressed through Chelan County and City of Leavenworth comprehensive plans and zoning. The Preferred Alternative provides additional mitigated water supply for City of Leavenworth and Chelan County domestic uses through at least 2050. Development impacts are expected to occur irrespective of implementation of the Icicle Strategy. However, the Icicle Strategy includes BMPs and terrestrial mitigation in addition to robust instream flow improvements to help offset impacts that may result from planned growth.
5-7	The co-leads adopted a FPEIS with programmatic level analysis. Opportunities for project level analysis would occur during project level review in the future.
5-8	The IFS has met at least annually each year at the direction of the IWG and includes state, tribal, federal, and NGO representatives, including WDFW. The operation of the IFS is based on the IWG operating procedures, which WDFW helped develop. The co-leads envision additional IFS support during project level environmental review and project implementation. The IFS will also be tasked with evaluating whether a Fish and Wildlife Coordinated Act Report (CAR) would be helpful during project level environmental review and Icicle Strategy implementation. WDFW's continued involvement in the IFS would be valued by the IWG.
5-9	IPID and COIC conservation projects are intended to meet agricultural reliability and instream flow Guiding Principles. The Preferred Alternative includes the COIC Irrigation Efficiencies and Pump Exchange, which is currently being designed with a pump station on Icicle Creek near the Icicle Creek/Wenatchee River confluence. The IPID Dryden Pump Exchange project is included in the Preferred Alternative if long-term operation and maintenance funding can be identified. Both projects provide substantial instream flow benefit in Icicle Creek.
5-10	The Preferred Alternative does not include removal of the IPID diversion from Icicle Creek. Long-term enhancement of the IPID diversion can be considered in future Icicle Strategy stages.
5-11	City and County’s domestic water use is already low relative to other eastern Washington communities. City of Leavenworth metering and leak detection is expected to conserve water supply further. Water conservation is considered in all action alternatives. The FPEIS includes more expansive water conservation opportunities around lawn reduction that is also intended to extend domestic supplies.
5-12	These lakes and stream experience drawdown and increased flows at least once every five years, if not more often under current baseline conditions. The total volume of release would not change under the Alpine Lakes Optimization, Modernization, and Automation project. Discussion of baseline conditions in the tributaries are located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases is not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
5-13	The co-leads envision the IFC playing a continuing role in maximizing fisheries benefit associated with the Icicle Strategy.

5-14	See response to comment 5-1. OCR manages the two-third/one-third statutory responsibility at the program level, not project level. If WDFWs suggestion were taken, the Guiding Principle for domestic water supply would not be met.
5-15	The Guiding Principles for domestic supply requires mitigation for consumptive use impacts when instream flows are not met. There is natural flow availability in Icicle Creek and the Wenatchee River above weekly instream flows that does not require mitigation. Use of the 900 ac-ft for consumptive use mitigation only, means that more than 900 ac-ft of water right authorizations are possible.
5-16	The 900 ac-ft have historically been released for irrigation purposes, which is more consumptive than domestic use.
5-17	The figure on page 2-64 has been updated to reflect 900 acre-feet, which is the correct quantity.
5-18	Your comment is noted. This requirement is referenced in the final PEIS.
5-19	Your concern regarding storage enhancement projects is noted. Discussion of impacts to shoreline of these projects is described at a programmatic level in Section 4.18.5. These projects are not included in the Preferred Alternative.
5-20	We envision WDFW helping the IWG select appropriate mitigation projects as part of the Preferred Alternative habitat project list. The co-leads are envisioning WDFW will help select conservation acquisitions, with priority being given to in basin habitat projects, as part of implementation of the Preferred Alternative.
5-21	See response to comment 5-20
5-22	Your comment is noted.
5-23	Section 1.9 provides information regarding the SEPA and NEPA process and integration. Project level environmental review for both SEPA and NEPA will be determined by appropriate lead agencies in determining whether project level impacts, mitigation, and permitting requirements are fully met.
5-24	Your comment will be incorporated into the FPEIS.
5-25	Your comment will be incorporated into the FPEIS.
5-26	Water markets are proposed to meet the agricultural reliability Guiding Principle, not instream flow benefit, which is provided by other projects in the Preferred Alternative. However, there may be opportunistic instream flow benefit that can be identified as this element of the Preferred Alternative is further developed.
5-27	The 0.5 cfs from the Icicle Reserve is envisioned for a combination of City of Leavenworth and Chelan County domestic water uses, which will be determined at project level review and permitting. Additionally, the City and the County have an interlocal agreement regarding reserve quantities provided for in the Wenatchee Instream Flow Rule (Chapter 173-545 WAC), which is designated for domestic use.
5-28	The Preferred Alternative includes the City of Leavenworth utilizing their well field for new growth as part of the Icicle Strategy. Any water provided for from the Icicle Strategy for use at the City wellfield will be debited based on total use rather than consumptive use.
5-29	Ecology and Chelan County are co-managing responsibility for reserve accounting. The reserve frame work described in RCW 173-545-090 and your comment is referenced in the FPEIS.
5-30	A legislative OCPI change is not included as part of the preferred alternative.

5-31	The Preferred Alternative aligns well with the project list referenced in this comment. The Preferred Alternative also includes that rule amendment adopted as part of the 2006 Wenatchee Watershed Plan, which is necessary to meet the domestic supply guiding principle. The Preferred Alternative also includes a voluntary or incentivized lawn buyback program that will reduce terrestrial impacts and increase conservation as part of the Icicle Strategy.
Comment Letter No. 006 - Icicle Creek Watershed Council and Trout Unlimited-Washington Water Project	
6-1	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. In this instance, the proposal has not changed in a way nor has new information been found indicating that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, additional project level environmental review will be required.
6-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning, not at the programmatic environmental review stage. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation.
6-3	Your comment regarding concern over the implementation timeline of activities at LFNH is noted.
6-4	The goal of the co-leads has been to provide as much detail and information as possible for each of the alternatives under consideration. SEPA threshold determinations will be made on each project. Permitting agencies will determine what level of additional project level analysis is required, if any, on a project by project basis.
6-5	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action, which comes after environmental review. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
6-6	The co-leads view the short-term goal to be achievable in approximately 10 years and the long-term goal to be achievable in approximately 50 years. Revisions have been made to Chapter 1 of the FPEIS to clarify these time-steps.
6-7	The method used for determining average year and drought year hydrographs align with the protocols provided in the Department of Ecology document "Historical Stream Flow Data by Water, Protocols for Creating Streamflow Graphs". These graphs were created using the most recent 20-years of stream flow data as recorded at the USGS gage. Additionally, using averaged historical data is a common practice for modeling future conditions. However, to address concerns with "washing out" low flow conditions, these graphs include the lowest recorded flow as a point of comparison (purple line), which appropriately shows "worst case scenario".

6-8	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. These lakes and tributaries are already dammed and already experience increased flow and draw down at least once out of every five years if not more frequently, so natural conditions do not currently exist. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis.
6-9	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. Alternative 3 represents a conservation focused alternative. However, an OCPI legislative fix would be required for a conservation focused alternative because without storage, it will not be possible to meet domestic supply goals year-round without impacts to the instream flow rule. Converting agricultural lands to residential lands is not an objective of the Icicle Strategy, and conflicts with the agricultural reliability guiding principle.
6-10	See response to comment 6-5.
6-11	See response to comment 6-7.
6-12	See response to comment 6-7.
6-13	See response to comment 6-7.
6-14	OCR and Chelan County evaluated climate change impacts associated with each alternative. Given the programmatic nature of the analysis in the PEIS, individually calibrated catchment scale climate models are beyond the scope of this analysis. The co-leads included storage projects that are better able to adapt to climate change in the Preferred Alternative. The co-leads envision long-term monitoring and adaptation to evaluate performance of the Preferred Alternative.
6-15	See response to comment 6-7. Table 4-3 and Appendix F has been updated to include 2030 and 2050 modeling data.
6-16	The co-leads view the short-term goal to be achievable in approximately 10 years and the long-term goal to be achievable in approximately 50 years. Revisions have been made to Chapter 1 of the document to clarify these time-steps.
6-17	City and County's domestic water use is already low relative to other eastern Washington communities. City of Leavenworth metering and leak detection is expected to conserve water supply further. Section 2.5.4 of the FPEIS includes more detailed description of water conservation opportunities around lawn reduction that is also intended to extend domestic supplies. IPID conservation goals have been developed and are described in the newly released CWCP. More detailed description of conservation projects will occur after project design, when specific conservation work will be selected for additional review and implementation. Land use and the land use regulatory framework is described in Section 3.16.
6-18	See response to comment 6-5.
6-19	Your comments in support of the IPID Full Piping and Pump Exchange Project are noted. Your comment in opposition to projects proposed in the ALWA is noted.
6-20	City and County's domestic water use is already low relative to other eastern Washington communities. City of Leavenworth metering and leak detection is expected to conserve water supply further. The Preferred Alternative includes more expansive water conservation opportunities around lawn reduction that is also intended to extend domestic supplies. IPID conservation goals have been developed and are described in the newly released CPCW. Converting agricultural lands to residential lands is not an objective of the Icicle Strategy and conflicts with the agricultural Guiding Principle.
6-21	See response to comment 6-8.
6-22	See response to comment 6-8.

6-23	See response to comment 6-8.
6-24	See response to comment 6-8.
Comment Letter No. 007 - Washington Water Trust	
7-1	Your comment in support of the goals of the Icicle Strategy is noted.
7-2	Per your comment, discussion of the system laterals has been added to the COIC Irrigation Efficiencies and Pump Exchange project description.
7-3	Your comment affirming the environmental benefit of the COIC project is noted.
7-4	This level of detail was not added to the PEIS. It is the co-leads understanding that while the COIC advisory board supports pump station site 3, some factors have emerged that may make this site less feasible than the location on lower Icicle Creek near the confluence with the Wenatchee. Currently, project design is focused on this Icicle Creek site.
7-5	See response to comment 7-4.
7-6	Per your comment, the cost estimate for the COIC Irrigation Efficiencies and Pump Exchange will be updated.
7-7	Your comment is noted.
7-8	Your comment is noted.
7-9	Your comment is noted. A note has been added to the table pointing out that the parcels served are subject to change.
7-10	The text on page 4-20 has been updated to reflect your comment regarding COIC's season of use.
7-11	Your comment is noted. The co-leads recognize the likely quantities and trust water reach that would result from the COIC pump exchange portion of this project.
7-12	This language has been updated per your comment.
7-13	Comment noted. The text on page 4-50 has been updated with the correct river mile.
7-14	Per your comment, additional text about the benefit reach for the Icicle Creek Pump Station site has been added.
7-15	Per your comment, outmigration benefits have been added to this section.
7-16	Per your comment, changes to the test on page 4-153 have been made.
7-17	Per your comment, changes to the text on page 4-270 have been made.
7-18	Per your comment, change to the text on page 4-283 have been made.
7-19	The text on page 4-320 have been updated to reflect the use of PUD power at the proposed COIC pump station.
7-20	Per your comment, the text on page 4-327 have been updated to reflect possible lane closures during the construction phase of the COIC Irrigation Efficiencies and Pump Exchange project.
Comment Letter No. 008 - Daryl Harnden, IWG Agricultural Representative & Local Farmer	
8-1	Your comment in support of Alternative 1 is noted.
Comment Letter No. 009 - Yakama Nation	
9-1	Your comment is noted. The co-leads recognize the importance of LNFH in mitigating fish losses associated with Grand Coulee Dam.

9-2	The Yakama Nation's support for Alternative 1 is noted.
Comment Letter No. 010 - Washington State Department of Agriculture	
10-1	Your support for Alternative 1 is noted.
Comment Letter No. 011 - Department of Health, Office of Drinking Water	
11-1	Your general support of the process is noted.
11-2	Growth projections were used to estimate long-term growth in Section 1.5.1.4 for programmatic review. A more detailed analysis may occur during project level review. If projections under-predict growth, then the municipal guidance principle will not extend to 2050 as planned. Alternatively, if projections over-predict growth, then water supply past 2050 will be available.
11-3	The 2018 Water System Plan (WSP) was reviewed. While the projections in the updated WSP suggested improved efficiency since the release of the 2011 plan, projects and goals developed for the Icicle Strategy have not been changed. If projections over-predict growth or demand, then water supply past 2050 will be available.
11-4	Per your comment, changes to the text in Section 1.10.23 have been made.
11-5	Per your comment, changes to the text in Section 1.10.25 have been made.
11-6	Per your comment, changes to the text have been made to more clearly define group systems.
11-7	Per your comment, changes to the text have been made to more clearly describe when WSP must be updated.
11-8	Per your comment, reference to Municipal Water Law has been updated to RCW 70.119A.180
11-9	Per your comment, text has been revised so that Dryden, Monitor, Peshastin and Sunnyslope are not referred to as cities or towns, but as unincorporated areas.
11-10	Per your comment, "State" has been added to "The Forest Practices Act" for clarity and consistency.
11-11	Per your comment, a list of Group A water systems has been added to section 3.19.1.
11-12	While Chelan County is not a water purveyor, they are the responsible party for domestic exempt well use through their management of the Wenatchee Reserve established in WAC 173-545. Additionally, because they are responsible for issuing building permits and regulating building codes, they have a role in managing rural domestic water conservation.
Comment Letter No. 012 - Alpine Lakes Protection Society et al.	
12-1	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
12-2	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
12-3	Your support for specific elements of the Icicle Strategy are noted.

12-4	The Icicle Work Group has invited additional members that represent the conservation or recreation communities, who have chosen not to become members. The co-leads welcome additional input on organizations who wish to become members. More detailed information about adding members to the Icicle Work Group is available in the Operating Procedures, which are incorporated into the FPEIS by reference.
12-5	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads included information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. Such a project would be for irrigation reliability, not for instream flow and domestic uses. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
12-6	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
12-7	See response to comment 12-6.
12-8	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter (Letter 4), coordination will occur at the project level for any projects that may have permitting actions required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review.
12-9	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
12-10	See response to comment 12-6.
12-11	See response to comment 12-5 and 12-6.
12-12	See response to comment 12-1.
12-13	See response to comment 12-5. The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative to ensure compliance with all applicable rule and regulations.
12-14	See response to comment 12-13.
12-15	See response to comment 12-6.
12-16	See response to comment 12-13.
12-17	Your comment is noted. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review. A PEIS is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level construction details that is required in subsequent project level review. See response to comment 12-13.

12-18	The FPEIS provides general language from the IPID easements and applicable wilderness regulations to provide a comprehensive understanding of the proposal and issues. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative to ensure compliance with all applicable rule and regulations.
12-19	Impacts to Wilderness, Recreation, and Aesthetics are described in Sections 4.17, 4.15, and 4.11 respectively. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts to these resources will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
12-20	See response to comment 12-17.
12-21	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
12-22	See response to comment 12-13. Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
12-23	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
12-24	In the notes for Table 5-2, it states that should special use permits be required by the USFS, USFS would likely serve as the federal lead agency responsible under NEPA. To clarify this point, additional discussion will be added to the text and this note will be added to all projects proposed in the ALWA.
12-25	See response to comment 12-1.
12-26	Per the Guiding Principles, all projects must comply with federal laws. Under SEPA environmental impacts of the proposals are considered. While several of the projects proposed under Alternatives 1, 2, 4, and 5 include action in the ALWA, the IWG and co-leads have found these projects to be feasible at the programmatic level. Additionally, the DPEIS does consider an alternative that does not include action in the ALWA, Alterative 3. However, the DPEIS does recognize that IPID has expressed intent to restore historical storage levels at Eightmile Lake outside of the IWG process should an alternative be selected that does not include the Eightmile Lake Storage Restoration Project. This discussion is provided in Section 2.3.1. Consideration of these impacts does not preclude the dam at Eightmile Lake being repaired rather than restored, so long as that action does not have any additional significant adverse environmental impacts.
12-27	See Response to comment 12-26.
12-28	See Response to comment 12-26.

12-29	Per WAC 197-11-406, an EIS should occur as early as possible to meaningfully contribute to the decision-making process. Additionally, this is a programmatic level review that is intended to provide a comprehensive overview to help decision makers select one of several programmatic alternatives (WAC 197-11-704(2)(b)). Some elements of the project are not known at this time, such as number of helicopter flights. However, the DPEIS does provide as much information as possible regarding impacts, such as inundated and disturbed land (Section 4.29). However, to be responsive to concerns about impacts of the number of helicopter flights, the FPEIS includes a rough magnitude of helicopter flights to compare between alternatives. A more specific number of helicopter flights will be reviewed at the project level, as required depending on the Preferred Alternative.
12-30	Per your comment, text has been revised in Section 1.9.3 to better describe the environmental review process.
12-31	Per your comment, text has been revised in Section 1.9.3 to better describe the environmental review process.
12-32	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address potential increased costs of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS. This will be revisited during project level review.
12-33	Each project assumes between 10 and 20 percent of the budget will go to environmental review and design. The DPEIS provides a two-year timeline for completing additional environmental review. The co-leads believe it is reasonable for NEPA review to be completed during a two-year window, but ultimately the federal lead conducting NEPA will determine the appropriate schedule.
12-34	See response to comment 12-32.
12-35	See response to comment 12-32.
12-36	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. These lakes and tributaries are already dammed and already experience increased flow and draw down at least once out of every five years if not more frequently, so natural conditions do not currently exist. Discussion of baseline conditions in the tributaries are located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases is not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species based on input from the IWG Instream Flow Subcommittee. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
12-37	See response to comment 12-36
12-38	See response to comment 12-36.
12-39	See response to comment 12-36.
12-40	See response to comment 12-36.
12-41	See response to comment 12-36.
12-42	See response to comment 12-36.
12-43	See response to comment 12-36.
12-44	See response to comment 12-36.
12-45	See response to comment 12-36.
12-46	See response to comment 12-36.
12-47	See response to comment 12-36.

12-48	See response to comment 12-36.
12-49	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
12-50	Your support for conservation is noted. City and County's domestic water use is already low relative to other eastern Washington communities. City of Leavenworth metering and leak detection is expected to conserve water supply further. The Preferred Alternative includes water conservation opportunities around lawn reduction that is also intended to extend domestic supplies. IPID conservation goals have been developed and are described in the newly released CWCP.
12-51	Conservation has been included in all Alternatives. However, increased focus and discussion of conservation has been included in the PEIS.
12-52	See response to comment 12-51.
12-53	The domestic supply goal is to meet demand to 2050 at a minimum. If the City of Leavenworth continues to increase efficiency, which is a goal of the IWG, additional water for the City of Leavenworth will provide for sustained supply for a further planning horizon.
12-54	See response to comment 12-53.
12-55	The major diverters on Icicle Creek have already achieved reasonable efficiency as is required by State Law. The standard for efficiency is based on local custom per Ecology v. Grimes. Detailed information regarding IPID's water use is available in the recently completed CWCP, which is incorporated by reference. COIC water use information is available in their Alternatives Evaluation Study, which is also incorporated by reference. The City and County's domestic water use is already low relative to other eastern Washington communities. This information has been added to Section 3.6 of the FPEIS.
12-56	Per your comment, more detail about Washington State water law is included in Section 3.6 of the FPEIS.
12-57	See response to comment 12-6.
12-58	Your comment is noted. Please see response to comment 12-55.
12-59	IPID recently completed a CWCP, which details their water use and measures to improve efficiency. IPID uses their rights in a way that is consistent with local custom and maintains an efficiency that is not considered waste under RCW. 90.09.005 per Ecology v. Grimes.
12-60	IPID recently completed a CWCP that details water use. This report will be incorporated by reference.
12-61	See response to comment 12-59.
12-62	Your comment is noted. The additional water provided to the City of Leavenworth in the Icicle Strategy is intended to resolve the water right dispute in Leavenworth v. Ecology and provide for additional growth. Increased domestic conservation is a goal of the Icicle Strategy, as discussed in more detail in Section 2.5.4 of the FPEIS.
12-63	The domestic supply goal is to meet demand to 2050 at a minimum. If the City of Leavenworth continues to increase efficiency, which is a goal of the IWG, additional water for the City of Leavenworth will provide for sustained supply for a further planning horizon.
12-64	See response to comment 12-63.
12-65	The additional water provided to the City of Leavenworth in the Icicle Strategy is intended to resolve the water right dispute in Leavenworth v. Ecology and provide for additional growth. The domestic supply goal is to meet demand to 2050 at a minimum. If the City of Leavenworth continues to increase efficiency, which is a goal of the IWG, additional water for the City of Leavenworth will provide for sustained supply for a further planning horizon.

12-66	The conservation measures outlined in the WSP are a minimum commitment to conservation required by RCW 70.119A.180. The Icicle Strategy includes conservation measures that exceed this minimum requirement.
12-67	See response to comment 12-66. The Icicle Strategy is proposing to spend $1 million on funding conservation efforts. To be responsive to concerns over lawn watering, a lawn buyback program along with other conservation measures have been added to the Domestic Conservation Project.
12-68	Domestic supply is envisioned for a combination of City of Leavenworth and Chelan County domestic water uses, which will be determined at project level review and permitting. Additionally, the City and the County have an interlocal agreement regarding reserve quantities provided for in the Wenatchee Instream Flow Rule.
12-69	Your comment in support of closing the Wenatchee Basin to new water rights is noted. Closing the Wenatchee Basin is outside the scope of the Icicle Work Group.
12-70	Growth will be compliant with City of Leavenworth or Chelan County's Comprehensive Plan and planning efforts.
12-71	Supporting LNFH in improving its water supply and efficiency is one of the goals of the IWG. While this goal is in line with current planning goals of LNFH, these goals were developed independent of one another. The Icicle Strategy is an integrated water resource management plan, that includes efforts to support LNFH in meeting the BiOp. A plan to improve streamflow, habitat, and tribal fish harvest in the Icicle Creek Subbasin without setting sustainability goals at LNFH would be incomplete. The requirements at LNFH and the BiOp are described throughout Chapter 1.
12-72	Your support for water markets are noted. To be responsive to concerns over lawn watering, a lawn buyback program along with other conservation measures have been added to the Domestic Conservation Project.
12-73	Maximum habitat benefit (100 percent WUA) for steelhead rearing in Reach 4 would be achieved with a flow of 250 cubic feet per second (cfs) and the IWG adopted this as their long-term goal. However, the IWG recognized a diminishing return on investment above 100 cfs (80 percent WUA) when considering additional habitat achieved for each 1 cfs of flow improvement. The IWG also recognized that funding may be a constraint, at least initially, to achieve the highest level of flow improvement. Therefore, the IWG endorsed an initial flow restoration target of 100 cfs, which increases WUA to 80 percent, while maintaining the long-term restoration goal of 250 cfs.
12-74	Figure 2-6 through Figure 2-17 indicate all action alternatives would meet the short-term instream flow goal of 100 cfs during non-drought years and 60 cfs during drought years. Additional information on how to read these figures have been added to the FPEIS.
12-75	The Icicle Strategy proposes using water markets or market-based reallocation of senior water rights to improve agricultural reliability of water user’s junior to the instream flow rule. Your comment in support of closing the Wenatchee Basin to new water rights is noted. Closing the Wenatchee Basin is outside the scope of the Icicle Work Group.
12-76	Legal descriptions of the easements are in Appendix F. Maps provided by the USFS and/or IPID are also available in this Appendix, but new maps were not created because of the availability of survey data. These maps do not include Eightmile Lake easements.
12-77	The IWG believes that expanding habitat conservation and connectivity with areas outside the Subbasin provides benefits for wildlife within the Subbasin, as wildlife often move beyond Subbasin boundaries. The co-leads envision WDFW helping the IWG select appropriate mitigation projects as part of the Preferred Alternative habitat project list. The co-leads are envisioning WDFW will help select conservation acquisitions, with priority being given to in basin habitat projects. Land acquisition is not a requirement of the reserve amendment as described in WAC 173-545-090(1)(d)(iv).

12-78	The additional water provided to the City of Leavenworth in the Icicle Strategy is intended to resolve the water right dispute in Leavenworth v. Ecology and provide for additional growth. The domestic supply goal is to meet demand to 2050 at a minimum. If the City of Leavenworth continues to increase efficiency, which is a goal of the IWG, additional water for the City of Leavenworth will provide for sustained supply for a further planning horizon. Currently, the City of Leavenworth is meeting water conservation standards set in WAC 246-290-496(1) and has use that is low when compared to other Eastern Washington communities.
12-79	The impacts of groundwater augmentation at LNFH on groundwater and flows in Icicle Creek are discussed in Section 4.3. It is anticipated that increases in flows to Icicle Creek will more than offset impacts of groundwater augmentation. A more detailed analysis of impacts to groundwater and groundwater/surface water interaction will be reviewed during project level review as appropriate.
12-80	OCR's methodology for developing estimates on water development costs is available in the 2017 Columbia River Basin Annual Water Supply Inventory Report located on Ecology's website: https://fortress.wa.gov/ecy/publications/documents/1812001.pdf.
Comment Letter No. 013 - Washington Trails Association, The Mountaineers, and Access Fund	
13-1	Your support for specific elements of the Icicle Strategy are noted.
13-2	Your opposition to Alternative 4 is noted. This was not selected as the Preferred Alternative.
13-3	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2.
13-4	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
13-5	Seasonal inundation of trail and surrounding campsites would result from this project. Impacts to recreation and visual impacts are discussed in Sections 4.11.5.2 and 4.15.5.2. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. This project was not included in the Preferred Alternative selected for the Icicle Strategy.
13-6	Construction impacts to recreation are expected to be short in duration and may be managed through timing of construction. The PEIS reviews the impacts of the various alternatives in as much detail as is appropriate for a programmatic evaluation. A more specific look at impacts and mitigation will occur at project-level environmental review.
13-7	Based on the GIS data provided by the USFS, it appears that the trail along the northside of Eightmile Lake and many documented backcountry campsites are above the proposed highwater level of the Eightmile Lake Storage Restoration project. A more specific look at impacts and mitigation will occur at project-level environmental review.
13-8	Your opposition to the Eightmile Lake Storage Enhancement project and concerns regarding recreation impacts are noted. This project was not included in the Preferred Alternative for the Icicle Strategy.
13-9	Your opposition to this project and concern regarding relocating the trail are noted. Seasonal inundation of the trail would occur if the Upper and Lower Snow Lakes Storage Enhancement Project were implemented. This project was not included in the Preferred Alternative for the Icicle Strategy.

13-10	Your opposition to the Upper Klonaqua Lake Storage Enhancement project and concerns regarding visual and physical impacts are noted. Projects under the alternatives considered in the PEIS are at varying stages of development, and as much detail as possible at a programmatic level. This project was not included in the Preferred Alternative for the Icicle Strategy.
13-11	The USFS is an active member of the IWG and regularly attends meetings. Per the USFS comment letter (Letter 4), coordination will occur at the project level for any projects that may have a permitting action required by USFS.
13-12	See response to comment 13-11. The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2.
13-13	USBR and USFWS are working as co-lead agencies for NEPA actions related to their infrastructure at Snow Lake and LNFH. USFS will likely be NEPA lead agency for work that would require a special use permit within the National Forest. NEPA review, along with project level SEPA environmental review, would likely occur following feasibility and design, when project level permitting is started. Information regarding project level SEPA review and NEPA review will occur via Chelan County's Icicle Workgroup webpage, public notices and press releases, and at IWG meetings.
13-14	See response to comment 13-4.
13-15	Your email address will be added to the IWG email distribution list.
Comment Letter No. 014 - Alpine Lakes Foundation	
14-1	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
14-2	See response to comment 14-1.
14-3	See response to comment 14-1. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations.
14-4	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative.
14-5	The Preferred Alternative selected for the Icicle Strategy does not include any project at Upper Klonaqua Lake.
14-6	See response to comment 14-1.
14-7	Your support for the IPID Full Piping and Pump Exchange project is noted. Your concern for other projects proposed under Alternative 5 is noted.
14-8	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
14-9	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations.

Comment Letter No. 015 - Chelan-Douglas Land Trust	
15-1	Your comment in support of conservation protection and acquisition is noted. $2.5 million is the amount of conservation funds that the IWG has currently committed to. Selection of this level of conservation funding will not preclude additional conservation work in the future. Although, additional environmental review would be required if any adverse impacts were likely.
Comment Letter No. 016 - Great Old Broads for Wilderness	
16	This letter does not contain comments relevant to the Icicle Creek Strategy DPEIS.
Comment Letter No. 017 - North Central Washington Audubon Society	
17-1	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
17-2	Per your comment, the text has been modified in Section 1.1 to clarify the environmental review process.
17-3	Certified water use was used as a surrogate for demand, along with data form the City of Leavenworth's WSP and the Wenatchee Watershed Plan, which is appropriate for a programmatic level review. The water rights listed in Table 3-10 have historically been used and use has been certified by Ecology or its predecessor agency. To address concern with lack of annual quantities in Table 3-10, annually quantities were estimated based on available data or authorized instantaneous quantities. All major diverters on Icicle Creek measure their water use. To help improve water conservation, IPID has completed a CWCP which examines water use and conservation savings potentials. Additionally, expanded conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
17-4	Any water quantity greater than what is authorized in water rights would require additional water right authority. Section 4.6 discusses the need to obtain additional water rights for storage enhancement projects. However, storage enhancement projects are not included in the Preferred Alternative.
17-5	The rights listed in Tables 3-9 and 3-10 have been permitted or certified. Information regarding new water rights required for various projects is provided in Table 5-2.
17-6	Your comment is noted. Text will be updated to indicate the City will exercise new water made available through the Icicle Strategy from their Wenatchee River well field, with any exceptions, such as emergency situations or peaking that cannot be met with wellfield capacity, provided.
17-7	Long term growth in the Icicle Subbasin and Wenatchee Basin, and the environmental impacts thereof are addressed through Chelan County and City of Leavenworth comprehensive plans and zoning. The Preferred Alternative provides additional mitigated water supply for City of Leavenworth and Chelan County domestic uses through at least 2050. Development impacts are expected to occur irrespective of implementation of the Icicle Strategy. However, the Icicle Strategy includes BMPs and terrestrial mitigation in addition to robust instream flow improvements to help offset impacts that may result from planned growth.

17-8	For the projects within the ALWA, the operational changes proposed are not anticipated to cause significant adverse impacts. Many of these projects are modification of existing storage that are within the historical operational range. The DPEIS found that storage enhancement would likely have moderate impacts on several resources. However, Alternative 4 was not selected as the Preferred Alternative. More detail has been provided in Section 4.28 to provide decisionmakers with additional information. The level of detail provided in this section is appropriate for a programmatic EIS and provides a comprehensive understanding of the impacts of implementing the Icicle Strategy. Additional environmental review will be conducted on individual products as they are carried forward for additional planning and review.
Comment Letter No. 018 - Olympic Park Associates	
18-1	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2.
18-2	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. These lakes and tributaries are already dammed and already experience increased flow and draw down at least once out of every five years if not more frequently, so natural conditions do not currently exist. Discussion of baseline conditions in the tributaries are located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
18-3	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation of the Preferred Alternative.
18-4	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
Comment Letter No. 019 - Pacific Crest Trail Association	
19-1	Your opposition to the Icicle Strategy is noted.
19-2	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations.
19-3	None of the proposed actions are within the viewshed of the Pacific Crest Trail (PCT), nor is the PCT accessible by trail from any of the proposed project sites. We do not anticipate adverse impacts to PCT recreational users.
19-4	See response to comment 19-2.

Comment Letter No. 020 - Pacifica Law Group	
20-1	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
20-2	Per WAC 197-11-055, a programmatic SEPA review was launched at the earliest possible point in programmatic development to allow decision making to be guiding by the environmental review process.
20-3	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120. The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative to ensure compliance with all applicable rules and regulations.
20-4	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. An overview of this process is provided in Water Resources POL-1120.
20-5	The level of detail provided in the PEIS is intended to provide a programmatic level comprehensive understanding of the impacts of implementing the Icicle Strategy. As discussed in the response to comment 20-3, limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative to ensure compliance with all applicable rules and regulations.
20-6	The section of the Wilderness Act involving presidential approval for water resources projects, 33 U.S.C. 1133(d)(4), relates to prospecting for new water resources and establishment of and maintenance of new reservoirs. Other provisions of the Wilderness Act, 33 U.S.C. Sections 1133-1136, indicate that wilderness protections are in certain circumstances subject to preexisting private property rights and that access to private or state-owned inholdings shall be provided. The Act also contains provisions relating to the federal government's acquisition of private property within designated wilderness, as has occurred here.
20-7	At this point in project development, number of helicopter flights is not known. Details regarding number of helicopter flights will be known prior to project level environmental review. The PEIS provides this information in the level of detail appropriate for a programmatic of review. As discussed in Section 4.17, it is anticipated that the long-term number of helicopter flights initiated by LNFH and IPID will decrease with remote management and modernized infrastructure.

20-8	The PEIS provides this information in the level of detail appropriate for a programmatic of review. A more detailed analysis is appropriate for a project level review and project permitting. A SEPA programmatic review is not intended to predetermine permitting decisions, especially those that are the jurisdiction of other programs or agencies.
20-9	The alternatives reviewed in the DPEIS were developed in response to comments received during scoping. The description and analysis of these alternatives was programmatic in nature based on data and information available at the time of writing.
20-10	The No-action Alternative contemplates what would happen should the Icicle Strategy not be implemented, per WAC 197-11-440(5)(b)(ii). Based on discussion with Icicle Work Group members, the co-leads characterized which projects would likely proceed without an integrated water management strategy, and which project would likely not proceed. Those that would proceed regardless of the IWG's adoption of the integrated strategy were included in as the No-action Alternative. It should be noted, that although some projects may proceed if no-action is taken on the Icicle Strategy, the beneficiaries of those projects may not be the same as it would be under the Icicle Strategy.
20-11	Per WAC 197-11-786, a reasonable alternative is one that could feasibly attain or approximate the proposal's objective. Dam removal in the Uinta Wilderness was possible because of a large BOR project lower in the basin. There are no analogous reservoirs to the Big Sandy Reservoir (Uinta) near the Icicle Creek Subbasin to make dam removal a reasonable alternative to meeting program objectives. Without the water storage offered by the existing dams, there was not a reasonable alternative project suite available that could achieve the IWG guiding principles, which include increased stream flow, domestic supply, and agricultural reliability. This is discussed in more detail in Section 2.11.
20-12	See response to comment 20-10.
20-13	These notes and inclusions were provided to be as transparent as possible about the fact that some projects may be undertaken outside of the IWG process if not selected as part of the preferred alternative. This was based on statements made by work group members and discussed at Icicle Work Group meetings.
20-14	Analysis of emergency work at Eightmile Lake is outside the scope of the PEIS. This analysis was not included in the DPEIS or the FPEIS and proceeded under a separate SEPA review. Department of Ecology Dam Safety Program and Chelan County Emergency Response are leading emergency work effort at Eightmile Lake. Since Eightmile Lake emergency work is not analyzed in this environmental review, the DPEIS does not provide any ex post facto justification.
20-15	The lack of specificity about environmental impacts is due to the programmatic level of detail for the alternatives given the level of planning of specific projects under the proposal at this point in time (WAC 197-11-442). As noted in the FPEIS, project environmental review will be conducted on individual projects as they are carried forward.
20-16	The level of detail on mitigation measures is appropriate for the programmatic review. More detailed mitigation measures will be reviewed in project level analysis once specific design and construction elements are identified.
20-17	The co-leads adopted a FPEIS with programmatic level analysis. Opportunities for project level analysis would occur during project level review in the future.
Comment Letter No. 021 - Washington Native Plant Society	
21-1	This DPEIS was developed under SEPA. Future NEPA review will be required for any projects with a federal nexus, such as permitting or funding. Impacts to vegetation was reviewed at a programmatic level in Section 4.8.
Comment Letter No. 022 - Wise Use Movement	
22-1	Your opposition to the Office of the Columbia River is noted. Per your request, the report attached to your comments is included in the record.

22-2	City and County's domestic water use is already low relative to other eastern Washington communities. City of Leavenworth metering and leak detection is expected to conserve water supply further. The Preferred Alternative includes more expansive water conservation opportunities around lawn reduction that is also intended to extend domestic supplies. IPID conservation goals have been developed and are described in the newly released CWCP. LNFH is required for mitigation of Grand Coulee Dam and considering fish passage over Grand Coulee Dam is beyond the scope of the Icicle Work Group. The USFWS recently conducted an alternatives analysis that included the potential of removing LNFH. This report found that improving efficiency at LNFH was the best alternative.
22-3	IWG meetings are open to the public. Members of the public are encouraged to attend and provided opportunity to comment during the meetings. The Guiding Principles (Improve Instream Flow, Improve Sustainability of LNFH, Protect Tribal and Non-Tribal harvest, Improve Domestic Supply, Improve Agricultural Reliability, Enhance Icicle Creek Habitat, Comply with State and Federal Law, and Wilderness Acts) have received broad support. However, you are welcome to attend meetings and provide input on the Icicle Strategy objectives during a public comment period.
22-4	Average per capita domestic water use in King County is 82 gallons per day per person (USGS, 2018). City of Leavenworth and Chelan County's domestic water use is already low relative to other eastern Washington communities. City of Leavenworth metering and leak detection is expected to conserve water supply further. The Preferred Alternative includes more expansive water conservation opportunities around lawn reduction that is also intended to extend domestic supplies.
22-5	Considering passage over Grand Coulee Dam is beyond the scope of the Icicle Work Group. While SEPA requires reasonable alternatives be considered, it does not require alternatives that do not align with program objects to be considered.
22-6	See response to comment 22-5.
22-7	See response to comment 22-5.
22-8	See response to comment 22-5.
22-9	See response to comment 22-5.
22-10	See response to comment 22-5.
Comment Letter No. 023 - Anne Bridges	
23-1	Your comment is noted.
Comment Letter No. 024 - Kathleen Ward (Fromm)	
24-1	Your support of the process is noted. Several representatives from the conservation, Wilderness, and recreation community were invited to participate at the inception of the Icicle Work Group. However, these groups have chosen not to participate. The Icicle Work Group would welcome additional members that represent these communities. More detailed information about adding members to the Icicle Work Group is available in the Operating Procedures, which are incorporated into the FPEIS by reference.
24-2	The PEIS reviewed impacts of the project on recreational access in Section 4.15. Recreational impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
24-3	Based on the programmatic level of analysis, we do not anticipate that any of the action alternatives would significantly increase bank erosion because flows increase would be within the range of already occurring flows. Additional, some habitat improvement projects that would be pursued under the Icicle Strategy could reduce bank erosion in Lower Icicle Creek. Project level analysis will analyze impacts to earth resources, including bank erosion, which will include more detailed analysis where appropriate.
24-4	Your comment is noted.

24-5	Your support for specific elements of the Icicle Strategy is noted.
Comment Letter No. 025 - Natalie Williams	
25-1	Your support for pump exchange projects and concern regarding projects within ALWA is noted. The IWG and co-leads will work with the USFS at the project level review and project permitting for projects in the Preferred Alternative that are located in the ALWA to ensure compliance with all applicable rules and regulations.
25-2	Your comment is noted. The USFWS and BOR are working together on funding and environmental review relating to upgrades at LNFH and to meet BiOp requirements. More discussion of BiOp requirements for upgrades at LNFH are discussed throughout Chapter 1.
Comment Letter No. 026 - Chad Spies	
26-1	Your support of the Icicle Strategy and comments about recreational impacts are noted. Section 4.15 of the PEIS discussed the impacts of the Alternatives on recreation.
26-2	Your support for Alternative 4 is noted.
Comment Letter No. 027 - Jan Petrie	
27-1	Your support of the Icicle Strategy is noted.
27-2	Your support for Alternative 4 is noted.
Comment Letter No. 028 - Jerome "Jerry" Schneider	
28-1	Your support for the COIC Pump Exchange and Irrigation Efficiencies Project is noted.
Comment Letter No. 029 - Will Henson	
29-1	Your concerns are noted. Project level environmental review will provide more detailed analysis on the impacts of the projects in the Preferred Alternative on streamflow where appropriate.
29-2	Your concerns about recreation is noted. Project level environmental review will provide more detailed analysis on the impacts of the projects in the Preferred Alternative on recreation where appropriate.
29-3	Your concerns about LNFH is noted. LNFH is in compliance with Clean Water Act requirements. More discussion about LNFH is provided throughout Chapter 1.
29-4	Your concern regarding water storage elements in the Icicle Strategy is noted. The Preferred Alternative includes restoration of the dam at Eightmile Lake to the original dam height.
29-5	You support for expanded conservation, groundwater right use, and reallocating shares in the irrigation district are noted. An expanded description of water conservation measures is described in Section 2.5.4 of the FPEIS, which includes a program for irrigation water reallocation under the Preferred Alternative.
29-6	See response to comment 29-2.
29-7	Your comment regarding dam safety is noted. IPID is working with Ecology's Dam Safety office and Chelan County's Office of Emergency Response to make sure all the dams in the area are safe and up to code. Your comment in opposition to instream flow improvements and recreational use is noted. Project level environmental review will provide more detailed analysis on the impacts of the projects in the Preferred Alternative on recreation and streamflow where appropriate.

Comment Letter No. 030 - Gro Buer	
30-1	Your comment about concern over the cost is noted. Part of the purpose of the FPEIS is to focus work on a specific set of projects, so design work and more specific cost estimates can be developed. This will help inform decision making further. If a project is determined to be fatally flawed for cost, or any other reason, that project will be replaced as required by the IWG Operating Procedures. The FPIES does not authorize any spending, and estimated costs are included to aid in the decision-making process.
30-2	Your support for expanded conservation measures is noted. Conservation is an important element of the Preferred Alternative. Additional detail regarding conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.5.4. IPID recently completed its CWCP, which details efficiency upgrades that can be made to improve streamflow by reducing IPID's diversion on Icicle and Peshastin Creeks. The CWCP is incorporated in the FPEIS by reference. Similarly, the City of Leavenworth has an up-to-date conservation section in its water system plan. More detail on the Domestic Conservation portion of the Icicle Strategy is expected during project development, review, and permitting. The Programmatic EIS is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan in Icicle Creek Subbasin. Your comment about having an outside panel of experts looking at additional conservation measures is noted.
Comment Letter No. 031 - Norm Stoddard	
31-1	Your support for the No-action Alternative and support for storage elements discussed in the PEIS is noted.
Comment Letter No. 032 - Greg Shannon	
32-1	Your comment is noted. A 60-day comment period was selected to balance the need for public and agency review and input and moving the process forward with limited delay.
Comment Letter No. 033 - Alan F. Hunt	
33-1	Your support for the No-action Alternative is noted.
33-2	Your comments about population, tourism, and ERU growth in the City of Leavenworth is noted. Growth occurs in compliance with County and City comprehensive planning and limiting tourism is outside the scope of the Icicle Work Group or the Icicle Strategy. The Preferred Alternative makes a fixed quantity of water available for domestic use which is intended to supply growth through at least 2050, but actual growth will determine the longevity of that supply.
33-3	See response to comment 33-2.
33-4	The Icicle Strategy seeks to improve domestic supply for both the City of Leavenworth and areas outside the City's urban growth boundary. These projections are based on Watershed Planning documents, OFM population growth statistics, City of Leavenworth planning documents, and information about litigation between City of Leavenworth and Ecology over water rights.
33-5	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur at project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative.

33-6	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
33-7	Your support for the IPID Full Piping and Pump Exchange project is noted. Your concern regarding other projects in Alternative 5 is noted.
33-8	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
33-9	See response to comment 33-5.
Comment Letter No. 034 - Bill Burwell	
34-1	See response to comment 33-6.
34-2	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter, coordination will occur at the project level for any projects that may have permitting actions required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review as needed.
34-3	Your comment supporting wilderness protections is noted.
34-4	Fisheries impacts are discussed in section 4.7 of the document. Impacts were found to be less than significant and, in most cases, beneficial. Fish impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
34-5	The USFS is an active member of the IWG and regularly attends meetings. See response to 34-2.
34-6	Federal reserved water rights can be established with the Congressional reservation of federal lands. These rights are limited to the purpose and intent of the reservation. Federal reserved rights priority dates are the date of federal reservation and do not superspeed senior water rights. No federal reserve water rights have been determined in these areas.
34-7	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process or irrigation drought resiliency, if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored.
34-8	LNFH and City of Leavenworth each hold rights to divert water from Icicle Creek. Some of the elements in the action Alternatives considered in the PEIS would require a change in purpose of use or other water right permitting actions. This is described in Section 4.6 of the PEIS.
34-9	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
34-10	The scoping process is intended to identify additional alternatives to be considered, potential impacts, and potential mitigation measures as described in WAC 197-11-792. Alternative 4 was developed in response to comments received regarding the development of additional water supplies.

34-11	Your support for the IPID Full Piping and Pump Exchange project is noted.
34-12	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. Your concern over greenhouse gas emissions is noted. Reducing greenhouse gas emissions is outside the scope of the Icicle Work Group, but energy consumption was considered in the PEIS.
34-13	Several informational meetings have been held throughout the Puget Sound area and information had been distributed throughout the state that detailed how to comment on the DPEIS. Your comment for more outreach on the westside is noted.
34-14	See response to comment 34-3.
34-15	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 035 - Dick Rieman	
35-1	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Water is currently released from these lakes to supply water for irrigation uses. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
Comment Letter No. 036 - Dick Rieman (2)	
36-1	See response to comment 35-1.
Comment Letter No. 037 - Drew Meyers	
37-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
37-2	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases for instream flow benefit not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
37-3	See response to comment 37-1.

Comment Letter No. 038 - Edward Henderson	
38-1	Table 5-2 details anticipated permits for each alternative considered in the PEIS. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
38-2	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. Per the USFS comment letter, coordination will occur at the project level for any projects that may have a permitting action required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review.
38-4	See response to comment 38-1.
38-5	One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW. The Icicle Strategy is not seeking to increase water supplies at LNFH with water from IPID's storage rights.
38-6	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
38-7	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
38-8	The construction approach for many of the projects that might occur in the ALWA are detailed in Appendix B and C. The PEIS reviews the impacts of the various alternatives in as much detail as is appropriate for a programmatic evaluation and at the current level of project planning. A more specific look at construction impacts, such as number of helicopter flights, and mitigation will occur at project-level environmental review.
38-9	Impacts of the proposal on noise is detailed in Section 4.14 and impacts on wilderness values is detailed in Section 4.17.
38-10	Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
38-11	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
38-12	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.

38-13	Your comment supporting wilderness protections is noted. Wilderness Protection is a Guiding Principle of the Icicle Strategy and the Preferred Alternative must be in compliance with it.
38-14	This is a programmatic level EIS, which looks to examine non-project actions, such as developing an integrated water resource management plan. Project level environmental review will occur on any project implemented under the plan. If permitting agencies deem it appropriate, project level EIS's would be prepared prior to implementation of specific project.
38-15	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2.
38-16	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 039 - James Woods	
39-1	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2. The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2.
39-2	Your comment supporting wilderness protections is noted. Icicle Creek and tributary flows within and outside the Alpine Lakes have not been natural for nearly 100 years, but are instead regulated for irrigation purposes. Instead, the Preferred Alternative would regulate them for both irrigation and instream flow purpose.
39-3	The natural flow pattern of the watershed has been modified by authorized dams that have existed for nearly 100 years. Under the action alternatives, flow would be within the range of flows currently experiences within the subbasin. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
39-4	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
39-5	The efficacy of the various alternatives under climate change scenarios are discussed in section 4.13 and Appendix F of the DPEIS.
Comment Letter No. 040 - Janet Thompson	
40-1	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.

40-2	Your comment supporting wilderness protections is noted.
40-3	Your concerns regarding storage enhancement and restoration are noted.
40-4	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads included information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. The No-action Alternative contemplates what would happen should the Icicle Strategy not be implemented, per WAC 197-11-440(5)(b)(ii). Based on discussion with Icicle Work Group members, the co-leads characterized which projects would likely proceed without an integrated water management strategy, and which project would likely not proceed. Those that would proceed regardless of the IWG's adoption of the integrated strategy were included in as the No-action Alternative. It should be noted, that although some projects may proceed if no-action is taken on the Icicle Strategy, the beneficiaries of those projects may not be the same as it would be under the Icicle Strategy.
40-5	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
40-6	Federal reserved water rights can be established with a Congressional reservation of federal lands. These rights are limited to the purpose and intent of the land reservation. Federal reserved rights priority dates are the date of federal reservation and do not superspeed senior water rights. No federal reserve water rights have been determined in these areas.
40-7	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project under the Preferred Alternative, as described in Chapter 2.
40-8	Your comment supporting ecosystem function is noted. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
40-9	Current members that represent environmental interests include Trout Unlimited, Washington Water Trust, and Icicle Creek Watershed Council. Originally, the Center for Environmental Law and Policy and Wild Fish Conservancy represented environmental interests on the work group as well. However, these entities choose to leave the Icicle Work Group to pursue a lawsuit against the LNFH, which is another member of the work group. This action violated membership expectations, as members cannot participate in good-faith with an honest intent to find collaborative solutions to address the needs, issues, and concerns of all Work Group Members while actively engaged in litigation with other work group members. The Icicle Work Group has invited and would welcome additional members that represent the conservation, Wilderness, or recreation communities. More detailed information about adding members to the Icicle Work Group is available in the Operating Procedures, which are incorporated into the FPEIS by reference.

Comment Letter No. 041 - Janiese Loekn	
41-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 042 - Jeffrey Currier	
42-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
42-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
Comment Letter No. 043 - Julia Beebs	
43-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 044 - Julianne Lamsek	
44-1	Your comment supporting wilderness protections is noted.
44-2	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer, but this was not selected as the Preferred Alternative. No other projects considered under the action alternatives are expected to result in trail or campsite inundation.
44-3	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
44-4	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS.
Comment Letter No. 045 - Laurie Colacurcio	
45-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.

Comment Letter No. 046 - Ryan Jones	
46-1	Your comment supporting wilderness protections is noted. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. The action alternatives considered in the PEIS do not include energy development. However, several alternatives considered include modification or reoperations to existing dam structures in the ALWA.
Comment Letter No. 047 - William B. and Margaret L. Beyers	
47-1	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
47-2	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. In this instance, the proposal does not meet these criteria and a supplemental draft EIS is not required at this time. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 048 - Allison Oster	
48-1	Your comment opposing new dams is noted. No new dams are proposed under the action alternatives considered in the PEIS. Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 049 - Ansel Wald	
49-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
49-2	Your comment to seek supplies from the Columbia River as an alternative water supply is noted.
Comment Letter No. 050 - Brynne Koscianski	
50-1	Your comment supporting wilderness protections is noted. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS.
Comment Letter No. 051 - Chris Murray	
51-1	Your comment supporting wilderness protections is noted.

51-2	Your support for expanded conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. All action alternatives analyzed in the PEIS include water markets to improve agricultural reliability.
Comment Letter No. 052 - Darrel Martin	
52-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 053 - Deanna Pumplin	
53-1	Your comment opposing the Icicle Strategy is noted. The referenced letter was considered during scoping.
53-2	Your comment supporting wilderness protections is noted.
53-3	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. Most of the proposed water supply under the Icicle Strategy would go to improve instream flow for fish. The goals of the Icicle Strategy, known as the Guiding Principles, are described in section 1.5.
Comment Letter No. 054 - Fichard Fiddler	
54-1	Impacts to wilderness character are described in Sections 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review. The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Currently, coordination with USFS on Wilderness issues occurs at IWG meetings. USFS is an active member of the IWG, and regularly attends meetings. IWG meeting are open to the public and published on Chelan County's website. Members of the public are encouraged to attend and provided opportunity to comment during the meetings. Your comment supporting wilderness protections is noted.
54-2	The Center for Environmental Law and Policy and Wild Fish Conservancy chose to leave the Icicle Work Group to pursue a lawsuit against the LNFH, which is another member of the work group. This action violated membership expectations, as members cannot participate in good-faith with an honest intent to find collaborative solutions to address the needs, issues, and concerns of all Work Group Members while actively engaged in litigation with other work group members. Current members that represent environmental interests include Trout Unlimited, Washington Water Trust, and Icicle Creek Watershed Council. The Icicle Work Group would welcome additional members that represent the conservation, Wilderness, or recreation communities. More detailed information about adding members to the Icicle Work Group is available in the Operating Procedures, which are incorporated into the FPEIS by reference.

54-3	Your support for expanded conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. Your comment supporting wilderness protections is noted.
Comment Letter No. 055 - Jeff Lambert	
55-1	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
55-2	Impacts to ecosystem resources and recreation are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
55-3	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 056 - John Russell	
56-1	Your support for dam removal is noted. Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
Comment Letter No. 057 - M. Johnson	
57-1	Your general support of the Icicle Strategy is noted.
Comment Letter No. 058 - Mark Shipman	
058-1	Your support for storage enhancement is noted.
Comment Letter No. 059 - Matt Parker	
59-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Serval of the alternatives considered include modifications and/or reoperation of dams to meet the Guiding principles described in section 1.5.
Comment Letter No. 060 - Michelle Bright	
60-1	Your comment supporting wilderness protections is noted.
60-2	The goals of the Icicle Strategy are described in section 1.5 of the PEIS. The primary objective is to provide increased instream flows, better water quality, and more habitat for salmonid species. The Guiding Principles, which are the objectives of the Icicle Strategy, are not seeking to increase water supply for irrigation uses. One of the goals is to increase agricultural reliability. To this accomplish a water markets approach was proposed by the IWG and included in all of the action alternatives considered in the PEIS. Climate change impacts on each alternative are discussed in the PEIS.

60-3	Impacts of the alternatives on climate change are discussed at the programmatic level in section 4.13 of the DPEIS. The action alternatives are not anticipated to have a significant increase in greenhouse gas emissions.
60-4	Your support for seeking alternative water supplies is noted.
60-5	Your comment supporting wilderness protections is noted.
Comment Letter No. 061 - Natalie Williams	
61-1	Your concern with the alternative presented in the PEIS is noted. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS.
61-2	Your support of the IPID Full Piping and Pump Exchange is noted.
61-3	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
61-4	Your comment suggesting the IPID Full Piping and Pump Exchange to Alternative 3 is noted. The co-leads have decided not to consider additional alternatives at this time.
Comment Letter No. 062 - Peter Fiddler	
62-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 063 - Sam Smith	
63-1	The labeling on Figure 3-1 appears accurate.
63-2	Illustrations of proposed changes are located in project descriptions in Chapter 2 and Aesthetics in Chapter 4. Figures 2-19 through 2-25 show the current conditions of equipment at the Eightmile, Colchuck, Square Klonaqua, Nada, and Snow Lakes. Figure 2-26 show what the proposed equipment upgrades would likely look like under the Alpine Lakes Optimization, Modernization, and Automation project. Figure 4-26 through 4-28 shows photos of representative equipment installed elsewhere. Figures 4-29 through 4-42 show comparative photos of these lakes at their high water and low water stages. Under the Alpine Lakes Optimization, Modernization, and Automation project, lake levels would not change, but the lakes would be drawn down more frequently. Currently, drawdown occurs one to two times every five years. Under this project, drawdown would occur in response to instream flow needs in lower Icicle Creek and would likely occur annually. Figure 2-30 is a map that shows current and proposed shoreline changes for the Eightmile Lake Storage Restoration project. Figures 4-52 through 4-54 provide current and simulated photos based on shoreline changes proposed under the project. Figures 2-46, 2-47, and 2-48 are maps showing current and proposed shoreline changes for the Eightmile Storage Enhancement project, the Upper Klonaqua Storage Enhancement project, and the Snow Lake Storage Enhancement project. These projects are included in Alternative 4. Figures 4-57 through 4-65 provide current and simulated photos based on shoreline changes proposed under these projects.
Comment Letter No. 064 - Thor Thompson	
64-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 065 - Timothy Gartland	
65-1	Your comment supporting wilderness protections is noted.

65-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
65-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
65-4	Your support for the IPID Full Piping and Pump Exchange projects is noted. Your concern regarding the Eightmile Lake Storage Restoration project is noted.
65-5	See response to 65-2. Federal reserved water rights can be established with a Congressional reservation of federal lands. These rights are limited to the purpose and intent of the land reservation. Federal reserved rights priority dates are the date of federal reservation and do not superspeed senior water rights. No federal reserve water rights have been determined in these areas.
65-6	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
65-7	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter, coordination will occur at the project level for any projects that may have a permitting action required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review.
65-8	See response to comment 65-6.
65-9	One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW. The Icicle Strategy is not seeking to increase water supplies at LNFH with water from IPID's storage rights.
65-10	See response to comment 65-7.
65-11	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS.
65-12	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.

65-13	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
65-14	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
65-15	Your comment is noted.
65-16	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 066 - Will Henson	
66-1	Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
66-2	LNFH is required for mitigation of Grand Coulee Dam and considering fish passage over Grand Coulee Dam is beyond the scope of the Icicle Work Group. The USFWS recently conducted an alternatives analysis that included the potential of removing LNFH. This report found that improving efficiency at LNFH was the best alternative. More discussion about why this was not considered in the PEIS is provided in Section 2.11.2.
66-3	You comment is noted.
66-4	Your concerns regarding commercial tubing is noted.
Comment Letter No. 067 - Will Henson (2)	
67-1	Your concerns regarding commercial tubing is noted.
Comment Letter No. 068 - Andrea Fisher	
68-1	Your comment opposing the Icicle Strategy is noted.
Comment Letter No. 069 - Charles Bagley	
69-1	Your support of Alternative 2 is noted.
69-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 070 - Christopher Barchet	
70-1	Your comment supporting wilderness protections is noted.
70-2	This letter was considered during the PEIS scoping phase.
Comment Letter No. 071 - James Donaldson	
71-1	Your comment supporting wilderness protections is noted.

Comment Letter No. 072 - Mark Curtis	
72-1	Your comment in support of beaver re-introduction is noted.
Comment Letter No. 073 - Melinda Mueller	
73-1	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
73-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Currently, coordination with USFS on Wilderness issues occurs at IWG meetings. USFS is an active member of the IWG, and regularly attends meetings.
73-3	Each project assumes between 10 and 20 percent of the budget will go to environmental review and design. The DPEIS provides a two-year timeline for completing additional environmental review. The co-leads believe it is reasonable for NEPA review to be completed during a two-year window. The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2.
73-4	Your support for expanded conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
73-5	The IWG does not hold any water rights, although several work group members do. You comment is noted.
73-6	The No-action Alternative contemplates what would happen should the Icicle Strategy not be implemented, per WAC 197-11-440(5)(b)(ii). Based on discussion with Icicle Work Group members, the co-leads characterized which projects would likely proceed without an integrated water management strategy, and which project would likely not proceed. Those that would proceed regardless of the IWG's adoption of the integrated strategy were included in as the No-action Alternative. It should be noted, that although some projects may proceed if no-action is taken on the Icicle Strategy, the beneficiaries of those projects may not be the same as it would be under the Icicle Strategy.
73-7	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels and releases are currently managed for agricultural water supply. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
73-8	Your comment supporting wilderness protections is noted.

Comment Letter No. 074 - Peter Fry	
74-1	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Your preference for the No-action Alternative is noted.
74-2	Your comment supporting wilderness protections is noted.
74-3	The goals of the Icicle Strategy, which are called the Guiding Principles, are described in section 1.5 of the PEIS. The primary objective is to provide increased instream flows, better water quality, and more habitat for salmonid species. Goals also include improving sustainability of LNFH, protecting fish harvest rights, improving domestic supply, improving passage, improving agricultural reliability, and complying with state federal laws.
Comment Letter No. 075 - Rebecca Caulfield	
75-1	Your comment supporting wilderness protections is noted.
75-2	The Icicle Strategy is proposing to spend significant funding for domestic conservation efforts. This irrigation and domestic conservation elements are included in all five action alternatives. To be responsive to concerns over lawn watering, a lawn buyback program along with other conservation measures have been added to the Domestic Conservation Project.
75-3	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120. Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
75-4	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
75-5	One of the goals of the Icicle Strategy is improved domestic supply, along with increased instream flow, and improved conservation and habitat. Long term growth in the Icicle Subbasin and Wenatchee Basin are addressed through Chelan County and City of Leavenworth comprehensive plans and zoning.
75-6	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.

Comment Letter No. 076 - Allison Kutz	
76-1	Your comment supporting wilderness protections is noted.
76-2	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 077 - Anastasia Christman	
77-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
77-2	Your comment supporting wilderness protections is noted.
77-3	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer, but Alternative 4 was not selected as the Preferred Alternative. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. Section 4.24 analyzes the socioeconomics of the five action alternatives considered in the PEIS.
Comment Letter No. 078 - Barbara Gamrath	
78-1	You support for the No-action Alternative is noted.
Comment Letter No. 079 - Brian Telfner	
79-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Your comment supporting wilderness protections is noted.
Comment Letter No. 080 - Brianne Vanderlinden	
80-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS
80-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 081 - Brittany Granger	
81-1	Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 082 - William All	
82-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS
Comment Letter No. 083 - Carol Sund	
83-1	Your support for the No-action Alternative is noted.

Comment Letter No. 084 - Carolyn Graham	
84-1	Your comment supporting wilderness protections is noted.
84-2	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 085 - Cedar Hyde	
85-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternatives 1, 2, 4, and 5 propose projects that would modify and/or re-operate the dams at these sites.
85-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS.
Comment Letter No. 086 - Christian Chabot	
86-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
86-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 087 - CJ Beegle	
87-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
87-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 088 - Constance Anderton	
88-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
88-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS.
Comment Letter No. 089 - Craig Mabie	
89-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 090 - Danielle Graham	
90-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
90-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 091 - David Panozzo	
91-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

91-2	Your opposition is noted.
Comment Letter No. 092 - David Van Cleve	
92-1	The City has determined in necessary to maintain their Icicle Creek diversion for redundancy purposes. Any additional water made available through the Icicle Strategy to the City of Leavenworth would be taken from the City's wellfield.
92-2	The conservation measures outlined in the WSP are a minimum commitment to conservation required by RCW 70.119A.180. The Icicle Strategy includes conservation measures that seek to exceed this minimum requirement. While the Icicle Strategy is not proposing reclaimed water at this time, it may be explored under the Domestic Conservation element. More detail regarding specific conservation projects will be developed as project level planning is initiated.
92-3	The additional water provided to the City of Leavenworth in the Icicle Strategy is intended to resolve the water right dispute in Leavenworth v. Ecology and provide for additional growth. The domestic supply goal is to meet demand to 2050 at a minimum. If the City of Leavenworth continues to increase efficiency, which is a goal of the IWG, additional water for the City of Leavenworth will provide for sustained supply for a further planning horizon.
92-4	See response to comment 92-2 and 92-3.
92-5	Domestic supply is envisioned for a combination of City of Leavenworth and Chelan County domestic water uses, which will be determined at project level review and permitting. Additionally, the City and the County have an interlocal agreement regarding reserve quantities provided for in the Wenatchee Instream Flow Rule. Your support for developing additional water markets is noted and water marketing is a part of the Preferred Alternative. Development is regulated by the Chelan County and City of Leavenworth's through zoning and comprehensive plans.
Comment Letter No. 093 - Deanna Gill	
93-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 094 - Deloa Dalby	
94-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 095 - Elizbeth Vu	
95-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
95-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 096 - Gabriel Houle	
96-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 097 - Greg Wellman	
97-1	Your comment supporting wilderness protections is noted.

97-2	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 098 - Harvey Halpern	
98-1	Your comment supporting wilderness protections is noted. Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 099 - Jane Erickson	
99-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 100 - Jeanne Poirier	
100-1	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. The goals of the Icicle Strategy are described in section 1.5 of the PEIS. The primary objective is to provide increased instream flows, better water quality, and more habitat for salmonid species. The Guiding Principles, which are the objectives of the Icicle Strategy, are not seeking to increase water supply for irrigation uses. One of the goals is to increase agricultural reliability. To this accomplish a water markets approach was proposed by the IWG and included in all of the action alternatives considered in the PEIS.
Comment Letter No. 101 - Jeffrey Whittall	
101-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 102 - Juliet Maurer	
102-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
102-2	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer, but Alternative 4 was not selected as the Preferred Alternative. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. Section 4.9 describes impacts to wildlife. At the programmatic level, wildlife impacts were found to be less than significant. Wildlife impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
102-3	See response to comment 102-1
Comment Letter No. 103 - Karen Thomas	
103-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
103-2	Your support for specific elements of the Icicle Strategy are noted.

Comment Letter No. 104 - Kathleen and Robert Nerenberg	
104-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 105 - Katrina Kok	
105-1	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. No other projects considered under the action alternatives are expected to result in trail or campsite inundation.
Comment Letter No. 106 - Kendra Stegner	
106-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
106-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 107 - Kimberly Stachowski	
107-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 108 - Lane Aasen	
108-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Your support for wilderness protections is noted.
Comment Letter No. 109 - Laura Shauger	
109-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Your support for wilderness protections is noted.
Comment Letter No. 110 - Lawrence Lewin	
110-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
110-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 111 - Leann Arend	
111-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
111-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 112 - Louise Suhr	
112-1	Your comment supporting wilderness protections is noted.

Comment Letter No. 113 - Mary Eve	
113-1	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. The co-leads are not aware of any scientific literature that demonstrates water management or storage increases wildfires or impacts the climate of mountain environments. Section 4.2.4.3 analyzes erosion impacts of the alternatives and found them to be less than significant. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. Climate change, including alternative efficacy and refill reliability for the Alpine Lake reservoirs in included in Section 4.13 and Appendix F. Refill reliability is not expected to significantly change.
Comment Letter No. 114 - Matt Busch	
114-1	Impacts to ecosystem resources and recreation are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. This is described in Section 4.15. Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 115 - Mattias Huhta	
115-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 116 - Michael Schemmel	
116-1	Your comment supporting wilderness protections is noted. Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. No other projects considered under the action alternatives are expected to result in trail or campsite inundation.
116-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 117 - Michael Wyant	
117-1	Your support for Alternative 1 is noted.
117-2	Your secondary support for Alternative 2 is noted.
117-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

117-4	Your support of IPID pump exchange projects is noted.
117-5	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
Comment Letter No. 118 - Michelle Privat Obermeyer	
118-1	Your support of the WTA and Mountaineers comment letter is noted.
Comment Letter No. 119 - Mike Gundlach	
119-1	Your concerns regarding storage enhancement projects in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
119-2	Impacts to ecosystem resources and recreation are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
119-3	See response to comment 119-2
119-4	Your support of collecting rainwater is noted.
119-5	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 120 - Misa Heater	
120-1	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. There are no anticipated impacts to climbing sites in the Lower Snow Creek area. Recreational impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 121 - Pat Siggs	
121-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
121-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative.
Comment Letter No. 122 - Patrick Podenski	
122-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.

Comment Letter No. 123 - Peter Dunau	
123-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
123-2	Impacts to Recreation are described in Sections 4.15. Recreational Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2.
Comment Letter No. 124 - Peter Polson	
124-1	Your concerns regarding storage enhancement projects in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
124-2	Your comment supporting wilderness protections is noted.
124-3	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. However, based on the goals established in the Guiding Principles (section 1.5), conservation alone cannot meet the objectives of the IWG.
Comment Letter No. 125 - Philip Evans	
125-1	Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. This seasonal inundation would occur prior to peak backpacking season in the area. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. There are no anticipated impacts to climbing sites in the Lower Snow Creek area. Recreational impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. Your concerns regarding storage enhancement projects in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 126 - Prithvi Shylendra	
126-1	Your concerns regarding storage enhancement projects in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
126-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 127 - Rebecca Walton	
127-1	Impacts to ecosystem resources and recreation are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. Your concerns regarding specific projects in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
127-2	See response to comment 127-1.
127-3	Your support for specific elements of the Icicle Strategy are noted.

Comment Letter No. 128 - Rebeccah Leiter	
128-1	Your comment supporting wilderness protections is noted.
128-2	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
128-3	Your comment supporting wilderness protections is noted.
Comment Letter No. 129 - Robert Werth	
129-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 130 - Robert Yates	
130-1	Your comment supporting wilderness protections is noted. Impacts to wilderness character and recreation are described in Sections 4.17 and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Resource impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 131 - Roberta de Regt	
131-1	Your comment supporting wilderness protections is noted.
131-2	Your opposition to the Icicle Strategy is noted.
Comment Letter No. 132 - Robin Buxton	
132-1	Your comment supporting wilderness protections is noted. A discussion of baseline conditions of the water bodies analyzed in the PEIS is provided in Section 3.3.
132-2	Your support for expanded conservation measures is noted. All five action alternatives considered in the PEIS include domestic and agricultural water conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
132-3	Your comment supporting wilderness protections is noted.
Comment Letter No. 133 - Ronald Harden	
133-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Your support for specific elements of the Icicle Strategy are noted. Your support of additional alternatives or adoption of the No-action Alterative is noted.
Comment Letter No. 134 - Sandra Ciske	
134-1	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
134-2	Your support for specific elements of the Icicle Strategy are noted.

Comment Letter No. 135 - Sara Papanikolaou	
135-1	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
135-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 136 - Sarah Leyrer	
136-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 137 - Stefanie Dirks	
137-1	Your opposition to the storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. The PEIS reviews four other action alternatives that were developed to meet various goals. These alternatives are described in detail throughout Chapter 2. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake from being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
137-2	Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
137-3	Your comment supporting wilderness protections is noted.
137-4	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required. See response to comment 137-1.
137-5	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
Comment Letter No. 138 - Steve Swenson	
138-1	Your comment supporting wilderness protections is noted.

138-2	Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 139 - Steven Cox	
139-1	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 140 - Steven Jones	
140-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 141 - Timothy Hall	
141-1	As described in section 1.5, one of the goals of the Icicle Strategy is improved domestic supply, along with increased instream flow, and improved conservation and habitat. Long term growth in the Icicle Subbasin and Wenatchee Basin, and the environmental impacts thereof are addressed through Chelan County and City of Leavenworth comprehensive plans and zoning.
Comment Letter No. 142 - Tina Thompson	
142-1	Your support of the No-action Alternative is noted.
142-2	Your comment supporting wilderness protections is noted.
142-3	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS. Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 143 - Alan Moen	
143-1	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternative elements that focus on storage reoperation and dam modification are intended to increase streamflow for salmonids in lower Icicle Creek and improve reliability of the domestic water supply.
143-2	Your support for expanded conservation measures is noted. Agricultural conservation is included as an element in the five action alternatives proposed under the Icicle Strategy. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.

143-3	Your comment supporting wilderness protections is noted.
143-4	One of the goals of the Icicle Strategy is improved domestic supply, along with increased instream flow, and improved conservation and habitat. Long term growth in the Icicle Subbasin and Wenatchee Basin, and the environmental impacts thereof are addressed through Chelan County and City of Leavenworth comprehensive plans and zoning.
143-5	Your support for expanded conservation measures is noted. All five action alternatives considered in the PEIS include domestic and agricultural conservation. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2 of the FPEIS.
143-6	See response to comment 143-3.
143-7	Metering is required for all major diverters on Icicle Creek.
143-8	See response to comment 143-1 and 143-3.
Comment Letter No. 144 - Alex Bond	
144-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 145 - Alexander Phillips	
145-1	Your comment has been included as part of the public record.
Comment Letter No. 146 - Allison Shaw	
146-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 147 - Andrea Riley	
147-1	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternatives 1, 2, 4, and 5 include elements of dam modification to either restore or increase storage and/or modifying the current management on these lakes to increase stream flow and increase domestic water reliability. Your comment opposed to dams is noted.
Comment Letter No. 148 - Ann Crosby	
148-1	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes.
148-2	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.

148-3	Your comment supporting wilderness protections is noted. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
148-4	Your support for expanded conservation measures is noted. All five action alternatives include conservation projects. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
148-5	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2. The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Impacts to Threatened and Endangered Species are described in Sections 4.10. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts to Threatened and Endangered Species will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. ESA compliance requirements are discussed in Table 5-2. Per WAC 197-11-406, an EIS should occur as early as possible to meaningfully contribute to the decision-making process. Additionally, this is a programmatic level review that is intended to provide a comprehensive overview to help decision makers select one of several programmatic alternatives (WAC 197-11-704(2)(b)). Some elements of the project are not known at this time. However, the DPEIS does provide as much information as possible regarding impacts at the programmatic level. Project-level environmental review will occur for all projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. Your comment supporting wilderness protections is noted.
148-6	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.

148-7	Your comment supporting wilderness protections is noted. See response to comment 148-4.
Comment Letter No. 149 - Bruce Williams	
149-1	Your support of the No-action alternative is noted.
149-2	Your concern about the Icicle Strategy cost is noted. Alternative costs and general costs of water supply projects is provided for each alternative in Chapter 2.
149-3	Conservation elements for domestic, agricultural, and LNFH use are included in all action alternatives. Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. However, it should be noted that conservation is generally more expensive per unit of water than other methods of water supply development and that conservation only will not meet the Guiding Principles described in section 1.5 of the PEIS.
149-4	See response to comment 149-3.
149-5	IPID has worked with an independent consultant to release a CWCP. This plan was recently released and is incorporated into the PEIS by reference.
149-6	See response to comment 149-5.
149-7	The City has a current conservation program in its waters system plan. The domestic conservation element of the Icicle Strategy is intended to allow for the design and implementation of conservation measures. More detail regarding aspects of this element have been added to the FPEIS in Chapter 2. Additional detail will be developed during project planning.
149-8	Conservation elements for domestic, agricultural, and LNFH use are included in all action alternatives.
149-9	See response to comment 149-7. The IPID CWCP includes more detailed information about how much water can be saved from IPID with conservation improvements. Based on this document, it appears IPID could save 18.1 cfs with an investment of up to $27 million. The unit price of this would be up to $1.5 million/cfs. If IPID initiated all of these conservation upgrade and all other major diverters on Icicle Creek reduced water use by 50-percent, the instream flow goals described in the 1.5 of the PEIS would still not be achievable.
149-10	Your comment supporting wilderness protections is noted.
149-11	See response to comment 149-1.
Comment Letter No. 150 - Carina Wedel	
150-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 151 - Carolyn Waldow	
151-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5.
151-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 152 - Cathy Craver	
152-1	Your concern regarding storage enhancement elements included in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
152-2	Your support for specific elements of the Icicle Strategy are noted.

Comment Letter No. 153 - Charles Raymond	
153-1	Your comment supporting wilderness protections is noted.
153-2	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2. If a project is determined to be impermissible under federal or state law, that project will be replaced by another project to meet the Guiding Principles, as described in the Operating Procedures for the Icicle Work Group.
153-3	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review. The co-leads will continue to engage with the USFS to ensure compliance with all applicable regulations in the ALWA.
153-4	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
153-5	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Your concerns regarding the Eightmile Lake Storage Restoration project are noted. See responses to comment 153-3 and 153-4.
153-6	Your concerns regarding the Alpine Lakes Optimization, Modernization, and Automation project are noted. See response to comment 153-3.
153-7	Your support for pump exchange projects is noted.
153-8	These conservation projects are included in all action alternatives considered in the PEIS. Your support for conservation projects is noted.
153-9	The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations.
153-10	Your comments in support of the Alpine Lakes Optimization, Modernization, and Automation Project are noted.
153-11	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
153-12	See response to comment 153-5.
153-13	Your support for Alternative 5 is noted.

153-14	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS. See response to comments 153-2 and 153-4.
153-15	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 154 - Chris Lish	
154-1	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
154-2	Your comment supporting wilderness protections is noted.
154-3	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
154-4	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
154-5	Your support for Alternative 5 and the Full IPID Piping and Pump Exchange are noted. The efficacy of the various alternatives under climate change scenarios are discussed at the programmatic level in section 4.13 and Appendix F of the DPEIS. All action alternatives are expected to reach instream flow goals under low, medium, and high climate change scenarios in 2080, except Alternative 3.

154-6	One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW. The Icicle Strategy is not seeking to increase water supplies at LNFH with water from IPID's storage rights.
154-7	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS. Each project assumes between 10 and 20 percent of the budget will go to environmental review and design. The DPEIS provides a two-year timeline for completing additional environmental review. The co-leads believe it is reasonable for NEPA review to be completed during a two-year window. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2.
154-8	See response to comment 154-7. The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Project level of detail regarding permitting and NEPA integration will be provided during project level review.
154-9	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
154-10	See response to comment 154-1.
Comment Letter No. 155 - Claire Giordano	
155-1	Impacts to ecosystem resources and wilderness character are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2. If a project is determined to be impermissible under federal or state law, that project will be replaced by another project to meet the Guiding Principles, as described in the Operating Procedures for the Icicle Work Group.
155-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

155-3	Based on the GIS data provided by the USFS, it appears that the trail along the northside of Eightmile Lake and documented backcountry campsites are above the proposed highwater level of the Eightmile Lake Storage Restoration project. A more specific look at impacts and mitigation will occur at project-level environmental review.
155-4	Your support of Alternative 3 is noted. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
155-5	Your comment supporting wilderness protections is noted.
Comment Letter No. 156 - Cliff Leight	
156-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 157 - David Foster	
157-1	Your support for specific elements of the Icicle Strategy are noted.
157-2	Your concern regarding storage enhancement elements described in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 158 - Diana Rosenberg	
158-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 159 - Diana Timpson	
159-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 160 - Donald Mazzola	
160-1	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation.
160-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
160-3	Your comment supporting wilderness protections is noted.
160-4	Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
160-5	Your support of the No-action Alternative is noted.
Comment Letter No. 161 - Donald Potter	
161-1	Your comment is noted.

161-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Currently, coordination with USFS on Wilderness issues occurs at IWG meetings. USFS is an active member of the IWG, and regularly attends meetings.
161-3	Impacts to Wilderness Character are described in Sections 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
161-4	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. Agricultural conservation is included as an element in the five action alternatives proposed under the Icicle Strategy. IPID conservation goals have been developed and are described in the newly released CWCP, which in incorporated into the FPIES by reference.
Comment Letter No. 162 - Edward Henderson	
	This is a duplicate submission. See comment and responses to comment letter 36.
Comment Letter No. 163 - Elaine Badejo	
163-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 164 - Erik Hagstrom	
164-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Impacts to ecosystem resources and recreation are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate
Comment Letter No. 165 - Evan Schelter	
165-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
165-2	Your comment is noted.
Comment Letter No. 166 - Fabian Frank	
166-1	Your comment supporting wilderness protections is noted.
166-2	Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.

166-3	See response to comment 166-1.
Comment Letter No. 167 - Francis and Gerald Conley	
167-1	Your comment supporting wilderness protections is noted. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
167-2	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Many of the alternatives in the PEIS propose modification and reoperation of these dams/lakes to increase streamflow for salmonid benefit. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate. Section 4.13 and appendix F provide analysis and discussion of climate change in the Icicle Creek Subbasin, specifically in the lower reaches of Icicle Creek. These sections also evaluate the efficacy of the alternatives under modeled climate change condition.
Comment Letter No. 168 - Greg Shannon	
168-1	Per WAC 197-11-406, an EIS should occur as early as possible to meaningfully contribute to the decision-making process. Additionally, this is a programmatic level review that is intended to provide a comprehensive overview to help decision makers select one of several programmatic alternatives (WAC 197-11-704(2)(b)). Some elements of the project are not known at this time. However, the DPEIS does provide as much information as possible regarding impacts at the programmatic level. Project-level environmental review will occur for all projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
168-2	USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2.
168-3	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
168-4	Any water quantity greater than what is authorized in water rights would require additional water right authority. Text will be modified in Section 4.6.5 to provide clarity to this issue. However, storage enhancement projects are not included in the Preferred Alternative. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
168-5	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS.
168-6	Your support for the IPID Full Piping and Pump Exchange project is noted.

168-7	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
168-8	Section 4.13 and appendix F provide analysis and discussion of climate change in the Icicle Creek Subbasin, specifically in the lower reaches of Icicle Creek. These sections also evaluate the efficacy of the alternatives under modeled climate change condition. The level of detail regarding climate change is appropriate for this programmatic review.
168-9	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
168-10	Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 169 - Gregory Sheehan	
169-1	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 170 - Heather Heffner	
170-1	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
170-2	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 171 - Howard Nebeck	
171-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 172 - Isaac Gundersen	
172-1	Your comment supporting wilderness protections is noted. Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
172-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. See response to comment 172-1.
172-3	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.

Comment Letter No. 173 - Jacueline Shin	
173-1	Your concerns regarding the Icicle Strategy are noted. Impacts to wildlife are described in Sections 4.9. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Resource impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. The PEIS reviewed five different action alternatives and a No-action Alternative.
Comment Letter No. 174 - Jana Hobbs	
174-1	Your comment supporting wilderness protections is noted and your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. The Icicle Strategy seeks to increase water reliability for junior irrigators through a water market element that is included in all action alternatives. Water made available through reoperation and modification to storage would be manage for instream flow benefit and to meet projected domestic water supply needs.
174-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Impacts to shorelines and vegetation are described in Sections 4.18 and 4.8. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Resource impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
174-3	Your support for the modernizing existing facilities is noted.
174-4	The priority species list was prepared with information provided by WDFW. To identify and assess vegetation, wetlands, wildlife, and threatened and endangered species within the Study Area, information was gathered from a variety of sources including agency information, existing literature, resource maps, and aerial photographs. Reconnaissance-level site visits to five of the Alpine Lakes were also performed on July 11 through July 15, 2016. Impacts these resources will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
174-5	See response to comment 174-4.
174-6	Your comment supporting wilderness protections is noted.
174-7	Your comment is noted. The City of Leavenworth is an active member of the IWG, and regularly attends meetings.
174-8	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
174-9	Your support for the IPID Full Piping and Pump Exchange project is noted.
174-10	See response to comment 174-6.
174-11	The goals of the Icicle Strategy are described in section 1.5 of the PEIS. The primary objective is to provide increased instream flows, better water quality, and more habitat for salmonid species. The Guiding Principles, which are the objectives of the Icicle Strategy, are not seeking to increase water supply for irrigation uses. One of the goals is to increase agricultural reliability. To this accomplish a water markets approach was proposed by the IWG and included in all of the action alternatives considered in the PEIS.

Comment Letter No. 175 - Janna Treisman	
175-1	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
175-2	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
175-3	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes.
175-4	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issues as they move to project level review and implementation.
175-5	See response to comment 175-1. One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW. The Icicle Strategy is not seeking to increase water supplies at LNFH with water from IPID's storage rights.
175-6	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
175-7	Your comment in support of the Alpine Lakes Optimization, Modernization, and Automation Project is noted.
175-8	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review. Your support of using hikers to change head gate settings at the dams is noted.
175-9	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
175-10	Your support for the IPID Full Piping and Pump Exchange project are noted.

175-11	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS.
175-12	Your support for conservation upgrades and LNFH are noted.
Comment Letter No. 176 - Jena Gilman	
176-1	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
176-2	At this point, it has not been determined if all equipment will be flown in or if any equipment will be walked in for the Eightmile Lake Storage Restoration project. It is possible that a combination of these methods is used. If equipment is walked in, these impacts will be assessed at the project level environmental review.
176-3	The thought behind this statement is that stakeholders in the IWG would hold fellow project proponents to additional standards during project design because of the diverse interests of the group. Where the irrigation district itself may not be concerned with the aesthetics of a project, the IWG as a whole would be. The project permitting process may not require a project to be designed to blend in naturally with the surrounds, as was the case with the Nada Dam reconstruction that occurred in 2009. The quoted language in the EIS does not mean to suggest that individual project permitting standards would be any different depending on whether a project is part of the IWG or not.
176-4	The bathtub rings at the lakes are visible now. Alternative 4 was not selected, which includes alterations at Snow Lake. Restoration of Eightmile Lake is included in the Preferred Alternative, but will be subject to project level environmental review, NEPA review, and project level permitting as appropriate.
176-5	The Recreation section (section 4.15) focuses on impacts that could permanently alter the ability to use the recreation resource. While the Aesthetics section focuses more on user experience. However, there are several cross references in the Recreation section to the Aesthetic section. We will revise the Recreation introduction paragraph to make clear the focus of the Recreation section and where visual impacts are described.
176-6	Mitigation can take many forms per WAC 197-11-768, including actions to minimize impacts, or monitor impacts and take appropriate corrective measures if necessary. Often, these are actions required through permit conditions and regulatory requirements. As such, compliance with the terms and conditions of local, state, and federal regulations minimizes potential impacts of a proposal. The intent of the PEIS is to provide as much detail regarding impacts and mitigation as is appropriate at this stage in planning and at the programmatic level. A more specific look at impacts and mitigation will occur at project-level environmental review.
176-7	Your comment regarding chapter organization is noted.
176-8	It is incorrect that the primary focus of the Icicle Strategy is on future domestic supply for the City. The primary focus of the Icicle Strategy is on instream flow and fish habitat based on dollars spent and water allocated, although other elements of the Guiding Principles are equally important. Information regarding the purpose and need for the Icicle Strategy, and background about the Icicle Creek Subbasin are including in Chapter 1. Section 1.6 describes past activities in the subbasin including watershed planning and instream flow and passage studies. Section 1.8 describes litigation that the Icicle Strategy is attempting to resolve. Chelan County and the City of Leavenworth manage growth and development through comprehensive planning, which is discussed in section 3.16.

176-9	Your comment in support of the No-action Alternative is noted.
Comment Letter No. 177 - Jeremy Jostad	
177-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 178 - Jessica O'Sell	
178-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 179 - Jim Perkins	
179-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
179-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
Comment Letter No. 180 - Joan Frazee	
180-1	Your concern regarding natural resource impacts is noted. Discussion of natural resource impacts are included throughout Chapter 4. his is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
180-2	It is anticipated that IPID trips to the ALWA for operation and maintenance of their facilities would be reduced by the updated proposed in the Alpine Lakes Optimization, Modernization, and Automation project. However, the co-leads recognize that on-site operation and maintenance would not be completely eliminated.
180-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
180-4	Your comments regarding noxious weeds are noted. During a reconnaissance survey, no noxious weed species were observed. No data specific to the Alpine Lakes Area as defined in Chapter 3 was found in the Aquatic Plants database or the weed list. Vegetation Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 181 - John Pollock	
181-1	The PEIS includes five action alternatives and one No-action Alternative. Your comment supporting wilderness protections is noted.

Comment Letter No. 182 - Kathleen Hurley	
182-1	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
182-2	Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational Impacts will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
182-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
182-4	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 183 - Kathleen Shannon	
183-1	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS. Your comment about adding wilderness protection to the Guiding Principles is noted. While a EIS under SEPA does not specifically need to assess impacts to wilderness, the PEIS does a programmatic level analysis of wilderness character impacts in section 4.17.
183-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
183-3	Your comment is noted.
Comment Letter No. 184 - Kathleen Ward	
184-1	The Icicle Work Group would welcome additional members that represent the conservation or recreation communities, including ALPS. More detailed information about adding members to the Icicle Work Group is available in the Operating Procedures, which are incorporated into the FPEIS by reference. The PEIS provides an overview of impacts at the Alpine Lakes and streams that they feed at the programmatic level. More detailed analysis of project level impacts will occur for projects in the Preferred Alternative where appropriate.
184-2	Growth management, zoning, and planning is guided by Chelan County and the City of Leavenworth. The Icicle workgroup seeks to meet domestic supply projections that have been developed through watershed planning, the City's water System Plan, and the State of Washington's Office of Financial Management. This is discussed in more detail in section 3.16 and 3.6 of the PEIS.
Comment Letter No. 185 - Kathy Haviland	
185-1	Your comment supporting wilderness protections is noted.

185-2	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational impacts will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 186 - Kelsie Maney	
186-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 187 - Kevin Farrell	
187-1	Instream flows and habitat are a top priority of the Icicle Strategy. The goals of the Icicle Strategy, known as the Guiding Principles, is detailed in section 1.5.
187-2	Your comment regarding tradition is noted.
187-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
187-4	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
187-5	Your comment supporting wilderness protections is noted.
187-6	See response to comment 187-3. Your support for pump exchange projects is noted.
187-7	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy. More specific project details will be developed as projects move to design and project level environmental review.
187-8	Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
187-9	Your comment on timeline is noted.
187-10	Your support for continued monitoring, data collection, and public outreach is noted.
Comment Letter No. 188 - Kyle Kohlwes	
188-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 189 - Lael White	
189-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.

Comment Letter No. 190 - Laurence Leveen	
190-1	Your comment supporting wilderness protections is noted.
190-2	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
190-3	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which is incorporated in the FPEIS by reference.
190-4	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 191 - Lisa Bellefond	
191-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 192 - Marjorie Fields	
192-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 193 - Mathias Ricken	
193-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
193-2	Your support for specific elements of the Icicle Strategy are noted.
193-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
193-4	Impacts to Recreation are described in Sections 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Recreational impacts will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. Your concern regarding impacts of increased storage to trails and campsites is noted. Enhancement projects considered in Alternative 4 would likely result in seasonal inundation of trails and campsites. Alternative 4 was not selected as the Preferred Alternative. At this point, no inundation is expected to result from the Eightmile Lake Storage Restoration project.
Comment Letter No. 194 - Megan Johnson	
194-1	Your comment supporting wilderness protections is noted.

Comment Letter No. 195 - Meghan Younge	
195-1	Your comment supporting wilderness protections is noted. Impacts to Wildlife are described in Sections 4.9. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Wildlife impacts will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate**.**
Comment Letter No. 196 - Michael Weinberg	
196-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 197 - Mitchell McCommons	
197-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 198 - Monica Charpentier	
198-1	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 199 - Nancy Zahn	
199-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
199-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
199-3	Your concern regarding Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS. Per WAC 197-11-793, the purpose of SEPA scoping is to identify potential impacts and alternatives to consider in the EIS. During the scoping process for the Icicle Strategy, some comments reflected a desire for more storage and/or increased streamflow. Inclusion of Alternative 4 in the DPEIS was in response to those comments.
199-4	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS. Your support of the IPID Full Piping and Pump Exchange project is noted.
199-5	See response to comment 199-2.

199-6	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter, coordination will occur at the project level for any projects that may have a permitting action required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review.
199-7	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
199-8	One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW.
199-9	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. The USFS is an active member of the IWG and regularly attends meetings. Per the USFS comment letter, coordination will occur at the project level for any projects that may have a permitting action required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review. The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS. Each project assumes between 10 and 20 percent of the budget will go to environmental review and design. The PEIS provides a two-year timeline for completing additional environmental review. The co-leads believe it is reasonable for NEPA review to be completed during a two-year window.
199-10	Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
199-11	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases will not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
199-12	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.
199-13	Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.

199-14	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 200 - Nete Olson	
200-1	Per WAC 197-11-793, the purpose of SEPA scoping is to identify potential impacts and alternatives to consider in the EIS. During the scoping process for the Icicle Strategy, some comments reflected a desire for more storage and/or increased streamflow. Inclusion of Alternative 4 in the DPEIS was in response to those comments.
200-2	Your comment supporting wilderness protections is noted. A programmatic EIS is not a plan, rather it is a high-level analysis of the probable environmental impacts of implementing a plan. The PEIS provided as detailed analysis as possible based on the information available. Some of this information was limited because of where the various alternatives and elements are in the planning process.
200-3	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
200-4	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter, coordination will occur at the project level for any projects that may have a permitting action required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review.
200-5	One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW.
200-6	See response to comment 200-1. Your concerns regarding to Alternative 4 are noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
200-7	The co-leads provided for alternatives that were responsive to comments received during scoping that ranged from not wanting projects in the ALWA to be included to increased storage options. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.

200-8	See responses to comment 200-6. See response to comment 200-3. See response to comment 200-5.
200-9	See response to comment 200-7.
200-10	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS. Project level analysis of Wilderness Act requirements, including minimum tools analysis, will be conducted during project level environmental review.
200-11	Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which is incorporated in the FPEIS by reference.
200-12	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 201 - Patrick Conn	
201-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 202 - Rachel Nunez	
202-1	Your comment supporting wilderness protections is noted.
202-2	Your concerns regarding to Alternative 4 are noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
202-3	Your support for specific elements of the Icicle Strategy are noted.
Comment Letter No. 203 - Rachel Youngberg	
203-1	Your concerns regarding to Alternative 4 are noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
203-2	Impacts to vegetation, wildlife, and water quality are described at the programmatic level in Sections 4.8, 4.9, and 4.5 respectively. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts on these resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
203-3	Impacts to recreation and wilderness are described in 4.15 and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts on these resources will undergo project level analysis for projects in the Preferred Alternative, which will include more detailed analysis where appropriate. See response to comment 203-1.

Comment Letter No. 204 - Richard Curtis	
204-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
204-2	The PEIS reviews the impacts of the alternatives on recreation in section 4.15 at the programmatic level. Recreational impacts will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. The lakes involved in Icicle Strategy have already been developed as reservoirs and are used for agricultural purposes. The action alternatives considered in the PEIS seek to change operation or management to increase stream flow and meet the Guiding Principles described in section 1.5 of the document. Alternatives 1, 4 and 5 propose modernizing the outlet structures on these lakes, so that they can be remotely managed for instream flow and fish benefit. Alternatives 1, 2, and 5 proposing restoring Eightmile Lake Dam to its original height to provide increase stream flow and domestic supply. Alternative 4 proposes increasing storage for instream flow and fish benefit. All alternatives include a water market to increase agricultural reliability. A complete discussion of the alternatives is provided in Chapter 2.
204-3	The efficacy of the alternatives under climate change is analyzed in Section 4.13 of the PEIS. Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. See response to comment 204-1.
204-4	Your support for specific elements of the Icicle Strategy are noted.
204-5	Your concerns regarding to Alternative 4 are noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
204-6	See response to comment 204-2.
Comment Letter No. 205 - Richard Forbs	
205-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
205-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
205-3	Conservation at LNFH is included as an element in the five action alternatives proposed under the Icicle Strategy. LNFH is required for mitigation of Grand Coulee Dam and considering fish passage over Grand Coulee Dam is beyond the scope of the Icicle Work Group. The USFWS recently conducted an alternatives analysis that included the potential of removing LNFH. This report found that improving efficiency at LNFH was the best alternative. More discussion about why this was not considered in the PEIS is provided in Section 2.11.2.
205-4	Your comment supporting wilderness protections is noted.

Comment Letter No. 206 - Richard Forbs (2)	
	Duplicate Letter. See Comment Letter No. 205
Comment Letter No. 207 - Richard Haydon	
207-1	This PEIS was prepared under SEPA regulations detailed in Chapter 197-11 WAC. The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. A more detailed analysis of the specific projects will occur during project level analysis where appropriate. NEPA integration is discussed in Section 1.9. NEPA will be performed on projects with a federal permitting or funding nexus.
207-2	While the PEIS provided as much detail as possible given the programmatic nature of the review and the current level of detail known about the various alternatives, it is not intended to be a site-specific, project level analysis. A more detailed analysis of the specific projects will occur during project level analysis where appropriate.
207-3	This is a programmatic environmental review prepared in accordance with WAC 197-11-442. Section 1.9 details the type of environmental review that was conducted under the PEIS, as well as the time-line for design, feasibility, and project level review.
207-4	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws. The PEIS reviewed wilderness regulations and impacts in sections 3.17 and 4.17 respectively, and other land use regulations and impacts in sections 3.16 and 4.16 respectively, at the programmatic level. A more detailed analysis of the specific projects will occur during project level analysis where appropriate.
207-5	The DPEIS discusses water right authority and state water law in Sections 3.6 and 4.6 at the programmatic level. Additional review of water rights will occur at project level review or permitting. Indian Trust Assets and Fishing Harvest are described in Section 3.23 and 4.23. The Yakama Nation and the Confederated Tribes of the Colville Reservation, with the Wentachi band is a member of, are active members of the Icicle Work Group, and have provided feedback and guidance of the development of the Icicle Strategy.
207-6	This PEIS was developed under SEPA, not NEPA. Your concern regarding the analysis related to water rights and federal wilderness laws relative to Eightmile Lake is noted.
207-7	As discussed in responses above, this is a programmatic EIS that has been developed under the SEPA rules and regulations. The DPEIS complies with the requirements of Chapter 197-11 WAC. A more detailed analysis of the specific projects will occur during project level analysis where appropriate.
Comment Letter No. 208 - Richard Korry	
208-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
208-2	Your concerns regarding Alternative 4 are noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

208-3	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 209 - Richard Noll	
209-1	This letter does not contain comments relevant to the Icicle Creek Strategy DPEIS.
Comment Letter No. 210 - Richard Rutz	
210-1	Your comment supporting wilderness protections is noted.
210-2	The purpose of the PEIS is to assess the probable environmental impacts to existing conditions of initiating an integrated water resource management plan for the Icicle Creek subbasin that focuses on the development of a suite of projects to solve instream flow and water supply issues in Icicle Creek. As described in section 2.2, alternatives for the Icicle Strategy focused on the objectives of the Icicle Work Group, known as the Guiding Principles (Section 1.5) and feedback provided during SEPA Scoping. The objectives of the Icicle Work Group are not specifically dam removal or wilderness restoration, so these actions were not included in the suite of alternatives considered.
210-3	Your comment in support of dam removal is noted. The PEIS' responsibility under Chapter 197-11 WAC is to analyze the probable environmental impacts to baseline conditions (i.e. existing environmental conditions) of implementing a plan or policy. SEPA does not require proposal proponents to improve existing environmental conditions. Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
210-4	The PEIS reviews the impacts of the various alternatives on wilderness (section 4.17), fish (section 4.7), wildlife (section 4.9), recreation (section 4.15), and aesthetics (section 4.11) in as much detail as is appropriate for a programmatic evaluation. Impacts will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
210-5	The No-action Alternative contemplates the likely outcomes if the Icicle Strategy is not adopted. The co-leads discussed stakeholder intent with IWG members to determine what would likely occur if the Icicle Strategy were not adopted. The No-action Alternative describes in section 2.3 is the result of these discussions.
210-6	Alternative 1, 2, and 5 do not propose increasing storage water rights. They propose using the rights granted to IPID between 1920 and 1940 and restoring Eightmile dam to its original height before overtopping eroded part of the dam at some point in the 1990s or 2000s. Alternative 4 would require additional storage water rights be issued. That process would be regulated by state and federal permitting and wilderness laws. However, Alternative 4 has not been selected as the Preferred Alternative.
210-7	Per WAC 197-11-442, a PEIS is a document that analyzes probable environmental impacts of implementing a plan or policy. The Icicle Strategy PEIS analyzes the probable impacts of implementing a comprehensive water management strategy in Icicle Creek Subbasin. The document itself does not have or cause environmental impacts.

210-8	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
210-9	Your concerns regarding Alternative 4 are noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
210-10	Your support for specific elements of the Icicle Strategy are noted.
210-11	A Programmatic SEPA review was launched at the earliest possible point in programmatic development to allow decision making to be guiding by the environmental review process. The level of analysis and detail in the PEIS is appropriate given the programmatic nature of the document and the amount of detail known at this time. Opportunities for project level analysis would occur during project level review in the future. Table 5-2 provides probable permitting and regulatory requirements for the various alternatives.
210-12	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions of the watershed, including water resources, water quality, shoreline, vegetation, and fish and wildlife are located in Chapter 3. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts to watershed function of increased frequency of releases will occur during project level analysis where appropriate. Your support for expanded conservation measures is noted. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
210-13	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS. Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
210-14	See response to comment 210-3.
210-15	Your comment supporting wilderness protections is noted.

210-16	The PEIS meets the requirements of a non-project environmental review, as described in WAC 197-11-442. An overview of applicable wilderness regulations is described in Section 3.17 and wilderness impacts are discussed section 4.17. However, the intent of this document is to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. The co-leads will coordinate with the USFS on specific wilderness area requirements. Per the USFS comment letter, this coordination will occur at the project level for any projects that may have a permitting action required by USFS.
Comment Letter No. 211 - Robert Metzger	
211-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 212 - Scott Presho	
212-1	Alternative 1, 2, and 5 do not propose increasing storage water rights. They propose using the rights granted to IPID between 1920 and 1940. Alternative 4 would require additional storage water rights be issued. That process would be regulated by state and federal permitting laws. However, Alternative 4 has not been selected as the Preferred Alternative.
212-2	Your support for expanded conservation measures is noted. Additional conservation detail has been added to the Domestic Conservation Project, as described in Chapter 2. This expanded description includes a lawn buyback program to address concerns raised about lawn watering in the area. More details regarding conservation measures and savings will emerge during project level planning. The current program focuses on the programmatic impacts of increasing funding on conservation measures by $1 million.
212-3	See response to comment 212-3.
Comment Letter No. 213 - Steve Uyenishi	
213-1	This letter does not contain comments relevant to the Icicle Creek Strategy DPEIS.
Comment Letter No. 214 - Tami Rust	
214-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 215 - Teresa Catford	
215-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 216 - Terri and Ronald Jones	
216-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 217 - Tessa Rue	
217-1	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 218 - Bill Burwell	
	Duplicate Letter. See Comment Letter No. 032
Comment Letter No. 219 - Antje Fray	
219-1	See response to Wilderness Watch letter (comment number 379).

219-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The dams at Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes are upstream of natural passage barriers.
219-3	Your support for wilderness protections is noted.
Comment Letter No. 220 – Christine Clum	
220-1	See response to Wilderness Watch letter (comment number 379).
220-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Many of the alternatives considered in the PEIS examine modifying or re-operating these existing structures. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. None of the alternatives considered in the PEIS would result in people's homes being inundated.
Comment Letter No. 221 – Dawn Serra	
221-1	See response to Wilderness Watch letter (comment number 379).
221-2	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
Comment Letter No. 222 – Jennifer Schultz	
222-1	See response to Wilderness Watch letter (comment number 379).
222-2	Your support for protecting waterways and community water supplies is noted.
Comment Letter No. 223 – Joe McPhee	
223-1	See response to Wilderness Watch letter (comment number 379).
223-2	Your support for wilderness protections is noted. Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
Comment Letter No. 224 – LD Anderson	
224-1	See response to Wilderness Watch letter (comment number 379).
224-2	Your support for waste water recycling and wetland recharge is noted.

Comment Letter No. 225 – Linda Berd	
225-1	See response to Wilderness Watch letter (comment number 379).
225-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes.
225-3	The IWG commissioned a report from UW's climate impacts group that reviewed likely impacts of climate change on hydrology in the Icicle Creek Subbasin. This report is included in Appendix F.
225-4	The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter, coordination will occur at the project level for any projects that may have a permitting action required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations.
Comment Letter No. 226 – Linda Yow	
226-1	See response to Wilderness Watch letter (comment number 379).
226-2	Your comment around septic systems is noted.
226-3	Your support for storage modification and reoperation projects and instream flow improvements is noted.
Comment Letter No. 227 – M. Lou Orr	
227-1	See response to Wilderness Watch letter (comment number 379).
227-2	One of the Guiding Principles, which are the goals of the Icicle Strategy and described in section 1.5, is to protect tribal harvest rights. The Confederated Tribes of the Colville are IWG members that actively participate at meetings and on the Instream Flow Subcommittee.
Comment Letter No. 228 – N Refes	
228-1	See response to Wilderness Watch letter (comment number 379).
228-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 229 – Noel Orr	
229-1	See response to Wilderness Watch letter (comment number 379).
229-2	One of the Guiding Principles, which are the goals of the Icicle Strategy and described in section 1.5, is to protect tribal harvest rights. The Confederated Tribes of the Colville and the Yakama Nation are IWG members that actively participate at meetings and on the Instream Flow Subcommittee.
Comment Letter No. 230 – Sherry L. Olson, Ph.D.	
230-1	See response to Wilderness Watch letter (comment number 379).

230-2	An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
Comment Letter No. 231 – Singgih Tan	
231-1	See response to Wilderness Watch letter (comment number 379).
231-2	The IWG commissioned a report from UW's climate impacts group that reviewed likely impacts of climate change on hydrology in the Icicle Creek Subbasin. This report is included in Appendix F.
Comment Letter No. 232 – Aimee Polekoff	
232-1	See response to Wilderness Watch letter (comment number 379).
232-2	The Wenatchee Valley does not receive enough rain to grow crops such as pears without irrigation. Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Many of the alternatives considered in the PEIS examine modifying or re-operating these existing structures. Water from such projects would go to instream flow benefit and domestic supply. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
Comment Letter No. 233 – Al Kisner	
233-1	See response to Wilderness Watch letter (comment number 379).
233-2	Your support of beaver dams is noted.
Comment Letter No. 234 – Alice Nguyen	
234-1	See response to Wilderness Watch letter (comment number 379).
234-2	Impacts to wilderness character are described in Sections 4.17. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2. One of the primary goals of the Icicle Strategy is to increase streamflow. The goals are described in section 1.5.
Comment Letter No. 235 – Amy Davis	
235-1	See response to Wilderness Watch letter (comment number 379).
235-2	Your concern regarding all dams is noted. Your comment supporting wilderness protections is noted.
Comment Letter No. 236 – Andrew Fisher	
236-1	See response to Wilderness Watch letter (comment number 379).
236-2	The referenced video does not appear to contain comments or information regarding the Icicle Strategy DPEIS.

Comment Letter No. 237 – Ann Rogers	
237-1	See response to Wilderness Watch letter (comment number 379).
237-2	Your concern regarding all dams is noted.
Comment Letter No. 238 – Antje Fray (2)	
238-1	See response to Wilderness Watch letter (comment number 379).
238-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The dams at Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes are upstream of natural passage barriers.
Comment Letter No. 239 – Arrie Hammel	
239-1	See response to Wilderness Watch letter (comment number 379).
239-2	Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 240 – Barbara Trudell	
240-1	See response to Wilderness Watch letter (comment number 379).
240-2	Your concern regarding all dams is noted.
Comment Letter No. 241 – Beth Stanberry	
241-1	See response to Wilderness Watch letter (comment number 379).
241-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 242 – Bill Parker	
240-2	See response to Wilderness Watch letter (comment number 379).
	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 243 – Billy Angus	
243-1	See response to Wilderness Watch letter (comment number 379).
243-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 244 – Bonnie Macraith	
244-1	See response to Wilderness Watch letter (comment number 379).

244-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The dams at Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes are upstream of natural passage barriers. Impacts to vegetation and shoreline are described in Sections 4.8 and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Resource impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 245 – Carol Ann Brady, R.N.	
245-1	See response to Wilderness Watch letter (comment number 379).
245-2	Your support for water way protection is noted.
Comment Letter No. 246 – Carol Hatfield (2)	
246-1	See response to Wilderness Watch letter (comment number 379).
246-2	Your support for water way protection is noted. Impacts to ecosystem resources and wilderness character are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 247 – Carol Hatfield	
247-1	See response to Wilderness Watch letter (comment number 379).
247-2	See response to comment 246-2.
Comment Letter No. 248 – Carol Jackson	
248-1	See response to Wilderness Watch letter (comment number 379).
248-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. IPID and LNFH coordinates with USFS and Ecology's Office of Dam Safety to ensure all dams under their ownership and operation are safe.
Comment Letter No. 249 – Carolyn Wacaser	
249-1	See response to Wilderness Watch letter (comment number 379).
249-2	Impacts to ecosystem resources and wilderness character are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 250 – Cheryl Lechtanski	
250-1	See response to Wilderness Watch letter (comment number 379).

250-2	Impacts to ecosystem resources and wilderness character are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 251 – Cris Smith	
251-1	See response to Wilderness Watch letter (comment number 379).
251-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. and section 3.3 provides descriptions of the baseline conditions.
Comment Letter No. 252 – Darlene Marley	
252-1	See response to Wilderness Watch letter (comment number 379).
252-2	Your support of sustainable water management is noted. This is one of the goals, or Guiding Principles, of the Icicle Work Group, as described in section 1.5.
Comment Letter No. 253 – Donna Greathouse-Neel	
253-1	See response to Wilderness Watch letter (comment number 379).
253-2	Your support for Wilderness Watch is noted.
253-3	Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
Comment Letter No. 254 – Echo Mitchell	
254-1	See response to Wilderness Watch letter (comment number 379).
254-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The Icicle Strategy does not include any energy development elements.
Comment Letter No. 255 – Edson Rood	
255-1	See response to Wilderness Watch letter (comment number 379).
255-2	Your comment is noted. The purpose of the PEIS is to fine an alternative with the lowest level of environmental cost to achieve an objective. The PEIS describes the Icicle Strategy objectives in section 1.5.
Comment Letter No. 256 – Elizabeth Lynch	
256-1	See response to Wilderness Watch letter (comment number 379).
256-2	The PEIS describes the Icicle Strategy objectives, called the Guiding Principles, in section 1.5.
Comment Letter No. 257 – Gayle Areheart	
257-1	See response to Wilderness Watch letter (comment number 379).

257-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The Icicle Strategy does not include any energy development elements.
Comment Letter No. 258 – George Wuerthner	
258-1	See response to Wilderness Watch letter (comment number 379).
258-2	IPID holds storage water rights at Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes. Any new water right authorization must not be detrimental to the public interest test, as required by Chapter 90.03 RCW.
Comment Letter No. 259 – Gita Barbezat	
259-1	See response to Wilderness Watch letter (comment number 379).
259-2	Your comment is noted. The purpose of the of a PEIS is to assess probable environmental impacts prior to implementing a plan or policy as a means of reducing and mitigating impacts of a project.
Comment Letter No. 260 – Helga Oestreicher	
260-1	See response to Wilderness Watch letter (comment number 379).
260-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 261 – Jeffrey Christo	
261-1	See response to Wilderness Watch letter (comment number 379).
261-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternative elements that focus on storage reoperation and dam modification are intended to increase streamflow for salmonids in lower Icicle Creek and improve reliability of the domestic water supply. The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. A more detailed analysis on the impacts of implementing projects in the Preferred Alternative will occur during project level analysis where appropriate.
Comment Letter No. 262 – Jessica McGeary	
262-1	See response to Wilderness Watch letter (comment number 379).
162-2	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 263 – Joseph Breazeale	
263-1	See response to Wilderness Watch letter (comment number 379).

263-2	Your support for dam removal is noted.
Comment Letter No. 264 – Joy Keithline	
264-1	See response to Wilderness Watch letter (comment number 379).
264-2	Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 265 – Kathy, Mark, Chris & Jessie Groth	
265-1	See response to Wilderness Watch letter (comment number 379).
265-2	Your concern regarding all dams is noted.
Comment Letter No. 266 – Kevin Spelts	
266-1	See response to Wilderness Watch letter (comment number 379).
266-2	Your support of natural watersheds is noted.
Comment Letter No. 267 – Lisa Dahill	
267-1	See response to Wilderness Watch letter (comment number 379).
267-2	Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
Comment Letter No. 268 – Loren Amelang	
268-1	See response to Wilderness Watch letter (comment number 379).
268-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 269 – Louise Wallace	
269-1	See response to Wilderness Watch letter (comment number 379).
269-2	Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5. One of the primary goals of the Icicle Strategy is to improve instream flow and enhance habitat for salmonids.
Comment Letter No. 270 – Lynn Welch	
270-1	See response to Wilderness Watch letter (comment number 379).
270-2	Your support of natural watersheds is noted.
Comment Letter No. 271 – Maggie Frazier	
271-1	See response to Wilderness Watch letter (comment number 379).

272-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. The Alternatives are described throughout Chapter 2 and the Guiding Principles are described in section 1.5. Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. The dams at Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes are upstream of natural passage barriers.
Comment Letter No. 272 – Maija Dravnieks	
272-1	See response to Wilderness Watch letter (comment number 379).
272-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 273 – Martha Jo Willard	
273-1	See response to Wilderness Watch letter (comment number 379).
273-2	The Icicle DPEIS does not contain energy development elements. Your comment regarding fossil fuels does not appear to be relevant to the DPEIS being considered.
Comment Letter No. 274 – Martha Stevens	
274-1	See response to Wilderness Watch letter (comment number 379).
274-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 275 – Mary Leon	
275-1	See response to Wilderness Watch letter (comment number 379).
275-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Impacts to surface water resources are described in Sections 4.3. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 276 – Marya Bradley	
276-1	See response to Wilderness Watch letter (comment number 379).
276-2	The co-leads have held several public meetings and open houses regarding the Icicle Strategy. Furthermore, all IWG meetings are open to the public. More information regarding public involvement are included in sections 1.9.3.4 and 5.1. Your support for the least harm is noted.
Comment Letter No. 277 – Maryann Foss	
277-1	See response to Wilderness Watch letter (comment number 379).

277-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 278 – Maureen Knutsen	
278-1	See response to Wilderness Watch letter (comment number 379).
278-2	Impacts to Water Quality are described in Sections 4.5. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Water Quality impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 279 – Michael and Barbara Hill	
279-1	See response to Wilderness Watch letter (comment number 379).
279-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The Icicle Strategy does not include any energy development elements.
Comment Letter No. 280 – Michelle Rice	
280-1	See response to Wilderness Watch letter (comment number 379).
280-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. One of the primary goals of the Icicle Strategy is to improve instream flow and habitat for salmonids. The goals of the Icicle Strategy, known as the Guiding Principles are detailed in section 1.5.
Comment Letter No. 281 – Mike Hemphill	
281-1	See response to Wilderness Watch letter (comment number 379).
281-2	Your comment is noted. This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan.
Comment Letter No. 282 – Nina Council	
282-1	See response to Wilderness Watch letter (comment number 379).
282-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. One of the primary goals of the Icicle Strategy is to improve instream flow and habitat for salmonids. The goals of the Icicle Strategy, known as the Guiding Principles are detailed in section 1.5.

Comment Letter No. 283 – Pamela Nelson	
283-1	See response to Wilderness Watch letter (comment number 379).
283-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Your comment supporting wilderness protections is noted.
Comment Letter No. 284 – Patricia Always	
284-1	See response to Wilderness Watch letter (comment number 379).
284-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. Impacts to Indian Sacred Sites and Indian Trust Assets are described in Sections 4.22 and 4.24. This analysis found no significant impacts to these resources. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 285 – Randall Potts	
285-1	See response to Wilderness Watch letter (comment number 379).
285-2	The DPEIS is a draft programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. The Alternatives are described throughout Chapter 2 and the Guiding Principles are described in section 1.5. Impacts to ecosystem resources are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; and 4.18. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 286 – Robert Bauer	
286-1	See response to Wilderness Watch letter (comment number 379).
287-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. The Alternatives are described throughout Chapter 2 and the Guiding Principles are described in section 1.5. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 287 – Robert Fritsch	
287-1	See response to Wilderness Watch letter (comment number 379).

287-2	Impacts to surface water are described in Sections 4.3. At the programmatic level, impacts were found to be less than significant for the alternatives considered. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 288 – Rose Jenkins	
288-1	See response to Wilderness Watch letter (comment number 379).
288-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 289 – Ruth Parcell	
289-1	See response to Wilderness Watch letter (comment number 379).
289-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 290 – Scott Elliott	
290-1	See response to Wilderness Watch letter (comment number 379).
290-2	Impacts to Recreation and Socioeconomics are described in Sections 4.15 and 2.24. The PEIS found no significant impacts were likely to result from the alternatives considered. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 291 – Teresa Hayes	
291-1	See response to Wilderness Watch letter (comment number 379).
291-2	The co-leads are not aware of any scientific literature that demonstrates water management increases drought. Impacts to surface water are described in Sections 4.3. The PEIS found no significant impacts were likely to result from the alternatives considered. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 292 – Thelma Nelson	
292-1	See response to Wilderness Watch letter (comment number 379).
292-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed.
Comment Letter No. 293 – Theo Giesy	
293-1	See response to Wilderness Watch letter (comment number 379).

293-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Should a permitting agency determine that additional information is required to understand the impacts of a specific proposal, a project level EIS will be required.
Comment Letter No. 294 – Amy Derocher	
294-1	See response to Sierra Club letter (comment number 380).
294-2	Your concerns regarding the Eightmile Lake Storage Restoration project is noted. USFS is an active member of the IWG, and regularly attends meetings. The co-leads will coordinate with the USFS on any projects that occur within ALWA to ensure compliance with all applicable regulations. We have referenced applicable regulations and permitting actions in Table 5-2.
Comment Letter No. 295 – Larry Oneil	
295-1	See response to Sierra Club letter (comment number 380).
295-2	The efficacy of the various alternatives under climate change scenarios are discussed at the programmatic level in section 4.13 and Appendix F of the DPEIS. All action alternatives are expected to reach instream flow goals under low, medium, and high climate change scenarios in 2080, except Alternative 3. Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
Comment Letter No. 296 – Catherine Buchanan	
296-1	See response to Washington Wild letter (comment number 381).
296-2	This PEIS is prepared under SEPA not NEPA. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 297 – Cheyenne Lively	
297-1	See response to Washington Wild letter (comment number 381).
297-2	Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Chapter 2 contains descriptions of the alternatives and section 3.3 provides a baseline discussion of surface water resources in the watershed. One of the primary goals of the Icicle Strategy is to improve instream flow and habitat for salmonids. The goals of the Icicle Strategy, known as the Guiding Principles are detailed in section 1.5. Impacts to Indian Sacred Sites and Indian Trust Assets are described in Sections 4.22 and 4.24. This analysis found no significant impacts to these resources. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 298 – Christina Durtschi	
298-1	See response to Washington Wild letter (comment number 381).

298-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. The Alternatives are described throughout Chapter 2 and the Guiding Principles are described in section 1.5. Impacts to Wilderness Character and Fish are described in Sections 4.17 and 4.7. Impacts were found to be less than significant. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. Baseline information regarding water use is described in Section 3.6. Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
Comment Letter No. 299 – Courtney Carlisle	
299-1	See response to Washington Wild letter (comment number 381).
299-2	Socioeconomic Impacts are described in Sections 4.24. Impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate. None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 300 – Jace Bylenga	
300-1	See response to Washington Wild letter (comment number 381).
300-2	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
Comment Letter No. 301 – Mary Gallagher	
301-1	See response to Washington Wild letter (comment number 381).
301-2	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
Comment Letter No. 302 – Nicole Marcotte	
302-1	See response to Washington Wild letter (comment number 381).

302-2	Impacts to ecosystem resources and wilderness character are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.17. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate. Your comment supporting wilderness protections is noted. Impacts of the alternatives on climate change are discussed at the programmatic level in section 4.13 of the DPEIS. The action alternatives are not anticipated to have a significant increase in greenhouse gas emissions.
Comment Letter No. 303 – Carlie Miller	
303-1	See response to Washington Trails Association letter (comment number 383).
303-2	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference. The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. A more detailed analysis of projects included in the Preferred Alternative will occur during project level analysis where appropriate.
Comment Letter No. 304 – David Johnshoy	
304-1	See response to Washington Trails Association letter (comment number 383).
304-2	Your support for conservation measures is noted. All action alternatives analyzed in the PEIS include domestic and agricultural conservation elements. Additional conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2. IPID conservation goals have been developed and are described in the newly released CWCP, which has been incorporated into the FPEIS by reference.
Comment Letter No. 305 – Douglas Hedrick	
305-1	See response to Washington Trails Association letter (comment number 383).
305-2	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. The Alternatives are described throughout Chapter 2 and the Guiding Principles are described in section 1.5.
Comment Letter No. 306 – Fit Cahall	
306-1	See response to Washington Trails Association letter (comment number 383).
306-2	Your support for the No-action Alternative is noted.
Comment Letter No. 307 – Ingra Walker	
307-1	See response to Washington Trails Association letter (comment number 383).

307-2	Your support for no changes at Eightmile Lake are noted. Impacts to ecosystem resources and aesthetics are described in Sections 4.2 through 4.5; 4.7 through 4.10; 4.12; 4.18; and 4.11. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 308 – Jacob Gunn	
308-1	See response to Washington Trails Association letter (comment number 383).
308-2	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted.
Comment Letter No. 309 – Jean Coy	
309-1	See response to Washington Trails Association letter (comment number 383).
309-2	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Impacts to recreation and aesthetics are described in Sections 4.15 and 4.11. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 310 – Judy Knold	
310-1	See response to Washington Trails Association letter (comment number 383).
310-2	Impacts to recreation and wildlife are described in Sections 4.15 and 4.9. No significate impacts were found at the programmatic level. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 311 – Kevin Shipe	
311-1	See response to Washington Trails Association letter (comment number 383).
311-2	Socioeconomic Impacts and impacts to recreation are described in Sections 4.24 and 4.15. The analysis provided in this PEIS is programmatic nature and is intended to provide a comprehensive understanding of the impacts of implementing a plan or policy, not specific project level issues. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 312 – Manuela Giese	
312-1	See response to Washington Trails Association letter (comment number 383).
312-2	Members of the PEIS team have read Cadillac Desert.
Comment Letter No. 313 – Mark Salser	
313-1	See response to Washington Trails Association letter (comment number 383).
313-2	Your comment supporting wilderness protections is noted. Your concern regarding enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

Comment Letter No. 314 – Michaela Mansfield	
314-1	See response to Washington Trails Association letter (comment number 383).
314-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. Under several of the alternatives considered in the PEIS, modified storage is included. There are no alternatives that include construction of new dams. Section 3.3 provides a baseline discussion of surface water resources in the watershed. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5. Impacts to Recreation are described in Sections 4.15. Storage enhancement elements of Alternative 4 are expected to cause seasonal inundation of some campsites and sections of trail lasting about a month in early summer. No other projects considered under the action alternatives are expected to result in trail or campsite inundation. Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
Comment Letter No. 315 – Robert Pasko	
315-1	See response to Washington Trails Association letter (comment number 383).
315-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. Your comment supporting wilderness protections is noted.
Comment Letter No. 316 – Robert Schutzner	
316-1	See response to Washington Trails Association letter (comment number 383).
316-2	This is a programmatic EIS, which is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan. The PEIS examined five action alternatives and a No-action Alternative. Each alternative included a suite of projects and elements aimed at meeting the Icicle Strategy goals, known as the Guiding Principles. Your comment supporting wilderness protections is noted.
Comment Letter No. 317 - Rachel Swerdlow	
317-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 318 - Roberta Daniels	
318-1	Your comment in support for storage enhancement is noted.
Comment Letter No. 319 – Alyssa Barton	
319-1	See response to Sierra Club letter (comment number 380).
319-2	The Icicle Strategy seeks to strike a balance between these long-standing issues in Icicle Creek. The objectives of the Icicle Strategy are to improve instream flows, improve the sustainability of Leavenworth National Fish Hatchery, protect tribal and non-tribal fish harvest, improve domestic supply, improve agricultural reliability, enhance Icicle Creek habitat, and comply with State and Federal Law, including the Wilderness Acts. Details about these objectives, known as the Guiding Principles, are provided in section 1.5.

319-3	Your comment supporting wilderness protections is noted.
Comment Letter No. 320 – Andrea Carter	
320-1	See response to Sierra Club letter (comment number 380).
320-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 321 – Aylin Llona	
321-1	The objectives of the Icicle Strategy are described in section 1.5 of the PEIS: improve instream flows, improve the sustainability of Leavenworth National Fish Hatchery, protect tribal and non-tribal fish harvest, improve domestic supply, improve agricultural reliability, enhance Icicle Creek habitat, and comply with State and Federal Law, including the Wilderness Acts within the Icicle Creek Subbasin, Chelan County, Washington. Your support for preservation is noted.
321-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 322 – Barry Truman	
322-1	Your comment is noted. Damming the Potomac River was not included in the alternatives considered in the PEIS because it would likely not meet the objectives of the Icicle Strategy, which are described in section 1.5 of the PEIS: improve instream flows, improve the sustainability of Leavenworth National Fish Hatchery, protect tribal and non-tribal fish harvest, improve domestic supply, improve agricultural reliability, enhance Icicle Creek habitat, and comply with State and Federal Law, including the Wilderness Acts within the Icicle Creek Subbasin, Chelan County, Washington.
322-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 323 – Chris Gnehm	
323-1	See response to Sierra Club letter (comment number 380).
323-2	The programmatic EIS is intended to provide a comprehensive understanding of the impacts of implementing an integrated water resource management plan in Icicle Creek Subbasin. More specific details regarding if any trees would need to be removed would be identified once the projects are better defined. Vegetation impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 324 – Daniel Erickson	
324-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 325 – Denise Mahnke	
325-1	See response to Sierra Club letter (comment number 380).
325-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternative elements that focus on storage reoperation and dam modification are intended to increase streamflow for salmonids in lower Icicle Creek and improve reliability of the domestic water supply. Your comment supporting wilderness protections is noted.
Comment Letter No. 326 – Dorothy Hiestand	
326-1	Your comment supporting wilderness protections is noted.

326-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 327 – Ellen Lyons	
327-1	See response to Sierra Club letter (comment number 380).
327-2	The PEIS reviewed the wildlife and fish impacts of the proposal in Section 4.9 and 4.7. Wildlife impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 328 – Gerry Smith	
328-1	Your comment supporting wilderness protections is noted.
328-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 329 – James Davis	
329-1	The goals of the Icicle Strategy are described in section 1.5 of the PEIS: improve instream flows, improve the sustainability of Leavenworth National Fish Hatchery, protect tribal and non-tribal fish harvest, improve domestic supply, improve agricultural reliability, enhance Icicle Creek habitat, and comply with State and Federal Law, including the Wilderness Acts within the Icicle Creek Subbasin, Chelan County, Washington.
329-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 330 – Janet Way	
330-1	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. These lakes and tributaries are already dammed and already experience increased flow and draw down at least once out of every five years if not more frequently, so natural conditions do not currently exist. Discussion of baseline conditions in the tributaries are located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS reviewed the groundwater, habitat, and water quality impacts of the proposal in Section 4.4, 4.7, 4.8, 4.9, and 4.5. These resource impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
330-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 331 – Kate Butt	
331-1	See response to Sierra Club letter (comment number 380).
331-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 332 – Kevin Jones	
332-1	See response to Sierra Club letter (comment number 380).
332-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 333 – Kristeen Penrod	
333-1	Your support for dam removal is noted. Per WAC 197-11-789, a reasonable alternative is an action that could feasibly attain the proposal's objectives, but at a lower environmental cost. Reservoir removal did not receive additional consideration because it was determined that it could not attain the Icicle Strategy's objectives. Detail on this decision is provided in Section 2.11. The Icicle Strategy's objectives are the Guiding Principles, as described in section 1.5.
333-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 334 – Kristen Long	
334-1	See response to Sierra Club letter (comment number 380).

334-2	No photo was included in this comment. Therefore, we are not able to include it in the public record. Your comment appears to be related to emergency repairs at Eightmile Dam. The emergency repairs at Eightmile Dam are not part of this proposal, with SEPA review occurring under a separate pathway. Alternative 1, 2, 4, and 5 of the Icicle Strategy does include alteration of the Eightmile Dam. The PEIS reviewed the wildlife impacts of the proposal in Section 4.9. Wildlife impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 335 – Kristina Fury	
335-1	The PEIS reviewed the impacts of the proposal at the programmatic level throughout Chapter 4. This analysis included socioeconomic and climate change impacts. These impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
335-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 336 – Mark Stewart	
336-1	See response to Sierra Club letter (comment number 380).
336-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 337 – Matt Knox	
337-1	See response to Sierra Club letter (comment number 380).
337-2	Your support for wilderness protection is noted. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process or irrigation drought resiliency, if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored.
Comment Letter No. 338 – Mayellen Henry	
338-1	Your comment supporting wilderness protections is noted.
338-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 339 – Menno Sennesael	
339-1	See response to Sierra Club letter (comment number 380).
339-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 340 – Niels and Susan Andersen	
340-1	See response to Sierra Club letter (comment number 380).
340-2	Your comment supporting the Alpine Lakes is noted.
Comment Letter No. 341 – Oliver Dunn	
341-1	Your comment supporting wilderness protections is noted.
341-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 342 – Patrick Conn	
342-1	Your support for preservation is noted.
342-2	See response to Sierra Club letter (comment number 380).

Comment Letter No. 343 – Paul Fior	
343-1	See response to Sierra Club letter (comment number 380).
343-2	None of the action alternatives propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Your support for conservation is noted. Conservation projects are included in all action alternatives considered in the PEIS.
Comment Letter No. 344 – Paul Granquist	
344-1	The construction footprint of the projects within the Alpine Lakes Wilderness Area are compact, and the duration of construction would be limited and timed to minimize impacts. The PEIS analyzes the impacts of construction at the programmatic level in Chapter 4 under short-term impacts for each resource. This analysis found that the impacts of construction for each alternative would be less than significant with appropriate mitigation. The impacts of construction will also be reviewed during project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
344-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 345 – Rachel Thomas	
345-1	The goals of the Icicle Strategy are described in section 1.5 of the PEIS: improve instream flows, improve the sustainability of Leavenworth National Fish Hatchery, protect tribal and non-tribal fish harvest, improve domestic supply, improve agricultural reliability, enhance Icicle Creek habitat, and comply with State and Federal Law, including the Wilderness Acts within the Icicle Creek Subbasin, Chelan County, Washington.
345-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 346 – Rose Lagerberg	
346-1	Your comment supporting wilderness protections is noted.
Comment Letter No. 347 – Shanna Sierra	
347-1	Your comment supporting wilderness protections is noted.
347-2	See response to Sierra Club letter (comment number 380).
Comment Letter No. 348 – Sigrid Asmus	
348-1	See response to Sierra Club letter (comment number 380).
348-2	Your comment supporting wilderness protections is noted. Your concern over the cost is noted. The FPIES does not authorize any spending, and estimated costs are included to aid in the decision-making process.
Comment Letter No. 349 – Sue Tiffany	
349-1	See response to Sierra Club letter (comment number 380).
349-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 350 – Suzanne Davis	
350-1	See response to Sierra Club letter (comment number 380).
350-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 351 – Tanya Lawson	
351-1	See response to Sierra Club letter (comment number 380).

351-2	Your concern over the cost is noted. The FPIES does not authorize any spending, and estimated costs are included to aid in the decision-making process.
Comment Letter No. 352 – Venard Trevisanut	
352-1	See response to Sierra Club letter (comment number 380).
352-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 353 – Barbara Cunningham	
353-1	See response to Wilderness Watch letter (comment number 379).
353-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 354 – Barbara Cunningham (2)	
354-1	See response to Wilderness Watch letter (comment number 379).
354-2	Your comment supporting Alternative 5 and wilderness protections is noted.
Comment Letter No. 355 – Cassandra Bufano	
355-1	Your comment supporting wilderness protections is noted.
355-2	See response to Washington Trails Association letter (comment number 383).
Comment Letter No. 356 – Jennifer Schultz (2)	
356-1	See response to Wilderness Watch letter (comment number 379).
356-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 357 – Mark and Susan Vossler	
357-1	See response to Wilderness Watch letter (comment number 379).
357-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 358 – Mark and Susan Vossler (2)	
358-1	See response to Wilderness Watch letter (comment number 379).
358-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 359 – Mary Johnson	
359-1	See response to Wilderness Watch letter (comment number 379).
359-2	Your support for protecting waterways and wilderness is noted.
Comment Letter No. 360 – Nancy Anderson	
360-1	See response to Wilderness Watch letter (comment number 379).
360-2	Your comment supporting wilderness protections is noted. The PEIS reviewed the wildlife impacts of the proposal in Section 4.9. Wildlife impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 361 – Robert Havrilla	
361-1	See response to Wilderness Watch letter (comment number 379).

361-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in the 1990s. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur at project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative. Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
Comment Letter No. 362 – Robert Havrilla (2)	
362-1	See response to Wilderness Watch letter (comment number 379).
362-1	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternative elements that focus on storage reoperation and dam modification are intended to increase streamflow for salmonids in lower Icicle Creek and improve reliability of the domestic water supply.
Comment Letter No. 363 – Edith Lie	
363-1	See response to Wilderness Watch letter (comment number 379).
363-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 364 – Linda Carroll	
364-1	See response to Wilderness Watch letter (comment number 379).
364-2	Your recreational use of the Alpine Lakes Wilderness Area is noted.
Comment Letter No. 365 – Bruce Turcott	
365-1	See response to Washington Wild letter (comment number 381).
365-2	Your recreational use of the Alpine Lakes Wilderness Area is noted.
Comment Letter No. 366 – Tim McNulty	
366-1	See response to Washington Wild letter (comment number 381).
366-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternative elements that focus on storage reoperation and dam modification are intended to increase streamflow for salmonids in lower Icicle Creek and improve reliability of the domestic water supply.
Comment Letter No. 367 – Thom Peters	
367-1	See response to Washington Wild letter (comment number 381).
367-2	None of the alternatives considered in the PEIS include elements or projects that would move irrigation water to domestic use.
Comment Letter No. 368 – Susan Cuturilo	
368-1	See response to Washington Wild letter (comment number 381).

368-2	Square, Lower Klonaqua, Eightmile, Colchuck, Nada and Snow Lakes have been artificially enlarged by dam structures built between 1920 and 1940 (depending on the site), and lake levels are currently managed for agricultural water supply. Section 3.3 describes the baseline conditions of these lakes. Alternative elements that focus on storage reoperation and dam modification are intended to increase streamflow for salmonids in lower Icicle Creek and improve reliability of the domestic water supply.
Comment Letter No. 369 – Shirley Sonnichsen	
369-1	See response to Washington Wild letter (comment number 381).
369-2	Your comment supporting wilderness protections is noted. Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
Comment Letter No. 370 – Seth Rolland	
370-1	See response to Washington Wild letter (comment number 381).
370-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 371 – Scott Elliott	
371-1	See response to Washington Wild letter (comment number 381).
371-2	The PEIS reviewed the socioeconomic impacts of the proposal in Section 4.24. Socioeconomic impacts will undergo project level analysis for projects included in the Preferred Alternative, which will include more detailed analysis where appropriate.
Comment Letter No. 372 – Peter Carskaddan	
372-1	See response to Washington Wild letter (comment number 381).
372-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 373 – Mr. Shelley Dahlgren, PhD	
373-1	See response to Washington Wild letter (comment number 381).
373-2	Your support for wilderness protection is noted. Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process or irrigation drought resiliency, if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored.
Comment Letter No. 374 – Michael Siptroth	
374-1	See response to Washington Wild letter (comment number 381).
374-2	Your comment supporting wilderness protections is noted. One of the objectives of the Icicle Strategy is to improve instream flow and habitat for salmonid species.
Comment Letter No. 375 – Julie Stohlman	
375-1	See response to Washington Wild letter (comment number 381).

375-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in the 1990s. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made by the USFS and IPID. Per USFS's comment letter (Letter 4), this will occur at project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation on the Preferred Alternative. Your comment supporting wilderness protections is noted.
Comment Letter No. 376 – Emily Myette	
376-1	See response to Washington Wild letter (comment number 381).
376-1	The PEIS analyzed five alternatives. Under Alternative 1, 2, and 5, the dam at Eightmile Lake would increase in height by four feet to the historic operating level. Under Alternative 3, no action would occur at Eightmile Lake under the Icicle Strategy, although project proponents might pursue the storage restoration project independently of the Icicle Strategy. Under Alternative 4, the dam would be rebuilt up to 10 feet higher. A programmatic analysis of the aesthetic impacts is provided in Section 4.11. Restoration of Eightmile Lake is included in the Preferred Alternative.
Comment Letter No. 377 – Denise Harnly	
377-1	See response to Washington Wild letter (comment number 381).
377-2	Your comment supporting wilderness protections is noted.
Comment Letter No. 378 – Bob Aegerter	
378-1	See response to Washington Wild letter (comment number 381).
378-2	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
Comment Letter No. 379 – Wilderness Watch	
379-1	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
379-2	Your support for public lands and wilderness is noted.
379-3	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Currently, coordination with USFS on Wilderness issues occurs at IWG meetings. USFS is an active member of the IWG, and regularly attends meetings. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120.
379-4	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

379-5	Your support for Alternative 5 and the Full IPID Piping and Pump Exchange are noted.
379-6	One of the guiding principles is to increase instream flow and domestic water supplies, which would require a water right permitting action. Water right transfers and changes in purpose of use are provided for in Chapter 90.03 RCW. The Icicle Strategy is not seeking to increase water supplies at LNFH with water from IPID's storage rights.
379-7	The cost estimates included in the PEIS are programmatic in nature and reflect the co-leads best estimate of cost to date. This is why contingencies have been included in all costs. To address cost overrun concerns of work in the wilderness area, an additional 25-percent contingency has been added to all projects proposed in the wilderness area in the FPEIS.
379-8	The objective of the PEIS is to analyze changes to current conditions at a programmatic level to provide a comprehensive understanding of the impacts of implementing the Icicle Strategy. Discussion of baseline conditions in the tributaries is located in Section 3.3.1, 3.3.2, and 3.5.2. The PEIS found that increased frequency of releases not likely to have a significant adverse impact. Increased flows in late summer are widely believed to be beneficial to aquatic species. A more detailed analysis on the impacts of increased frequency of releases will occur during project level analysis where appropriate.
Comment Letter No. 380 – Sierra Club	
380-1	You comment in support of public lands and wilderness is noted.
380-2	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
380-3	You comment in support of public lands and wilderness is noted.
Comment Letter No. 381 – Washington Wild	
381-1	None of the action alternative propose projects within the Enchantment Basin, although there are proposed changes within the ALWA under Alternative 1, 2, 4, and 5. Your comment supporting wilderness protections is noted. Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws. Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

381-2	The USFS granted easements to IPID in exchange for IPID deeding over their private property to the USFS for inclusion in the ALWA in 1990. Limitations on the IPID easements at the Alpine Lakes is a determination that will be made between IPID and USFS. Per USFS's comment letter (Letter 4), this will occur during project level planning. The IWG and co-leads will work with the USFS on this issue as they move to project level review and implementation. Currently, coordination with USFS on Wilderness issues occurs at IWG meetings. USFS is an active member of the IWG, and regularly attends meetings. An extent and validity analysis, which is completed to determine if a water right or a portion of a water right has been relinquished by non-use or abandoned, is triggered by a water right permitting action. There are several exemptions to relinquishment, which would be reviewed during an extent and validity analysis. At this point, there has been no water right permitting action that has triggered an extent and validity review. The process and timing of an extent and validity analysis is provided in Water Resources POL-1120. The co-leads recognize that NEPA will be required on projects that have a federal nexus, such as permitting actions or funding. NEPA integration and review is discussed in Section 1.9.3.2 and potential permitting requirements are discussed in Table 5-2. Per the USFS comment letter, coordination will occur at the project level for any projects that may have permitting actions required by USFS. Project level of detail regarding permitting and NEPA integration will be provided during project level review as needed.
381-3	Alternative 3 was included in the PEIS in an effort to provide an offsite/non-wilderness alternative. However, in an attempt to be fully transparent, the co-leads including information about the intent of the irrigation district to pursue Eightmile Lake Storage Restoration outside the Icicle Work Group process if it is not selected as part of the preferred alternative. This is discussed in section 2.3.1 of the PEIS. Including this information does not preclude or prevent the dam on Eightmile Lake being repaired rather than restored, so long as it would not have additional adverse impacts not analyzed in the PEIS.
381-4	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 382 – The Wilderness Society	
382-1	Your comment supporting wilderness protections is noted. Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.
382-2	IPID’s water rights are described in Section 3.6. The additional water rights required to implement Alternative 4 is discussed in Section 4.6.
382-3	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 383 – Washington Trails Association	
383-1	Your comment supporting wilderness protections is noted.
383-2	Your concern regarding storage enhancement elements in Alternative 4 is noted. This alternative has not been selected as the Preferred Alternative in the FPEIS.

383-3	Per WAC 197-11-405 a supplemental draft EIS is required if there are substantial changes to the proposal so that the proposal is likely to have significant adverse environmental impacts; or there is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts. New information has not been found nor has the proposal changed in a way that new probable significant adverse environmental impacts are likely.
Comment Letter No. 384 – Unknown Template Email	
	There is no comment.
Comment Letter 385 – Gena Di Labio & Teresa Dix	
385-1	Impacts of the alternatives on climate change and efficacy of the alternatives under climate change conditions are discussed at the programmatic level in section 4.13 of the DPEIS. The action alternatives are not anticipated to have a significant increase in greenhouse gas emissions.
385-2	Impacts to aesthetics, vegetation, and wildlife are described in Sections 4.11, 4.8, and 4.9. No significate impacts were found at the programmatic level. These resources will undergo project level analysis for project included in the Preferred Alternative, which will include more detailed analysis where appropriate.
385-3	Your comment supporting wilderness protections is noted.
385-4	Any project pursued under the Icicle Strategy will need to comply with federal and state laws. Based on programmatic level analysis and information made available by IPID and the USFS, the alternatives considered in the PEIS appear to meet this criterion. Additional analysis and coordination with regulatory agencies will occur at the project level and during project permitting to ensure compliance with all federal and state laws.
385-5	Your support for expanded conservation measures is noted. Conservation is an important element of the Preferred Alternative. Additional detail regarding conservation measures have been added to the Domestic Conservation Project, as described in Chapter 2.5.4. IPID recently completed its CWCP, which details efficiency upgrades that can be made to improve streamflow by reducing IPID's diversion on Icicle and Peshastin Creeks. The CWCP is incorporated in the FPEIS by reference. Similarly, the City of Leavenworth has an up-to-date conservation section in its water system plan. More detail on the Domestic Conservation portion of the Icicle Strategy is expected during project development, review, and permitting.
385-6	See response to comment 385-5.
385-7	See response to comment 385-2, 385-3, and 385-5.

APPENDIX B

SEPA Responsiveness Summary

SEPA Responsiveness Summary – Final
Icicle Strategy SEPA PEIS Scoping

No.	Commenter	Comment Summary	Response
1	Guy Moura, Project Manager Tribal Historic Preservation Officer Confederated Tribes of the Colville Reservation	1) Concern regarding protection of Tribal Treaty Fishing Rights 2) Archaeological, ethnographic, and historical sites of significance within program area	Compliance with state and federal laws, including Tribal fishing rights, is one of the Guiding Principles. Continue consultation with the Confederated Tribes of the Colville Reservation. The PEIS will include a cultural resource survey of areas potentially impacted by projects proposed to meet the Guiding Principles. Consultation with Washington Department of Archaeology and Historic Preservation.
2	William B. Beyers, President Alpine Lakes Foundation	1) Extent of water rights when the Alpine Lakes Wilderness Area was created in 1976 2) Full or partial relinquishment of water rights before or after the creation of the Alpine Lakes Wilderness Area 3) Relationship between storage and diversion rights, and if storage rights are subject to relinquishment if diversion right is exercised 4) Legal ability to build or expand structures on Alpine Lakes 5) Legal ability to construct or expand structures or tunnels upstream from the lakes 6) Legal ability to construct a tunnel	Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will evaluate reasonable alternatives. Existing easements, in-holder agreements, and State water rights will be reviewed.

		7) Rights granted by USFS to IPID and authority to grant those rights during a land transaction in 1990 8) Legal ability to change the purpose of use of a water right 9) To what extent can the IWG process supersede state and federal laws 10) Can the Department of Ecology make objective decisions regarding status of IPIDs water rights	
3	Edward Whitesell 816 Plymouth St., SW Olympia, WA 98502	1) Concern regarding infringement upon the wilderness character of the Alpine Lakes Wilderness. 2) Concern that water management strategy activities/actions would be at odds with 1964 Wilderness Act.	The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws.
4	Derek Poon 400 Boylston Ave E, #2 Seattle, WA 98102 206-729-9378 cell, derekcpoon@gmail.com 206-602-6565 land line	1) How and when will federal provisions and ESA regulations be incorporated into the Icicle Strategy? 2) Are the ESA recovery plan voluntary roadmaps to recovery (delisting) already incorporated into the Icicle Strategy? 3) Have designated use (DU) protections been accommodated within the Icicle Strategy? will my DU matrix be used and published (Alpine Lake 2-17-15, attached)?	Compliance with state and federal law is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal law, including the Endangered Species Act and Clean Water Act.

		4) If the Icicle Strategy cannot adequately protect certain DUs, are economic exemptions planned or have already been explored under the CWA Use Attainability Analysis (UAA, also see CWA Watershed Academy, p. 11), ESA God Squad Decision, or Congressional exemptions? Attachments: 1) ESA Section 4F Recovery Plan criteria, GAO summary.pdf 2) Alpine Lake 2-17-15 IWG mtg, with CWA DU MATRIX.pdf 3) DP 3-4-15 letter, BNR, 3-10-15 meeting.pdf.	
5	Natalie Williams nataliesees@gmail.com	Removal of any resource from a federally-designated wilderness area is a violation of the Wilderness Act and the Alpine Lakes Wilderness Area Management Plan. The EIS should include Alternatives that: 1) protects and preserves the Alpine Lakes water resource in compliance with the above Act and Management Plan 2) acknowledges the limits of the City of Leavenworth, IPID, and other users of the original purpose and legal agreement of the above Act and Management Plan 3) establishes a water rights/volume swap water market in addition to implementing aggressive conservation measures, including	Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will evaluate reasonable alternatives. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project.

		raising prices, issuing limits, scheduled watering, etc.	
6	Norm Stoddard 12556 Shore Street, Leavenworth, WA 98826	What will be the impact of water conservation measures on domestic water wells? Will loss of groundwater dry up wells?	The PEIS will consider impacts to groundwater for projects proposed to meet the Guiding Principles.
7	Steve McKenna 12490 Shore Street, Leavenworth, WA 98826	Commends the IWG for successful collaboration. Enjoyed the presentation. Was very pleased with the outreach and involvement of the community in the process.	General support for the project noted. Additional outreach opportunities are forthcoming at the Draft PEIS stage, Final PEIS, and related to any additional project level EIS's.
8	Scot Brower TU Leavenworth Chapter	Concerns regarding manipulation or alteration of the existing Boulder Field: 1) Is upper Icicle Creek suitable habitat for Steelhead? 2) Will Steelhead passage into upper Icicle Creek result in closure of existing rainbow trout fishery (due to ESA status of Steelhead)?	The PEIS will consider potential aquatic habitat, habitat suitability, and recreational impacts of the projects proposed to meet the Guiding Principles. Opportunities for fish passage improvements throughout Icicle Creek will be evaluated. Compliance with state and federal law is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal law, including the Endangered Species Act.

9	Nete Olsen 836 NW 61st St Seattle, WA 98107	1) A Water Balance Chart should be prepared for the Icicle Creek system: a) baseline flows expected for Icicle Creek and the lakes during "normal" and "drought" years, and anticipated future flows related to global warming. b) water outputs from Icicle Creek under current operations during "normal" and "drought" years showing the locations of the diversions, maximum rates and volumes of diversion, whether the diversions are firm or interruptible, and the holders of the diversionary rights. c) locations of problem areas in the drainage system that the IWG is trying to address to improve instream flows. 2) The Guiding Principles outlined by the IWG need to be ranked in order to establish the relative importance of each principle. Consider assigning "Required" and "Additional" as categories for the Guiding Principles. 3) "Conservation First" should be added as the 10th Guiding Principle. 4) Relocating the diversion locations along Icicle Creek must be considered as an alternative to meet the Guiding Principle of Improving Instream Flow. 5) Transferability of water rights must be demonstrated in the Eightmile Lake Restoration Project.	All of the Guiding Principles have equal priority and must be met as a package to effectuate the proposal endorsed by the Icicle Workgroup. Existing documents provide background on baseline flows, diversions, and current conditions in the Icicle Creek Subbasin, (see county website). The PEIS will provide additional detail on streamflow, diversions, out-of-stream use, and a need statement relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project. The PEIS will discuss proposed actions under the Guiding Principles and related projects that are required by state/federal law. The PEIS will discuss water conservation to meet the Guiding Principles.

		6) Limits of Inundation of Eightmile Lake perimeter should be mapped. 7) Alpine Lakes Optimization, Modernization, and Automation operation strategy needs to be defined: a) How much water will be taken from each lake during a "normal" water year? b) Will the ease of water withdrawal increase the "baseline" withdrawal rate that currently gets drawn? For example, will irrigated acreage increase so that the needs for irrigation rise, and every year becomes a "drought" year? Providing a more regular supply may only make for more severe shortages as the impacts of global warming become clearer. c) How will the benefits to Instream Flows (as an interruptible flow) be balanced with the needs of irrigation (as a firm demand)? 8) Stage/Storage data and bathymetry needs to be developed for each of the Alpine Lakes within the "optimization" program.	The PEIS will provide detail regarding Alpine Lakes Optimization, Modernization, and Automation including release rates, hydrologic inputs, changes to inundated area, and instream flow benefits.
10	Roy McMurtrey	We need wilderness kept pristine, get the water some other way.	Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws.

			The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles.
11	Ken Hemberry General Manager Peshastin Hi-Up Growers	Orchardists/Growers depend on a reliable source of water for irrigation. It was great to learn that the [Icicle] Work Group was focused on meeting the needs of all stakeholders through a consensus process. We both appreciate and support the Work Group's plans and Guiding Principles.	General support for project noted. Agricultural reliability is one of the Guiding Principles.
12	Jori Adkins 301 Puyallup Ave. Tacoma, WA 98421 253-365-1459	Concern about the Icicle group's proposal to use the Alpine Lakes as reservoirs. Wilderness areas are a place of rejuvenation and healthy hiking and wildlife watching.	Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles.
13	Vic Clayson Cashmere, WA	Appreciative of opportunity for public comment. Very much in favor of increased water storage in the subbasin. Concerned about where funding will come from.	General support for project noted. Additional outreach opportunities are forthcoming at the Draft PEIS stage, Final PEIS, and related to any additional project level EIS's. Storage projects will be evaluated as part of reasonable alternatives to meet the Guiding Principles.

			Funding for the proposal is expected to be comprised of local, state, and federal funding sources.
14	Merrie Davis	In favor of additional water storage in the Alpine Lakes area. I hope the proposal is a success.	General support for project noted. Storage projects will be evaluated as part of reasonable alternatives to meet the Guiding Principles.
15	Cristina Hill Leavenworth, WA	As part of the Conservation initiative of the proposed project, the City of Leavenworth should initiate a water metering program and tiered pricing for residential customers. In favor of improving passage at Boulder Field. In favor of upgrading fish screens and new rearing tanks at LNFH. In favor of piping irrigation diversion/delivery systems.	The PEIS will evaluate reasonable alternatives, including conservation incentives. The PEIS will consider impacts on fish passage and screening of the projects proposed to meet the Guiding Principles. General support for project noted.
16	Tim Gartland 9120 Woodworth Avenue Gig Harbor, WA 98332	SEPA Environmental Checklist for the Project may be incomplete. The responses appear to ignore the upstream impacts. Additionally, the manipulated flows meant to provide additional water during the late summer and early fall are by definition unnatural and will have deleterious effects on wildlife, wildlife systems and humans.	The PEIS will assess the potential impacts to wildlife and recreation that might result from the projects proposed to meet the Guiding Principles. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles.

		Increased late-season instream flows will make Icicle Creek unsafe for upstream property owners, camp site users, and other visitors to swim, wade, or bathe themselves.	
17	Ed Burns	Conservation efforts seem to have the lowest priority. The remote control of output from the lakes would seem to be relatively innocuous; the rebuilding of the Eightmile dam less so (interesting that in the reports the "historic" level of the lake is the level after the original dam was built); and the diversion from Upper Klonaqua Lake, outrageous.	All of the Guiding Principles have equal priority and must be met as a package to effectuate the proposal endorsed by the Icicle Workgroup. The PEIS will evaluate reasonable alternatives.
18	Margie Van Cleve 272 Mapleway Road Selah, WA 98942	1) Objects to the term "reservoir" to describe the lakes within the Alpine Lakes Wilderness Area and to the purpose of the project (to manage release from the reservoirs that would optimize water supply in the Icicle Creek subbasin and be coordinate among all users). 2) Conservation of municipal water should be a higher priority. Conservation initiatives should be addressed as a primary means of increasing instream flows; optimizing, modernizing, and automating reservoir management should come secondary. 3) Concerned that IPID's agricultural water rights associated with the	Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles. The PEIS will describe the history of the Alpine Lakes, existing reservoirs, and current operations. All of the Guiding Principles have equal priority and must be met as a package to effectuate the proposal endorsed by the Icicle Workgroup. The PEIS will evaluate reasonable alternatives. The PEIS will evaluate projects to meet the Guiding Principles, including conservation and reclaimed water, agricultural to domestic water right conversions, and storage.

		Alpine Lakes will be converted to domestic water rights. 4) Opportunities for utilizing reclaimed water should be considered as an alternative.	The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles.
19	Fred Smith PO Box 357 Dryden, WA 98821 509-860-3997	1) The number one priority should be whichever project increases stream flow the greatest during mid to late summer. This should be the rebuilding of the dam at Eightmile Lake to the original height, along with installation of automated valves. 2) Regarding the Boulder Field: learn to live with it (i.e., make no change).	All of the Guiding Principles have equal priority and must be met as a package to effectuate the proposal endorsed by the Icicle Workgroup. Project phasing and timelines will be included in the PEIS. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives. Opportunities for fish passage improvements throughout Icicle Creek will be evaluated.
20	Lisa Pelly Director, Trout Unlimited-Washington Water Project Mike Wyant President, Icicle Valley Chapter of Trout Unlimited TU Washington Water Project 103 Palouse Street, Suite 14 Wenatchee, WA 98801 509.888.0970	1) TU is concerned that the Project package meeting Icicle Creek demands through 2050 is not substantiated because no assessment has been conducted specifically addressing future water supply and climate scenarios in the subbasin. Recommends procurement of a water supply and climate change analysis from a team of experts (e.g., UW Climate Impacts Group). TU has provided an analysis of stream flow for Icicle Creek.	The PEIS will consider climate change and its impact on proposed projects. The PEIS will evaluate reasonable alternatives. The PEIS will include a narrative of the current state of water rights in the Icicle Creek Subbasin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project. The PEIS will describe NEPA and other permitting requirements

		2) The IWG should develop a full list of project alternatives, should any of the projects in the proposed package require replacement. 3) Lead agency under NEPA should be identified. 4) Flow objectives could be monitored at the USGS gauge station above the Snow Creek confluence. 5) Concerns about changes to the Alpine Lakes Wilderness area has been expressed by various stakeholders and user groups; these concerns should be taken seriously. 6) TU has ongoing restoration projects in the subbasin. These projects will continue to be managed independent of the IWG Strategy process. 7) The IWG should articulate benefit/cost information for projects in the proposed package. Preferably, this analysis should be conducted independent of the IWG.	The PEIS will assess flow improvements in Icicle Creek at multiple locations. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. The PEIS will include a narrative of projected costs and benefits of projects proposed to meet the Guiding Principles. The PEIS will describe “Alternatives Not Considered” to meet the Guiding Principles, but could be evaluated in another environmental review.

21	Rob Newsom Eightmile Creek Leavenworth, WA 98826 Cell 509-670-3166	I am glad for the water use study in the Icicle. Two things of concern: 1) Every time extra water is released from Colchuck Lake there is a tremendous sediment load suddenly flowing by in Eightmile Creek/ Mountaineer Creek. This is a completely unnatural condition for fish and people in late summer. 2) The continued use of helicopter support and further construction of dams in the Alpine Lakes Wilderness Area is blatantly at odds with the spirit of The Wilderness Act.	General support for project noted. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. The PEIS will discuss potential water quality impacts from projects proposed to meet the Guiding Principles. Using and maintaining the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles.
22	Ruth Dight, AICP (206) 283 9254 2549 11th Ave W Seattle, WA 98119	1) The EIS must consider a Wilderness Protection Alternative to promote wilderness values (Wilderness Act of 1964) and would not allow new water infrastructure or diversions inside the Alpine Lakes Wilderness, and would require all new water supply to be obtained outside the Alpine Lakes Wilderness. 2) The EIS must consider a Water Conservation Alternative, to use aggressive water conservation measures (inclusive of lawn-water restrictions). This alternative should also assess transfer of water rights from irrigation districts to cities, where agricultural land-use has	Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe

		been replaced by residential land-use. This alternative should also assess agricultural irrigation efficiency (e.g., replacing open gravity canals with pipes and pumps). 3) The EIS must consider an Irrigation District Water Right Change Alternative to evaluate moving the IPID water right diversion from Icicle Creek downstream ~3 miles to the Wenatchee River. This measure, which would permanently fix Icicle Creek's low flow problem, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). The Icicle Work Group should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric. 4) The EIS must consider a Water Right Relinquishment Alternative. Loss of potential water resulting from lower dam at Eightmile Lake should be considered as relinquishment of water rights.	what existing and new permits would be necessary for the project.

23	W. Thomas Soeldner Valleyford, Washington	1) The EIS must consider a Wilderness Protection Alternative that would promote the wilderness values set forth in the Wilderness Act of 1964. 2) The EIS must consider a Water Conservation Alternative. 3) The EIS must consider an Irrigation District Water Right Change Alternative, which would involve evaluating a move of the IPID water right diversion to the Wenatchee River Downstream, converting the diversion from gravity flow to pumping. Renewable energy options should be able to supply such power. 4) The EIS should consider a Water Right Relinquishment Alternative, since the dam at Eightmile Lake collapsed decades ago.	The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will include a narrative of the current state of water rights in the Icicle Creek Subbasin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project.
24	John de Yonge President Wise Use Movement PO Box 17804 Seattle, WA 98127	Unacceptable for work group to include agency conveners. IWG must comply with Federal Advisory Committee Act. Programmatic EIS should not preclude project level environmental review. NEPA is required The PEIS should identify existing and historic hydrologic conditions in Icicle Creek.	General objection to the project noted. The PEIS will evaluate reasonable alternatives. The PEIS will describe NEPA and other permitting requirements Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. Objection to SEPA checklist noted. The checklist was an optional process the IWG elected to do in order to

		Comments on completeness of SEPA Checklist Request for the PEIS to describe potential affected environment and identify potential impacts of program and proposed projects. Request for the PEIS to include mitigation measures for potential impacts. The PEIS should address the relationship between the LNFH and Icicle Creek, including purpose and need, fish production, and water withdrawals. The PEIS should address tribal and non-tribal harvest of wild and hatchery fish in Icicle Creek. The PEIS should provide background and need for domestic water supply in the Icicle Creek Subbasin. The PEIS should provide a Wilderness Alternative. The PEIS should identify existing fish passage barriers and projects which would improve fish passage. The PEIS should comply with all local, state, and federal laws. Projects proposed to meet the Guiding Principles should evaluate the potential	provide transparency. A Determination of Significance was issued. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles. PEIS will include a narrative of the current state of water rights in the Icicle Creek Subbasin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS. The PEIS will include background information related to the development of the Guiding Principles, current condition in the Icicle Subbasin, and a need statement. This background information will include background on information on LNFH and domestic water supply. The PEIS will identify targets for instream flows to support spawning, rearing, and migration of ESA-listed salmon, steelhead, and bull trout in Icicle Creek. The PEIS will assess the potential impacts to wilderness and recreation, that might result from the projects proposed to meet the Guiding Principles. The PEIS will consider potential aquatic habitat, habitat suitability, and recreational impacts of the projects proposed to meet the Guiding Principles. Opportunities for fish passage improvements throughout Icicle Creek will be evaluated.

		for increased irrigation efficiencies and conservation practices, water markets, operational improvements to the LNFH, and improvements to fish screening. The PEIS should identify the locations of all proposed projects.	
25	Thomas H. Walker 3815 Bagley Ave N Seattle, WA 98103	1) The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. 2) The EIS should include a "Wilderness Protection" alternative, which should include an alternation of public purchase (buy-back) of private water rights in the Alpine Lakes. 3) The EIS should include a "Water Right Relinquishment" alternative. 4) The EIS should include an alternative that recognizes Icicle Working Group members' water rights are limited to the purposes for which they were initially granted, and cannot be redirected to other purposes. 5) The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the local water users. 6) The EIS should include a "Water Right Change" alternative.	The PEIS will evaluate reasonable alternatives. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will include a narrative of the current state of water rights in the Icicle Creek Subbasin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project. The PEIS will consider impacts of lake/reservoir draw-down from proposed projects The PEIS will identify targets for instream flows to support spawning, rearing, and migration of ESA-listed salmon, steelhead, and bull trout in Icicle Creek. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS.

		7) The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation, and funding that are needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail. 8) The EIS should discuss the hydrological and biological impacts of the current drawdown of the lakes, and any proposed changes. 9) The EIS should provide a detailed operations, maintenance, and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions, including helicopter use. 10) The EIS should fully explain the purpose and need for the water these projects would provide. 11) The EIS should fully explain what human activities caused the degraded conditions that the projects seek to improve. 12) The EIS should analyze adequacy of proposed in-stream flows to support spawning, rearing, and migration of steelhead and bull trout.	Existing documents provide background on baseline flows, diversions, and current conditions in the Icicle Creek Subbasin, (see county website). The PEIS will provide additional detail on streamflow, diversions, out-of-stream use, and a need statement relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles. The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles. The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles.

26	Michael Wyant 12125 Emig Drive Leavenworth, WA 98826 (509) 548 7747	I am concerned that the projections for water savings to reach flow targets are overly optimistic: • The projections rely on all of the proposed projects being completed. The suite of proposals should include additional options so that meeting the target for flows does not rely on completing all of the projects. • The proposed positive effects of identified water management strategies are overly optimistic given many of the climate change projections for the next 50 years. Though I consider myself a staunch supporter of wilderness, I am in favor of the proposed changes at the lakes in the Alpine Lakes Wilderness that are managed as water storage reservoirs. • I support those changes because maintaining the existence of the reservoirs was grandfathered in when the wilderness was established. • It makes sense to use the water in those reservoirs as efficiently as possible, even though doing so intrudes and will continue to intrude on the wilderness experience. • I support the reconstruction of Eightmile Lake dam to its original height even though doing so will inundate land that	General support for project noted. The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles.

		has been above lake level for many years. • I oppose raising the height of the original reservoir because that would represent a change to the agreement to keep the existing reservoirs when the wilderness was established. I would like to be assured that sufficient scientific study is in place to make it relatively certain that the project will have the positive effects that are proposed and that the possibility that the project will have unintended negative consequences has been thoroughly considered. I would also like to know that each project that has the potential to impact the icicle ecosystem includes a plan and the resources necessary to study the post-project impacts. • Too often projects are completed with the idea that they will improve an ecosystem when there is no post-project evidence that they actually had the intended effects and that they are not, in fact, having a negative or unintended effect.	
27	Winnie Becker	1) Please preserve the Alpine Lakes Wilderness. To build dams and change water rights would not be in keeping with the wilderness. 2) The EIS should include a "Wilderness Protection" alternative. The increase of water removal from	Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives.

		the Alpine Lakes Wilderness is not in keeping with protecting the wilderness which is so very important for generations to come. Water should be obtained from sources outside the Wilderness. The Wilderness Protection alternative should comply with all the provisions in the Forest Service's administrative Alpine Lakes Wilderness Management Plan, including: " Except as provided for in Section 4(D)(4) of the Wilderness Act, watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge. 3) The Wilderness Protection alternative should evaluate public purchase (buy-back) of private water rights in the Alpine Lakes, which would allow removal of dams and other structures from the lakes to restore the area to its true natural character. 4) The EIS should include "Water Right Relinquishment" alternative. The alternative should analyze existing water rights to the Alpine Lakes and acknowledge those rights that have been relinquished or abandoned. 5) The EIS should include an alternative that recognizes IWG members" water rights are limited to the purposes for which they were initially granted (irrigation is an	The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will consider impacts of lake/reservoir draw-down from proposed projects. The PEIS will identify targets for instream flows to support spawning, rearing, and migration of ESA-listed salmon, steelhead, and bull trout in Icicle Creek. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS. Existing documents provide background on baseline flows, diversions, and current conditions in the Icicle Creek Subbasin, (see county website). The PEIS will provide additional detail on streamflow, diversions, out-of-stream use, and a need statement relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe

		example) and cannot be redirected to other purposes (such as suburban development). 6) The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the city of Leavenworth, Icicle-Peshastin Irrigation District, the Leavenworth fish Hatchery and other water users. This alternative should evaluate water markets that facilitate selling and trading of water rights. 7) The Water Conservation alternative should evaluate a transfer of water rights from IPID to Leavenworth for properties within the city limits that have now converted from orchards to residential properties. This alternative should analyze how appropriate reductions in water usage (that is, not using agricultural water quantities for lawn irrigation) would save that would then be available for other Leavenworth needs. 8) The Water Conservation alternative should evaluate how IPID spills large quantities of water back into the Wenatchee River at the end of several of its canals. The alternative should evaluate how this 19th century irrigation practice could be replaced with modern pumping and piping technologies. The EIS should work to reduce water	what existing and new permits would be necessary for the project.

		demand as an alternative to water supply. 9) The EIS should include a "Water Right Change" alternative. This alternative would evaluate improving Icicle Creek flows by moving IPID's point of diversion downstream (to the Wenatchee River). This measure, which would add 100 cfs of water to Icicle Creek every year, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). This alternative should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric. 10) The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes, and any proposed changes. The analysis should include a review of scientific literature on the impacts of water removals upon wildlife, vegetation, soil and wilderness values 11) The EIS should analyze each proposed action's site-specific impacts, past practices and the restoration, mitigation and funding that are needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail.	

		12) The EIS should provide a detailed operations, maintenance and environmental monitoring for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions including helicopter use. 13) The EIS should fully explain the purpose and need for water these projects would provide. 14) The EIS should fully explain what human activities caused the degraded conditions (such as low instream flows in Icicle Creek) that the projects seek to improve. 15) The EIS should analyze adequacy of proposed instream flows to support spawning, rearing and migration of steelhead and bull trout.	
28	Dean and Martha Effler	Please do not allow any agreement to provide water to commercial or residential users that would impact the hydrology and natural beauty of the Alpine Lakes Wilderness. A wilderness no longer is a wilderness when you drain its natural resource or flood its land. Only allow growth in local cities and counties based on water conservation methods rather than tapping into the waters of a protected wilderness.	Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles.

29	Jena F. Gilman, P.E. (WA 23673) 1480 SW 10th Street North Bend, WA 98045	1) The EIS should fully explain the purpose and need for each of the water projects outlined in the "Icicle Strategy". 2) The EIS should analyze each of the proposed action's site-specific impacts, past practices, and the restoration, mitigation and funding needed in the future. At each site, proposed construction activities need to be explained and illustrated in detail as well as how wilderness and habitat values will be maintained throughout the period of construction for Wilderness users and the complete array of fauna and flora that inhabit these areas. 3) The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes within the Wilderness and the incremental impacts of any proposed changes. The analysis should include the impacts of water removals upon all wildlife, vegetation, soil and wilderness values.	The PEIS will evaluate reasonable alternatives. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will consider impacts of lake/reservoir draw-down. The PEIS will identify targets for instream flows to support spawning, rearing, and migration of ESA-listed salmon, steelhead, and bull trout in Icicle Creek. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS. The PEIS will include background information related to the development of the Guiding Principles, current condition in the Icicle Creek Subbasin, and a need statement.

		4) The EIS should provide detailed operations and maintenance plans for proposed infrastructure and an analysis of the impacts on the wilderness experience of specific maintenance actions, including helicopter operations. 5) The EIS should consider a Wilderness Protection Alternative. This alternative would promote wilderness values as set forth in the Wilderness Act of 1964, would not allow new water infrastructure or diversions inside the Alpine Lakes Wilderness, and would require all new water supply to be obtained outside the Alpine Lakes Wilderness. 6) The EIS should consider a serious Water Conservation Alternative. This alternative would assess using aggressive water conservation measures by area cities, including restrictions on lawn watering and provision for landscaping that is suited to the climate without irrigation for any new development. This alternative should also assess transfer of water rights from irrigation districts to cities, where orchards have already been torn out and replaced with residential subdivisions. This alternative should also assess agricultural irrigation efficiency, such as replacing open gravity canals with pipes and pumps. This	The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project.

		Alternative should also consider water re-use technologies. 7) The EIS should consider an Irrigation District Water Right Change Alternative, which would fix Icicle Creek's low flow problem. This alternative would evaluate moving the Icicle-Peshastin Irrigation District's water right diversion, which presently takes 100 cubic feet per second out of Icicle Creek, to the Wenatchee River downstream. 8) The EIS should consider a Water Right Relinquishment Alternative. Removal of water from the Alpine Lakes Wilderness is an issue only because the Icicle-Peshastin Irrigation District holds water rights that were grandfathered when the Wilderness was created. When the dam at Eightmile Lake failed the Irrigation District did not fix it because they did not need the water. When a party doesn't use their rights, they lose them. The "Use It or Lose It" doctrine should govern. The EIS needs to acknowledge this issue.	
30	Carmen Andonaegui WDFW, Region 2 Habitat Program Manager 1550 Alder St NW Ephrata, WA 98823 (509) 754-4624	1) It is essential the PEIS describes the sequencing and timing of permittable projects and identifies the beneficiaries of in-stream and out-of-stream flow improvements. WDFW is concerned that water will be allocated for out-of-stream uses before an adequate amount of flow	Continue consultation with WDFW. Appropriate habitat and wildlife surveys will be conducted on affected environment for each of the proposed projects. The PEIS will provide detailed streamflow, diversions, instream and out-of-stream use information

		improvements are made in Icicle Creek. 2) At the public scoping meeting held in Leavenworth it was stated by Aspect Consulting that the timeframe associated with implementing projects ranged from 5-20 years. In order to "track" flow improvements that may occur over the next 5-20 years, a project implementation schedule should be included in the PEIS so readers can adequately provide comments, mitigation recommendations, and resource protection expectations within the context of "real water" in "real time". 3) Please describe the "Alternative Projects" being contemplated for replacing projects that may not be feasible. WDFW expectations are that alternative projects would be identified through a collaborative process to replace those benefits and functions intended by the project determined to be infeasible. 4) As fisheries co-managers for the state of Washington, WDFW does not support waiting 5-20 years to upgrade the Leavenworth Hatchery. We respect Ecology and CCNRD's efforts to find non-litigious solutions to upgrading the hatchery to meet state and federal laws. However, we also want to be clear that though our agency is an active member of the IWG, we are in no way	relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles. All of the Guiding Principles have equal priority and must be met as a package to effectuate the proposal endorsed by the Icicle Workgroup. Project phasing and timelines will be included in the PEIS. The PEIS will include a narrative of projected costs and benefits of projects proposed to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives. The PEIS will discuss proposed actions under the Guiding Principles and related projects that are required by state/federal law. The PEIS will consider climate change and its impact on proposed projects. The PEIS will identify and discuss early implementation items. The PEIS will describe NEPA and other permitting requirements The PEIS will describe "Alternatives Not Considered" to meet the Guiding Principles, but could be evaluated in another environmental review. The Guiding Principles include robust instream flow improvement. Construction of projects designed to provide this instream flow improvement may have some terrestrial impacts, which will be evaluated in the PEIS. The adequacy of lands proposed for acquisitions under

		advocating delaying compliance-related upgrades at the hatchery as a result of being a project element of the PEIS. We suggest providing details within the PEIS that "cross-walks" your efforts to solve hatchery issues with the U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service's efforts. 5) It is essential that long-term climate change scenarios serve as the "backbone" to developing the PEIS. Refill scenarios for the Alpine Lakes remain uncertain, as do in-stream flows influenced from timing and quantity of annual precipitation. WDFW urges Ecology not to over-commit water for out-of-stream uses made "available" as a result of implementing any of the projects. We would not be doing our job as a resource agency if we did not safeguard stream flows to protect fish and their habitat throughout this PEIS process. We assume the same level of safeguarding will occur from Ecology to protect senior water right holders from harm or avoid project actions that may cause adverse impacts to stream flows or water quality. WDFW expects to see a robust section in the PEIS that evaluates climate change effects on project operational scenarios (e.g. new water management of the Alpine Lakes) and then illustrates how stream flow improvements will be	the guidance of the Upper Wenatchee Community Lands Plan will be scaled appropriately. Fish life stages will be described in the PEIS, as well as impacts to various species based on different instream flow quantities.

		achieved while simultaneously providing additional water for out-of-stream uses (i.e. show the math). 6) Ecology and CCNRD have indicated that some of the projects listed above may be described with a higher level of detail within the PEIS than the broader ICWRMS projects, making some projects ready for early implementation. Evaluation of projects considered for early implementation should include an assessment of natural resource costs and benefits as a function of project sequencing/early implementation within a subsequent project-level EIS, as necessary. 7) As you are aware, WDFW is actively working on several fish screen and diversion replacement projects in Icicle and Peshastin Creeks to protect fish life; these projects are slated to occur in the near future. WDFW staff will continue to manage these projects and our own environmental compliance process, associated grant awards, and partnerships independent of the Icicle Strategy. However, our WDFW team is always available to assist with project planning and/or provide expertise to support PEIS development. 8) Please provide a hardy, water conservation and reduction section in the PEIS. For example, what are	

		some ways CCNRD and Ecology will reduce the current gallon per capita per day as a tool to provide water for future growth and respond to drought effects? How will those endeavors be coordinated with investigating new water supply in the Alpine Lakes? WDFW recommends including a plan in the PEIS by which (1) CCNRD and Ecology will partner with utility providers to offer rebates for using less water, (2) to update local regulations and/or develop ordinances to promote and/or require water savings wherever possible, and (3) to develop water conservation and reduction incentive programs. 9) WDFW still isn't clear how the Upper Wenatchee Community Lands Plan is linked to the ICWMRS. WDFW habitat and wildlife staff have communicated with CCNRD that parcels identified in the Upper Wenatchee Community Lands Plan for acquisition may modestly add habitat value for wildlife or watershed protection in of itself. WDFW doubts these lands will be sufficient to provide "commensurate compensation for impacts to fish and wildlife resources" in the Icicle Creek basin. In addition to low habitat value, the scope of the Upper Wenatchee Community Plan includes Cashmere to Stevens Pass, with	

		three sub-areas not located in the Icicle Creek Basin including: 1) Blewett Pass/Peshastin, 2) Chumstick Valley, and 3) Nason & Coulter Creek. The Wenatchee Community Lands Plan webpage makes no clear reference to how these "out-of-basin lands" are linked to the ICWRMS. WDFW recommends Ecology and CCNRD work with resource experts to assess lands for acquisition and/or enhancement within the Icicle Creek basin that can provide valuable fish and wildlife habitat. As you are aware, mitigation should be similar to the resource values lost through project development; out-of-place and/or out-of-kind mitigation is only appropriate when all other in-place mitigation opportunities have been exhausted. 10) WDFW encourages Ecology and CCNRD to identify a lead federal agency to undertake the NEPA process as soon as possible. WDFW is unclear if federal participation on the IWG and dedication of time and personnel constitutes a "major federal action" within the meaning of NEPA. WDFW suggests delineating projects in the PEIS that cannot proceed until NEPA has been fulfilled. This will ensure local, state, and federal agencies, tribes, and other stakeholder groups have a clear understanding of project	

		implementation timelines and associated in-stream flow benefits for each project (i.e. when will the water be in Icicle Creek and how much). ***Wildlife*** • The WDFW Priority Habitat and Species (PHS) data layers are a tool for planning purposes. These data sources cannot be assumed complete or exhaustive in expanses of wilderness considered in the PEIS. Lack of information for any species does not indicate a lack of presence. If the U.S. Forest Service (USFS) does not have species presence/absence surveys, WDFW recommends terrestrial surveys be completed for species likely to occur within the project footprint. • Project activities requiring the use of helicopters pose a significant disturbance threat to mountain goats in the Alpine Lakes Wilderness - flying over mountain goats is considered to be a direct disturbance. WDFW recommends conducting surveys for concentrations of mountain goats for PEIS development. Specific consideration should be made for the timing of helicopter use to avoid the period when females are giving birth and following weeks when raising young. • Golden eagles, peregrine falcons, northern goshawks, and northern	

		spotted owls all occupy, nest, and rear young in associated habitats in the wilderness and may be located within the project footprint. WDFW recommends conducting surveys within the project footprint so a plan can be developed to avoid disturbing nest sites, particularly until young have fledged. The high elevation and colder conditions of the wilderness will extend fledging dates into the summer later than warmer low elevation habitats. • WDFW recommends conducting surveys for pika within the project footprint and to work closely with WDFW and the USFS to avoid impacts to this species at the project planning stage. • Any open water habitat included within the project footprint should be surveyed for common loon nesting. The potential for direct impacts to loon nests is high for any project activities that would result in a rise of water elevation on any lakes. • The USFS and WDFW are coordinating in summer of 2016 to conduct amphibian and reptile surveys at wetlands, lakes, ponds or streams located within and whereas water-levels or flows are impacted by the package of projects in the PEIS. Data collected and information in the final report should be used to	

		develop the Final PEIS and for future, subsequent EISs. ***Habitat*** • Installation of a flow meter, with access to the data should be made publicly available to confirm proposed minimum instream flows designated for the Historic Channel in Icicle Creek are being met. • WDFW support CCNRDs efforts to fund and install meters on all diversions. • The water market being developed for Icicle Creek will need to be coordinated annually with fisheries co-managers to avoid seasonal harm to instream flows, including winter flows to protect fish life. ***Fish*** • Fish passage improvements should include flow as an important component to ensure riffles are passable to upstream migrating salmonids. • WDFW can provide fish stocking data for the Alpine Lakes if requested. Our agency has a vested interest in ensuring changes in operations at the lakes do not adversely impact fish • Modeling flow scenarios out of each and/or all of the Alpine Lakes being contemplated in the PEIS will help prioritize flows scenarios that maximize benefits to fish at each relevant life stage. Focal	

		species and relevant life stages include Steelhead (adult, rearing), Rainbow trout (adult, rearing), Bull Trout (adult/sub-adult, rearing), Cutthroat Trout (adult, rearing), and Lamprey (adult). • Bringing fish screening associated with diversions into compliance with state and federal requirements should be a nondiscretionary "early action" item of the PEIS; this action should be funded and pursued in the immediate future as a priority of the ICWRMS.	
31	Doug Scott Wilderness Consulting 1723 18th Avenue, Suite 25 Seattle, WA 98122	The Alpine Lakes Wilderness Area is a beloved part of America's National Wilderness Preservation System: The Wilderness Area--every acre of it -- is protected with the full strength of the 1964 Wilderness Act. The building of new dams or water diversions, however "minor" you may think they would be, is illegal. Were your proposal to succeed, it would constitute a very serious and unacceptable precedent.	Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles.

32	Alpine Lakes Protection Society; Alpine Lakes Foundation; Alliance for the Wild Rockies; American Whitewater; Aqua Permanente; Center for Environmental Law & Policy; Conservation Congress; El Sendero; Endangered Species Coalition; Federation of Western Outdoor Clubs; Friends of the Bitterroot; Friends of Bumping Lake; Friends of the Clearwater; Friends of the Enchantments; Friends of Lake Kachess; Friends of Wild Sky; Great Old Broads for Wilderness; Issaquah Alps Trail Club; Kachess Homeowners Association; Kachess Ridge Maintenance Association; Kittitas Audubon Society; Kittitas County Fire District #8; The Mazamas; Middle Fork Recreation Coalition; North Cascades Conservation Council; North Central Washington Audubon Society; Olympic Forest Coalition; River Runners for Wilderness; Save Our Sky Blue Waters; Seattle Audubon Society; Sierra Club; Spokane Mountaineers; Spring Family Trust for Trails; Washington Native Plant Society; Washington Wild; Western Lands Project; Wilderness Watch; Wild Fish Conservancy; Doug Scott Wilderness Consulting; and Rachael Osborn	1) We suggest several reasonable alternatives to fully evaluate project opportunities, impacts and needed mitigation. We believe that the alternatives below are reasonable and can feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation: 2) The EIS should include a "Wilderness Protection" alternative. 3) The EIS should include a "Water Right Relinquishment" alternative. 4) The EIS should include a "Water Conservation" alternative 5) The EIS should include a "Water Right Change" alternative 6) Given the fact that the Wilderness Area is federally managed, the relationship between these two different review processes should be disclosed. 7) The impact of each alternative on Icicle Creek's resilience to climate change, particularly with regard to changes in amount or timing of precipitation and instream flow, should be evaluated. 8) The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes, and how the proposed	The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will consider impacts of lake/reservoir draw-down from proposed projects. Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles. The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles. Existing documents provide background on baseline flows, diversions, and current conditions in the Icicle Creek Subbasin, (see county website). The PEIS will provide additional detail on streamflow, diversions, out-of-stream use, and a need statement relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles The PEIS will describe all potential projects and impacts under the proposed program in detail. Additional detail will be provided in any subsequent project level EIS. The PEIS will identify targets for instream flows to support spawning, rearing, and migration of ESA-listed salmon, steelhead, and bull trout in Icicle Creek. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the

		changes will affect the current situation. 9) The EIS should provide a detailed operations, maintenance, and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions, including helicopter use. 10) The EIS should fully explain the purpose and need for the water these projects would provide. 11) The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation, and funding that would be needed in the future. 12) The EIS should analyze the adequacy of proposed instream flows to support spawning, rearing and migration of steelhead, salmon and bull trout. 13) The EIS should include maps, diagrams and photos to clearly show the current situation (including the place of diversion and amount of water diverted) at each of the lakes and other project locations and how that would change under the proposed action(s) under each alternative	Guiding Principles and the projects proposed to meet the Guiding Principles. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project. Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles Existing easements, in-holder agreements, and State water rights will be reviewed.

33	Jasa Holt Data Specialist WDNR Washington Natural Heritage Program 1111 Washington St SE MS 47001 Olympia, WA 98504-7001	A summary of information on rare plants or rare and/or high quality ecological communities in the vicinity of your project accompanies this letter (Excel file; GIS shapefile).	Comment noted. Information provided by WDNR will be incorporated into the PEIS.
34	Eric Rickerson State Supervisor USFWS Washington Fish and Wildlife Office Central Washington Field Office 215 Melody Lane, Suite 103 Wenatchee, WA 98801	1) The USFWS recommends that a single Coordination Act Report be requested for the entire proposed Project package in collaboration with Ecology, CCNRD, WDFW, and the USFWS. 2) The PEIS should include the sequencing and timing of proposed Projects. The PEIS should also develop a phased implementation schedule to facilitate Section 7(a)(2) consultation with the USFWS to assess individual and cumulative impacts of Projects. 3) 'Early and Often' coordination with the USFWS Central Washington Field Office and federal partners is encouraged. 4) A single federal agency should be selected to lead Section 7(a)(2) consultation and NEPA processes. 5) Please carefully consider the scoping comments provided by the WDFW.	Continue consultation with the USFWS and WDFW Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. All of the Guiding Principles have equal priority and must be met as a package to effectuate the proposal endorsed by the Icicle Workgroup. Project phasing and timelines will be included in the PEIS. The PEIS will describe NEPA and other permitting requirements Comment noted.

35	American Rivers, The Wilderness Society, Washington Trails Association, The Mountaineers	1) Our organizations recommend the IWG explore non-Wilderness options for improving instream flows. 2) We are very concerned by the potential negative impacts to recreation in the Enchantment Lakes region. These impacts should be identified through the PEIS and alternatives should be provided that avoid all negative impacts to aesthetics, user experience, trails, access and camping. There should be no net loss of recreational access and experience. 3) We are concerned that the scope of the Icicle Strategy may extend beyond the valid, existing water rights as limited by relinquishment and recorded agreements. We recommend that all water rights be analyzed for valid use. 4) Our organizations recommend the evaluation of improving Icicle Creek flows by moving the Icicle-Peshastin Irrigation District's point of diversion downstream to the Wenatchee River. 5) We recommend identification of a federal agency that will serve as the lead during NEPA processes 6) Our organizations recommend the development of a list of proposed project alternatives that will meet the Guiding Principles established by the IWG and that are practical, feasible and implementable. Project alternatives will also demonstrate that the final package contains projects that have the greatest	The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. The PEIS will describe NEPA and other permitting requirements Using the Alpine Lakes as reservoirs is the existing condition. One of the Alternatives being considered is to improve the operation of the Alpine Lakes reservoirs to meet the Guiding Principles

		conservation benefit for the most effective cost.	
36	Bob and Linda Welsh	1) Please do not seek any increase in the amount of water removed from the Alpine Lakes Wilderness area. 2) The EIS should include a Wilderness protection alternative 3) The EIS should include a Water Conservation alternative. 4) The EIS should include a Water Right Change alternative 5) The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation, and funding that are needed in the future. 6) The EIS should provide a detailed operations, maintenance, and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of the specific maintenance actions, including helicopter use.	The PEIS will evaluate all reasonable alternatives. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS. Existing documents provide background on baseline flows, diversions, and current conditions in the Icicle Creek Subbasin, (see county website). The PEIS will provide additional detail on streamflow, diversions, out-of-stream use, and a need statement relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles.

		7) The EIS should fully explain the purpose and need for the water these projects would provide. 8) The EIS should fully explain what human activities caused the degraded conditions that the projects seek to improve.	The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles.
37	Chester Marler Leavenworth	1) The PEIS should present the documentation that establishes the historic high water line at Eightmile Lake. 2) Mitigation for activities at Eightmile Lake might include some trail re-routing around the lake, constructing new campsites on higher ground, softening the appearance of vegetation removal for the higher reservoir, etc. 3) PEIS need to acknowledge the goal of protecting Wilderness values, not simply meet the letter of the law—acknowledge the feelings of Wilderness enthusiasts. 4) Optimization and modernization of the flow from the lakes are great—should have been accomplished long ago. 5) Water conservation by IPID and COIC does not appear as robust as it could. This should be more specific. Both districts need to address the non-agricultural use of a significant portion of their water—watering of extravagant and very large “lawns”. This tends to lessen	The PEIS will provide detail regarding Alpine Lakes Optimization, Modernization, and Automation including release rates, hydrologic inputs, changes to inundated area, and instream flow benefits. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles. The PEIS will consider environmental monitoring as appropriate for potential impacts of any proposed projects. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives.

		the public image of the districts, and makes one wonder if legislative changes to the state's water rights laws are in order. 6) At some point in the future the pressure on water resources will be much greater and I would not be surprised to see many responsible citizens asking for fundamental changes to water law. This could include reducing water rights when lands change from agricultural use to suburban. The PEIS could look ahead and discuss how some of these issues will require being more flexible and creative in finding solutions.	
38	Charles Raymond 3798 NE 97th St. Seattle, WA 98115 (206) 522-3798 cfr98115@gmail.com	1) The PEIS needs to present a range of alternatives with significantly more extensive analysis than given in the present information for scoping. 2) Recognition of Wilderness values. All alternatives need to account for the special circumstances for construction and maintenance of structures in Wilderness Areas. 3) Some alternatives (at least one and perhaps all) should include the aim to enhance Wilderness values through reduction in footprint, appearance of structures and the mode of maintaining them. What is the cost benefit ratio for each of the 7 managed lakes? Could one or more of them be returned to a	The PEIS will evaluate reasonable alternatives. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will provide detailed streamflow, diversions, and out-of-stream use information relevant to the Guiding Principles and the projects proposed to meet the Guiding Principles.

		natural condition without significant loss of flexibility or dependability? Could there be public buyback of associated water right to enable compensating adjustment on the user end? 4) The PEIS needs to give historical background on actual water withdrawal and use and a clear explanation of corresponding water rights including identification of purposes for which they were granted. 5) The PEIS should evaluate alternative diversion points (e.g., outside Icicle Creek in the Wenatchee River). 6) The PEIS should include a conservation alternative.	
39	Patricia Danner Spokane County and Washington State lifelong resident and registered voter Alpine Lakes Wilderness Hiker	Wilderness areas need to remain WILD…Please, please, please use your position and ability to protect this gem of a wilderness area…If there is not enough water for the humans, then limit the human expansion in the area. Don't drain and destroy the wilderness!	Comment noted. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws.

40	Andy Zahn, Toutle, WA	I am especially opposed to the reconstruction of the Eightmile lake dam and any new construction on Klonaqua lakes… Such projects are not compatible with the primeval character of wilderness. These are the two parts of the proposal with which I take the most issue, but I would like to express my disapproval of most everything else it contains. I would see all the Icicle Basin dams on alpine lakes removed and the region restored to its natural state. These structures are an ugly blemish on an otherwise pristine and spectacular region. Please explore other options such as water conservation rather than cause further degradation of the Alpine Lakes Wilderness.	Comment noted. The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles.
41	Laurel Schandelmier	1) The public would appreciate a better understanding of the purpose and intent of making these proposed changes to improve instream flows. The EIS should provide alternatives that minimize, or even reverse, damage to existing wilderness area. 2) The EIS should include a "Wilderness Protection" alternative that would not increase the amount of water removed from the Alpine Lakes Wilderness, not create a disturbance or encroach on wilderness lands, and not expand easements should be considered. 3) The EIS should evaluate the feasibility of purchasing back private water rights to the Alpine Lakes to	The PEIS will evaluate reasonable alternatives. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will consider impacts of lake/reservoir draw-down from proposed projects. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS.

		allow removal of dams and other structures to restore the wilderness to its pre-developed state. If this is not possible, I agree that installing remotely controllable valves to allow for the controlled drawdown of lake levels over a season, responding to current weather patterns and water needs, would add flexibility and robustness to the system. 4) The EIS should consider a "Water Right Relinquishment" option for existing water rights in the Alpine Lakes if any have been relinquished or abandoned. 5) The EIS should consider a "Water Conservation" option emphasizing aggressive water conservation. 6) The EIS should analyze each proposed action's site-specific impacts, past practices, and any restoration, mitigation, or funding needed in the future. For each site, proposed construction activities and water diversions should be laid out in detail. 7) The EIS should discuss the hydrological and biological impacts of the current level of lake drawdown, as well as any proposed future changes. 8) A detailed operations, maintenance, and environmental monitoring plan for the water infrastructure alongside an analysis of wilderness	The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles.

		impacts of specific maintenance actions.	
42	Philip Fenner Seattle	I understand the rationale behind your proposal to revive the old dams on some of the lakes there. I can see why you would like to do it. But I don't think you should. Doing that ought to be the absolute LAST thing you consider if water in the Wenatchee basin runs low. And here's why: Alpine Lakes Wilderness is a sacred place, in many ways to many people. It should not be subjected to artificial manipulation - period. Just because it was manipulated in the past is no reason to start manipulating it again now. If you're short on water do EVERYTHING else first, starting with a ban on lawn watering and taking other such water conservation measures. And the fish hatchery is a big water waster, fix that first. It just makes NO sense to damage a natural area if anything else could be done beforehand to see if the water equation could work without damaging Wilderness.	The PEIS will include background information related to the development of the Guiding Principles, current condition in the Icicle Creek Subbasin, and a need statement. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles. The PEIS will evaluate reasonable alternatives.

43	Greg Shannon 313 Olive Street Cashmere, WA 98815	I have concerns about the collaborative efforts by members of the Icicle Working Group and the agency participation in the study. I also have a concern about increasing water for development (transfer of water rights) without having a detailed PEIS alternative to look at major conservation of water by all users. Any impacts in the Alpine Lakes Wilderness should be addressed in a specific alternative.	Comment noted. The PEIS will evaluate reasonable alternatives. The PEIS will assess the potential impacts to wilderness and recreation that might result from the projects proposed to meet the Guiding Principles.
44	Robert Mullins 234 Mine St. Leavenworth, WA	I support, actually I demand, that Icicle-Peshastin Irrigation District will fully and completely use its water rights including any related construction, transportation, use of aircraft, use of power equipment, use of all legitimate activity, equipment, and construction related to full implementation of Icicle-Peshastin Irrigation District water rights and resultant uses in the Alpine Lakes Wilderness as existed before the creation of the Alpine Lakes Wilderness. These rights pre-exist and are more important than the Alpine Lakes Wilderness and any uses of any visitors to the Alpine Lakes Wilderness. I understand the water rights, my family and I are dependent on that water.	Comment noted. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws.

45	Ann Fink 201 Mine Street Leavenworth, WA 98826 northfork@nwi.net May 11, 2016	1) The Irrigation districts has easements on only 2 of the 4 sections that underlie Eightmile Lake. The other two sections are wilderness and don't appear to have "easements". Please explain how the IWG can flood congressionally designated wilderness lands without involving the U.S. Forest Service in these discussions. 2) The Icicle Irrigation District should provide its records regarding its use of water from this lake. 3) I would like to see a discussion of how the Irrigation District and its partners will mitigate some of the ugly visual effects of raising the level of the lake and then lowering well below current levels. The effects to plants and wildlife need to also be addressed. Improvements at other lakes also need to consider the visual and ecological effects. 4) Remote monitoring and control of existing facilities appear to be a good modern option if the equipment needed for this activity can be blended into the surroundings without intruding on wilderness values. 5) The Icicle Working Groups needs to champion conservation measures and improved facilities (non-leaky) water distribution systems for rational and equitable water distribution.	The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will assess potential impacts to aesthetics. The PEIS will consider mitigation measures for likely impacts identified in the document. The PEIS will consider impacts of lake/reservoir draw-down from proposed projects.

46	Kimberly Wells	I urge the county to consult the applicable federal laws, including NEPA, the Wilderness Act, and the Endangered Species Act, and to reconsider the proposed project before proceeding to violate them.	Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws.
47	Jerry Bodine 585 SW Mt. Cedar Dr. Issaquah, WA 98027	1) The EIS should include a "Wilderness Protection" alternative. This alternative should promote Wilderness values by not seeking any increase in the amount of water removed from the Alpine Lakes Wilderness; not expanding easements; not encroaching on wilderness lands; not using mechanical transport; and not building any structure or installation in the Wilderness. Under the Wilderness Protection alternative, any new water supplies should be obtained from sources outside the Wilderness, and use non-Wilderness options for improving instream flows (for example, the IPID change in diversion point discussed below). The Wilderness Protection alternative should comply with all provisions in the Forest Service's administrative Alpine Lakes Wilderness Management Plan, including: "Except as provided for in Section 4(d)(4) of the	The PEIS will evaluate reasonable alternatives. Compliance with state and federal laws, including the Wilderness Acts, is one of the Guiding Principles. The PEIS will discuss the compatibility of projects proposed to meet the Guiding Principles with applicable state and federal laws. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS. The PEIS will consider impacts of lake/reservoir draw-down from proposed projects. The PEIS will consider monitoring, maintenance, and operation of projects proposed to meet the Guiding Principles. Existing documents provide background on baseline flows, diversions, and current conditions in the Icicle Creek Subbasin, (see county website). The PEIS will provide additional detail on streamflow, diversions, out-of-stream use, and a need statement relevant to the

		Wilderness Act, watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge." 2) The Wilderness Protection alternative should evaluate public purchase (buy-back) of private water rights in the Alpine Lakes, which would allow removal of dams and other structures from the lakes to restore the Wilderness area to its true natural character. 3) The EIS should include a "Water Right Relinquishment" alternative. This alternative should analyze existing water rights to the Alpine Lakes and acknowledge those rights that have been relinquished or abandoned. 4) The EIS should include an alternative that recognizes IWG members' water rights are limited to the purposes for which they were initially granted (for example, irrigation) and cannot be redirected to other purposes (such as suburban development). 5) The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the City of Leavenworth, Icicle-Peshastin Irrigation District, the Leavenworth Fish Hatchery and other water users. This alternative should	Guiding Principles and the projects proposed to meet the Guiding Principles. The PEIS will identify targets for instream flows to support spawning, rearing, and migration of ESA-listed salmon, steelhead, and bull trout in Icicle Creek. The PEIS will include narrative of the current state of water rights in the basin. For each project designed to meet the Guiding Principles, the PEIS will prescribe what existing and new permits would be necessary for the project.

		evaluate water markets that facilitate selling and trading of water rights. 6) The Water Conservation alternative should evaluate a transfer of water rights from IPID to Leavenworth for properties within the city limits that have now converted from orchards to residential properties. This alternative should analyze how appropriate reductions in water usage (that is, not using agricultural water quantities for lawn irrigation) would save water that would then be available for other Leavenworth needs. 7) The Water Conservation alternative should evaluate how IPID spills large quantities of water back into the Wenatchee River at the end of several of its canals. This alternative should evaluate how this 19th century irrigation practice (which was required to ensure water made it to the furthermost customers) could be replaced with modern pumping and piping technologies. The EIS should consider the resulting reduction in water demand as an alternative water supply. 8) The EIS should include a "Water Right Change" alternative. This alternative would evaluate improving Icicle Creek flows by moving IPID's point of diversion downstream (to the Wenatchee	

		River). This measure, which would add 100 cfs of water to Icicle Creek every year, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). This alternative should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric. 9) The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation and funding that are needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail. 10) The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes, and any proposed changes. The analysis should include a review of scientific literature on the impacts of water removals upon wildlife, vegetation, soil and wilderness values. 11) The EIS should provide a detailed operations, maintenance and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions, including helicopter use.	

		12) The EIS should fully explain the purpose and need for the water these projects would provide. 13) The EIS should fully explain what human activities caused the degraded conditions (such as low instream flows in Icicle Creek) that the projects seek to improve. We should not be repeating the mistakes of the past. 14) The EIS should analyze adequacy of proposed instream flows to support spawning, rearing and migration of steelhead and bull trout.	
48	Michael J. Painter Californians for Western Wilderness P.O. Box 210474 San Francisco, CA 94121-0474 info@caluwild.org	Californians for Western Wilderness fully endorses the comments submitted by Alpine Lakes Protection Society and 39 other organizations, dated May 11, 2016.	Comment noted. Responses to the endorsed letter are provided under comment 32.

49	Kayt Hoch kayt@kaythoch.com	Proposed plan looks like a good approach that seems to have minimal impacts for a great benefit to region. I hope there isn't going to be negative fall-out from the Puget Sound group Do you have some construction impacts estimations/projections? After the quick recovery of our own property after the impacts form the bridge project I'm not, concerned, just curious.	General support noted. The PEIS will describe potential projects and impacts under the proposed program. Additional detail will be provided in any subsequent project level EIS.

From: Mary Jo Sanborn
To: Meghan O"Brien
Cc: Dan Haller
Subject: FW: icicle strategy
Date: Wednesday, February 17, 2016 2:40:47 PM

Hi Meghan – Here's the first SEPA comment we've gotten.

Thanks,

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department

Please Note Our NEW ADDRESS:
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
Fax: (509)-667-6527
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Monday, February 15, 2016 12:38 PM
To: Guy Moura (HSY)
Cc: 'Ellis, Liz (ECY)'; 'Kaehler, Gretchen (DAHP)'; Karen Capuder (HSY); Chuck Brushwood (Charles.Brushwood@colvilletribes.com); Mary Jo Sanborn
Subject: RE: icicle strategy

Thank you, Mr. Moura, email received. We look forward to future consultation. I cc'ed Chuck Brushwood, who has been a participant in the efforts of the Icicle Work Group and may be able to assist you internally with project descriptions, context, etc.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

Please note our new address

From: Guy Moura (HSY) [mailto:Guy.Moura@colvilletribes.com]
Sent: Saturday, February 13, 2016 9:18 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Cc: 'Ellis, Liz (ECY)' <lell461@ECY.WA.GOV>; 'Kaehler, Gretchen (DAHP)' <Gretchen.Kaehler@DAHP.wa.gov>; Guy Moura (HSY) <Guy.Moura@colvilletribes.com>; Karen Capuder (HSY) <Karen.Capuder@colvilletribes.com>
Subject: icicle strategy

Dear Mr. Kaputa:

Please be advised that the various undertakings in the Icicle Basin are in the traditional territory of the Wenatchee Tribe, a constituent tribe of the Confederated Tribes of the Colville Reservation. It also appears all of the projected projects are within what many consider the Wenatshapam Reserve. A reserve set aside for the Wenatchi under Article 10 of the 1855 Yakama Treaty (this story is told @ http://www.colvilletribes.com/wenatchi_indians.php). The *p'¤sqŸaw's* (Wenatchi) recently regained their fishing rights in the icicle (*na'sik-elt*) via a court case. Establishment of the reserve is being negotiated. The vicinity of the proposed projects has archaeological, ethnographic, and historic sites of significance to the Confederated Tribes of the Colville Reservation.

We await continued consultation, which may be with the Department of Ecology, under various federal and state laws, regulations, and mandates. We recommend a cultural resource report to identify existing archaeological and traditional sites.

We appreciate you consulting with the Confederated tribes of the Colville Reservation.

lim ləmt, qeʔciéẃyeẃ (thank you)

Guy Moura
Program Manager, History/Archaeology
Tribal Historic Preservation Officer
Confederated Tribes of the Colville Reservation
(509) 634-2695

William B. Beyers
7159 Beach Drive SW
Seattle, Washington 98136

February 20, 2016

Mr. Mike Kaputa, Director
Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Icicle Strategy Scoping Comments

Dear Mr. Kaputa:

The Alpine Lakes Foundation would like to offer these comments on the scope of the environmental impact statement that Chelan County and the Washington State Department of Ecology plan to prepare on the Icicle Creek Water Management Strategy (hereafter "Icicle Strategy").

The Alpine Lakes Foundation is a Washington non-profit corporation in good standing since 1993, when it was established to act as an advocate and protector for the resources of the Alpine Lakes area. It has served in this role for the past 23 years.

All of the lakes that are the subject of your Icicle Strategy are within the Alpine Lakes Wilderness Area, established by Congress in 1976. The Icicle Strategy proposes the construction or restoration of a number of structures at these lakes, including dams, pumps, and tunnels. These raise a number of questions under the Alpine Lakes Management Act of 1976, 16 U.S.C. 1132. Note Section 2(c) of this Act states:

> The Federal lands designated as the Alpine Lakes Wilderness shall be administered in accordance with the provisions of this Act and with the provisions of the Wilderness Act (78 Stat. 890), whichever is the more restrictive.

Section 2(e) of this Act provides that non-federal within the Wilderness and Intended Wilderness will become part of the Alpine Lakes Wilderness when acquired by the Federal Government. Thus, all the lakes included in the Icicle Strategy are now within the Alpine Lakes Wilderness and must be administered according to the Alpine Lakes Management Act and the Wilderness Act.

The Wilderness Act, 16 U.S.C. 1131-36, provides in section 4(c):

> PROHIBITION OF CERTAIN USES
> (c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required

in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

Applying this section, courts have held that Congressional awareness at the time it created a wilderness that a pre-existing dam was in the area declared wilderness does not create an implied exception to the Wilderness Act prohibition on structures. Courts also have held that the prohibition on structures in a wilderness applies equally to rebuilding, maintaining, or repairing them.

The Icicle Strategy appears to rely on water rights held by the Icicle Peshastin Irrigation District (hereafter "irrigation district"), based on rights granted to its predecessor in 1927.

The relationship between those rights, the statutes mentioned above, and the Icicle Strategy plans for lakes within the Alpine Lakes Wilderness (hereafter "Alpine Lakes") raise these questions, numbered for ease of reference:

1. What was the extent of the irrigation district's existing water rights within the Alpine Lakes Wilderness when Congress created that Wilderness in 1976?
2. Has the irrigation district forfeited any of those rights through non-use or only partial use before or after creation of the Wilderness?
3. If the irrigation district has diverted more water from streams in the Icicle basin than it stored at any of the Alpine Lakes, does that additional diversion offset any forfeiture of storage or use rights that it did not use at those lakes?
4. Whether the right to store and use water from an Alpine Lake includes the right to build or expand structures now when the irrigation district has previously relied on pumping or other non-structural methods to obtain lake water?
5. Whether the right to store and use water from an Alpine Lake includes the right to build or expand structures or tunnels upstream in the Wilderness from that lake.
6. Whether a tunnel is a "structure" or "installation" prohibited by the Wilderness Act.
7. Did the US Forest Service expand, revive, or have the authority to expand or revive any of the irrigation district's rights by granting an easement to the irrigation district in 1990 when the irrigation district conveyed lands adjoining Eightmile Lake and within the Wilderness to the federal government?
8. May the irrigation district use any of its water rights for purposes other than irrigation when that was the sole basis on which they were granted?
9. To what extent do these same issues apply to water rights claimed by the US Bureau of Reclamation and/or the US Fish and Wildlife Service for operation of the Leavenworth National Fish Hatchery with waters stored, diverted, or used from lakes within the Alpine Lakes Wilderness?

Finally, we have two procedural questions:

A. To what extent can the Icicle Work Group's so-called stakeholder-based collaborative process supersede state and federal laws (for example, the Clean Water Act and Endangered Species Act)?

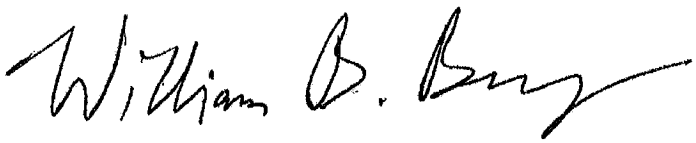
B. Can the state Department of Ecology, acting as Washington state's water regulator, make objective decisions about the status of the irrigation district's water rights and the extent to which they may have been forfeited, when DOE itself is one of the lead agencies on this project, has a material interest in its success, and that success would depend on DOE's rulings?

Please share these comments with the Washington State Department of Ecology and consider them when drafting your environmental impact statement.

Should you have any questions, please feel free to contact us.

ALPINE LAKES FOUNDATION

By



William B. Beyers, President
7159 Beach Drive S.W.
Seattle, WA 98136

Tel (home): (206) 935-6282
beyers@u.washington.edu

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:26 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Icicle Strategy Public Comment

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Thursday, March 24, 2016 2:47 PM
To: Ted Whitesell
Cc: Mary Jo Sanborn
Subject: RE: Icicle Strategy Public Comment

Thanks, Ed, we'll make sure your comments are entered into the record.

If you have a chance I'd appreciate talking with you. You can try me at the number below.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

Please note our new address

From: Ted Whitesell [mailto:ted.whitesell@gmail.com]
Sent: Wednesday, March 23, 2016 8:50 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle Strategy Public Comment

Mr. Mike Kaputa
Director of Natural Resources

Chelan County

Dear Mr. Kaputa,

I understand that the Icicle Work Group is developing a water management strategy that could include infringing upon the wilderness character of the Alpine Lakes Wilderness by constructing dams, altering water levels, and issuing water rights for several lakes in the Wilderness Area. Even if only part of this is true, it would infringe upon the mandate, established by Congress in the 1964 Wilderness Act, to protect our designated Wilderness Areas in an untrammeled condition for all future generations. Even if you feel that there are some legal pathways that might sanction such infringement of the wilderness character of the area, it is important to remember that there are many individuals and organizations who stand ready to defend all designated Wilderness Areas from such infringement, through the courts and the political process, if necessary.

The National Wilderness Preservation System is just a remnant of the once magnificent wilderness our ancestors enjoyed in this country only a few generations ago. We must resolutely defend every parcel that is left, no matter how convenient and logical it may seem to take a little water here or there, "just this once." Wilderness designation is intended to provide the most durable and stringent protection of any federal land classification. It must never be compromised.

Please enter my comments in the record of public comments on the Icicle Strategy.

Thank you.

Edward Whitesell
816 Plymouth St., SW
Olympia, WA 98502

From: **Derek Poon** <derekcpoon@gmail.com>
Date: Wed, Feb 18, 2015 at 10:34 AM
Subject: 2/17/15 Alpine Lakes Icicle Work Group meeting, Seattle; a CWA DU protection matrix
To: Mike.Kaputa@co.chelan.wa.us, thomas.tebb@ecy.wa.gov, Charity.Davidson@dfw.wa.gov, jmanning@cascadialaw.com, deortman@msn.com, patsump@juno.com, rr.wolfe@comcast.net, Andrea@wildwarivers.org
Cc: John Osborn <John@waterplanet.ws>, Rachael Osborn <rdpaschal@earthlink.net>, Joan Crooks <joan@wecprotects.org>, Becky Kelley <becky@wecprotects.org>, Environmental Priorities Coalition <lisa@wecprotects.org>, "kurt@wildfishconservancy.org" <kurt@wildfishconservancy.org>

As discussed at the Icicle Work Group (IWG) meeting last night at Seattle, I attached my working draft of the Clean Water Act (CWA) Matrix of Existing and Designated Uses (DU) versus the level of DU protection. This matrix distills the nine Icicle Creek Guiding Principles into an easy format for analysis of the Wilderness Act, SEPA, NEPA, CWA 401 certification, or Endangered Species Act (ESA) Section 7 determination.

Note that CWA and ESA are integrated because ESA species are a protected CWA DU. I submit the very essence of the CWA is DU protection.

I attended this meeting at the urging of Dr. John Osborn of Sierra Club and Center for Environmental Law and Policy (CELP). Thank you for the opportunity to meet with and listen to you, particularly Rachael Osborne, a CELP co-founder and IWG member. John's invitation with Rachael's Conservation Alternative is pasted below.

One of your participants Dr. Rebecca Wolfe spoke to the possibility of adding the "precautionary principle" to your recommendations. I agree with her proposal and took the liberty of providing a recent short analysis on why CWA water quality standards are by necessity (or should be) precautionary (See KFNC Suitability Determination, second letter dated 1/19/15 and citing "precautionary principle" at the end of the letter.). This Suitability Determination may differ from the IWG process, but the analysis is relevant.

I speak only for myself as an independent observer and am responsible for any interpretations or accuracy. My one-page resume is attached FYI. I apologize for my ignorance and for my limited understanding of your project specifics. Please use or delete any of my concepts as you see fit.

All the best, and thanks again for your indulgence.

Derek
--
Derek Poon
400 Boylston Ave E, #2
Seattle, WA 98102
206-729-9378, derekcpoon@gmail.com

"All it takes is for the right people in the right position to take action."
David Lewis, SCIENCE FOR SALE, 2014

---------- Forwarded message ----------
From: **John Osborn** <John@waterplanet.ws>
Date: Mon, Feb 16, 2015 at 11:09 PM
Subject: Alpine Lakes Wilderness: new irrigation dams vs. viable water solutions
To: John Osborn <John@waterplanet.ws>

For those of you attending Tuesday's Seattle meeting on proposed irrigation dams for the Enchantments / Alpine Lakes Wilderness, Rachael has prepared a handout on viable water solutions for the Icicle Work Group Process

Conservation Alternative for the Icicle Work Group Process

Rachael will also be driving over from Spokane to attend, and will bring copies of the Conservation Alternative. Again, here is the meeting information:

Meeting - **new irrigation dams & diversions proposed for Alpine Lakes Wilderness, Enchantments**
When: **Tuesday, Feb. 17 7 p.m.**

Where: **Seattle, Good Shepard Center, Rm 202**
Additional links -

- Rachael's 4-part blog: News Dams & Diversions in the Alpine Lakes Wilderness?
- Interviews with Harriet Bullitt and Russ Bush on Icicle River and Elwha River: Water Heroes: Never Give Up

For those of you who have fought so hard to protect and expand the Alpine Lakes Wilderness, we hope you are able to attend the meeting.

Best wishes - and thank you for caring about Alpine Lakes Wilderness and Icicle River.

John Osborn MD
CELP, Sierra Club
509.939-1290

Matrix of Clean Water Act (CWA) Existing or Designated Uses (DU) and DU protection under the CWA water quality standards For Alpine Lake Icicle Working Group

Working Draft subject to edits, Derek Poon, 2/17/15

X axis (independent variables):

A long **CWA DU list**: use 1, use 2, use 3.....use to the nth; e.g. **Water uses, Tribal treaty rights, ESA species, recreation, Wilderness Act specification, etc.**

Y axis (dependent variables):

A list of subprojects (by location, timing, or task) of the total project.

Within each subproject, list **four DU protection categories** and explain application or non-application of each category.

1. **Protected;**
2. **Unprotected but adequately mitigated (agreement reached consistent with the law);**

3. **Unprotected and inadequately mitigated (agreed to disagree);**
4. **Economic exemption granted by Congress, CWA Use Attainability Analysis (UAA), or ESA God Squad.**

Application to the Wilderness Act, SEPA, NEPA, CWA 401 certification, ESA Section 7 determination:

- Findings and conclusions should be based on Matrix.
- Specific to ESA Section 7:
    - No jeopardy
    - Likely to Adversely Affect (LAA)
    - Reasonable and prudent measures and terms/conditions prescribed consistent with
        - ESA Section 7(a)(1) to proactively promote ESA species recovery and delisting.
        - ESA planning principle of "Not Everything Everywhere All The Time (NEEATT), balancing project mitigation requirement (e.g. Leavenworth Hatchery) with Wilderness Act.

Derek Poon Letter to the Washington Board of Natural Resources
For March 10, 2015 Board meeting
Sent by email March 4, 2015

Members of the Washington Board of Natural Resources:

As an experienced and recently retired scientist and administrator in the Endangered Species Act (ESA) and the Clean Water Act (CWA), I speak only for myself and not for any organization or coalition.

My one-page resume is pasted at the end of this letter for your information.

I understand the Board is developing, at the same time, the Sustainable Harvest Calculation (SHC) and the Long Term Conservation Strategy (LTCS) for the ESA-listed Marbled Murrelet (MaMu). Since the LTCS places caveats on timber harvest locations, methods, and rates, it makes sense that the LTCS be completed before the SHC and be applied to the SHC, as advocated by the Washington Environmental Council and others.

Several ESA and CWA provisions assist LTCS and SHC.

1. Under ESA, LTCS is based on the concept of "Not Everything Everywhere All The Time" (NEEATT) allowing for timber harvest and protecting Washington (WA) Department of Natural Resources (DNR) fiduciary responsibility, as long as MaMu recovery and delisting use best available science in a completed ESA recovery plan according to the law.
2. For environmental protection, ESA planning priority goes to the listed species. Moreover, under CWA, ESA species are Existing and Designated "uses" (DU) protected under the CWA water quality standards. A trajectory to successful MaMu recovery and delisting satisfies both ESA and CWA policies.
3. Under ESA Section 7(a)(1), federal agencies will use their program authorities to promote ESA species recovery and delisting, thus proactive regulatory assistance to DNR MaMu management comes from the US Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), US Environmental Protection Agency (EPA), and the (CWA delegated state agency) WA Department of Ecology.
4. Deference to adaptive management to achieve MaMu recovery and delisting is entirely appropriate as long as there is upfront agreement on targets and "SMART" contingencies or "plan B's," where SMART stands for specific, measurable, attainable, relevant, and time-bound.
5. Incentives of money, regulatory flexibility, and recognition should supplement environmental regulations and assist timber-dependent communities.
6. Should achievement of SHC and DNR fiduciary responsibility preclude MaMu recovery and delisting, economic exemptions can be granted by Congress; via the CWA Use Attainability Analysis (UAA); or by an ESA God Squad decision.

I hope this input is useful to your planning, and please help us avoid extinction of the little MaMu seabird while supporting economic viability of our coastal communities.

Respectfully submitted,

Derek Poon
400 Boylston Ave E, #2
Seattle, WA 98102
206-729-9378
derekcpoon@gmail.com

Derek Poon

derekcpoon@gmail.com, 206-729-9378

EDUCATION: Ph.D. Fisheries, Oregon State University, 1977
B.A. Zoology, University of California, Berkeley, 1967

EXPERIENCE:

NATURAL RESOURCE CONSULTANT (Since retirement 12/8/11)
[Current work on Adaptive Management and compliance with Endangered Species Act (ESA) and Clean Water Act (CWA)]

REGIONAL SALMON ECOLOGIST and ESA SPECIALIST
US Environmental Protection Agency, Seattle, Washington (2001-2011)

ENDANGERED SPECIES ACT BIOLOGIST
Sustainable Fisheries Division
National Marine Fisheries Service, Seattle, Washington (1997-2001)

ADMINISTRATOR, Washington State Timber/Fish/Wildlife (TFW) Policy Group
Seattle, Washington, 1996 to 1997

CO-CHAIR, Washington State TFW Policy Group, 1994-1995

CHIEF, King County Natural Resource Planning Section
Seattle, Washington, 1986 to 1995

FACILITATOR, US Section, US/Canada Salmon Treaty Negotiations
Seattle, Washington, 1985

Pacific Northwest Salmon and Steelhead ENHANCEMENT COORDINATOR
Salmon and Steelhead Conservation & Enhancement Act
Portland, Oregon and Seattle, Washington, 1983 to 1986

CONSULTANT, Northwest Power Planning Council
COUNCIL-DESIGNATED REVIEWER, Columbia Basin Fish & Wildlife Program
Portland, Oregon, 1981 to 1983

GENERAL MANAGER, Northern Southeast Regional Aquaculture Association
Sitka, Alaska, 1977 to 1981

PROGRAM AND POLICY MANAGER, Governor's Special Projects Office
Juneau, Alaska, 1977

FISHERIES PROGRAM DIRECTOR, Sheldon Jackson College
Sitka, Alaska, 1973 to 1975

SALMON RESEARCHER
National Marine Fisheries Service (Alaska Region) and Oregon State University
1968 to 1973, 1975 to 1977

Current Interests: Marathon running; news; reading; music.

March 2015

****

ESA Section 4F Recovery Plan criteria are as follows.

http://www.gao.gov/new.items/d06463r.pdf

The Endangered Species Act requires each recovery plan to incorporate, to the maximum extent practicable:

(1) ***Site specific management actions*** *- descriptions of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species.*
(2) ***Time and cost estimates*** *- for completing site specific management actions; estimates of the time required and cost to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal.*
(3) ***Recovery criteria*** *- objective, measurable criteria which, when met, would result in a determination, in accordance with provisions of the act, that the species be removed from the list of threatened and endangered species (i.e., delisted). Courts have found that the Endangered Species Act requires the services to address each of five delisting factors to the maximum extent practicable when designing recovery criteria.*

> *These five delisting factors are the same factors that are considered when listing a species: (1)* ***the present or threatened destruction, modification, or curtailment of a species' habitat or range****; (2)* ***overutilization of the species for commercial, recreational, scientific, or educational purposes****; (3)* ***disease or predation;*** *(4) t****he inadequacy of existing regulatory mechanisms****; or (5)* ***other natural or manmade factors affecting a species' continued existence.***

Jordan Sanford

From: Meghan O'Brien
Sent: Tuesday, March 29, 2016 11:36 AM
To: Jordan Sanford
Subject: FW: ESA and CWA Questions: Icicle Strategy, March 30, 2016 Seattle meeting
Attachments: ESA Section 4F Recovery Plan criteria, GAO summary.pdf; Alpine Lake 2-17-15 IWG mtg, with CWA DU MATRIX.pdf; DP 3-4-15 letter, BNR, 3-10-15 meeting.pdf

This one just came in…

Thanks,
Meghan

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Tuesday, March 29, 2016 11:26 AM
To: Dan Haller <dhaller@aspectconsulting.com>; Meghan O'Brien <mobrien@aspectconsulting.com>
Subject: FW: ESA and CWA Questions: Icicle Strategy, March 30, 2016 Seattle meeting

Public comments for the record…

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department

Please Note Our NEW ADDRESS:
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
Fax: (509)-667-6527
www.co.chelan.wa.us/nr

From: Derek Poon [mailto:derekcpoon@gmail.com]
Sent: Monday, March 28, 2016 5:13 PM
To: Mike Kaputa; (GTEB461@ecy.wa.gov)
Cc: Karl Forsgaard (karlforsgaard@comcast.net); Andrea Imler; Kitty Craig; Benjamin Greuel; deortman@msn.com; Rachael Osborn (rosborn@celp.org); Lisa Pelly; Susan Adams; Greg McLaughlin (greg@washingtonwatertrust.org); Mary Jo Sanborn; Jim Brown (James.Brown@dfw.wa.gov); Keith Goehner; Jay Manning; Downes, Melissa M. (ECY); Lisa Dally Wilson (lisadallywilson@gmail.com); Charity Davidson (Charity.Davidson@dfw.wa.gov); Jen Watkins; (okeefe@americanwhitewater.org); kgeragh t@gmail.com; sarahk@mountaineers.org; rckmcguire@gmail.com; espackard@msn.com; Don Parks; voice4wild@aol.com; tom@wawild.org; kurt@wildfishconservancy.org; Michael Garrity; efr98115@tpl.org; AMY K. SNOVER; GUILLAUME S. MAUGER (gmauger@uw.edu); Harriet Bullit; drieman@tumwater.net; James Schroeder; Paul Kundtz; trolfe@celp.org; patsump@juno.com; rr.wolfe@comcast.net; Andrea@WildWaRivers.org; John Osborn; Joan Crooks; Becky Kelley; Environmental Priorities Coalition; spmalloch@gmail.com
Subject: ESA and CWA Questions: Icicle Strategy, March 30, 2016 Seattle meeting

Mike and Tom,

Thank you for providing information on the programmatic environmental impact statement (PEIS) for the *Icicle Strategy*, developed by Chelan County and the WA Department of Ecology/Office of the Columbia River. I will attend the March 30 Seattle workshop at Phinney Center to learn from your presentation.

Since the WA Department of Ecology (Ecology) is the
US Environmental Protection Agency (EPA) delegated state entity
to implement
much of
the federal
Clean Water Act (
CW

A
)
in Washington,
and since Endangered Species Act (ESA) species are

protected Existing and Designated Uses (DU) under the CWA water quality standards
,
Ecology guidance is particularly meaningful for CWA actions, including effects on ESA species
and their designated critical habitat
.

To

provide time for pre-meeting analysis
, I defined the following
ESA and CWA
questions to be asked
at the
March 30
meeting
, based on your PEIS and my 3/30/15 letter

(pasted below)

to you following your last Seattle workshop on 2/17/15.

1. Based on ESA Section 7(a)(1), **all federal agencies**

   are to use their programmatic authorities to promote ESA species recovery, and for the National Oceanic and Atmospheric Administration (NOAA) and US Fish and Wildlife Service (USFWS),

   priority goes to the listed species

. Since some of these federal developments are still incomplete, particularly the non-discretionary ESA Section 7 consultation Terms & Conditions

,

how and when will federal provisions and ESA regulations be incorporated into the *Icicle Strategy*?

2. ESA recovery plans are required for every ESA-listed species (Recovery Plan requirement

   summary

   file attached). Since each recovery plan should have a voluntary roadmap to recovery (delisting), **are these roadmaps already incorporated into the *Icicle Strategy*?**

3. Every agency is either required to

   apply

   or

   to

   comport with

   CWA DU protection

   according to the law

   , exemptions, and antidegradation (See p, 9-21 of CWA Watershed Academy).

   Since DU includes such uses as ESA species, Tribal rights, commercial and aesthetic water uses, and Wilderness Act, **have these DU protections been accommodated within the *Icicle Strategy***,

   such

   as indicated by question #7 in your "Supplemental Sheet under nonproject actions"? More specifically, my proposed DU protection matrix (Alpine Lake 2-17-15…file attached) was designed to address DU protection in one single table; **will this DU matrix be used and published?**

4. Given the complexities and

   realities

   of

some

incompatible uses, DU protections must be negotiated and some not

likely

met. If the *Icicle Strategy* cannot

adequately

protect certain uses, **are economic exemptions planned or have already been explored** under the CWA Use Attainability Analysis (UAA, also see CWA Watershed Academy, p. 11), ESA God Squad Decision, or Congressional exemptions?

(See #6, attached DP 3-4-15 letter.)

For full disclosure, I am participating at request of Dr. John Osborn of the Sierra Club, but I speak only for myself. For those who don't know me, my one-page resume is in the attached "DP 3-4-15 letter, BNR, 3-10-15 meeting.pdf."

Since this email and its attachments are public documents in the administrative record, feel free to use, distribute, dispute, or delete, as you see fit. Thank you for your continuous work on this complex project. See you March 30.

Best,

Derek

Attachments:

1) ESA Section 4F Recovery Plan criteria, GAO summary.pdf
2) Alpine Lake 2-17-15 IWG mtg, with CWA DU MATRIX.pdf
3) DP 3-4-15 letter, BNR, 3-10-15 meeting.pdf.

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Derek Poon
400 Boylston Ave E, #2
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206-729-9378 cell, derekcpoon@gmail.com
206-602-6565 land line

"All it takes is for the right people in the right position to take action."
David Lewis, SCIENCE FOR SALE, 2014
"This insecticide is dedicated to a healthier world." EPA approved slogan, 2007.
E. G. Vallianatos, POISONED SPRING, 2014

---------- Forwarded message ----------
From: **Mike Kaputa** <Mike.Kaputa@co.chelan.wa.us>
Date: Sun, Mar 20, 2016 at 5:19 PM
Subject: RE: Icicle Strategy, March 30, 2016, Phinney Community Center, Seattle

To: "Karl Forsgaard (karlforsgaard@comcast.net)" <karlforsgaard@comcast.net>, Andrea Imler <aimler@wta.org>, Kitty Craig <kitty_craig@tws.org>, Benjamin Greuel <benjamin_greuel@tws.org>, "deortman@msn.com" <deortman@msn.com>, "Rachael Osborn (rosborn@celp.org)" <rosborn@celp.org>, Lisa Pelly <Lisa.Pelly@tu.org>, Susan Adams <susan@washingtonwatertrust.org>, "Greg McLaughlin (greg@washingtonwatertrust.org)" <greg@washingtonwatertrust.org>, Mary Jo Sanborn <MaryJo.Sanborn@co.chelan.wa.us>, "Jim Brown (James.Brown@dfw.wa.gov)" <James.Brown@dfw.wa.gov>, Keith Goehner <Keith.Goehner@co.chelan.wa.us>, Jay Manning <jmanning@cascadialaw.com>, "Downes, Melissa M. (ECY)" <MNIH461@ecy.wa.gov>, "Lisa Dally Wilson (lisadallywilson@gmail.com)" <lisadallywilson@gmail.com>, "Charity Davidson (Charity.Davidson@dfw.wa.gov)" <Charity.Davidson@dfw.wa.gov>, Jen Watkins <jwatkins@conservationnw.org>, "(okeefe@americanwhitewater.org)" <okeefe@americanwhitewater.org>, "kgeraght@gmail.com" <kgeraght@gmail.com>, "sarahk@mountaineers.org" <sarahk@mountaineers.org>, "rckmcguire@gmail.com" <rckmcguire@gmail.com>, "espackard@msn.com" <espackard@msn.com>, Don Parks <dlparks398@gmail.com>, "voice4wild@aol.com" <voice4wild@aol.com>, "tom@wawild.org" <tom@wawild.org>, "kurt@wildfishconservancy.org" <kurt@wildfishconservancy.org>, Michael Garrity <mgarrity@americanrivers.org>, "efr98115@tpl.org" <efr98115@tpl.org>, "AMY K. SNOVER" <aksnover@uw.edu>, "GUILLAUME S. MAUGER (gmauger@uw.edu)" <gmauger@uw.edu>, Harriet Bullit <harrietb@sleepinglady.com>, "drieman@tumwater.net" <drieman@tumwater.net>, James Schroeder <jschroeder@tnc.org>, Paul Kundtz <paul.kundtz@tpl.org>, "trolfe@celp.org" <trolfe@celp.org>, Derek Poon <derekcpoon@gmail.com>, "patsump@juno.com" <patsump@juno.com>, "rr.wolfe@comcast.net" <rr.wolfe@comcast.net>, "Andrea@WildWaRivers.org" <Andrea@wildwarivers.org>, John Osborn <John@waterplanet.ws>, Joan Crooks <joan@wecprotects.org>, Becky Kelley <becky@wecprotects.org>, Environmental Priorities Coalition <lisa@wecprotects.org>, "(GTEB461@ecy.wa.gov)" <GTEB461@ecy.wa.gov>, "spmalloch@gmail.com" <spmalloch@gmail.com>

The Icicle Work Group is holding a Seattle-area workshop to provide details on its *Icicle Strategy*. Chelan County and the WA Department of Ecology/Office of the Columbia River have recently initiated development of a programmatic environmental impact statement for the *Icicle Strategy* and will accept comments until May 11, 2016. See attached documents.

The workshop will be held March 30, 7 PM at the Phinney Center, 6532 Phinney Ave N, Seattle, WA 98103.

We hope that you will be able to attend this workshop to learn more about the *Icicle Strategy* and how to provide input during environmental review. Please feel free to circulate this email and let others know about the workshop. For more information, please visit our website at the following link: http://www.co.chelan.wa.us/natural-resources/pages/icicle-work-group?parent=Planning

Thanks.

Mike

Attachments:
Icicle Strategy DS Signed.pdf
Icicle Strategy SEPAchecklist.pdf

Mike Kaputa, Director

Chelan County Natural Resource Department

411 Washington Street, Suite 201

Wenatchee, WA 98801

Phone: (509) 670-6935

---------- Forwarded message ----------
From: **Derek Poon** <derekcpoon@gmail.com>
Date: Mon, Mar 30, 2015 at 4:16 PM
Subject: DP thanks, with info: Icicle Work Group Seattle Meeting February 17, 2015
To: Mike Kaputa <Mike.Kaputa@co.chelan.wa.us>
Cc: Keith Goehner <Keith.Goehner@co.chelan.wa.us>, "glearnedsr@hotmail.com" <glearnedsr@hotmail.com>, "amatzke@gmail.com" <amatzke@gmail.com>, "patsump@juno.com" <patsump@juno.com>, "rr.wolfe@comcast.net" <rr.wolfe@comcast.net>, Lisa Pelly <Lisa.Pelly@tu.org>, Trish Rolfe <trolfe@celp.org>, "lfetterly_47@hotmail.com" <lfetterly_47@hotmail.com>, Benjamin Greuel <benjamin_greuel@tws.org>, "tony.iid.pid@nwi.net" <tony.iid.pid@nwi.net>, "Lisa Dally Wilson (lisadallywilson@gmail.com)" <lisadallywilson@gmail.com>, "Charity Davidson (Charity.Davidson@dfw.wa.gov)" <Charity.Davidson@dfw.wa.gov>, "(GTEB461@ecy.wa.gov)" <GTEB461@ecy.wa.gov>, Andrea Imler <aimler@wta.org>, Jay Manning <jmanning@cascadialaw.com>, "dlparks398@gmail.com" <dlparks398@gmail.com>, "HBRomb@aol.com" <HBRomb@aol.com>, "Karl Forsgaard (karlforsgaard@comcast.net)" <karlforsgaard@comcast.net>, "voice4wild@aol.com" <voice4wild@aol.com>, "raelene@seanet.com" <raelene@seanet.com>, "deortman@msn.com" <deortman@msn.com>, "espackard@msn.com" <espackard@msn.com>, "buukrat@gmail.com" <buukrat@gmail.com>, "paulkgould@comcast.net" <paulkgould@comcast.net>, "Rachael Osborn (rdpaschal@earthlink.net)" <rdpaschal@earthlink.net>, Janine Blaeloch <blaeloch@westernlands.org>, Susan Adams <susan@washingtonwatertrust.org>, Michael Garrity <mgarrity@americanrivers.org>, "tom@wawild.org" <tom@wawild.org>, John Osborn <John@waterplanet.ws>, Ron Walter <Ron.Walter@co.chelan.wa.us>, Doug England <Doug.England@co.chelan.wa.us>, "Kuiken, Jason J -FS" <jkuiken@fs.fed.us>, Jeff Rivera <jrivera02@fs.fed.us>, Mary Jo Sanborn <MaryJo.Sanborn@co.chelan.wa.us>, "dhaller@aspectconsulting.com" <dhaller@aspectconsulting.com>, "David W. Rice" <drice@anchorqea.com>

Mike,

Your notes of the February 17 IWG meeting and the Powerpoint are much appreciated!

To keep everyone equally informed, I am providing to the notes distribution my suggested data analysis format sent to you on February 18, in the file "**Alpine Lakes 2-17-15 IWG mtg, with CWA DU MATRIX.pdf**). I also attached several files on Clean Water Act (CWA) Existing and Designated uses (DU) protection and Endangered Species Act (ESA) Section 7(a)(1), both referenced in my recommendations.

To all, feel free to delete or use these files as you see fit. Since they all went to policy folks, they are provided to give full disclosure. For those who don't know me, I attached my one-page resume in the attached file, "DP 3-4-15 letter, BNR, 3-10-15 meeting.pdf."

Again, Mike, thanks for your efforts and all the best in this challenging project.

Derek

Four attachments:
1) Alpine Lake 2-17-15 IWG mtg, with CWA DU MATRIX.pdf
2) CWA DU protection and ESA 7(a)(1), 3-26-15.pdf
3) KFNC suitability determination, to Kelsey at ACOE, January, 2015.pdf
4) DP 3-4-15 letter, BNR, 3-10-15 meeting.pdf

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Derek Poon
400 Boylston Ave E, #2
Seattle, WA 98102
206-729-9378, derekcpoon@gmail.com

"All it takes is for the right people in the right position to take action."
David Lewis, SCIENCE FOR SALE, 2014
"This insecticide is dedicated to a healthier world." EPA approved slogan, 2007.
E. G. Vallianatos, POISONED SPRING, 2014

On Sun, Mar 29, 2015 at 9:30 AM, Mike Kaputa <Mike.Kaputa@co.chelan.wa.us> wrote:

Thank you all for attending the February 17 meeting to discuss Icicle Work Group efforts and, specifically, those efforts in the Alpine Lakes Wilderness. Attached are notes from that meeting. Please let me know if you have any edits by April 10. The Powerpoint from the meeting is available on our website at http://www.co.chelan.wa.us/natural-resources/iwgminutes?parent=Planning

I could not decipher email addresses from the following people: Ann Wechsler, Morgan Ahouse, and Connor Briggs. Please forward this email to them or send me their email addresses.

I appreciated the opportunity to follow up with many of you in early March and look forward to getting into more details and, as we discussed, a potential site visit when weather permits.

Again, many thanks for your time and involvement.

Mike

Mike Kaputa, Director

Chelan County Natural Resource Department

411 Washington Street, Suite 201

Wenatchee, WA 98801

Phone: (509) 670-6935

Please note our new address

Written Comment Sheet for

Scoping the Icicle Strategy Programmatic Environmental Impact Statement

Scoping is the process used to determine what should be evaluated in an environmental impact statement (EIS). It is conducted before any analysis of impacts is begun. You can participate in this process by submitting your scoping comments below.

Comments will be accepted through May 11, 2016 and can be sent to Mike Kaputa at mike.kaputa@co.chelan.wa.us or 411 Washington Street, Suite 201, Wenatchee, WA 98801

DEPARTMENT OF ECOLOGY
State of Washington

Contact Info (Required)

Name: NATALIE WILLIAMS Date: 20 APRIL '16

Address: _____

Telephone: _____ Email: nataliesees@gmail.com

☒ Please send me an electronic copy of the draft EIS.

☐ Please send me a paper copy of the draft EIS.

Your Comments

Removal of any resource from a Federally designated Wilderness is a violation of the Wilderness Act and the Alpine Lakes Wilderness Area Management Plan. The NHSEL is a good example - even though that could have been argued under "education" outlined in the Act. Section 4d-4 specifically prohibits any 'taking' - increase or change, of the water resource, either quality or quantity. All 'added' water needs to come from 'added' sources - CONSERVATION

- The EIS should include an Alternative that Protects & Preserves the ALW water resource in compliance with the Wilderness Act and ALWA MP.
- The EIS should include an Alt that acknowledges the limits of the City of Leavenworth, Icicle Irr. Dist and all other Users to the ORIGINAL purpose and legal agreement of Section 4(d)-4.
- The EIS should include an Alt that establishes a water rights / volume swap - broker market in addition to implementing aggressive conservation measures (eg; King County including raising prices, issueing limits, scheduling watering, etc. ALL avenues of conservation and reclamation must be exhausted before (if ever) violating a Wilderness resource.

Written Comment Sheet for

Scoping the Icicle Strategy Programmatic Environmental Impact Statement

Scoping is the process used to determine what should be evaluated in an environmental impact statement (EIS). It is conducted before any analysis of impacts is begun. You can participate in this process by submitting your scoping comments below.

Comments will be accepted through May 11, 2016 and can be sent to Mike Kaputa at mike.kaputa@co.chelan.wa.us or 411 Washington Street, Suite 201, Wenatchee, WA 98801

DEPARTMENT OF ECOLOGY
State of Washington

Contact Info (Required)

Name: Norm Stoddard Date: 5/20/2016

Address: 12556 Shore St. Leavenworth, Wa. 98826

Telephone: 509-548-4898 Email:

☐ Please send me an electronic copy of the draft EIS.

☒ Please send me a paper copy of the draft EIS.

Your Comments

What will be the impact of conservation on domestic water wells. Will loss of ground water dry up wells?

Written Comment Sheet for

Scoping the Icicle Strategy Programmatic Environmental Impact Statement

Scoping is the process used to determine what should be evaluated in an environmental impact statement (EIS). It is conducted before any analysis of impacts is begun. You can participate in this process by submitting your scoping comments below.

Comments will be accepted through May 11, 2016 and can be sent to Mike Kaputa at mike.kaputa@co.chelan.wa.us or 411 Washington Street, Suite 201, Wenatchee, WA 98801

DEPARTMENT OF ECOLOGY
State of Washington

Contact Info (Required)

Name: Steve McKenna Date:

Address: 12490 Shore St

Telephone: 509-670-1104 Email: smckenna@nwi.net

☐ Please send me an electronic copy of the draft EIS.

☐ Please send me a paper copy of the draft EIS.

Your Comments

I commend the IWG for this most impressive collaboration! You've come together and worked for over 3 year to arrive at consensus on projects to improve stream flow on the Icicle. Having local entities, with often competing values, come together for solutions is a model for others to follow. The presentation was thorough, thought provoking, & Nice job involving the community as part of this process.

Written Comment Sheet for

Scoping the Icicle Strategy Programmatic Environmental Impact Statement

Scoping is the process used to determine what should be evaluated in an environmental impact statement (EIS). It is conducted before any analysis of impacts is begun. You can participate in this process by submitting your scoping comments below.

Comments will be accepted through May 11, 2016 and can be sent to Mike Kaputa at mike.kaputa@co.chelan.wa.us or 411 Washington Street, Suite 201, Wenatchee, WA 98801

DEPARTMENT OF ECOLOGY
State of Washington

Contact Info (Required)

Name: Scot Brower Date: 4/20/16

Address: 5821 Icicle Rd Leavenworth WA 98826

Telephone: 548-4160 206-819-3202 Email: scotbrower@comcast.net

☒ Please send me an electronic copy of the draft EIS.

☐ Please send me a paper copy of the draft EIS.

Your Comments

TU - leavenworth chapter

Concerns regaurding Boulder Field Removal

1) will upper Icicle Creek support Steelhead or is it too cold or lack sufficient food

2) will Steelhead passage into upper Icicle result in closure of trout fishery (Rainbow) because Steelhead protected by Endangered Species Act?

Nete Olsen
836 NW 61st St
Seattle, WA 98107

April 19, 2016

Via email: Mike.Kaputa@co.chelan.wa.us

Chelan County Natural Resources Department
Attn: Mike Kaputa, Director
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: Scope of Programmatic EIS for Icicle Creek Water Resource Management Strategy

Dear Mr. Kaputa,

Thank you for the opportunity to comment on the Scope of the Programmatic Environmental Impact Statement for the Icicle Creek Water Resource Management Strategy. It is my understanding that you are currently soliciting questions, recommendations and comments regarding the Guiding Principles that helped to delineate the scope, as well as the baseline projects briefly outlined in the "Icicle Strategy". My comments are as follows:

1. **A Water Balance Chart should be prepared for the Icicle Creek system.** This chart should show: a) the baseline flows expected for Icicle Creek and the tributary lakes during a "normal" flow year, a "drought" year, and anticipated future flows that take into account the impacts of global warming; b) water outputs from Icicle Creek under current operations during "normal" and "drought" years showing the locations of the diversions, the maximum rates and volumes of diversion, whether the diversions are firm or interruptible, and the holders of the diversionary rights; and c) locations of problem areas in the drainage system that the IWG is trying to address to improve instream flows. Note that all of the flow rates and volumes should be presented for each individual water right—for example, Snow/Nada Lakes should be broken into the diversions for the Fish Hatchery and for the Icicle Peshastin Irrigation District (IPID).

2. **The Guiding Principles outlined by the IWG need to be ranked in order to establish the relative importance of each principle.** Clearly, some of the principles are legal requirements (Tribal Treaty Harvest, State and Federal

Laws, Wilderness Act), which take precedence over other principles presented (eg. Improve Domestic Supply, Improve Agricultural Reliability). For that reason, not all guidelines are created equal. Rather, there are Required Guiding Principles and Additional Guiding Principles, and they should be noted as such. This ranking must be done because the projects that will follow from this scoping document will all be tied to these Guiding Principles, and not all of them will be able to be met. So, the ranking system will help to define which project should take precedence.

3. **"Conservation First" should be added as the 10th Guiding Principle**. While conservation of water as a limited resource is of clear interest to those within the working group, defining Conservation First as a separate Guiding Principle will more clearly demonstrate the IWG's desire to meet water needs through conservation before attempting to find and develop any "new" sources of water. Additionally, bringing water conservation to the forefront will keep conservation as the first line of action in meeting future water needs. Generally, conservation is cheaper, easier, and faster than developing new water sources.

4. **Relocating the diversion locations along Icicle Creek must be considered as an alternative to meet the Guiding Principle of Improving Instream Flow.** Clearly, if the stretch of Icicle Creek that most suffers from reduced stream flow is the segment downstream of the diversion structures for the irrigation districts, the City of Leavenworth, and the Fish Hatchery, then using a pumping system to divert flows to the gravity diversion channels from the confluence must be studied, considered, and compared.

5. **Transferability of water rights must be demonstrated in the Eightmile Lake Restoration Project.** It appears that the water rights for the Alpine Lakes (including Eightmile Lake) were granted to the IPID, and the agreements with the Forest Service in the Wilderness Act were negotiated with the IPID. It is not clear to me how any changes made to Eightmile Lake can be made in order to provide water to a municipal water provider, as that appears to be outside of the water usages established by these two agreements. The summary of the water rights presented in the *Alpine Lake Optimization and Automation* report prepared by Aspect Consulting and Anchor QEA describe the rights as certified "for the purpose of irrigation of 7,000 acres lying within the lands of the Icicle and Peshastin Irrigation Districts."

6. **Limits of Inundation of Eightmile Lake perimeter should be mapped.** This mapping would help to define what the potential impacts would be of raising the water level of Eightmile Lake by 4 feet, including the impacts to trails, campsites, forested areas, and habitat. It would also help to determine the feasibility of raising the lake—ie would the lake even be able to impound the

higher water level, or are there geologic factors that would keep the lake from being able to impound a higher level of water?

7. **Alpine Lakes Optimization, Modernization, and Automation operation strategy needs to be defined**, particularly since it is linked to the "Improve Instream Flow" Guiding Principle:
   - **a)** How much water will be taken from each lake during a "normal" water year?
   - **b)** Will the ease of water withdrawal increase the "baseline" withdrawal rate that currently gets drawn? For example, will irrigated acreage increase so that the needs for irrigation rise, and every year becomes a "drought" year? We all know that demands will rise as supply becomes available, and providing a more regular supply may only make for more severe shortages as the impacts of global warming become clearer.
   - **c)** How will the benefits to Instream Flows (as an interruptible flow) be balanced with the needs of irrigation (as a firm demand)?

8. **Stage/Storage data and bathymetry needs to be developed for each of the Alpine Lakes within the "optimization" program.**

Thank you again for this opportunity to comment. Please include me in all future mailings on this project.

Sincerely,

Nete Olsen
836 NW 61st St
Seattle, WA 98107
neteolsen@olsenviolins.com

Jordan Sanford

From: Meghan O'Brien
Sent: Thursday, April 21, 2016 1:03 PM
To: Jordan Sanford
Subject: FW: No dams in Alpine Lakes Wilderness!

Here is another public comment to add to the table.
Thanks,
Meghan

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Thursday, April 21, 2016 12:45 PM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: No dams in Alpine Lakes Wilderness!

Comment below…

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Sunday, April 17, 2016 7:57 PM
To: Roy & Jean McMurtrey
Cc: Mary Jo Sanborn
Subject: RE: No dams in Alpine Lakes Wilderness!

Hi Roy. I will make sure your comment is in the record.

Are you aware that dams were constructed on several alpine lakes in the early 1900s, before the wilderness designation, and are currently maintained operated by agreement between the US Forest Service and Icicle Irrigation District? Your comment suggested to me that you thought dams did not exist up there.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201

Wenatchee, WA 98801
Phone: (509) 670-6935

From: Roy & Jean McMurtrey [mailto:dmcmurtrey@msn.com]
Sent: Sunday, April 17, 2016 4:10 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: No dams in Alpine Lakes Wilderness!

What a terrible idea. We need wilderness kept pristine, get the water some other way, please.

Roy McMurtrey

Sent from Mail for Windows 10

Jordan Sanford

From: Meghan O'Brien
Sent: Monday, April 25, 2016 11:02 AM
To: Jordan Sanford
Subject: FW: Icicle Stategy

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Monday, April 25, 2016 11:03 AM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Icicle Stategy

Comment below…

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Friday, April 22, 2016 11:47 AM
To: Mary Jo Sanborn
Subject: FW: Icicle Stategy

From: Ken Hemberry [mailto:ken@hiupgrowers.com]
Sent: Friday, April 22, 2016 11:08 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle Stategy

Mike
Peshastin Hi-Up Growers President of the Board Rudy Prey Jr. and I attended the Icicle Strategy Meeting held in Leavenworth on April 20th. As the General Manager of a company that packs 50 million pounds of pears annually, I am acutely aware of the value of water. There really isn't anything that is more important to our growers and countless other growers than having a dependable source for irrigation. While Rudy and I came to the meeting with our personal interests in mind, it was great to learn that the Work Group was focused on meeting the needs of all stakeholders through a consensus process.

On April 21st our board held its monthly meeting. Rudy and I reported on the Icicle Strategy. Our board was very pleased to hear of both your efforts and your approach. We want to pass on to you that we both appreciate and support the Work Group's plans and Guiding Principles. If there is any way that we can assist please let us know.

Ken Hemberry
General Manager
Peshastin Hi-Up Growers

Jordan Sanford

From: Meghan O'Brien
Sent: Monday, April 25, 2016 11:08 AM
To: Jordan Sanford
Subject: FW: Save the Alpine Lakes Wilderness!
Attachments: IMG_6448.JPG

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Monday, April 25, 2016 11:04 AM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Save the Alpine Lakes Wilderness!

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Friday, April 22, 2016 9:29 AM
To: joriadkins@mac.com
Cc: Dorothy Walker; Mary Jo Sanborn
Subject: RE: Save the Alpine Lakes Wilderness!

Thanks, Jori, for your comments. We'll make sure that they are entered into the record.

I wanted to make sure you knew that Snow, Nada, Colchuck, Square, Klonaqua and Eightmile Lakes already have dams in place and were constructed before the wilderness designation. I read your email to say that you thought there are not dams there now and that the Icicle Work Group is proposing to build new ones. Here are some photos that show some of these lakes from last year and the dam at Eightmile.

Let me know if I can provide any additional information.

From: joriadkins@mac.com [mailto:joriadkins@mac.com]
Sent: Tuesday, April 19, 2016 10:53 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Cc: Dorothy Walker <dorothyw@centurylink.net>
Subject: Save the Alpine Lakes Wilderness!

Dear Mike Kaputa,

I am very concerned about the Icicle group's proposal to use the Alpine Lakes as *reservoirs* for, when the smoke lifts, new housing starts in the Leavenworth area as well as other Chelan County suburbs.

Their plan looks "balanced" but it isn't when it is looked at closely. Yes, they play lip service to Fisheries, yes, they mention the Widerness Acts and complying with State and Federal laws, but basically the list of stakeholders are those that profit from the water and would like to control it for more direct growth of that profit. Their tactics are very arrogant, making statements that make it sound as if it were a done deal! Calling the lakes reservoirs is the worst! This is all very wrong!

I am one of the people that sees wilderness areas as a place of rejuvenation and healthy hiking and wildlife watching, to see an area like Alpine Lakes is to see something that has not been affected by humans (that is the definition of a wilderness area). People like me do not dam the lakes for the profit of a few but leave it for others and our grandchildren to enjoy and seek healthy renewal.

This proposal uses our taxes too and we were not notified in time for meetings because we are not an organization but individuals that go out to hike in the wilderness.
This project uses our taxes and they are being spent to benefit a few. This is very wrong!

Please leave the Alpine Lakes Wilderness alone as the pristine Alpine wilderness it is!

Thank you for your time and consideration,

Jori Adkins
301 Puyallup Ave.
Tacoma, WA 98421
253-365-1459

Jordan Sanford

From: Meghan O'Brien
Sent: Monday, April 25, 2016 11:09 AM
To: Jordan Sanford
Subject: FW: Comment on Icicle Basin water

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Monday, April 25, 2016 11:04 AM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Comment on Icicle Basin water

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Friday, April 22, 2016 9:14 AM
To: Mary Jo Sanborn
Subject: FW: Comment on Icicle Basin water

From: Mike Kaputa
Sent: Friday, April 22, 2016 9:13 AM
To: 'Vic Clayson' <vkclayson@charter.net>
Subject: RE: Comment on Icicle Basin water

Thanks, Vic, we'll make sure your comments are entered into the record. Please let me know if there is any more information we can provide.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department

411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Vic Clayson [mailto:vkclayson@charter.net]
Sent: Friday, April 22, 2016 8:17 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Comment on Icicle Basin water

Good morning,

I appreciate the opportunity you're giving for public comment on the Icicle Basin water issue.

I'm very much in favor of increasing the capacity for water storage. I don't know just how this is going to be done or if the source of funding is known. If funding is available and the various agencies can come to an agreement to repair dams where necessary or whatever needs to be done to get more storage, I'm all for it. I'm not claiming to be an expert in how to do it but I'm sure that there are experts who know how to get the job done and I'm going to trust them to do that.

It seems like such a waste to see all of the brown, muddy water going down the Wenatchee River every spring. I assume that whatever is done in the Icicle Basin probably won't do much, if anything, to reduce the high level of water that we see so often during parts of the year. Even so, if there's a way we could even do more to contain some of that water I'd also be for that but I'm realistic enough to know that isn't likely to happen.

Sincerely,
Vic Clayson
Cashmere

Jordan Sanford

From: Meghan O'Brien
Sent: Monday, April 25, 2016 11:09 AM
To: Jordan Sanford
Subject: FW: Icicle Water project

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

-----Original Message-----
From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Monday, April 25, 2016 11:04 AM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Icicle Water project

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

-----Original Message-----
From: Mike Kaputa
Sent: Friday, April 22, 2016 9:12 AM
To: Merrie Davis
Cc: Mary Jo Sanborn
Subject: RE: Icicle Water project

Thanks, Merrie, we'll make sure your comments are entered into the record. Please let me know if there is any additional information we can provide you.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

-----Original Message-----
From: Merrie Davis [mailto:wmdavis@yesimadeit.com]
Sent: Thursday, April 21, 2016 10:56 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle Water project

I am in favor of the proposal for additional water storage in the Alpine Lakes area. I hope the proposal is a success.

Merrie Davis

Jordan Sanford

From: Dan Haller
Sent: Wednesday, April 27, 2016 11:28 AM
To: Jordan Sanford
Subject: Fwd: IWG Comments

Sent from my U.S. Cellular® Smartphone

-------- Original message --------
From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Date: 4/27/16 11:17 AM (GMT-08:00)
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: IWG Comments

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Tuesday, April 26, 2016 3:58 PM
To: Cristina Hill
Cc: Mary Jo Sanborn
Subject: RE: IWG Comments

Thanks for taking the time to provide comments, I'll make sure they are entered into the record…Mike

From: Cristina Hill [mailto:cristina.e.hill@gmail.com]
Sent: Monday, April 25, 2016 12:50 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: IWG Comments

Dear Mr. Kaputa,

As part of the IWG SEPA public comment period, I would like to ask that the City of Leavenworth initiate a water metering program and tiered pricing for residential customers. As part of the stated effort to improve conservation efforts, this one is perhaps the most obvious. Not only do people not know how much water they currently use, but there is no financial incentive for conservation? This should change.

In addition, I completely support improvement of passage conditions at the Icicle Boulder Field, installation of fish screening at the Leavenworth National Fish Hatchery intake, along with their upgrade to circular tanks for fish rearing. The conversion of any delivery systems to irrigators to on-demand pumps with pressurized pipes is also a good one, though their users should also be asked to allow metering in exchange for public financing of their infrastructure. Thank you for consideration of my comments.

Cristina Hill
Leavenworth Resident

Jordan Sanford

From: Dan Haller
Sent: Wednesday, April 27, 2016 3:45 PM
To: Jordan Sanford
Subject: FW: Comment regarding Icicle Work Group and SEPA Checklist

Daniel R. Haller, PE, CWRE | Aspect Consulting, LLC | Principal Engineer | Direct: 509.895.5462 | Cell: 509.952.8607

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From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Wednesday, April 27, 2016 3:05 PM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Comment regarding Icicle Work Group and SEPA Checklist

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Wednesday, April 27, 2016 11:35 AM
To: timgartland@centurytel.net
Cc: Mary Jo Sanborn
Subject: RE: Comment regarding Icicle Work Group and SEPA Checklist

Thanks, Tim, we appreciate the thorough review and will make sure these comments are entered into the record and considered.

Mike

From: Timothy R Gartland [mailto:timgartland@centurytel.net]
Sent: Wednesday, April 27, 2016 10:44 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Comment regarding Icicle Work Group and SEPA Checklist

Dear Mr. Kaputa,

It appears to me that answers submitted in your SEPA Environmental Checklist related to Icicle Work Group proposals are incomplete. That is, your responses ignore the upstream impacts of the Icicle Work Group's proposed increases to water flows over those upper stretches of Icicle Creek and its tributaries. The manipulated flows meant to provide additional water during the late summer and early fall are by definition unnatural, and as such will (of course) have an impact. Yet your SEPA responses make no mention of this simple fact.

Here are some examples to support my observation:

Regarding:
Section B. Environmental Elements
Subsection 8. Land and Shoreline Use

Question a: What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.
Your answer: "The proposal will increase instream flow, which will provide beneficial results for a variety of agricultural, recreational, domestic, commercial, and natural uses on adjacent properties."
This response fails to account for the deleterious effects to wildlife, wildlife systems and humans that have come to count upon the natural seasonal reductions to instream flows (upstream of the proposal's beneficiaries.)

Question j: Approximately how many people would the completed project displace?
Your answer: "None anticipated."
This response fails to account for the upstream property owners, camp site users and other visitors who count on using the natural seasonal reductions for swimming and wading who will be discouraged by the danger presented by the increased flows. If the water flow were increased 30 or 50% on the stretch where I generally camp it would render the stream unsafe for entry. As it is now, I and other campers can wade, swim or bathe themselves naturally. The increased flows could result in the entire population of future campers losing swimming areas forever.

Subsection 12. Recreation

a. Would the proposed project displace any existing recreational uses? If so, describe.
Your answer: "The proposal would improve some recreational opportunities by enhancing the natural aesthetic of the affected geographical area through increased streamflow in Icicle Creek."
This response fails to account again for the upstream property owners, camp site users and other visitors who count on using the natural seasonal reductions for swimming and wading who will be discouraged by the danger presented by the increased flows.

Section D. Supplemental Sheet for NonProject Actions

Question 2. How would the proposal be likely to affect plants, animals, fish or marine life?
Your answer: "The program is designed to improve instream flow and habitat for fish."
The response fails again to account for the deleterious effects to wildlife and humans that have come to count upon the natural seasonal reductions to flows upstream of the proposal's beneficiaries.

Question 4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?
Your answer: "Implementation of the Guiding Principles would not result in any long-term changes, new construction or lasting disturbance to any environmentally sensitive areas."
This response fails to account for the permanent presence of unnatural, counter seasonal increased water flows from originating sources within wilderness areas through to the downstream beneficiaries. To repeat, the increased flows would be permanent and unnatural.

The few examples above illustrate how your responses ignore upstream impacts of the increased water flows. Which is surprising because the impacts of artificially storing and releasing water flows are well documented from a long history of numerous projects around the globe. The impacts include those associated with river-line erosion and changes in water temperature, not to mention the increased dangers to humans wishing to bathe in and along its shores. River-line erosion impacts shores and riverbed, and threaten shoreline ecosystems. Further, stream beds can deepen and thus narrow over

time. The counter seasonal increases also result in the cooling of the waters. These cooler temperatures can impact fish, flora and fauna in ways not addressed in your responses.

Water flows have seasonally ebbed and flowed since time began. Aquatic and land animals have come to depend upon this ancient system, including myself. I look forward to the naturally low volumes and warmer waters to cool myself during the hot summer months. Aquatic animals may depend upon the lower volumes to breed or build fat stores. Land animals may advantage the lower flows to traverse the river or complete migratory travel. The artificial manipulation of the flows is by definition abnormal and unnatural, and as such will definitely impact the systems and the animals which populate the flows. Your responses should acknowledge and respect this fact. Its my observation that they do not. And as such, you should make amendments to correct the omissions.

Respectfully submitted,

Tim Gartland
9120 Woodworth Avenue
Gig Harbor, WA 98332
Frequent recreational visitor to the Icicle River and Valley

Jordan Sanford

From: Meghan O'Brien
Sent: Thursday, April 28, 2016 2:46 PM
To: Jordan Sanford
Cc: Dan Haller
Subject: FW: comments on IWG scoping

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

-----Original Message-----
From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Thursday, April 28, 2016 2:15 PM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: comments on IWG scoping

Mary Jo Sanborn
Water Resource Manager
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-----Original Message-----
From: Mike Kaputa
Sent: Thursday, April 28, 2016 2:09 PM
To: Ed Burns
Cc: Mary Jo Sanborn
Subject: RE: comments on IWG scoping

Thanks, Ed, we'll get your comments into the record and included in our scoping effort. We appreciate your time and effort to participate and put these together.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201

Wenatchee, WA 98801
Phone: (509) 670-6935

-----Original Message-----
From: Ed Burns [mailto:rpwa2003@yahoo.com]
Sent: Thursday, April 28, 2016 11:53 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: comments on IWG scoping

The main limitation I see with the plan is that conservation efforts seem to have the lowest priority. In the area where I live, which is served by COIC, there is no incentive to conserve since the water is basically free ($80/yr/acre) and essentially nobody does conserve. The vast majority of usage appears to be lawn watering in an inefficient manner. At the height of last years snowpack drought people were not even making minimal efforts to conserve, e.g., they watering in the middle of 100 degree days, watering daily, over watering, etc. Lining the ditch won't have any effect on usage and the small amount saved will just be dumped in the Wenatchee. I don't see where the incentive for users to conserve will come from. Since it's a user-owned district the users are not going to vote to do something that will cost them money such as metering, or even agree to it if someone else pays costs of installing meters. I see nothing in the plan that will persuade them into giving up their lush green lawns in mid summer which, although ridiculous in an area which ranges from semi arid to outright desert, seem to be regarded as a god-given right (the irony is, if you drive to Seattle in the summer, the majority of people there let their lawns go dormant in mid summer). Why weren't the costs of a California-like scheme to pay people to go to xeriscaping considered? I also don't see how the pumping options help because it seems like it's a robbing Peter to pay Paul scheme where flow in the lower Icicle is increased whereas flow in the Wenatchee decreased.

From my observations it seems that the lack of conservation efforts are the norm in the area. I see the same watering behavior in Leavenworth and in the domestic users in the IPID as in COIC. The manager of IPID is quoted during last summer's drought: “Icicle users have been using record amounts of water.....We have been pushing the canal as hard a we can push it.” He also claims that agricultural users irrigation efficiency is basically maxed out, but again, I saw sprinklers going in the middle of the day, and I'd wager that Israeli farmers are getting by with about half the water for the same crops. Although Leavenworth claims to have reduced per capita water usage, this was the result of a one-time (step function) decrease in usage when they installed meters, and it has not declined since then.

As far as environmental impact of individual projects: the remote control of output from the lakes would seem to be relatively innocuous; the rebuilding of the eightmile dam less so (interesting that in the reports the “historic” level of the lake is the level after the original dam was built); and the diversion from Upper Klonaqua lake, outrageous.

In summary, I think the plan proposes spending vast amounts of money on projects to provide water which serious conservation efforts, especially on the part of residential users, could largely provide.

272 Mapleway Road
Selah, WA 98942
April 30, 2016

Mike Kaputa
411 Washington Street
Suite 201
Wenatchee, WA 98801
Mike.kaputa@co.chelan.wa.us

Dear Mr. Kaputa,

Thank you for the opportunity to comment on the preparation of the Programmatic Environmental Impact Statement (PEIS) for the Icicle Strategy. I have the following comments:

Regarding the handouts shown on the website http://www.co.chelan.wa.us/natural-resources/pages/sepa-public-open-house,

1. Alpine Lakes Optimization, Modernization and Automation handout: I have a strong objection to the project description: "Seven *reservoirs* (emphasis added) located within the Alpine Lakes Wilderness Area are currently used to augment water supply for Icicle and Peshastin Irrigation Districts (IPID) and the US Fish and Wildlife Service Leavenworth National Fish Hatchery: Upper and Lower Snow, Nada, Colchuck, Eightmile, Klonaqua, and Square Lake." Further, "The purpose of this project is to manage release from these "*reservoirs*" (emphasis added) based on water levels and changing conditions in a way that would optimize the water supply in the basin and be coordinated among all users."

   Nowhere does it mention that these "reservoirs" are not, in fact, "reservoirs" but named geographic features (lakes) located within the Alpine Lakes Wilderness. It is also apparent that there was no consideration made for "users" of the Alpine Lake Wilderness, only for those who wish to consume the water from those "reservoirs" aka, lakes, from within the Alpine Lakes Wilderness.

2. Domestic Conservation Efficiencies handout: Quoting the project description, "Future conservation projects identified by the IWG include replacing residential meters, *evaluating* (emphasis added) a conservation oriented rate structure, expand conservation education and xeriscape programs, increase domestic leak detection programs, and rebates for efficient residential fixtures. Additionally, City of Leavenworth is *exploring* (emphasis added) opportunities for reclaimed water and replacing leaky watermains.

In the 1970's and 1980's, energy conservation was looked at as a stop-gap measure used prior to construction of coal or nuclear plants. The coal or nuclear plants would then provide the "real" energy necessary for an expanding economy.

We now know that those coal and nuclear plants were not necessary and energy conservation is the preferred alternative in the Pacific Northwest.

So why is the IWG providing first for hard engineering regarding "optimizing, modernizing and automating" the "reservoirs" but only "evaluates" and "explores" conservation opportunities? Shouldn't it be the other way around? Why do you first want to mine the water in the Alpine Lakes Wilderness before you have evaluated and explored the potential for conservation?

As a senior water right holder in the Yakima basin, I am familiar with the rush towards high dollar capital projects for new water sources (especially when the State or Federal government is paying) with conservation playing second or third fiddle.

I do understand that IPID has specific water rights from the Alpine Lakes Wilderness. My understanding is that those rights are for agricultural purposes. I question the conversion of those agricultural right to domestic water rights, especially when the IWG is only proposing an "evaluation" of a conservation oriented rate structure and the City of Leavenworth is only proposing "exploring" opportunities for reclaimed water and replacing leaky watermains.

Shouldn't you at least replace the leaky watermains? With all respect, replacing leaky watermains would appear to be a good place to spend capital dollars. Leaky watermain replacement could provide additional water through conservation with a side effect of improving the city's infrastructure.

I would like to see an alternative that does not allow "optimizing, modernizing and automating" the "reservoirs" but does require a conservation oriented rate structure, increased domestic leak detection, rebates for efficient residential fixtures and replacement of leaky watermains. Opportunities for reclaimed water should also be evaluated.

Thank you for your consideration of these comments.

Kind regards,

Margie Van Cleve

Written Comment Sheet for

Scoping the Icicle Strategy Programmatic Environmental Impact Statement

Scoping is the process used to determine what should be evaluated in an environmental impact statement (EIS). It is conducted before any analysis of impacts is begun. You can participate in this process by submitting your scoping comments below.

Comments will be accepted through May 11, 2016 and can be sent to Mike Kaputa at mike.kaputa@co.chelan.wa.us or 411 Washington Street, Suite 201, Wenatchee, WA 98801

DEPARTMENT OF ECOLOGY
State of Washington

Contact Info (Required)

Name: Fred Smith Date: 5/5/2016

Address: P.O. Box 357

Telephone: 860-3997 Email:

☐ Please send me an electronic copy of the draft EIS.

☒ Please send me a paper copy of the draft EIS.

Your Comments

The number one priority should be which ever project increases stream flow the greatest during mid to late summer. This would have the greatest positive effect on fish, and it would also insure a more reliable water flow for the Wenatchee Valley agricultural industry.

That project/projects would be the rebuilding of the Eight Mile Lake Dam to it orginal "legal" height, along with installing

automated valves.

As for the bolder field, learn to live with it, as past generations have.

TO: Tom Tebb
Director, Office of Columbia River
Washington State Department of Ecology
1250 Alder Street
Union Gap, WA 98903

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: Request for Comments on the Scope of the Programmatic Environmental Impact Statement (PEIS) for the Icicle Creek Water Resource Management Strategy (Icicle Strategy)

DATE: May 4, 2016

Dear Dir. Tebb and Dir. Kaputa,

The Washington State Department of Ecology (Ecology) directed the Chelan County Natural Resource Department (CCNRD) to develop a PEIS for the Icicle Strategy. Currently, the potential project package established by the Icicle Work Group (IWG) is open to public comment. Comments will be used to inform a draft State Environmental Policy Act (SEPA) PEIS for the Icicle Strategy. Trout Unlimited (TU) appreciates the opportunity to provide comments during the scoping period.

The purpose of the SEPA PEIS is to address probable significant adverse impacts associated with implementation of a suite of projects within the Icicle Creek basin aimed at enhancing stream flow and habitat conditions for fisheries and other aquatic organisms, improving operations and water storage at historical reservoirs within the Alpine Lakes Wilderness, maintaining water security and supply reliability for out of stream users of Icicle Creek water, and reinstating water reserves that will facilitate growth/development in Chelan County.

TU sits on the IWG Steering Committee and has worked with IWG membership to ensure the proposed package aligns with TU's mission to conserve, protect, and restore North America's coldwater fisheries and their watersheds. These projects include:

- Efficiency upgrades for Icicle Peshastin Irrigation District (IPID) and Cascade Orchards Irrigation Company (COIC)
- Domestic conservation and efficiencies
- Diversion screening upgrades (IPID, COIC, and City of Leavenworth)

- Eightmile Lake restoration and Alpine Lakes reservoir management optimization and automation
- Leavenworth National Fish Hatchery water conservation and water quality improvements, intake rehabilitation, and Structure #2 operational improvements
- Icicle Creek habitat improvements/land acquisitions
- Fish passage and tribal fishery improvements
- Water markets/banks
- Instream Flow Rule amendment

TU understands that a primary purpose of the SEPA PEIS is to help clarify resources and information that will inform programmatic environmental review for the Icicle Strategy as well as individual environmental review processes for each project. TU takes seriously its role within the IWG and wishes that the Icicle Strategy have a lasting positive benefit for the people and environment in North Central Washington. Moreover, TU understands that the IWG approved the current suite of projects for public comment and SEPA review, but that it does not necessarily represent the final project package or approval of individual projects in the PEIS.

TU has the following concerns and comments that should be addressed during the SEPA review and PEIS development:

1. An article on the Icicle Strategy in the April 22, 2016 print issue of the Wenatchee World noted that in the opinion of the IWG, "If implemented in full, the (Icicle Strategy) will support area population growth while also supplying fish and irrigators with the water they need through 2050." TU is concerned that the ability of the proposed project package meeting Icicle Creek demands through 2050 is not substantiated because no assessment has been conducted specifically addressing future water supply and climate scenarios in the Icicle Creek basin. Potential impacts of a changing climate in the Pacific Northwest include reduced snowpack and decreased summer stream flows. IWG guiding principles include instream flow objectives of 60 cfs in drought years and 100 cfs in non-drought years. TU encourages the IWG to review the attached analysis of Icicle Creek water/climate conditions performed by Dick Rieman and TU-Washington Water Project staff and urges the IWG to procure a water supply and climate change analysis from a team of experts such as the University of Washington Climate Impacts Group. It does not seem prudent to move a final project list forward without first securing water supply information so the Icicle Strategy is built on sound science and solid fundamentals.

2. TU understands that the success of the Icicle Strategy hinges on implementation of the full suite of proposed projects. However, it is unclear what projects have been identified to replace those in the proposed package should any one become unattainable due to logistics, lack of public support, unanticipated expenses, or other reason(s). TU strongly urges the IWG to develop a list of proposed project alternatives that will also meet IWG guiding principles and that are practical, feasible, and implementable. In addition to identifying potential replacement projects should one of the proposed projects drop from the final package, a comprehensive list of project alternatives will also demonstrate that the final package contains projects that have the greatest conservation benefit for the most effective cost.

3. TU understands that the National Environmental Policy (NEPA) process must be undertaken by a lead federal agency. At this time no lead agency has been identified. TU recommends identification of a federal agency that will serve as the lead during NEPA processes and procedures.

4. TU understands that IWG flow objectives may focus on LNFH historic channel flow. TU wonders if flow objectives ought to be observed at the USGS gauge station above the Snow Creek confluence since this location has an established, long-running monitoring record that may be useful in historic, contemporary, and future analyses.

5. Multiple parties have indicated concerns about changes to the lakes in the Alpine Wilderness area. TU urges the Department of Ecology and Chelan County to take these concerns seriously and work closely with the Forest Service to determine what can and cannot be constructed or designed in that area.

6. Project implementation is an on-going process in Icicle Creek like most watersheds throughout North Central Washington. TU and numerous other entities are currently working on restoration projects within the Icicle Creek and Wenatchee River basins and will continue to manage these projects independent of the Icicle Strategy process.

7. Future materials should clearly articulate benefit/cost information for projects envisioned by the IWG. TU recommends that this process be undertaken independent of the IWG.

TU supports collaborative efforts to develop a holistic water resource management strategy for Icicle Creek and commends the work of member organizations, tribes, agencies, and individuals who have spent significant time to participate. The needs of fish, farms, and families must be balanced to ensure the region supports healthy ecosystems, maintains a robust economy, and shares the costs of the Icicle Strategy among the various users.

Sincerely,

Lisa Pelly
Director, Trout Unlimited-Washington Water Project

Michael Wyant

Mike Wyant
President, Icicle Valley Chapter of Trout Unlimited

Stream flow, temperature, and snow water equivalent in Icicle Creek basin, Washington: historic conditions and potential future scenarios

Trout Unlimited-Washington Water Project[1] and Dick Rieman[2]

[1]Trout Unlimited-Washington Water Project, 103 Palouse Street, Wenatchee, WA, 98801
[2]Concerned citizen (please direct questions to Cody Gillin, Project Manager with Trout Unlimited-Washington Water)

Background

Trout Unlimited-Washington Water Project and Leavenworth resident Dick Rieman conducted an examination of Icicle Creek stream flow and climate conditions. Analyses focused on historical conditions but also included some effort to understand possible future scenarios. USGS stream gauge station #12458000 on Icicle Creek above the Snow Creek confluence provided baseline stream flow data. Public data repositories for SNOTEL site #791 at Stevens Pass, University of Washington Climate Impacts Group (CIG), and National Weather Service Cooperative Observer Program (COOP) provided historical and future temperature data. Snow water equivalent (SWE) data were provided by the University of Washington Climate Impacts group. Future stream flow projections were derived from National Stream Internet (NSI) attribute data joined to the National Hydrography Dataset (NHD) streamlines geospatial layer.

Methodology

USGS gauge station #12458000 was operational 1937-present with a 23-year period of decommission 1971-1993. This analysis utilized all available data for complete water years (1937-1970 and 1994-2015). Stream flow data (cubic feet per second or cfs and acre feet or ac-ft) were evaluated numerically and graphically by examining raw data, trends/patterns, and measures of central tendency. Evaluated time periods included annual, monthly, daily, and center time (date by which half the total annual water volume flowed past the gauge station). Annual data were considered based on the water year calendar October 1-September 30.

Monthly stream flow data were compared with monthly water demand placed on Icicle Creek by existing out of stream uses and minimum instream environmental flows outlined by the Icicle Working Group (IWG). Out of stream uses vary by month and include Icicle-Peshastin Irrigation District (IPID), Leavenworth National Fish Hatchery (LNFH), Cascade Orchards Irrigation Company (COIC), and City of Leavenworth (Leavenworth). Minimum environmental flow restoration objectives described in the IWG Guiding Principles are 60 cfs for drought years and 100 cfs for normal years. Note that this analysis used drought year environmental flow values of 60 cfs when calculating demand so all years are considered drought years. Demand for out of stream uses and environmental flows outlined in the IWG guiding principles are referred to as IWG water demands.

Median monthly temperatures for SNOTEL site #791 (Stevens Pass) were evaluated for the entire period of record (1984-2013).

COOP historical mean monthly temperature raster data were compared with CIG Western US Hydroclimate Scenarios Project projected 2040s mean monthly temperature data derived from the CMIP3 global model archive for the A1B emissions scenario. CIG and COOP data were resampled to a finer resolution to facilitate visualization at the scale of the Icicle Creek basin. Raster data were quantified and percent change in watershed area comprised by the raster classes was calculated.

Historical mean monthly SWE data were compared with future data. SWE data were resampled to the same cell size as temperature data to facilitate visualization. All geospatial data were analyzed using ESRI ArcMap 10.4. All graphs were developed using Microsoft Excel. Numerical calculations were conducted using both ESRI ArcMap 10.4 and Microsoft Excel.

Results and Observations

Historical Data: Stream Flow

Mean volume of water passing USGS gauge station #12458000 was approximately 450,000 ac-ft in 1937 and 442,000 ac-ft in 2015 (Fig. 1). Linear regressions suggested total mean monthly water volumes are increasing each month from November 1-March 31 and decreasing each month from April 1-October 31 (e.g., Figs. 2, 3, 4). Mean center time at USGS gauge station #12458000 was May 27 in 1937 and May 8 in 2015 (Fig. 5). Variability of center time (range of center time date) increased through the period of record. During the two gauge station periods of operation, the earliest center time date during the early period occurred on April 30, 1960. Nearly 25% of center time dates during the recent period of operation occurred earlier than April 30, including two dates in early March and one date in late February (Fig. 5).

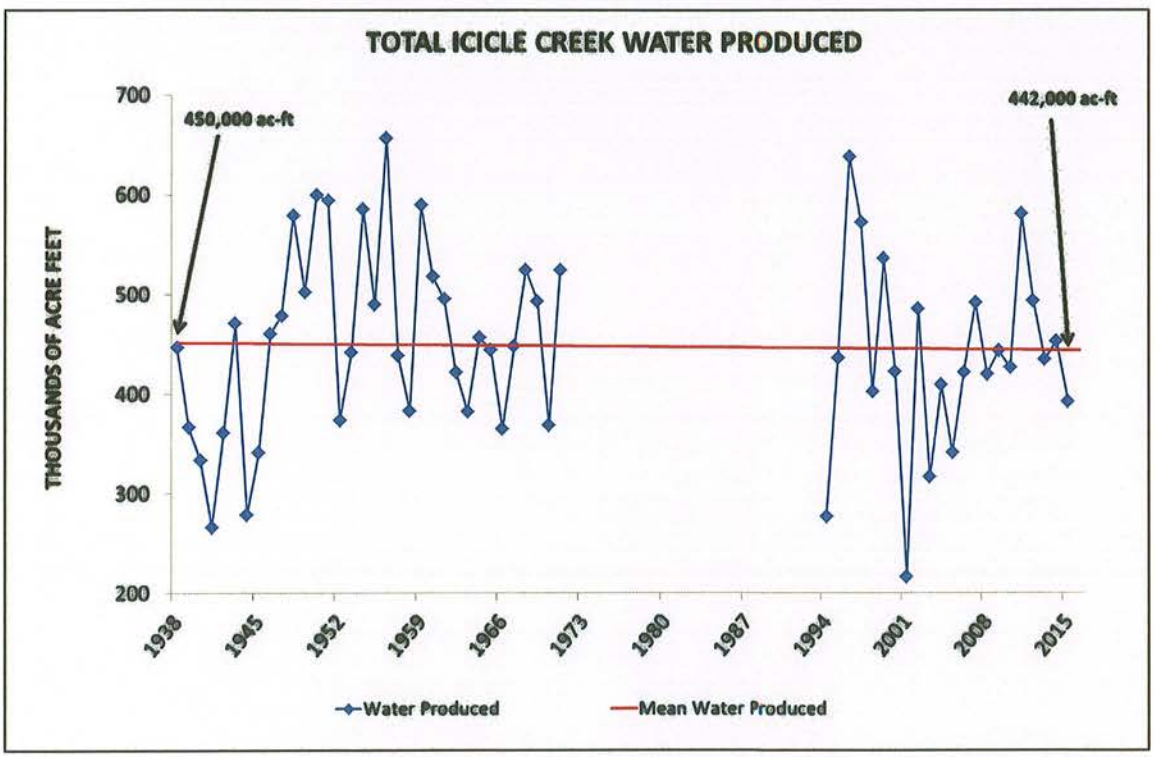

Figure 1. Total volume of water measured at USGS gauge station #12458000 was variable on an annual basis but on average remained relatively unchanged through the period of record.

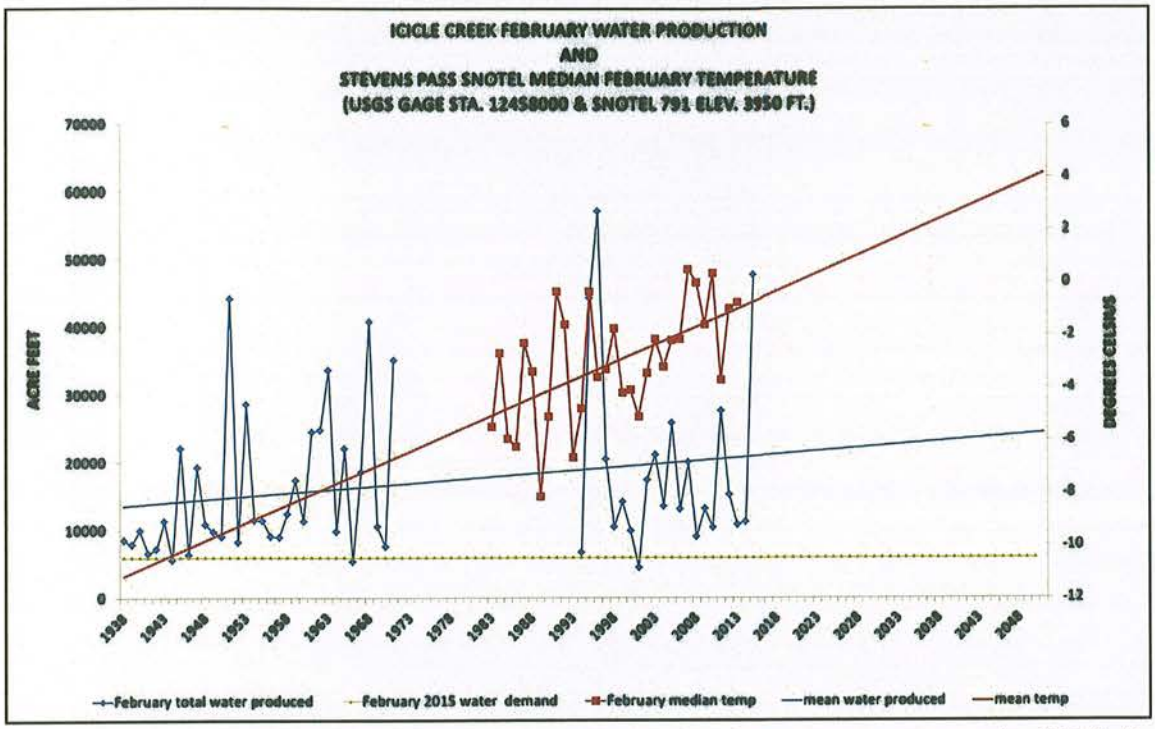

Figure 2. Total volume of water measured at USGS gauge #12458000 and median temperature measured at SNOTEL site #791 increased for the month of February. The same result (increased water production and temperature) was found for all months during the period November 1-March 31).

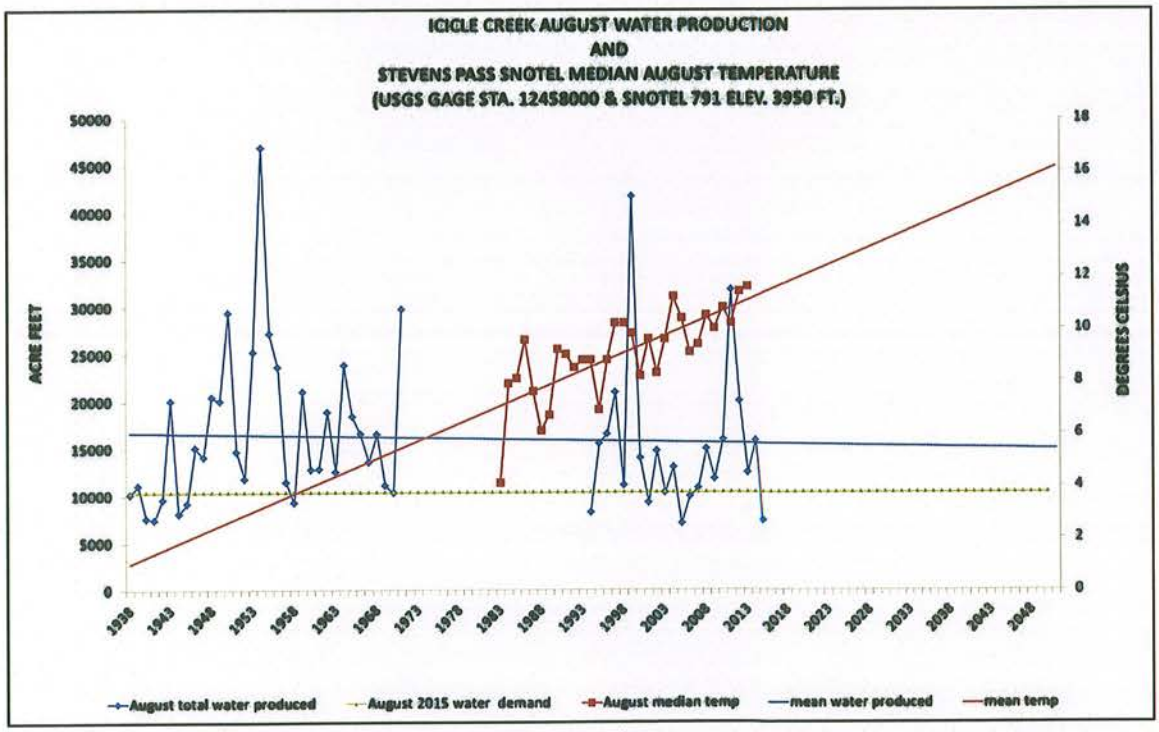

Figure 3. Total volume of water measured at USGS gauge #12458000 decreased and median temperature measured at SNOTEL site #791 increased for the month of August. The same result (decreasing water production and increasing temperature) was found for all months during the period April 1-October 31).

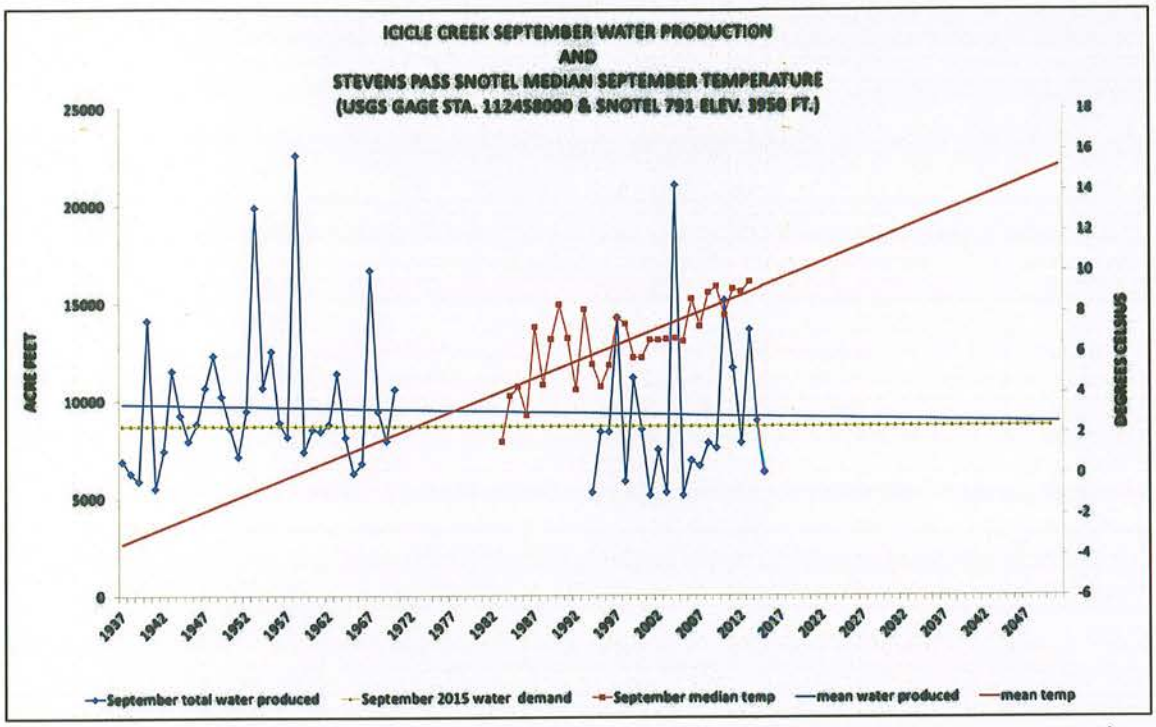

Figure 4. Total volume of water measured at USGS gauge #12458000 decreased and median temperature measured at SNOTEL site #791 increased for the month of September. The same result (decreasing water production and increasing temperature) was found for all months during the period April 1-October 31).

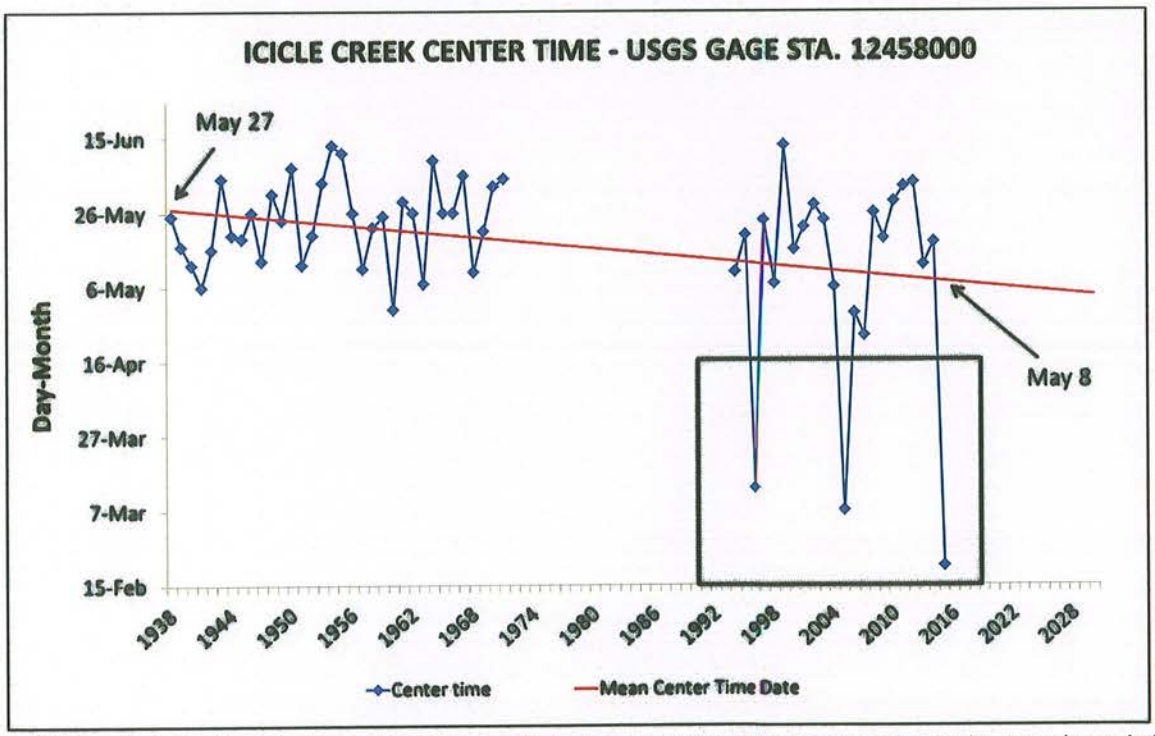

Figure 5. Mean Icicle Creek center time date measured at USGS gauge #12458000 shifted 19 days earlier over the period of record. Note three dates (boxed) occurred on March 13 or earlier 1996-2015.

Historical Data: Temperature

Linear regressions of median temperatures suggested increasing temperatures for all months at SNOTEL site #791 (e.g., Figs. 2, 3, 4). Temperature increases ranged from a minimum of 1.2°C in June to a maximum of 4.8°C in September (Table 1). Average median monthly temperature increase was 3.0°C. SNOTEL data may be biased and this analysis did not research a bias nor apply a bias correction.

Table 1. Median monthly temperatures measured at SNOTEL site #791 (Stevens Pass) increased during the period of record 1984-2013.

Stevens Pass SNOTEL Data: Linear Regression of Median Monthly Temperatures				
Month	**1984 (°C)**	**2013 (°C)**	**Change (°C)**	**Change (Percent)**
Oct	1.7	4.2	2.5	147.1
Nov	-3.0	0.4	3.4	113.3
Dec	-6.0	-2.1	3.9	65.0
Jan	-5.1	-1.2	3.9	76.5
Feb	-5.0	-1.1	3.9	78.0
Mar	-2.7	-0.6	2.1	77.8
Apr	-1.0	0.8	1.8	180.0
May	1.1	3.4	2.3	209.1
Jun	4.8	6.0	1.2	25.0
Jul	7.5	10.2	2.7	36.0
Aug	7.3	11.2	3.9	53.4
Sep	4.3	9.1	4.8	111.6
Mean	0.3	3.4	3.0	97.7

IWG Water Demands and Historical Stream Flow Conditions

Historical mean daily flows at USGS gauge station #12458000 were compared with Icicle Creek July-October IWG water demands for the recent period of gauge operation (1994-2015). Recorded mean daily flows would not have met total instantaneous IWG demands 32.7% of the time (884 of 2706 days) (Table 2). IWG water demand was greater than mean daily flows most often in August (34%) and September (63%). Total monthly water production during the same time period would not have met IWG demands for 27% of the August data (6 of 22 years) and 68% of September data (15 of 22 years) (Figs. 3, 4). Demand deficits ranged from 27-3316 ac-ft (0.5-54 cfs) for August and 165-3563 ac-ft (2.8-60.0 cfs) for September.

Table 2. Number of days when IWG demand would not have been met by mean daily flows in Icicle Creek measured at USGS gauge station #12458000 (deficit days are in red text).

HISTORICAL PERIOD 1994-2015				
Year/Month	July	August	September	October
1994	4	29	30	23
1995	0	1	30	0
1996	0	1	19	0
1997	0	0	0	0
1998	0	12	30	26
1999	0	0	2	0
2000	0	16	20	0
2001	6	29	30	10
2002	0	2	21	31
2003	1	16	30	12
2004	0	11	0	0
2005	15	31	29	2
2006	0	19	30	31
2007	0	15	29	0
2008	0	0	23	2
2009	0	9	22	14
2010	0	3	0	0
2011	0	0	0	0
2012	0	0	19	13
2013	0	9	4	0
2014	0	0	15	1
2015	24	30	30	23
Total Days	682	682	660	682
Days Below Demand	50	233	413	188
Pct. Days Below Demand	7%	34%	63%	28%

Future Projections: Snow Water Equivalent

Climatologists predict climate change impacts to the region will include air and water temperature increases, decreased April 1 SWE, and reduced summer base flow conditions (among other effects) (e.g., 2014 USDA Climate Change Vulnerability and Adaptation in the North Cascades Region, Washington). This analysis resampled regional geospatial data to a finer resolution to facilitate visualization at the Icicle Creek watershed scale. Temperature and SWE investigations focused on March-April data as these factors during March-April play a key role in determining runoff timing and water supply availability throughout the arid summer months. CIG data indicate April 1 SWE will decline, with an increase in the portion of the watershed containing snowpack below 800 mm SWE and a much smaller portion of the watershed containing snowpack above 800 mm SWE (Fig. 6). The largest decrease is in Icicle Creek watershed area with more than 1000 mm April SWE, which historically represented 20.86% of the basin but is projected to decline to 2.30% (Table 3).

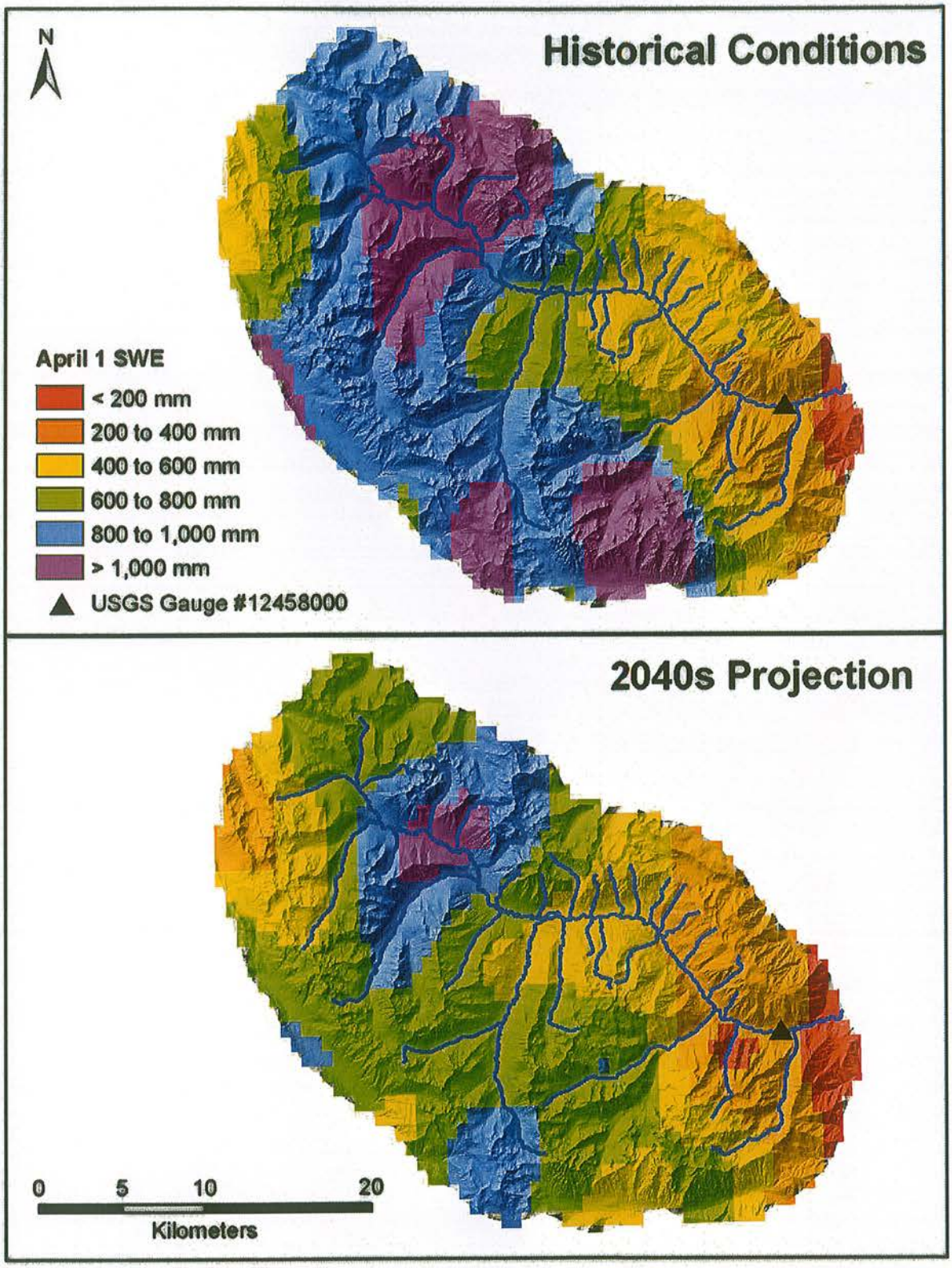

Figure 6. April 1 snow water equivalent (SWE) in the Icicle Creek watershed is projected to decline, with the greatest reductions occurring in the portion of the basin historically comprising snowpack greater than 1000 mm SWE.

Table 3. April 1 snow water equivalent (SWE) less than 800 mm is projected to increase and 800 mm or greater is projected to decrease.

	Historical Conditions		*2040s Projection*		
April 1 SWE (mm)	**Acres**	**Percent of Catchment Area**	**Acres**	**Percent of Catchment Area**	**Percent Change**
< 200	3,665.14	1.73%	7,502.19	3.54%	51.15%
200 to 400	21,045.92	9.91%	35,570.34	16.77%	40.83%
400 to 600	33,227.34	15.65%	45,038.80	21.23%	26.23%
600 to 800	30,935.01	14.57%	87,097.85	41.06%	64.48%
800 to 1000	79,197.45	37.29%	32,025.30	15.10%	-147.30%
> 1000	44,301.18	20.86%	4,872.91	2.30%	-809.13%

Future Projections: Temperature

According to the 2014 United States Department of Agriculture report *Climate Change Vulnerability and Adaptation in the North Cascades Region, Washington* a current warming trend in the Pacific Northwest is expected to continue with mean warming of 2.1°C by the 2040s. This analysis compared COOP historical temperature observations with CIG Western US Hydroclimate Scenarios Project forecasted 2040s mean monthly temperature data. A focus was placed on late winter and spring months (February-May) as this period is critical to dry season water supplies (possible snow accumulations or snow melt, depending on weather/climate). In general, temperatures are predicted to increase for all months analyzed across the Icicle Creek basin. March was used to exemplify the trend as it is a transitional month that can be more like winter or spring depending on variability of inter-annual conditions. Temperatures increased for all locations in the basin. The greatest change was for temperatures below -2°C, which historically comprised 23.16% of the Icicle Creek basin but are projected to comprise just 0.78% of the basin by the 2040s (Table 4, Fig. 7).

Table 4. Temperatures in the Icicle Creek basin are projected to continue a current increasing trend with the largest change for temperatures historically less than -2°C.

	Historical Conditions		*2040s Projection*		
Mean Temperature (°C)	**Acres**	**Percent of Catchment Area**	**Acres**	**Percent of Catchment Area**	**Percent Change**
< -2	49,137.77	23.16%	1,600.68	0.78%	-2,969.82%
-2 to -1	92,833.73	43.76%	47,736.31	23.28%	-94.47%
-1 to 0	53,023.91	25.00%	96,212.80	46.92%	44.89%
0 to 1	10,018.38	4.72%	49,706.30	24.24%	79.84%
1 to 2	4,597.81	2.17%	9,780.28	4.77%	52.99%
> 2	2,517.81	1.19%	7,093.44	3.46%	64.51%

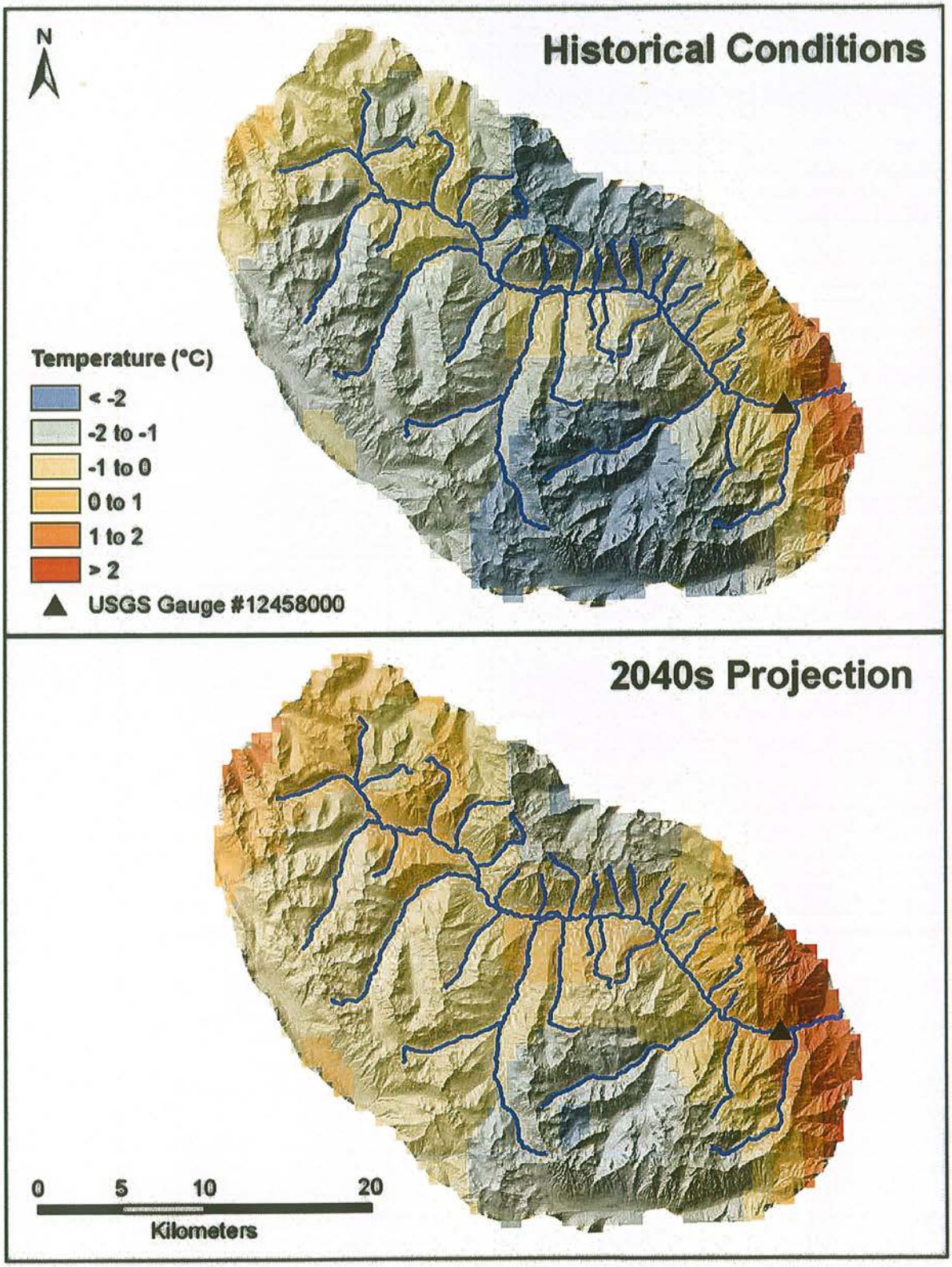

Figure 7. Mean March temperatures in the Icicle Creek basin are projected to increase, with large declines in watershed area historically comprised of mean March temperatures below -1°C.

IWG Water Demands and Future Summer Stream Flow Conditions

In general, climatologists predict reduced summer stream flows as a result of climate change in the region. A review of literature and climate models revealed variable percent of flow reduction from historical conditions. For example, National Stream Internet data indicated a mean summer (June-September) reduction of 39.33% and mean August reduction of 63% in Icicle Creek at the confluence with Snow Creek by the 2040s. The 2014 National Climate Assessment Northwest Regional Report by the United States Global Climate Research Program suggested 40-50% reduction of flows in the Wenatchee River near Icicle Creek. Since no future stream flow data specifically developed for the Icicle Creek basin were available, this analysis considered a 35% reduction in July-October Icicle Creek flows for the historical period 1994-2015 measured at USGS gauge station #12458000. The period July-October was considered because aforementioned evaluations determined historical flows would not have met IWG demands most often during these months. IWG demand was greater than mean daily flows applied with a 35% reduction most often in August (71%) and September (89%) when IWG water demand would not be met for a majority of days (Table 5). Historical Icicle Creek flows applied with a 35% reduction to simulate potential climate change impacts would not have met IWG demand for the entire month of September in 15 of 22 years.

Table 5. Historical Icicle Creek flows measured at USGS gauge station #12458000, when applied with a 35% reduction to simulate potential climate change impacts, would not meet IWG demand for a majority of the typical low-flow period July-October.

35% FLOW REDUCTION				
Year/Month	July	August	September	October
1994	13	31	30	25
1995	1	15	30	0
1996	0	16	30	19
1997	0	11	20	0
1998	7	31	30	31
1999	0	0	23	18
2000	0	25	30	10
2001	17	31	30	16
2002	0	20	30	31
2003	13	31	30	16
2004	10	25	4	0
2005	30	31	30	26
2006	4	31	30	31
2007	6	31	30	11
2008	0	19	30	17
2009	0	27	30	20
2010	0	18	13	4
2011	0	0	27	0
2012	0	10	30	14
2013	6	31	23	0
2014	0	19	28	15
2015	31	31	30	29
Total Days	682	682	660	682
Days Below Demand	138	484	588	333
Pct. Days Below Demand	20%	71%	89%	50%

Interpretation and Conclusions

The purpose of this study was to examine stream flow, temperature, and SWE in the Icicle Creek basin. Investigations yielded a trend of increasing stream flow during the period November 1-March 31 and decreased stream flow during the period April 1-October 31 in Icicle Creek measured at USGS gauge station #12458000. Center time date became earlier through the gauge station period of record. Median monthly temperatures at SNOTEL site #791 at Stevens Pass increased for all months. Icicle Creek basin SWE declined and temperature increased when historic conditions were compared with projected future conditions.

Current IWG materials indicate an instream flow demand of 60/100 cfs and conservation benefit of 47/77 cfs in drought/normal years. This analysis utilized only drought year instream flow demand of 60 cfs. IWG water demand was compared with historical flows measured at the gauge station. Mean daily and mean monthly demand deficits occurred during the period of record, including several instances of deficits greater than the 47 cfs drought year conservation benefit. If the analysis had considered a 100 cfs normal year demand the frequency and quantity of the demand deficit would increase.

A 35% reduction of historical stream gauge mean daily flow data for July-October during the recent period of gauge operation was used to simulate potential future conditions. IWG demand was frequently not met under this scenario, particularly in August, September, and October. Deficits greater than the 47 cfs drought year conservation benefit occurred in each month, with some months exceeding a 47 cfs deficit every day (e.g., September 1998, August 2001, September 2003). Furthermore, there are many October months with large deficits that could not be closed by proposed projects since much of the normal year conservation benefit is associated with irrigation/reservoir management effective only during the irrigation season (ending in September). Note that although this scenario is hypothetical, the authors selected a value for the percent reduction in stream flows based on a review of pertinent literature.

This analysis utilized Icicle Creek stream flow data to evaluate how IWG water demand compared with historical and potential future Icicle Creek flow conditions. Furthermore, the analysis investigated historic temperatures measured near the headwaters of the Icicle Creek basin and also compared historic temperature and SWE data with projected future temperature and SWE conditions across the entire Icicle Creek basin to gain a fundamental understanding of recent and potential future climate conditions. All data utilized were publicly available and the authors encourage interested parties to contact them with questions or data requests.

The study examined data trends and applied straightforward methods such as sums, measures of central tendency, simple linear regressions, and percent changes. No test of statistical significance was applied. Resampling of geospatial data was meant to facilitate visualization and may not be the most appropriate method for analysis. The authors do not claim to be climate experts. Rather, results of this analysis highlighted the need for an expert evaluation of future water supply, instream flow, and climate conditions in the Icicle Creek basin. Such an evaluation has been utilized in other resource planning endeavors and can be a valuable tool when planning projects and making decisions that impact ecosystem health and human communities.

Jordan Sanford

From: Meghan O'Brien
Sent: Tuesday, May 10, 2016 11:38 AM
To: Jordan Sanford
Subject: FW: Icicle Manipulation Comments

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

-----Original Message-----
From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Tuesday, May 10, 2016 11:38 AM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Icicle Manipulation Comments

Meghan and Dan - just for reference, Rob lives off-grid on Eightmile Creek at the Icicle confluence.

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

-----Original Message-----
From: Mike Kaputa
Sent: Tuesday, May 10, 2016 11:26 AM
To: Mary Jo Sanborn
Subject: FW: Icicle Manipulation Comments

-----Original Message-----
From: Mike Kaputa
Sent: Tuesday, May 10, 2016 11:26 AM
To: 'Rob' <rob@boudreauxcellars.com>
Cc: Tim Gartland <timgartland@centurytel.net>; Scot Brower <scotbrower@comcast.net>; harriett@sleepinglady.com
Subject: RE: Icicle Manipulation Comments

Thanks, Rob, good to hear from you. We'll make sure your comments are entered into the record. Interesting observation about the sediment loading and something we will look into.

Mike

-----Original Message-----
From: Rob [mailto:rob@boudreauxcellars.com]
Sent: Monday, May 09, 2016 9:59 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Cc: Tim Gartland <timgartland@centurytel.net>; Scot Brower <scotbrower@comcast.net>; harriett@sleepinglady.com
Subject: Icicle Manipulation Comments

Dear Mike,
Hope all is well. I am glad for the water use study in the Icicle. Two things concern me.
1. Eightmile Creek/ Mountaineer Creek runs right by my back door. Every time extra water is released from Colchuck Lake there is a tremendous sediment load suddenly flowing by. This is a completely unnatural condition for fish and people in late summer.
2. The continued use of helicopter support and further construction of dams in the Alpine Lakes Wilderness Area is blatantly at odds with the spirit of The Wilderness Act. I do not see how we can continue to call this wilderness if we make exceptions for our own over-population and profit.
If you need me I'm here. :)
Best regards,
Rob Newsom
Eightmile Creek
Leavenworth, WA 98826
Cell 509-670-3166

Sent from my iPad

Jordan Sanford

From: Meghan O'Brien
Sent: Tuesday, May 10, 2016 2:55 PM
To: Jordan Sanford
Subject: FW: Alpine Lakes Wilderness Scoping and EIS

Meghan O'Brien | Aspect Consulting LLC | Project Specialist | Direct: 509.895.5261 | Cell: 509.607.0059

From: Mary Jo Sanborn [mailto:MaryJo.Sanborn@CO.CHELAN.WA.US]
Sent: Tuesday, May 10, 2016 2:50 PM
To: Meghan O'Brien <mobrien@aspectconsulting.com>
Cc: Dan Haller <dhaller@aspectconsulting.com>
Subject: FW: Alpine Lakes Wilderness Scoping and EIS

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Tuesday, May 10, 2016 1:55 PM
To: Ruth Dight
Cc: Mary Jo Sanborn
Subject: RE: Alpine Lakes Wilderness Scoping and EIS

Thank you, Ruth, we'll make sure your comments are entered into the record….Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Ruth Dight [mailto:tooruth@earthlink.net]
Sent: Tuesday, May 10, 2016 1:47 PM

To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Alpine Lakes Wilderness Scoping and EIS

Dear Mr. Kaputa:

I attended your presentation in Seattle and find I agree with all of the recommendations outlined on the NAIADS website listed below.

- The EIS must consider a **Wilderness Protection Alternative**. This alternative would promote wilderness values as set forth in the Wilderness Act of 1964, would not allow new water infrastructure or diversions inside the Alpine Lakes Wilderness, and would require all new water supply to be obtained outside the Alpine Lakes Wilderness.
- The EIS must consider a **Water Conservation Alternative**. This alternative would assess using aggressive water conservation measures by Wenatchee Valley cities, including restrictions on lawn watering (as the citizens of Seattle have learned to do). This alternative should also assess transfer of water rights from irrigation districts to cities, where orchards have already been torn out and replaced with residential subdivisions. This alternative should also assess agricultural irrigation efficiency, such as replacing open gravity canals with pipes and pumps and other 21st century concepts.
- The EIS must consider an **Irrigation District Water Right Change Alternative**, which would fix Icicle Creek's low flow problem. This alternative would evaluate moving the Icicle-Peshastin Irrigation District's water right diversion, which presently takes 100 cubic feet per second out of Icicle Creek, to the Wenatchee River downstream about 3 miles. This measure, which would permanently fix Icicle Creek's low flow problem, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). The Icicle Work Group should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric.
- The EIS must consider a **Water Right Relinquishment Alternative**. Removal of water from the Alpine Lakes Wilderness is on the table only because IPID holds water rights that were grandfathered when the Wilderness was created. And – as IPID will tell anyone who will listen – every year they use what they need. When the dam at Eightmile Lake fell down decades ago they didn't fix it because they did not need more water. When a party doesn't use their rights, they lose them. "Use It Or Lose It" – the basic rule of western water law – is controlling. The EIS needs to analyze this.

I feel especially concerned that Chelan County consider the water conservation alternative.

Thank you,

Ruth Dight, AICP
(206) 283 9254
2549 11th Ave W
Seattle, WA 98119

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Tuesday, May 10, 2016 4:32 PM
To: Jordan Sanford; Meghan O'Brien
Cc: Dan Haller
Subject: FW: Objection to EIS - Alpine Lakes Wilderness

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Tuesday, May 10, 2016 4:12 PM
To: W. T. Soeldner
Cc: Mary Jo Sanborn
Subject: RE: Objection to EIS - Alpine Lakes Wilderness

Thank you, we'll make sure your comments are entered into the record….Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: W. T. Soeldner [mailto:waltsoe@allmail.net]
Sent: Sunday, May 08, 2016 7:50 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Objection to EIS - Alpine Lakes Wilderness

Mike Kaputa, Director
Chelan County Natural Resources Department

Dear Mr. Kaputa:

I am writing regarding what I believe to be **serious flaws in the scope of the Alpine Lakes Optimization and Automation Study**. I have hiked the Alpine Lakes Wilderness three times, spending a total of ten days there. I find the proposal to steal water from wilderness when alternative water management options have not been explored is a travesty, and quite likely will be proven to be illegal.

To begin with the Icicle Work Group (IWG), which has made this study has no members who are advocating to protect the Alpine Lakes Wilderness. (I am aware that the Center for Environmental Law and Policy withdrew from the group when the operating procedures were changed to gag CELP's objection to wilderness water projects.) It appears that the IWG is a self appointed conglomerate of groups interested in getting the contracts to do the work the IWG proposes. This is ethically indefensible.

The IWG has not considered a number of alternatives that would protect the Alpine Lakes Wilderness, one of the Northwest's most popular and iconic wilderness areas.

The the EIS proposed by the IWG must consider a **Wilderness Protection Alternative** that would promote the wilderness values set forth in the Wilderness Act of 1964. This would not allow new water infrastructure or diversions inside the Alpine Lakes Wilderness, requiring all new water supply to be obtained outside this wilderness.

The EIS must consider a **Water Conservation Alternative**. This would do an assessment of using aggressive water conservation measures by Wenatchee Valley cities, including restrictions on lawn watering. This should also assess transfer of waster rights from irrigation districts to cities in those places where orchards have already been replaced with residential subdivisions. And it should assess agricultural irrigation efficiency.

The EIS must also consider an **Irrigation District Water Right Change Alternative**, which would fix Icicle Creek's low flow problem. This would involve evaluating a move of the Icicle-Pehastin Irrigation District's (IPID)water right diversion to the Wenatchee River Downstream, permanently fixing Icicle Creek's low flow problem, and converting the IPID's diversion from gravity flow to pumping. Renewable energy options should be able to supply such power.

Finally the EIS should consider a **Water Right Relinquishment Alternative**. When a party doesn't use their rights, they lose them. The IPID says it only uses what it needs, and they have not used all their rights since the dam at Eightmile Lake collapsed decades ago.

For the sake of all that is good about our nation's public lands and especially its wilderness, this plan must be reconsidered with alternatives in mind.

Sincerely,
W. Thomas Soeldner
Valleyford, Washington

Naturam Expellas Furca *Tamen Usque Recurret*

WISE USE MOVEMENT

P.O. Box 17804, Seattle, WA 98127

May 10, 2016

Chelan County Natural Resources Department
Attention: Mike Kaputa, Director
411 Washington Street, Suite 201
Wenatchee, WA 98801
Email: <Mike.Kaputa@CO.CHELAN.WA.US>

RE: SEPA Scoping Comments on the Icicle Creek Water Resource Management Strategy

GENERAL COMMENTS

The Wise Use Movement agrees that the Icicle Creek Water Resource Management Strategy (ICWRMS) would have a significant adverse impact on the environment such that an environmental impact statement must be prepared. However, it would save taxpayers and concerned citizens significant resources if the ICWRMS were withdrawn. The Wise Use Movement strongly opposes the ICWRMS for the following reasons:

- The Department of Ecology used a process taken from the fatally flawed Yakima Work Group to select a small number of participants to prepare the ICWRMS while discouraging public participation. The Yakima Plan is not a national model and neither is the ICWRMS.
- The Icicle Workgroup, like the Yakima Work Group, included the agency conveners as workgroup members. This is unacceptable and introduces an unwarranted level of agency control over what should be an advisory committee.
- The Icicle Workgroup is providing policy direction in an advisory capacity to a number of Federal Agencies, including the Bureau of Reclamation, the US Forest Service, the US Fish and Wildlife Service, and NOAA-Fisheries. Both the Icicle Workgroup and the Yakima Work Group have failed to comply with the Federal Advisory Committee Act.

- The Department of Ecology is asking for scoping on an ICWRMS programmatic EIS under the State Environmental Policy Act (SEPA), Chapter 43.21C Revised Code of Washington (RCW). This allows Ecology to avoid responding to comments on project specific impacts from the ICWRMS, as it did with the Programmatic EIS for the Yakima Plan.

- The ICWRMS has specific adverse environmental impacts to resources located in the Alpine Lakes Wilderness Area, within the Okanogan-Wenatchee National Forest, yet no NEPA environmental impact statement is proposed at this time.
- We also strongly object to the Department of Ecology and Chelan County's continued efforts to hide from the public the impacts that the ICWRMS would have on the Alpine Lakes Wilderness Area. Chelan County gave several PowerPoint presentations of the ICWRMS without showing the Alpine Lakes Wilderness Area on its maps. In addition, the Determination of Significance issued by G. Thomas Tebb (Director, Office of Columbia River) and Mike Kaputa (Director, Chelan County Natural Resource) fails to even mention the Alpine Lakes Wilderness Area. The Chelan County SEPA Environmental Checklist list of environmental information (page 4) fails to list even a single National Forest Service document concerning the Alpine Lakes Wilderness, and the Alpine Lakes Wilderness Area is mentioned only three times in the Applicant's entire Environmental Checklist (pages 7, 13, and 22).

  The Department of Ecology's Office of Columbia River relies on state legislation passed in 2006 to "to aggressively seek out new water supplies for both instream and out-of-stream uses." When the Office of Columbia River assaults our Nation's wilderness areas that belong to all this country's citizens, they have crossed the line. After 10 years of failing to find new water supplies at a cost of $200 million dollars it is time for the Washington Legislature to terminate the Office of Columbia River.

- It appears that the ICWRMS has been rushed out on some sort of artificial timetable. The Environmental Checklist states that the Icicle Strategy is made up of nine Guiding Principles (page 5), but only seven bullets are shown. This is a sloppy presentation. Until Chelan County can provide clear and concise information to the public about the Guiding Principles that form the basis of the ICWRMS, the scoping notice must be withdrawn until Chelan County can get its head out of the beer.

Comments on the Guiding Principles (Environmental Checklist pages 5 and 6)

The Wise Use Movement objects to a small cabal, including members with a direct financial interest, agreeing to an ICWRMS prior to the preparation of environmental review. The Chelan County Natural Resources Department has stated that ALL nine guiding principles must be met. This is completely prejudicial to the SEPA planning process that depends on the presentation and review of alternatives. There is no legal precedent that requires that ALL nine guiding principles be met.

Regarding "Improve Instream Flows in Icicle Creek Historic Channel"-

- The DPEIS must identify and locate the "historic" Icicle Creek channel; identify the historic yearly Icicle Creek streamflows; identify the current yearly Icicle Creek streamflows; identify the source for the proposed 60 cfs minimum flows (drought years); explain why "minimum instream flows" must be reduced during a drought year; identify an alternative that would provide 250 cfs minimum flows during all years; identify an alternative that would provide "optimum instream flows" during all years; identify the

yearly maximum Icicle Creek streamflows; identify the environmental impacts from Icicle Creek streamflows from less than 60 cfs and more than 2,600 cfs.

Regarding "Improve sustainability of Leavenworth National Fish Hatchery (LNFH)"-

- The DPEIS must identify and address the following: the location and history of the LNFH; the production output of the LNFH since its construction compared to the historic runs of wild salmon; the amount of water withdrawn from the Icicle Creek or groundwater for the LNFH; impacts to fish production from cutting water withdrawals to the LNFH by half; clarify whether fish passage at Grand Coulee would remove the "obligation" for continued use of the LNFH; include fishery disease and predation morality since the construction of the LNFH; clarify the status of the LNFH NPDES permit.

Regarding "Protect Tribal and Non-Tribal harvest"-

- The DPEIS must identify and address the following: tribal and non-tribal harvest of wild fish spawning in the Icicle Creek and Wentachee River basins since the construction of the LNFH; tribal and non-tribal harvest of LNFH hatchery fish since the construction of the LNFH.

Regarding "Improve Domestic Supply"-

- The DPEIS must explain and address the following: the City of Leavenworth's 1995 water right change application to Ecology in 1995, and subsequent lawsuit against Ecology to increase their annual water right withdrawal; identify the City of Leavenworth's current water usage and any City water conservation plan; an explanation of why the City is demanding more water withdrawals and why demand for more water cannot be met by conservation; an estimate of the likely number of new residences through 2050, with and without additional water withdrawals; an estimate of the lawn acreage within the City; and an estimate of the number of groundwater wells and annual withdraw volumes.

Regarding "Agricultural reliability" -

- The DPEIS must explain and address the following: include an alternative that does not rely on any modifications to current withdrawals from lakes within the Alpine Lakes Wilderness area; include an alternative that does not rely on any withdrawals from lakes within the Alpine Lakes Wilderness area; provide detailed crop selection and acreage for each irrigation district with water withdrawal rights in the Alpine Lakes Wilderness Area; clarify whether these water rights withdrawals are specific to the lakes within the Alpine Lakes Wilderness Area or are withdrawals from Icicle Creek: and provide an explanation of why current interruptible agricultural users must be converted to senior water right holders.

Regarding "Enhance Icicle Creek Habitat" -

- The DPEIS must explain and address the following: identify fish passage impediments and projects that would improve fish passage, and explain why such measures have not been previously undertaken; and identify all proposed land acquisition/easements.

Regarding "Comply with State and Federal Law, and Wilderness Acts" -

- The DPEIS must explain and address the following: list how many different Wilderness Acts are under consideration; identify the regulators; review any water rights maintained under the 1976 Alpine Lakes Wilderness Act; disclose all agreements signed by the US Forest Service concerning land exchanges within the Alpine Lakes Wilderness Act; and

explain why LNFH, IPID, and COIC withdrawals are not currently appropriately screened.

Specific Comments on Base Package

IPID Irrigation Efficiencies. The DPEIS must evaluate a range of irrigation efficiencies for the IPID, including alternative crop selection, crop insurance, land fallowing, aquifer storage, water delivery costs, and re-reg reservoirs. The DPEIS must include the historic as well as 2015 drought acre-foot usage by the IPID.

COIC Irrigation Efficiencies. The DPEIS must evaluate a range of irrigation efficiencies for the COIC, including alternative crop selection, crop insurance, land fallowing, aquifer storage, water delivery costs, and re-reg reservoirs.

Domestic Conservation Efficiencies. The DPEIS must evaluate a range of domestic conservation efficiencies, including water delivery costs, elimination of leaky water pipes, restrictions on lawn watering; and use of low-flow toilets, clothes washers, and shower heads.

LHFH Conservation and Water Quality Improvements. The DPEIS must evaluate water use savings from a smaller size hatchery. The hydrologic continuity between wellfield and instream withdrawals must be analyzed.

Alpine Lakes optimization, Modernization, and Automation. The DPEIS must evaluate dropping these projects. In addition, the DPEIS must include an alternative of restoring the seven lakes within the Alpine Lakes Wilderness Area to their natural (pre-irrigation use) conditions.

Eightmile Lake Restoration Project. The DPEIS must evaluate dropping this project. In addition, the DPEIS must include an alternative of restoring Eightmile Lake to its natural (pre-irrigation) condition.

Water Markets. The DPEIS must prioritize a water market that makes maintaining optimum instream flows in Icicle Creek as the highest priority.

Habitat Improvements and Land Acquisition. The DPEIS must identify all locations proposed for "engineered logjams." In addition, the DPEIS must identify all existing impediments blocking fish passage and explain why such blockages or impediments still exist in 2016.

Rehabilitate LNFH Intake, Operational improvements at Structure 2, Icicle Creek Passage, and Tribal Fisheries Improvements. The DPEIS must evaluate a range of alternatives for rehabilitation of the LNFH, including a smaller size hatchery.

Screening Improvements. The DPEIS must identify all faulty diversion screens and explain why such faulty diversion screens still exist in 2016.

Instream Flow Rule Amendment. The DPEIS must explain how the Wenatchee Instream Flow Rule (WC 173-545) meets the purposes of this chapter to retain perennial rivers, streams, and

lakes in the Wenatchee River basin with instream flows and levels necessary to protect water quality, wildlife, fish, and other environmental values when instream flows are defined as "minimum flows." The DPEIS must include optimum instream flows that would protect water quality, wildlife, fish and other environmental values more consistent with historic flows.

Specific Comments on the Environmental Checklist

Chelan County's Environmental Checklist is inadequate and has failed to provide the most basic information about the proposal and have failed to answer questions either accurately or carefully, as required by RCW 197-11-960. The following are specific comments on errors and omissions in Chelan County's Environmental Checklist:

A.2. Name of Applicant. The name of the applicant is "Chelan County Department of Natural Resources." However, the proposal purports to benefit irrigation districts, the City of Leavenworth, as well as the Leavenworth National Fish Hatchery. Why are these not listed as co-applicants?

A. 7. The Environmental Checklist states that each individual project proposed under the ICWRMS would have its own environmental review process. The PEIS must clarify that "environmental review" may also lead to Findings of No Significant Impact (FONSI) and that additional environmental impact statements on individual projects may not be prepared.

A.8. We request that environmental information from the US Forest Service regarding the Alpine Lakes Wilderness Area be reviewed and listed. We also request that the following report be added:

U.S. Fish and Wildlife Service (USFWS). 2004. Comprehensive Hatchery Management Plan for the Leavenworth National Fish Hatchery. Planning Report Number ?, U.S. Fish and Wildlife Service, Leavenworth National Fish Hatchery, Leavenworth, Washington. http://www.fws.gov/pacific/fisheries/hatcheryreview/reports/leavenworth/le--002leavenworthhgmp_000.pdf

A. 11. The Environmental Checklist states that the ICWRMS proposes to enhance instream flows, water supplies, and aquatic habitat project that fulfill nine Guiding Principles established by the Icicle Work Group, but, as noted above, only seven bulleted items are listed on page 5 and 6. This only creates confusion as to what the proponents actually intend. In addition, RCW 43.21C.030(b)(iii) requires a detailed statement on alternatives to the proposed action. WAC 197-11-784 defines "Proposal" as including "a particular or preferred course of action or several alternatives." While an applicant may submit an application for a preferred course of action, when it comes to planning, it is not appropriate for government agencies to huddle with a small number of stakeholders, cut deals, and establish a single plan of action. By doing so, government agencies commit themselves, prior to any environmental review, to their selected plan. Any programmatic EIS must, therefore, disclose a range of alternatives, and not a preferred alternative established by the Icicle Work Group.

In addition, the response to Section A. 11 gives figures in both acre-feet and cfs. For consistency purposes, the DPEIS must provide both acre-feet and cfs figures to aid the reviewer in understanding the quantities of water involved.

B.1. Earth - Earthquakes. The DPEIS must identify all known or suspected earthquakes faults in the area.

B.a. 2). Surface Water. The DPEIS must identify all proposed habitat improvement projects, passage barrier removal, and improved diversion screening.

B.3.a. 4). Surface Water. The DPEIS must identify all new proposed surface diversions and alternative locations. The DPEIS must analyze the adverse environmental impacts from new home construction on instream flows.

B.3.b.1). Ground Water. The DPEIS must analyze the amount of projected new rural domestic wells in response to any increase in domestic reserves under the Wenatchee Instream Flow Rule. The DPEIS must provide domestic water conservation measures alternatives in lieu of increasing domestic reserves. The DPEIS must analyze the adverse environmental impacts from new home construction on ground water. The DPEIS must analyze the hydrologic continuity between instream flows and groundwater from any LNFH groundwater augmentation wells.

B.4.b. Plants. The DPEIS must analyze the adverse environmental impacts on vegetation from new home construction.

B.4.c. Plants. The DPEIS must review all US Forest Service information concerning ESA listed plant species within the Alpine Lakes Wilderness Area.

B..5.a and b. Animals. The DPEIS must review all US Forest Service information concerning ESA listed animal species within the Alpine Lakes Wilderness Area.

B.5. d. Animals. The Environmental Checklist claims that the Alpine Lakes Optimization will preserve and enhance wildlife. This is incorrect. Additional development in the Alpine Lakes Wilderness Area would have an unacceptable adverse impacts to fish and wildlife. The DPEIS must not let the Applicant claim that additional Alpine Lakes Wilderness Area development would benefit aquatic wildlife.

B.6.c. Energy and Natural Resources. We again object to any construction projects in the Alpine Lakes Wilderness Area. We again request that an alternative be developed without any such construction projects.

B.7.b.2 Noise. What additional noise levels would be generated by pumps and associated mechanical and electrical equipment within the Alpine Lakes Wilderness Area? Would such noise be covered by "local noise ordinances?"

B.8.a. Land and Shoreline Use. Again, we question why Chelan County would fail to mention the Alpine Lakes Wilderness Area as part of its description of Land and Shoreline use. Chelan

County claims that increasing instream flows would provide beneficial results for natural uses. Chelan County fails to disclose that increasing flows by new construction projects in the Alpine Lakes Wilderness Area would have adverse impacts.

B.8.c. Land and Shoreline Use. Chelan County describes new Alpine Lakes reservoirs in the Alpine Lakes Wilderness Area as an "improvement." Congress designated the Alpine Lakes Wilderness Area, not the Alpine Reservoirs Wilderness Area. The fact that Chelan County has portrayed the Alpine Lakes as "reservoirs" multiple times, demonstrates that Chelan County has little appreciation of and little understanding of wilderness or wilderness values. This is especially ironic, given that that the Applicant is the County's "Natural Resources Department." It appears that this Department is more interested in dismantling and destroying natural resources than preserving, protecting, or enhancing.

B.8.l. Land and Shoreline Use. Chelan County again fails to mention the US Forest Service or the Alpine Lakes Wilderness Area in addressing proposed measures to ensure the proposal is compatible with existing and project land uses and plans. The DPEIS must review US Forest Service planning documents for the Alpine Lakes Wilderness Area.

B.10.b. Aesthetics. Chelan County claims that new construction projects within the Alpine Lakes Wilderness Area would "improve views." Increasing water withdrawals from the Alpine Lakes Wilderness Area would not improve views of these areas and would have adverse impacts on recreational aesthetics. The DPEIS must address these impacts.

B.12.a. and c. Recreation. Again, Chelan County refused to even specifically list the Alpine Lakes Wilderness Area as a recreational opportunity in the vicinity or to list proposed measures to reduce or control impacts on recreation. The DPEIS must include an alternative that does not include construction activities within the Alpine Lakes Wilderness Area. The DPEIS must include recreation usage of the Alpine Lakes Wilderness Area, including day visits.

D.1. Chelan County asserts that implementation of the Guiding Principles is intended to "improve the environment," without addressing impacts from construction activities within the Alpine Lakes Wilderness Area.

D.2. Again, Chelan County asserts that the program would improve instream flow and habitat for fish and benefit terrestrial species, without addressing impacts from construction activities and additional water drawdowns within the Alpine Lakes Wilderness Area or impacts from new home construction. Chelan County again asserts that the Alpine Lakes Optimization, Modernization, and Automation would "benefit aquatic wildlife." Chelan County must not be allowed to describe the proposed program as beneficial while avoiding the purposes of SEPA to disclose to decisionmakers the potential significant adverse impacts.

D.3. Contrary to the assertions of Chelan County, the proposed Alpine Lakes Optimization, Modernization, and Automation would deplete natural resources by increasing water withdrawals from these lakes.

D.4. Contrary to the assertions of Chelan County, the proposed Alpine Lakes Optimization, Modernization, and Automation would result in long-term changes to the environmentally sensitive Alpine Lakes Wilderness Area. Chelan County also asserts that the proposed changed management regime for Alpine Lakes Wilderness Area drawdown "is to improve instream habitat for ESA-listed salmonids and other aquatic species in the Icicle Basin." The DPEIS should clarify whether Alpine Lakes Wilderness Area drawdowns are also intended to provide new water supplies for the City of Leavenworth, the LNFH, and IPID and COIC. The DPEIS must include an alternative that increases instream flows without additional modifications to the Alpine Lakes Wilderness Area.

Additional Specific Comments and Issues

The following are specific comments and issues to be addressed as part of any DPEIS on the ICWRMS. SEPA requires the following elements be included:
(i) the environmental impact of the proposed action,
(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
(iii) alternatives to the proposed action,
(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. *RCW 43.21C.031(2).*

1. Alternatives

* A no-action alternative is the most critical part of any EIS because it avoids all the adverse environmental impacts from the ICWRMS proposed project. The Applicant's Environmental Checklist (page 6) states that the DPEIS will describe both the base package and other alternative projects that could meet Guiding Principles. Again, a slavish attachment to the Guiding Principles, is contrary to SEPA. The DPEIS must include alternatives to the Guiding Principles, including alternatives that do not require more construction within the Alpine Lakes Wilderness Area, and that return the Alpine Lakes Wilderness Area to its pre-irrigation withdrawal condition.

The Department of Ecology refused to provide any alternatives to the Yakima Plan in its PEIS, other than the no-action alternative. Ecology should uphold SEPA and not work to circumvent it. Why would Ecology include alternative projects to meeting the Guiding Principles, when it refused to provide any alternative projects in the Yakima Plan PEIS?

2. Earth Resources

* How will the DPEIS evaluate the project's potential impacts and identify potential mitigation measures for those impacts, such as impacts of filling, soil contamination and erosion; and potential impacts from earthquakes?

3. Air Resources

* How will the DPEIS evaluate the project's potential impacts on existing air quality?
* How will the DPEIS evaluate compliance with the requirements of the Clean Air Act for construction and operation phases?

* What would be the project's contribution to climate change gases?
* What would be the carbon footprint of the proposed projects?
* Will the DPEIS evaluate the impacts on air quality and visibility caused by fugitive and exhaust emissions from construction, traffic, and truck emissions, and all point source emissions? Will the DPEIS analysis include airborne pollutants associated with any built project's day-to-day operations?

4. Water Resources
* Will the DPEIS evaluate the effects of a 100-year and 500-year flood on any project site?
* What water quality monitoring would be proposed?
* Will the DPEIS include a description of the potential for spills of contaminants into waters of the United States and the measures such as an emergency response plan to mitigate impacts?
* What is the scope of the water quality analysis? Will the DPEIS disclose which water bodies may be impacted by the project, the nature of the potential impacts, and the specific pollutants likely to impact those waters? Will it also report those water bodies potentially affected by the project that are listed on the State's current 303(d) list and whether the Washington Department of Ecology has developed a water quality restoration plan (Total Maximum Daily Load) for the water bodies and the pollutants of concern? If a Total Maximum Daily Load (TMDL) has not been established for those water bodies on the 303(d) list, in the interim will the DPEIS demonstrate that there will be no net degradation of water quality to these listed waters?
* Will the DPEIS explain how anti-degradation provisions of the Clean Water Act would be met for any proposed project?
* Will the DPEIS address the effects on water quality from the runoff of pollutants, including fertilizers and pesticides from residential landscaping and from storm water associated with additional impervious surfaces that might result from providing additional water to the City of Leavenworth for new residential construction?

5. Shoreline Habitat
* Will any damage to the Alpine Lakes Wilderness Shoreline result from the proposed projects and associated uses in the area?

* Will the Biological Assessment required for compliance with Section 7 of the Endangered Species Act be a clearly identifiable section?

* Will an assessment of fisheries and benthic impacts specifically address the requirements for an Essential Fish Habitat Assessment per the Magnuson Stevens Act?

* Will studies be carried out of an assessment: 1) species type, life stage, and abundance; based upon existing, publicly available information, 2) potential changes to habitat types and sizes; and 3) the potential for fishery population reductions.
* Will the DPEIS assess potential indirect impacts to fish and wildlife that may result from changes in water movement, sediment transport, and shoreline erosion?
* Will the DPEIS include a Benthic Macroinvertebrate Community Assessment of the nearshore areas of lakes in the Alpine Lakes Wilderness and along Icicle Creek?
* Will the DPEIS comprehensively address the interconnections between the

benthic, fisheries and avian resources?

6. Biological Resources

* Will the DPEIS analyze potential impacts on fish, wildlife and their habitats from every element of the ICWRMS, along with identification of mitigation measures?
* How will the DPEIS consider ecological objectives? Will ecological objectives be designed to protect water quality and to maintain and/or enhance the natural habitats in the Alpine Lakes Wilderness as well as Icicle Creek for the benefit of fish and wildlife resources and the public?
* Will the DPEIS address measures that compensate for the loss of habitats of value to fish and wildlife?
* Will the DPEIS identify the endangered, threatened, and candidate species under the Endangered Species Act (ESA), and other sensitive species within the proposed project area for each alternative? In addition, will the DPEIS describe the critical habitat for these species and identify any impacts the proposed project will have on these species and their critical habitat?
* Will the DPEIS describe the current quality and potential capacity of habitat, its use by fish and wildlife on and near the proposed ICWRMS project area, and identify known fish and wildlife corridors, migration routes, and areas of seasonal fish and wildlife congregation?
* Will the DPEIS evaluate effects on fish and wildlife from any habitat removal and alteration, aquatic and terrestrial habitat fragmentation caused by land use and management activities, and human activity? How will endangered species and habitat, including steelhead or salmon in the Alpine Lakes Wilderness and Icicle Creek be protected?
* How will Ecology ensure that its decision complies with the Migratory Bird Species Act of 1918, as amended?
* What major plant communities are present and affected? Will the DPEIS consider impacts on any sensitive plant species, particularly those endemic to the Alpine Lakes Wilderness and Icicle Creek? How will any sensitive plant species in the vicinity be protected?
* How much new impervious surfaces would be developed?

7. Avian Impacts

* How will the DPEIS describe any avian impacts to the Alpine Lakes Wilderness and Icicle Creek? How will the DPEIS establish a baseline data set? The species, number, type of use, and spatial and temporal patterns of use must be described. Information derived from other studies, which provides a three-year baseline data set, must be included if available. Information must be based on (1) existing, published and unpublished research results, especially research that describes long-term patterns in use, and (2) new field studies undertaken for this DPEIS. Data on use throughout the year, especially in Spring for migratory species, and under a range of conditions must be collected. Data collection must allow a statistically rigorous analysis of results. Issues needing to be addressed include: (1) bird migration, (2) bird flight during storms, foul weather, and/or fog conditions, (3) food availability, (4) predation, and (5) benthic habitat and benthic food sources.
* Will a Biological Assessment be prepared under Section 7 of the Endangered Species Act?

8. Noise and vibrations

* How will the DPEIS include an assessment of the magnitude and frequency of underwater noise and vibrations, and the potential for adversely affecting fish and mammal habitats from construction and operation of any facilities? Will the DPEIS include an assessment of fish and

mammal tolerance to noise and vibrations, with particular emphasis on noise and vibration thresholds that may exist for each of the species? Will the DPEIS also include the potential of noise impacts to human activity?
* How will the DPEIS address identification of existing noise levels and evaluation of the project's potential short-term and long-term noise impacts along with potential mitigation measures?
* Has a noise contours map been developed for any proposed ICWRMS project and does it show day-night average sound level (DNL)? How will any DNL's that are in excess of local ordinance requirements be mitigated?
* Will the DPEIS evaluate noise generating activities associated with construction and ongoing operations, including traffic to and from the project site?

9. Environmental Health
* How will the DPEIS address impacts of any hazardous materials and identification of mitigation measures?

10. Land and Shoreline Use
* How will the DPEIS address compliance with land use laws, plans and policies?
* How will the DPEIS address compliance with the State Shoreline Management Act and the Chelan County and City of Leavenworth Shoreline Master Programs?
* How will the DPEIS address compliance with federal laws governing Wilderness areas?

11. Aesthetics
* How will the visual impacts be mitigated?

12. Recreation
* How will the DPEIS address any ICWRMS project impacts on recreational use of the Alpine Lakes Wilderness Area?

13. Transportation
* How will the DPEIS address the project's potential transportation impacts and identification of mitigation measures?
* How many vehicle trips will be generated, including trips by employees and service and delivery vehicles?
* How will the positive effects of alternative fuels and hybrid cars be factored into trip generation projections?
* Will the DPEIS evaluate the level of service and overall traffic generation from any ICWRMS project activities including: construction traffic; and the level of service and overall traffic generation reasonably expected from project-associated growth in the City of Leavenworth?
* Will the traffic study calculate road maintenance costs attributable to the project?
* What is the scope of mitigation of traffic impacts that will be considered in the DPEIS?
* What is the capacity of surrounding highways, streets, and roads, to accommodate additional traffic associated with any proposed project and additional residential development?

14. Public Services and Utilities

* How will be the need for additional public services, including public safety and emergency services, and for infrastructure improvements be met?
* Will the effects of induced development, including pressure for urban growth expansions, be considered? What will be the scope of such an analysis? i.e., what communities in Chelan County will be included in the analysis?

15. Cultural Resources

* How will the DPEIS address requirements to comply with federal and state laws concerning cultural resources?
* Will the scope of the cultural resources analysis include identifying all historic properties or cultural resources potentially impacted by the project or associated offsite development, including traditional cultural properties, other Native cultural resources, and non-Native historic properties? Will the DPEIS evaluate the impacts to any identified historic properties and cultural resources, i.e., what are the impacts of the project and associated off-site development (e.g., housing, amenities)?
* How will historical tribal uses of this area be factored in, including effects on sacred sites and fishing grounds?
* How will the project affect the cultural heritage of the area?
* Will the DPEIS consider Tribal fishery impacts?
* How will the DPEIS coordinate with the State Historic Preservation Officer?

16. Environmental Justice

* Will the DPEIS consider, based on the experience of such projects elsewhere, effects on levels of poverty?
* Will the DPEIS assess whether low income or people of color communities will be impacted by the proposed project and disclose what efforts were taken to meet environmental justice concerns?

17. Socio-Economics

* Will a comprehensive economic analysis be undertaken to identify potential effects of the proposed project on Chelen County?
* What will be the time frame for the assessment of economic and social impacts; 10, 20, 50 years?
* For comparison purposes, will the socioeconomic effects of other similar projects on other communities in the state be examined?
* How many jobs will be created; at what wage levels? What percentage of work would be reserved for local contractors? Will prevailing wages be paid?
* What will be the consequences on property values and property taxes in Leavenworth and Chelan County?
* How will effects on quality of life, including community character, demographics, and small town atmosphere, be assessed?
* How will the DPEIS address safety considerations during construction of any project?

18. Other Issues

* What tribal consultation would occur with nearby Indian tribes?

* How will Washington communities be consulted with and involved in the SEPA process?
* What consultation with school districts and other service providers will occur?
* What other permits and approvals are required?
* Has a geo-tech study been done for any proposed project site? What extra structural precautions will be taken for potential earthquake liquefaction?
* Will any proposed project be affected by seismic faults or fractures?
* Will the DPEIS address the potential for increased litter?

Please send us a copy of the DPEIS if it becomes available.

Sincerely,

John de Yonge

PRESIDENT

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Tuesday, May 10, 2016 4:34 PM
To: Jordan Sanford; Meghan O'Brien
Cc: Dan Haller
Subject: FW: Public Comment regarding dams and water-level manipulation in Icicle Creek

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Tuesday, May 10, 2016 4:17 PM
To: Tom Walker
Cc: Mary Jo Sanborn
Subject: RE: Public Comment regarding dams and water-level manipulation in Icicle Creek

Thanks, Tom, we'll get your comments into the record…Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Tom Walker [mailto:twalker@nsecomposites.com]
Sent: Sunday, May 08, 2016 4:24 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Public Comment regarding dams and water-level manipulation in Icicle Creek

To whom it may concern:

I'm appalled to read that there is serious consideration being given to building dams and manipulating water levels in lakes within the Icicle Creek drainage. These lakes are located in the Alpine Lakes Wilderness, and it is my opinion that only pre-existing water rights that are being used for the purposes intended, should supersede

the importance of Wilderness. Specifically, I agree with the key points of the position taken by the Alpine Lakes Protection Society, i.e.,

- The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.
- The EIS should include a "Wilderness Protection" alternative, which should include an alternation of public purchase (buy-back) of private water rights in the Alpine Lakes.
- The EIS should include a "Water Right Relinquishment" alternative.
- The EIS should include an alternative that recognizes Icicle Working Group members' water rights are limited to the purposes for which they were initially granted, and cannot be redirected to other purposes.
- The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the local water users. This alternative should evaluate a transfer of water rights for IPID to Leavenworth for properties within the city limits that have now converted from orchards to residential properties. In addition, it should evaluate how IPID spills large quantities of water back into the Wenatchee River at the end of several of its canals.
- The EIS should include a "Water Right Change" alternative.
- The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation, and funding that are needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail.
- The EIS should discuss the hydrological and biological impacts of the current drawdown of the lakes, and any proposed changes.
- The EIS should provide a detailed operations, maintenance and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions, including helicopter use.
- The IES should fuly explain the purpose and need for the water these projects would provide.
- The EIS should fully explain what human activities caused the degraded conditions that the projects seek to improve.
- The EIS should analyze adequacy of proposed in-stream flows to support spawning, rearing, and migration of steelhead and bull trout.

Again, I strongly urge you to give paramount consideration to the Wilderness aspects of these areas.

Sincerely,

Thomas H. Walker
3815 Bagley Ave N
Seattle, WA 98103

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Tuesday, May 10, 2016 4:34 PM
To: Meghan O'Brien; Jordan Sanford
Cc: Dan Haller
Subject: FW: Icicle Work Group PEIS Environmental Review Comment

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
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-----Original Message-----
From: Mike Kaputa
Sent: Tuesday, May 10, 2016 4:19 PM
To: Carol or Mike Wyant
Cc: Mary Jo Sanborn
Subject: RE: Icicle Work Group PEIS Environmental Review Comment

Thanks, Mike, we'll get these into the record and considered....Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

-----Original Message-----
From: Carol or Mike Wyant [mailto:cmwyant@charter.net]
Sent: Sunday, May 08, 2016 1:19 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle Work Group PEIS Environmental Review Comment

Director Kaputa,

Please consider the following comments concerning the Icicle Work Group suite of proposals for long term improvement of the water management situation on Icicle Creek.

1. The suite of proposals appears to present a viable path to improving water management and increasing the amount of water that stays in Icicle Creek. However, I am concerned that the projections for water savings to reach flow targets are overly optimistic for two reasons. The first concern is that the projections rely on all of the proposed projects being completed. I believe that it is unlikely that some of the projects can be completed to the extent that they will provide the projected water savings. For example, the proposed efficiencies in the Icicle Irrigation District water system seem to be unlikely to be accomplished in my view. I wish that the suite of proposals included additional options so that meeting the target for flows does not rely on completing all of the projects. I am concerned that flow targets and the proposed positive effects of identified water management strategies are overly optimistic given many of the climate change projections for the next 50 years.

2. Though I consider myself a staunch supporter of wilderness, I am in favor of the proposed changes at the lakes in the Alpine Lakes Wilderness that are managed as water storage reservoirs. I support those changes because maintaining the existence of the reservoirs was grandfathered in when the wilderness was established. It makes sense to use the water in those reservoirs as efficiently as possible, even though doing so intrudes and will continue to intrude on the wilderness experience. I support the reconstruction of Eightmile Lake dam to its original height even though doing so will inundate land that has been above lake level for many years. While raising the height of the original Eightmile Lake dam has been taken off the table by the Icicle Work Group, I understand that it is still in mind for folks at the icicle Irrigation District. I oppose raising the height of the original reservoir because that would represent a change to the agreement to keep the existing reservoirs when the wilderness was established.

3. As each individual project comes up for approval I would like to be assured that sufficient scientific study is in place to make it relatively certain that the project will have the positive effects that are proposed and that the possibility that the project will have unintended negative consequences has been thoroughly considered. I would also like to know that each project that has the potential to impact the icicle ecosystem includes a plan and the resources necessary to study the post-project impacts. Too often it seems that projects are completed with the idea that they will improve an ecosystem when there is no post-project evidence that they actually had the intended effects and that they are not, in fact, having a negative or unintended effect.

Thank you for considering these comments.

Michael Wyant
12125 Emig Drive
Leavenworth, WA 98826
(509) 548 7747

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Tuesday, May 10, 2016 4:35 PM
To: Meghan O'Brien; Jordan Sanford
Cc: Dan Haller
Subject: FW: Dam Building and New Water Rights

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
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-----Original Message-----
From: Mike Kaputa
Sent: Tuesday, May 10, 2016 4:19 PM
To: winnie becker
Cc: Mary Jo Sanborn
Subject: RE: Dam Building and New Water Rights

Thank you, Winnie, we'll make sure your comments are entered into the record....Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

-----Original Message-----
From: winnie becker [mailto:winnbec@netscape.net]
Sent: Saturday, May 07, 2016 7:57 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Dam Building and New Water Rights

Dear Mike,

Please preserve the Alpine Lakes Wilderness. To build dams and change water rights would not be in keeping with the wilderness.

The EIS should include a "Wilderness Protection" alternative. The increase of water removal from the Alpine Lakes Wilderness is not in keeping with protecting the wilderness which is so very important for generations to come. Water should be obtained from sources outside the Wilderness. The Wilderness Protection alternative should comply with all the provisions in the Forest Service's administrative Alpine Lakes Wilderness Management Plan, including: " Except as provided for in Section 4(D)(4) of the Wilderness Act, watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge.

The Wilderness Protection alternative should evaluate public purchase (buy-back) of private water rights in the Alpine Lakes, which would allow removal of dams and other structures from the lakes to restore the area to its true natural character.

The EIS should include "Water Right Relinguishment" alternative. The alternative should analyze existing water rights to the Alpine Lakes and acknowledge those rights that have been relinquished or abandoned.

The EIS should include an alternative that recognizes IWG members" water rights are limited to the purposes for which they were initially granted (irrigation is an example) and cannot be redirected to other purposes (such as suburban development).

The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the city of Leavenworth, Icicle-Peshastin Irrigation District, the Leavenworth fish Hatchery and other water users. This alternative should evaluate water markets that facilitate selling and trading of water rights.

The Water Conservation alternative should evaluate a transfer of water rights from IPID to Leavenworth for properties within the city limits that have now converted from orchards to residential properties.
This alternative should analyze how appropriate reductions in water usage (that is, not using agricultural water quantities for lawn irrigation) would save that would then be available for other Leavenworth needs.

The Water Conservation alternative should evaluate how IPID spills large quantities of water back into the Wenatchee River at the end of several of its canals. The alternative should evaluate how this 19th century irrigation practice could be replaced with modern pumping and piping technologies. The EiS should work to reduce water demand as an alternative to water supply.

The EIS should include a "Water Right Change" alternative. This alternative would evaluate improving Icicle Creek flows by moving IPID's point of diversion downstream (to the Wenatchee River). This measure, which would add 100 cfs of water to Icicle Creek every year, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). This alternative should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric.

The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes, and any proposed changes. The analysis should include a review of scientific literature on the impacts of water removals upon wildlife, vegetation, soil and wilderness values.

The EIS should analyze each proposed action's site-specific impacts, past practices and the restoration, mitigation and funding that are needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail.

The EIS should provide a detailed operations, maintenance and environmental monitoring for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions including helicopter use.

The EIS should fully explain the purpose and need for water these projects would provide.

The EIS should fully explain what human activities caused the degraded conditions (such as low instream flows in Icicle Creek) that the projects seek to improve.

The EIS should analyze adequacy of proposed instream flows to support spawning, rearing and migration of steelhead and bull trout.

Thank you for your attention.

Sincerely,

Winnie Becker

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Wednesday, May 11, 2016 10:42 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Alpine Lake Wilderness in Washington

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

-----Original Message-----
From: Mike Kaputa
Sent: Tuesday, May 10, 2016 5:35 PM
To: Dean Effler
Cc: Mary Jo Sanborn
Subject: RE: Alpine Lake Wilderness in Washington

Thank you both for your comments, we'll make sure they are entered into the record and considered during the scoping process.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

-----Original Message-----
From: Dean Effler [mailto:efflerbiz@gmail.com]
Sent: Thursday, May 05, 2016 8:07 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Alpine Lake Wilderness in Washington

Please do not allow any agreement to provide water to commercial or residential users that would impact the hydrology and natural beauty of the Alpine Lakes Wilderness. A wilderness no longer is a wilderness when you drain it's natural resource or flood it's land. Only allow growth in local cities and counties based on water conservation methods rather than tapping into the waters of a protected wilderness.

Sent from my iPad
Dean and Martha Effler

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Wednesday, May 11, 2016 10:41 AM
To: Meghan O'Brien; Jordan Sanford
Cc: Dan Haller
Subject: FW: Scoping Comments - Icicle Work Group's "Icicle Strategy" Scoping Request

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
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From: Mike Kaputa
Sent: Tuesday, May 10, 2016 5:33 PM
To: Jena Gilman
Cc: maib461@ecy.wa.gov; Mary Jo Sanborn; (GTEB461@ecy.wa.gov)
Subject: RE: Scoping Comments - Icicle Work Group's "Icicle Strategy" Scoping Request

Jena, thank you for the comments. They will be entered into the record and considered as part of the scoping process.

On your last point, I wanted you to know that we have had and will continue to have meetings in the Seattle area (so far, two at Good Shepherd Center in Wallingford and one at Phinney Neighborhood Association in Phinney Ridge) to broaden our engagement. I will add you to that distribution list.

We are also planning a field visit with the conservation community to Eightmile Lake in late summer, probably September, to view the lakes after they have been drawn down for the irrigation season.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Jena Gilman [mailto:jena.gilman1@gmail.com]
Sent: Thursday, May 05, 2016 11:50 AM

To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Cc: maib461@ecy.wa.gov
Subject: Scoping Comments - Icicle Work Group's "Icicle Strategy" Scoping Request

Dear Mike:
The Icicle Work Group's “Icicle Strategy” is a recipe for serious degradation of Alpine Lakes Wilderness lands and waters that are becoming increasingly important to the exploding numbers of hikers and other outdoorspeople throughout our State. Instead of honoring these wilderness values, the “Icicle Strategy” instead celebrates the banality of suburban sprawl and the enshrinement of golf courses as our society’s vision of the highest and best use of our water resources.
Any environmental impact statement (EIS) for the water theft and attack on wilderness that the promotors champion in the “Icicle Strategy” must consider the following at minimum:

-

- The EIS should fully explain the purpose and need for each of the water projects outlined in the “Icicle Strategy”.

- The EIS should analyze each of the proposed action’s site-specific impacts, past practices, and the restoration, mitigation and funding needed in the future. At each site, proposed construction activities need to be explained and illustrated in detail as well as how wilderness and habitat values will be maintained throughout the period of construction for Wilderness users and the complete array of fauna and flora that inhabit these areas.

- The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes within the Wilderness and the incremental impacts of any proposed changes. The analysis should include the impacts of water removals upon all wildlife, vegetation, soil and wilderness values.

- The EIS should provide detailed operations and maintenance plans for proposed infrastructure and an analysis of the impacts on the wilderness experience of specific maintenance actions, including helicopter operations.

- The EIS should consider a Wilderness Protection Alternative. This alternative would promote wilderness values as set forth in the Wilderness Act of 1964, would not allow new water infrastructure or diversions inside the Alpine Lakes Wilderness, and would require all new water supply to be obtained outside the Alpine Lakes Wilderness.

- The EIS should consider a serious Water Conservation Alternative. This alternative would assess using aggressive water conservation measures by area cities, including restrictions on lawn watering and provision for landscaping that is suited to the climate without irrigation for any new development. This alternative should also assess transfer of water rights from irrigation districts to cities, where orchards have already been torn out and replaced with residential subdivisions. This alternative should also assess agricultural irrigation efficiency, such as replacing open gravity canals with pipes and pumps. This Alternative should also consider water re-use technologies.

- The EIS should consider an Irrigation District Water Right Change Alternative, which would fix Icicle Creek's low flow problem. This alternative would evaluate moving the Icicle-Peshastin Irrigation District's water right diversion, which presently takes 100 cubic feet per second out of Icicle Creek, to the Wenatchee River downstream.

- The EIS should consider a Water Right Relinquishment Alternative. Removal of water from the Alpine Lakes Wilderness is an issue only because the Icicle-Peshastin Irrigation Distirct holds water rights that were grandfathered when the Wilderness was created. When the dam at Eightmile Lake failed the Irrigation District did not fix it because they did not need the water. When a party doesn't use their rights, they lose them. The "Use It Or Lose It" doctrine should govern. The EIS needs to acknowledge this issue.

Please use some common sense in the scoping process. Anything in the "Icicle Strategy" that affects and detracts from the wilderness character of the Alpines Lakes Wilderness on a long-term, short-term, or cumulative basis needs to be fully vetted.
Finally, the Alpine Lakes Wilderness, and particularly the Enchantment Lakes area, is a national asset, important to people far beyond Chelan County. Therefore, public meetings and notices limited to Chelan County will be inadequate to the public's inquiry into the "Icicle Strategy" and its proposed actions within the Wilderness.
Thank you for your attention,

Sincerely,
Jena F. Gilman, P.E. (WA 23673)
1480 SW 10th Street
North Bend, WA 98045

- Born in Yakima 1952
- Raised in Moses Lake (MLHS Class of 1971)
- First sight of Nada and Snow Lakes: July 25-26, 1969

State of Washington
Department of Fish and Wildlife
Mailing Address: 1550 Alder St NW, Ephrata, WA 98823, (509) 754-4624, TDD (360) 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia WA

May 6, 2016

Tom Tebb, Director
Office of Columbia River
Washington State Department of Ecology
1250 W. Alder St.
Union Gap, WA 98903

Mike Kaputa, Director
Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: WDFW Scoping Comments – Determination of Significance (DS) and Request for Comments on Scope of State Environmental Policy Act (SEPA) Nonproject Programmatic Environmental Impact Statement (PEIS) for the *Icicle Creek Water Resource Management Strategy* (ICWRMS)

Dear Mr. Tebb and Mr. Kaputa,

The Chelan County Natural Resources Department (CCNRD) has been contracted by the Washington Department of Ecology (Ecology), through the Office of Columbia River (OCR) to develop a Final ICWRMS SEPA PEIS. Since 2007, the Washington Department of Fish and Wildlife (WDFW) has supported Ecology's efforts to fulfill its legislative mandate to, *"aggressively pursue development of new water supplies for instream and out-of-stream uses."* Our agency is a collaborative partner to ensure natural resource values are adequately reflected in decision-making. Thus, WDFW appreciates the opportunity to provide comments during the public scoping[1] period to assist with the development of the Draft PEIS.

As stated in the DS, the SEPA *Non Project*[2] PEIS is being prepared to *generally* address impacts associated with collectively implementing a suite of projects within the Icicle Creek basin. These projects aim to improve instream flows to protect fish and aquatic habitat, improve water storage and operational flexibility within the Alpine Lakes Wilderness, and reinstate water

[1] WAC 197-11-455

[2] "Nonproject actions are governmental actions involving decisions on policies, plans, or programs that contain standards controlling use or modification of the environment, or that will govern a series of connected actions. Nonproject review allows agencies to consider the "big picture" by conducting comprehensive analysis, addressing cumulative impacts, possible alternatives, and mitigation measures". SEPA Online Handbook, Ecology.

reserves[3] to accommodate growth within Chelan County. WDFW staff has been involved with the planning process since the Icicle Work Group (IWG) convened in 2012. WDFW Region 2 Director Jim Brown currently serves as the Chair for the IWG Steering Committee to help facilitate the collaborative process and to promote WDFW's interests to protect fish, wildlife, and their habitats in the Icicle Creek basin.

WDFW appreciates the value Ecology and CCRND bring to managing water resources in Icicle Creek for both in-stream and out-of-stream uses. WDFW promotes[4] developing the PEIS in such a way that adequately assesses impacts (beneficial and adverse) for the following suite of projects in Icicle Creek:

- Icicle Peshastin Irrigation District (IPID) Irrigation Efficiency Upgrades
- Cascade Orchards Irrigation Company (COIC) Irrigation Efficiency Upgrades
- Domestic Conservation Efficiency Upgrades
- Alpine Lakes Optimization, Modernization, and Automation
- Leavenworth National Fish Hatchery (LNFH) Conservation and Water Quality Improvements (e.g. Rehabilitate LNFH Intake, Operational Improvements at Structure 2
- Eightmile Lake Restoration Project
- Water Markets
- Habitat Improvements between RM 2.7-4.5 and Land Acquisitions
- Icicle Creek Passage, Tribal Fisheries Improvements
- LNFH/COIC, IPID, and City of Leavenworth Diversion Screening Upgrades
- Instream Flow Rule Amendment (WAC 173-545)

WDFW General Scoping Comments

1) It is essential the PEIS describes the sequencing and timing of permittable projects and identifies the beneficiaries of in-stream and out-of-stream flow improvements. WDFW is concerned that water will be allocated for out-of-stream uses before an adequate amount of flow improvements are made in Icicle Creek.
2) At the public scoping meeting held in Leavenworth it was stated by Aspect Consulting that the timeframe associated with implementing projects ranged from 5-20 years. In order to "track" flow improvements that may occur over the next 5-20 years, a project implementation schedule should be included in the PEIS so readers can adequately provide comments, mitigation recommendations, and resource protection expectations within the context of "real water" in "real time".
3) Please describe the "Alternative Projects" being contemplated for replacing project that may not be feasible. WDFW expectations are that alternative projects would be identified through a collaborative process to replace those benefits and functions intended by the project determined to be infeasible.

[3] Senate Bill 6513
[4] Per November 19, 2015 WDFW Support Letter to Ecology and CCNRD

4) As fisheries co-managers for the state of Washington, WDFW does not support waiting 5-20 years to upgrade the Leavenworth Hatchery. We respect Ecology and CCNRD's efforts to find non-litigious solutions to upgrading the hatchery to meet state and federal laws. However, we also want to be clear that though our agency is an active member of the IWG, we are in no way advocating delaying compliance-related upgrades at the hatchery as a result of being a project element of the PEIS. We suggest providing details within the PEIS that "cross-walks" your efforts to solve hatchery issues with the U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service's efforts.
5) It is essential that long-term climate change scenarios serve as the "backbone" to developing the PEIS. Refill scenarios for the Alpine Lakes remain uncertain, as do in-stream flows influenced from timing and quantity of annual precipitation. WDFW urges Ecology not to over-commit water for out-of-stream uses made "available" as a result of implementing any of the projects. We would not be doing our job as a resource agency if we did not safeguard stream flows to protect fish and their habitat throughout this PEIS process. We assume the same level of safeguarding will occur from Ecology to protect senior water right holders from harm or avoid project actions that may cause adverse impacts to stream flows or water quality. WDFW expects to see a robust section in the PEIS that evaluates climate change effects on project operational scenarios (e.g. new water management of the Alpine Lakes) and then illustrates how stream flow improvements will be achieved while simultaneously providing additional water for out-of-stream uses (i.e. show the math).
6) Ecology and CCNRD have indicated that some of the projects listed above may be described with a higher level of detail within the PEIS than the broader ICWRMS projects, making some projects ready for early implementation. Evaluation of projects considered for early implementation should include an assessment of natural resource costs and benefits as a function of project sequencing/early implementation within a subsequent project-level EIS, as necessary.
7) As you are aware, WDFW is actively working on several fish screen and diversion replacement projects in Icicle and Peshastin Creeks[5] to protect fish life; these projects are slated to occur in the near future. WDFW staff will continue to manage these projects and our own environmental compliance process, associated grant awards, and partnerships independent of the Icicle Strategy. However, our WDFW team is always available to assist with project planning and/or provide expertise to support PEIS development.
8) Please provide a hardy, water conservation and reduction section in the PEIS. For example, what are some ways CCNRD and Ecology will reduce the current gallon per capita per day as a tool to provide water for future growth and respond to drought effects? How will those endeavors be coordinated with investigating new water supply in the Alpine Lakes? WDFW recommends including a plan in the PEIS by which (1) CCNRD and Ecology will partner with utility providers to offer rebates for using less water, (2) to update local regulations and/or develop ordinances to promote and/or require water savings wherever possible, and (3) to develop water conservation and reduction incentive programs.

[5] Icicle Irrigation Diversion and City of Leavenworth Diversion as examples.

9) WDFW still isn't clear how the Upper Wenatchee Community Lands Plan[6] is linked to the ICWMRS. WDFW habitat and wildlife staff have communicated with CCNRD that parcels identified in the Upper Wenatchee Community Lands Plan for acquisition may modestly add habitat value for wildlife or watershed protection in of itself. WDFW doubts these lands will be sufficient to provide "commensurate compensation for impacts to fish and wildlife resources" in the Icicle Creek basin. In addition to low habitat value, the scope of the Upper Wenatchee Community Plan includes Cashmere to Stevens Pass, with three sub-areas not located in the Icicle Creek Basin including: 1) Blewett Pass/Peshastin, 2) Chumstick Valley, and 3) Nason & Coulter Creek. The Wenatchee Community Lands Plan webpage makes no clear reference to how these "out-of-basin lands" are linked to the ICWRMS. WDFW recommends Ecology and CCNRD work with resource experts to assess lands for acquisition and/or enhancement within the Icicle Creek basin that can provide valuable fish and wildlife habitat. As you are aware, mitigation should be similar to the resource values lost through project development; out-of-place and/or out-of-kind mitigation is only appropriate when all other in-place mitigation opportunities have been exhausted[7].
10) WDFW encourages Ecology and CCNRD to identify a lead federal agency to undertake the NEPA process as soon as possible. WDFW is unclear if federal participation on the IWG and dedication of time and personnel constitutes a "major federal action" within the meaning of NEPA. WDFW suggests delineating projects in the PEIS that cannot proceed until NEPA has been fulfilled. This will ensure local, state, and federal agencies, tribes, and other stakeholder groups have a clear understanding of project implementation timelines and associated in-stream flow benefits for each project (i.e. when will the water be in Icicle Creek and how much).

Fish, Wildlife, and Habitat Resource Considerations and Information Needs

Wildlife

- The WDFW Priority Habitat and Species (PHS) data layers are a tool for planning purposes. These data sources cannot be assumed complete or exhaustive in expanses of wilderness considered in the PEIS. Lack of information for any species does not indicate a lack of presence. If the U.S. Forest Service (USFS) does not have species presence/absence surveys, WDFW recommends terrestrial surveys be completed for species likely to occur within the project footprint.
- Project activities requiring the use of helicopters pose a significant disturbance threat to mountain goats in the Alpine Lakes Wilderness - flying over mountain goats is considered to be a direct disturbance. WDFW recommends conducting surveys for concentrations of mountain goats for PEIS development. Specific consideration should be made for the timing of helicopter use to avoid the period when females are giving birth and following weeks when raising young.

[6] Upper Wenatchee Community Lands Plan, CCNRD, Trust for Public Lands, the Nature Conservancy, and the Chelan-Douglas Land Trust (2015), funded through OCR.

[7] WDFW Mitigation Policy M5002[7] guides our agency to "achieve no net loss of habitat functions and values" when reviewing or permitting projects. WDFW preferred alternative is to mitigate for natural resource impacts within the Icicle Creek basin by implementing habitat protection, conservation, and restoration actions in-place and in-kind or secondarily in-place and out-of-kind.

- Golden eagles, peregrine falcons, northern goshawks, and northern spotted owls all occupy, nest, and rear young in associated habitats in the wilderness and may be located within the project footprint. WDFW recommends conducting surveys within the project footprint so a plan can be developed to avoid disturbing nest sites, particularly until young have fledged. The high elevation and colder conditions of the wilderness will extend fledging dates into the summer later than warmer low elevation habitats.
- WDFW recommends conducting surveys for pika within the project footprint and to work closely with WDFW and the USFS to avoid impacts to this species at the project planning stage.
- Any open water habitat included within the project footprint should be surveyed for common loon nesting. The potential for direct impacts to loon nests is high for any project activities that would result in a rise of water elevation on any lakes.
- The USFS and WDFW are coordinating in summer of 2016 to conduct amphibian and reptile surveys at wetlands, lakes, ponds or streams located within and whereas water-levels or flows are impacted by the package of projects in the PEIS. Data collected and information in the final report should be used to develop the Final PEIS and for future, subsequent EISs.

Habitat

- Installation of a flow meter, with access to the data should be made publicly available to confirm proposed minimum instream flows designated for the Historic Channel in Icicle Creek are being met.
- WDFW support CCNRDs efforts to fund and install meters on all diversions.
- The water market being developed for Icicle Creek will need to be coordinated annually with fisheries co-managers to avoid seasonal harm to instream flows, including winter flows to protect fish life.

Fish

- Fish passage improvements should include flow as an important component to ensure riffles are passable to upstream migrating salmonids.
- WDFW can provide fish stocking data for the Alpine Lakes if requested. Our agency has a vested interest in ensuring changes in operations at the lakes do not adversely impact fish
- Modeling flow scenarios out of each and/or all of the Alpine Lakes being contemplated in the PEIS will help prioritize flows scenarios that maximize benefits to fish at each relevant life stage. Focal species and relevant life stages include Steelhead (adult, rearing), Rainbow trout (adult, rearing), Bull Trout (adult/sub-adult, rearing), Cutthroat Trout (adult, rearing), and Lamprey (adult).
- Bringing fish screening associated with diversions into compliance with state and federal requirements should be a nondiscretionary “early action” item of the PEIS; this action should be funded and pursued in the immediate future as a priority of the ICWRMS.

Closing Remarks

Flows in Icicle Creek need to be restored to avoid extinction of trout and steelhead populations. Withdrawing additional water from Icicle Creek cannot occur until fisheries experts agree that flow is sufficient to protect fish at all life stages and there is "wiggle" room to allocate water for out-of-stream uses. WDFW looks forward to working toward water resource solutions that embody a balance of public interests with natural resource protection for the benefit of all! If you have questions or concerns regarding our comments, please feel free to contact me directly by email at carmen.andonaegui@dfw.wa.gov or by phone at (509) 754-4624 ext. 212.

Sincerely,

Carmen Andonaegui

WDFW, Region 2 Habitat Program Manager

cc: Jim Brown, WDFW Region 2 Director
Amy Windrope, WDFW Ecosystem Services Division Manager
Jeff Korth, WDFW Region 2 Fish Program Manager
Matt Monday, WDFW Region 2 Wildlife Program Manager
Charity Davidson, WDFW Environmental Planning Coordinator

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Wednesday, May 11, 2016 10:43 AM
To: Meghan O'Brien; Jordan Sanford
Cc: Dan Haller
Subject: FW: Formal Comment: Icicle Work Group's "Icicle Strategy."

Mary Jo Sanborn
Water Resource Manager
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From: Mike Kaputa
Sent: Tuesday, May 10, 2016 5:55 PM
To: Doug Scott
Cc: George Nickas; John Gilroy; Mary Jo Sanborn
Subject: RE: Formal Comment: Icicle Work Group's "Icicle Strategy."

Doug, thank you for your comments. We will make sure they are entered into the record and considered during scoping.

I did recently talk with Rep. McCormack about the "in-holders" in the wilderness area who held ownership rights prior to the wilderness being established. By "in-holders" I am referring to Pack River, Icicle Irrigation District and Burlington Northern Santa Fe Railways. Given your role in establishing the wilderness, any input you could provide on how those "in-holders" were to be addressed post-wilderness designation would be appreciated.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Doug Scott [mailto:scottdoug959@gmail.com]
Sent: Friday, May 06, 2016 1:11 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>

Cc: George Nickas <gnickas@wildernesswatch.org>; John Gilroy <jgilroy@pewtrusts.org>
Subject: Formal Comment: Icicle Work Group's "Icicle Strategy."

Mr. Kapula --

On behalf of my company, Doug Scott Wilderness Consulting, I wish to comment on your proposed Icicle Work Group's Icicle Strategy.

As background, in the mid-1970s I was the Northwest Representative of the Sierra Club based in Seattle. As such, I represented the large coalition of organizations (local, state, and national) which sought the designation of the Alpine Lakes Wilderness Area. I testified at the U.S. Forest Service hearings in Seattle and Wenatchee, at the congressional field hearings, and at the hearings before both the Senate and House committees in Washington, DC.

I worked closely with the sponsors of the legislation that designated the wilderness area, notably Representatives Lloyd Meeds, Joel Pritchard, and Mike McCormack, who represented the Wenatchee side of the wilderness area, and with Senators Henry M. Jackson and Warren Magnuson, as well as the many congressional committee members involved. I worked closely with leaders of the U.S. Forest Service, including the chief, and with officials in the Department of Agriculture and the White House.

I attended and was recognized at the Forest Service's celebration of the new wilderness area in 1976 at Snoqualmie Pass.

I have often visited the Icicle, including the hike up the Snow Lake Trail to the Enchantments area at the eastern end of the wilderness area. I was involved in the enactment of the amendment which added 22,172 acres in the lower valley of the Middle Fork, Snolqualmie River sponsored by Representative Xxxxx Xxxxx and Senators Xxxxx Xxxxx and Maria Cantrell. I attended and was recognized at the celebration of this addition held near the new boundary.

The Alpine Lakes Wilderness Area is a beloved part of America's National Wilderness Preservation System:

> The wilderness area--every acre of it -- is protected with the full strength of the 1964 Wilderness Act.
>
> The building of new dams or water diversions, however “minor” you may think they would be, is illegal.
>
> Were your proposal to succeed, it would constitute a very serious and unacceptable precedent.

I can assure you that any such final decision will, on the day it is issue, bring you before a federal judge and will be prosecuted with the full resources of the national wilderness movement and with the well-regarded legal skills of the top environmental attorneys practicing today.

Prior to that, you are obligated legally to produce and reveal a complete and thorough environmental impact statement to cover your proposal and -- as you have indicated you will do -- to include the mandatory full range of alternatives to your proposed action.

This include the non-action alternative -- leaving well enough alone without violating the wilderness area.

Every alternative -- every -- that would achieve your goal without violating the wilderness area.

Three notable facts:

> The father of the Alpine Lakes Wilderness Area in the U.S. Senate was Senator Henry M. Jackson who was also chairman of the committee which produced the area. Senator Jackson was also the

father of the National Environmental Policy Act. It would be a slur on his memory for you to cut corners in any way in meeting your obligations under his statute. A lawsuit is certain.

Senator Jackson chaired the meeting of the entire Washington congressional delegation in which final issues of the boundaries and wording of the Alpine Lakes Area Management Act of 1976.

I represented the coalition of supporting organizations in presenting to this private meeting the results of final negotiations which I carried out with Bill Ruckelshaus, then of Weyerhaeuser Company, who acted on behalf of the timber industry coalition, including local governments -- including Wenatchee County. Mr. Ruckelshaus was, of course, the first administrator of the U.S. Environmental Protection Agency which oversees the environmental impact statement process.

You have similar but separate obligations under statutes of the State of Washington.

Issues of impacts on the interests and needs of Native American Tribes and on anadromous fisheries are mandatory topics you must cover in complete detail.

You are on notice. Your agency and its constituents are apparently not aware of what you are doing, for you court an enormous waste of your time, the time of many other agencies, organizations, and individuals, and the money the taxpayers who pay for your efforts. And it will be for naught. You will learn this as have those who attempted much smaller dams and diversions within the Selway-Bitterroot Wilderness Area, Montana.

You will end up empty handed and ... with our thanks, the author of yet another strong pro-wilderness precedent.

Think again!

Doug Scott
Principle

Doug Scott Wilderness Consulting
1723 18th Avenue, Suite 25
Seattle, WA 98122
www.wilderness-reources.net

Doug Scott, a forester by training, is recipient of the highest honor of the national Sierra Club, the John Muir Award.

cc:

George Nickas, Executive Director, Wilderness Watch
John Gilroy, Assistant Director, Campaign for America's Wilderness, U.S. Lands, The Pew Charitable Trusts

Alpine Lakes Protection Society ● Alpine Lakes Foundation
Alliance for the Wild Rockies ● American Whitewater ● Aqua Permanente
Center for Environmental Law & Policy ● Conservation Congress
El Sendero ● Endangered Species Coalition ● Federation of Western Outdoor Clubs
Friends of the Bitterroot ● Friends of Bumping Lake ● Friends of the Clearwater
Friends of the Enchantments ● Friends of Lake Kachess ● Friends of Wild Sky
Great Old Broads for Wilderness ● Issaquah Alps Trails Club
Kachess Homeowners Association ● Kachess Ridge Maintenance Association
Kittitas Audubon Society ● Kittitas County Fire District #8 ● The Mazamas
Middle Fork Recreation Coalition ● North Cascades Conservation Council
North Central Washington Audubon Society ● Olympic Forest Coalition
River Runners For Wilderness ● Save Our Sky Blue Waters ● Seattle Audubon Society
Sierra Club ● Spokane Mountaineers ● Spring Family Trust for Trails
Washington Native Plant Society ● Washington Wild ● Western Lands Project
Wilderness Watch ● Wild Fish Conservancy

May 11, 2016

Via email to: mike.kaputa@co.chelan.wa.us

Chelan County Natural Resources Department
Attention: Mike Kaputa, Director
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: **Icicle Creek Water Resource Management Strategy – SEPA scoping**

Dear Director Kaputa:

Thank you for the opportunity to provide scoping comments on the Icicle Creek Water Resource Management Strategy. As non-profit organizations focused on conservation and recreation with members who live, work and play in the project area, we have a strong interest in current and future management activities in the Icicle Creek watershed and the Alpine Lakes Wilderness. Many of our organizations attended the informational and scoping meetings held in 2013-2016 regarding this proposal, and some of us have participated in Icicle Work Group meetings and have submitted comment letters previously. We appreciate the difficult challenge to provide instream flows and supply water for historic agricultural uses. There are impacts inherent in this, and Chelan County should work to minimize such impacts by prioritizing water conservation measures that are not detrimental to wilderness values. We are willing to work towards a solution. We support the tribes' insistence that any solution ensure adequate instream flows for fish. However, we are very concerned about the substantial impact of current and proposed water management activities on the lakes in the Wilderness, and the proposal to increase water diversions from seven lakes in the Alpine Lakes Wilderness that flow into Icicle Creek: Colchuck, Eightmile, Upper and Lower Snow, Nada, Lower Klonaqua and Square Lakes.

Chelan County and the Washington State Department of Ecology jointly issued a SEPA Determination of Significance, determining that a Programmatic Environmental Impact Statement (PEIS) is required, due to the proposal's probable significant environmental impacts. We agree with that determination, and we support the decision to prepare an EIS, given the scope and severity of the potential environmental impacts associated with the proposal.

After reading through the materials you published online, we offer the following comments:

Full range of alternatives

Key to the effectiveness of the EIS is presenting a full range of alternatives. "The range of alternatives considered in an EIS must be sufficient to permit a reasoned choice."[1] The proposed action and a "No Action" alternative do not present a sufficient range of alternatives, especially given the large scope of the overall proposal. Furthermore, the EIS cannot be constrained solely by the set of principles agreed to by the Icicle Work Group, as that would be contrary to law. "[A]n agency violates SEPA by shaping the details of a project before completing an EIS, effectively turning administrative approval into a 'yes or no' vote on that project as detailed, rather than allowing for the development and consideration of alternatives after the EIS is completed."[2] The large amounts of money that the Work Group has expended on the proposed action cannot be used to justify foreclosure of other reasonable alternatives.[3]

We suggest several other reasonable alternatives below to fully evaluate the project opportunities, impacts and needed mitigation. We believe that the alternatives below are reasonable and can "feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation."[4]

Wilderness Protection alternative

The Alpine Lakes Wilderness is a shared natural resource that many people use and care about; it must be respected and protected. It is the Wilderness area nearest to the millions of people who live in the Puget Sound metropolitan area, and is one of the most popular Wilderness areas in the United States. Alpine Lakes Wilderness has operated under a permit system for decades because of the popularity of this Wilderness with the people of Washington State. It has national importance as part of the National Wilderness Preservation System, and it is owned and visited by people from all over the country. It took many years of struggle and hard work by members of our non-profit organizations to establish the Wilderness.

The EIS should include a "Wilderness Protection" alternative. This alternative should promote Wilderness values in keeping with the Wilderness classification of the Alpine Lakes Wilderness area, while simultaneously meeting the objectives of the proposal. This alternative should not increase the amount of water removed from the Alpine Lakes Wilderness; not expand easements; not encroach on wilderness lands; not use mechanical transport; and not build any structure or

[1] *Solid Waste Alternative Proponents v. Okanogan County*, 66 Wn.App. 439, 445, 832 P.2d 503 (1992).
[2] *Columbia Riverkeeper v. Port of Vancouver USA*, 189 Wn.App. 800, 818-19, 357 P.3d 710 (2015).
[3] *Id.*
[4] WAC 197-11-440(5)(b).

installation in the Wilderness. Rather, under the Wilderness Protection alternative, any new water supplies should be obtained from application of conservation measures and from sources outside the Wilderness, and use non-Wilderness options for improving instream flows (for example, the Icicle-Peshastin Irrigation District change in diversion point discussed below). The Wilderness Protection alternative should comply with all provisions in the Forest Service's administrative Alpine Lakes Area Land Management Plan, including: "Except as provided for in Section 4(d)(4) of the Wilderness Act, watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge."

The EIS list of relevant laws, rules and plans should include the Wilderness Act of 1964; the Alpine Lakes Area Management Act of 1976, the Alpine Lakes Area Land Management Plan (1981), and the Wenatchee NF Forest Plan (1990) as amended.

The Wilderness Protection alternative should evaluate public purchase (buy-back) of private water rights in the Alpine Lakes, which would allow removal of dams and other structures from the lakes to restore the Wilderness area to its true natural character.

The Icicle Work Group's guiding principle on Wilderness should be stated as a separate principle, and not subsumed or merged or blended into the other principles. Most of the Icicle Creek watershed is within the Alpine Lakes Wilderness.

Water Right Relinquishment alternative

We appreciate the irrigators' need for water to irrigate their orchards and keep them productive. We do not object to the exercise of valid, existing water rights of the Icicle-Peshastin Irrigation District, but we question any assertion of water rights that have been relinquished or are otherwise invalid.

The EIS should include a "Water Right Relinquishment" alternative. This alternative should analyze existing water rights to the Alpine Lakes and acknowledge those rights that have been relinquished or abandoned. Further, to the extent that relinquishment of water rights affects the basis of other alternatives, a relinquishment analysis should be part of each alternative considered. For example, has the Icicle-Peshastin Irrigation District (IPID) relinquished through non-use any part of the Eightmile Lake water right on which the dam rebuilding scheme is predicated? If so, it would be improper to analyze an alternative that is based upon the invalid assumption that IPID has valid water rights that would be needed to pursue the project.

The EIS should include an alternative that recognizes Icicle Work Group members' water rights are limited to the purposes for which they were initially granted (for example, agricultural irrigation) and cannot be redirected to other purposes (such as suburban development). Furthermore, all alternatives should be assessed for compliance with all applicable provisions of the Water Code, RCW 90.03.

Water Conservation alternative

The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the City of Leavenworth, Icicle-Peshastin Irrigation District, the Leavenworth Fish Hatchery and other water users as a means to achieve the proposal's objectives. This alternative should consider the adoption of conservation measures (such as restrictions on watering lawns) that have been implemented in the Seattle area, where water consumption actually declined while the population increased. This alternative should also evaluate water markets that facilitate selling and trading of water rights.

The Water Conservation alternative should evaluate a transfer of water rights from IPID to Leavenworth for properties within the city limits that have now converted from orchards to residential properties. This alternative should analyze how appropriate reductions in water usage (that is, not using agricultural water quantities for lawn irrigation) would save water that would then be available for other Leavenworth needs.

The Water Conservation alternative should evaluate how IPID spills large quantities of water back into the Wenatchee River at the end of several of its canals. This alternative should evaluate how this 19th century irrigation practice (which was required to ensure water made it to the furthermost customers) could be replaced with modern pumping and piping technologies constructed outside of the Wilderness Area. The EIS should consider the resulting reduction in water demand as an alternative water supply.

A strong water conservation program can and should be a part of all the action alternatives, and should be compared to current practices (the No Action alternative).

Water Right Change alternative

The EIS should include a "Water Right Change" alternative. This alternative would evaluate improving Icicle Creek flows by moving IPID's point of diversion downstream (to the Wenatchee River). This measure, which would add 100 cfs of water to Icicle Creek every year, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). This alternative should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric. Options for changing the point of diversion have already been studied and information on their feasibility and costs is available.

Relationship Between NEPA & SEPA Review

The involvement of several federal agencies and the likelihood of significant environmental impacts justify a finding of significance under NEPA.[5] Therefore, it is imperative that the Forest Service, as the federal land manager of the Wilderness, take a hard look at the Wilderness impacts associated with the proposed projects.[6] If the proposed SEPA EIS is "programmatic" and contains no federal decisions, the SEPA EIS should say so explicitly and note that any project that requires a federal decision will require NEPA analysis and cannot rely solely on this

[5] 42 U.S.C. § 4332.
[6] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

SEPA EIS. It is unclear, from the documents produced thus far, how the SEPA and NEPA analyses will be related, if at all. Given the fact that the Wilderness Area is federally managed, the relationship between these two different review processes should be disclosed.

Climate Change Impacts Must Be Considered

The impact of each alternative on Icicle Creek's resilience to climate change, particularly with regard to changes in amount or timing of precipitation and instream flow, should be evaluated.[7] According to Ecology:

> *Climate Change will increase the variability – widening the range – of future supply and demand of water. As climate change shifts the timing and volume of streamflow and reduces snowpack , lower flows during the summer will make it more difficult to maintain an adequate supply of water for communities, agriculture, and fish and wildlife. Lower summer flows and higher stream temperatures will continue to degrade our water quality and place stress on salmon*.[8]

These impacts are foreseeable and must be assessed as part of the EIS.

Impacts of Water Withdrawal Must Be Analyzed

The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes, and how the proposed changes will affect the current situation. The analysis should include a review of scientific literature on the impacts of water removals upon wildlife, vegetation, soil and wilderness values.

Operations, Maintenance & Environmental Monitoring Analysis

The EIS should provide a detailed operations, maintenance and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions, including helicopter use. The EIS should also provide a detailed accounting of budgets and funding sources for these items.

The Purpose & Need of the Project Should Be Identified

The EIS should fully explain the purpose and need for the water these projects would provide. We understand the need to increase instream flows in Icicle Creek, but what are the additional

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[7] RCW 43.21C.030(f) (SEPA is to be implemented in a fashion that "recognize[s] the worldwide and long-range character of environmental problems and, where consistent with state policy, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of the world environment."); WAC 197-11-444; *Rech v. San Juan Cnty*, 2008 WL 5510438 (Wash. Shorelines Hearings Bd.) (June 12, 2008) at *12 n.8 ("We further note an emerging trend in the case law under the National Environmental Policy Act ("NEPA") and state NEPA analogues in which courts are increasingly requiring agencies to analyze climate change impacts during environmental assessments.").

[8] Ecology, Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy (April 2012) at 101-102; *id.* at 103 (stating that climate change will lead to "increases in winter precipitation, posing additional challenges for managing reservoirs for flood control, fish, and hydropower.").

out-of-stream uses to be served by these projects? To what beneficial use will the additional water be put?

The EIS should fully explain what human activities caused the degraded conditions (such as low instream flows in Icicle Creek) that the projects seek to improve. We should not be repeating the mistakes of the past and this information is highly relevant as to the purpose and need of the projects in the first place.

Direct, Indirect & Cumulative Impacts Must Be Assessed

The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation, and funding that would be needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail.

The direct, indirect and cumulative impacts of all proposed projects must be assessed.[9] Cumulative impacts include "the impact from the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions."[10] "A cumulative impact analysis need only occur when there is some evidence that the project under review will facilitate future action that will result in additional impacts."[11] Here, all of the projects are being analyzed in one EIS, are not speculative, and thus must be assessed in a holistic fashion. In addition, if the projects are going to be implemented in phases, that must be described and done in a manner that does not improperly segment the environmental impacts of all proposed projects.

Instream Flow Impacts on Fish and ESA Consultation

The EIS should analyze the adequacy of proposed instream flows to support spawning, rearing and migration of steelhead, salmon and bull trout. Each project's impacts on instream flows and the species likely to be affected should be identified. Under the Endangered Species Act, the Upper Columbia River distinct population segment of steelhead is listed as a threatened species, and the Upper Columbia River spring-run Chinook salmon evolutionary significant unit is listed as endangered. Therefore, consultation under the Endangered Species Act must be required. Icicle Creek contains some of the last remaining nearly pristine habitat available to these fish. Icicle Creek is designated critical habitat for the Upper Columbia River steelhead and contains spawning, rearing, and migration habitat for this species. Upper Columbia River spring-run Chinook salmon also spawn in Icicle Creek. However, human activities have lowered instream flows and devastated these fish in Icicle Creek.

Information on Existing Diversions Is Needed

The EIS should include maps, diagrams and photos to clearly show the current situation (including the place of diversion and amount of water diverted) at each of the lakes and other project locations and how that would change under the proposed action(s) under each alternative.

[9] WAC 193-11-060(4).
[10] 40 C.F.R. § 1508.7.
[11] *Boehm v. City of Vancouver*, 111 Wn.App. 711, 720, 47 P.3d 137 (2002).

Thank you for considering these comments.

Sincerely,

Karl Forsgaard, President
Alpine Lakes Protection Society (ALPS)

Trish Rolfe, Executive Director
Center for Environmental Law & Policy

Harry Romberg, National Forests Chair
Washington State Chapter
Sierra Club

Mark Boyar, President
Middle Fork Recreation Coalition (MidFORC)

John Spring, Manager
Spring Family Trust for Trails

Brock Evans, President
Endangered Species Coalition

Dave Kappler, President
Issaquah Alps Trails Club

Shelley Spalding, Climate Action Liaison
Great Old Broads for Wilderness

Kathi & Greg Shannon, Steering Comm members
Friends of the Enchantments

Mike Garrity, Executive Director
Alliance for the Wild Rockies

Denise Boggs, Executive Director
Conservation Congress

Gary Macfarlane, Ecosystem Defense Director
Friends of the Clearwater

Lee Davis, Executive Director
The Mazamas

Tom Uniack, Executive Director
Washington Wild

Rachael Osborn
former member, Icicle Work Group

Gus Bekker, President
El Sendero
Backcountry Ski and Snowshoe Club

Mike Town, President
Friends of Wild Sky

Tom Hammond, President
North Cascades Conservation Council

Chris Maykut, President
Friends of Bumping Lake

William Beyers, President
Alpine Lakes Foundation

George Nickas, Executive Director
Wilderness Watch

George Milne, President
Federation of Western Outdoor Clubs

Tom Martin, Council Member
River Runners For Wilderness

Larry Campbell, Conservation Director
Friends of the Bitterroot

Kurt Beardslee, Executive Director
Wild Fish Conservancy

Tom Gauron, President
Kittitas Audubon Society

Janine Blaeloch, Executive Director
Western Lands Project

Doug Scott, Principal
Doug Scott Wilderness Consulting

Lori Andresen, President
Save Our Sky Blue Waters

Robert Angrisano, President
Kachess Homeowners Association

Terry Montoya, President
Kachess Ridge Maintenance Association

Thomas O'Keefe, PhD
Pacific Northwest Stewardship Director
American Whitewater

Melissa Bates, President
Aqua Permanente

Art Campbell, President
North Central Washington Audubon Society

Bill Campbell, President
Friends of Lake Kachess

Jerry Watts, Chair
Board of Fire Commissioners
Kittitas County Fire District #8

Brian Hoots, President
Spokane Mountaineers

Clay Antieau, President
Washington Native Plant Society

John Brosnan, Executive Director
Seattle Audubon Society

Connie Gallant, President
Olympic Forest Coalition

Cc: Tom Tebb, Department of Ecology
other Icicle Work Group members
Governor Jay Inslee
U.S. Senator Patty Murray
U.S. Senator Maria Cantwell
U.S. Representative Dave Reichert
U.S. Interior Secretary Sally Jewell
U.S. Bureau of Reclamation Commissioner Michael Connor
U.S. Forest Service, Regional Forester Jim Pena
Okanogan-Wenatchee National Forest Supervisor Mike Williams
Wenatchee River District Ranger Jeff Rivera

WASHINGTON STATE DEPARTMENT OF
Natural Resources

PETER GOLDMARK
Commissioner of Public Lands

May 11, 2016

Mike Kaputa
Chelan County Natural Resource Dept.
411 Washington Street, Suite 201
Wenatchee, WA 98801

SUBJECT: Icicle Creek Water Resource Management Strategy

We've searched the Natural Heritage Information System for information on rare plants or rare and/or high quality ecological communities in the vicinity of your project. A summary of this information accompanies this letter (Excel file; GIS shapefile). In your planning, please consider protection of these significant natural features, and feel free to contact us for consultation.

The information provided by the Washington Natural Heritage Program is based solely on existing information in the database. There may be significant natural features in your study area of which we are not aware. These data are being provided to you for informational and planning purposes only - the Natural Heritage Program has no regulatory authority. This information is for your use only for environmental assessment and is not to be redistributed. Others interested in this information should be directed to contact the Natural Heritage Program.

The Washington Natural Heritage Program is responsible for information on the state's rare plants as well as high quality ecosystems. For information on animal species of concern, please contact Priority Habitats and Species, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia WA 98501-1091, or by phone (360) 902-2543.

For more information on the Natural Heritage Program, please visit our website at http://www.dnr.wa.gov/natural-heritage-program. Species lists and fact sheets, as well as rare plant survey guidelines are available for download from the site. For the self-service system, please follow the Reference Desk link to Location Search. Please feel free to call us at (360) 902-1667 if you have any questions, or e-mail us at natural_heritage_program@dnr.wa.gov.

Sincerely,

Jasa Holt, Data Specialist

Washington Natural Heritage Program
Forest Resources and Conservation Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
Central Washington Field Office
215 Melody Lane, Suite 103
Wenatchee, Washington 98801

May 11, 2016

In Reply Refer To:
USFWS Reference: 01EWFW00-2016-TA-0800
Hydrologic Unit Codes: 17-02-00-11-04

Tom Tebb
Director, Office of Columbia River
Washington State Department of Ecology
1250 West Alder Street
Union Gap, WA 98903-0009

Mike Kaputa
Director, Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: Scoping Comments on the Programmatic Environmental Impact Statement (PEIS) for the Icicle Creek Water Resource Management Strategy

Dear Mr. Tebb and Mr. Kaputa:

This responds to your request for scoping comments to assist with the development of a Draft State Environmental Policy Act (SEPA) PEIS for the Icicle Creek Water Resource Management Strategy (ICWRMS). The U.S. Fish and Wildlife Service's (Service) Central Washington Field Office has participated periodically in the Icicle Work Group (IWG) meetings with a focus on implementation, consultation, and recovery planning issues surrounding the ICWRMS. The Service supports developing the PEIS to assess projects that could provide a more secure water supply for agricultural and municipal uses as well as advancing the conservation of species. The Service encourages continued coordination and collaboration with federal stakeholders as site-specific projects are developed and packaged for National Environmental Policy Act (NEPA) review, consultation in accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), and for the implementation of priority recovery actions associated with Section 7(a)(1) of the ESA.

General Comments

1. Many of these proposed actions appear to be a "water resource development" as defined by the Fish and Wildlife Coordination Act (FWCA), as amended (16 U.S.C. 661 *et seq.*). The FWCA was developed to ensure that fish and wildlife resources receive equal consideration as other aspects of a water resource development project. The FWCA requires the federal agencies involved to consult with the Service and the state fish and wildlife agency (Washington Department of Fish and Wildlife, WDFW) to request a Coordination Act Report (CAR). The CAR assesses the effects of the action, considers the fish and wildlife resources at risk, and recommends measures to protect, develop, and improve these habitats. Although not binding, the federal agency must strongly consider the recommendations of the CAR to prevent loss or damage to fish and wildlife resources and to mitigate any unavoidable impacts.

   Although the ICWRMS is a non-federal effort not directly bound by the FWCA, many or perhaps all of the subsequent steps of implementation appear to have at least one federal agency involved. Rather than conducting several individual CARs for each successive step implementing the ICWRMS, the Service recommends a more comprehensive and efficient approach. The Service recommends a single CAR be produced for the entire ICWRMS in collaboration with the Department of Ecology, Chelan County Natural Resources Department, WDFW, and the Service. We look forward to future discussions regarding this possibility.

2. Please describe the sequencing and timing of projects, and how increased instream flows will be metered out among the beneficiaries of flow increases, as projects are implemented. This will ensure that all stakeholder groups have a clear understanding of project implementation timelines and associated instream benefits for each projects (i.e. when and how much water will be in Icicle Creek and over what timeframe). Similarly, develop a phased implementation schedule to facilitate Section 7(a)(2) consultation with the Service to assess individual and cumulative impacts of implementing projects under the ICWRMS.

3. To improve and expedite any Section 7(a)(2) consultation for individual ICWRMS projects, please insure appropriate coordination with the Service's Central Washington Field Office and federal partners (especially land management agencies such as the Forest Service) occurs early in the planning and implementation schedule. Early and often coordination and engagement with the Service is the single best way to foster an efficient consultation environment.

4. The Service encourages the Department of Ecology and Chelan County Department of Natural Resources to identify a single federal agency to lead the Section 7(a)(2) consultation and NEPA processes. At the April 20, 2016, ICWRMS open house, it appeared that some individual projects could have several federal agencies involved. In these cases, we recommend that the federal agency with the higher NEPA standards be the lead action agency (i.e., so one NEPA document can meet both agencies standards).

5. We have also reviewed scoping comments prepared by the WDFW on the ICWRMS. We find the WDFW comments to be very thoughtful and detailed, and we hope they are carefully considered. Although the WDFW comments extend to areas outside of the Service's purview, we endorse the spirit and content of their comments that all reflect a clear desire to protect fish and wildlife resources.

Thank you for your assistance in the conservation of listed species. If you have any questions or comments regarding this letter, please contact Jeff Krupka at the Central Washington Field Office in Wenatchee at (509)665-3508, extension 2008, or via e-mail at jeff_krupka@fws.gov.

Sincerely,

Steve Clou for

Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

cc: Via e-mail;
Carmen Andonaegui, WDFW, Region 2 Habitat Program Manager
Charity Davidson, WDFW Environmental Planning Coordinator
Dave Irving, USFWS, Leavenworth Fisheries Complex
Jeff Rivera, OWNF, Wenatchee River Ranger District

American Rivers | The Wilderness Society
Washington Trails Association

May 11, 2016

Tom Tebb
Director, Office of Columbia River
Washington Department of Ecology
1250 Alder Street
Union Gap, WA 98903

Mike Kaputa
Director, Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Submitted electronically on May 11, 2016 to Mike Kaputa.

RE: Request for Comments on the Scope of the Programmatic Environmental Impact Statement (PEIS) for the Icicle Creek Water Resource Management Strategy (Icicle Strategy)

Dear Directors Tebb and Kaputa:

Thank you for the opportunity to provide scoping comments on the Icicle Creek Water Resource Management Strategy (Icicle Strategy). The Washington State Department of Ecology (Ecology) directed the Chelan County Natural Resource Department (CCNRD) to develop a PEIS for the Icicle Strategy. Scoping comments gathered on the potential project package established by the Icicle Work Group (IWG) will be used to inform a draft State Environmental Policy Act (SEPA) PEIS for the Icicle Strategy. Our organizations appreciate the opportunity to provide feedback on the current proposal.

The project area of the Icicle Strategy proposal encompasses one of the most iconic - and treasured - wilderness areas and one of the most visited valleys in the state. Thousands of hikers and adventurers explore the Alpine Lakes Wilderness each year, and the Enchantments Lakes Region specifically. Our organizations and members have great interest in the management and stewardship of these lands, and are committed to working to ensure wilderness, recreation, and scenic values are protected into the future.

SEPA Purpose

The purpose of the SEPA PEIS is to address probable significant adverse impacts associated with implementation of a suite of projects within the Icicle Creek basin aimed at enhancing streamflow and habitat conditions for fisheries and other aquatic organisms, improving operational flexibility and water storage at high-alpine lakes within the Alpine Lakes Wilderness, maintaining water security and supply reliability for out-of-stream users of Icicle Creek water, and reinstating water reserves that will facilitate growth and development in Chelan County. The primary purpose of the SEPA PEIS is to help clarify resources and information that will inform programmatic environmental review for the Icicle Strategy as well as individual environmental review processes for each project.

The undersigned organizations understand that current suite of projects proposed by the IWG for public comment does not necessarily represent the final project package nor approval of individual projects in the PEIS. We do hope the concerns and comments provided below will inform further refinement of the current suite of projects.

Concerns and Comments

The undersigned organizations are pleased to share the following concerns and comments that should be addressed during the SEPA review and PEIS development.

1. Alpine Lakes Wilderness Area Compliance and Impacts

Icicle Creek is a major tributary to the Wenatchee River in Chelan County, and the Icicle Creek watershed encompasses an area of approximately 212 square miles, most of which is designated as the Alpine Lakes Wilderness (ALW) and currently managed by the U.S. Forest Service. The 920,000-acre ALW was designated in 1976 to protect some of the most wild, rugged, scenic, and beloved lands in the Central Cascade Mountains.

One of the seven guiding principles cited in the Icicle Strategy is to "comply with State and Federal Law, and Wilderness Acts." Several layers of law are relevant to the projects and actions proposed in the Icicle Strategy, and in many ways, the interpretation of those laws will determine the viability of the projects proposed at the wilderness lakes, specifically the restoration/repair at Eightmile Lake as well as automation and optimization efforts. It is our understanding that the U.S. Forest Service has participated in the IWG, but has not provided any specific guidance on the projects proposed and how such proposals comply with current management agreements with the Icicle-Peshastin Irrigation District or the suite of wilderness laws relevant in this situation, including the 1964 Wilderness Act, 1976 Alpine Lakes Area Management Act, and the 1981 Alpine Lakes Wilderness Management Plan (ALWMP). Such interpretation and guidance from the U.S. Forest Service is imperative, and should happen as a part of the SEPA process. Relevant direction from these laws is cited below and requires federal interpretation and development of guidance for federal actions in relation to the Icicle Strategy.

From the 1964 Wilderness Act, Section 4(d)(4), related to the requirement of Presidential approval of facilities, including water resources, that are not compliant with wilderness regulations:

> *Within Wilderness areas in the national forests designated by this Act, (1) the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest . . . upon his determination that such use or uses in the specific area will better service the interests of the United States and the people thereof than will its denial…* [emphasis added]

From the 1964 Wilderness Act, Section 4(c), related to the concept of Minimum Requirements, and applicable to activities related to special provisions mandated by the Wilderness Act such as access to inholdings and maintenance of water developments:

> *Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.* [emphasis added]

From the 1981 ALWMP, related to specific management guidance for water resources:

> *Management Objective: to preserve water bodies and stream courses in a natural state with minimal modification or human-caused contaminants. . .*
>
> *Management Direction: (1) except as provided for in Section 4(d)(4) of the Wilderness Act, watershed will not be altered or managed to provide increased water quantity, quality or timing of discharge. . . (2) . . . long-term weather modification programs producing repeated or prolonged changes in the weather during any part of success years and having substantial impacts on the Wilderness resource will not be permitted. Prior to any weather management modification activity within the Alpine Lakes Wilderness, formal application must be filed and approved by the Chief of the Forest Service. The proponents must, through an environmental analysis accompanying their applications, provide reasonable, scientifically supportable assurance that their activities will not produce permanent or substantial changes in natural conditions, nor will they include any feature that might reasonably be expected to produce conditions incompatible in appearance with the environment or reduce the values for with the Wilderness was created.* [emphasis added]

Because of the constraints related to water resource management in wilderness established by federal law, our organizations recommend the IWG explore non-Wilderness options for improving instream flows (for example, the IPID change in diversion point discussed below).

2. Recreation Impacts

The Alpine Lakes Wilderness and the lands surrounding the wilderness are one of the most popular recreation destinations in the state for hikers, climbers, backcountry skiers, snowshoers and others who enjoy getting out on our public lands. The Enchantment Lakes region is considered one of Washington's iconic areas, filled with crystal-clear blue lakes, subalpine meadows and rocky spires. Thousands of people come from all over the world to visit this area. The Enchantment Lakes region is so popular and fragile due to its higher elevation that the Forest Service instigated a backcountry camping permit system years ago, and has since expanded the season during which permits are required. Now, the Enchantment Lakes sees hundreds of people visiting for a day hike, alpine climb or week-long backpacking trip each summer.

We are very concerned by the potential negative impacts to recreation in the Enchantment Lakes region. These impacts should be identified through the PEIS and alternatives should be provided that avoid all negative impacts to this fragile and beloved area. Impacts to aesthetics, user experience, trails, access and camping should be included in the analysis and alternatives provided that result in no net loss of recreational access and experience.

3. Water Rights Issues

Our organizations understand and appreciate the need for water to irrigate orchards and keep them productive. We do not object to the use of valid, existing water rights in the Icicle-Peshastin Irrigation District. However, we are concerned that the scope of the Icicle Strategy may extend beyond the valid, existing water rights as limited by relinquishment and recorded agreements. We recommend that all water rights be analyzed for valid use.

4. Water Right Change

As part of the PEIS, our organizations recommend the evaluation of improving Icicle Creek flows by moving the Icicle-Peshastin Irrigation District's point of diversion downstream to the Wenatchee River. Our organizations support the alternatives analysis provided by Trout Unlimited for moving the IPID downstream.

5. National Environmental Policy Act

Our organizations understand that the National Environmental Policy (NEPA) process must be undertaken by a lead federal agency. At this time no lead agency has been identified. We recommend identification of a federal agency that will serve as the lead during NEPA processes. If any of the proposed projects cannot proceed until NEPA is completed, we recommend that these projects be identified so that interested stakeholders understand the timelines associated with project implementation.

6. Range of Projects

We understand that the success of the Icicle Strategy hinges on implementation of the full suite of proposed projects. However, it is unclear what projects have been identified to replace those in the proposed package should any one become unattainable due to logistics, lack of public support,

unanticipated expenses, or other reason(s). Our organizations recommend the development of a list of proposed project alternatives that will meet the Guiding Principles established by the IWG and that are practical, feasible and implementable. In addition to identifying potential replacement projects should one of the proposed projects drop from the final package, a comprehensive list of project alternatives will also demonstrate that the final package contains projects that have the greatest conservation benefit for the most effective cost.

Thank you for the opportunity to provide scoping comments on the Icicle Strategy. Our organizations support collaborative efforts to develop innovative and sound approaches to water and natural resource management for Icicle Creek and the greater Wenatchee basin and appreciate the commitment of member organizations, tribes, agencies, and individuals to this important endeavor. As we face a certain future of increased demands on limited water resources, such collaborative efforts will be required to balance the range of competing needs. Broad-based community involvement and support as well as transparency and trust are critical ingredients for success. Please feel free to contact representatives from the organizations listed below for further comments or questions.

Sincerely,

Andrea Imler Advocacy Director Washington Trails Association	Kitty Craig Washington State Deputy Director The Wilderness Society
John Seebach Vice President for River Basin Conservation American Rivers	Katherine Hollis Conservation and Advocacy Director The Mountaineers

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 8:59 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Public comment

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Wednesday, May 11, 2016 4:56 PM
To: Robert Welsh
Cc: Mary Jo Sanborn
Subject: RE: Public comment

Thank you, Bob and Linda. We'll get your comments into the record and considered during scoping. Appreciate the input…..Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Robert Welsh [mailto:welshrp@comcast.net]
Sent: Monday, May 09, 2016 9:29 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Public comment

Please be aware the Alpine Lakes Wilderness is a shared natural resource that must be respected and protected. Please do not seedk any increase in the amount of water removed from the Alpine Lakes Wilderness area. The Wilderness protection alternative should comply with all provisions in the Forest Service's administrative Aalpine Lakes Wilderness Management Plan, icluding: "except as provided for in Section 4 (d))4) of the Wilderness Act, watersheds will not be altered or managed to provide increased water quntitn, lquality or timing of discharge. The Water Conservation alternative should evaluate how IPID spills large quantities of water back into the Wenatchee River at eh end of several

of its canals. The EIS should include a Water Right Change alternative . This would evaluate improving Icicle Creek flows by m9ving IPIDs point of divethe EIS should discuss the hydrological and biological impacts of the current drawdowns of thelakes, land any proposed changes actionss downstream . The EIS should analyze each proposed anction's site-specific inpacts, past practices, and the restoration, mitigation, and funding that are needed in the future. The EIS should provide a detiled operationds maintenance and envioronmental monitorins plan for the water insfrastructure, and analysis of the wilderness impacts of the specific maintenancae actions including helicoter use. The EIS should fully explain the prupose and need for the water these projects would provide. The EIS shold fully explain what human activities caused the degraded conditions that the projets seek to improve. WE SHOULD NOT BE REPEATING THE MISTAKES OF THE PAST. Thank You. Bob and Linda Welsh

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:08 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: comments concerning the Icicle Work Group's "Icicle Strategy"

Mary Jo Sanborn
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From: Mike Kaputa
Sent: Wednesday, May 11, 2016 5:01 PM
To: Chester Marler
Cc: Mary Jo Sanborn
Subject: RE: comments concerning the Icicle Work Group's "Icicle Strategy"

Thanks, Chester, we'll get your comments into the record and considered during scoping. Much appreciated.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Chester Marler [mailto:northfork@nwi.net]
Sent: Wednesday, May 11, 2016 4:18 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: comments concerning the Icicle Work Group's "Icicle Strategy"

Hello Mike—pleased to see Chelan County and DOE initiating this collaborative effort. A few comments follow:

- Eightmile Lake restoration—would like to have the PEIS uncover the documentation that establishes the historic high water line. I was unaware it was so high, rather surprised. Also I assume some adverse affects to recreation values from both the raising of the lake in the spring and lowering to levels below current drawdown. Mitigation might include some trail re-routing around the lake, constructing new campsites on higher ground, softening the

appearance of vegetation removal for the higher reservoir, etc. PEIS need to acknowledge the goal of protecting Wilderness values, not simply meet the letter of the law—acknowledge the feelings of Wilderness enthusiasts.

- Optimization and modernization of the flow from the lakes are great—should have been accomplished long ago.
- Water conservation by IPID and COIC does not appear as robust as it could. This should be more specific—not so many “mays” or “coulds”. Both districts need to address the non-agricultural use of a significant portion of their water—watering of extravagant and very large “lawns”. This tends to lessen the public image of the districts, and makes one wonder if legislative changes to the state’s water rights laws are in order. Better to address the issue without regulation and use common sense ethics instead. As we all know water will be increasingly precious in the decades to come.

At some point in the future the pressure on water resources will be much greater and I would not be surprised to see many responsible citizens asking for fundamental changes to water law. This could include reducing water rights when lands change from agricultural use to suburban. A time will come in the NW when agriculture will need to use water much more sparingly—not more open canals and watering on windy, hot daytime periods. Perhaps the PEIS could look ahead and at least discuss how some of these issues will require being more flexible and creative in finding solutions.

Chester Marler
Leavenworth

May 11, 2016

Chelan County Natural Resources Department
Attention: Mike Kaputa, Director
411 Washington Street, Suite 201
Wenatchee, WA 98801

Via email to: *mike.kaputa@co.chelan.wa.us*

RE: **Icicle Creek Water Resource Management Strategy – SEPA scoping**

Dear Mr. Kaputa:

I have visited the Alpine Lakes multiple times every year since 1969. In the 70s and early 80s my activity was primarily in the Icicle Creek drainage. This is a captivating place. I found that there were a lot of people who shared my attraction. Over time I spread my attention to other parts of the Alpine Lakes making room for others in the increasing popular Icicle. Overall, my visits to the Wilderness have been a highly meaningful part of my life.

For the most part I would consider myself an outdoor recreationist (climbing, backcountry skiing, hiking, kayaking among others). Occasionally, I have been motivated toward an activist role interacting with the USFS concerning their management of the Alpine Lakes Wilderness and surrounding areas. The "Icicle Creek Water Resource Management Strategy" generated by the Icicle Creek Working Group (ICWG) now draws my attention because of its significance locally for the Alpine Lakes Wilderness and potentially nationally for precedence with regard to the National Wilderness Act. I agree that a PEIS is needed and here respond to the request for comments on its scope.

My comments that follow are based on the public information at:
http://www.co.chelan.wa.us/ natural-resources/pages/icicle- work-group

Range of Alternatives. The PEIS needs to present a range of alternatives with significantly more extensive analysis than given in the present information for scoping. The issues are complex and significant. A single preferred-action proposal from a consensus group of stakeholders is inadequate.

Recognition of Wilderness values. All alternatives need to account for the special circumstances for construction and maintenance of structures in Wilderness Areas. The "SEPA Determination of Significance" does not even mention the Alpine Lakes Wilderness Area even though the "Primary Development Area" involved with the "Base Package of Projects" involves a significant footprint in the Wilderness. PEIS must recognize that the Alpine Lakes Wilderness is a community natural resource that must be respected and protected. Correspondingly, historical management of the the seven natural lakes that have served as storage reservoirs and associated legally-standing water rights must also be respected as important to the identity and economic well-being of the local community. However, that does not justify nor does the Wilderness Act allow expansion of storage facilities beyond actual traditional use without highest level decisions at the National level. Environmental analysis must include the direct biological and hydrological effects on lakes, surrounding terrain and outlet streams associated

with management of the lakes in the past and and future for all alternatives. The PEIS list of relevant laws, rules and plans should include the Wilderness Act of 1964; the Alpine Lakes Area Management Act of 1976, the Alpine Lakes Area Land Management Plan (1981), and the Wenatchee NF Forest Plan (1990) as amended.

Reduction of Wilderness footprint. The 7 managed lakes encompass the largest lakes and a significant fraction of the total lake area in the Icicle Creek drainage. That is a lot of impact for an area in the Cascades named for its unique lakes. Some alternatives (at least one and perhaps all) should include the aim to enhance Wilderness values through reduction in footprint, appearance of structures and the mode of maintaining them. What is the cost benefit ratio for each of the 7 managed lakes? Could one or more of them be returned to a natural condition without significant loss of flexibility or dependability? Could there be public buyback of associated water right to enable compensating adjustment on the user end? An alternative should explore this possibility.

Clarity about water rights and priority for in-stream flow. The PEIS needs to give historical background on actual water withdrawal and use and a clear explanation of corresponding water rights including identification of purposes for which they were granted. This background is needed for understanding the strategy (a preferred alternative?) presented by the ICWG. "The Projects" page for the present SEPA scoping proposes "the adoption of an integrated package of projects to meet agricultural and domestic water supply needs while increasing the amount of in-stream flow required to maintain healthy fish populations." The stated "Metrics" indicate significant gains for in-stream flow. Sounds good, but what is the actual priority when the inevitable water-availability crunches occur. In-stream water flow has generally been on the losing end. Given that the total water rights at times exceed the total flow, there must be some sort of relinquishment of priority to in-stream flows to make this work. This issue is especially important since increases in releasable water storage in the ICWG plan are associated with a specific water right holder (IPID) and corresponding specific use. Please make this explicit and more clear in the PEIS for the ICWG strategy and other alternatives, including one that does not increase storage in the Alpine Lakes.

Alternative diversion points. A pivotal issue for Icicle Creek in-stream flow appears to be the Boulder Field and the traditional stream bed downstream from the Irrigation Districts' diversion points. The most direct approach to enhancing in-stream flow in these sections would be to have diversion points farther downstream, possibly from the Wenatchee River and at multiple places. This is obviously unattractive since new infrastructure and pumping would be required. In order to minimize these requirements, this (these) diversion point(s) could be active only during drought conditions and withdraw only the amount needed to support the in-stream flow in the critical reaches between it and the normal-continuously operating, gravity flow diversion point upstream. Perhaps there would be a mechanism for in-stream flow to buy the gravity flow loss that the IPID would incur. (This raises a question in my mind: Does the IPID have a right to the potential energy of the water that it withdraws?)

Aggressive Conservation. Conservation is the only way to achieve a sustainable future. There is not more water. The ICWG discussion concerns manipulation of the timing of run off to maintain availability during the dry part of the year. This becomes more true with the

disappearance of perennial snow and ice from the watershed. Some alternative(s) should put heavy emphasis on conservation and multiple (recycled) use.

Thank you for considering these comments.

Sincerely,

Charles Raymond
3798 NE 97th St.
Seattle, WA 98115

(206) 522-3798
cfr98115@gmail.com

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:16 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Alpine Lakes Wilderness comment

Mary Jo Sanborn
Water Resource Manager
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411 Washington St., Suite 201
Wenatchee, WA 98801
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From: Mike Kaputa
Sent: Wednesday, May 11, 2016 9:53 PM
To: Patty D
Cc: Mary Jo Sanborn
Subject: RE: Alpine Lakes Wilderness comment

Thank you, Patty, we'll get your comments into the scoping process. I appreciate what you are saying.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Patty D [mailto:pattyd777@gmail.com]
Sent: Wednesday, May 11, 2016 8:35 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Alpine Lakes Wilderness comment

Dear Mr. Kaputa,

Alpine Lakes Wilderness provides a majestic, peaceful, and awe inspiring place for humans to be with nature. It provides a relatively undisturbed and pristine habitat for wild animals. Wilderness areas need to remain WILD. The short sighted efforts of some people to encroach on these shrinking areas of wilderness

baffles me. We need to protect the area AND its water for the health of the earth, which provides for the health of the animals and the health of the humans. If we are to leave anything kind of habitable earth left for future generations, we must start protecting our environment and wild places NOW, not selling them out to the highest bidder.

I am sure that you will receive many letters with all the more technical points of concern highlighted about this proposed plan to dam and drain the alpine lakes, so I don't need to repeat all that. This appeal comes from the heart. Please, please, please use your position and ability to protect this gem of a wilderness area. The process must also include input from environmentalists and the people who value and visit softly this beautiful land. The time has come to limit human impact on these places. If there is not enough water for the humans, then limit the human expansion in the area. Don't drain and destroy the wilderness!

Thank you!

Sincerely,
Patricia Danner
Spokane County and Washington State lifelong resident and registered voter
Alpine Lakes Wilderness Hiker

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:17 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Icicle Basin water plan

Mary Jo Sanborn
Water Resource Manager
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411 Washington St., Suite 201
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From: Mike Kaputa
Sent: Wednesday, May 11, 2016 9:56 PM
To: Andy Zahn
Cc: Mary Jo Sanborn
Subject: RE: Icicle Basin water plan

Thanks, Andy, we'll consider your comments during the scoping process. I appreciate that you took the time to put these together.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Andy Zahn [mailto:cmotdibbler5@gmail.com]
Sent: Wednesday, May 11, 2016 1:26 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle Basin water plan

Hello,

I am writing to comment on the Icicle basin water plan. I am especially opposed to the reconstruction of the Eightmile lake dam and any new construction on Klonaqua lakes.The Eightmile dam was destroyed so long ago that to rebuild the dam would be equivalent to constructing a dam on a lake where a dam has never existed

before. This is a popular hiking destination, and the destruction of the shoreline would make it an unattractive place to visit. It would also be disruptive to the ecosystem, and overall a severe detriment to one of Washington's finest natural treasures. I feel the same regarding the proposed actions at Klonaqua lakes. Such projects are not compatible with the primeval character of wilderness. These are the two parts of the proposal with which I take the most issue, but I would like to express my disapproval of most everything else it contains. I would see all the Icicle Basin dams on alpine lakes removed and the region restored to its natural state. These structures are an ugly blemish on an otherwise pristine and spectacular region. Please explore other options such as water conservation rather than cause further degradation of the Alpine Lakes Wilderness.

Sincerely,
Andy Zahn,
Toutle, WA

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:17 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Icicle Creek Water Resource Management Strategy – SEPA scoping

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
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www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Wednesday, May 11, 2016 9:57 PM
To: Laurel Schandelmier
Cc: Mary Jo Sanborn
Subject: RE: Icicle Creek Water Resource Management Strategy – SEPA scoping

Thanks, Laurel, received and will be considered during the scoping process.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Laurel Schandelmier [mailto:lschandelmier@gmail.com]
Sent: Tuesday, May 10, 2016 10:20 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle Creek Water Resource Management Strategy – SEPA scoping

To whom it may concern,

Thank you for the opportunity to provide scoping comments on the Icicle Creek Water Resource Management Strategy. I am a concerned citizen who enjoys the fact that our Washington wilderness area and its natural

resources are able to be shared by all. I understand that managing the resources in a fair and equitable way can be challenging, but I'd like to share my thoughts on this proposed plan.

I think the public would appreciate a better understanding of the purpose and intent of making these proposed changes to improve instream flows. Is the intent primarily to address current water rights that are not being satisfied? Are new water rights being issued? Who primarily stands to benefit from these increased flows? I would ask that other alternatives be considered in an effort to minimize, or even reverse damage to existing wilderness area.

A "Wilderness Protection" alternative that would not increase the amount of water removed from the Alpine Lakes Wilderness, not create a disturbance or encroach on wilderness lands, and not expand easements should be considered. Any new water supplies would ideally be obtained from non-wilderness sources and use non-wilderness options for improving instream flows. Additionally, evaluating the feasibility of purchasing back private water rights to the Alpine Lakes to allow removal of dams and other structures to restore the wilderness to its pre-developed state would be most preferred. If this is not possible, I agree that installing remotely controllable valves to allow for the controlled drawdown of lake levels over a season, responding to current weather patterns and water needs, would add flexibility and robustness to the system.

Alternatively, a "Water Right Relinquishment" option could analyze existing water rights to the Alpine Lakes if any have been relinquished or abandoned. Water rights should be limited to the purposes for which they were originally granted, such as for irrigation, and should not be redirected for other purposes, including suburban development. A "Water Conservation" option emphasizing aggressive water conservation measures by the City of Leavenworth and other water uses could analyze markets available for selling and trading water rights. For example, if some properties have been converted from orchards to residential properties, the water rights could be sold or traded accordingly. This option would have an "efficiency first" mentality: first, reduce the sources of water demand before looking to bringing in additional capacity. Aggressive reductions in water usage for non-agricultural purposes, such as watering lawns, could be encouraged through such measures as low-flow fixtures, drip irrigation, planting native species in gardens that require no or little irrigation, greywater recycling, and rainwater harvesting.

Additionally, the EIS should analyze each proposed action's site-specific impacts, past practices, and any restoration, mitigation, or funding needed in the future. For each site, proposed construction activities and water diversions should be laid out in detail. The EIS should discuss the hydrological and biological impacts of the current level of lake drawdown, as well as any proposed future changes. The analysis should include a review of scientific literature on how water removals impact wildlife, vegetation, soil, and overall ecosystems. A detailed operations, maintenance, and environmental monitoring plan for the water infrastructure alongside an analysis of wilderness impacts of specific maintenance actions should be included. The EIS should include maps, diagrams and photos to clearly show the current situation at each of the lakes and other project locations and how that would change under the proposed actions. The EIS should fully and completely explain the need for the water these projects would provide. What human activities caused the degraded conditions - i.e., low instream flows in Icicle Creek - should be identified, avoided in future, and ideally mitigated.

Thank you for considering these comments.

Regards,

Laurel Schandelmier

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:17 AM
To: Jordan Sanford; Meghan O'Brien
Subject: FW: Icicle strategy comment

Mary Jo Sanborn
Water Resource Manager
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-----Original Message-----
From: Mike Kaputa
Sent: Wednesday, May 11, 2016 10:00 PM
To: Philip Fenner
Cc: Mary Jo Sanborn
Subject: RE: Icicle strategy comment

Thank you, Philip, comments received and will be considered during scoping.

We will have another Seattle meeting this summer and possibly a hike to Eightmile in September so hope you can continue participate.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

-----Original Message-----
From: Philip Fenner [mailto:pfitech.seanet.com@gmail.com]
Sent: Tuesday, May 10, 2016 8:18 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>

Subject: Icicle strategy comment

I attended your meeting in Seattle and wanted to thank you for coming here to tell us what you'd like to do in Alpine Lakes Wilderness.

I understand the rationale behind your proposal to revive the old dams on some of the lakes there. I can see why you would like to do it. But I don't think you should. Doing that ought to be the absolute LAST thing you consider if water in the Wenatchee basin runs low. And here's why: Alpine Lakes Wilderness is a sacred place, in many ways to many people. It should not be subjected to artificial manipulation - period. Just because it was manipulated in the past is no reason to start manipulating it again now.

Those old decrepit dams should be left to deteriorate naturally as they have been, to keep the current lake levels as unchanged as nature allows. Just the sheer amount of motorized incursions into Wilderness there to rebuild those dams and associated infrastructure is in itself anathema to what Wilderness is and represents - the last enclave of natural processes "untrammeled by man." Choppering-in concrete and construction equipment would be as appropriate there as in the Sistine Chapel! No, come to your senses and if you're short on water do EVERYTHING else first, starting with a ban on lawn watering and taking other such water conservation measures. And the fish hatchery is a big water waster, fix that first. It just makes NO sense to damage a natural area if anything else could be done beforehand to see if the water equation could work without damaging Wilderness.

We're in the Age of Elwha now, we're looking at taking out dams and restoring natural waters. The last thing we should be doing (literally) is building up old dams anywhere.

You started your talk by saying you didn't understand why you hadn't made any progress getting this Icicle Creek watershed management plan done for so long.... Maybe it's because so many people don't want you to touch Wilderness. It's probably as simple as that.

Philip Fenner
Seattle

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:18 AM
To: Meghan O'Brien; Jordan Sanford
Subject: FW: IWG comments from public on PEIS

Mary Jo Sanborn
Water Resource Manager
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From: Mike Kaputa
Sent: Wednesday, May 11, 2016 10:04 PM
To: GW Shannon
Cc: Mary Jo Sanborn
Subject: RE: IWG comments from public on PEIS

Thanks, Greg, we'll get these comments into the record.

Are you related to Kathi Rivers-Shannon? I wanted to reach out to her and discuss the effort to look at recreation impacts and how the Icicle Work Group efforts might be integrated with that one.

Thanks.

Mike

From: GW Shannon [mailto:gwshannon@gmail.com]
Sent: Tuesday, May 10, 2016 6:10 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: IWG comments from public on PEIS

Mike Kaputa, Director

Mike.kaputa@co.chelan.wa.us

Chelan County

411 Washington Street, Ste. 201

Wenatchee, WA 98801

Re: Icicle Work Group; Comments on the scope of the PEIS

Dear Mr. Kaputa:

I have concerns about the collaborative efforts by members of the Icicle Working Group and the agency participation in the study. It seems awkward or unprofessional to have agencies commit to a number of projects with either a yes or no in advance of public and environmental review on specific projects. The premise the IWG has in regards to the project goals, second paragraph, also seems flawed *"If a project is determined to be fatally flawed, it must be replaced or modified to ensure all guiding principles are met."* How can IWG be realistically committed to that goal without specific project and environmental assessments. It sounds as if successful projects with proper funding and meeting public and environmental review could be jeopardized or delayed because other projects were cancelled.

The process feels to me like backroom politics, especially with a $2,885,000 budget since 2012. For example, Icicle-Peshastin Irrigation District's manager said to me in person at the meeting that if they accessed water (either tunnel or pipe) from Upper Klonaqua Lake, they would give that water to the Department of Ecology for fish purposes. I wonder what the Irrigation District will get in return from the Department of Ecology? I am under the impression that water the irrigation district utilizes shall only be used for irrigation purposes.

I also have a concern about increasing water for development (transfer of water rights) without having a detailed PEIS alternative to look at major conservation of water by all users. Even though the amount seems minimal, is the water coming from Icicle-Peshastin Irrigation District's increased flow through optimization or from reduced use of water by the Leavenworth Fish Hatchery, or other source? Why is the hatchery's participation even needed in the working group as they already have federal mandates to reduce water usage and their funding will come from federal sources?

Is it true that the US Forest Service is not a voting member of the IWG? If they aren't a voting member, it seems that they should be to represent the Alpine Lakes Wilderness. Many of the projects take place in wilderness and those wilderness impacts and considerations are not being considered. The Alpine Lakes Wilderness is more than a reservoir. It is a unique wilderness with many shared natural resources used by the public. The Forest Service has a mandate to protect wilderness resources even though Icicle-Peshastin Irrigation District has water rights for irrigation purposes. As stated in the Forest Service's policy:

> *In wildernesses where the establishing legislation permits resource uses and activities that are nonconforming exceptions to the definition of wilderness as described in the Wilderness Act, manage these nonconforming uses and activities in such a manner as to minimize their effect on the wilderness resource.*

In fact, are there not water right issues that are involved at Eight-Mile Lake that have not be resolved or will need to be resolved in the courts? Any impacts in the Alpine Lakes Wilderness should be addressed in a specific alternative. In looking at the estimated cost of optimization at the seven lakes (reservoirs) which is estimated at $680,000.00, has the IWG looked at the Alpine Lakes Wilderness Management Plan in that regard? In Section 4(d)(4) of that plan, it states "*watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge.*"

Why are the releases set infrequently under current management? It seems you could hire a couple high school graduates to camp out part of the summer with a radio at different lakes to gain a level optimization close to what the irrigation district is to trying to achieve at a much lower cost. The irrigation district would still have maintenance and monitoring costs associated with any optimization of the dams.

Thank you for this opportunity to comment on the Icicle Work Group's anaylsis.

Greg Shannon

313 Olive Street

Cashmere, WA 98815

c. Governor Jay Inslee

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Thursday, May 12, 2016 9:19 AM
To: Meghan O'Brien; Jordan Sanford
Subject: FW: Uphold the water rights of Icicle-Peshastin Irrigation District

Mary Jo Sanborn
Water Resource Manager
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411 Washington St., Suite 201
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From: Mike Kaputa
Sent: Wednesday, May 11, 2016 10:05 PM
To: Mary Jo Sanborn
Subject: FW: Uphold the water rights of Icicle-Peshastin Irrigation District

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From: rmullins3316@frontier.com [mailto:rmullins3316@frontier.com]
Sent: Friday, May 06, 2016 1:22 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Uphold the water rights of Icicle-Peshastin Irrigation District

Chelan County Natural Resources Department
Attention: Mike Kaputa, Director

cc: Alpine Lakes Protection Society, El Sendero, Wilderness Watch.

My name is Robert Mullins. I am a resident and property owner in Leavenworth, WA. I have resided in Leavenworth and Chelan County since 1980.

This email is to comment in re the SEPA and any other consideration involving the rights of Icicle-Peshastin Irrigation District water rights and resultant uses in the areas overlaid by Alpine Lakes Wilderness.

I support, actually I demand, that Icicle-Peshastin Irrigation District will fully and completely use its water rights including any related construction, transportation, use of aircraft, use of power equipment, use of all legitimate activity, equipment, and construction related to full implementation of Icicle-Peshastin Irrigation District water rights and resultant uses in the Alpine Lakes Wilderness as existed before the creation of the Alpine Lakes Wilderness. These rights pre-exist- by many decades (!) - and are more important than the Alpine Lakes Wilderness and any uses of any visitors to the Alpine Lakes Wilderness.

Of interest, I have worked in advocacy in protection of Wilderness with those organizations copied above. I am a user of Wilderness. In advocacy, along with the above mentioned, in the cause of Wilderness Protection.

Specifically in the Alpine Lakes Wilderness, we have vigorously implored the protection of the Alpine Lakes Wilderness according to the 1964 Wilderness Act.

According to Law, per the 1964 Wilderness Act, the water rights of Icicle-Peshastin Irrigation District and all related equipment and activity are established. These organizations opposing complete and full implementation of the water rights of icicle-Peshastin Irrigation District are making demands contrary to Law, specifically contrary to the 1964 Wilderness Act.

I have hiked, camped, fished, skied, climbed throughout the lakes and areas surrounding the reservoir high lakes of the Icicle-Peshastin Irrigation District. I understand the water rights, my family and I are dependent on that water. I will point out that the negative impacts to be defined correctly are from the Wilderness tourists that enter the area or advocates who attempt to reduce or diminish the water rights of Icicle-Peshastin Irrigation District and all related equipment and activity. In other words. users of the Alpine Lakes Wilderness have been allowed to travel into the areas of the water rights of Icicle-Peshastin Irrigation District, Wilderness is an overlay of pre-existing water rights. Numerous examples exist of watersheds being closed to public entry in order to protect the resource.

I would invite the Wilderness users and advocates offended by this more important lawful water right to please stay near their own home and do not enter the area of the Alpine Lakes Wilderness that was overlaid on the the water rights of Icicle-Peshastin Irrigation District. If there is any conflict, the pre-existing entity, the water rights of Icicle-Peshastin Irrigation District and all related equipment and activity , must be protected, and therefore any unauthorized visitors to these areas must be prohibited from entry.

Sincerely,

Robert Mullins
234 Mine St.
Leavenworth, WA

Ann Fink
201 Mine Street
Leavenworth, WA 98826
northfork@nwi.net
May 11, 2016

Mike Kaputa
411 Washington Street, Suite 201
Wenatchee, WA 98801

RE: Icicle Working Group Proposals

Dear Mr. Kaputa:

Impacts to Recreational Use at Eightmile Lakes and other Lakes.

The Irrigation districts has easements on only 2 of the 4 sections that underlie Eightmile Lake. The other two sections are wilderness and don't appear to have "easements". Please explain how the IWG can flood congressionally designated wilderness lands without involving the U.S. Forest Service in these discussions. I do not see any consultation with the Forest Service listed in section 9 of your SEPA checklist until the point of obtaining permits is reached. Now is the time to address these issues.

I see that the question of water rights has been raised within the working groups. It has been suggested that since the district did not use all their rights in the Eightmile drainage that they might be forfeit. I do know that in the last 40 years of my activities in the Alpine Lakes Wilderness, I have never seen any drawdown of the reservoir. Admittedly, this anecdotal observation is highly sporadic, but, the question needs to be addressed. The Icicle Irrigation District should provide its records regarding its use of water from this lake.

Eightmile Lake is a very popular destination in the Alpine Lakes Wilderness Area. While Icicle Irrigation has rights to its existing dam and reservoir, the operation of these facilities will greatly impact the experiences of many, many wilderness users who use this area. I would like to see a discussion of how the Irrigation District and its partners will mitigate some of the ugly visual effects of raising the level of the lake and then lowering well below current levels. The effects to plants and wildlife need to also be addressed. Improvements at other lakes also need to consider the visual and ecological effects to

Remote monitoring and control of existing facilities appear to be a good modern option if the equipment needed for this activity can be blended into the surroundings without intruding on wilderness values.

Conservation:
The proposal includes many possible projects that include water conservation principals. But these projects are not definite and are described as might occur and maybes. Water conservation for the Leavenworth City Area is proposed but other water district users need to reduce their consumption of water. Agricultural practices need to be more efficient and reduce their water intake. The most egregious cases in point the emerald green lawns in the Ski Hill Area and Icicle Valley. While the Fish Hatchery has a legal mandate, it too needs to produce a

water savings with more efficient equipment and fish rearing techniques. These need to be “will happen” projects and not “mights” and “maybes”.

As we are all aware, the world of water availability is changing and we can no longer continue to be efficient under existing water laws. While these laws will not change for this project, the Icicle Working Groups needs to champion conservation measures and improved facilities (non-leaky) water distribution systems) for rational and equitable water distribution.

Sincerely,

Ann L. Fink

May 11, 2016

Chelan County Natural Resources Department
Attention: Mike Kaputa, Director
411 Washington Street, Suite 201
Wenatchee, WA 98801

Dear Mr. Kaputa,

I am writing to express my concerns about the proposed Icicle Creek Water Resource Management Strategy.

My first concern is that this project is being segmented to avoid a full environmental review under the National Environmental Policy Act (NEPA). The proposed project will affect an immense area and will require federal approval in the form of permits such as Clean Water Act National Pollutant Discharge Elimination System and § 404 permits and a special use permit from the Forest Service. To comply with NEPA, the environmental impacts of large projects requiring federal approval or using federal funding must be analyzed before the project begins.

My second concern is with the County's approach to tiered environmental review. During the public meeting in Seattle, you explained that Chelan County is not planning to conduct a programmatic NEPA analysis because it is conducting a programmatic State Environmental Policy Act (SEPA) review. Both the federal and state laws anticipate a tiered review for large and complex proposals such as the Icicle Creek Water Resource Management Strategy. To comply with NEPA the County must conduct a programmatic environmental review in addition to project specific analysis. Analysis under state law is a separate requirement and does not substitute for NEPA analysis. To comply with SEPA the County must also conduct a programmatic environmental review and project specific analysis.

My third and final concern is that the County has not adequately considered the federally designated wilderness that would be affected by the proposed project. The Wilderness Act restricts the activities that can occur, the structures that can be built, and the tolerable impacts in wilderness areas. It is troubling that the proposal and the public presentations contained no explanation of how the County intends to comply with the Wilderness Act. The public presentations implied that the County is trying to balance the need for water with the need for wilderness when Congress struck that balance over fifty years ago and established non-negotiable limits on wilderness use. When discussing compliance with the Wilderness Act the proposal is only to "identify and engage regulators in the process." The proposal would violate the Wilderness Act because it would install permanent fixtures in a designated wilderness. Simply engaging regulators does not remedy such a blatant violation of the Wilderness Act. The lack of consideration for required wilderness protection is a fatal flaw in the proposed Icicle Creek Water Resource Management Strategy.

I urge the county to consult the applicable federal laws, including NEPA, the Wilderness Act, and the Endangered Species Act, and to reconsider the proposed project before proceeding to violate them.

Sincerely,

Kimberly Wells

Jordan Sanford

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Tuesday, May 10, 2016 4:31 PM
To: Jordan Sanford; Meghan O'Brien
Cc: Dan Haller
Subject: FW: Subject: Comments on Damming and Water Rights in Alpine Lakes Wilderness

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Tuesday, May 10, 2016 4:07 PM
To: Jerry Bodine
Cc: Mary Jo Sanborn
Subject: RE: Subject: Comments on Damming and Water Rights in Alpine Lakes Wilderness

Thanks, Jerry, we'll make sure your comments are entered in to the record. We plan on having another Seattle-area meeting and tour of Eightmile Lake so hope that you will be able to join us.

Mike

Mike Kaputa, Director
Chelan County Natural Resource Department
411 Washington Street, Suite 201
Wenatchee, WA 98801
Phone: (509) 670-6935

From: Jerry Bodine [mailto:jbodine.bwphotog@yahoo.com]
Sent: Monday, May 09, 2016 3:01 PM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Subject: Comments on Damming and Water Rights in Alpine Lakes Wilderness

Dear Mr. Kaputa,

I want to provide my input to the subject issues. As a member of the Alpine Lakes Protection Society (ALPS) for decades, I have very strong feelings about these proposed activities; I expended a great deal of effort in supporting ALPS' activities leading to the Wilderness designation for this area in the first place. My personal attitude, without delving deeply into the politics of policing the requirements of the Wilderness Act of 1964, is that those requirements are NON-DEBATABLE. PERIOD. Now, we are faced with a designated working group (IWG) that seems oblivious to those requirements and refuses to recognize them. For example, re-naming our beloved lakes as "reservoirs" really raised the hair on my neck, as well as other indications of their lack of caring about the preservation of Nature's "systems." Therefore, lacking a legal background or knowledge of the history of amendments to the "ACT" since its inception, I can only offer my support of ALPS' effort to resist IWG's proposals. With all this in mind, then, I offer a number of comments:

The Alpine Lakes Wilderness is a shared natural resource that must be respected and protected.

The EIS should include a "Wilderness Protection" alternative. This alternative should promote Wilderness values by not seeking any increase in the amount of water removed from the Alpine Lakes Wilderness; not expanding easements; not encroaching on wilderness lands; not using mechanical transport; and not building any structure or installation in the Wilderness. Under the Wilderness Protection alternative, any new water supplies should be obtained from sources outside the Wilderness, and use non-Wilderness options for improving instream flows (for example, the IPID change in diversion point discussed below). The Wilderness Protection alternative should comply with all provisions in the Forest Service's administrative Alpine Lakes Wilderness Management Plan, including: "Except as provided for in Section 4(d)(4) of the Wilderness Act, watersheds will not be altered or managed to provide increased water quantity, quality or timing of discharge."

The Wilderness Protection alternative should evaluate public purchase (buy-back) of private water rights in the Alpine Lakes, which would allow removal of dams and other structures from the lakes to restore the Wilderness area to its true natural character.

The EIS should include a "Water Right Relinquishment" alternative. This alternative should analyze existing water rights to the Alpine Lakes and acknowledge those rights that have been relinquished or abandoned.

The EIS should include an alternative that recognizes IWG members' water rights are limited to the purposes for which they were initially granted (for example, irrigation) and cannot be redirected to other purposes (such as suburban development).

The EIS should include a "Water Conservation" alternative that emphasizes aggressive water conservation measures by the City of Leavenworth, Icicle-Peshastin Irrigation District, the Leavenworth Fish Hatchery and other water users. This alternative should evaluate water markets that facilitate selling and trading of water rights.

The Water Conservation alternative should evaluate a transfer of water rights from IPID to Leavenworth for properties within the city limits that have now converted from orchards to residential properties. This alternative should analyze how appropriate reductions in water usage (that is, not using agricultural water quantities for lawn irrigation) would save water that would then be available for other Leavenworth needs.

The Water Conservation alternative should evaluate how IPID spills large quantities of water back into the Wenatchee River at the end of several of its canals. This alternative should evaluate how this 19th century irrigation practice (which was required to ensure water made it to the furthermost customers) could be replaced with modern pumping and piping technologies. The EIS should consider the resulting reduction in water demand as an alternative water supply.

The EIS should include a "Water Right Change" alternative. This alternative would evaluate improving Icicle Creek flows by moving IPID's point of diversion downstream (to the Wenatchee River). This measure, which would add 100 cfs of water to Icicle Creek every year, would convert the IPID diversion from gravity flow to pumping (requiring electrical power). This alternative should therefore analyze renewable energy options to supply that power, including solar, wind and in-canal hydroelectric.

The EIS should analyze each proposed action's site-specific impacts, past practices, and the restoration, mitigation and funding that are needed in the future. At each site, proposed construction activities and proposed water diversions need to be spelled out in detail.

The EIS should discuss the hydrological and biological impacts of the current drawdowns of the lakes, and any proposed changes. The analysis should include a review of scientific literature on the impacts of water removals upon wildlife, vegetation, soil and wilderness values.

The EIS should provide a detailed operations, maintenance and environmental monitoring plan for the water infrastructure, and analysis of the wilderness impacts of specific maintenance actions, including helicopter use.

The EIS should fully explain the purpose and need for the water these projects would provide.

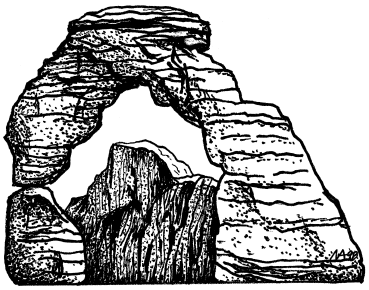
The EIS should fully explain what human activities caused the degraded conditions (such as low instream flows in Icicle Creek) that the projects seek to improve. We should not be repeating the mistakes of the past.

The EIS should analyze adequacy of proposed instream flows to support spawning, rearing and migration of steelhead and bull trout.

Sincerely,
Jerry Bodine
585 SW Mt. Cedar Dr.
Issaquah, WA 98027

Californians for Western Wilderness

A project of Resource Renewal Institute



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May 17, 2016

Mr. Mike Kaputa, Director
Chelan County Natural Resources Department
411 Washington Street, Suite 201
Wenatchee, WA 98801

Re: Icicle Creek Water Resource Management Strategy – SEPA scoping

Dear Mr. Kaputa:

I am writing on behalf of the more than 830 members and supporters of Californians for Western Wilderness (CalUWild), a citizens organization dedicated to encouraging and facilitating citizen participation in legislative and administrative actions affecting wilderness and other public lands in the West. Our members use and enjoy the public lands all over the West.

Although the formal deadline for submitting scoping comments has passed, CalUWild fully endorses the comments submitted by the Alpine Lakes Protection Society and 39 other organizations, dated May 11, 2016.

Thank you for your positive consideration.

Sincerely,

Michael J. Painter
Coordinator

Coordinator
Michael J. Painter
(415) 752-3911

P.O. Box 210474
San Francisco
CA 94121-0474

e-mail:
info@caluwild.org

Meghan O'Brien

From: Mary Jo Sanborn <MaryJo.Sanborn@CO.CHELAN.WA.US>
Sent: Tuesday, May 17, 2016 8:53 AM
To: Jordan Sanford; Meghan O'Brien
Cc: Dan Haller
Subject: FW: Icicle watershed

This one came in after the 11th...

Mary Jo Sanborn
Water Resource Manager
Chelan County Natural Resource Department
411 Washington St., Suite 201
Wenatchee, WA 98801
Desk: (509)-667-6532
Cell: (509)-860-2135
www.co.chelan.wa.us/nr

From: Mike Kaputa
Sent: Monday, May 16, 2016 9:29 AM
To: Mary Jo Sanborn; dhaller@aspectconsulting.com
Subject: FW: Icicle watershed

One more comment.

From: Kayt Hoch [mailto:kayt@kaythoch.com]
Sent: Monday, May 16, 2016 9:15 AM
To: Mike Kaputa <Mike.Kaputa@CO.CHELAN.WA.US>
Subject: Icicle watershed

Hi Mike,

Anne and I both read the watershed working group information and had meant to write earlier. The proposed plan looks like a good approach to us as it seems to have minimal impact for a great benefit to the region. After reading the Sunday paper, I certainly hope there isn't going to be negative fall-out from the Puget Sound group.

The only curiosity I have is if you all have some construction impact estimations/projections re the dam rebuild at Eight Mile lake that you could share. After our personal experience with the quick recovery of our own property after the impacts from the bridge project I'm not concerned, just curious if you have any info.

Thanks for all the great work you and your department is doing!

Best always,
Kayt

APPENDIX C

Eightmile Lake Storage Restoration Feasibility Study

April 2018
Icicle Creek Water Resource Management Strategy

ANCHOR QEA

Eightmile Lake Storage Restoration Feasibility Study

Prepared for:
Icicle and Peshastin Irrigation Districts
Chelan County Natural Resources Department

Ecology Grant No. WROCR-VER1-ChCoNR-00002

April 2018
Icicle Creek Water Resource Management Strategy

Eightmile Lake Storage Restoration Feasibility Study

Prepared for
Icicle and Peshastin Irrigation Districts
P.O. Box 371
5594 Wescott Drive
Cashmere, Washington 98815

Chelan County Natural Resources Dept.
411 Washington Street, Suite 201
Wenatchee, Washington 98801

Prepared by
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, Washington 98101

Aspect Consulting, LLC
23 South Mission St.
Wenatchee, Washington 98801

Project Number: 140204-02
K:\Projects\Chelan_County\Icicle_Creek_Comp_Water_Mgt_Plan_(140204-02)\2016-2017 Work\Task 04A - Eightmile Lake Restoration Feasibility\Reports\Eightmile Lake - Feasibility Study - FINAL_2018-04-30.docx

TABLE OF CONTENTS

Executive Summary **E-1**

1 Introduction **1**

1.1 Compatibility with Icicle Strategy 1

1.2 Project Background 2

1.2.1 Prior Studies and Related Documents 5

1.3 Feasibility Study Description 7

1.3.1 Scope of Work 7

1.3.2 Purpose and Objectives 8

1.4 Report Organization 8

1.5 Feasibility-level Design Drawings 9

2 Existing Reservoir Conditions **11**

2.1 Dam and Embankment 11

2.2 Low-Level Outlet Pipeline and Gate 14

2.3 Overflow Channel to Eightmile Creek 15

2.4 Useable Storage Capacity 15

2.5 Topography 17

2.6 Geology 17

2.7 Existing Reservoir Operations 18

2.8 Challenges, Deficiencies, and Constraints 20

3 Eightmile Lake Hydrology **21**

3.1 Dam Safety Review 21

3.2 Watershed Description 22

3.3 Watershed Yield 23

3.4 Downstream Hazard Analysis 24

3.5 Design Storm Calculation 25

3.5.1 Identify Climatic Region 26

3.5.2 Estimate Mean Annual Precipitation 26

3.5.3 Estimate L-Moment Statistics 26

3.5.4 Calculate Mean At-Site Precipitation 26

3.5.5 Calculate Base Precipitation Values 26

3.5.6 Scaling Precipitation Estimates 27

3.5.7 Calculate Total Storm Precipitation 28

3.5.8 Calculate Peak Rainfall Intensity 29
3.5.9 Calculate Snowmelt Contribution 29
3.5.10 Calculate Design Storm Hyetograph 30
3.6 Design Storm Hydrologic Analysis 31
3.6.1 Methodology 31
3.6.2 Soil Characteristics and Land Cover 32
3.6.3 Land Cover and Curve Number 33
3.6.4 Estimated Inflow from Design Storm 33
3.6.5 Comparison to USGS Methodology 34

4 Eightmile Lake Storage Restoration Design 36
4.1 Design Criteria 36
4.2 Site Preparation 36
4.3 Dam and Embankment Restoration 37
4.3.1 Central Dam and Flow/Level Control 37
4.3.2 Primary Spillway Section 38
4.3.3 Secondary Spillway Section 38
4.4 Spillway Analysis and Design 38
4.4.1 Reservoir Storage and Spillway Dimensions 38
4.4.2 Spillway Discharge Calculations 39
4.4.3 Inflow Routing Calculation 39
4.4.4 Inflow Design Flood Selection 45
4.5 Low-level Outlet Pipe, Valves, and Release Controls 45
4.5.1 Hydraulic Analysis 47
4.6 Reservoir Operations 48
4.7 Restored Useable Storage Capacity 49

5 Construction Approach 52
5.1 Constraints and Limitations 52
5.2 Access and Mobilization 52
5.3 Access Options 52
5.3.2 Comparison 55
5.4 Materials Delivery and Staging 55
5.5 Construction Sequence and Scheduling 57

6 Cost Analysis 58
6.1 Summary of Probable Implementation Costs 58

6.2 Helicopter Mobilization and Rental 59
6.3 Long-term Operating Costs 59

7 Water Rights 61

7.1 History 61
7.2 Water Right Change Strategy and Process 63

8 Environmental and Permitting Strategy 64

8.1 Affected Environment and Anticipated Impacts 64
8.1.1 Geology 64
8.1.2 Water Resources and Water Use 65
8.1.3 Aquatic Habitat and Species 65
8.1.4 Vegetation 66
8.1.5 Wildlife 67
8.1.6 Cultural Resources 68
8.2 Anticipated Permitting Requirements 69
8.3 Recommended Permitting Approach 73

9 Summary and Recommendations 75

9.1 Summary of Proposed Improvements 75
9.2 Recommended Next Steps 76

10 References 78

TABLES

Table 1-1 Prior Studies and Related Documents 5
Table 2-1 Lake Volume Summary (From 2014 Forsgren Associates, Inc./Gravity Consulting, LLC Study) 16
Table 2-2 Lake Volume Summary (Based on Additional Data Collection) 17
Table 3-1 Eightmile Lake Drainage Area and Estimated Watershed Yield 24
Table 3-2 Results of Precipitation Frequency Analysis 27
Table 3-3 Total Precipitation for Design Storms 28
Table 3-4 Peak Storm Intensities for Design Storms 29
Table 3-5 Snowmelt Contribution for Design Storms 30
Table 3-6 Estimated Inflow from Design Storm 34
Table 4-1 Spillway Dimensions and Characteristics 39
Table 4-2 Elevation – Area – Storage Relationship Above Primary Spillway 41

Table 4-3 Spillway Outflow Summary for Potential Inflow Design Storms 45
Table 4-4 Low-level Outlet Pipeline Analysis 48
Table 4-5 Anticipated Reservoir Operations 49
Table 5-1 Potential Construction Access and Mobilization Approach Comparison 55
Table 6-1 Opinion of Probable Project Implementation Costs 58
Table 6-2 Likely Helicopter Mobilization and Rental Costs 59
Table 8-1 Anticipated Eightmile Lake Storage Restoration Project Permitting Requirements 70

FIGURES

Figure 1-1 Location Map 3
Figure 1-2 Photo-realistic Rendering of Proposed Eightmile Lake Improvements 10
Figure 2-1 Eightmile Lake Drainage Basin 12
Figure 2-2 Eightmile Lake Drainage Basin Geology Map 19
Figure 3-1 Design Storm (Step 8) Hyetographs 31
Figure 3-2 HEC-HMS Sub-basin Delineation 32
Figure 3-3 Design Storm (Step 8) Inflow Hydrographs 35
Figure 4-1 Proposed Eightmile Lake Stage-Storage Curve 40
Figure 4-2 Short-Duration Storm, Inflow-Outflow Relationship 42
Figure 4-3 Intermediate-Duration Storm, Inflow-Outflow Relationship 43
Figure 4-4 Long-Duration Storm, Inflow-Outflow Relationship 44
Figure 4-5 Eightmile Lake Water Surface Area Comparison 51

APPENDICES

Appendix A Feasibility-Level Drawings
Appendix B Photographs
Appendix C Downstream Hazard Analysis Worksheet
Appendix D Precipitation Data Lookup Worksheets
Appendix E Snowmelt Calculation Worksheet
Appendix F HEC-HMS Model Results
Appendix G Spillway Channel Capacity Worksheet
Appendix H Opinion of Probable Project Costs

ABBREVIATIONS

AEP	Annual Exceedance Probability
Anchor QEA/Aspect	Anchor QEA, LLC, and Aspect Consulting, LLC
BGS	below ground surface
CCNRD	Chelan County Natural Resources Department
cfs	cubic feet per second
CMP	Corrugated Metal Pipe
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
DC	direct current
DEM	Digital elevation model
DF	design factor
DSO	Washington State Department of Ecology Dam Safety Office
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
GIS	Geographic information system
H:V	Horizontal to vertical
HDPE	High-density polyethylene
HEC-HMS	Hydrologic Modeling System
IDA	Incremental damage analysis
IDF	Inflow Design Flood
IID	Icicle Irrigation District
IPID	Icicle and Peshastin Irrigation Districts
IWG	Icicle Work Group
JARPA	Joint Aquatic Resource Application
L-Cv	Site-specific coefficient used in Dam Safety Office spreadsheet to calculate At-site Mean Precipitation.
L-Skew	Site-specific skew value used in DSO spreadsheet to calculate At-site Mean Precipitation
LNFH	Leavenworth Fish Hatchery
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
P_{gds}	Estimated 2-, 6-, or 24-hour precipitation for selected frequency
P_{sd}	Scaling precipitation for 2-, 6- or 24-hour index period
PEIS	Programmatic Environmental Impact Statement
Q	flow rate
Q_{min}	minimum flow rate
SEPA	State Environmental Policy Act
SNOTEL	Snow Telemetry
USGS	U.S. Geologic Survey
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
RCW	Revised Code of Washington
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WSEL	Water Surface Elevation

Executive Summary

Eightmile Lake is one of four lakes in the Alpine Lakes Wilderness Area managed by Icicle and Peshastin Irrigation Districts (IPID) to provide water storage for irrigation. A small dam, low-level outlet pipeline, and slide gate at the outlet of Eightmile Lake allow for controlled releases of stored water to supplement flows in Icicle Creek to increase water supply available for irrigation during low flow periods, which typically occur during the late summer. IPID has relied on Eightmile Lake and the other Alpine Lakes they manage for nearly 80 years. Eightmile Lake captures runoff from a 3,822-acre drainage basin. Due to the large size of the drainage basin relative to the storage volume in the lake, Eightmile Lake has a high potential for refill, even during dry years. Because the storage is so reliable and the lake is more accessible than the other Alpine Lakes that IPID manages, the lake is a critical piece of IPID's water supply infrastructure.

The infrastructure at Eightmile Lake is aging and will require improvement to continue to operate in a way that meets IPID's needs. The most urgent issue identified by IPID is that the low-level outlet pipe has collapsed in multiple locations, which has recently reduced the capacity of the pipeline and limits the rate at which IPID can release water to Icicle Creek. If the pipe is not replaced or repaired before the next big drought cycle, IPID will likely not be in a position to meet the irrigation water supply needs of the IPID water users. The gate that controls flow to the low-level outlet pipe also needs to be replaced. It was damaged by ice or debris and is now very difficult to open and close. In addition, the dam structure that allows IPID to store water has deteriorated. Erosion of the earthen embankment portion of the dam structure has reduced the active storage available for release by gravity without pumping or siphoning to less than 1,400 acre-feet. Some additional storage is released via seepage. Due to these limitations, improvements are needed to restore the useable storage capacity of Eightmile Lake to 2,500 acre-feet, which is the volume allowed for storage and release by IPID's water right for the lake. Improvements are also needed to ensure efficient control and release of water stored in the lake to meet downstream water supply and instream flow needs.

In addition, the Jack Creek Fire burned to the shoreline of Eightmile Lake in August of 2017. A large percentage of the Eightmile Lake watershed was damaged by the fire. The potential change in runoff resulting from the fire combined with deficiencies at the dam has caused concern on the part IPID, the Washington State Department of Ecology Dam Safety Office (DSO), and local emergency responders about the potential for a large runoff event to damage the dam or cause it to fail.

This Feasibility Study identified and evaluated the follow improvements for restoring the storage at Eightmile Lake and improving the control and release of water from the lake:

- Replacement of the dam with a reinforced concrete and earthen embankment structure that would have a primary spillway elevation of 4,671 feet, which would match the historical high

water surface elevation (WSEL) in the lake and restore the useable storage capacity to 2,500 acre-feet.

- Construction of an embankment and secondary spillway structure in a low spot south of the existing dam to provide additional spillway capacity to meet Washington State Department of Ecology Dam Safety Office requirements.
- Replacement of the existing low-level outlet facilities with a new pipeline that would allow for greater flexibility in drawing down the lake. Flow through the new low-level outlet would be controlled by an automated valve. Telemetry would allow for remote access from IPID's office to operate the valve and optimize releases. The low-level outlet would operate by gravity when the lake is full and transition to siphon operation as the lake is drawn down.

The hydrology and hydraulics of the proposed lake operation under improved conditions was evaluated to inform the design, as required by Ecology's DSO. Consultation was initiated with DSO as part of this Feasibility Study to better understand their requirements for permitting construction of improvements to the dam and outlet facilities. DSO reviewed the draft Feasibility Study and provided general comments regarding the analysis and geotechnical evaluation of the proposed facilities that will be applied to the detailed design of the improvements. No changes were made to this report to reflect DSO comments regarding the detailed design of the proposed project. Those comments will be addressed through detailed design of the project. This study reflects the concept and feasibility-level analysis completed through the end of 2017 and does not include additional analysis requested by DSO in response to the Jack Creek Fire or recent emergency declaration by IPID. Consultation with DSO is ongoing and will continue through the design and construction of the proposed improvements. The calculations and sizing of facilities provided in this feasibility are based on conservative assumptions for hydrology and the impact that a dam breach would have on downstream properties. Additional analysis completed during detailed design may allow for some optimization of the size and configuration of dam and spillway facilities to reduce the cost and complexity of the project as much as possible.

Eightmile Lake Storage Restoration is one of several projects being evaluated under the direction of the Icicle Work Group. The multi-stakeholder group is working together to identify and evaluate projects that will improve management of water in the Icicle Creek Sub-basin. The group has adopted Guiding Principles that represent the collective goals established by the group for improving water management in the Icicle Creek Sub-basin. The proposed Eightmile Lake Storage Restoration project helps meet multiple prongs of the Guiding Principles, including augmentation of streamflow in Icicle Creek, providing additional water to meet municipal demands, improving agricultural reliability by increasing water supply available in the late summer, creating additional streamflow to meet fish passage and habitat goals, improving treaty and non-treaty harvest rights, and potentially making more water available to Leavenworth National Fish Hatchery.

The primary challenge to implementing this improvement project will be determining how to construct the project at a remote location within the Alpine Lakes Wilderness. IPID has an easement agreement with the USFS that was established when the property was transferred to the USFS for management as part of the Alpine Lakes Wilderness Area. The easement agreement allows IPID to continue to have access to the site, including with mechanized equipment, to maintain the facilities and to make full use of IPID's water right. However, the site is not accessible by roads. The Alpine Lakes are often accessed by IPID by helicopter for maintenance, but even the largest helicopters have payload limitations that will make mobilization of large equipment to the site a challenge. Options that were identified are transport of a smaller excavator by large helicopter, overland transport of a larger tracked excavator, or overland transport of a spider excavator. The approach will likely be dictated by funding, the equipment available, and permit approval constraints.

Another challenge to implementing this project that is closely related to the challenge of mobilizing equipment will be the narrow window available for construction. The lake will need to be drawn down to construct the project, which typically does not happen until late in the summer. IPID might be able to facilitate early drawdown of the lake for construction, but will be constrained by weather and runoff conditions in the early summer. Construction will need to be complete before significant snowfall and consistent freezing temperatures occur. Due to the elevation of the site, snowfall and consistent freezing temperatures are likely to occur in October or early November.

The estimated implementation cost of a project that would rely on helicopters to transport and mobilize equipment to the site is approximately $2.62 to $2.97 million. Based on the estimated useable storage that could be restored by the project (1,125 acre feet), the cost would be $2,329 to $2,644 per acre-foot of additional storage created.

1 Introduction

Eightmile Lake is one of four lakes in the Alpine Lakes Wilderness Area managed by Icicle and Peshastin Irrigation Districts (IPID) to provide water storage for irrigation. A small dam, low-level outlet pipeline, and slide gate at the outlet of Eightmile Lake allow for controlled releases of stored water to supplement flows in Icicle Creek to increase water supply available for irrigation during low flow periods, which typically occur during the late summer. The proposed Eightmile Lake Storage Restoration Project would replace the existing dam structure, low-level outlet pipeline, gate, and controls to restore the usable storage capacity of the lake and allow for automation and optimization of releases from the lake. This Feasibility Study summarizes the preliminary design analysis of proposed improvements that would restore the available storage capacity in Eightmile Lake to the volume that was historically available to IPID.

1.1 Compatibility with Icicle Strategy

The Eightmile Lake Storage Restoration Project is one of several potential projects currently being evaluated under the direction of the Icicle Work Group (IWG). The IWG is a multi-stakeholder group that was convened by Chelan County Natural Resources Department (CCNRD) and the Washington State Department of Ecology (Ecology) to take a comprehensive look at water resource management in the Icicle Creek Sub-basin. The IWG consists of federal, state, and local agencies; irrigation districts, including IPID; the City of Leavenworth; the Leavenworth National Fish Hatchery (LNFH); non-profit organizations; environmental groups; and other stakeholders. The IWG is working together to identify and evaluate projects that will improve management of water in the Icicle Creek Sub-basin and improve instream flow conditions in lower Icicle Creek. CCNRD retained Anchor QEA, LLC, and Aspect Consulting, LLC (Anchor QEA/Aspect), to complete this Feasibility Study. The study was funded under a grant from Ecology's Office of the Columbia River.

Projects endorsed by the IWG are collectively intended to meet the following nine Guiding Principles:

1. Streamflow that:
    a. Provides passage
    b. Provides healthy habitat
    c. Serves channel formation function
    d. Meets aesthetic and water quality objectives
    e. Is resilient to climate change
2. Sustainable hatchery that:
    a. Provides healthy fish in adequate numbers
    b. Is resource efficient
    c. Significantly reduces phosphorus loading
    d. Has appropriately screened diversion(s)

    e. Does not impede fish passage
3. Tribal Treaty and federally protected fishing/harvest rights are met at all times.
4. Provide additional water to meet municipal and domestic demand.
5. Improve agricultural reliability that:
    a. Is operational
    b. Is flexible
    c. Decreases risk of drought impacts
    d. Is economically sustainable
6. Improve ecosystem health including protection and enhancement of aquatic and terrestrial habitat.
7. Comply with state and federal law.
8. Protect Non-Treaty Harvest.
9. Comply with the Wilderness Act of 1964, the Alpine Lakes Wilderness Act of 1976, and the Alpine Lakes Wilderness Management Plan.

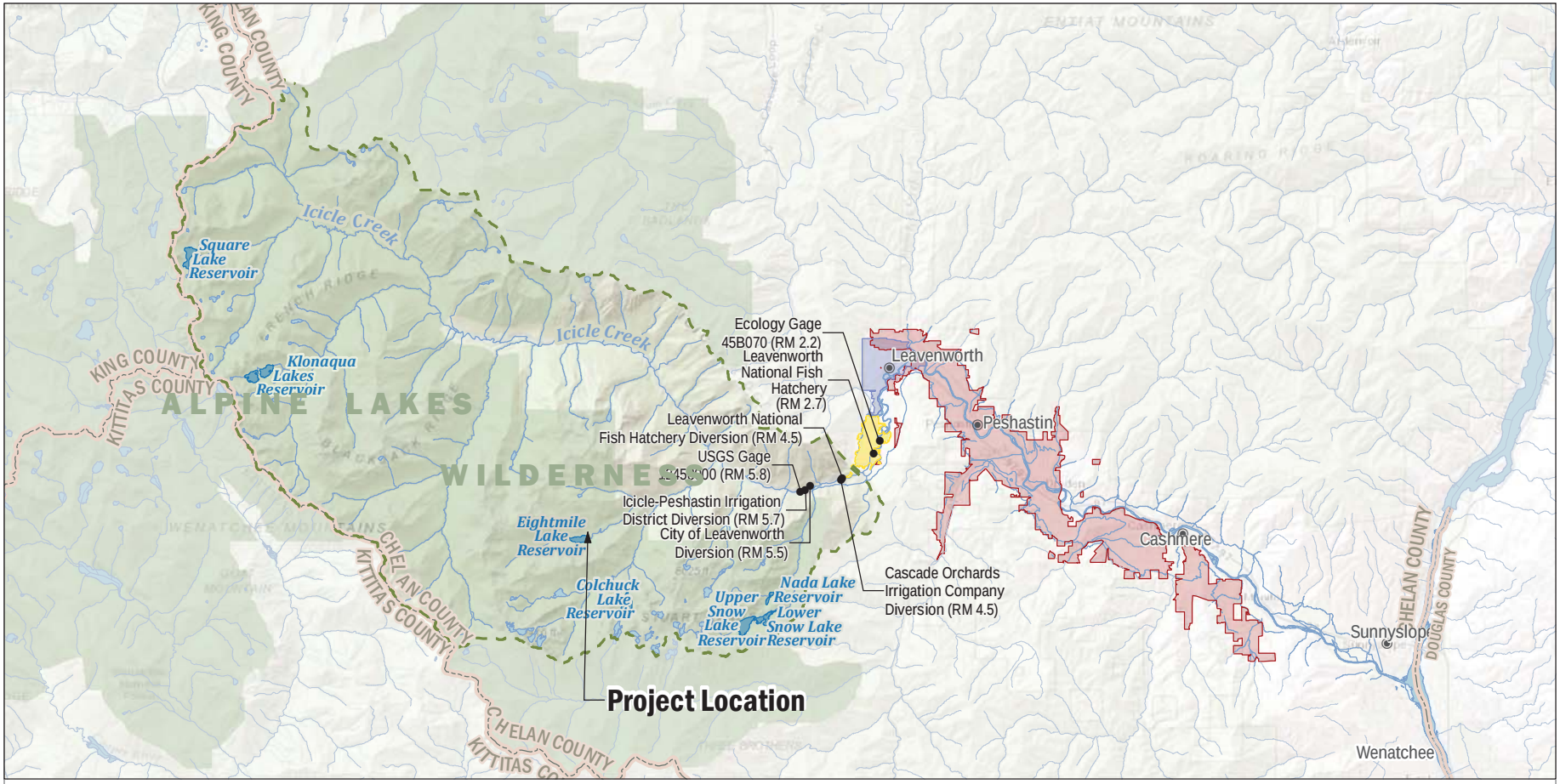
The intent of the Eightmile Lake Storage Restoration Project is to meet multiple prongs of the Guiding Principles. This project has the potential to achieve the following:

- Augment streamflow in Icicle Creek (Guiding Principle No. 1)
- Provide additional water to meet municipal demands (Guiding Principle No. 4)
- Improve agricultural reliability by increasing water supply available in the late summer to meet IPID's diversion needs (Guiding Principle No. 5)
- Benefit fish passage and habitat (Guiding Principle No. 6) and Treaty and Non-Treaty Harvest (Guiding Principles No. 3 and No. 8)

Relative to Guiding Principle 2, maintaining a sustainable hatchery, it should be noted that the project could also be operated to allow for the release of additional water during the winter low flow period, which would benefit LNFH water supply needs. Low flow conditions in the Icicle Creek Sub-basin typically occur in late-summer and again during the winter when a hard freeze occurs. The Hatchery Canal is dewatered from mid-summer through early spring to meet instream flow needs in Icicle Creek. Releases from Eightmile Lake have not historically occurred during the winter low-flow period, but the improvements discussed in this report could potentially allow for management of releases to benefit LNFH.

1.2 Project Background

Eightmile Lake is located in the Alpine Lakes Wilderness Area of Okanogan-Wenatchee National Forest approximately 10 miles west of the City of Leavenworth, as shown in Figure 1-1. It is one of four lakes in the Alpine Lakes Wilderness Area managed by IPID.



LEGEND:

- Points of Interest
- Leavenworth Urban Growth Area
- Cascade Orchards Irrigation
- IPID Service Area
- County
- Icicle Creek Watershed

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Figure 1-1
Location Map
Eightmile Lake Restoration Feasibility Study
Icicle and Peshastin Irrigation Districts

A small dam with a low-level outlet pipeline or tunnel and control gate was installed at the outlet of each of the lakes in the early part of the twentieth century to allow IPID to capture and store runoff during the winter and spring for release during the late summer low flow period. The supplemental flows allow IPID to maintain irrigation diversions and meet instream flow obligations.

The dam, outlet, and control gate at Eightmile Lake are aging and in need of repair. The dam consists of a rock-masonry/concrete structure with stop logs and an earthen embankment section that extends from the rock-masonry/concrete structure to the hillside north of the dam. Stop logs were historically placed in a notch in the concrete portion of the dam up to the spillway crest (elevation ~4,671 feet North American Vertical Datum of 1988 [NAVD 88]) to allow the lake to fill to that elevation. The earthen embankment portion of the dam has eroded around the left side (looking downstream) of the rock-masonry/concrete structure. Consequently, the dam is not currently capable of impounding water to the full level for which it was designed and at which it historically operated. IPID can now only raise the water to an elevation of approximately 4,667 feet. This has reduced the storage capacity annually available for release by gravity without pumping or siphoning to less than 1,400 acre-feet. Some additional storage is released via seepage. Storage can also be accessed up to IPID's water right (2,500 acre-feet) using pumps or siphons.

The rock masonry/concrete portion of the dam is also deteriorating. The guides and logs used to check the flow of water from the lake through the notch in the concrete portion of the dam no longer function as designed. The slide gate that controls flow from the lake to the low-level outlet pipeline is also very difficult to operate and needs to be refurbished or replaced.

This Feasibility Study summarizes analysis of facilities that would be needed to replace the existing dam, low-level outlet pipeline, and control gate and enable releases from the dam to be automated and optimized to better manage releases. The *Feasibility Study, Alpine Lakes Optimization and Automation* (Aspect 2017) prepared concurrent with this report outlines the feasibility of automating and optimizing the releases from all of the IPID-managed reservoirs to improve late-summer flows in Icicle Creek. The improvements would restore IPID's ability to capture and release up to 2,500 acre-feet, as permitted by their water right for the lake.

1.2.1 Prior Studies and Related Documents

Table 1-1 provides a list of existing key studies and documentation related to the restoration of storage at Eightmile Lake.

Table 1-1
Prior Studies and Related Documents

Date	Study and Relevance	Author
April 1981	*Icicle Irrigation District Helicopter Access Environmental Assessment* This environmental assessment was completed by the U.S. Forest Service to evaluate Icicle Irrigation District's use of helicopters to access the lakes they manage in the Alpine Lakes Wilderness Area for operations and maintenance. The document recommended use of helicopters for transportation to and from the lakes and found that helicopter access "provides for health and safety as well as protection of wilderness resources and trail systems."	U.S. Forest Service
December 1989 May 1990	*Easement Termination Agreement* and *Special Warranty Deed* These include legal documents deeding the property around Eightmile Lake and other Alpine Lakes held historically by IPID to the U.S. Forest Service, with language that preserves IPID's right to operate and maintain the lakes, access the lakes for maintenance, and make full use of water storage rights for the lakes.	U.S. Forest Service and Icicle Irrigation District
December 1995	*Reconnaissance Inspection of Eightmile Lake Dam; File No. CH45-228* This letter was prepared by Ecology's Dam Safety Office following a reconnaissance visit to the site to evaluate and inspect the dam facilities at Eightmile Lake. The letter noted the breach or erosion of the embankment portion of the dam adjacent to the rock masonry structure and concluded that the breach had cut a channel down to a hardened surface that had potential to widen further with subsequent flood events, but that the configuration of the dam did "not pose a sufficient incremental damage threat to warrant mandating a retrofit of the spillway."	Ecology Dam Safety Office; Mel Schaefer Jerald LaVassar Doug Johnson
June 2006	*Multi-purpose Water Storage Assessment in the Wenatchee River Watershed* This report, prepared under the direction of IWG member CCNRD, identified and evaluated a wide range of potential opportunities for increasing storage in the watershed, including automating and optimizing releases from the IPID-managed Alpine Lakes (Eightmile, Colchuck, Klonaqua, and Square Lakes)	Montgomery Water Group, Inc. (Now Anchor QEA, LLC)
November 2013	*Eightmile Lake Surveys Technical Memorandum* The memorandum summarized topographic and bathymetric survey data collected by Gravity Consulting, LLC, at Eightmile Lake in October of 2013. The survey was collected under the direction of IWG Member Trout Unlimited.	Gravity Consulting, LLC

Date	Study and Relevance	Author
July 2014	*Draft Icicle Irrigation District Instream Flow Improvement Options Analysis Study* This study, prepared under the direction of IWG Member Trout Unlimited, included an evaluation of storage volumes and available storage at Eightmile Lake based on the survey that was completed by Gravity Consulting, LLC.	Forsgren Associates, Inc.
March 2015	*Appraisal Study, Eightmile Lake Storage Restoration* This study, prepared under the direction of IWG Member CCNRD, provided an appraisal-level assessment of existing storage conditions and lake operations, identified four alternatives for increasing the useable storage in Eightmile Lake, identified options for optimizing and automating releases from the lake, summarized potential uses and benefits of the water that would be made available, and provided a preliminary review of environmental impacts and permitting.	Anchor QEA, LLC, and Aspect Consulting, LLC
March 2015	*Appraisal Study, Alpine Lakes Optimization and Automation* This study, prepared under the direction of IWG Member CCNRD, provided an appraisal-level assessment of existing control facilities at each of the managed Alpine Lakes, including Eightmile Lake, and provided recommendations for potential equipment and improvements that would be needed to optimize and automate releases from the lakes.	Aspect Consulting, LLC, and Anchor QEA, LLC

Notes:
CCNRD: Chelan County Natural Resources Department
IPID: Icicle and Peshastin Irrigation Districts
IWG: Icicle Work Group

Several additional studies are being prepared under the direction of the IWG, concurrent with this Feasibility Study, to evaluate the projects being evaluated by the IWG. The two that are most related to this feasibility study include the following:

- *Icicle Strategy Programmatic Environmental Impact Statement* (Aspect pending) – The IWG is currently developing a programmatic environmental impact statement (PEIS) for the strategy that has been developed by the IWG to improve the management of water in the Icicle Creek Sub-basin. The Icicle Strategy PEIS will evaluate four alternatives and a no-action alternative. The alternatives each include a suite of projects that are collectively intended to meet the guiding principles listed above. The Eightmile Lake Storage Restoration Project will be included as a component of three of the four action alternatives evaluated by the PEIS.
- *Feasibility Study; Alpine Lakes Optimization and Automation* (Aspect 2017) – This study, prepared under the direction of IWG member CCNRD, will include a feasibility-level evaluation and design recommendations for implementing improvements that will allow IPID and the U.S. Fish and Wildlife Service to optimize and automate releases from the managed lakes in the Alpine Lakes Wilderness Area, including Eightmile Lake.

1.3 Feasibility Study Description

This study provides a feasibility-level evaluation and design recommendations for a project that would replace the existing dam, low-level outlet pipeline, and control gate facilities at Eightmile Lake with facilities that are designed to restore the useable storage at Eightmile Lake to 2,500 acre-feet and allow for automated releases from the lake.

Consultation was initiated with DSO as part of this Feasibility Study to better understand their requirements for permitting construction of improvements to the dam and outlet facilities. DSO reviewed the draft Feasibility Study and provided general comments regarding the analysis and geotechnical evaluation of the proposed facilities that will be applied to the detailed design of the improvements. No changes were made to this report to reflect DSO comments regarding the detailed design of the proposed project. Those comments will be addressed through detailed design of the project. This study reflects the concept and feasibility-level analysis completed through the end of 2017 and does not include additional analysis requested by DSO in response to the Jack Creek Fire or recent emergency declaration by IPID. Consultation with DSO is ongoing and will continue through the design and construction of the proposed improvements.

1.3.1 Scope of Work

The scope of work for this Feasibility Study included the following work:

- The Anchor QEA/Aspect team worked with IPID and Chelan County to identify key components and characteristics of the preferred design concept, based on additional data and observations made during the Summer of 2015, when water was drawn down below the existing outlet, and the outlet pipe condition was determined to be significantly different than assumed in the *Appraisal Study, Eightmile Lake Storage Restoration* (Anchor QEA 2015)
- The Anchor QEA/Aspect team worked with IPID and Chelan County to evaluate potential approaches to constructing the proposed improvements to Eightmile Lake.
- The Anchor QEA/Aspect team provided preliminary sketches showing key components of the preferred design concept to confirm the preferred concept with IPID and Chelan County.
- The Anchor QEA/Aspect team developed a draft construction work plan for IPID use in coordinating with the United States Forest Service (USFS).
- The Anchor QEA/Aspect team reviewed the potential improvements with Ecology's Dam Safety Office (DSO) to identify likely requirements for securing a DSO dam construction permit. This report summarizes the design reports, application forms, and supporting documentation that would be required for DSO review and approval of dam modifications.
- The Anchor QEA/Aspect team refined the evaluation of hydrology, lake levels, and refill, based on work completed during the summer of 2016.
- The team analyzed peak inflow hydrology and hydraulics of the low-level outlet, spillway, and dam improvements as a basis for sizing the facilities to meet DSO requirements.

- The Anchor QEA/Aspect team also developed conceptual design drawings showing proposed improvements in plan and section view, identifying key materials and dimensions.
- The Anchor QEA/Aspect team prepared an opinion of probable costs.
- The Anchor QEA/Aspect team developed a photographic rendering illustrating what the proposed reservoir modifications might look like following construction.
- The Anchor QEA/Aspect team prepared this report to summarize the findings of the Feasibility Study.

1.3.2 Purpose and Objectives

The following are the goals of the Feasibility Study:

- Review and provide a more complete understanding of the existing conditions, constraints, and design requirements for proposed improvements at Eightmile Lake.
- Evaluate the preferred improvement option in enough detail to provide IPID and the IWG with the information needed to determine whether additional resources can be allocated to complete the design and implement the project and identify those resources.

The overall goal of the Eightmile Lake Restoration project is to restore storage capacity at Eightmile Lake and improve control of releases from the lake to improve the water supply available in Icicle Creek to meet instream flow and out-of-stream water supply needs.

1.4 Report Organization

This report is organized into the following sections:

- **Existing Reservoir Conditions** provides a summary of existing conditions and deficiencies at Eightmile Lake based on recent work done by Anchor QEA, Aspect, Gravity Consulting, LLC, and Forsgren Associates, Inc.; input from IPID; and conditions documented during a site visit to the lake.
- **Eightmile Lake Hydrology** summarizes the results of hydrologic analyses including watershed yield, a downstream hazard analysis, and design storm calculations and analysis.
- **Eightmile Lake Storage Restoration Design** summarizes proposed hydraulic analysis, design calculations, and improvements.
- **Construction Approach** provides a summary of construction access and sequencing options and anticipated limitations to implementing the proposed project.
- **Cost Analysis** includes a summary of preliminary opinions of probable project costs associated with the proposed restoration design.
- **Water Rights** summarizes the existing water rights associated with storage and release of water from Eightmile Lake.
- **Environmental and Permitting Strategy** includes a summary of likely environmental impacts and permitting requirements, and recommends a strategy for securing permit approvals.

- **Summary and Recommendations** provides an overall summary of the Feasibility Study and recommendations for future study and implementation.

Tables and figures are included throughout the report. Appendices, including design drawings, photographs, calculations, and other information, are included at the back of the report.

1.5 Feasibility-level Design Drawings

Feasibility level design drawings have been prepared and are included in Appendix A. In addition, a rendering was developed to illustrate what the finished project might look like from an aerial perspective. The rendering is show in Figure 1-2.

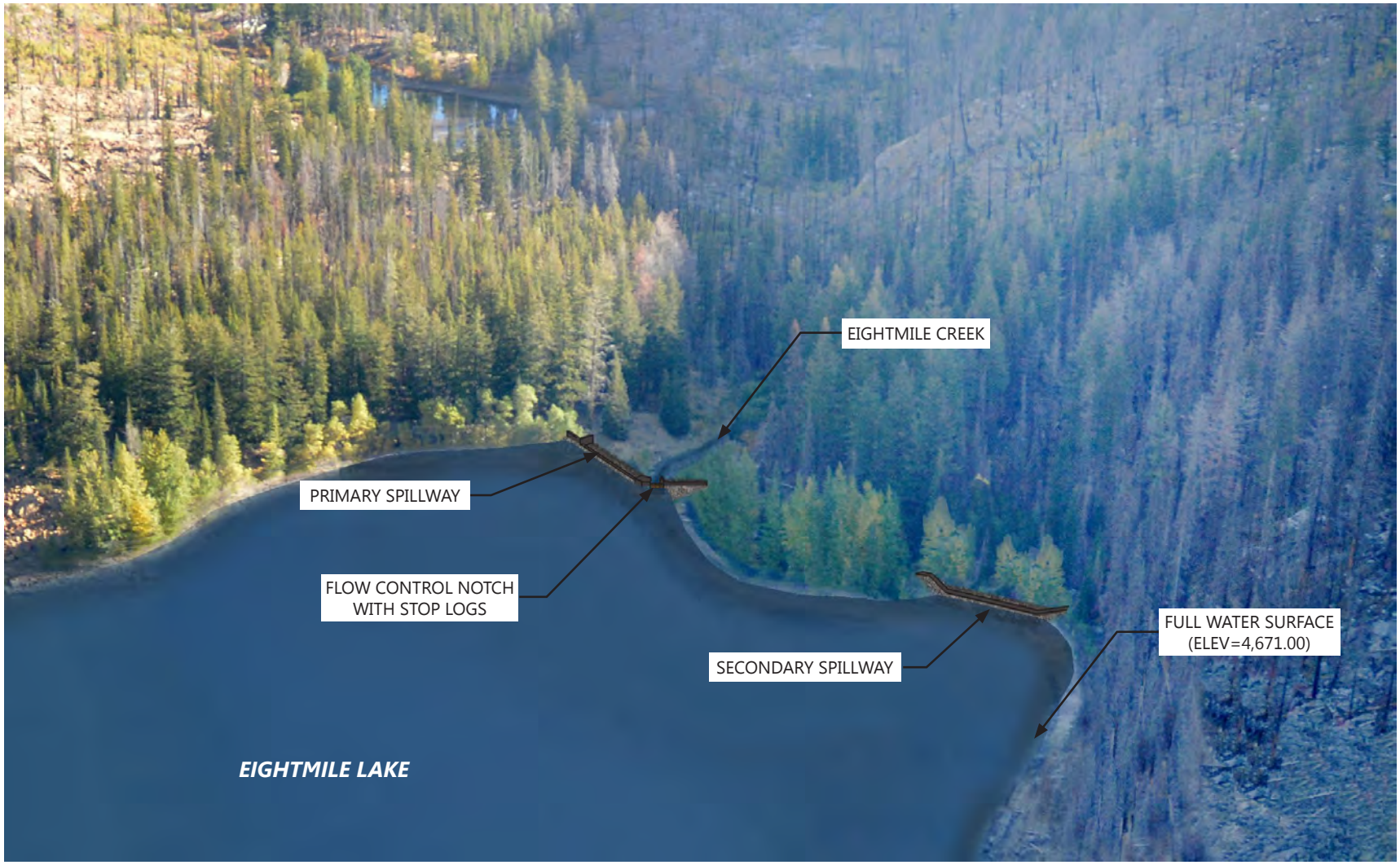

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Figure 1-2
Photo-realistic Rendering of Proposed Eightmile Lake Improvements
Eightmile Lake Storage Restoration Feasibility Study
Icicle and Peshastin Irrigation District

2 Existing Reservoir Conditions

Eightmile Lake is located in the Icicle Creek Sub-basin on the east slopes of the Cascade Mountains approximately 10 miles west of the City of Leavenworth, Washington (See Figure 1-1). The lake is situated within Sections 32 and 33, T24N, R16E, and currently has a full water surface area of approximately 76.6 acres. Eightmile Lake captures water from a 3,822-acre drainage basin and discharges surface water to Eightmile Creek, which is a tributary to Icicle Creek. The Eightmile Lake drainage basin is delineated in Figure 2-1.

The lake can be accessed on foot via the Eightmile Lake Trail (USFS Trail No. 1552). The trailhead is accessible from Leavenworth by vehicle following Icicle Road, USFS Road 7600, and USFS Road 7601. The trail generally follows Eightmile Creek from U.S. Geologic Survey (USGS) Road 7601 to Eightmile Lake. The distance from the trailhead to the lake is approximately 4 miles. Because of its relative accessibility, the lake is a popular destination for hikers and campers. Because of its proximity to Icicle Creek and relative ease of access, IPID visits Eightmile Lake and operates the gate to release water from the lake more frequently than at the more remote lakes it operates. Consequently, it is a critical piece of IPID's water supply infrastructure.

The existing facilities that control flow from Eightmile Lake to Eightmile Creek consist of a dam and embankment structure, a low-level outlet pipeline, and a slide gate. The configuration of these facilities is shown on the existing conditions plan of the feasibility-level design drawings (See Drawing G-04, Appendix A). Additional survey data was collected on the dam structure and low-level outlet pipeline during a site visit on September 30, 2016, to provide better definition for development of the feasibility-level design.

2.1 Dam and Embankment

The existing dam consists of a rock masonry and concrete wall structure with an earthen embankment section. Photographs 1 and 2 (Appendix B) show the dam and spillway structures. Pieces of the masonry rock and concrete wall structure have deteriorated and fallen down, but most of the structure is still intact. The rock masonry and concrete structure spans approximately 43 feet across the outlet of the lake and features the following:

- **Flow Control Notch** – A 5-foot 9-inch-wide notch near the center of structure, has a crest elevation of 4,661.6 to 4,661.8 feet. Guides were originally included in the notch so that stop logs could be placed to control the level at which the lake spills to the downstream channel through the notch. The stop log guides have deteriorated and no longer function as designed; however, IPID still places logs in the notch and drapes plastic over the logs to control the high water surface elevation in the lake.

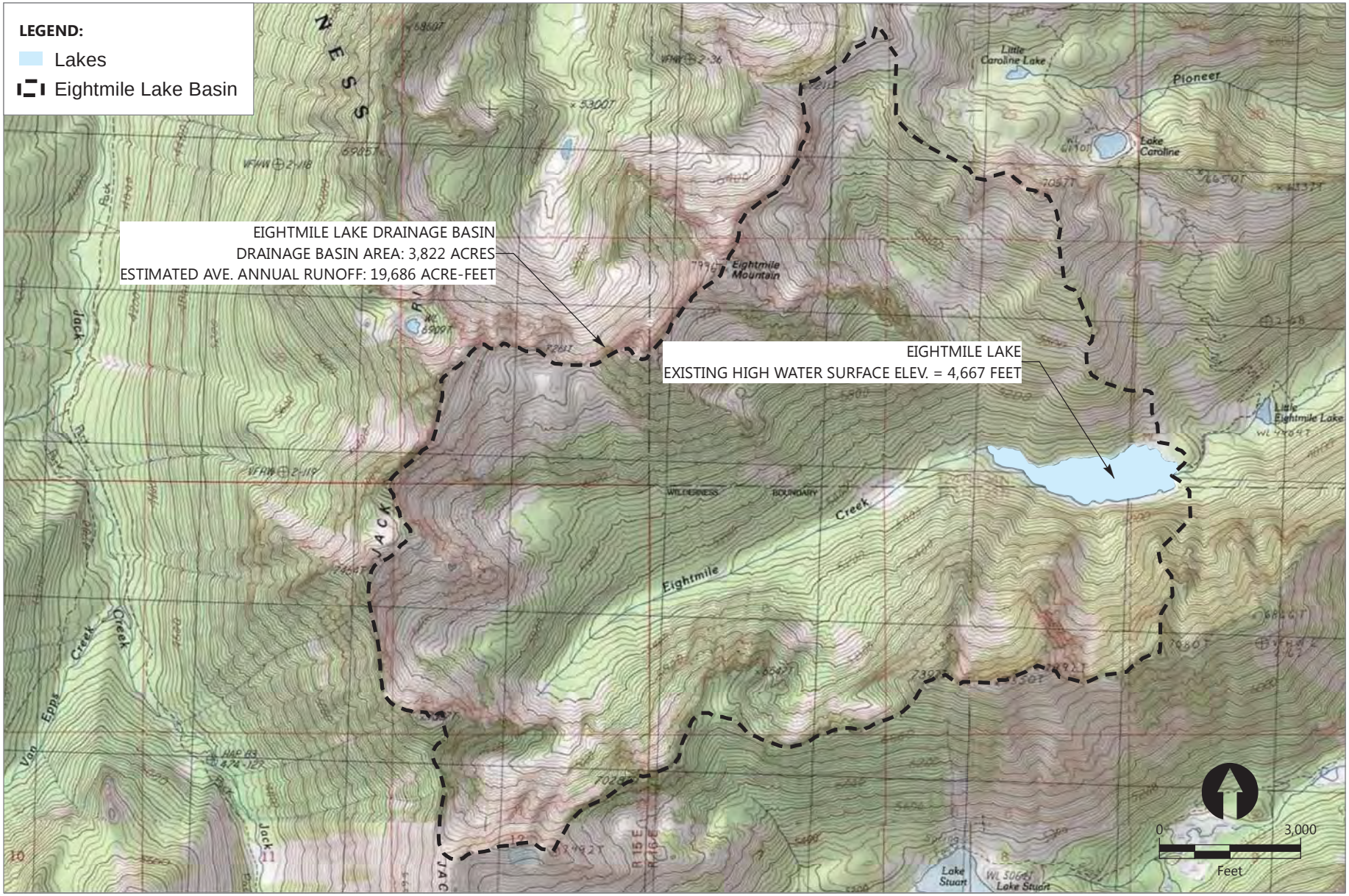

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Figure 2-1
Eightmile Lake Drainage Basin
Eightmile Lake Storage Restoration Feasibility Study
Icicle and Peshastin Irrigation Districts

- **Spillway** – The wall south of the notch comprises the historical spillway, with a crest elevation that varies from 4,671.3 to 4,671.4. The spillway crest length is approximately 6 feet. Historically, stop logs were placed in the notch during the spring or early summer to capture runoff and raise the lake level to the spillway elevation (~4,671 feet).
- **South Wing Wall** – A rock masonry wall extends from the spillway to the hillside south of the structure. The high point on the south wing wall is just over 4,673 feet.
- **North Wing Wall** – A rock masonry wall also extends from the notch north of the dam. The highest portion of the north wing wall is also just over 4,673 feet. The earthen embankment portion of the dam was historically connected to the north wing wall and likely matched the elevation at the top of the wing wall.
- **Stilling Basin and Cutoff Wall** – When the gate on the low-level outlet is closed and the lake is full to the top of the stop logs in the flow control notch, water spills over the stop logs into a concrete basin on the downstream side of the structure. It is not clear what the design function of the basin was intended to be, but it appears to have been the original location of the control gate and may have provided access to the low-level outlet pipeline. The basin extends down to within a few feet of the top of the low-level outlet pipe, but it is typically filled with rock, logs, and debris. The basin was cleaned out in 2015 by IPID in an effort to determine the connection between the basin and the low-level outlet pipeline. A concrete cutoff wall forms the downstream edge of the basin and extends down to the low-level outlet pipeline. IPID has observed that water flowing into the basin disappears through the debris into the low-level outlet pipeline. During high flow periods, the basin fills completely with water and excess water discharges over the cutoff wall and to the rock-lined Eightmile Creek channel. The IPID Manager indicated that under current operation, water overtops the cutoff wall on the downstream side of the basin during the spring and early summer.

The earthen embankment section of the dam extends more than 120 feet from the hillside north of the dam to the north wing wall. The portion of the earthen embankment closest to the north wing wall has eroded to an elevation that is more than 4 feet below the crest of the spillway. No historical information has been found to indicate exactly how or when the embankment was eroded. It likely occurred during a large storm event when no one was at the site to observe. The erosion suggests that the spillway is not large enough to accommodate flow rates during peak storm events. The width of the eroded portion of the embankment is approximately 25 feet. The upper (west) portion of the embankment appears to be intact and is covered with large rock.

Three engineers from Ecology DSO completed a reconnaissance inspection of the dam in September 1995. A letter prepared following the inspection (Ecology 1995) summarized their observations and conclusions. They observed both the earthen embankment and the rock masonry/concrete structure. They noted that the portion of the embankment adjacent to the rock masonry/concrete structure had eroded and the cut was roughly 25 feet wide and 5 feet deep. They

concluded that this "past breach of the embankment has cut a channel across the embankment down to a "hardened" or stable floor. In the event of another major flood, it is likely that the breach section would widen further." Although this widening during a major flood would likely result in surges of flood releases, DSO suggested that the spillway might actually "function, to a limited degree, as a false plug spillway – cutting laterally rather than vertically." They concluded that the "possibility of surges and on-going flood releases from a lateral erosion of the existing breach may be construed by the Owner to be a liability concern. If so, they may wish to minimize their liability by widening and hardening the channel now." However, in the judgement of the DSO Engineers that did the inspection, the dam configuration at the time of the inspection did not pose a "sufficient incremental damage threat to warrant mandating a retrofit of the spillway".

2.2 Low-Level Outlet Pipeline and Gate

A slide gate and low-level outlet pipeline control releases from Eightmile Lake to Eightmile Creek. The gate is a 30-inch-diameter, round, cast iron slide gate and was originally equipped with a hand-wheel operator. The gate is typically submerged in the lake just upstream of the dam, but can be opened to release water through the low-level outlet pipeline to Eightmile Creek. It appears that a rock-masonry/concrete gate tower was originally constructed to support the gate stem and manual hand-wheel operator, which was mounted above the water surface of the lake. The tower appears to have been completely destroyed and the manual gate operator has been removed. The IPID Manager indicated that the gate and tower were likely damaged by ice or debris. The gate currently has to be operated by attaching a log as a come-along to a square metal loop welded to the top of the remaining gate stem below the water surface. This makes gate operation very challenging. The IPID Manager also indicated that rock settles above and against the gate, preventing the gate from closing completely. IPID removed the rock that was piled against the gate and cleaned out the channel leading to the gate from the lake when the lake was drawn down at the end of the summer of 2015. Photograph 3 (Appendix B) shows the exposed gate.

The existing low-level outlet pipeline is nearly 300 feet long and consists of pipe that varies in size and composition. IPID personnel inspected the pipe from the inside late in the summer of 2015 when the lake was drawn down to document the condition and configuration. The existing conditions map in the feasibility-level drawing set shows the observed pipe configuration (See Drawing G-04, Appendix A). The following segments of pipe were observed by IPID:

- **30-inch Corrugated Metal Pipe (CMP), Gate to Dam Structure** – This segment of pipe is in relatively good condition and includes two bends.
- **30-inch Wood Stave Pipe, Under Dam Structure** – Under the stilling basin on the downstream side of the dam structure, the pipe transitions to wood stave pipe.
- **Open Chamber with Log Ceiling** – At the cutoff wall on the downstream side of the stilling basin, the pipe transitions into a more open chamber with a log ceiling. The chamber varies in

height and width. An opening has eroded at the base of the cutoff wall that allows water in the stilling basin to flow into the chamber from above and down the low-level outlet pipe.

- **30-inch Log Stave Pipe** – A log stave pipe, formed by banding raw, round logs together with steel bands, extends from the open chamber on the downstream side of the first cutoff wall to an open chamber on the upstream side of the second cutoff wall. The log stave pipe has collapsed mid-way between the cutoff walls. IPID has indicated that capacity of the pipeline has declined significantly due to blockage caused by this collapse and is a major concern for IPID.
- **Open Chamber with Log Ceiling** – A second chamber is located at the second cutoff wall, approximately 48 feet downstream of the first cutoff wall.
- **30-inch CMP, Downstream of Cutoff Wall** – A segment of 30-inch CMP extends downstream of the second cutoff wall and includes a bend.
- **30-inch Wood Stave Pipe** – The 30-inch CMP transitions to Wood Stave Pipe again downstream of the bend.
- **30-inch CMP, Wood Stave Pipe to Outlet** – A final segment of 30-inch CMP extends from the Wood Stave Pipe to the outlet to the Eightmile Creek channel. The CMP pipe has a couple of large deformations.

Photographs of the pipe interior are included as Photographs 8 through 11 in Appendix B. Most of the pipe is buried under large rock. The pipe outlet is typically submerged in the spring and early summer. A large rock that had been naturally deposited in the channel immediately downstream of the outlet was removed by IPID as part of the maintenance and inspection done late in the summer of 2015. The IPID Manager indicated that when the gate is open and the reservoir is releasing water, conditions at the pipe outlet are turbulent.

2.3 Overflow Channel to Eightmile Creek

An overflow or spillway channel extends from the dam above the buried low-level outlet pipeline to the pipe outlet. The channel is filled with large rock. At least some of the rock appears to have been deposited in the channel naturally since it was first constructed. The channel is typically filled with water during the spring and early summer when the lake is spilling. During the late summer, when the gate is open and controlled releases are occurring, the channel runs dry down to the low-level pipeline outlet.

2.4 Useable Storage Capacity

A survey and lake volume evaluation was completed by Gravity Consulting, LLC, and Forsgren Associates, Inc. (Forsgren 2014), to estimate the volume of the lake at key water surface elevations. The volumes estimated in that report are summarized in Table 2-1. Elevations were surveyed by Gravity Consulting, LLC, relative to the NAVD 88. All elevations reported in this Feasibility Study are

based on that datum. Gravity Consulting, LLC, estimated that the current high water surface elevation was approximately 4,667 feet, based on the current configuration of the dam and input from IPID about placement of stop logs. If IPID attempts to raise the water level higher than that by adding more stop logs to the notch, water spills through the embankment breach around the north wing wall of the dam. The total estimated volume of the lake at that elevation is estimated to be approximately 2,706 acre-feet. The current useable storage in the lake is the volume of water storage between the minimum drawdown level, which was estimated by Gravity Consulting, LLC, and Forsgren Associates, Inc., to be approximately 4,644 feet, and the current high water surface elevation, 4,667 feet. The current usable storage volume, or storage available for release by gravity without pumping or siphoning, was estimated to be approximately 1,375 acre-feet.

Table 2-1
Lake Volume Summary (From 2014 Forsgren Associates, Inc./Gravity Consulting, LLC Study)

Description	Water Surface Elevation (Feet)	Water Surface Area (Acres)	Total Volume (Acre-feet)	Usable Storage Volume[1] (Acre-feet)
1) Existing Low-Level Outlet (Max Drawdown)	4,644	44.1	1,331	↑ 1,375 ↓
2) Existing Top of Weir at Flow Control Notch	4,664	73.5	2,486	
3) Existing High Water Surface	4,667	76.6	2,706	
4) Existing Spillway Crest/Historical High Water Surface	4,671	80.8	2,998	

Note:

1. Icicle and Peshastin Irrigation Districts estimates that additional seepage below the low-level outlet draws the lake down below elevation 4,644 and that the total useable storage, or total volume that can be released from the lake during the late summer, with the additional seepage that occurs after the lake has been drawn down to the low-level outlet, is approximately 1,600 acre-feet.

Additional topographic survey data was collected as part of this analysis to provide better definition of the embankment, rock masonry/concrete structure, and low-level outlet. Table 2-2 summarizes the key elevations and existing stage-storage-area relationship in the lake, based on a refined analysis with the new data collected. When the original analysis was done by Gravity Consulting, LLC, and Forsgren Associates, Inc., the inlet to the low-level outlet pipeline was submerged and likely buried by rock and debris. The additional survey data gathered in 2016 was collected when the lake was drawn down to the low-level outlet elevation. The surveyed elevation at the invert of the low-level outlet is more than 4 feet higher than what was originally estimated as the maximum drawdown elevation. The useable storage volume between the estimated high water surface elevation and the surveyed invert of the low-level outlet is actually only 1,151 acre-feet. However, the lake continues to draw down below the low-level outlet during the late summer due to seepage. For example, the water surface level of the lake during September 2015 was observed at least 3 feet below the low-

level outlet invert. So, it is likely that the lake can be drawn down to an elevation beyond the 4,644 feet estimated by Gravity Consulting, LLC, and Forsgren Associates, Inc., through seepage at the end of the summer. IPID estimates that the total volume that can currently be released by gravity in the late summer without pumping or siphoning, when considering the volume that drains via seepage below the low-level outlet, is approximately 1,600 acre-feet.

Table 2-2
Lake Volume Summary (Based on Additional Data Collection)

Description	Water Surface Elevation (Feet)	Water Surface Area (Acres)	Total Volume (Acre-feet)	Usable Storage Volume[2] (Acre-feet)	
0) Existing Low Lake Level (Max Drawdown)[1, 2]	4,644.0±	44.1	1,331	↑ 1,367 ↓	
1) Existing Low-level Outlet Invert	4,648.7	47.9	1,547		↑ 1,151 ↓
2) Existing Top of Weir at Flow Control Notch	4,664.6	73.7	2,514		
3) Existing High Water Surface[2]	4,667.0±	76.6	2,698		
4) Existing Spillway Crest/Historical High Water Surface	4,671.3	81.7	3,035		

Notes:
1. Existing low lake level was not surveyed in fall 2016, but is based on original analysis by Gravity Consulting, LLC, and Forsgren Associates, Inc. The low lake level has been observed a few feet below the invert of the existing low-level outlet invert. The lake continues to draw down water below the low-level outlet through seepage during the late summer.
2. IPID estimates that additional seepage below the low-level outlet draws the lake down below elevation 4,644 and that the total useable storage, or total volume that can be released from the lake during the late summer, with the additional seepage that occurs after the lake has been drawn down to the low-level outlet, is approximately 1,600 acre-feet.
3. Existing high water surface not surveyed in fall 2016, but is based on original analysis by Gravity Consulting, LLC, and Forsgren Associates, Inc.

2.5 Topography

Eightmile Lake captures runoff from a 3,822-acre drainage basin on the east slopes of the Cascade Range. The general topography of the basin is very rugged and comprises steep craggy peaks and a deep glacial valley. Elevations in the basin range from approximately 7,980 feet to the outlet of Eightmile Lake, at approximately 4,661 feet. The mean basin slope, calculated from a 30-meter USGS digital elevation model (DEM), is 62%.

2.6 Geology

A geotechnical investigation has not been completed as a basis for the design of the improvements to Eightmile Lake; however, general data on soil types and geology was collected from USGS and Natural Resources Conservation Service (NRCS). The geology of the Eightmile Lake basin is dominated by rocky soils and tonalite geology. According to the NRCS Web Soil Survey database, approximately 79% of the soils within the basin are designated as rock outcrop or rock outcrop

complex, with bedrock at or within 3 feet of the surface. The valley bottom is composed primarily of very rocky, sandy loam with boulders and comprises approximately 19% of the basin terminating at the outlet of the lake. The underlying geology is dominated by tonalite, which is classified as an igneous, intrusive rock of felsic composition, with phaneritic texture. Less abundant geologic components include ultrabasic (ultramafic) rock, talus deposits, alluvium, and mass-wasting deposits.

A geology map, showing geologic units mapped by the USGS, is included in Figure 2-2. The map shows that there is a large landslide area with mass-wasting deposits just north and east of the lake. This landslide area and the associated rock and boulders deposited at the base of it are visible on aerial photographs of the lake (See Drawing G-03, Appendix A).

2.7 Existing Reservoir Operations

Eightmile Lake is one of four storage sites in the Alpine Lakes Wilderness managed by IPID. The operation of Eightmile Lake was last reviewed with the IPID Manager during a site visit in September 2016. During a typical year, the storage from only one or two of the IPID-managed lakes is actively managed. Typically, releases from the lakes are rotated from year to year to ensure that the lakes refill between releases. However, because of its proximity to Icicle Creek, relative ease of access, and high probability of refill, the useable storage at Eightmile Lake is released more frequently than the storage at the more remote lakes.

The lake typically fills to the crest elevation of the notch in the rock masonry/concrete portion of the dam during the winter and spring. IPID personnel go to the lake when the snow melts enough to provide access late in the spring or early in the summer to place stop logs and plastic to capture the last few feet of additional storage while the snowmelt runoff is still occurring. To actively manage the storage in Eightmile Lake, IPID personnel hike to the lake to open the gate on the low-level outlet pipeline sometime in July or August when flows in Icicle Creek begin to drop. IPID personnel return to close the gate, remove the stop logs and plastic, and perform maintenance in late September or October, when the lake is drawn down and the irrigation season is over.

When the gate is open, water discharges through the low-level outlet to Eightmile Creek, which is a tributary to Icicle Creek. Based on recent experience and observations from IPID personnel, the lake typically refills by early summer following the irrigation season when the lake is drawn down. The useable storage capacity available for release and the equivalent volume that has to be refilled is limited by the condition of the dam at the outlet. When the lake is full, water flows over the stop logs in a notch in the dam and down the low-level outlet or spillway channel to Eightmile Creek. Water continues to flow through the lake uncontrolled, until the gate is opened for controlled release.

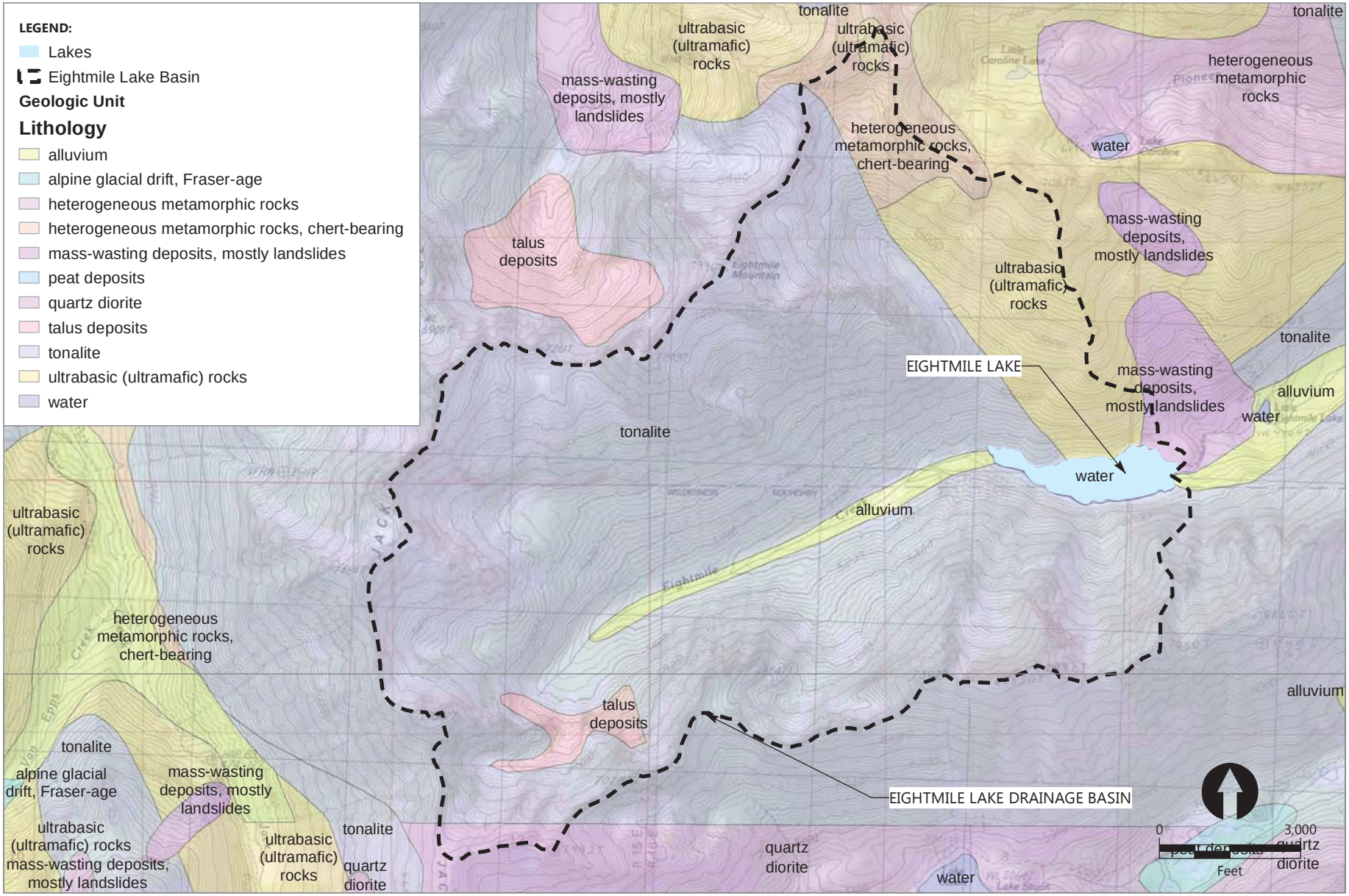

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Figure 2-2
Eightmile Lake Drainage Basin Geology Map
Eightmile Lake Storage Restoration Feasibility Study
Icicle and Peshastin Irrigation Districts

2.8 Challenges, Deficiencies, and Constraints

Several operational challenges and deficiencies exist due to the current configuration and condition of the facilities at Eightmile Lake. These include the following:

- **Gate Operation** – Current gate operation requires that IPID personnel attach a log as a come-along to a submerged metal loop welded to the gate stem to open and close the gate. IPID also indicated that rock settles above and against the gate. These two issues make the gate very difficult to open and close. Rock was removed from above and against the gate in the summer of 2015 when the lake was drawn down.
- **Dam Condition and Level Control** – The dam is no longer in condition to allow for effective control of the water level at the notch in the dam. The embankment portion of the dam has eroded adjacent to the rock masonry/concrete portion of the dam to an elevation that is lower than the dam crest and historical overflow elevation.
- **Lake Drawdown** – IPID's water rights allow for lake storage to be drawn down below the invert of the existing low-level outlet. Some drawdown below the low-level outlet occurs through seepage. However, drawing the lake down to access additional storage below the low-level outlet currently requires pumping.
- **Low-Level Outlet Pipe Condition** – The condition of the low-level outlet pipe was visually assessed by IPID in 2015. As noted previously, some sections of the pipe are damaged or collapsing. The largest collapse has recently reduced the capacity of the pipeline is a major concern for IPID. If water cannot be released at the historical rate of release, there could be water shortages in Icicle Creek during the late summer in coming drought years.

3 Eightmile Lake Hydrology

Critical information needed for the design of improvements at Eightmile Lake include hydrologic inputs to the lake, peak storm conditions, and estimates of the design capacity of the dam, spillway facilities, and low-level outlet facilities to safely pass or release flows while minimizing the risk to downstream properties and infrastructure. This section summarizes the hydrologic analysis done to determine the design storm and peak flow rates used for design of improvements to the dam, spillway, and low-level outlet pipeline.

3.1 Dam Safety Review

The proposed improvements to Eightmile Lake will require review and approval by Ecology's DSO. Consultation was initiated with DSO as part of this Feasibility Study to better understand their requirements for permitting construction of improvements to the dam and outlet facilities. DSO reviewed the draft Feasibility Study and provided general comments regarding the analysis and geotechnical evaluation of the proposed facilities that will be applied to the detailed design of the improvements. No changes were made to this report to reflect DSO comments regarding the detailed design of the proposed project. This study reflects the concept and feasibility-level analysis completed through the end of 2017 and does not include additional analysis requested by DSO in response to the Jack Creek Fire or recent emergency declaration by IPID. Consultation with DSO is ongoing and will continue through the design and construction of the proposed improvements. Based on consultation with DSO to date. DSO will likely require that the following items be submitted for review and approval prior to issuing a dam construction permit for the improvements:

- **Cover Letter** – The cover letter would summarize the project and introduce the deliverables.
- **Dam Construction Permit Application** – A completed dam construction permit application would be downloaded from the DSO web site and submitted with the supporting documents.
- **Engineering Reports**
  - **Geotechnical Engineering Report** – DSO will require that a geotechnical engineer perform a complete subsurface geotechnical field investigation and prepare a report with recommendations for the dam foundation, embankment composition and construction, a description of the local groundwater regime, and identification of earthquake and other potential hazards. Because the site is remote and cannot easily be accessed with equipment to do an effective subsurface geotechnical investigation, completion of geotechnical field investigations will be very challenging. Test pits and geophysical methods will likely be required, at a minimum, to support the design. The design will also require geotechnical supervision, input, and review during construction to address site conditions.
  - **Hydrology and Hydraulics Report** – DSO will require a detailed report with a description of the site, a summary of site hydrology, an estimate of all sources of inflow

to Eightmile Lake, and hydrologic analysis to estimate the Inflow Design Flood (IDF). The report would also detail the design of the reservoir and provide estimates of the reservoir capacity, low-level outlet capacity, spillway capacity, and other design calculations. Sections 3 and 4 of this report include most of the information that would go into the Hydrology and Hydraulics Report for DSO.

- **Detailed Design Drawings** – Feasibility level design drawings are included in Appendix A. The design drawings would be developed to the level of detail needed for construction.
- **Technical Specifications** – A set of detailed technical specifications would be developed with the detailed design drawings.
- **Construction Inspection Plan** – DSO would require a short report listing specific construction activities, quality assurance testing, construction management, change order process, record keeping, and reporting during construction.
- **Operations and Maintenance Plan** – This document would provide general information on project operation, routine inspection and maintenance, and instrumentation and monitoring. Forms would be included for reporting, inspections, incident reporting, and monitoring.
- **Emergency Action Plan** – This document would identify downstream risk from a dam breach and delineate the area that could be inundated based on modeling of a dam breach. This document would also identify the Owner's response actions and responsible personnel.

The requirements and level of detail needed for each of these items will vary based on the scope and extent of improvements to the facilities at Eightmile Lake. For example, a full replacement of the existing dam, spillway, and low-level outlet facilities will require more detailed documentation than if only minor modifications were made to the existing facilities. However, DSO has indicated that they would need to perform some level of review and provide approval for any modifications to these facilities. This report has been reviewed with DSO and consultation is ongoing to define requirements for the detailed design of the proposed facilities.

3.2 Watershed Description

As noted earlier, Eightmile Lake is located in the Icicle Creek Sub-basin on the east slopes of the Cascade Mountains approximately 10 miles west of the City of Leavenworth, Washington. The lake currently has a full water surface area of approximately 76.6 acres. Eightmile Lake captures water from 3,822-acre drainage basin (approximately 6 square miles), as shown in Figure 2-1, and discharges water to Eightmile Creek, which is a tributary to Icicle Creek. The Eightmile Lake drainage basin is predominantly covered with rocky outcrops and exposed bedrock, with steep slopes and rugged terrain. Sub-alpine evergreen forest covers approximately 30% of the drainage basin.

3.3 Watershed Yield

Watershed yield is the annual volume of natural runoff that can be expected from a watershed and is typically estimated based on streamflow measured at a given location. There are not streamflow gaging stations or measurement devices in the Eightmile Lake drainage basin. In the absence of streamflow data, hydrologic analysis can be completed to estimate watershed yield. Watershed yield and lake recharge potential were originally evaluated as part of the *Appraisal Study, Alpine Lakes Optimization and Automation* (Aspect/Anchor QEA 2015). These calculations were updated and refined for the Eightmile Lake drainage basin as part of this study. The following describes the methodology used:

- The drainage basin for Eightmile Lake was delineated using geographic information system (GIS) software and DEM data from the USGS, as shown in Figure 2-1.
- Daily precipitation and snow-water equivalent data were downloaded from seven Snow Telemetry (SNOTEL) stations near Eightmile Lake. The monthly runoff, in inches, was estimated at each SNOTEL station based on daily precipitation and snow-water equivalent data.
- The average monthly precipitation in the Eightmile Lake drainage basin was estimated in GIS from the 1981 through 2016 average precipitation dataset from the Oregon State University PRISM Climate Group.
- The locations, elevations, and precipitation data from Water Years 1985 to 2016 of the SNOTEL sites was compared with the location, elevation, and estimated precipitation for the Eightmile Lake drainage basin. Based on the comparison, the Stevens Pass SNOTEL site was identified as the most appropriate for determining runoff for Eightmile Lake.
- A precipitation ratio was developed for Eightmile Lake that represents the ratio of the average annual precipitation in the lake's drainage basin, as estimated from the PRISM precipitation data, to the average annual precipitation at Stevens Pass from the SNOTEL data.
- Monthly runoff, in inches, was estimated for the Eightmile Lake drainage basin by multiplying the estimated runoff at the Stevens Pass SNOTEL site by the precipitation ratio developed for the lake for Water Years 1985 through 2016.
- The total monthly runoff volume, in acre-feet, was estimated for Eightmile Lake by multiplying the estimated runoff, in inches, by the area of the lake's drainage basin for Water Years 1985 through 2016.
- Evaporation was estimated for Eightmile Lake by using estimated evaporation from nearby stations. The two stations closest to Eightmile Lake are Wenatchee and Bumping Lake. It was determined that the Bumping Lake evaporation station would be the most appropriate for determining evaporation for Eightmile Lake because the elevations are similar. Monthly evaporation rates were determined by multiplying the monthly pan evaporation rate for Bumping Lake by 75% to convert pan evaporation to lake evaporation. The lake evaporation

was then multiplied by the full lake area to get an estimated monthly evaporation volume for Eightmile Lake for water years 1985 through 2016.

- Watershed yield was estimated for Eightmile Lake by subtracting the monthly evaporation volume from the monthly runoff volume.

Statistics of available annual watershed yield, or net annual inflow, were developed for Eightmile Lake, as shown in Table 3-1. The annual volume of useable storage allowed by IPID's water right (2,500 acre-feet) is a relatively small percentage of the watershed yield, even under drought conditions. Even if the maximum volume was released under drought conditions, the recharge potential for the lake is expected to be very high. The high recharge potential and relative ease of access make this lake an extremely valuable storage facility for maintaining flows in Icicle Creek and water supply available to IPID, especially during drought years.

Table 3-1
Eightmile Lake Drainage Area and Estimated Watershed Yield

Characteristic	Estimated Value
Drainage Area	3,822 acres
Maximum Annual Watershed Yield	31,001 acre-feet
10% Exceedance Annual Watershed Yield	24,829 acre-feet
Mean Annual Watershed Yield	19,686 acre-feet
50% Exceedance Annual Watershed Yield	19,128 acre-feet
90% Exceedance Annual Watershed Yield	15,152 acre-feet
Minimum Annual Watershed Yield	11,419 acre-feet

Notes:
1. Watershed yield estimated based on precipitation and evaporation data from 1985 through 2016.

3.4 Downstream Hazard Analysis

Ecology's *Dam Safety Guidelines Technical Note 1: Dam Break Inundation Analysis and Downstream Hazard Classification* (MGS Engineering Consultants, Inc. 2007) provides methodology for assessing downstream hazards based on a potential dam failure and resulting inundation. A preliminary hazard analysis was performed using Ecology's "Selection of Design/Performance Goals for Critical Project Elements" worksheet (Appendix C). The results of the hazard analysis yielded a "High" (Class 1A-1C) downstream hazard classification that indicates risk of loss of life, major economic loss, and lasting environmental damage from a potential dam break.

Ecology's *Dam Safety Guidelines Technical Note 2: Selection of Design/Performance Goals for Critical Design Elements* (Technical Note 2; Ecology 1992) provides guidelines for selecting design/performance goals for dam facilities using an eight-step format, where the

design/performance goals become more stringent with each step. A "High" (Class 1A-1C) downstream hazard classification typically requires use of Step 7 or Step 8 design/performance goals. Section 2 of Technical Note 2 indicates that, "Design Step 8 is applicable where the consequences of dam failure could be catastrophic with hundreds of lives at risk." The design/performance goal at Step 8 has an Annual Exceedance Probability (AEP) of 10^{-6}, or one chance in one million, of being exceeded in any given year, and generally corresponds to the theoretical maximum design event.

Ecology's *Dam Safety Guidelines Part IV: Dam Design and Construction* (Ecology 1993) allows for an alternative method of selecting the magnitude of the IDF referred to as incremental damage analysis (IDA). IDA involves completing a detailed flood inundation analyses to demonstrate that failure of the dam during a candidate design storm event would not significantly increase the level of downstream flooding over that caused by the ongoing, natural flood without a dam failure. If the analysis can demonstrate that the incremental difference is minimal, a lower design step with a smaller design storm event can be used.

A preliminary estimate of the peak flow that would result from failure of the dam was estimated using the formula provided in Technical Note 2. The peak dam failure flow was estimated to be at least 22,000 cubic feet per second (cfs). A detailed flood inundation analysis is beyond the scope of this Feasibility Study. For the sake of developing conservative design recommendations that will meet DSO requirements, the Step 8 design storm with an AEP of 10^{-6} was used for the design calculations and recommendations developed in this Feasibility Study. However, completion of IDA is recommended as part of future design work because it is possible that the analysis could result in a reduction in the design storm event and resulting peak flows used, which would reduce the required size and capacity of the spillway and height of the dam.

3.5 Design Storm Calculation

Ecology's *Dam Safety Guidelines Technical Note 3: Design Storm Construction* (Technical Note 3; MGS Engineering Consultants, Inc. 2009) provides steps for developing a design storm for use in calculating the IDF hydrograph. Chapter 1.2.2 of Technical Note 3 indicates that the short-duration thunderstorm is commonly the controlling design event in Eastern Washington when the drainage area is less than 50 square miles (MGS Engineering Consultants, Inc. 2009). Short duration storms are high intensity events that typically generate very high peak flood flows. Technical Note 3 also indicates that, in Eastern Washington, the long-duration storm is usually the controlling design event for larger watersheds or when the reservoir storage capacity is large enough to attenuate runoff from the contributing watershed. For this analysis, three design storm types were evaluated: short-duration, intermediate-duration, and long-duration. The following sections detail steps that were followed to complete this evaluation using the Step 8 design storm.

3.5.1 Identify Climatic Region

The site was determined to be within Climate Region 14 using the map provided in Figure 4 of Dam Safety Guidelines Technical Note 3. The climate region was verified using the precipitation data lookup worksheets from the DSO website (DSO 2016). Copies of the precipitation data lookup worksheets are included in Appendix D.

3.5.2 Estimate Mean Annual Precipitation

The mean annual, area-weighted precipitation for the Eightmile Lake drainage basin (centroid at 47.518924° N, 120.892544° W) was estimated to be 65.1 inches. The mean annual precipitation was determined using data mapped by MGS Engineering, Inc., and the Spatial Climate Analysis Service at Oregon State University using the PRISM climate model. The mean annual precipitation was verified using the precipitation data lookup worksheets from the DSO website.

3.5.3 Estimate L-Moment Statistics

The 2-, 6-, and 24-hour duration L-moment statistics for the project site were estimated based on the location and climatic region using the precipitation lookup worksheet from the DSO website. Statistics are summarized in Table 3-1.

3.5.4 Calculate Mean At-Site Precipitation

The 2-, 6-, and 24-hour "at-site" mean precipitation values were calculated using the precipitation lookup worksheets from the DSO website. At-site precipitation values are listed in Table 3-2.

3.5.5 Calculate Base Precipitation Values

The short-, intermediate-, and long-duration theoretical maximum precipitation storm values were calculated using the L-moment statistics, at-site mean precipitation, and equations from Dam Safety Guidelines Technical Note 3, as provided in the precipitation data lookup worksheets from the DSO website. Precipitation values for each storm duration were also calculated for the various return intervals shown in Table 3-2.

Table 3-2
Results of Precipitation Frequency Analysis

Analysis Result	Short-Duration (2-hour) Storm	Intermediate-Duration (6-hour) Storm	Long-Duration (24-hour) Storm
L-Cv	0.1414	0.1527	0.1764
L-Skew	0.2074	0.1724	0.1666
At-site Mean Precipitation (inches)	0.726	1.513	3.367
10-year Precipitation (inches)	0.97	2.06	4.79
25-year Precipitation (inches)	1.13	2.39	5.60
100-year Precipitation (inches)	1.39	2.90	6.82
500-year (Step 1) Precipitation (inches)	1.73	3.51	8.23
Step 2 Precipitation (inches)	1.89	3.79	8.84
Step 3 Precipitation (inches)	2.19	4.28	9.87
Step 4 Precipitation (inches)	2.52	4.78	10.90
Step 5 Precipitation (inches)	2.89	5.32	11.95
Step 6 Precipitation (inches)	3.30	5.88	13.01
Step 7 Precipitation (inches)	3.75	6.47	14.07
Step 8 Precipitation (inches)	4.26	7.09	15.15

Notes:

2. For worksheets and additional detail, See Appendix D.

L-Cv: Site-specific coefficient used in Dam Safety Office (DSO) spreadsheet to calculate At-site Mean Precipitation.
L-Skew: Site-specific skew value used in DSO spreadsheet to calculate At-site Mean Precipitation.

3.5.6 Scaling Precipitation Estimates

The precipitation estimates were scaled for design using a design factor recommended by Technical Note 3, as shown in Equation 1:

Equation 1

$$P_{sd} = DF \times P_{gds}$$

where:

P_{sd} = Scaling precipitation for 2-, 6- or 24-hour index period, in inches
DF = Design Factor; DF = 1.15 for new dams
P_{gds} = Estimated 2-, 6-, or 24-hour precipitation for selected frequency, in inches

3.5.7 Calculate Total Storm Precipitation

The total storm precipitation was calculated by multiplying the scaling precipitation by a total storm multiplier based on the climatic region for the project and the hyetograph for that region and storm type, as shown in Equation 2:

Equation 2

$$Total\ Storm\ Precip = P_{sd} \times Multiplier$$

where:

Total Storm Precip	=	Total precipitation for the design storm, in inches
P_{sd}	=	Scaling precipitation for 2-, 6- or 24-hour index period, in inches
$Multiplier$	=	Multiplier from mass curve for 4-, 18-, or 72-hour storm

Table 3-3 provides a summary of the design factor, scaling precipitation, multiplier, and total storm precipitation estimated by this method using the precipitation lookup worksheets from the DSO website.

Table 3-3
Total Precipitation for Design Storms

	100-year Storms			500-year Storms			Step 8 (10^6-year) Storms		
	2-hour	6-hour	24-hour	2-hour	6-hour	24-hour	2-hour	6-hour	24-hour
P_{gds} (inches)	1.39	2.90	6.82	1.73	3.51	8.23	4.26	7.09	15.15
DF	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
P_{sd} (inches)	1.60	3.33	7.84	1.99	4.04	9.46	4.90	8.15	17.42
Multiplier	1.091	1.879	1.685	1.091	1.879	1.685	1.091	1.879	1.685
Total Precipitation for Design Storm (inches)	1.74	6.26	13.21	2.17	7.59	15.95	5.34	15.31	29.36

Notes:
DF: design factor
P_{gds}: Estimated 2-, 6-, or 24-hour precipitation for selected frequency
P_{sd}: Scaling precipitation for 2-, 6- or 24-hour index period

3.5.8 Calculate Peak Rainfall Intensity

The peak rainfall intensity for the design storms was calculated as shown in Equation 3:

Equation 3

$$Peak\ rainfall\ intensity = (Total\ Storm\ Precip) \times (Peak\ Intensity\ Factor)$$

where:

Peak Rainfall Intensity	=	Peak rainfall intensity for the design storm, in inches/hour
Total Storm Precip	=	Total precipitation for the design storm, in inches
Peak Intensity Factor	=	Intensity factor based on climate region and storm type

The peak storm intensities are summarized in Table 3-4.

Table 3-4
Peak Storm Intensities for Design Storms

	100-year Storms			500-year Storms			Step 8 (10^6-year) Storms		
	2-hour	6-hour	24-hour	2-hour	6-hour	24-hour	2-hour	6-hour	24-hour
Total Precipitation for Design Storm (inches)	1.74	6.26	13.21	2.17	7.59	15.95	5.34	15.31	29.36
Peak Intensity Factor	2.99	0.270	0.123	2.99	0.270	0.123	2.99	0.270	0.123
Peak Storm Intensity (inches/hour)	4.79	1.69	1.63	5.98	2.05	1.97	14.71	4.14	3.62

3.5.9 Calculate Snowmelt Contribution

Floods may be produced during major rainfall events by a combination of rainfall and snowmelt. Rain on snow events typically only occur during the late winter or early spring, when only intermediate- and long-duration storms are most likely to occur. The contribution of snowmelt during the intermediate- and long-duration storms was calculated using a snowmelt spreadsheet provided by DSO (Appendix E). The snowmelt contribution was added to the total precipitation value for the design storms as shown in Table 3-5.

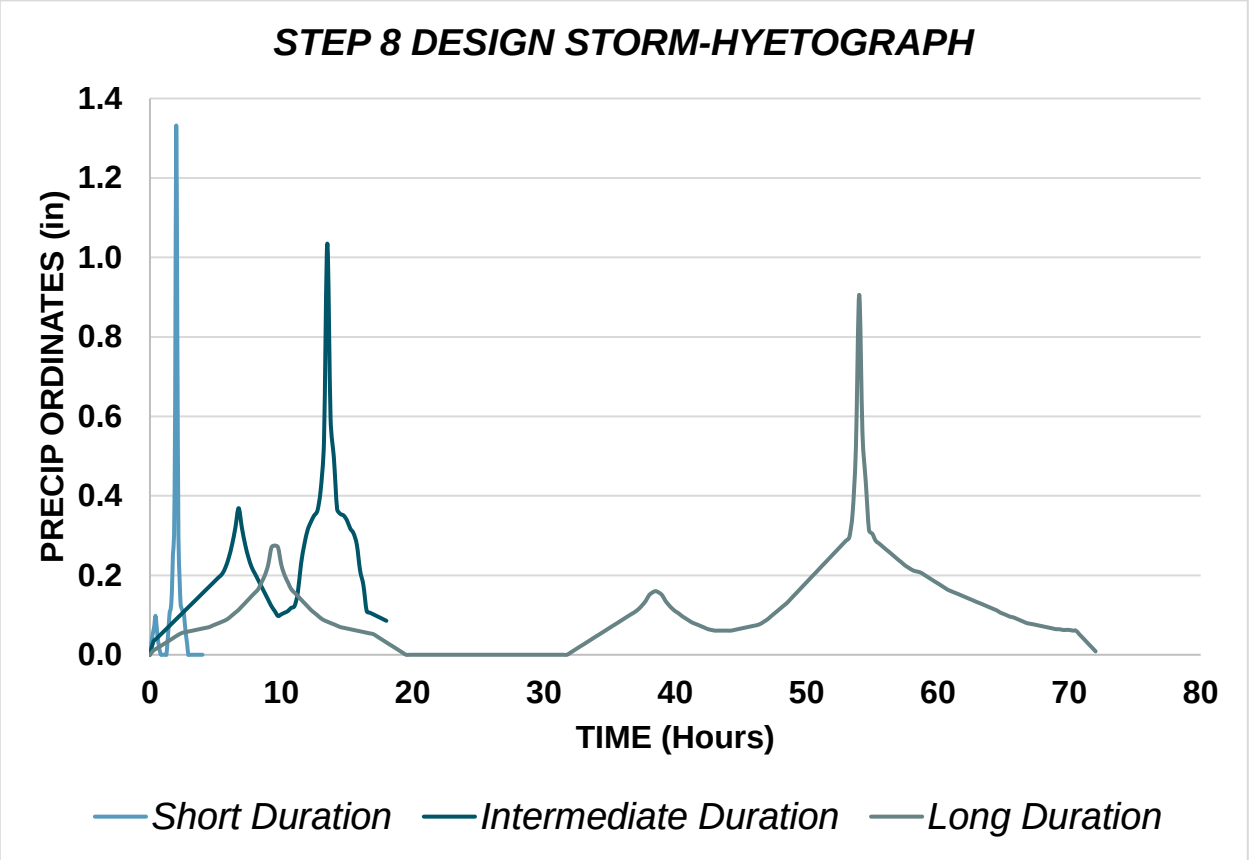
Table 3-5
Snowmelt Contribution for Design Storms

Frequency/Design Step		100-year	500-year	Step 8
Intermediate	Snowmelt (inches)	1.32	1.42	1.97
	Total Precipitation (inches)	6.26	7.59	15.3
	Precipitation + Snowmelt (inches)	7.58	9.01	17.3
Long	Snowmelt (inches)	4.45	4.65	5.52
	Total Precipitation (inches)	13.2	16.0	29.4
	Precipitation + Snowmelt (inches)	17.7	20.6	34.9

3.5.10 Calculate Design Storm Hyetograph

The design storm hyetographs were calculated based on a dimensionless unit-hyetograph. Technical Note 3 presents unit hyetographs for each storm duration and climatic region. The hyetographs are normalized so that the incremental ordinates add up to 1.0. The ordinates are then simply multiplied by the total design storm depth to obtain design storm precipitation values. Hyetographs showing the precipitation distribution estimated for the short-, intermediate-, and long-duration Step 8 design storms are plotted in Figure 3-1.

Figure 3-1
Design Storm (Step 8) Hyetographs



Notes:
in: inch

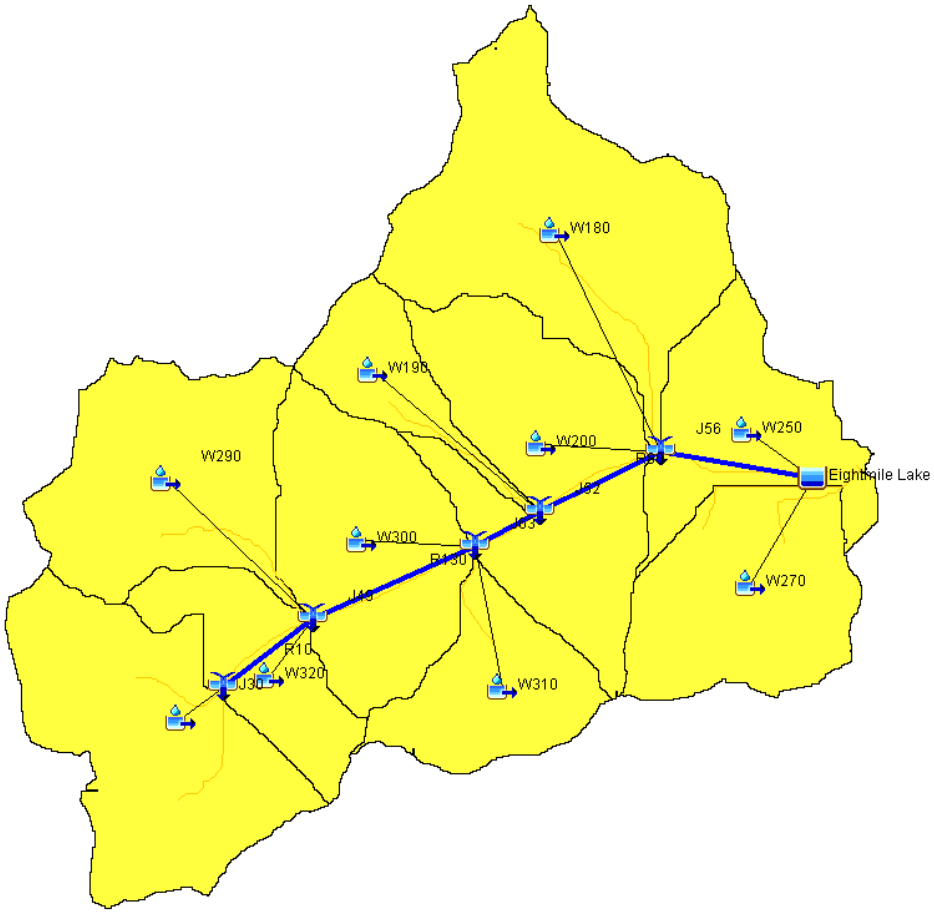
3.6 Design Storm Hydrologic Analysis

3.6.1 Methodology

The United States Army Corps of Engineers (Corps) Hydrologic Modeling System (HEC-HMS) software was used to estimate runoff volumes and flow rates from the drainage basin tributary to Eightmile Lake for the short-, intermediate-, and long-duration design storms characterized in Section 3.5. HEC-HMS software simulates the hydrologic processes of dendritic drainage systems and estimates hydrologic parameters, including infiltration, runoff routing, and runoff hydrographs.

The Eightmile Lake drainage basin was further divided into ten smaller sub-basins for the analysis. These were delineated using GIS software and DEM data from the USGS. The sub-basins used for the HEC-HMS analysis are shown in Figure 3-2.

Figure 3-2
HEC-HMS Sub-basin Delineation



Notes:
HEC-HMS: Hydrologic Modeling System

3.6.2 Soil Characteristics and Land Cover

The NRCS Web Soil Survey (Web Soil Survey 2017) for the area was reviewed to identify the soil characteristics for each sub-basin. Soils within the drainage area as a whole are characterized as follows:

- Rock outcrop – Rubble land-Glaciers snowfields complex, 30% to 99% slopes, no Hydrologic Soil Group. This soil covers approximately 51% of the drainage and is described as having lithic bedrock at 0 inch depth.
- Andic, Cryumbrepts-Haplocryods – Rock outcrop complex, 30% to 75% slopes, Hydrologic Soil Group C. This soil type covers approximately 29% of the drainage and is categorized as

having low available water storage and is underlain by bedrock 20 to 40 inches below ground surface (BGS).

- Soda – Very boulder sandy loam, 30% to 60% slopes, Hydrologic Soil Group B. This soil group covers approximately 16% of the drainage and is described as well drained, having low available water storage (about 4.3 inches), with a vegetative classification of subalpine fir/Cascade azalea.
- Culvop – Very gravelly loam, 30% to 60% slopes, Hydrologic Soil Group D. This soil covers approximately 3% of the drainage and is described as having very low water storage and is underlain by bedrock 10 to 20 inches BGS.

A hydrologic group of C was selected for the hydrologic analysis because a majority of the 6.1 square miles of drainage area tributary to Eightmile Lake are classified as Rock outcrop complex soil types. Hydrologic Type C group soils have low infiltration rates when thoroughly wetted and consist of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine textures. While the majority of the soils in the drainage have a high rate of water transmission, the underlying bedrock is relatively close to the surface.

3.6.3 Land Cover and Curve Number

The drainage area tributary to Eightmile Lake is undeveloped. Vegetation on the lower slopes tributary to the lake consist of shrubs and subalpine fir forests. The NRCS developed a method of combing the effects of soil type, topography, and land cover on the precipitation-runoff relationship into a single parameter called the runoff curve number. The HEC-HMS software uses the NRCS runoff curve number as one of the key parameters to calculate runoff. To determine the appropriate runoff curve numbers for each sub-basin, a hydrologic soil group was identified based on the soil characteristics of the site. Runoff curve numbers were estimated from Table 2-2c in the NRCS TR-55 Urban Hydrology for Small Watersheds (USDA NRCS 1986) for each sub-basin. Based on review of soil and land cover within the drainage area tributary to the lake, it was determined that site primarily contains a cover type of rocky outcrop and brush with less than 50% ground cover (poor conditions) over soils that are primarily in Hydrologic Soil Group C. Each sub-basin was assigned a composite runoff curve number that was used in the HEC-HMS model. The resulting composite runoff curve number for the entire basin was estimated at 80.

3.6.4 Estimated Inflow from Design Storm

The HEC-HMS model results for peak inflow and runoff volume for the short- (2-hour), intermediate- (6-hour), and long-duration (24-hour) design storms are included in Appendix F. Table 3-6 summarizes the key results.

Table 3-6
Estimated Inflow from Design Storm

	Design Storm (Step 8) Peak Inflow and Runoff Volume		
	Short	**Intermediate [1]**	**Long [1]**
Peak Inflow (cfs)	2,865	5,450	5,315
Runoff Volume (acre-feet)	890	4,460	9,535

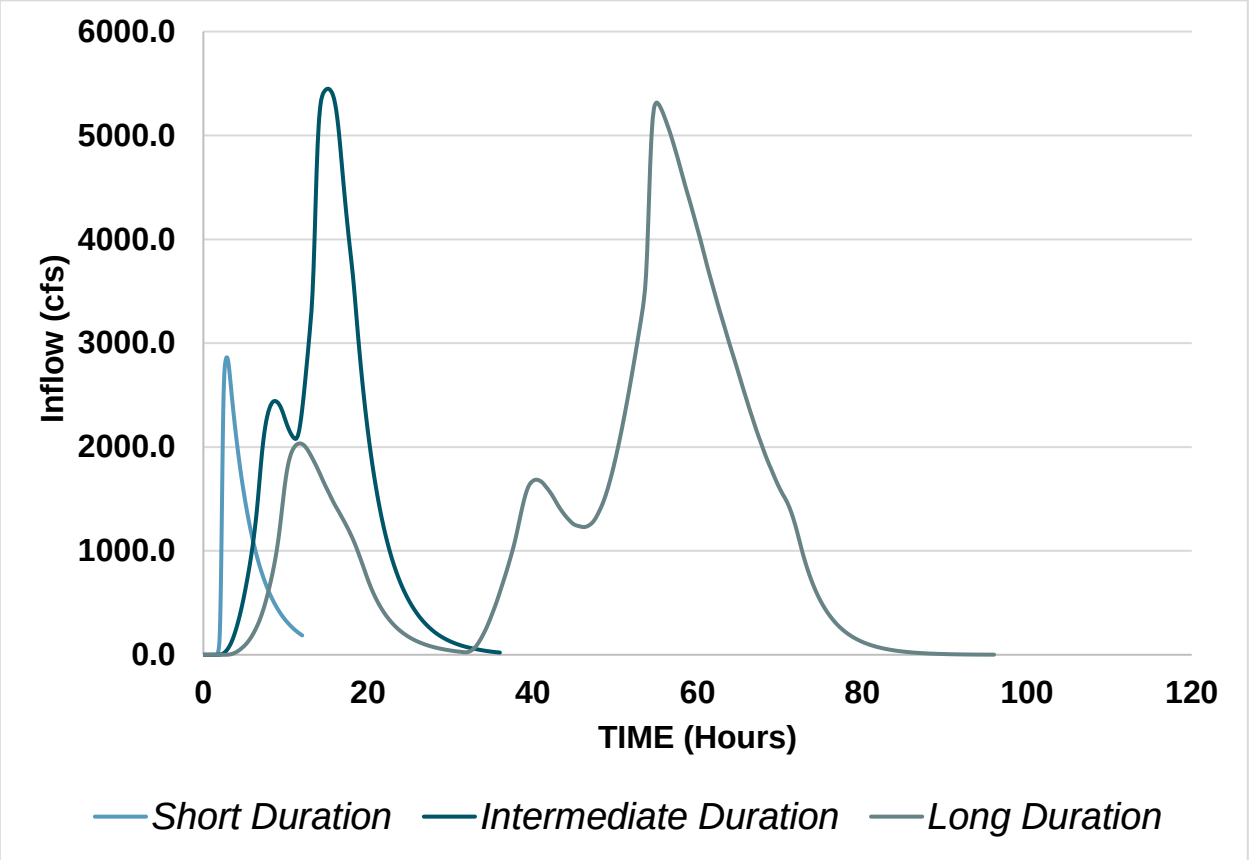
Notes:
1. The intermediate and long duration storm values include estimated snowmelt contributions
cfs: cubic feet per second

Design storm hydrographs were generated based on the HEC-HMS model results discussed above. The short-, intermediate-, and long-duration hydrographs for the Step 8 design storm resulting from the HEC-HMS analysis are shown in Figure 3-3.

3.6.5 Comparison to USGS Methodology

Ecology DSO recommended that the results from HEC-HMS be reviewed and that a check be completed using the USGS StreamStats program. DSO suggested that the variables used to estimate the time of concentration and excess runoff method in HEC-HMS (land cover and curve number) sometimes underestimate runoff from the short-duration storm. DSO suggested that the 100-year runoff estimated by USGS StreamStats be used to calibrate HEC-HMS by comparing the StreamStats results with the HEC-HMS results. The USGS StreamStats program estimates peak flow rates at basin outlet based on precipitation data and regression equations that relate flows at the basin outlet to measured flow rates at nearby USGS gaging stations. StreamStats was used to estimate the 2-year and 100-year flow rates at the outlet of Eightmile Lake. Peak runoff at the outlet of Eightmile Lake was estimated at 195 cfs for the 2-year precipitation event and 468 cfs for the 100-year precipitation event using USGS StreamStats. Peak runoff values for the 100-year short-, intermediate-, and long-duration precipitation events calculated using HEC-HMS were 338 cfs, 1,615 cfs, and 1,961 cfs respectively. In this case, HEC-HMS underestimated the runoff from 100-year short-duration storm, due to the relatively high curve number used. The curve number is used to estimate the amount of precipitation that does not run off due to infiltration or capture by vegetation. Because less precipitation is infiltrated or captured by vegetation during a short-duration storm, using the same curve number that is used for longer duration storms can result in a low estimate of runoff from the short-duration storm. Due to the shallow bedrock in this area, a relatively high curve number was used, which resulted in a conservative estimate of the 100-year short-duration storm in HEC-HMS.

Figure 3-3
Design Storm (Step 8) Inflow Hydrographs



Note:
cfs: cubic feet per second

4 Eightmile Lake Storage Restoration Design

The proposed reservoir improvements and grading are shown in the feasibility-level design drawings submitted with this report (Appendix A). This section summarizes the design of the proposed improvements.

4.1 Design Criteria

IPID proposes to replace the existing dam, low-level outlet pipe, and controls to meet the following design criteria:

- **Normal High Water Surface Elevation (WSEL):** The design will restore dam facilities so that the spillway and normal high WSEL are 4,671.00 feet, equal to the historical high WSEL.
- **Useable Storage Capacity:** The design will restore the useable storage capacity in Eightmile Lake to the annual release volume allowed by IPID's water right (2,500 acre-feet).
- **Low-level Outlet Capacity:** The design will allow for controlled release of the useable storage capacity over a 60-day period with a maximum flow capacity in the low-level outlet system of at least 30 cubic feet per second cfs.
- **Controls:** The design will provide improved control of releases with a new gate or valves. The design will also provide for automation and remote control of releases by installing an electronic actuator that can be connected to telemetry for remote control from IPID's office.
- **Regulatory Requirements:** The design will comply with minimum requirements and standards of Ecology's DSO, as required to get DSO approval of a dam construction permit. The following key criteria have been identified:
  - Spillway facilities will be sized to pass the inflow design flood while maintaining a minimum freeboard of 0.75 feet.
  - Low-level outlet facilities will be designed to provide for controlled release of water while preventing seepage or uncontrolled release of water under the dam.

4.2 Site Preparation

Drawing D-01 in Appendix A illustrates the proposed work that would need to be done to prepare the site for construction. Construction of the improvements would need to occur late in the summer after the lake has been drawn down to the invert elevation of the existing low-level outlet pipeline. The following would need to be done to prepare the site for construction:

- The lake would likely need to be drawn down further to allow improvements to be constructed "in the dry" through pumping, and dewatering facilities would need to be available to allow for dewatering of seepage water in excavations during construction.
- An area would need to be selected for staging of equipment and materials.
- Temporary erosion controls and other environmental protection measures would need to be installed prior to any disturbance and maintained throughout construction.

- Logs and debris collected at the edge of the lake along the proposed work area would need to be removed.
- The proposed construction area would need to be cleared of debris and vegetation. One of the goals of construction would be to minimize impact to native plants and vegetation, so the clearing area should be limited to just what is needed to construct the improvements.
- The existing control gate, debris rack, and related improvements would be removed.
- The rock masonry/concrete dam structure would be removed.
- The low-level outlet pipeline would be exposed by removing rock over the pipeline and excavating down to the pipe.
- The low-level outlet pipeline would be removed.

Additional detail and specific requirements for site preparation, demolition of existing facilities, and removal and disposal of materials will be included in the detailed drawings and project specifications prepared for construction.

4.3 Dam and Embankment Restoration

The project would replace the existing rock masonry/concrete dam structure and earthen embankment with new structures designed to meet the criteria specified in Section 4.2. The proposed dam and embankment restoration design is shown in the plan, profile, and section view in Drawings C-01 through C-06 in Appendix A. Key features are detailed in the following sections:

4.3.1 Central Dam and Flow/Level Control

The existing rock/concrete masonry structure will primarily be replaced with a new dam structure that will consist of a reinforced concrete core protected on both sides by an earth and rock embankment. The top of the reinforced concrete dam wall will be set at elevation 4,676.5 feet to provide freeboard over the spillway sections, as discussed in Section 4.5. Earth embankment, consisting of native material with a topping of native rocks and boulders will be placed on the upstream and downstream sides of the wall to protect the wall from debris and ice. An 8-foot wide notch in the center of the wall will allow IPID to control the lake level below the spillway elevation with stop logs similar to the form and function of the current dam. Under typical operations, IPID will remove the stop logs in the fall and the lake will fill to the crest elevation of the notch (4,666.0 feet) during the winter and spring. When the snow melts enough to allow access to the lake in the late spring or early summer, IPID will go up and place stop logs in the notch to the elevation of the spillway to allow the lake to capture late spring and early summer runoff and fill to the primary spillway elevation (4,671.0 feet). The lake would be full or near full to the spillway elevation when controlled releases begin late in the summer.

4.3.2 Primary Spillway Section

The design and sizing of spillways is detailed in Section 4.5. The primary spillway would include a 99-foot-long spillway section with a crest elevation of 4,671.0 feet, which matches the spillway elevation of the existing dam structure. The spillway section would consist of a reinforced concrete cutoff wall extending north from the reinforced concrete portion of the central dam structure. The spillway wall would be protected on the upstream and downstream sides by an earth and rock embankment. On the downstream side of the wall, the spillway would be lined with gabion baskets filled with native rock and slush concrete.

4.3.3 Secondary Spillway Section

The topography of the site indicates that there is a low spot south of the existing dam that is approximately 3 feet lower than the proposed and historical primary spillway elevation (4,671.0 feet). A secondary spillway section would be constructed in this low spot to provide additional spillway capacity, as described further in Section 4.5. The secondary spillway would include a 75-foot-long spillway section with a crest elevation of 4,673.2 feet. This spillway section would also consist of a reinforced concrete cutoff wall, protected on the upstream and downstream sides by an earth and rock embankment. Because the spillway crest would generally only extend a few feet above the existing ground surface, the extent of fill required would be limited. On the downstream side of the wall, the spillway would be lined with gabion baskets filled with native rock and slush concrete.

4.4 Spillway Analysis and Design

The primary spillway (crest elevation = 4,671.0 feet) will act as the main spillway for discharging peak flows to Eightmile Creek. The secondary spillway (crest elevation = 4,673.2 feet) was designed to provide additional capacity for flows exceeding the 100-year return interval storm inflow event. The following sections describe the approach used to size the spillway facilities.

4.4.1 Reservoir Storage and Spillway Dimensions

The HEC-HMS program was used to calculate the impact of flow routing through the improved Eightmile Lake. The crest elevations, lengths, and top elevations of the spillway and dam walls were adjusted through an iterative process to determine the spillway dimensions and elevations required to pass the Step 8 design storm peak flows from Eightmile Lake while maintaining a minimum of 0.75 feet of free board in the lake.

During the winter and spring, when the intermediate- and long-duration storm events are most likely to occur, the lake level would normally be at or below the crest elevation of the flow control notch because no stop logs would be placed in the notch until the late spring or early summer. During the early summer, with the stop logs placed in the notch, the lake level would fill to the primary spillway elevation. To reflect this, the analysis of the intermediate- and long-duration storms assumed a

starting lake level of 4,666.0 feet and the short-duration analysis assumed a starting lake level of 4,671.0 feet. The analysis also assumed that valves on the low-level outlet would be closed so that the only outflows from the lake would be through the flow control notch or the spillways. Table 4-1 summarizes the proposed flow control notch and spillway dimensions and characteristics identified as part of this analysis. The flow control notch and primary and secondary spillways will be designed to discharge flows to the existing Eightmile Creek channel east of the dam.

Table 4-1
Spillway Dimensions and Characteristics

Design Variable	Flow Control Notch	Primary Spillway	Secondary Spillway
Crest Length (feet)	8	99	75
Crest Elevation (feet)	4,666.0	4,671.0	4,673.2
Side Slopes (H:1V)	0	0	3
Approximate Channel Length (feet)	18	18	18
Approximate Channel Drop (feet)	2	4	1
Bed Material	Concrete Filled Gabions	Concrete Filled Gabions	Concrete Filled Gabions

Notes:
H:1V: horizontal to 1 vertical

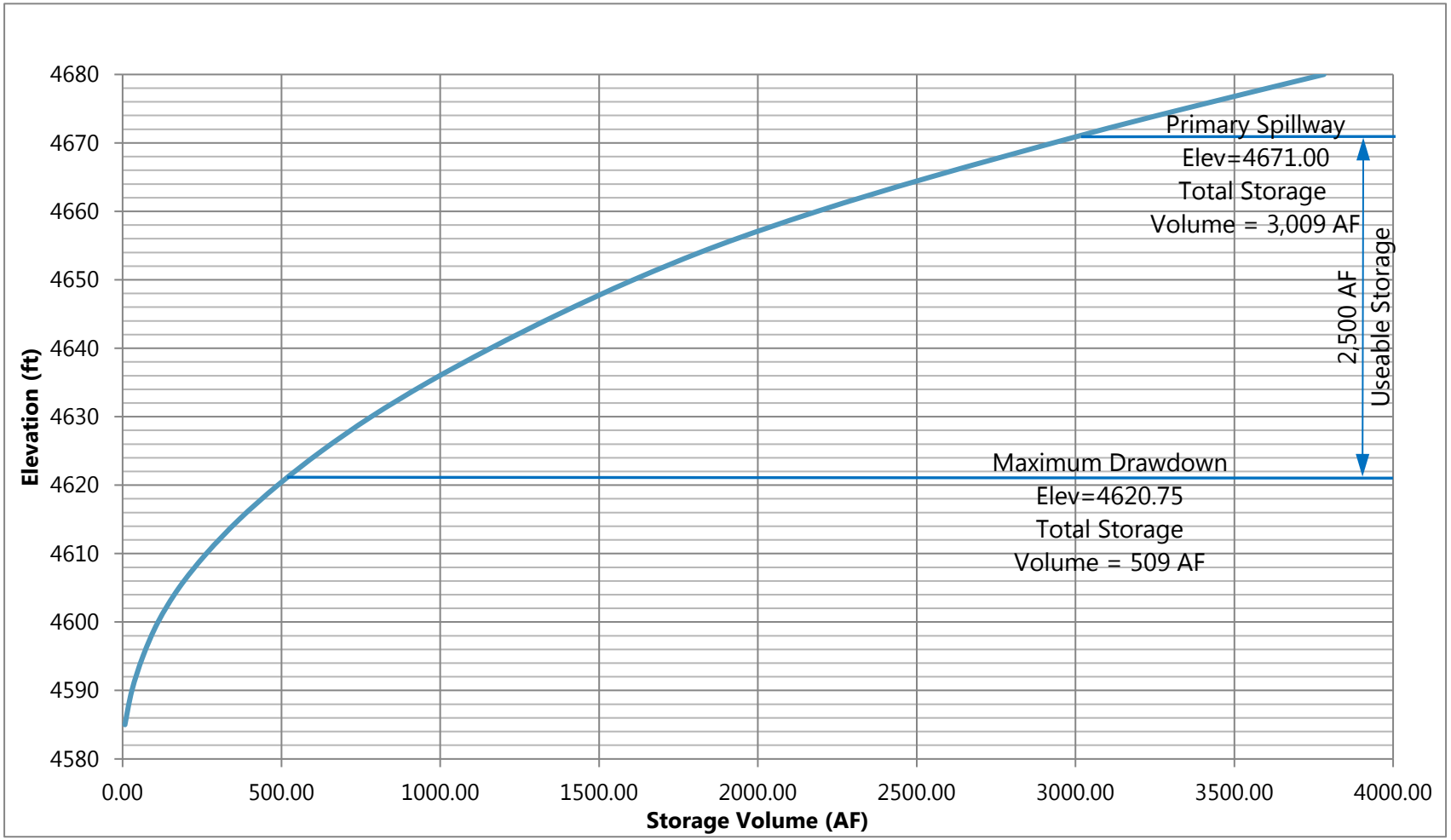
4.4.2 Spillway Discharge Calculations

A spreadsheet was downloaded from the DSO Web Site to verify spillway channel capacity. The spreadsheet (Appendix G) uses Manning's Equation to calculate the Froude number at set water level intervals based on the emergency spillway channel dimensions, material roughness, and channel slope. The calculations confirm that, at all stages, flow in the spillway channels will be super-critical, which means that flow at the crest of the spillways will be critical.

4.4.3 Inflow Routing Calculation

Because the flow is critical over the crest of the emergency spillway, the HEC-HMS program uses the standard broad-crested weir equation for critical flow to route flows from the lake through the spillways based on the given spillway characteristics shown in Table 4-1 and other the hydrologic inputs summarized in Section 3. The routing routine in HEC-HMS also relies on a user input stage-area-storage relationship for the lake. As part of the analysis, the lake contours from Gravity Consulting, LLC, and the proposed design were reviewed to verify the stage-area-storage relationship for Eightmile Lake with proposed improvements. The stage-storage curve for the proposed reservoir is included as Figure 4-1 with key storage and spillway elevation noted. The relationship between the water surface elevation, water surface area, and storage volume above the primary spillway crest elevation is summarized in Table 4-2.

Figure 4-1
Proposed Eightmile Lake Stage-Storage Curve



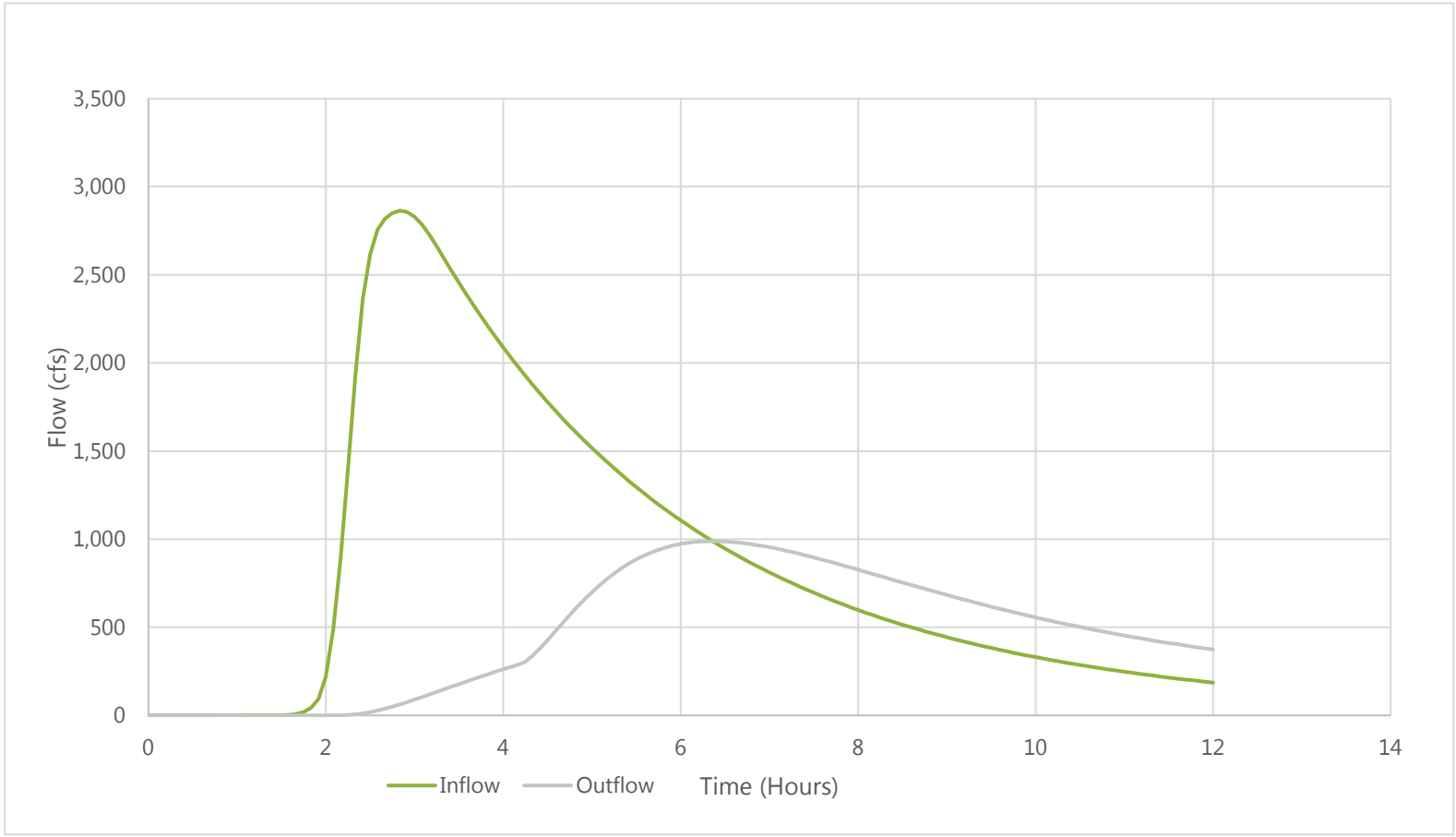
Notes: AF: acre-foot

Table 4-2
Elevation – Area – Storage Relationship Above Primary Spillway

Elevation (feet)	Depth Over Primary Spillway (feet)	Water Surface Area (acres)	Total Storage Above Primary Spillway (acre-feet)
4,671.0	0.0	81.4	0.0
4,671.5	0.5	81.9	41.7
4,672.0	1.0	82.4	83.4
4,672.5	1.5	82.9	125.1
4,673.0	2.0	83.4	166.8
4,673.5	2.5	83.9	208.5
4,674.0	3.0	84.4	250.2
4,674.5	3.5	84.9	292.0
4,675.0	4.0	85.4	333.7
4,675.5	4.5	85.9	377.6
4,676.0	5.0	86.4	421.5

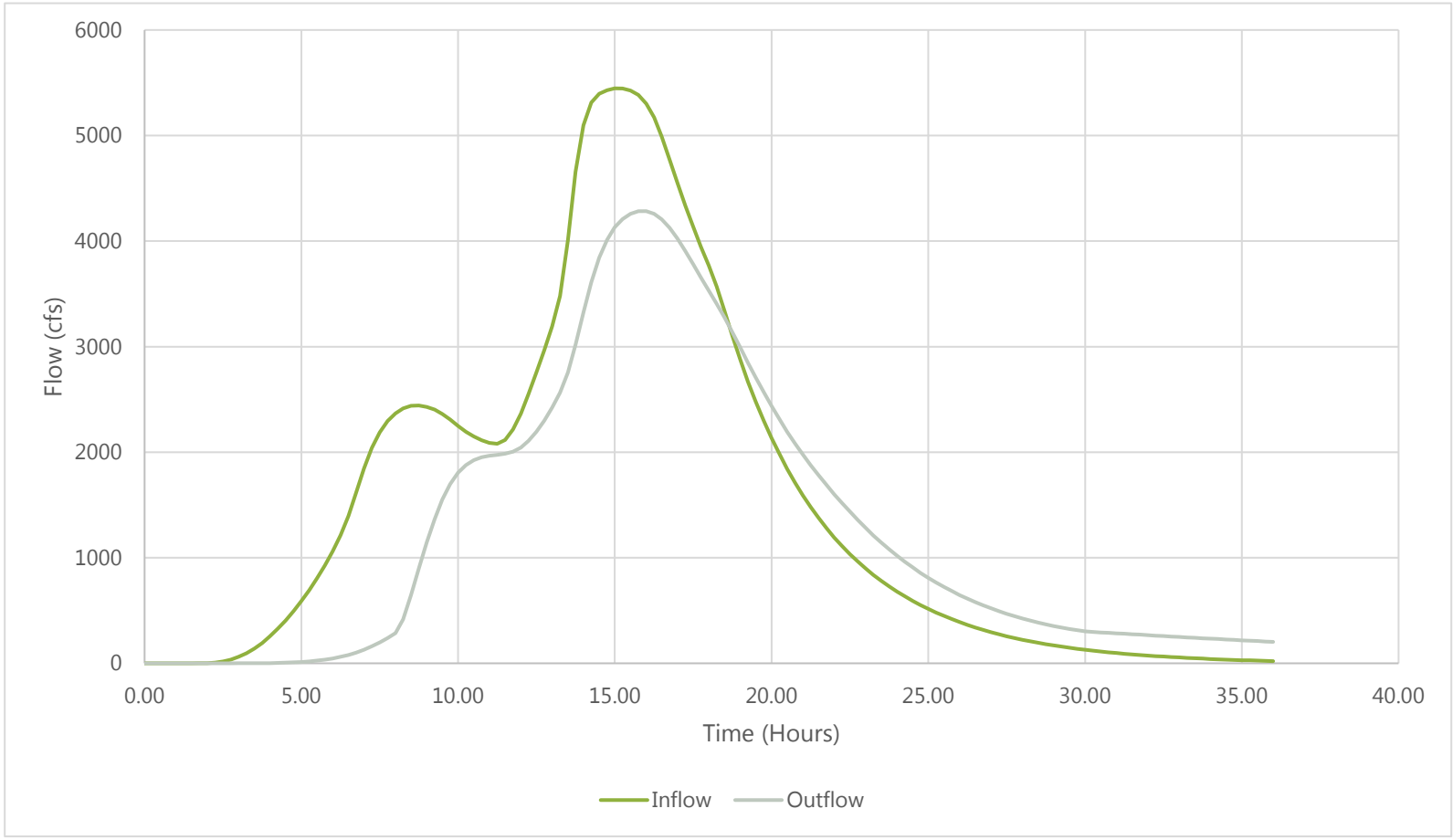
The HEC-HMS model estimates the relationship between inflows and outflows for each time step during the design storm. Inflow and outflow hydrographs were computed based on the Step 8 design storm for the short-, intermediate, and long-duration storms. The HEC-HMS routing results are summarized in Table 4-3, and the inflow-outflow relationships can be seen in Figures 4-2, 4-3, and 4-4. The results show that the peak inflow will be somewhat attenuated by the storage volume in the reservoir above the crest of the emergency spillway. Consequently, estimated peak outflows are less than peak inflows. However, the attenuation is limited, especially for the intermediate- and long-duration storms because the volume of the lake is small relative to the size of the watershed, the lake would start at full (to the primary spillway elevation), and the volume of runoff from the design storm would be much greater.

Figure 4-2
Short-Duration Storm, Inflow-Outflow Relationship



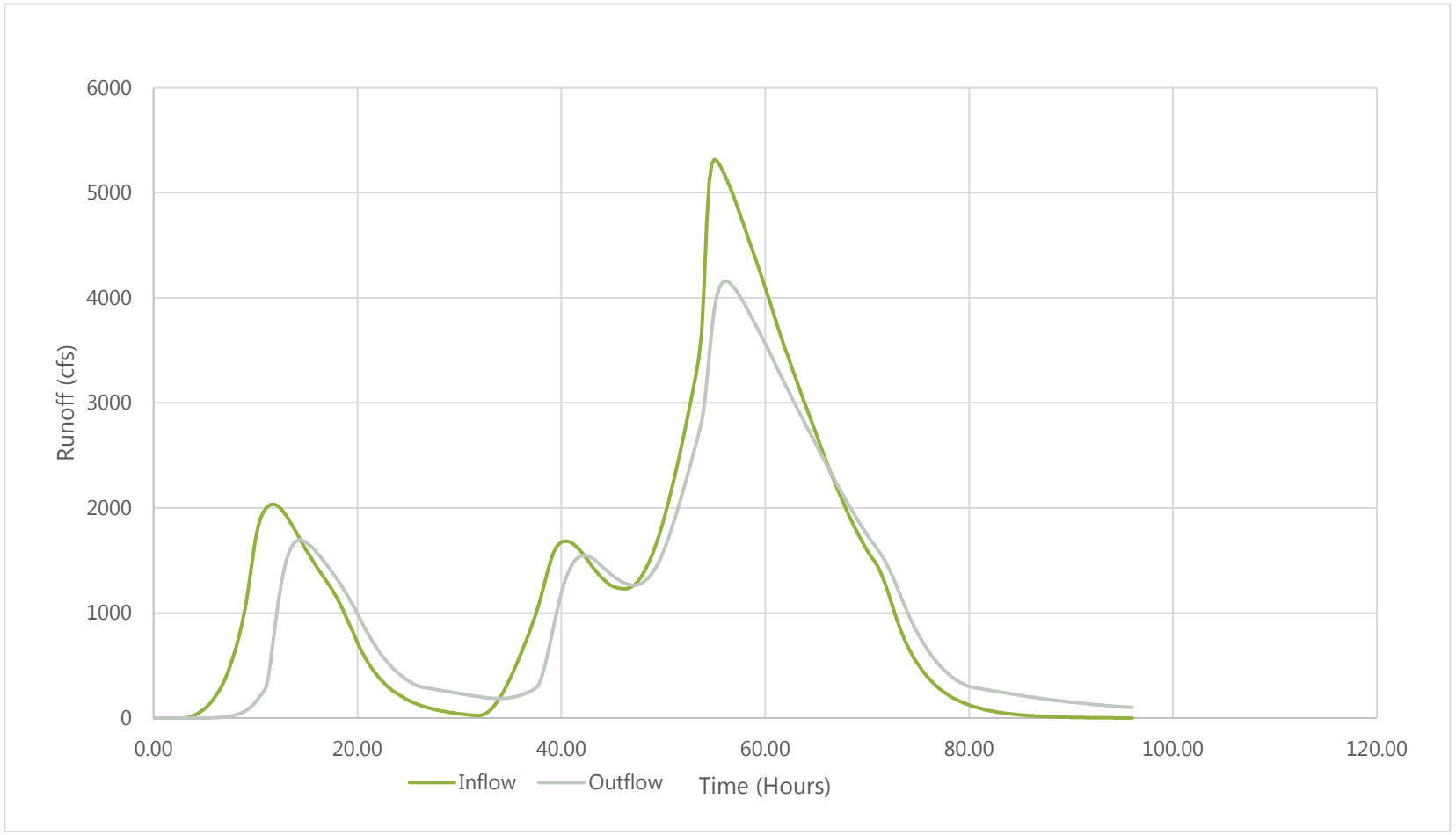
Note:
cfs: cubic feet per second

Figure 4-3
Intermediate-Duration Storm, Inflow-Outflow Relationship



Note:
cfs: cubic feet per second

Figure 4-4
Long-Duration Storm, Inflow-Outflow Relationship



NoteL
cfs: cubic feet per second

4.4.4 Inflow Design Flood Selection

With the dam and spillway configured as summarized above and shown in Drawings C-01 through C-06 in Appendix A, the intermediate-duration storm produces the highest water surface elevation and peak discharge rate over the spillways and is therefore the IDF, as shown in Table 4-3. The IDF results in a maximum WSEL of 4,675.7 feet, or 4.7 feet above the primary spillway crest elevation (4,671.0 feet) and 2.5 feet above the emergency spillway elevation (4,673.2 feet). With the top of the structure walls and embankment at 4,676.5 feet, the freeboard at the maximum WSEL is approximately 0.8 feet, which is slightly more than the required 0.75-foot minimum freeboard based on an analysis for intermediate dam freeboard.

Table 4-3
Spillway Outflow Summary for Potential Inflow Design Storms

	Short	Intermediate	Long
Peak Inflow (cfs)	2,864	5,447	5,315
Peak Outflow (cfs)	997	4,308	4,183.5
Peak Depth Above Primary Spillway (feet)	1.4	4.7	4.6
Peak Water Surface Elevation (feet)	4,672.4	4,675.7	4,675.6
Peak Storage Above Emergency Spillway (acre-feet)	3,031	3,314	3,305

Notes:
Results for intermediate and long storms include estimated snowmelt contribution
cfs: cubic feet per second

4.5 Low-level Outlet Pipe, Valves, and Release Controls

The proposed design also includes replacement of the low-level outlet pipeline and slide gate with a new pipeline that will be controlled by valves. The design of the low-level outlet pipeline, valves, and related controls is shown on Drawings C-07 through C-09 in Appendix A. The low-level outlet system would include the following primary components:

- **Low-level Outlet Pipeline:** The pipeline would consist primarily of 30-inch (nominal diameter) butt-fused, solid-wall high-density polyethylene (HDPE) pipe, which has an average inside diameter of approximately 27 inches. The pipe would neck down to 24-inch at valve enclosures to reduce the size and cost of the proposed valves. The pipe invert would be 4,618.25 feet at the inlet, 4,645.50 feet at the dam, and 4,614.00 feet at the outlet to Eightmile Creek. When the lake is full, the pipeline would operate full under gravity to release water from the lake, despite the high point in the pipe at the dam. When the lake is drawn down below the high point in the pipe at the dam, the pipe would operate as a siphon, relying on atmospheric pressure to keep water flowing through the pipe. This would allow IPID to draw

down the lake to an elevation of 4,620.75 feet without pumping to access the full 2,500 acre-feet of storage permitted by IPID's water right.

- **Inlet Debris Rack:** A cylindrical debris rack, consisting of welded-steel or aluminum bar, would be attached to the pipe inlet to keep debris from entering the pipeline.
- **Pipe Anchoring:** Approximately 380 feet of pipeline would be installed along the lake bottom. The pipe would likely be installed by floating the pipe on the lake and then filling the pipe with water so that it drops and rests along the lake bottom. The pipe would require anchoring to prevent the pipe from floating when water is evacuated from the pipe.
- **Encasement:** The proposed pipe would be buried from the lake to the outlet in Eightmile Creek. The pipe would be encased in reinforced concrete under the dam and embankment.
- **Isolation Valve Enclosure:** A 24-inch gate valve would be provided in an enclosure on the downstream side of the dam to allow IPID to isolate the pipeline below the dam. The isolation valve would be designed to be either fully open or closed. The valve would be left open during normal operations and would be closed only when needed to maintain the pipeline downstream of the valve. The valve enclosure would also include an air release valve on the upstream side of the isolation valve that would allow for the release of air from the pipeline as it fills with water over the winter and spring. A vacuum pump would be provided with a connection to the pipeline for use in priming the pipeline, in the event that the siphon breaks when the lake level is drawn down and releases are occurring. The enclosure would also include a sump pump to evacuate water. Power for the vacuum pump and sump pump would come from batteries charged by a nearby solar panel. The enclosure would consist of a 60-inch-diameter pipe riser with a weathertight, locking lid and an access ladder.
- **Control Valve Enclosure:** A 24-inch plug valve would be provided to control flow through the pipeline near the downstream end of the pipeline. The valve would be closed during the winter, spring, and early summer. As the lake fills, the pipeline would fill behind the valve. In the late summer the valve would be adjusted to release flows to Eightmile Creek. The plug valve would be equipped with an electronic actuator and connected to telemetry to allow for automated releases to be controlled by IPID via radio from their office in Cashmere. Automation of releases from the Alpine Lakes is detailed in the *Feasibility Study, Alpine Lakes Optimization and Automation* report (Aspect 2017), which is being prepared concurrent with this report. The actuator would be powered by batteries charged by a nearby solar panel. The enclosure for the valve, actuator, batteries, and controls would consist of a 60-inch-diameter buried pipe riser with a weathertight, locking lid above the ground surface and an internal access ladder.

As outlined in the Dam Safety Guidelines Part IV: Dam Design and Construction, there are five primary concerns for the hydraulic design of low-level outlet pipelines:

- The inlet invert elevation of the low-level outlet must be selected so as to sufficiently evacuate reservoir storage while remaining free of sedimentation.
- Sufficient discharge capacity should be provided for the project demands and future needs.
- Sufficient discharge capacity should be provided to allow for drawdown of the reservoir in a reasonable period of time for emergencies, maintenance, inspections, and repair of reservoir elements that would normally be submerged.
- The design should provide features to reduce slug flow potential.
- The design should provide redundant and repairable valves and shut-off capabilities to allow for conduit inspection and repairs, and prevent unintended release of storage waters if a system component were to fail.

4.5.1 Hydraulic Analysis

Table 4-4 summarizes the key design parameters for the low-level outlet pipeline. Hydraulic analysis of the low-level outlet indicates that the pipeline would generally have capacity to release water at rates in excess of 30 cfs. When the lake is full, the control valve would need to be partially closed to limit releases. For example, if the lake were full to the spillway elevation (4671.00 feet), the control valve would need to be closed to 40° to restrict the discharge to Eightmile Creek to less than 36 cfs. As the lake draws down, flow through the pipeline would decrease until the valve would need to be fully open to release 30 cfs. If the lake were drawn down to an elevation approaching the pipe inlet, the capacity would drop further. For example, if the lake were fully drawn down to the top of the pipe at the inlet (4,620.75 feet), with the valves fully open and the siphon fully primed, the pipeline would be able to discharge nearly 18 cfs to Eightmile Creek.

Table 4-4
Low-level Outlet Pipeline Analysis

Parameter	Design Value
Low-level Invert Elevation at Outlet to Channel	4,614.00 feet
Outlet Water Surface Elevation at Channel	4,614.00 feet
Low-level Invert Elevation at Dam	4,645.50 feet
Low-level Inlet Invert Elevation at Lake	4,618.25 feet
Nominal Pipe Diameter	30 inches
Nominal Pipe Diameter at Valves	24 inches
Pipe Material	Solid-wall HDPE, butt-fused
Pipe Length	844 feet
Q_{min} with Lake Surface at 4,620.75 (Fully Drawn Down, Siphon Flow)	17 to 18 cfs
Q with Lake Surface at 4,623.25 (Drawn Down, Siphon Flow)	~30 cfs
Q with Lake Surface at 4,671.00 (Lake Full, Valve Closed at 40°)	35-36 cfs
Q with Lake Surface at 4,671.00 (Lake Full, Valve Fully Open)	>100 cfs

Notes:
cfs: cubic feet per second
HDPE: high-density polyethylene
Q: flow rate
Q_{min}: minimum flow rate

4.6 Reservoir Operations

Table 4-5 summarizes the anticipated operation of the controls at the proposed dam and on the low-level outlet. The lake would fill during the late fall, winter, and spring to the crest elevation at the bottom of the flow control notch. When the snow melts and the lake is accessible in the late spring or early summer, IPID would place stop logs in the notch to the elevation of the primary spillway and the lake level would continue to rise to the spillway level through the early summer. When additional flows are needed in Icicle Creek, the control valve would be opened. The control valve would be adjusted remotely by IPID to optimize releases to meet instream flow and irrigation water supply needs. The operation of the low-level outlet would transition from gravity flow to siphon as the lake level drops below the high-point on the pipeline (elevation 4,645.5 feet). At the end of the irrigation season the control valve would be closed, the stop logs would be removed, and the system would be winterized. If the lake has been fully drawn down and the siphon breaks, the low-level outlet would fill as the lake refills over the winter. The air release valve located at the high-point of the pipeline near the dam would release air trapped in the pipe as it fills with water.

Table 4-5
Anticipated Reservoir Operations

Month	Storage Level	Stop Logs in Flow Control Notch[1]	Low-level Outlet Pipe Operation[2]	Isolation Valve Status[3]	Control Valve Status[4]
January	Refill	Removed	Closed/Filling	Open	Closed
February	Refill		Closed/Filling	Open	Closed[4]
March	Refill/Spill		Closed/Filling	Open	Closed[4]
April	Refill/Spill		Closed/Filling	Open	Closed
May	Refill/Spill		Closed/Filling	Open	Closed
June	Refill	Placed to 4,671.0	Closed	Open	Closed
July	Full (4,671 Max)		Release Begins	Open	Partially Opened
August	Draw Down		Gravity Release	Open	Partially Opened
September	Draw Down		Gravity/Siphon Release	Open	Fully Opened
October	Low (4,621 Min)	Remove	Closed	Open	Closed
November	Refill		Closed/Filling	Open	Closed
December	Refill		Closed/Filling	Open	Closed

Notes:

1. Stop logs would be placed in the flow control notch in late spring, early summer to the spillway elevation when snow has melted and the lake is accessible. Stop logs would be removed at the end of the release period in early October.
2. Releases through the low-level outlet would occur during the late summer, with initial release operating fully under gravity flow conditions and late in the summer under siphon flow conditions.
3. The isolation valve would remain open unless the downstream end of the pipe needs to be isolated for maintenance.
4. The control valve would be used to control releases from the low-level outlet. It would generally remain closed until the late summer and then adjusted to release flows to match needs in Icicle Creek during the late summer. If desired the valve could be operated to allow for some release to meet Leavenworth National Fish Hatchery water supply needs during the winter low flow period.

4.7 Restored Useable Storage Capacity

The proposed improvements would restore the useable storage capacity in Eightmile Lake to 2,500 acre-feet, which is the annual volume permitted for release by IPID's water right. If the total usable storage is released over a 60-day release period, the average flow release would be approximately 21 cfs. Automation of the control valve will allow for remote control and adjustment of releases to more closely match the need for additional water downstream in Icicle Creek. The actual period of release will vary from year to year and the magnitude of the releases will be modified throughout the release period to meet water supply needs.

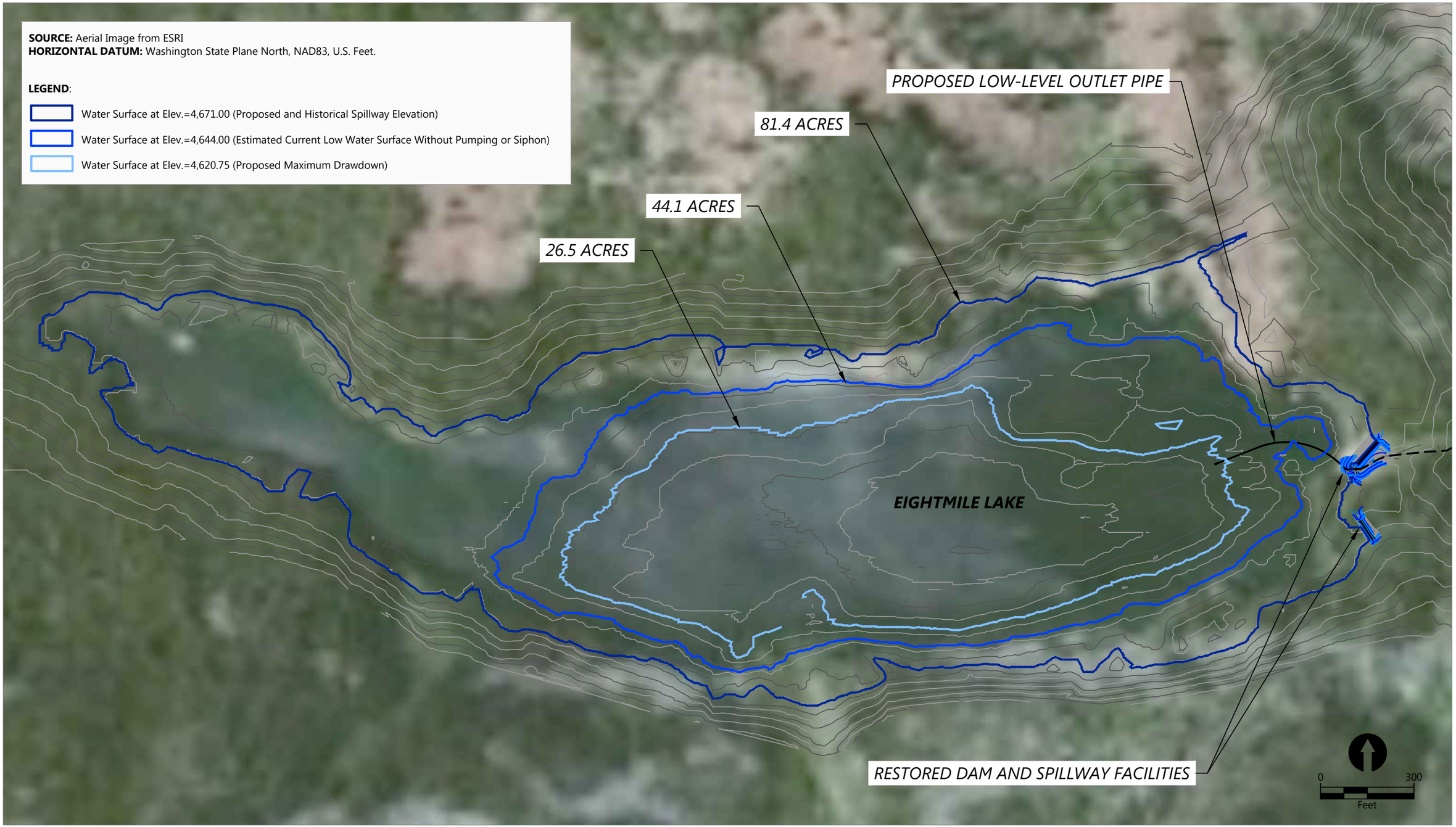
Figure 4-5 illustrates the new high and low water surfaces that would result from implementation of the proposed project, as reflected in the feasibility level design drawings. When the lake is full to the primary spillway elevation (4,671.00 feet), the water surface area of the lake will be approximately 81.4 acres. When the lake is drawn down to the top of the low-level outlet pipe at the inlet (4,620.75 feet), the water surface area of the lake will be approximately 26.5 acres. When the lake is

drawn down to the invert of the existing low-level outlet pipe, the water surface area is approximately 47.9 acres. However, as noted earlier, the lake continues to draw down due to seepage. Forsgren Associates, Inc., and Gravity Consulting, LLC, estimated the low draw-down elevation to be approximately 4,644 feet, which corresponds to a water surface area of approximately 44.1 acres.

SOURCE: Aerial Image from ESRI
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.

LEGEND:

- Water Surface at Elev.=4,671.00 (Proposed and Historical Spillway Elevation)
- Water Surface at Elev.=4,644.00 (Estimated Current Low Water Surface Without Pumping or Siphon)
- Water Surface at Elev.=4,620.75 (Proposed Maximum Drawdown)



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Filepath: K:\Projects\0204-Aspect Consulting, L.L.C\Icicle Creek Comp Water Mgt\Eightmile Lake\0204-RP-001 FS FIG 4-5.dwg FIG 4-5

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Figure 4-5
Eightmile Lake Water Surface Area Comparison

Eightmile Lake Feasibility Study
Icicle and Peshastin Irrigation Districts

5 Construction Approach

5.1 Constraints and Limitations

The primary challenge to implementation of the proposed Eightmile Lake Storage Restoration project will be determining how to construct the project at a remote location within the Alpine Lakes Wilderness Area that is not accessible by roads. The project will require careful planning to secure appropriate permits and ensure that the project can be constructed safely to meet the requirements of the design. The primary constraints and limitations that will need to be addressed are construction access; mobilization of the work crew, provisions, equipment, and materials; delivery and control of materials to meet specification requirements; and constructing the project within what could be a very tight window between when the lake is drawn down and when the snow falls.

5.2 Access and Mobilization

As noted earlier and shown in Figure 1-1, Eightmile Lake is located 10 miles west of the City of Leavenworth, Washington. The lake is situated within Sections 32 and 33, T24N, R16E, and is entirely within the Alpine Lakes Wilderness Area. There are no roads that access the lake directly. The lake can be accessed on foot via the Eightmile Lake Trail (USFS Trail No. 1552). The trailhead is accessible from Leavenworth by vehicle following Icicle Road, USFS Road 7600, and USFS Road 7601. The distance from the trailhead to the lake is approximately 4 miles.

For routine maintenance and access, IPID accesses Eightmile Lake on foot. To complete maintenance at multiple lakes and for activities that require more equipment than can be easily carried on foot, IPID accesses the lakes via helicopter. Typically, that access is provided with a small helicopter with a payload of 1,000 to 2,000 pounds, which limits the number of people and amount of gear that can be transported in one trip. IPID has used helicopters recently to access nearby Colchuck Lake to perform more intense maintenance activities that have required the transport of a small work crew, hand tools, camping gear, food and provisions for the work, sacks of concrete, other materials, mixing equipment, and a generator. Transporting the work crew, other equipment, and materials has typically required multiple trips in a small helicopter.

5.3 Access Options

The proposed Eightmile Lake Storage project would require access by a work crew and transport of gear, food and provisions, hand tools, larger mechanical equipment (including at least one excavator, a small tracked loader, a means of mechanically sorting on-site materials, and possibly concrete mixing equipment), concrete, pipe, valves, generators, dewatering pumps, trench protection equipment, debris rack, and other construction materials. To the extent possible, rock and earthen material would be sourced from on site. Transporting larger mechanical equipment and some of the

other construction materials that will be required to the site will likely require access via one of the following methods.

5.3.1.1 Helicopter

Transport of larger equipment and materials would require a much larger helicopter than what is used by IPID for typical maintenance. Columbia helicopters provides helicopter transport services for heavy lift, firefighting, and military applications. Columbia helicopters was contacted to understand the costs and limitations associated with use of helicopters to haul equipment and materials to the site (Dave Horax 2017). They provided the following information on options for helicopter transport:

- **Columbia Vertol 107-II:** The Vertol 107-II is a tandem rotor aircraft with a maximum gross weight of 22,000 pounds. The maximum payload at the elevation of the proposed project would be approximately 7,000 to 8,000 pounds. Mobilization of the helicopter and pilot would carry a $20,000 fee. The rental fee would be $7,500 per hour.
- **Columbia Chinook CH-47D:** The Chinook CH-47D is a tandem rotor aircraft with a maximum gross weight of 50,000 pounds. The maximum payload at the elevation of the proposed project would be approximately 20,000 to 22,000 pounds. Mobilization of the helicopter and pilot would carry a $45,000 fee. The rental fee would be $15,000 per hour.
- **Columbia 234-UT:** The 234-UT is also a tandem rotor aircraft with a maximum gross weight of 51,000 pounds. The maximum payload and costs for mobilization and rental would be similar to the cost for the Chinook CH-47D.

Other helicopter options exist that can carry similar payloads, but there are relatively few options that have a payload capacity similar to the Chinook CH-47D. With a payload capacity of 20,000 to 22,000 pounds, the Chinook CH-47D would have capacity to carry most of the materials and equipment. However, the challenge will be transporting an excavator that is large enough to efficiently move the material needed to remove and replace the existing dam and low-level outlet pipeline. For example, the largest Cat excavator that weighs less than 22,000 pounds would be a Cat 308E2 excavator, with an operating weight of 18,519 pounds. The 308E2 is a 65-horsepower machine and is classified as the largest of Cat's mini excavators. Other equipment that may need to be flown in by helicopter could include a small tracked multi-terrain loader.

One of the other key challenges will be transporting concrete; either the concrete would have to be batched on site with on-site water, or the concrete would have to be batched off-site, hauled to a pick-up location near the site, and transported via helicopter to the site. Columbia helicopters indicated that the Chinook CH-47D does not have a big bucket or hopper for transporting concrete. However, the Vertol 107-II helicopter has a bucket that can hall 1-1/2 yards of concrete.

5.3.1.2 Combined Helicopter/Overland Transport

Another option might include transport of smaller gear, equipment, and lighter materials with a small to medium-sized helicopter and walking a larger excavator to the site. A larger excavator would be able to complete the work much more efficiently, and transport overland would be much less expensive. However, this approach would likely have more of an impact on the environment along the trail to Eightmile Lake. Walking the excavator would consist of shifting the weight from the bucket to the tracks to maneuver the excavator over rocks, logs, and earth in a way that would minimize the impact on vegetation and other natural resources. IPID has proposed to investigate this option with the USFS to identify an overland route that would have least impact. IPID has indicated that there is a historical roadbed that was used in the past for access to Eightmile Lake that extends from Eightmile Lake Road up the slope almost to the boundary of the Alpine Lakes Wilderness. The existing Eightmile Lake Trail (USFS Trail No. 1552) ascends a steep slope from the trailhead and then uses this historic road bed as it extends west to the Alpine Lakes Wilderness Area. The historical road bed could be used as a route to transport the excavator part of the distance to Eightmile Lake. Where the trail narrows and enters the Alpine Lakes Wilderness Area, the excavator could be carefully maneuvered over rocks and logs near the base of the slope, parallel to but off the trail, where there is less vegetation that would be disrupted.

A couple of different types of excavators were investigated as options for this approach:

- **Standard Tracked Excavator:** The work required to restore storage at Eightmile Lake would be most effectively done with a medium- to large-sized tracked excavator, such as a Cat 330. This type of excavator moves on a heavy base with tracks and uses the tracks to distribute weight and travel over surfaces that are highly variable. IPID has a medium-sized excavator, as do most local contractors that would do this type of work.
- **Spider Excavator:** Another option may be to use a spider excavator. A spider excavator has legs with rubber-tired wheels, rather than a base with tracks. The legs and rubber-tired wheels allow for greater maneuverability. Some spider excavators come equipped with telescopic hydraulic stabilizing jacks that can extend from the front legs to stabilize the equipment for work on steep terrain. Spider excavators are often used on ski slopes and in remote mountain terrain, similar to the terrain around Eightmile Lake. Use of a spider excavator would likely have less impact on the environment, but would not likely provide the same horsepower, lifting, and digging capacity as a standard tracked excavator. Spider excavators are also less common, and so use of this type of excavator would likely limit the number of contractors that would be able to do the work. A contractor was contacted in California that does spider excavation all over the Western United States. The cost for the excavator and an operator would be $200 to $250 per hour, depending on the size of machine, plus a $200 per day per diem rate and a mobilization/demobilization fee of $5,000.

5.3.2 Comparison

Table 5-1 provides a summary and comparison of the potential approaches to accessing the site and delivering equipment and materials to the site.

Table 5-1
Potential Construction Access and Mobilization Approach Comparison

Access and Mobilization Approach	Large Helicopter, Small Excavator	Overland Access, Tracked Excavator	Overland Access, Spider Excavator
Mobilize Crew, Provisions	Small Helicopter or Trail	Small Helicopter or Trail	Small Helicopter or Trail
Mobilize Equipment	Small Helicopter	Small Helicopter	Small Helicopter
Mobilize Excavator	Large Helicopter	Walk Overland	Walk Overland
Mobilize Excavator	Large Helicopter	Small-Medium Helicopter	Small-Medium Helicopter
Type of Excavator	Small Excavator	Medium-Large Excavator	Spider Excavator
Excavator Example	Cat 308E2	Cat 330F	Menzi Muck M545
Excavator Weight	20,000 Pounds Max	60,000 Pounds+	25,000 to 30,000 Pounds
Excavator Horsepower	65 hp	235 hp	180 hp
Excavator Max Dig Depth	13 to 14 feet	23 to 24 feet	15 to 30 feet[1]
Impact to Environment	Least impact to area between trailhead and Eightmile Lake	Most impact to area between trailhead and Eightmile Lake	Some impact to area between trailhead and Eightmile Lake
Cost	Highest due to Helicopter Mobilization, Rental	Lowest	Slightly Higher than Standard Excavator
Equipment Limitations	Helicopter Payload; Excavator Size, Power, and Lifting Capacity	Excavator Maneuverability	Excavator Size, Power, and Lifting Capacity
Contractor and Equipment	Requires Specialized Helicopter, Pilot; Could Transport Other Equipment, Like a Small Tracked Loader	Standard Contractor, Standard Equipment	Specialty Contractor, Specialty Excavator
Work, Efficiency	Least Efficient due to Small Excavator	Most Efficient (Except that mobilization would take more time)	Medium Efficiency (Mobilization would also take time)

Notes:

1. Excavation depth depends on chassis configuration and position relative to ground slope.

hp: horsepower

5.4 Materials Delivery and Staging

The proposed project will require a variety of materials, including earth, rock, concrete, reinforcement, pipe, valves, valve enclosures, a debris rack, stop logs, an actuator, a vacuum pump,

risers, solar panels, batteries, controllers, and other miscellaneous equipment. The following challenges will arise related to material delivery and quality control during construction:

- **Earthwork** – To the extent possible, native material should be used to construct the embankment and backfill excavations. Typically, specifications for materials placed for a dam structure or backfill adjacent to a structure have requirements for the size distribution of materials, compaction, moisture content, and other characteristics. The quality of these materials is managed by reviewing the materials prior to placement and performing compaction tests to ensure that materials are properly placed. Ensuring that on-site materials meet specific requirements will be a challenge for this project because the site is so remote. Sorting materials properly will be difficult because there will be a limit to the type of mechanical sorting equipment that can be brought to the site. Compaction testing equipment will have to be flown in and a certified testing agency will need to access the site regularly.
- **Concrete** – The project will require placement of approximately 168 cubic yards of concrete. As noted previously, concrete will either need to be flown in or batched on site. The benefits and challenges of flying in the concrete would include the following:
  - The concrete would be batched in a plant to meet the specifications.
  - The time between batching and placing the concrete could push acceptable limits. Depending on where concrete is batched, it would likely take more than an hour to transport concrete to a pick-up point, transfer the concrete to the hopper on the helicopter, and fly the concrete to the site.
  - Managing the moisture content throughout the transport would be a challenge.
  - Helicopters have limited capacity, so many trips would need to be made to transport concrete. The limited delivery rate would make the work less efficient.
  - There would be potential for pollution in flying concrete in a helicopter, so pollution controls would need to be implemented.

  The benefits and challenges of batching the concrete on site would include the following:
  - The concrete would not need to be transported long distances.
  - The dry concrete materials, including cement and aggregate, would have to be flown in, which would add complexity and time to the mobilization effort.
  - Quality control of the material would be very challenging. It would be almost impossible so that the concrete placed consistently meets the material specifications.
  - It would be difficult to manage the quality of the water used in the concrete mix.
  - On-site water would need to be used for the concrete mix, which may not be of consistent or appropriate quality for the concrete mix.
  - Batching on site would have potential for pollution and would require controls.
  - Space would need to be identified on site for mixing concrete and staging materials.
- **Other Equipment** – Pre-fabricated or manufactured materials and equipment would need to be transported to the site via helicopter and staged in a safe place prior to installation. HDPE

pipe would need to be transported in segments small enough for helicopter transport and then joined on site with a butt fusion machine. Valves, valve enclosures, a debris rack, stop logs, an actuator, a vacuum pump, risers, solar panels, batteries, controllers, and other miscellaneous equipment would all need to be transported in loads that were within the limitations of the helicopter. This may require some on-site assembly.

5.5 Construction Sequence and Scheduling

Sequencing of construction will be critical because the schedule for completing the work will be limited by the following:

- **Lake Drawdown** – The work at the lake will need to be completed after the lake has been drawn down well below the existing low-level outlet so that work can be completed "in the dry". Typically, the lake is not drawn down until late summer, when IPID releases water to maintain irrigation water supply. However, during the year the improvements are constructed, IPID may need to manage its other reservoirs to allow for early drawdown of Eightmile Lake. The draw down will still be constrained by the natural hydrologic cycle. If there is above average snow pack and a cool spring weather, the lake may still be capturing a lot of natural runoff well into late June or early July.
- **Weather** – Due to the location and elevation of Eightmile Lake, snow often begins to fall in October, although significant snow accumulation typically does not occur until November. Freezing weather may occur much earlier in the fall. In addition, October rainfall can result in runoff that would impact the lake level and the Contractor's ability to keep the site dry for construction. The Contractor will have to sequence and manage construction so that the project can be constructed in dry conditions and is substantially complete before significant snow accumulation or extended freezing weather occurs.

Ultimately, it is recommended that the construction specifications and contract documents be prepared so the selected Contractor as much flexibility as possible in determining the appropriate means and methods, schedule, and sequence for construction. Some of those means and methods, such as how materials and equipment are mobilized, where materials are staged, and what kind of controls will need to be in place to protect the environment, will likely be limited by permit approvals. However, to the extent possible, it will be beneficial to IPID and project funders to provide as much flexibility as possible to prospective bidders to figure out how to get the work done within the limitations dictated by the permit requirements and natural constraints at the site.

6 Cost Analysis

6.1 Summary of Probable Implementation Costs

Table 6-1 summarizes the opinion of probable project implementation costs for the project. A more detailed breakdown of the opinion of probable costs is included in Appendix H. The opinion of probable costs includes the following assumptions and allowances:

- An allowance of 10% of the construction subtotal (without helicopter costs) for general mobilization/demobilization.
- A separate allowance for helicopter mobilization and rental fees, as described below.
- A 20% contingency for the low estimate and a 40% contingency for the high estimate.
- A 20% allowance for engineering, permitting, and construction administration.
- A sales tax at 8.2%.

Table 6-1
Opinion of Probable Project Implementation Costs

Item	Cost
Site Preparation	$ 42,000
Demolition of Existing Facilities	$ 126,000
Install Low-Level Outlet and Valves	$ 449,000
Rebuild Dam and Embankment	$ 591,000
Automate Valves to Optimize Releases[1]	$ 45,000
Construction Subtotal[2]	**$ 1,253,000**
General Mobilization/Demobilization (10%)	$ 125,300
Helicopter Mobilization/Demobilization/Rental	$ 390,000
Construction Total[2]	**$ 1,768,000**
Contingency – LOW (20%)	$ 353,600
Contingency – HIGH (40%)	$ 707,200
Engineering, Permitting, and Administration	$ 353,600
Sales Tax	$ 144,976
Project Total - LOW[2,3]	**$ 2,620,000**
Project Total - HIGH[2,3]	**$ 2,974,000**

Notes:
1. Cost associated with installing monitoring equipment and telemetry connection to Icicle and Peshastin Irrigation Districts are included in the opinion of probable project costs for the Alpine Lakes Optimization and Automation project, as reported in the *Feasibility Study: Alpine Lakes Optimization and Automation* (Aspect 2017) and are not included here.
2. Subtotals and totals are rounded to the nearest $1,000.
3. Costs are represented in May 2017 dollars. Actual costs may vary based on labor rates, equipment costs, and materials costs at the time of construction.

6.2 Helicopter Mobilization and Rental

The opinion of probable project costs assumes that helicopters would be used to mobilize materials and equipment to the site, as discussed in Section 5. As noted earlier, Columbia Helicopters was contacted to get updated preliminary budget information on the cost of hauling equipment and materials to the site via helicopter. Table 6-2 summarizes the likely helicopter mobilization and rental costs that would be associated with this approach.

Table 6-2
Likely Helicopter Mobilization and Rental Costs

Type of Helicopter	Payload	Mobilization Fee	Rental Fee
Small[1]	1,000 to 2,000 pounds	--	$15,000 per day
Columbia Vertol 107-II[1, 2]	7,000 to 8,000 pounds	$20,000	$7,500 per hour
Columbia Chinook CH-47D[1, 2]	20,000 to 22,000 pounds	$45,000	$15,000 per hour

Notes:
1. Actual prices may vary based on availability of helicopters at the time of construction.
2. Provided by Columbia Helicopters.

The costs assume the following:

- A helicopter with a large payload, similar to the Chinook CH-47D, would be used to haul a small excavator, a tracked multi-terrain loader, and any other relatively heavy equipment and materials to the site to facilitate the work. Costs assume helicopter mobilization and 6 hours of use at the beginning and mobilization and 4 hours of use at the end of the project.
- A small helicopter with a payload of 1,000 to 2,000 pounds, contracted from a local helicopter company, would be used to transport provisions, smaller equipment, and personnel. This would require up to 10 total days of use during the project.
- Concrete materials would be mixed on site for the dam replacement project at Eightmile Lake. The alternative would be to haul ready-to-pour concrete via helicopter to the site, which would likely be accomplished with a smaller helicopter and more helicopter trips.

6.3 Long-term Operating Costs

The following are the costs to operate and maintain the new facilities:

- Regular maintenance and repair of valves, monitoring equipment, and communications equipment
- Repair and servicing of the power supply system (rechargeable direct current (DC) solar/battery power system)
- Inspection and repair of the new low-level outlet pipeline and related equipment

- One 2-day trip to the lake in the late spring to clear debris, place stop logs to capture the late spring early summer runoff, and perform preliminary start-up activities
- One 2-day trip to the lake in the fall to winterize the facilities
- Other short trips, as needed, to address operational issues, inspect the facilities, perform routine maintenance and cleaning, and prime the siphon in the event that the siphon pressure and flow break

Operation and maintenance of the proposed facilities would likely require more effort than the current facilities. However, remote operation of the facilities could reduce the number of trips required to access the lake because trips would not need to be made to adjust the gate to control releases. A conservative allowance of 0.5% of the total project cost was considered as a guideline for annual operations and maintenance costs (in 2017 dollars). Based on this guideline, operations, and maintenance costs would be on the order of $15,000 per year. This level of operations and maintenance would cover a 2-day trip to place stop logs and perform preliminary start-up activities in the late spring, a 2-day trip to winterize the facilities in the fall, two additional 1-day visits to the lake per year by IPID personnel to perform routine maintenance and resolve operational issues, and an allowance for cleaning, inspection, and repair of equipment at Eightmile Lake. The long-term operating costs would likely increase with inflation.

7 Water Rights

This section provides a summary of IPID's water rights and provides recommendations and guidance for additional work needed to prepare a change application to accommodate any changes in use of the water needed to be consistent with the goals and intent of the Icicle Strategy.

7.1 History

In 1926 Icicle Irrigation District (IID) filed an application with the state Office of Supervisor of Hydraulics (an Ecology predecessor agency) requesting to divert water from Eightmile Lake for seasonal irrigation. A petition was also filed with the Department of Public Lands (a Department of Natural Resources predecessor) to procure the shore and overflow rights to the lake[1]. The Office of Supervisor of Hydraulics issued a permit (Permit 828) in January 1927 to develop the lake source. Following payment of fees to cover damages to state lands from overflow of the lake, the Department of Public Lands then issued an Order dated October 26, 1927, which reads in part: "the right to overflow and perpetually inundate said lands [Eightmile Lake] may be duly exercised in accordance with the terms of this order[2], the lands included being more particularly described as follows: The bed and shores of Eight Mile Lake."

In 1927, water rights to Icicle Creek and its tributaries were adjudicated in Chelan County Superior Court. The 1929 Final Court Decree affirmed IID's water right permit for Eightmile Lake in the amount of 25 cfs, 2,500 acre-feet. The decree noted that the water right represented by the permit was "inchoate but may be perfected by compliance with provisions under which the permits were issued; that these rights for storage of water under said permits do not affect the water rights of any other claimant herein reported."

The storage right was subsequently certificated (Certificate 1228) by the Office of Supervisor of Hydraulics for 25 cfs for the purpose of irrigation of 7,000 acres; no annual quantity was specified on the certificate. The 2,500 acre-feet of annual storage volume specified in the Court Decree establishes the maximum authorized storage volume.

In the *Draft Icicle Irrigation District Instream Flow Improvement Options Analysis Study*, Forsgren Associates, Inc., and Gravity Consulting, LLC, estimated that the current high water mark corresponds to a usable storage volume of approximately 1,375 acre-feet, whereas the top of dam overflow elevation represents a usable volume of 1,666 acre-feet. Based on preferential operation of the lake early in the season, IPID can obtain approximately 300 acre-feet of additional capacity below the

[1] Additional applications and petitions were concurrently filed for use of water from Klonaqua Lake and Colchuck Lake.

[2] No specific terms were spelled out in the Order. The Order references Section 102, Chapter 255 of the Session Laws of 1927. This chapter and section authorized the Commissioner of Public Lands to grant the right to "back and hold water" and overflow and inundate state shore lands for the purpose of constructing and operating works for the impoundment of water for irrigation and other uses.

gravity outlet by relying on natural seepage in the late summer/early fall. The total lake volume is 2,700 to 3,000 acre-feet at these corresponding water surface levels, which is in excess of the 2,500 acre-feet permitted to be stored and beneficially used under IID's water right. In dry years, it is possible for IID to augment its usable storage volume by drawing down the lake further than the normal outlet elevation through additional mechanical or gravity means. The water right record is unclear whether IID's water rights are single-fill storage rights, or whether they can rely on additional natural flows to augment storage, which would further enhance the beneficial use history of the water right. If additional water right authority were needed to augment storage to meet Guiding Principles under an Icicle Integrated Plan, it is possible that additional spring filling water rights could be granted by Ecology because water is routinely available in excess of adopted instream flows during this time period.

In 1990 IPID and the USFS agreed to a land exchange where the USFS received title to IPID's interest in lands adjacent to Eightmile Lake. Lands at Eightmile Lake conveyed to USFS are described as Section 5, Lots 1 and 2 of Township 23 N, Range 16 EWM and Section 33, Lot 1 of Township 24 N, Range 16 EWM. These descriptions correspond to an approximately 40-acre-square parcel at the lake outlet and dam structure and an approximately 80-acre rectangular parcel along the south shore of the lake (see Figure 2-3). Under the land exchange agreement recorded with the Chelan County recorder's office IPID retained several rights to the land, including the following:

> A nonexclusive, perpetual easement across, through, along, and upon the property described herein for the purposes of maintenance, repair, operation, modification, upgrading and replacement of all facilities presently located in or upon the property described herein, together with a nonexclusive right of ingress to and egress from all such facilities for all such purposes, in accordance with Rules and Regulations of the Secretary of Agriculture, 36 CFR 251.17 and 251.18, attached hereto and made a part hereof, in such manner as not unreasonably to interfere with its use by the United States, its authorized users or assigns, or cause substantial injury thereto.
>
> The Grantor [IPID] may exercise the rights hereunder by any means reasonable for the purposes described, including but not limited to the use of motorized transportation and equipment, or aircraft. These rights include the right to regulate water level of all facilities located upon the property described herein. In performing maintenance, repair, operation, modification, upgrading and replacement of facilities located in or upon the property described herein, the Grantor will not without prior written consent of the Forest Service, which consent shall not unreasonably be withheld, materially increase the size or scope of the facilities.

The recorded deed further recognized that IPID reserved their rights under water right Certificate 1228 and the Order granted by the Commissioner of Public Lands.

7.2 Water Right Change Strategy and Process

The proposed project would convert this historical irrigation use to a combination of instream flow and municipal uses, while retaining irrigation use authority with uses matched to water availability in different types of water years according to the IWG Guiding Principles. A key element to the water right change strategy is obtaining a new secondary use permit to authorize the reoperated water uses. Under this proposal, the total restored quantity (2,500 acre-feet), will be placed into the trust water rights program for instream flows and mitigation through the issuance of a new secondary use permit. This trust water right will be managed through a trust water right agreement that will stipulate in drought years that up to 1,600 acre-feet will be available to IPID for irrigation. In non-drought years, this water will remain instream for environmental benefit. Annually, up to 900 acre-feet of consumptive use will be available for new mitigated permits to the City of Leavenworth and Chelan County to support domestic use.

Additional secondary use permits can be issued per the guidelines laid out in Revised Code of Washington (RCW) 90.03.370. New secondary use permits are subject to the four-part test:

1. Availability: If storage is restored to the original high water mark, water will be available for this use.
2. Impairment: This new secondary use permit is non-diversionary and non-consumptive in nature. Increased stream flow will not likely impair senior water users.
3. Public Interest: Ecology has found on numerous occasions that increased stream flows are in the public interest. Other public interest factors would need to be considered including recreation, aesthetics, wilderness values, and others. These are being considered more fully in the PEIS.
4. Beneficial Use: The legislature has determined that instream flows and mitigation are a beneficial use in Chapter 90.38 RCW and 90.42 RCW. So too are irrigation, domestic, and municipal uses under RCW 90.54.020.

Applying for a secondary use permit will require the parent water right, Certificate 1228, to undergo a tentative determination of extent and validity. This will require consideration of beneficial use, relinquishment, and abandonment, which has not occurred since the adjudicated water right was issued. If there are periods of 5 years or more where underutilization has occurred, the statutory exemptions provided in RCW 90.14.140 would need to be examined for applicability. Because this is primarily a storage right, Ecology will consider whether 2,500 acre-feet per year was impounded and stored. The amount of water released will also inform that analysis.

8 Environmental and Permitting Strategy

A preliminary environmental and permitting evaluation was completed as part of the *Appraisal Study, Eightmile Lake Storage Restoration* (Anchor QEA 2015). That evaluation identified natural resources that could be impacted by the proposed project, summarized potential impacts and regulatory requirements, and provided a list of anticipated permits that would be required to complete the project. As noted in Section 1, the Anchor QEA/Aspect team is currently working toward completion of the *Icicle Strategy Programmatic Environmental Impact Statement*. The PEIS evaluates five alternatives and a no-action alternative. The alternatives each include a suite of projects that are collectively intended to meet the IWG Guiding Principles. The Eightmile Lake Storage Restoration Project is included as a component of three of the five action alternatives evaluated by the PEIS. Another alternative includes an Eightmile Lake Storage Enhancement Project, which is a different project than what is evaluated by this Feasibility Study. The Eightmile Lake Storage Enhancement Project would include facilities that would increase the accessible storage in Eightmile Lake to 3,500 acre-feet by raising the spillway elevation of the dam and increasing drawdown.

As part of the work done for the PEIS, detailed field investigations were completed during a series of July 2016 site visits to verify the natural and cultural resources that could be impacted by the project. The PEIS includes detailed information about these resources and identifies potential impacts to these resources that would result from construction of the improvements to Eightmile Lake. Two supporting reports, the *Icicle Creek Water Resource Management Strategy Draft Cultural Resources Discipline Report* (Anchor QEA 2017a) and the *Icicle Creek Water Resource Management Strategy Draft Natural Resources Discipline Report* (Anchor QEA 2017b) were prepared to summarize field observations and provide additional data to support the conclusions of the PEIS.

This section summarizes the findings of the work that was done to support the PEIS related specifically to the Eightmile Lake Storage Restoration Project, provides an updated table listing the likely permitting and regulatory requirements, and recommends a strategy for securing the necessary permit approvals to construct the project.

8.1 Affected Environment and Anticipated Impacts

The following provides a summary of the resources that would likely be affected by the Eightmile Lake Storage Restoration project, as proposed in this Feasibility Study, and the potential impacts to those resources that could result from the work. Additional detail is provided in the *Icicle Strategy Programmatic Environmental Impact Statement*.

8.1.1 Geology

The geology at the proposed project site was summarized in Section 2.6 and shown in Figure 2-2. Geology is characterized by shallow rocky soils over bedrock or exposed bedrock. A relative large

mass wasting deposit near the outlet of Eightmile Lake includes loose rock and large boulders. On-site rock will be needed for dam and embankment construction. Overall, impacts on geology will be local to the project site and are not anticipated to be significant.

8.1.2 Water Resources and Water Use

The hydrology of the Eightmile Lake drainage basin is described in detail in Section 3. The proposed project will capture and store a portion of the natural winter, spring, and early summer runoff for release during the late summer to improve late summer flow conditions in Lower Icicle Creek. There is potential for some minor short-term water quality impacts, such as increased turbidity, from ground disturbance and placement of new dam materials during construction. Temporary erosion and sediment controls, spill prevention control, and other water quality controls would be installed to protect the water in Eightmile Lake during construction, in accordance with permit requirements and existing water quality standards. The potential impacts would also be minimized by drawing down the lake to construct improvements in the dry. The long-term impacts to downstream hydrology would generally be beneficial as the changes are designed to optimize releases to benefit natural resources in the Icicle Creek Sub-basin.

8.1.3 Aquatic Habitat and Species

Eightmile Lake is within a group of mountain lakes managed in Washington as "high lakes," which have historically lacked suitable spawning habitat or productive conditions for rearing juvenile fish. These lakes likely did not support fish populations until they were introduced for sport fishing by humans. Until 2005, Eightmile Lake had been stocked with cutthroat trout (*Oncorhynchus clarki lewisi*), rainbow trout (*O. mykiss*), and lake trout (*Salvelinus namaycush*). Fish abundance and stocking are tracked by Washington Department of Fish and Wildlife (WDFW) with the help of volunteer organizations. Invertebrates are a major source of food for fish and trout feed primarily on zooplankton and benthic invertebrates.

Eightmile Lake discharges to Eightmile Creek, which is a tributary to Icicle Creek. The Icicle Creek Corridor provides approximately 29 miles of spawning and rearing habitat for salmon and trout species, including Endangered Species Act (ESA)-listed Upper Columbia spring-run Chinook salmon (*O. tshawytscha*), Upper Columbia summer steelhead (*O. mykiss irideus*), and bull trout (*Salvelinus confluentus*). Passage for migratory fish species is blocked at several locations downstream of Eightmile Lake. Passage for migratory species is generally limited above the Icicle Creek Boulder Field at River Mile 5.6. Another project proposed as part of the Icicle Creek Strategy would modify the Boulder Field to improve passage and access to spawning and rearing habitat for anadromous fish species. Resident fish populations of bull trout, cutthroat trout, rainbow trout, and other species of minnows, sculpins, and suckers occupy Icicle Creek above the Boulder Field. Although bull trout and other fish species have been observed in the lower reaches of Eightmile Creek, passage is unlikely in

the upper reaches of Eightmile Creek because the stream has a very steep gradient from Little Eightmile Lake to the lower reach of Eightmile Creek near its confluence with Icicle Creek.

The reoperation of the lake would generally result in increased habitat for resident fish in Eightmile Lake in the early summer and decreased habitat in the late summer. However, because existing fish populations in the lake are likely to be low, impacts would not be significant.

Impacts on fish and other aquatic species likely to be present below Eightmile Lake within Eightmile and Icicle Creek are expected to generally be beneficial because the project would optimize releases from Eightmile Lake to improve passage and habitat conditions in Icicle Creek. Implementation of activities as part of the Tribal and Non-Tribal Fisheries project would further help to ensure there are no significant impacts on tribal fishing.

8.1.4 Vegetation

The Alpine Lakes area is dominated by forested habitat with species such as silver fir (*Abies amabilis*), subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*), and mountain hemlock (*Tsuga mertensiana*) in the upper elevation areas. Avalanche chutes are brushy with deciduous species such as Sitka alder (*Alnus sinuata*), vine maple (*Acer circinatum*), and Rocky Mountain maple (*Acer glabrum*). Lower elevations include Douglas fir (*Pseudotsuga menziesii*), western white pine (*Pinus monticola*), ponderosa pine (*Pinus ponderosa*), shore pine (*Pinus contorta*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) (USFS 2016; Franklin and Dyrness 1973). All of these species were observed during a reconnaissance site visit to Eightmile Lake in July 2016. Dominant shrub and understory species observed during the July 2016 site visit include Scouler willow (*Salix scouleriana*), Cascade azalea (*Rhododendron albiflorum*), twinberry (*Lonicera involucrata*), white spirea (*Spiraea betulifolia*), red huckleberry (*Vaccinium parvifolium*), kinnikinnick (*Arctosaphylos uva-ursi*), and western thimbleberry (*Rubus parviflorus*).

Existing mapping does not identify wetland habitats within the vicinity of Eightmile Lake. During the July 2016 site visit, wetland conditions were not observed at the outlet location, but several potential palustrine emergent, palustrine scrub-shrub, and palustrine forest wetland features were observed along the lake shoreline.

Short-term impacts to existing vegetation may include removal and disturbance of trees and bushes to accommodate the improvements to the dam and low-level outlet pipeline. In addition, short-term impacts could include clearing, removal, or disturbance of vegetation needed for overland access to the site with an excavator, if that option is pursued. Implementation of best management practices, such as clearing limits and protection of existing vegetation, would be implemented to protect vegetation. Long-term impacts would include inundation of area that was historically inundated, but has not recently been inundated by Eightmile Lake. This could impact existing vegetation along the

shoreline of the lake in areas that were historically inundated but have not recently been inundated. However, the area around the lake that would be impacted would be relatively small. As noted previously, the project would also result in an increase in downstream flows within Eightmile and Icicle Creeks. Downstream impacts are anticipated to be beneficial for riparian vegetation along this corridor. Overall, the project is not anticipated to result in significant long-term adverse impacts on vegetation or wetlands.

8.1.5 Wildlife

Wetlands and riparian areas associated with the Alpine Lakes and receiving streams provide habitat for a variety of amphibians, such as Pacific tree frog (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), tailed frog (*Ascaphus truei*), Cascades frog (*Rana cascadae*), Columbia spotted frog (*Rana luteiventris*), and long-toed salamander (*Ambystoma macrodactylum*). Reptiles, such as the western garter snake (*Thamnophis elegans*), are likely to occur in the upland habitats surrounding the lake. Upland habitats with rocks and wood debris support species such as northern alligator lizard (*Elgaria coerulea*) and western fence lizard (*Sceloporus occidentalis*). Common garter snakes (*Thamnophis sirtalis*) and northern alligator lizards were observed during the July 2016 site visit.

Mammal species associated with forested habitats at the Alpine Lakes area include mountain beaver (*Aplodontia rufa*), bobcat (*Lynx rufus*), hoary marmot (*Marmota caligata*), fisher (*Martes pennanti*), Douglas squirrel (*Tamiasciurus douglasii*), voles (*Microtus spp*.), pika (*Ochotona princeps*), and striped skunk (*Mephitis mephitis*). Larger mammals, such as elk (*Cervus elaphus*), black-tailed deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), cougar (*Felis concolor*), and coyote (*Canis latrans*), are also found in the forested habitat. Mountain goats (*Oreamnos americanus*) are found in the high-altitude areas. Deer tracks and scat were frequently observed during the July 2016 site visit.

Forested habitats around Eightmile Lake provide foraging and nesting habitat for a wide variety of bird species, including songbird species, migratory bird species, and others. Predatory birds, such as bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk *(Buteo jamaicensis),* and osprey *(Pandion haliaetus),* commonly hunt in these habitat types and occur in forested areas near bodies of water. The lake environment can be expected to provide habitat for belted kingfisher *(Ceryle alcyon*) and wintering and migratory waterfowl, including gadwall *(Anas strepera),* American widgeon *(Mareca americana),* mallard *(Anas platyrhynchos),* common loon (*Gavia immer*), and western grebe (*Aechmophorus occidentalis*).

Construction activity could temporarily disrupt the use of riparian and forested habitat by native wildlife species to breed, forage, rest, and overwinter. The greatest potential for short-term impacts on wildlife would occur as the result of increased noise during construction. Short-term increases would include some helicopter trips, movement and processing of on-site earth and rocks, and possibly blasting. The majority of construction noise would be relatively minor. In general, most

wildlife species are expected to disperse in response to periodic increases in noise and activity to adjacent habitat areas to avoid impacts. However, particularly vulnerable species may include those that may be breeding during this time. Construction scheduling and other practices would be implemented, as required by applicable permits, to minimize impacts during construction.

As noted above, long-term impacts would include inundation of area that was historically inundated, but has not recently been inundated by Eightmile Lake. This could impact wildlife along the shoreline of the lake as the result of periodic decreases in wildlife habitat when this area is flooded. However, the area impacted would be relatively small and is expected to occur for few months each spring. Overall, the project is not anticipated to result in significant long-term impacts on wildlife.

8.1.6 Cultural Resources

As part of the July 2016 reconnaissance site visits performed to assess conditions at the Alpine Lakes for the PEIS, an archaeological survey was completed at Eightmile Lake. This survey included a pedestrian survey and recordation of irrigation structures.

The survey revealed no cultural resources along the existing Eightmile Trail. However, at Eightmile Lake, the dam and low-level outlet facilities were recorded as a historical water release system. Along with the outlet facilities a Square Lake, Colchuck Lake, and Klonaqua Lake, the Eightmile Lake facilities were recommended as eligible for listing on the National Register of Historic Places (NRHP), based on the following criteria:

- Criterion A for the facilities association with historically significant and controversial water management in Chelan County
- Criterion B for the unique style influenced by the extremely difficult terrain and constraints of mid-century construction methods
- Criterion D for the potential to yield data about early twentieth century engineering and construction

No cultural resources were observed along the margins of the lake or within the existing width of the trail to the project site. No sacred sites (Native American ceremonial areas or natural landmarks) or sites recorded as Traditional Cultural Properties were identified at or near Eightmile Lake.

The improvements will modify the dam and low-level outlet facilities by removing the existing facilities and replacing them with new facilities. These activities would require compliance with various local, state, and federal regulations, which address in part the protection of cultural resources. If deemed necessary, compliance with these regulations could result in the development of mitigation measures to reduce cultural resources impacts in coordination with the Washington State Department of Archeology and Historic Preservation (DAHP).

8.2 Anticipated Permitting Requirements

For the purpose of this Feasibility Study, likely permitting requirements and the anticipated permitting process for the improvements to Eightmile Lake were identified. Table 8-1 lists the anticipated permits and approvals that will need to be secured for the project.

Table 8-1
Anticipated Eightmile Lake Storage Restoration Project Permitting Requirements

Permit	Agency	Apply with the JARPA (Y/N)	Permits Needed	Notes
Section 404 Permit[1]	Corps	Y	✓	Triggered by excavation in or placement of fill material into waters of the United States
NEPA Review[1]	Corps	N	✓	NEPA review would be triggered by the Corps CWA review.
USFS Special Use Permit	USFS	N		Authorizes uses on National Forest Service land that provide a benefit to the general public and protect public and natural resources values. Not required for work inside IPID easement, but could be required if work extends outside IPID easement.
ESA Section 7 Concurrence[2]	NMFS and USFWS	N	✓	This review is triggered by the Section 404 permit. The Corps would coordinate with NMFS and USFWS as needed to ensure potential impacts on fish and wildlife species are adequately addressed. It is anticipated that potential adverse impacts on downstream ESA-listed fish would be minimized through implementation of a long-term management plan for flow releases.
Magnuson-Stevens Fishery Conservation and Management Act Concurrence[2]		N	✓	
Fish and Wildlife Coordination Act Concurrence[2]		N	✓	
NHPA Section 106 concurrence, Archaeological Resources Protection Act Permit[2]	Corps and DAHP	N	✓	This review is triggered by the Section 404 permit. If significant adverse impacts are identified, consultation between the Corps, DAHP, IPID, and potentially affected tribes would be required to ensure the impacts are adequately addressed.
Section 401 Water Quality Certification[3]	Ecology	Y	✓	Triggered by excavation in or discharge dredge or fill material into water or isolated wetlands.
Dam Construction Permit[4]	Ecology	N	✓	Required for dams and supplemental structures impounding or controlling more than 10 acre-feet of water.
Water Right Change Permit[5]	Ecology	N	✓	Required for dams and supplemental structures impounding or controlling more than 10 acre-feet of water.
Ecology Sand and Gravel Permit[6]	Ecology	N	✓	Needed for projects that quarry on-site sand and gravel for use in construction to reduce construction costs.
Burn Permit[7]	WDNR	N	✓	May be required if project calls for burning of on-site cleared debris and logs, per WDNR requirements.

Permit	Agency	Apply with the JARPA (Y/N)	Permits Needed	Notes
Hydraulic Project Approval[8]	WDFW	Y	✓	Triggered by work below the ordinary high water mark in waters of the state.
Aquatic Use Authorization	WDNR	Y	✓	Triggered by work affecting bed/flow of state waters. This may not be required and should be confirmed.
NPDES Construction Stormwater General Permit[9]	Ecology	N	✓	Triggered by clearing, grading, and/or excavation resulting in the disturbance of 1 or more acres and discharges stormwater to surface waters of the state.
Shoreline Substantial Development Permit[10]	Chelan County	N	✓	Per the Chelan County Shoreline Management Plan, possible exemption for modification of existing agriculture facilities.
SEPA Determination	Chelan County	N	✓	SEPA determination to be made for Icicle Strategy PEIS, which includes the Eightmile Lake Storage Restoration project. Subsequent project-level review may be required but is expected to be streamlined.
Critical Areas Ordinance Compliance[11]	Chelan County	N	✓	Per the Chelan County Shoreline Management Plan, possible exemption for construction of irrigation structures.
Fill and Grade, Building Permits[11]	Chelan County	N	✓	Required by Chelan County.

Notes:

1. Corps NWP / NEPA Categorical Exclusion are the likely level of regulatory compliance for this project. Compliance with General Conditions 20 would require completion of a preconstruction notification, acknowledging potentially eligible resources pursuant to the National Historic Preservation Act; however, given the nature of the activities, it is anticipated that minimal review would be required. The preconstruction notification is fulfilled by filling out the Washington JARPA. Eightmile Lake is not a navigable waterway per Corps guidance and therefore does not require a Section 10 permit.
2. The Corps permit evaluation will address consistency with these regulations.
3. Streamlined review (e.g., approval letter) issued when CWA NWP conditions are adhered to.
4. Ecology Dam Safety Office review requiring submittal of engineering plans, specifications, and reports.
5. Required for adding instream flows as secondary uses.
6. Needed if on-site gravel would be quarried for construction to save costs.
7. A permit to burn cleared logs would only be required if it exceeded the specifications (i.e., fire content, size, and timing limitation) set forth by WDNR.
8. Compliance handled through the JARPA review process and expected to be minimal.
9. General permit anticipated, requiring compliance with general conditions.
10. A Shoreline Substantial Development Permit may not be required. This needs to be confirmed with Chelan County. Past operations and maintenance activities have most often resulted in Chelan County issuing approval versus a formal Shoreline Substantial Development Permit.
11. Permits may not be required. Need to confirm with Chelan County. It is possible that Ecology review if required as indicated in Note 4 would suffice to support Chelan County's approval.

Corps: U.S. Army Corps of Engineers
CWA: Clean Water Act
DAHP: Washington State Department of Archaeology and Historic Preservation
Ecology: Washington State Department of Ecology
ESA: Endangered Species Act
IPID: Icicle and Peshastin Irrigation District
JARPA: Joint Aquatic Resource Application
NEPA: National Environmental Policy Act
NHPA: National Historic Preservation Act
NMFS: National Marine Fisheries Service
NPDES: National Pollutant Discharge Elimination System
PEIS: Programmatic Environmental Impact Statement
SEPA: State Environmental Policy Act
USFS: U.S. Forest Services
USFWS: U.S. Fish and Wildlife Service
WDFW: Washington Department of Fish and Wildlife
WDNR: Washington Department of Natural Resources

8.3 Recommended Permitting Approach

In Anchor QEA's experience, project objectives, constraints, and challenges are communicated early on in the project to save time and effort required to respond to comments and questions from regulatory reviews later in the design process. Initial outreach and coordination has occurred as the result of developing the PEIS and many of the regulatory agencies listed in Table 8-1 are generally aware of the overall Icicle Creek Strategy. However, as the details of the Eightmile Lake Storage Restoration Project become further developed, it is recommended that a pre-planning meeting with a focused group of agencies occur to discuss the project to more clearly understand regulatory constraints and confirm the assumptions identified in Table 8-1 and discussed further in this section.

Anchor QEA recommends that this initial meeting occur with the Corps[3] and include Ecology, WDFW, and Washington Department of Natural Resources (WDNR). The timing of this meeting should occur 12 months prior to beginning construction to allow sufficient time for the appropriate permits/approvals to be secured. This timeline assumes that compliance with the Clean Water Act (CWA) and the National Environmental Policy Act (NEPA) could be addressed through a nationwide permit and Categorical Exclusion. The remainder of this section discusses the permitting triggers and thresholds relevant in the consideration of developing an efficient and coordinated project-level permitting strategy.

Because the project would include work within waters of the United States and of the state of Washington, environmental review related to the following permits/approvals is expected to be required:

- CWA Section 404 permit by the Corps
- CWA Section 401 certification by Ecology
- Hydraulic Project Approval review by WDFW
- Aquatic Use Authorization by WDNR (may not be required)

Review to support these permits/approvals would be initiated by submittal of the Washington Joint Aquatic Resource Permit Application (JARPA). This would provide the initial information the regulatory agencies listed above would need to be able to review the project.

Submittal of the JARPA to the Corps would also trigger their environmental review under NEPA, ESA, the Magnusson-Stevens Fisheries Act (MSA), the Fish and Wildlife Coordination Act (FWCA), and the National Historic Preservation Act. To provide sufficient information to the Corps to be able to consult with the appropriate agencies (e.g., U.S. Fish and Wildlife Service [USFWS], National Marine Fisheries Service [NMFS], and DAHP), IPID would develop and submit a preconstruction notification (PCN), which would be fulfilled through completion of the JARPA. Once the Corps has received initial

[3] It is Anchor QEA's understanding that the proposed work would occur within the existing IPID easement and while upfront coordination with USFS should be completed, USFS would not take the lead on ensuring compliance with the required federal permits/approvals.

project information, it is recommended that additional coordination meetings occur with USFWS, NMFS, and DAHP, focusing on the issues identified below.

Because the field survey completed in July 2016 identified the Eightmile Lake dam and low-level outlet facilities for listing on the NRHP, this information must be disclosed in the PCN and it is likely formal consultation with Washington State DAHP will be required. Consultation and review of all projects that comprise the alternatives outlined in the *Icicle Strategy Programmatic Environmental Impact Statement* will be initiated with DAHP as part of the PEIS review process. Specific consultation related to the Eightmile Lake Storage Restoration project should begin soon thereafter. Consultation with DAHP will focus on identifying appropriate mitigation for the impact to historic structures that will be removed and replaced as part of the project. It is possible that a Memorandum of Agreement may be executed between the Corps, DAHP, IPID, and any other participating agencies or tribes. To the extent that conceptual mitigation can be developed in coordination with DAHP through the process of completing the PEIS, this could help to shorten the project-level permitting timeline identified above.

Submittal of the JARPA to the Corps would also trigger the need for the Corps to ensure the proposed project compliance with the ESA, MSA, and FWCA. This would likely require coordination with NMFS and USFWS. As noted previously, the potential impacts on fish and wildlife under the jurisdiction of these agencies are generally limited to those that could occur during construction or are otherwise expected to be largely beneficial over the long term. It is not expected that compliance would require the development of a biological assessment or formal consultation between these agencies; however, this should be confirmed at the onset. Similarly, to the extent that potentially significant impacts and conceptual mitigation are identified through the process of completing the PEIS, this could help to shorten the project-level permitting timeline identified above.

Ecology's DSO has regulatory jurisdiction over all reservoirs that impound 10 acre-feet or more of water. Replacement of the dam at Eightmile Lake will require a dam construction permit from DSO. Consultation was initiated with DSO as part of this Feasibility Study. The requirements for securing a dam safety permit were outlined in Section 3.1. DSO should be given the opportunity to review this report and consultation should continue throughout the design process to ensure that DSO requirements are met.

Compliance with the remaining permits and approvals outlined in Table 8-1 would be mostly under the jurisdiction of Chelan County. It is possible that certain permits/approvals (e.g., project-level SEPA, Shoreline Substantial Development Permit, Critical Areas Ordinance, Cleanup and Abatement Order review) may be satisfied through demonstrated compliance with other state and federal approvals discussed above. Others would still be obtained during final project design but are anticipated to be relatively straightforward (e.g., NPDES construction permit, fill and grading permits).

9 Summary and Recommendations

9.1 Summary of Proposed Improvements

IPID has relied on Eightmile Lake and the other Alpine Lakes they manage for nearly 80 years. IPID constructed control facilities on the outlet of Eightmile Lake in the 1930s to capture and store spring and early summer runoff for release in the late summer when additional flow is needed in lower Icicle Creek to maintain irrigation diversions and instream flows for fish. Eightmile Lake captures runoff from a 3,822-acre drainage basin. Due to the large size of the drainage basin relative to the storage volume in the lake, Eightmile Lake has a high potential for refill, even during dry years. Because the storage is so reliable and the lake is more accessible than the other Alpine Lakes that IPID manages, the lake is a critical piece of IPID's water supply infrastructure.

The infrastructure at Eightmile Lake is aging and will require improvement to continue to operate in a way that meets IPID's needs. The most urgent issue identified by IPID is that the low-level outlet pipe has collapsed in multiple locations, which has recently reduced the capacity of the pipeline and limits the rate at which IPID can release water to Icicle Creek. If the pipe is not replaced or repaired before the next big drought cycle, IPID will likely not be in a position to meet the irrigation water supply needs of the IPID water users. The gate that controls flow to the low-level outlet pipe also needs to be replaced. It was damaged by ice or debris and is now very difficult to open and close. In addition, the dam structure that allows IPID to store water has deteriorated. Erosion of the earthen embankment portion of the dam structure has reduced the active storage capacity available for release without pumping or siphoning to less than 1,400 acre-feet. Some storage is released via seepage. Due to these limitations, improvements are needed to restore the useable storage capacity of Eightmile Lake to 2,500 acre-feet, which is the volume allowed for storage and release by IPID's water right for the lake. Improvements are also needed to ensure efficient control and release of water stored in the lake to meet downstream water supply and instream flow needs.

This Feasibility Study identified and evaluated the following improvements for restoring the storage at Eightmile Lake and improving the control and release of water from the lake:

- Replacement of the dam with a reinforced concrete and earthen embankment structure that would have a primary spillway elevation of 4,671 feet, which would match the historical high WSEL in the lake and restore the useable storage capacity to 2,500 acre-feet.
- Construction of an embankment and secondary spillway structure in a low spot south of the existing dam to provide additional spillway capacity to meet Ecology DSO requirements.
- Replacement of the existing low-level outlet facilities with a new pipeline that would allow for greater flexibility in drawing down the lake. Flow through the new low-level outlet would be controlled by an automated valve. Telemetry would allow for remote access from IPID's office

to operate the valve and optimize releases. The low-level outlet would operate by gravity when the lake is full and transition to siphon operation as the lake is drawn down.

The primary challenge to implementing this improvement project will be determining how to construct the project at a remote location within the Alpine Lakes Wilderness. IPID has an easement agreement with the USFS that was established when the property was transferred to the USFS for management as part of the Alpine Lakes Wilderness Area. The easement agreement allows IPID to continue to have access to the site, including with mechanized equipment, to maintain the facilities and to make full use of IPID's water right. However, the site is not accessible by roads. The Alpine Lakes are often accessed by IPID by helicopter for maintenance, but even the largest helicopters have payload limitations that will make mobilization of large equipment to the site a challenge. Options that were identified are transport of a smaller excavator by large helicopter, overland transport of a larger tracked excavator, or overland transport of a spider excavator. The approach will likely be dictated by funding, the equipment available, and permit approval constraints.

Another challenge to implementing this project that is closely related to the challenge of mobilizing equipment will be the narrow window available for construction. The lake will need to be drawn down to construct the project, which typically does not happen until late in the summer. IPID might be able to facilitate early drawdown of the lake for construction, but will be constrained by weather and runoff conditions in the early summer. Construction will need to be complete before significant snowfall and consistent freezing temperatures occur. Due to the elevation of the site, snowfall and consistent freezing temperatures are likely to occur in October or early November.

The estimated implementation cost of a project that would rely on helicopters to transport and mobilize equipment to the site is approximately $2.62 to $2.97 million. Based on the estimated increase in useable storage that would occur (1,125 acre feet), the cost would be $2,329 to $2,644 per acre-foot of additional storage created.

9.2 Recommended Next Steps

Because the need to implement these improvements is critical to maintaining IPID's water supply during drought conditions, it is recommended that IPID pursue funding for detailed design of the proposed improvements and move consultation forward with the USFS to identify the best method of accessing the site for construction. Securing the appropriate permits for construction of these improvements will be critical to implementation of the project. Consequently, it is recommended that consultation specific to the Eightmile Lake Storage Restoration project proceed with the key regulatory agencies as soon as the *Icicle Strategy Programmatic Environmental Impact Statement* has been reviewed and finalized (likely late in the summer of 2017). In addition to the USFS, agencies that will require early consultation may include the DAHP, the Corps, Ecology (including DSO), WDFW, USFWS, and NMFS.

Detailed design and construction of the project will require additional field data, which would likely need to be collected in the summer or early fall, when weather conditions permit access to the site:

- **Supplemental Topographic Survey**: Additional topographic survey will be needed of the area in and around the dam and along Eightmile Creek to the downstream end of the propose low-level outlet. Some data was collected last fall, but there are still gaps in the topographic data that will need to be addressed to accurately determine where material is available, where it will be placed, and what the final design grades should be.
- **Geotechnical Review**: Work to date has only included general field observations of geology and a desk review of geologic mapping and conditions. Ecology DSO will require a geotechnical engineering report that provides recommendations for dam construction based on a detailed field investigation of geologic conditions at the site. Access to the site with equipment like a drill or backhoe, which are typically used to investigate subsurface soil conditions, will be very challenging. To satisfy DSO requirements for geotechnical review, the following is recommended:
  - Complete the field investigation and prepare a geotechnical design report prior to detailed design. The investigation would include, at a minimum, test pits (if a backhoe or excavator can be mobilized to the site) and a geophysical investigation. An exhaustive desk review of available mapping and geology reports will also be completed. If needed, additional work will be done to mobilize a remote drill for additional subsurface investigation. IPID will work with DSO to verify requirements, review data collecting, and discuss findings and recommendations for design.
  - Provide detailed field direction by a geotechnical engineer during construction. Because the ability to gather subsurface geotechnical information will be limited and subsurface conditions are likely to be variable at the site, it is recommended that supervision and field direction be provided regarding processing and placement of earth and rock materials during construction.

Based on the information reviewed and analysis of the proposed improvements, no fatal flaws have been identified that would prevent implementation of the project. However, Anchor QEA acknowledges that the project will be very challenging due to the remote location of the proposed project, regulatory constraints, and access limitations. Early consultation regarding these challenges will be key to the success of the project.

10 References

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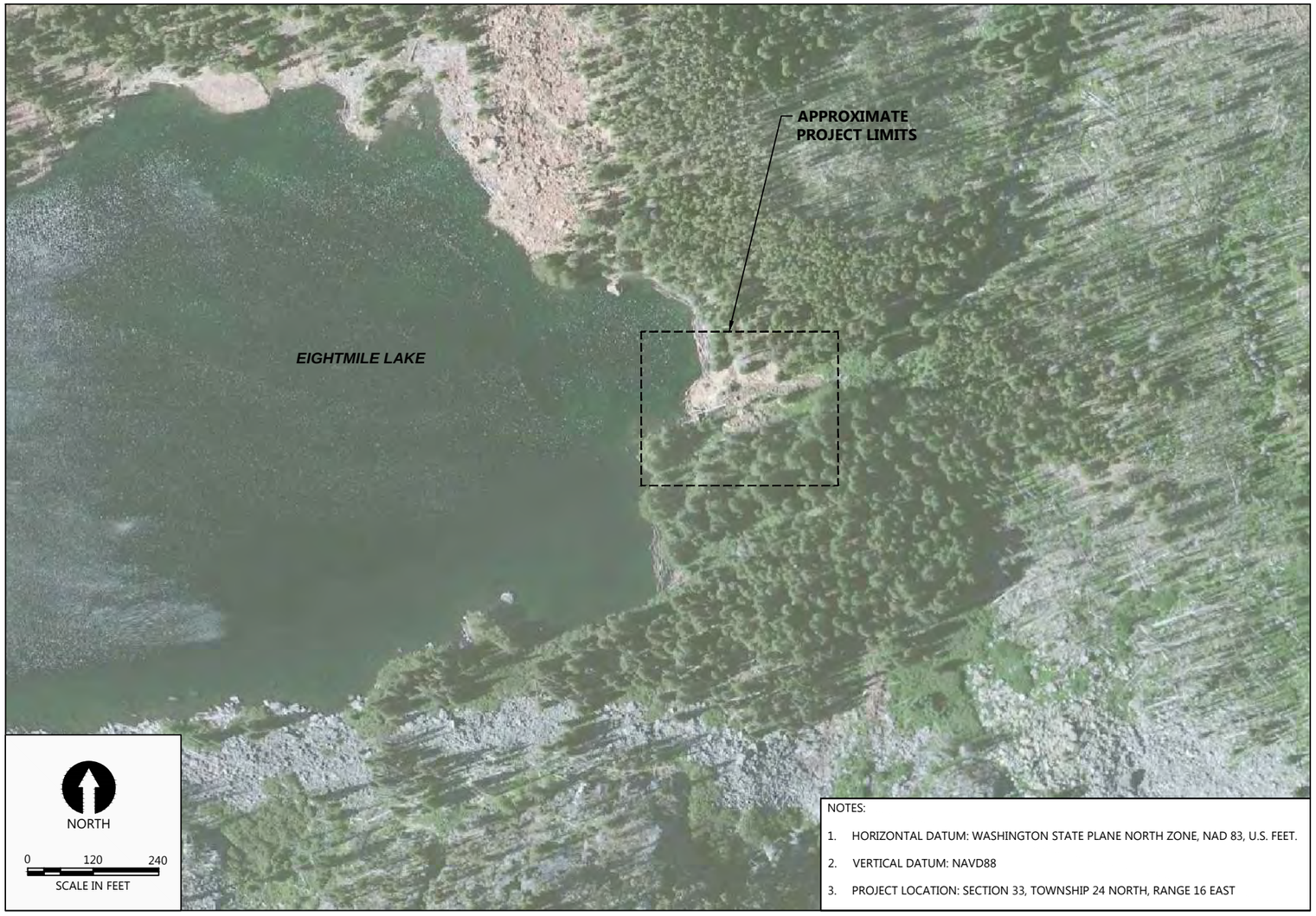
Appendix A
Feasibility-Level Drawings

FEASIBILITY-LEVEL DESIGN

EIGHTMILE LAKE RESTORATION PROJECT



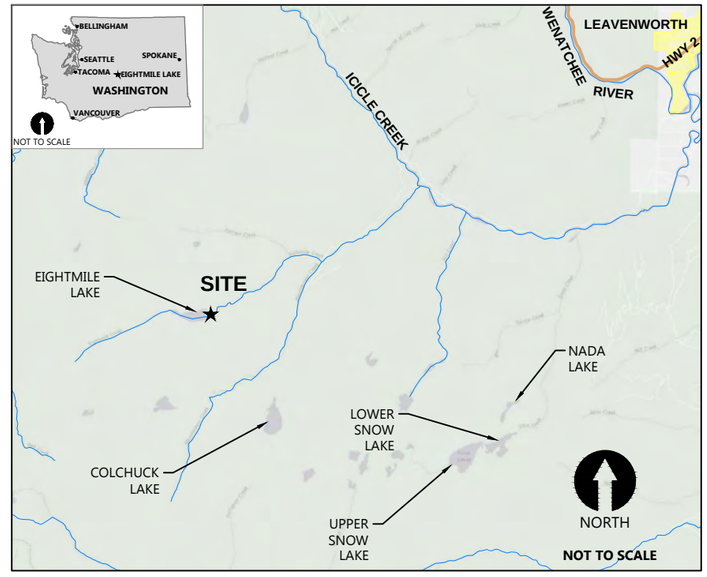
NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88
3. PROJECT LOCATION: SECTION 33, TOWNSHIP 24 NORTH, RANGE 16 EAST

SHEET LIST		
SHEET NUMBER	**SHEET**	**SHEET TITLE**
1	G-01	COVER SHEET
2	G-02	GENERAL NOTES, LEGEND, AND ABBREVIATIONS
3	G-03	OVERALL SITE PLAN
4	G-04	EXISTING CONDITIONS PLAN
5	T-01	CONSTRUCTION ACCESS PLAN
6	D-01	DEMOLITION PLAN
7	C-01	RESTORATION PLAN
8	C-02	EMBANKMENT PLAN
9	C-03	EMBANKMENT PROFILES
10	C-04	EMBANKMENT SECTIONS (1)
11	C-05	EMBANKMENT SECTIONS (2)
12	C-06	EMBANKMENT SECTIONS (3)
13	C-07	LOW-LEVEL OUTLET PLAN
14	C-08	LOW-LEVEL OUTLET PROFILE
15	C-09	DETAILS

NOTES:

1. STRUCTURAL DESIGN DRAWINGS AND ADDITIONAL DETAIL DRAWINGS WILL BE ADDED DURING FUTURE PHASES OF DESIGN.



AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

COVER SHEET

G-01

SHEET NO. 1 OF 15

Apr 10, 2017 7:38am drice K:\Projects\0204-Aspect Consulting, LL C\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-001 COVER.dwg G-01

LEGEND:

EXISTING MAJOR CONTOUR (5' INTERVAL)

EXISTING MINOR CONTOUR (1' INTERVAL)

PROPOSED MAJOR CONTOUR (5' INTERVAL)

PROPOSED MINOR CONTOUR (1' INTERVAL)

PROJECT INFORMATION:

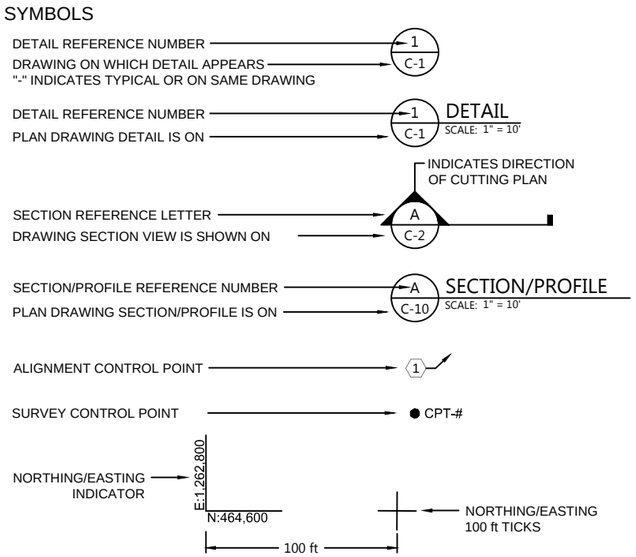
OWNER: TONY JANTZER, MANAGER
ICICLE AND PESHASTIN IRRIGATION DISTRICT
P.O. BOX 371
5594 WESCOTT DRIVE
CASHMERE, WA 98815-0371
(509) 782-2561

ENGINEER: DAVID RICE, P.E.
ANCHOR QEA, LLC
750 OLIVE WAY, SUITE 1900
SEATTLE, WA 98101
(206) 219-5902

SURVEY NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET
2. VERTICAL DATUM: NAVD88
3. SOURCES OF DATA:
   a. AERIAL PHOTOGRAPHY: ESRI BASEMAPS DATED 2016.
   b. BATHYMETRY: GRAVITY CONSULTANTS HYDROGRAPHIC SURVEY, OCTOBER 2013
   c. TOPGRAPHY: GRAVITY CONSULTANTS TOPOGRAPHIC SURVEY OF THE SHORELINE, OCTOBER 2013, SUPPLEMENTED BY USGS GRID ELEVATION DATA AWAY FROM THE SHORELINE. TOPOGRAPHY WAS VERIFIED AND SUPPLEMENTED BY LIMITED DATA COLLECTED BY ANCHOR QEA ALONG THE DAM AND EMBANKMENT CREST, AT THE SHORELINE NEAR THE DAM, AND AT ALONG THE PIPELINE ALIGNMENT, OCTOBER 2016.

SYMBOLS



GENERAL CONSTRUCTION NOTES:

1. CONTRACT DOCUMENTS REFER TO THESE DRAWINGS AND THE PROJECT SPECIFICATIONS. ALL COMPONENTS OF THE CONTRACT DOCUMENTS SHALL FULLY APPLY TO THE WORK WHETHER SPECIFICALLY REFERENCED ON THE DRAWINGS OR NOT. ANY ITEMS NOT SPECIFICALLY REFERENCED IN THE NOTES ON THE DRAWINGS SHALL BE AS DESCRIBED IN THE SPECIFICATIONS.
2. THE CONTRACTOR SHALL HAVE A COPY OF THE APPROVED CONTRACT DOCUMENTS ON THE JOBSITE AT ALL TIMES.
3. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE ALL WORK AS INDICATED ON THE CONTRACT DOCUMENTS.
4. A PRE-CONSTRUCTION MEETING BETWEEN THE CONTRACTOR, IPID, AND THE CONTRACTING OFFICER'S REPRESENTATIVE (COR) SHALL BE REQUIRED PRIOR TO ANY ON-SITE WORK. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO CONSTRUCTION AND SHALL BE RESPONSIBLE FOR VERIFYING FIELD CONDITIONS AND DIMENSIONS, DEVELOPNG A PLAN TO MOBILIZE EQUIPMENT AND MATERIALS NEEDED TO THE SITE TO COMPLETE THE WORK, AND CONFIRMING THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THESE CONTRACT DOCUMENTS. ANY DISCREPANCIES BETWEEN THE EXISTING FIELD CONDITIONS AND THE DRAWINGS OR ANY INCONSISTENCIES OR AMBIGUITIES BETWEEN THE DRAWINGS AND OTHER CONTRACT DOCUMENTS SHALL BE REPORTED IN WRITING TO THE COR PRIOR TO PROCEEDING WITH THE WORK. WORK DONE BY THE CONTRACTOR INVOLVING SUCH DISCREPANCIES WITHOUT A WRITTEN REPORT AND RESPONSE FROM THE COR SHALL BE DONE AT THE CONTRACTOR'S SOLE RISK AND EXPENSE.
6. THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND IS NOT LIMITED TO NORMAL WORKING HOURS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE IN THE CONTRACT DOCUMENTS, FIELD DIRECTED BY THE CONTRACTING OFFICER, OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH APPLICABLE PERMIT REQUIREMENTS, CODES, REGULATIONS, AND ORDINANCES.
10. THE DETAILS PROVIDED ON THE CONTRACT DOCUMENTS ARE INTENDED TO SHOW THE FINAL RESULT OF THE DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS. SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
11. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING STRUCTURES, IMPROVEMENTS, FENCES, GATES, ROADWAYS, DRAINAGE WAYS, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS. IF SUCH ITEMS ARE DAMAGED OR NEED TO BE REMOVED OR MODIFIED TO FACILITATE CONSTRUCTION, THE CONTRACTOR SHALL FIRST NOTIFY THE COR AND THEN REPLACE OR REPAIR THE ITEMS TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE COR.
12. THE CONTRACTOR SHALL KEEP THE JOB SITE AREA CLEAN AND FREE FROM HAZARDS. THE CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR THE DURATION OF THE WORK. UPON COMPLETION, THE CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED TO REMAIN ON THE PROPERTY. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
13. REPRESENTATIONS OF TRUE NORTH SHALL NOT BE USED TO IDENTIFY OR ESTABLISH THE BEARING OF TRUE NORTH AT THE JOB SITE.
14. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.

GENERAL CONSTRUCTION NOTES: (CONTINUED)

15. THE NOTES, DETAILS AND SPECIFICATIONS ON THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
16. DIMENSION CALL-OUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE CONTRACT DOCUMENTS.
17. STATIONING, DISTANCES, AND LENGTHS SHOWN ON THE DRAWINGS ARE BASED ON HORIZONTAL MEASUREMENTS.
18. THE CONTRACTOR SHALL BE REQUIRED TO CONTROL ON-SITE STORM WATER RUNOFF BY USING TEMPORARY OR PERMANENT DRAINAGE EROSION/SILTATION CONTROL PROCEDURES, AS INDICATED ON THE CONTRACT DOCUMENTS.
19. THE CONTRACTOR SHALL MAINTAIN HAND DRAWN REDLINES, FIELD NOTES AND PHOTOGRAPHS ("FIELD DOCUMENTATION") OF ALL IMPROVEMENTS AS THE WORK PROGRESSES. THE CONTRACTOR SHALL ALSO TAKE PHOTOGRAPHS AND VIDEO TO DOCUMENT CONDITIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR'S FIELD DOCUMENTATION SHALL BE MAINTAINED ON SITE AND SHALL BE AVAILABLE FOR REVIEW BY THE CONTRACTING OFFICER AT ALL TIMES. THE CONTRACTOR SHALL PROVIDE FIELD DOCUMENTATION TO THE COR FOR THE PREPARATION OF CERTIFIED RECORD DRAWINGS PRIOR TO PROJECT ACCEPTANCE.

GENERAL CIVIL CONSTRUCTION NOTES:

1. ALL SITE WORK SHALL BE AS INDICATED ON THE CONTRACT DOCUMENTS. DO NOT EXCAVATE AND DISTURB BEYOND THE CLEARING LIMITS SHOWN ON THE CONTRACT DOCUMENTS UNLESS OTHERWISE APPROVED BY THE COR.
2. DEBRIS AND GARBAGE SHALL BE REMOVED FROM THE JOB SITE AND DISPOSED OF LEGALLY, AS REQUIRED BY THE PROJECT SPECIFICATIONS.
3. THE AREAS OF THE JOB SITE DISTURBED BY THE WORK SHALL BE GRADED SMOOTH AND PROTECTED AND/OR REVEGETATED AS SPECIFIED HEREIN.
4. PIPE MATERIALS SHALL BE AS INDICATED ON THE CONTRACT DOCUMENTS.
5. ALL EQUIPMENT AND MATERIALS NOT INDICATED ON THE DRAWINGS TO COME FROM THE SITE SHALL BE NEW AND UNDAMAGED, UNLESS OTHERWISE APPROVED BY THE COR AND THE ENGINEER. THE SAME MANUFACTURER OF EACH ITEM SHALL BE USED THROUGHOUT THE WORK UNLESS OTHERWISE APPROVED BY THE COR AND THE ENGINEER.

ABBREVIATIONS:

ABB	TERM
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ABB	TERM
ABB	ABBREVIATION
APPROX	APPROXIMATE
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BM	BENCH MARK
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CONT	CONTINUED OR CONTINUOUS
CP	CONTROL POINT (AS IN SURVEY)
CPE	CORRUGATED POLYETHYLENE
CSBC	CRUSHED SURFACING BASE COURSE
CSTC	CRUSHED SURFACING TOP COURSE
°	DEGREES
DIA	DIAMETER
E	EAST, EASTING
EA	EACH
ELE	ELEVATION
EX	EXISTING
FG	FINISHED GRADE
FT	FOOT OR FEET
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HDPE	HIGH-DENSITY POLYETHYLENE
ID	INSIDE DIAMTER
IE	INVERT ELEVATION
IN	INCH OR INCHES
IPID	ICICLE AND PESHASTIN IRRIGATION DISTRICTS
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH, NORTHING
OC	ON CENTER
OD	OUTSIDE DIAMTER
PE	PROFESSIONAL ENGINEER
QTY	QUANTITY
R	RADIUS
S	SLOPE
SF	SQUARE FOOT OR FEET
SPEC	SPECIFICATION
STA	STATION
SY	SQUARE YARD
TOW	TOP OF WALL
TYP	TYPICAL
W	WEST
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSEL	WATER SURFACE ELEVATION
YR	YEAR

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

K:\Projects\0204-Aspect Consulting, LLC\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-002 NOTES.dwg G-02
Apr 10, 2017 7:40am dtrce

ANCHOR QEA

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

GENERAL NOTES, LEGEND, AND ABBREVIATIONS

G-02

SHEET NO. 2 OF 15

LEGEND:

—4570— MAJOR CONTOUR (10')

MINOR CONTOUR (2')

NORTH

0 200 400

SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88
3. FOR ADDITIONAL SURVEY NOTES, SEE DWG. G-02.
4. AERIAL PHOTOGRAPHY: ESRI BASE MAPS, 2015.

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

OVERALL SITE PLAN

G-03

SHEET NO. 3 OF 15

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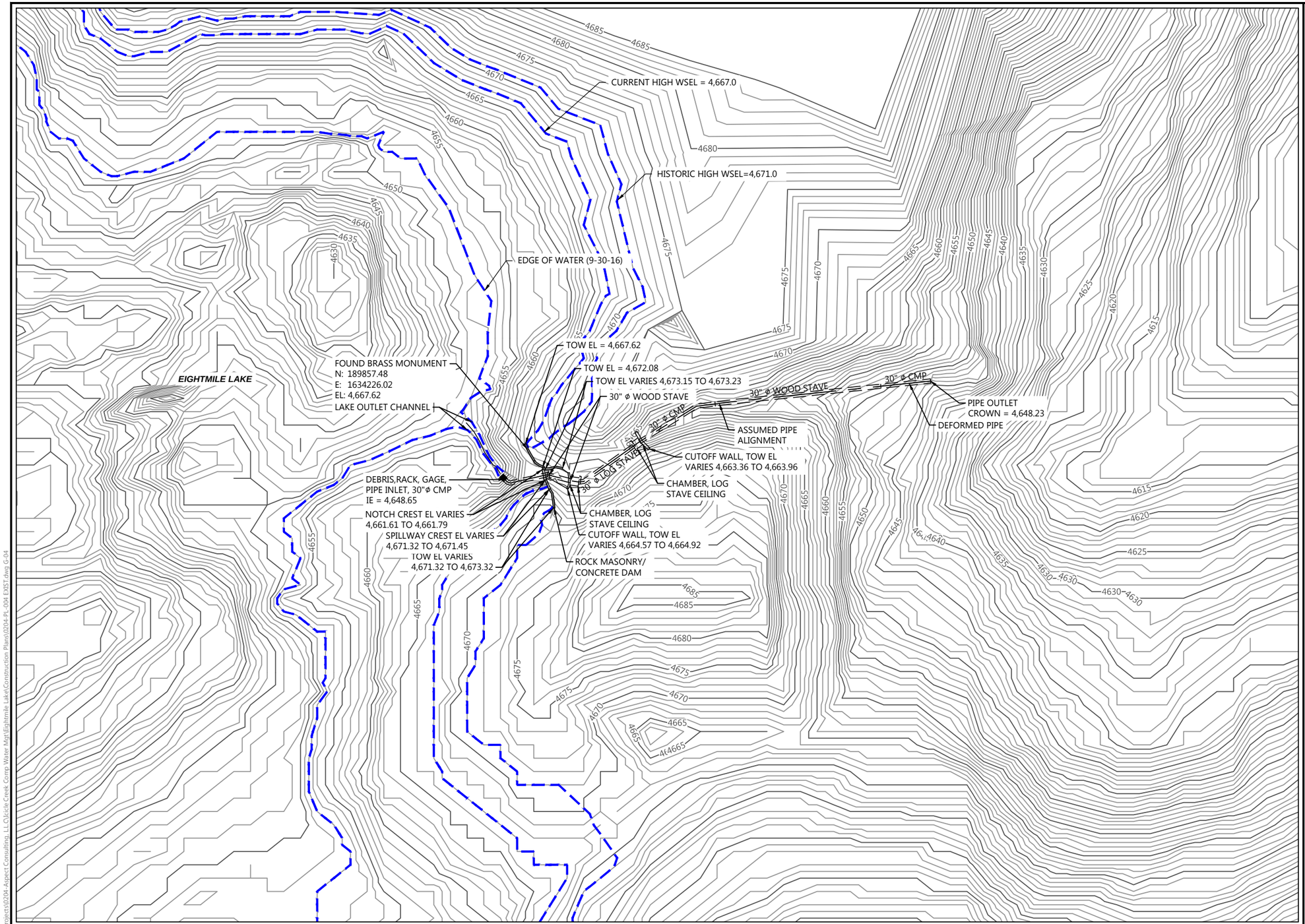
Apr 10, 2017 7:42am dtice



LEGEND:

—4570— MAJOR CONTOUR (10')

MINOR CONTOUR (2')

EXISTING PIPE (BURIED)

EDGE OF WATER

NORTH

0 30 60

SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88
3. FOR ADDITIONAL SURVEY NOTES, SEE DWG. G-02.

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

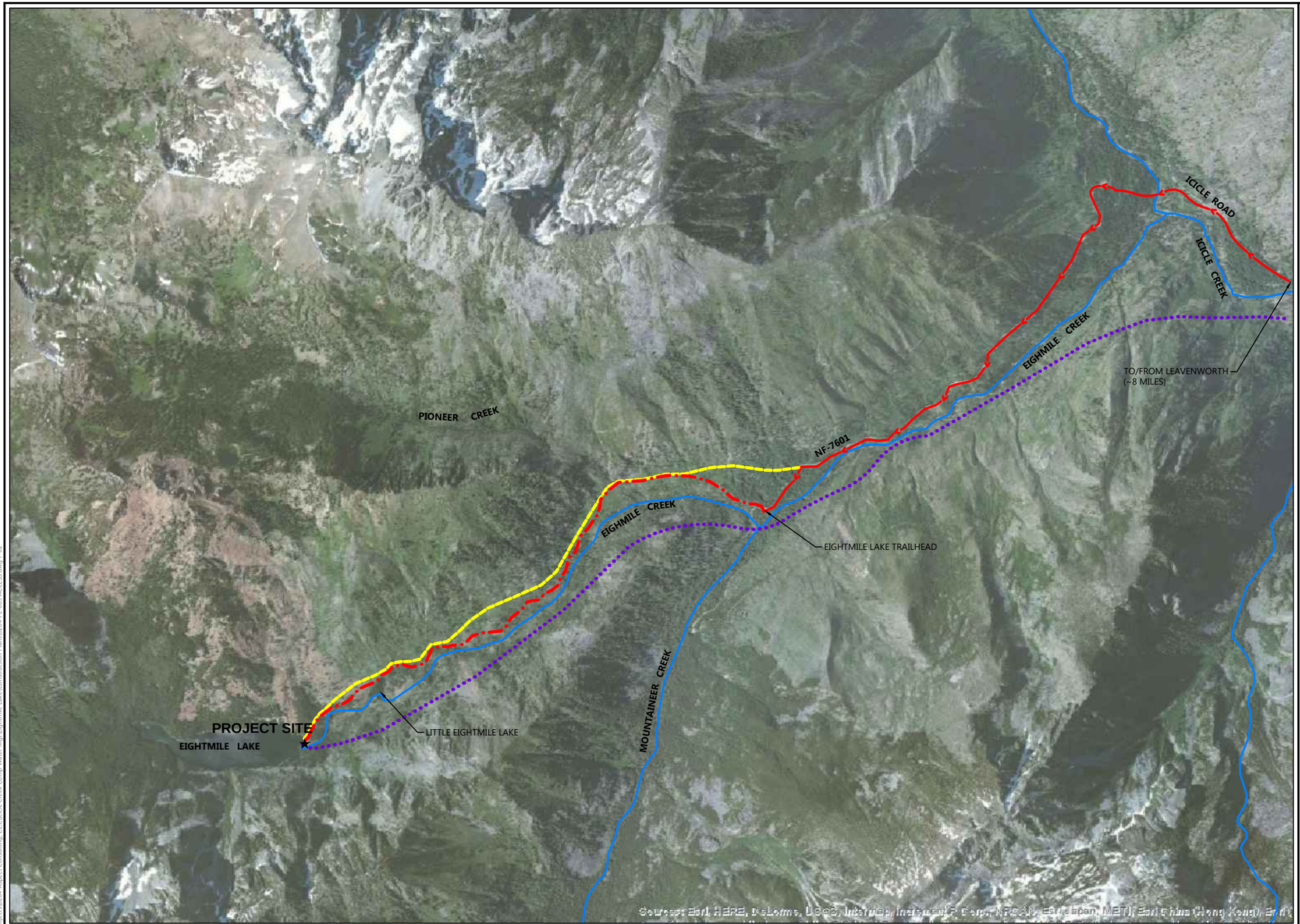
EXISTING CONDITIONS

G-04

SHEET NO. 4 OF 15

K:\Projects\0204-Aspect Consulting, LL C\Uncle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-004 EXIST.dwg G-04

Apr 10, 2017 7:45am drice



LEGEND:

- CREEK
- VEHICULAR ACCESS
- FOOT ACCESS
- EXCAVATOR ACCESS (IF PERMITTED)
- HELICOPTER ACCESS

NORTH

0 1,200 2,400

SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88
3. FOR ADDITIONAL SURVEY NOTES, SEE DWG. G-02.

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

CONSTRUCTION ACCESS PLAN

T-01

SHEET NO. 5 OF 15

Apr 10, 2017 7:48am drice K:\Projects\0204 Aspect Consulting, LLC\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-005 ACCESS.dwg T-01

EDGE OF WATER (9-30-16)
(DRAW LAKE'S LEVEL
DOWN PRIOR TO
DEMOLITION, AS NEEDED
TO WORK "IN THE DRY")

EIGHTMILE LAKE

PRIOR TO DEMOLITION,
REMOVE LOGSAND
DEBRIS FROM WORK AREA

INLET CHANNEL

REMOVE EXISTING
GATE AND APPURTENANCES
(NOTE 4)

EXCAVATE AND REMOVE
EXISTING BURIED LOW-LEVEL
OUTLET PIPE (NOTE 4)

ASSUMED EXISTING LOW-LEVEL
OUTLET PIPE ALIGNMENT

EXISTING PIPE OUTLET

REMOVE EXISTING
CUTOFF WALL STRUCTURE
(NOTE 5)

REMOVE EXISTING
CUTOFF WALL STRUCTURE
(NOTE 5)

REMOVE EXISTING
ROCK MASONRY AND
CONCRETE DAM STRUCTURE
(NOTE 5)

LEGEND:

- 4570 — MAJOR CONTOUR (10')
- MINOR CONTOUR (2')
- REMOVE PIPE
- REMOVE STRUCTURE
- REMOVE EQUIPMENT

NORTH

0 16 32
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88
3. FOR ADDITIONAL SURVEY NOTES, SEE DWG. G-02.
4. PIPE, GATE, AND OTHER EQUIPMENT SHALL BE FULLY REMOVED, HAULED FROM THE SITE BY HELICOPTER OR OTHER APPROVED METHOD, AND DISPOSED OF AS REQUIRED BY SPECIFICATIONS.
5. EXISTING ROCK MASONRY AND CONCRETE STRUCTURES SHALL BE BROKEN DOWN, STOCKPILED, AND REUSED, IF POSSIBLE, AS PART OF NEW DAM AND SPILLWAY CONSTRUCTION. IF NOT REUSED, CONCRETE AND REINFORCEMENT SHALL BE HAULED FROM THE SITE BY HELICOPTER AND DISPOSED OF, AS REQUIRED BY THE SPECIFICATIONS.

AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

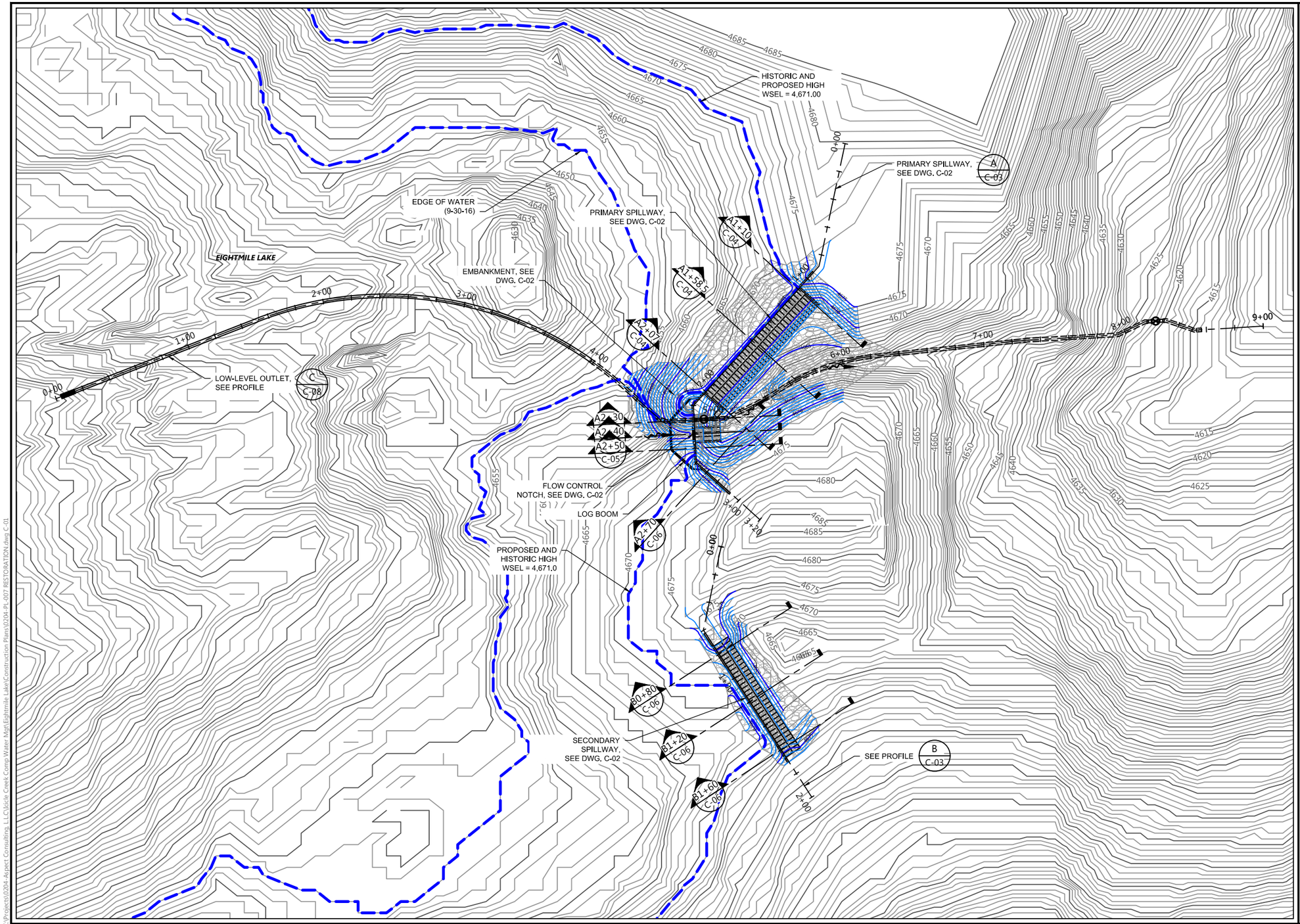
EIGHTMILE LAKE RESTORATION PROJECT

DEMOLITION PLAN

D-01

SHEET NO. 6 OF 15

K:\Project\0204-Aspect Consulting, LLC\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-006 DEMO.dwg D-01
Jun 02, 2017 5:57am dtrice



LEGEND:

- 4570 — EXISTING MAJOR CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- SLOPE ARMORING
- SPILLWAY GABIONS W/CONCRETE
- REINFORCED CONCRETE WALL
- DIRECTION OF SURFACE SLOW

SECTION "A" IS SHOWN ON DRAWING "C-02"

A C-02 — INDICATES DIRECTION OF CUTTING PLAN

NORTH

0 30 60
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88
3. FOR DETAILED EMBANKMENT PLAN, SEE DWG C-02.
4. FOR DETAILED LOW-LEVEL OUTLET PLAN, SEE DWG C-07.

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

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May 29, 2017 10:02am dfrice

ANCHOR QEA

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

RESTORATION PLAN

C-01

SHEET NO. 7 OF 15

EIGHTMILE LAKE

EDGE OF WATER (9-30-16)

TOW = 4,676.50

99' LONG PRIMARY SPILLWAY CREST EL = 4,671.00

SEE PROFILE A / C-03

8' WIDE FLOW CONTROL NOTCH WITH STOP LOGS CREST EL. = 4,666.00

LOG BOOM, NATIVE LOGS, EACH APPROX. 20' LONG, ANCHOR TO WALL AT ENDS AND SUBSURFACE ROCK AT CORNERS WITH 1" STEEL CHAIN

PROPSOED AND HISTORIC NORMAL HIGH WSEL = 4,671.0

6' x 3' X 18" DEEP GABION BASKETS FILLED WITH NATIVE ROCK AND SLUSH CONCRETE

TOW = 4,676.50

NATIVE ROCK ARMORING

75' LONG SECONDARY SPILLWAY CREST EL = 4,673.20

6' x 3' X 18" DEEP GABION BASKETS FILLED WITH NATIVE ROCK AND SLUSH CONCRETE

TOW = 4,676.50

SEE PROFILE B / C-03

LEGEND:

- 4570 EXISTING MAJOR CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- SLOPE ARMORING
- SPILLWAY GABIONS W/CONCRETE
- REINFORCED CONCRETE WALL
- DIRECTION OF SURFACE SLOW

INDICATES DIRECTION OF CUTTING PLAN

SECTION "A" IS SHOWN ON DRAWING "C-02"

NORTH

0 20 40

SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

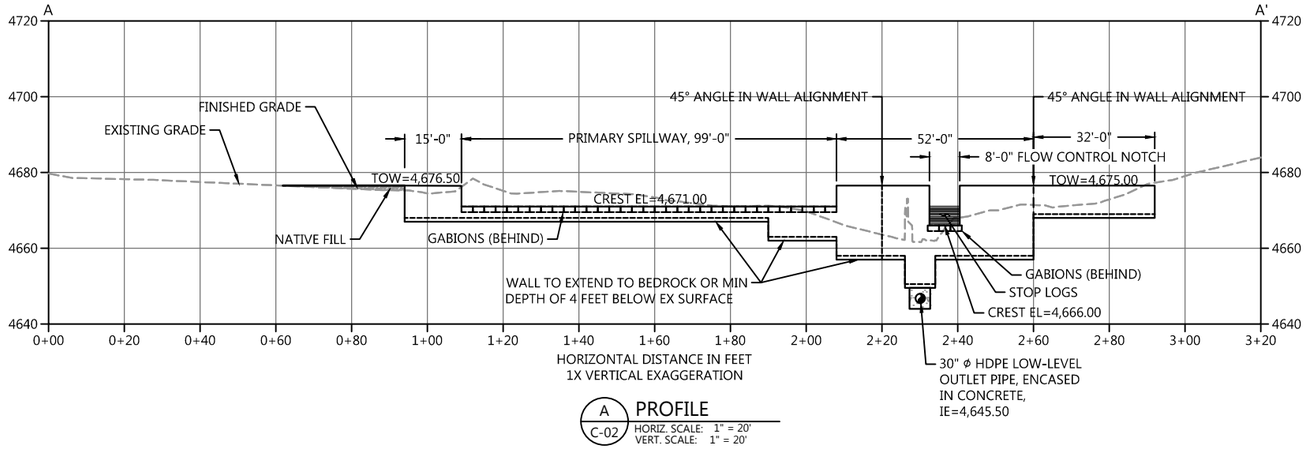
EMBANKMENT PLAN

C-02

SHEET NO. 8 OF 15

K:\Projects\0204-Aspect Consulting, LLC\Uncle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-008 EMBANKMENT SPILL XSEC.dwg C-02

May 29, 2017 9:44am drice



A / C-02 PROFILE
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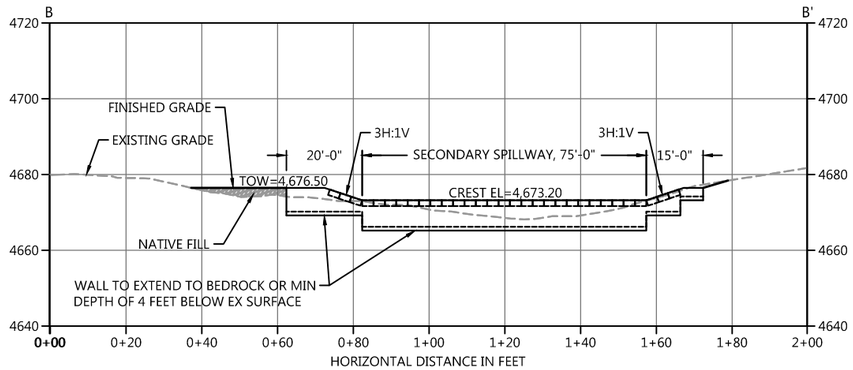
VERT. SCALE: 1" = 20'



B / C-02 PROFILE
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 20'

NORTH

0 20 40
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
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SCALE: AS NOTED
DATE: APRIL 2017

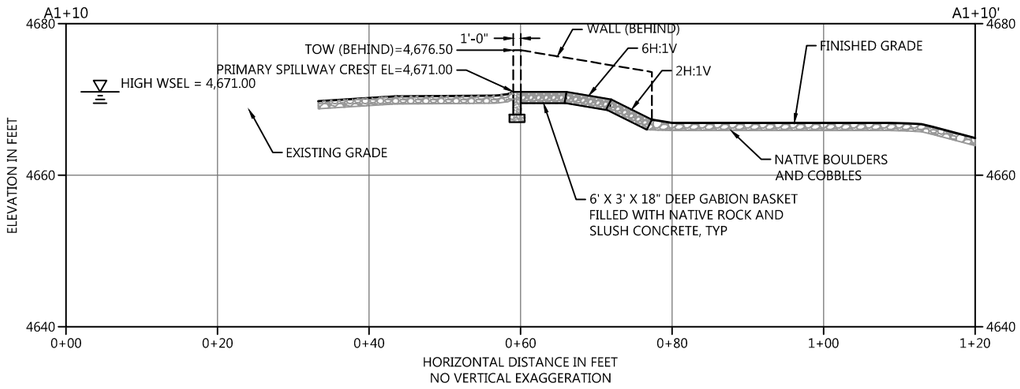
EIGHTMILE LAKE RESTORATION PROJECT

EMBANKMENT PROFILES

C-03

SHEET NO. 9 OF 15

May 29, 2017 9:49am dfrice K:\Projects\0204-Aspect Consulting, LLC\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-008 EMBANKMENT SPILL XSEC.dwg C-03



A1+10 / C-2 SECTION
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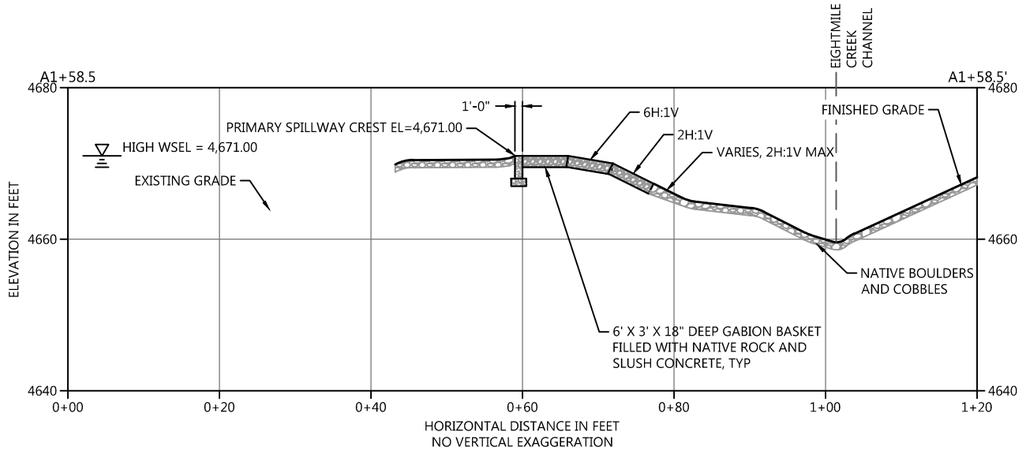
VERT. SCALE: 1" = 10'



A1+58.5 / C-2 SECTION
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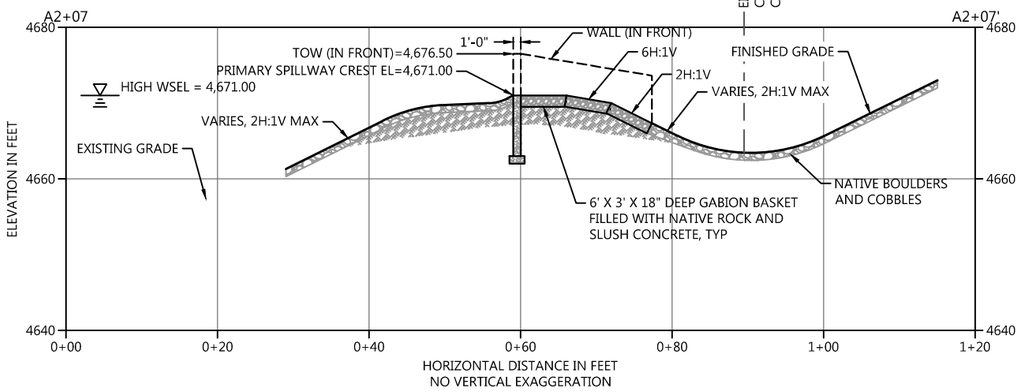

A2+07 / C-2 SECTION
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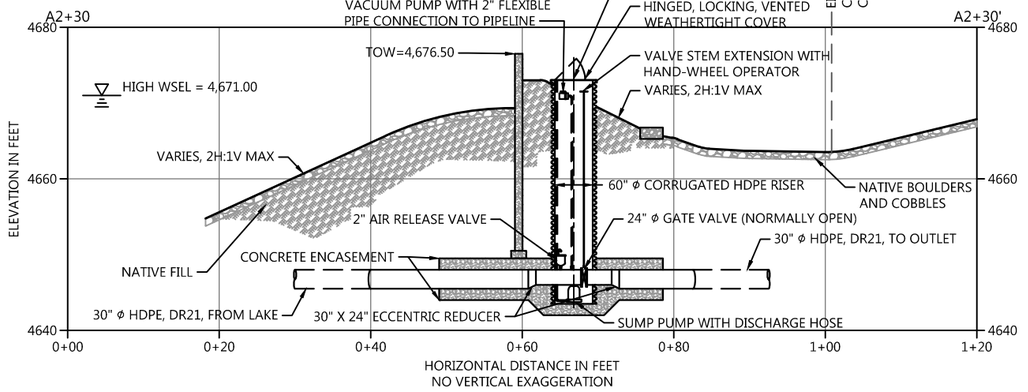

A2+30 / C-2 SECTION
HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'

NORTH

0 10 20
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

DRAFT

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

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DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

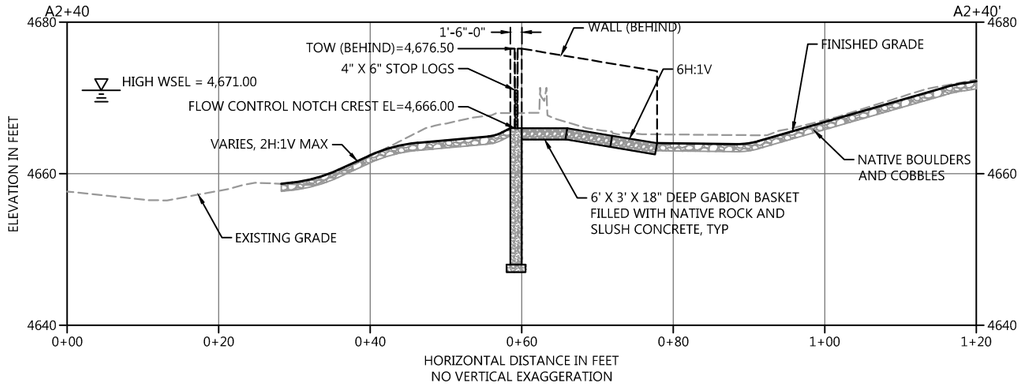
EIGHTMILE LAKE RESTORATION PROJECT

EMBANKMENT SECTIONS (1)

C-04

SHEET NO. 10 OF 15

May 29, 2017 10:23am dtrice K:\Projects\0204-Aspect Consulting, LLC\Uncle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-008 EMBANKMENT SPILL XSEC.dwg C-04



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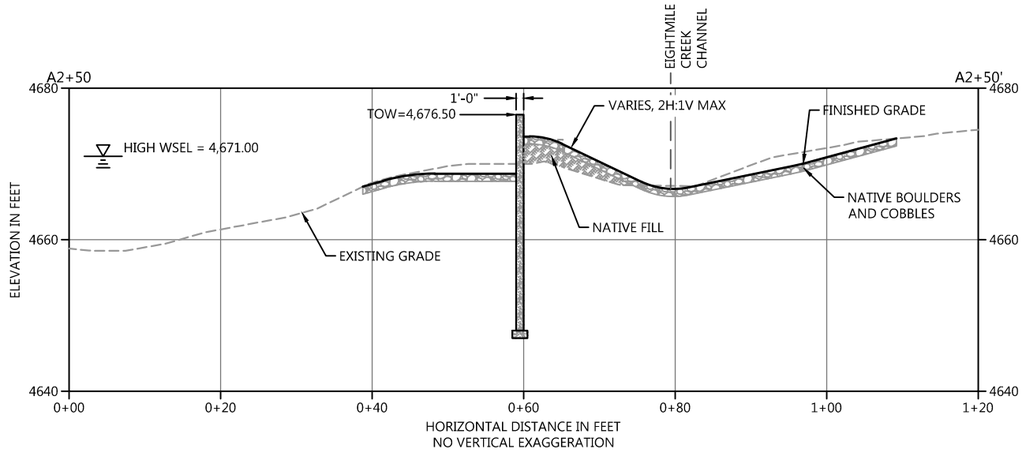

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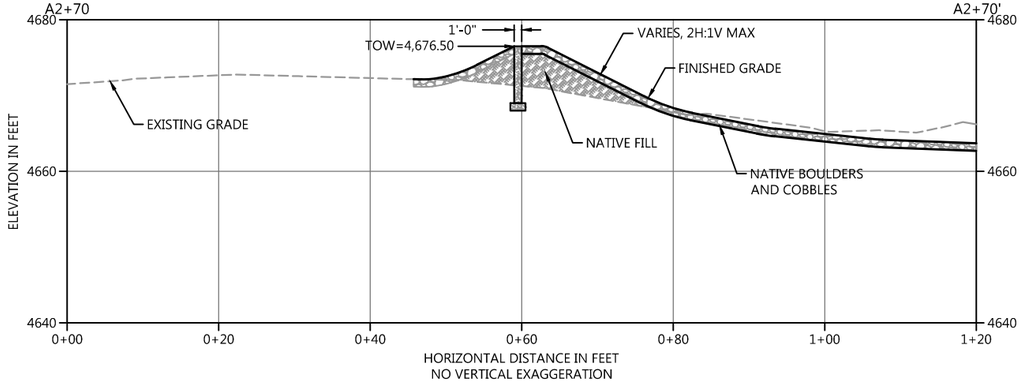

A2+70 / C-2 SECTION
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VERT. SCALE: 1" = 10'

NORTH

0 10 20
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

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ANCHOR QEA

REVISIONS

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CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

EMBANKMENT SECTIONS (2)

C-05

SHEET NO. 11 OF 15

K:\Projects\0204-Aspect Consulting, LLC\Uicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-008 EMBANKMENT SPILL XSEC.dwg C-05
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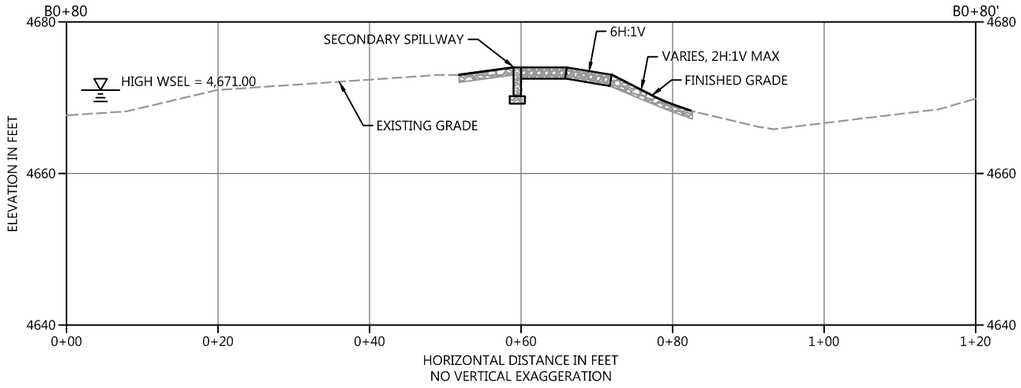

B0+80 / C-2 SECTION
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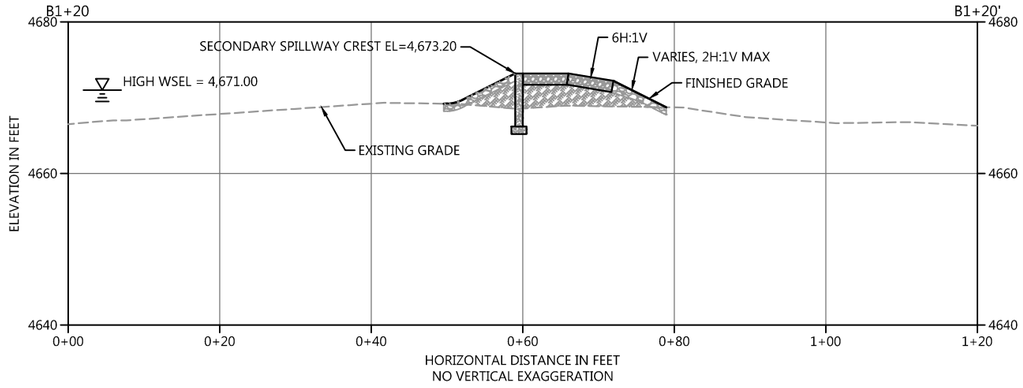

B1+20 / C-2 SECTION
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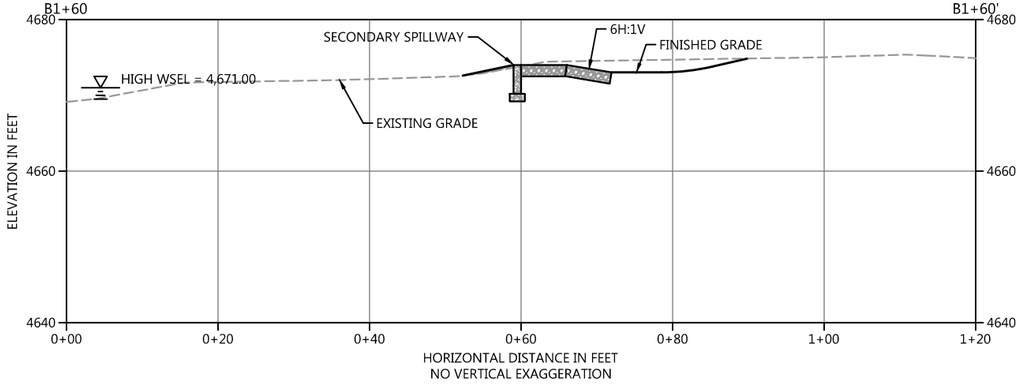

B1+60 / C-2 SECTION
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VERT. SCALE: 1" = 10'

NORTH

0 10 20
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

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REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

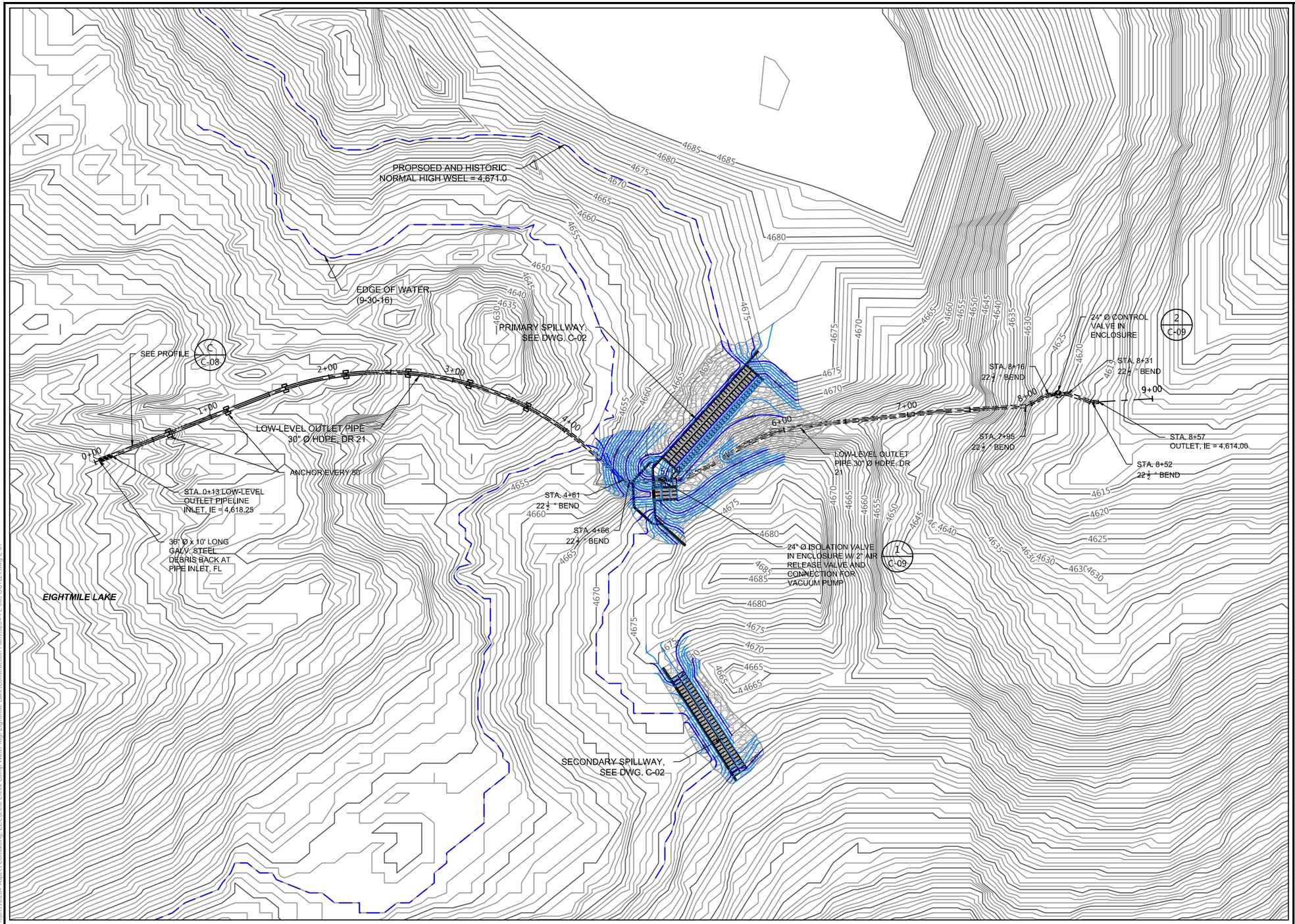
EIGHTMILE LAKE RESTORATION PROJECT

EMBANKMENT SECTIONS (3)

C-06

SHEET NO. 12 OF 15

K:\Project\0204-Aspect Consulting, LL C\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-008 EMBANKMENT SPILL XSEC.dwg C-06
Apr 26, 2017 8:15am dtice



LEGEND:

- 4570 EXISTING MAJOR CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- SUBMERGED PIPELINE
- BURIED PIPELINE
- SLOPE ARMORING
- SPILLWAY GABIONS W/CONCRETE
- REINFORCED CONCRETE WALL

NORTH

0 40 80
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

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ANCHOR QEA

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

LOW-LEVEL OUTLET PLAN

C-07

SHEET NO. 13 OF 15

K:\Project\0204-Aspect Consulting, LL C\Icicle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-009 OUTLET.dwg C-07
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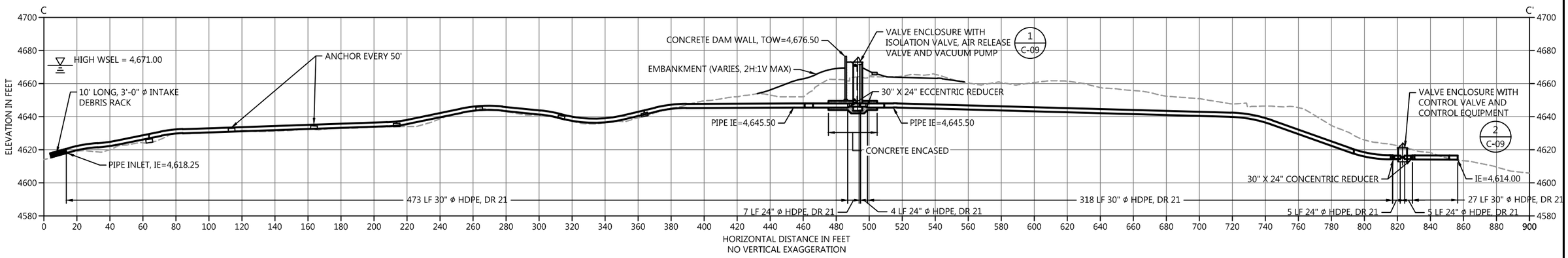


C / C-07 LOW-LEVEL OUTLET PROFILE
HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 30'

NORTH

0 30 60
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NAVD88

DRAFT

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: D. RICE
DRAWN BY: M. PRATSCHNER
CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

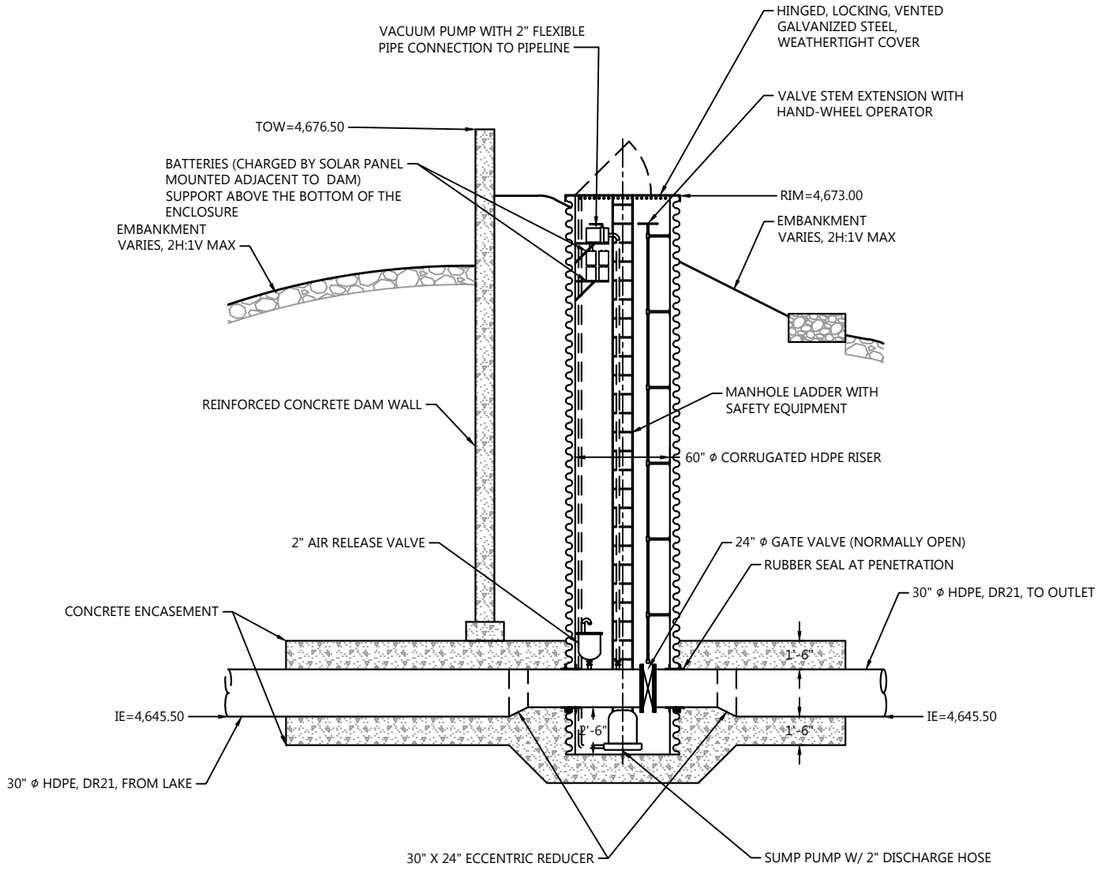
EIGHTMILE LAKE RESTORATION PROJECT

LOW-LEVEL OUTLET PROFILE

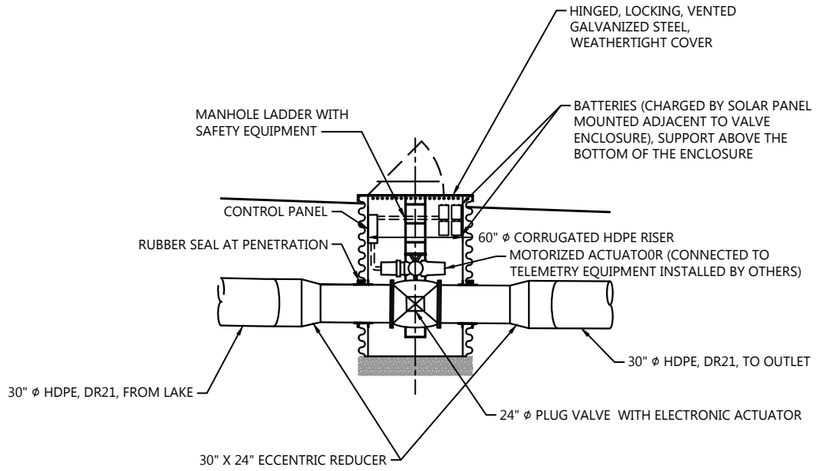
C-08

SHEET NO. 14 OF 15

Apr 26, 2017 8:25am dlrice K:\Projects\0204-Aspect Consulting, LLC\Circle Creek Comp Water Mgt\Eightmile Lake\Construction Plans\0204-PL-009 OUTLET.dwg C-08



1 C-07 ISOLATION VALVE ENCLOSURE
SCALE: 1" = 4'



2 C-07 CONTROL VALVE ENCLOSURE
SCALE: 1" = 4'

Jun 02, 2017 6:04am dhice K:\Projects\0204-Aspect Consulting, LLC\Circle Creek Comp Water Mgt\EightMile Lake\Construction Plans\0204-PL-008 EMBANKMENT SPILL XSEC.dwg C-09

DRAFT

AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

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CHECKED BY: R. MONTGOMERY
APPROVED BY: D. RICE
SCALE: AS NOTED
DATE: APRIL 2017

EIGHTMILE LAKE RESTORATION PROJECT

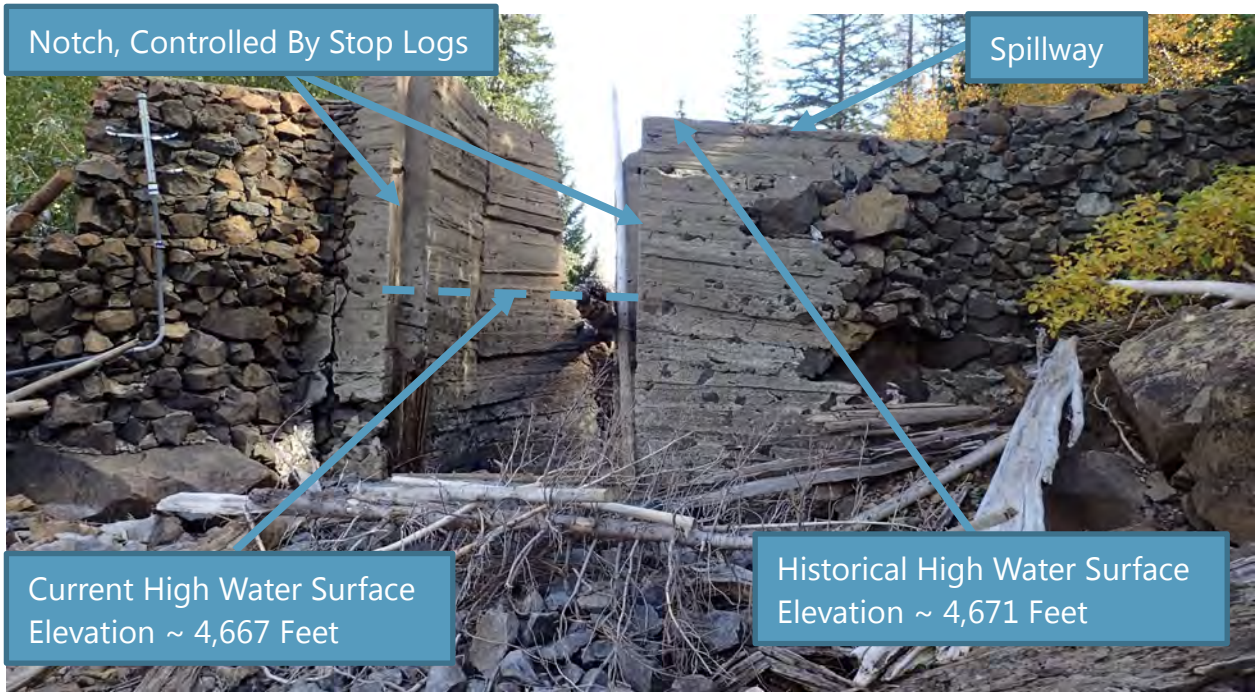
DETAILS

C-09

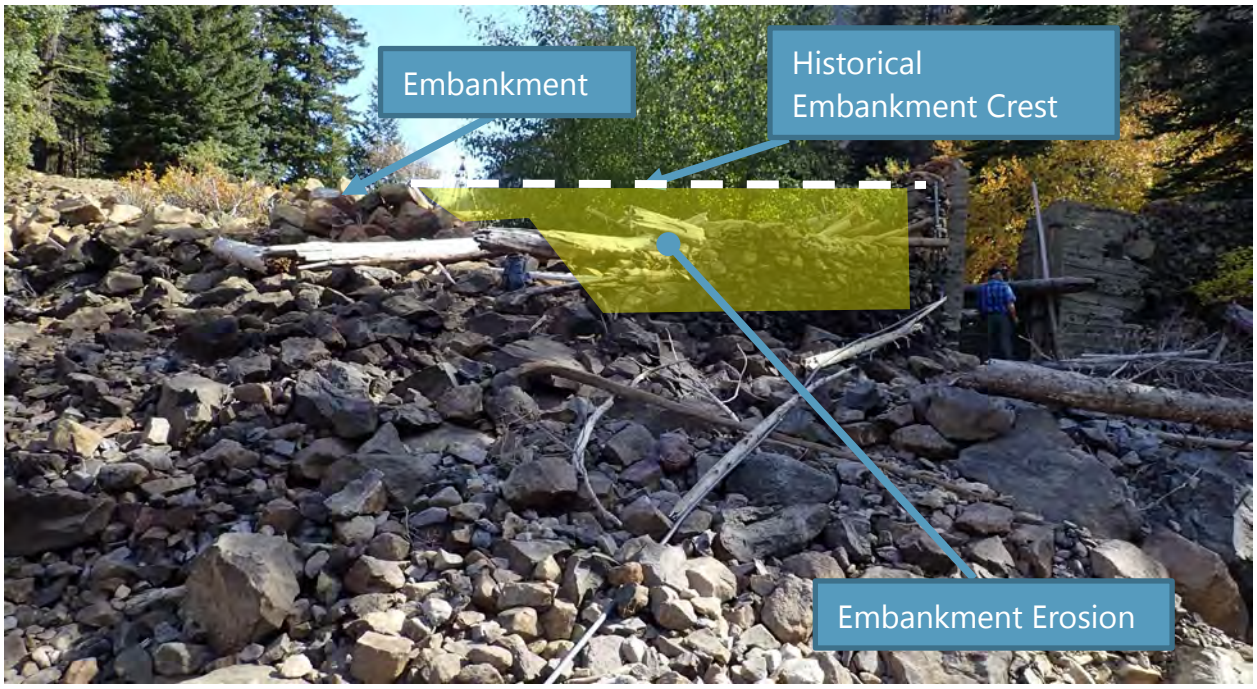
SHEET NO. 15 OF 15

Appendix B
Photographs

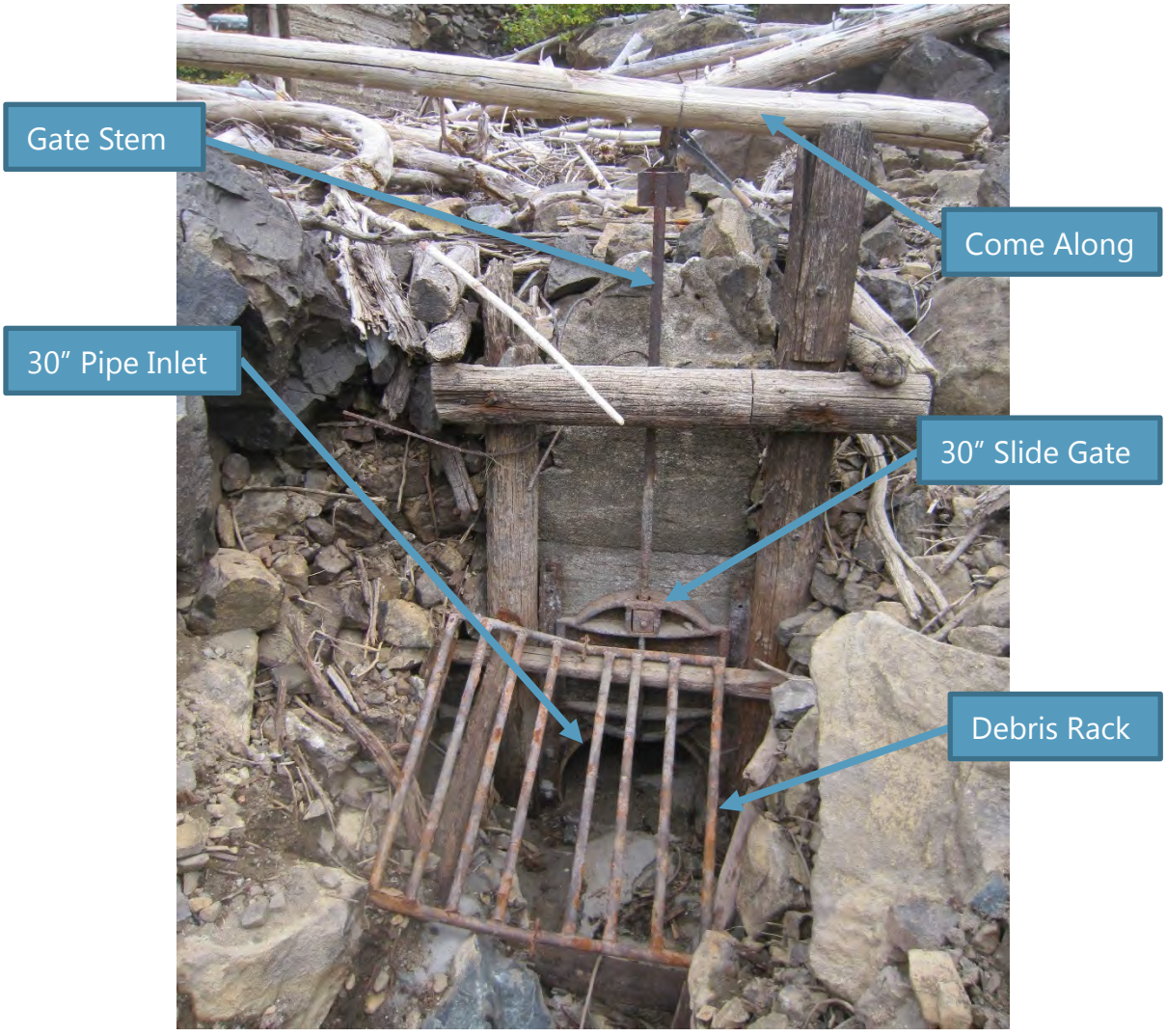
Photograph 1
Existing Dam and Spillway



Photograph 2
Existing Embankment



Photograph 3
Low-Level Outlet Gate



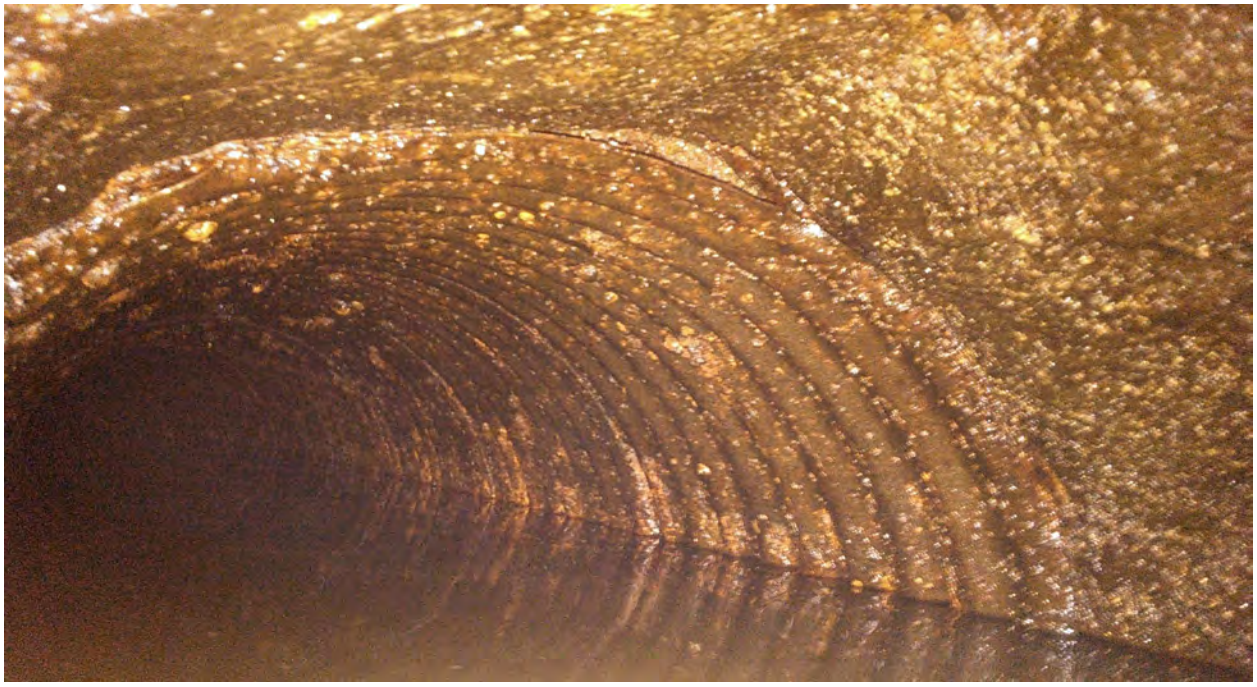
Photograph 4
Eightmile Lake – Drawn Down (September 15, 2015)

Photograph 5
Eightmile Lake – Full (July 25, 2016)

Photograph 6
Eightmile Lake – Drawn Down (September 15, 2015)

Photograph 7
Eightmile Lake – Near Full (August 29, 2012)

Photograph 8
Low-Level Outlet Pipe, Near Pipe Inlet



Photograph 9
Low-Level Outlet Pipe, Log-Stave Section

Photograph 10
Low-Level Outlet Pipe, Wood-Stave Section

Photograph 11
Low-Level Outlet Pipe, Near Pipe Outlet

Appendix C
Downstream Hazard Analysis Worksheet

WORKSHEET
DAM SAFETY GUIDELINES

SELECTION OF DESIGN/PERFORMANCE GOALS
FOR CRITICAL PROJECT ELEMENTS

PROJECT NAME: Eightmile Lake Storage Restoration Feasibility Study

DAM NAME: Eightmile Lake

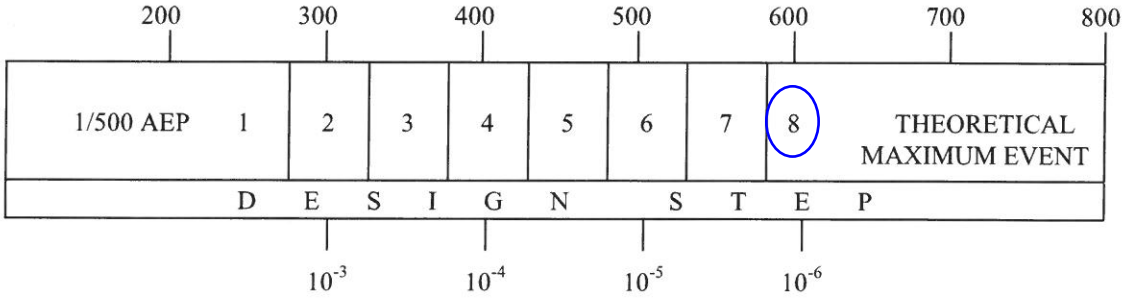
CONSEQUENCES EVALUATED FOR FAILURE OF Total failure at base of dam

AT RESERVOIR LEVEL OF EL=4673

SUMMARY SHEET

		CONSEQUENCE RATING POINTS
I.	CAPITAL VALUE OF PROJECT	110
II.	POPULATION AT RISK	295
III.	DOWNSTREAM PROPERTY AT RISK	77
	BASE POINTS	150
	CUMULATIVE CONSEQUENCE RATING POINTS	632

CUMULATIVE CONSEQUENCE RATING POINTS



DESIGN/PERFORMANCE GOAL - ANNUAL EXCEEDANCE PROBABILITY

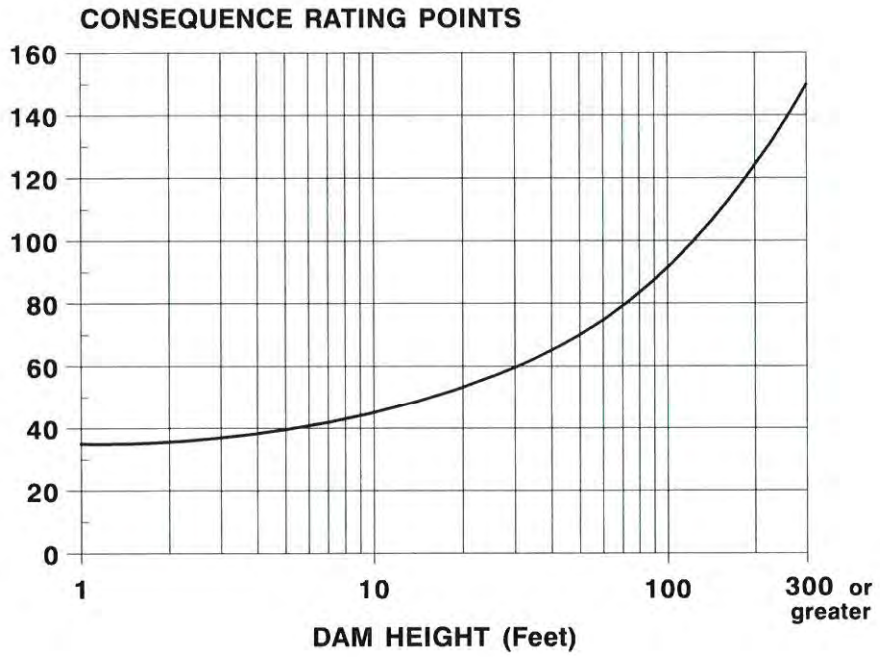
DESIGN STEP NUMBER 8

PROJECT ENGINEER David W. Rice **DATE** 02/2017

I. CAPITAL VALUE OF PROJECT

A. DAM HEIGHT INDEX

	Dam Height (feet)	Consequence Rating Points
Maximum Dam Height	26	60



I. CAPITAL VALUE OF PROJECT - Continued

B. VALUE OF RESERVOIR CONTENTS/PROJECT BENEFITS

Mandatory Consideration for Some Projects		Points Per Item	Consequence Rating Points
1.	Public Water Supply Storage	25 - 75	
Discretionary Considerations			
2.	Irrigation Water Supply Storage	10 - 75	40
3.	Industrial Water Supply Storage	10 - 75	
4.	Hydropower Generation Facilities	10 - 75	
5.	Mining or Manufacturing Process Water	10 - 75	
6.	Aesthetics, Recreation or Wildlife Habitat	10 - 25	10
7.	Other _____		

Describe: _____

Assignment of consequence rating points to dams which provide a community with a limited resource, such as a public water supply, is mandatory.

Assignment of consequence rating points to dams which provide benefits primarily to the owner, is at the discretion of the owner and/or project engineer.

A wide range of consequence rating points are possible for the various project benefits. Selection of an appropriate value should be based on the size and importance of the project benefit under consideration relative to the broad range of projects of that type. In addition, a larger or smaller value may be selected depending on the owner's and/or project engineer's perceived need for conservatism in protecting project benefits.

SUBSECTION I - SUBTOTAL OF CONSEQUENCE RATING POINTS 110

II. POPULATION AT RISK

A. CATASTROPHIC POTENTIAL INDEX

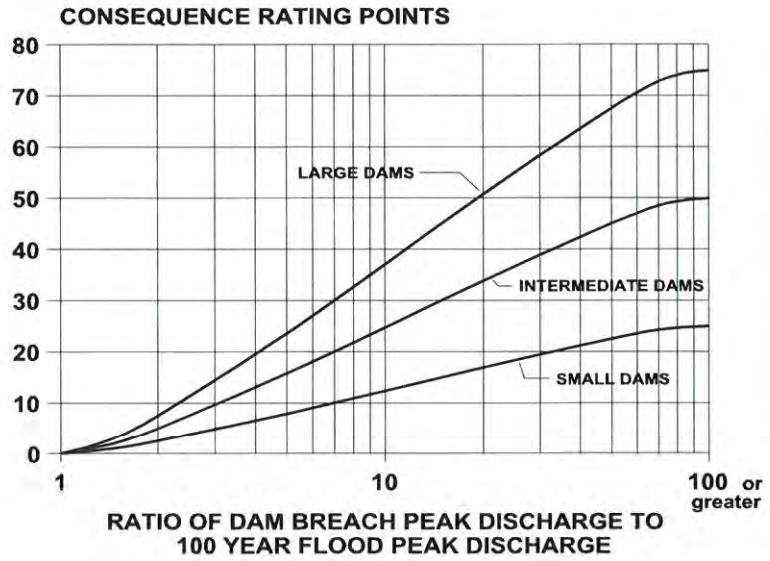
1. Estimated Dam Breach Peak Discharge at Dam Site due to Failure of Critical Project Element — 24,000-45,000 cfs

2. Estimated 100 year Flood Peak Discharge — 1620 cfs

Taken on a Natural Watercourse at First Location Downstream of the Dam Where There is a Potential for Loss of Life or

If There is No Downstream Development, It is Taken on the Natural Watercourse at a Point 1 Mile Downstream of Dam

	Index	Consequence Rating Points
3. Ratio of Dam Breach Peak Discharge to 100 Year Flood Peak Discharge	11-22	30

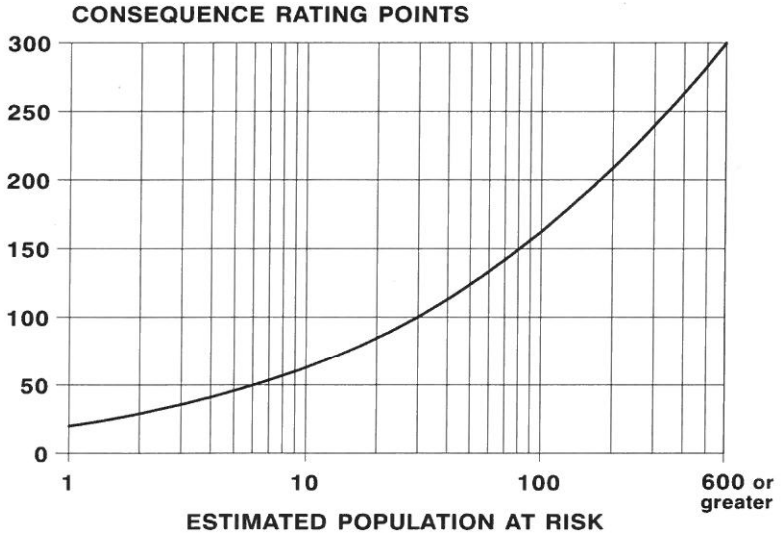


II. POPULATION AT RISK - Continued

B. POPULATION AT RISK INDEX

		No. of Persons	Consequence Rating Points
1.	Estimated Current Population at Risk (PAR)	150	
2.	Increase in Population Due to Development		
3.	TOTAL - Future Population at Risk	150	175

Describe: _____



II. POPULATION AT RISK - Continued

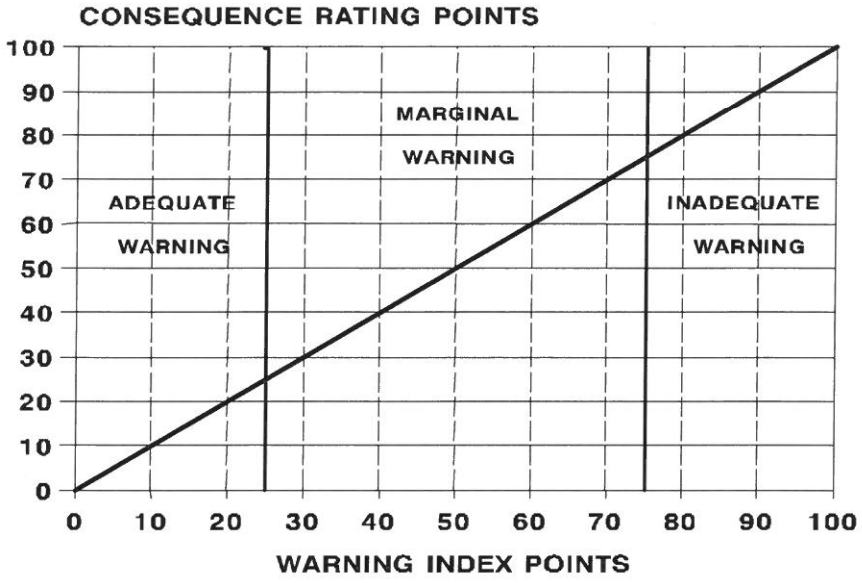
C. ADEQUACY OF WARNING

To be used when there is Population at Risk

FACTOR	ADEQUATE WARNING	MARGINAL WARNING	INADEQUATE WARNING
ADVANCED WARNING TIME	More than 30 minutes *0 Warning Index Points*	More Than 10 Minutes but Less Than 30 Minutes *25 Warning Index Points*	Less Than 10 Minutes *50 Warning Index Points*
LIKELIHOOD OF DANGEROUS SITUATION TO BE OBSERVED AND NOTIFICATION GIVEN TO GENERAL PUBLIC	Dam Owner Resides near Dam Site, or Designated Responsible Party Has Reasonably Short Access Time to Dam Site and has Duty of Initiating Warning *0 Warning Index Points*	Designated Responsible Party not Located near Dam Site, but Dam Site is Visible to General Public. There is Reasonably Good Vehicular Access near Dam Site and Intermittent Vehicular Traffic. *15 Warning Index Points*	No Designated Responsible Party near Dam Site. Dam in Remote Location. Poor Vehicular Access to Dam Site. *30 Warning Index Points*
DOWNSTREAM VALLEY SETTING AND EASE OF EVACUATION	Valleys with Good Access to High Ground and Good Roadway Systems for Escape Routes *0 Warning Index Points*	Valleys with Limited Access to High Ground and Limited Roadway Systems *10 Warning Index Points*	Narrow Confining Valley with Roadways near the Stream Bank or Along Valley Floor and Poor Access to High Ground *20 Warning Index Points*

	Item	Warning Index Points	Consequence Rating Points
1.	Advanced Warning Time	50	
2.	Likelihood of Dangerous Situations to be Observed and Notification Give to Public	30	
3.	Downstream Valley Setting and Ease of Evacuation	10	
	TOTAL WARNING INDEX POINTS	90	
	WARNING RATED AS _____		90

II. POPULATION AT RISK - Continued

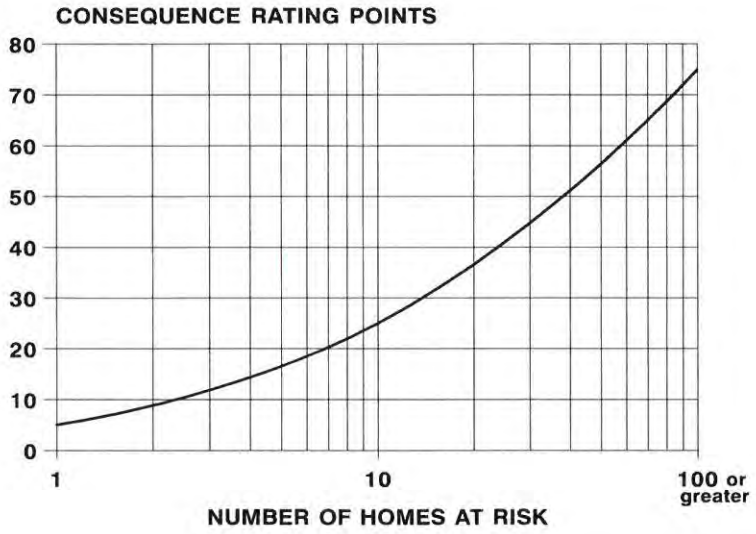


Describe: _____

SUBSECTION II - SUBTOTAL OF CONSEQUENCE RATING POINTS 295

III. DOWNSTREAM PROPERTY AT RISK

A. RESIDENTIAL UNITS	No. of Items	Consequence Rating Points
1. Equivalent Single Family Dwelling Units	50	55



B. LIFELINE FACILITIES	Points Per Item	No. of Items	Consequence Rating Points
1. Transportation Links - Bridges and Stream Crossings			
a. Freeways/interstate highways Railway main lines	25		
b. State highways	10		
c. Other public roads Railway spur lines	2 - 5	3	12

III. DOWNSTREAM PROPERTY AT RISK - Continued

	Points Per Item	No. of Items	Consequence Rating Points
2. Water Supply Systems			
a. Storage Reservoirs (Downstream)	10 - 75		
b. Treatment Facilities	10 - 25		
c. Delivery Systems	5 - 25		
3. Domestic Waste Treatment Systems			
a. Treatment Facilities	5 - 25		
4. Electric Power Facilities			
a. Electric power plant or Appurtenant works	5 - 75		
5. Emergency Response Facilities			
a. Hospitals, Police, Fire, Paramedical Units	10 - 75		

C. OTHER IMPORTANT FACILITIES

1. Public Buildings, Schools, Libraries	10 - 75		
2. Fish Hatcheries	5 - 25	1	10
3. Industrial, Commercial and Agricultural Developments	5 - 75		
4. Other Facilities or Considerations			

A wide range of consequence rating points are possible for the damages that could occur to property and lifeline facilities. Selection of an appropriate value should be based on the size and importance of the features under consideration relative to the broad range of features of that type. In addition, a larger or smaller value may be selected depending on the owner's and/or project engineer's perceived need for the protection against property damages.

III. DOWNSTREAM PROPERTY AT RISK - Continued

D. ENVIRONMENTAL DEGRADATION

	Points Per Item	No. of Items	Consequence Rating Points
1. Deleterious contents in proposed reservoir			
a. Release of reservoir contents will result in long term environmental degradation	10 - 75	_____	_____
b. Release of reservoir contents will result in temporary, minor environmental degradation	5 - 20	_____	_____
2. Damage to downstream facilities could result in release of deleterious materials stored on-site			
a. Release of deleterious materials will result in long term environmental degradation	10 - 75	_____	_____
b. Release of deleterious materials will result in temporary, minor environmental degradation	5 - 20	_____	_____

Description of damages to property, lifeline facilities, and environmental degradation: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SUBSECTION III - SUBTOTAL OF CONSEQUENCE RATING POINTS 77

GENERAL NOTES AND COMMENTS:

Appendix D
Precipitation Data Lookup Worksheets

Precipitation Magnitude-Frequency Gridded Data Set Lookup Calculator

This Work Book contains a Visual Basic for Applications macro that interpolates precipitation magnitude from gridded data set files. The user inputs the latitude and longitude of the location of interest, the precipitation duration (2-hours, 6-hours, or 24-hours), and the interpolation method. Clicking the ***Calculate*** button runs the macro and outputs the Climatic Region Number, L-Moment Statistics, and Precipitation Magnitude-Frequency Statistics below.

MGS Engineering Consultants, Inc.
7326 Boston Harbor Road NE
Olympia, WA 98506
(360) 570-3450
www.mgsengr.com

User Inputs	
Latitude (Decimal Degrees)	47.5199
Longitude (Decimal Degrees)	120.87919
Duration (hours)	6
Grid Cell Interpolation Method	1

(Enter 2, 6, or 24)
(Enter 0 for Center of Grid-Cell or 1 for Inverse Distance Weighting)

Project Name	Eightmile Lake

Calculate

Program Output	
Climatic Region Number	14
Mean Annual Precipitation (inches)	65.1
At-Site Mean (inches)	1.513
L-Cv	0.1527
L-Skew	0.1724
Hondo	-0.150

Precipitation Magnitude Frequency Output, 6-Hour Duration	
Precipitation Frequency	
10-Year	2.06
25-Year	2.39
100-Year	2.90
Step 1	3.51
Step 2	3.79
Step 3	4.28
Step 4	4.78
Step 5	5.32
Step 6	5.88
Step 7	6.47
Step 8	7.09
Program Status Message	*Successful*

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of **Intermediate** Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision
JTS, 12/09/2016

Project data:

	Input		Input	
Dam location:	T 24 N, R 16E, Section 33; 10 miles W of Levenworth, WA			
Watershed Lat/Long:	47.5199	deg. N	-120.8792	deg. W (> 3 decimal places)
Watershed elevation:	6026	feet		(Lat/Long and elev for centroid of watershed)
Climatic Region:	14			(MGS Look-up Calculator)
Mean Annual Precip:	65.1	inches		(MGS Look-up Calculator)
Duration of interest:	6	hours		(Index for intermediate storm)
Design Step:	8			(Worksheet from Tech Note 2)
Drainage area:	6	sq.miles.		(Compare to small watershed < 10 sq.miles)
	Input			

Key equations :

Precipitation estimates are calculated from gridded data set files by the MGS Look-up Calculator (the "Calculator" tab in this workbook) using the four-parameter Kappa probablility distribution. The specific equations are described in more detail in the following references :

Schaefer MG, Barker BL, Taylor GH and Wallis JR, Regional Precipitation-Frequency Analysis and Spatial Mapping of Precipitation for 24-Hour and 2-Hour Durations in Western Washington, prepared for Washington State Department of Transportation, Report WA-RD 544.1, MGS Engineering Consultants, March 2002.

Schaefer MG, Barker BL, Taylor GH and Wallis JR, Regional Precipitation-Frequency Analysis and Spatial Mapping of Precipitation for 24-Hour and 2-Hour Durations in Eastern Washington, prepared for Washington State Department of Transportation, MGS Engineering Consultants, January 2006.

The calculations were extended to the Dam Safety storms by the update to Technical Note 3.
The gridded data sets are provided by Ecology along with this spreadsheet and look-up calculator.

Scaling precipitation, P_{sd} = DF * P_{gds} Use design factor = 1.15 *Input*

where: P_{gds} = estimated 6-hr precip for selected frequency, inches
DF = design factor; DF = 1.15 for new dams
P_{sd} = scaling precip for 6-hr index period, inches

Total storm precip = (scaling precip for 6-hr index) x (multiplier from mass curve for 18-hr storm)
multiplier for 18-hr storm = 1.8790 for Climatic Region 14
*(from **Multipliers** worksheet)* Hyetograph no. 11

This project :

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Precip estimate, P_{gds} (in.) :	2.06	2.39	2.90	3.51	3.79	4.28
Scaling precipitation, P_{sd} (in.) :	2.37	2.75	3.33	4.04	4.36	4.92
Total precip for design storm :	4.46	5.16	6.26	7.59	8.20	9.24

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Precip estimate, P_{gds} (in.) :	4.78	5.32	5.88	6.47	7.09	9.62
Scaling precipitation, P_{sd} (in.) :	5.50	6.12	6.76	7.44	8.15	9.62
Total precip for design storm :	10.33	11.49	12.70	13.97	15.31	18.08

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of Intermediate Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision

Comparison to PMP for general storm. Ref: HMR-57, Map 1 - NW, Table 10.10.

PMP for a 6-hour period is estimated as a percentage of the 24-hour PMP. The percentage factor varies by climatic region as follows :

	Western Washington				Eastern Washington	
	Coast	Olympics	Cascades	Puget Sound	Mountains	Central Basin
Regions :	5	151-142	15-154	31-32	14-147-13	77-07
Factor :	0.43	0.40	0.40	0.44	0.52	0.59

This project :

Input

General storm, 24-hour PMP = 18.5 in. From HMR-57 Map 1

For region: 14

6-hr PMP= 0.52 x 24-hr = 9.62 in.

Input

Frequency / design step :	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Scaling precipitation, P_{sd} (in.) :	4.92	5.50	6.12	6.76	7.44	8.15
Percentage of 6-hr PMP (%) :	51.1	57.2	63.6	70.3	77.3	84.7

Note: Per Tech Note 3, page 10: For IDF = PMF, use PMP > Step 6.

Comparison to PMP for local storm (thunderstorm). Ref: HMR-57, Fig. 11.19 and 11.12, Table 11.4.

Input

Local storm, 1-hour PMP = 6.6 in.

6-hour PMP = 115% x 1-hr = 7.6 in.

Frequency / design step :	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Scaling precipitation, P_{sd} (in.) :	4.92	5.50	6.12	6.76	7.44	8.15
Percentage of 6-hr PMP (%) :	64.8	72.5	80.6	89.1	98.0	107.4

Note: Per Tech Note 3, page 10: For IDF = PMF, use PMP > Step 6.

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of Intermediate Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision

Peak rainfall intensity for design storm.

Peak rainfall intensity (in/hr) = (total storm precip) x (peak intensity factor)

peak intensity factor = 0.27032 for Climatic Region 14
*(from **Multipliers** worksheet)* Hyetograph no. 11

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Total precip for design storm :	4.46	5.16	6.26	7.59	8.20	9.24
Peak storm intensity (in/hr) :	1.21	1.40	1.69	2.05	2.22	2.50

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Total precip for design storm :	10.33	11.49	12.70	13.97	15.31	18.08
Peak storm intensity (in/hr) :	2.79	3.11	3.43	3.78	4.14	4.89

Total storm multipliers for intermediate storm hyetographs

MDW, 10/13/09

Regions	Hyetograph	Total storm multiplier	Peak intensity factor
5	8	1.6810	0.31408
151-142	9	1.8580	0.28416
15-154	9	1.8580	0.28416
31-32	10	1.6670	0.33352
14	11	1.8790	0.27032
147-77-07	12	1.5515	0.40476
13	13	1.6285	0.35612

This project :

Region	Hyetograph	Multiplier	Factor
14	11	1.8790	0.27032
	Input	*Input*	*Input*

Precipitation Magnitude-Frequency Gridded Data Set Lookup Calculator

This Work Book contains a Visual Basic for Applications macro that interpolates precipitation magnitude from gridded data set files. The user inputs the latitude and longitude of the location of interest, the precipitation duration (2-hours, 6-hours, or 24-hours), and the interpolation method. Clicking the ***Calculate*** button runs the macro and outputs the Climatic Region Number, L-Moment Statistics, and Precipitation Magnitude-Frequency Statistics below.

MGS Engineering Consultants, Inc.
7326 Boston Harbor Road NE
Olympia, WA 98506
(360) 570-3450
www.mgsengr.com

User Inputs	
Latitude (Decimal Degrees)	47.5199
Longitude (Decimal Degrees)	120.87919
Duration (hours)	24
Grid Cell Interpolation Method	1

(Enter 2, 6, or 24)
(Enter 0 for Center of Grid-Cell or 1 for Inverse Distance Weighting)

Project Name	Eightmile Lake

Calculate

Program Output	
Climatic Region Number	14
Mean Annual Precipitation (inches)	65.1
At-Site Mean (inches)	3.367
L-Cv	0.1764
L-Skew	0.1666
Hondo	-0.050

Precipitation Magnitude Frequency Output, 24-Hour Duration	
Precipitation Frequency	
10-Year	4.79
25-Year	5.60
100-Year	6.82
Step 1	8.23
Step 2	8.84
Step 3	9.87
Step 4	10.90
Step 5	11.95
Step 6	13.01
Step 7	14.07
Step 8	15.15
Program Status Message	*Successful*

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of **Long Duration** Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision
JTS, 12/09/2016

Project data :

	Input		Input	
Dam location:	T 24 N, R 16E, Section 33; 10 miles W of Levenworth, WA			
Watershed Lat/Long:	47.5199	deg. N	-120.8792	deg. W (> 3 decimal places)
Watershed elevation:	6026	feet		(Lat/Long and elev for centroid of watershed)
Climatic Region:	14			(MGS Look-up Calculator)
Mean Annual Precip:	65.1	inches		(MGS Look-up Calculator)
Duration of interest:	24	hours		(Index for long duration storm)
Design Step:	8			(Worksheet from Tech Note 2)
Drainage area:	6	sq.miles.		(Compare to small watershed < 10 sq.miles)
	Input			

Key equations :

Precipitation estimates are calculated from gridded data set files by the MGS Look-up Calculator (the "Calculator" tab in this workbook) using the four-parameter Kappa probablility distribution. The specific equations are described in more detail in the following references :

Schaefer MG, Barker BL, Taylor GH and Wallis JR, Regional Precipitation-Frequency Analysis and Spatial Mapping of Precipitation for 24-Hour and 2-Hour Durations in Western Washington, prepared for Washington State Department of Transportation, Report WA-RD 544.1, MGS Engineering Consultants, March 2002.

Schaefer MG, Barker BL, Taylor GH and Wallis JR, Regional Precipitation-Frequency Analysis and Spatial Mapping of Precipitation for 24-Hour and 2-Hour Durations in Eastern Washington, prepared for Washington State Department of Transportation, MGS Engineering Consultants, January 2006.

The calculations were extended to the Dam Safety storms by the update to Technical Note 3. The gridded data sets are provided by Ecology along with this spreadsheet and look-up calculator.

Scaling precipitation, P_{sd} = DF * P_{gds} Use design factor = 1.15 *Input*

where: P_{gds} = estimated 24-hr precip for selected frequency, inches
DF = design factor; DF = 1.15 for new dams
P_{sd} = scaling precip for 24-hr index period, inches

Total storm precip = (scaling precip for 24-hr index) x (multiplier from mass curve for 72-hr storm)
multiplier for 72-hr storm = 1.6854 for Climatic Region 14
*(from **Multipliers** worksheet)* Hyetograph no. 17

This project :

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Precip estimate, P_{gds} (in.) :	4.79	5.60	6.82	8.23	8.84	9.87
Scaling precipitation, P_{sd} (in.) :	5.51	6.45	7.84	9.46	10.17	11.35
Total precip for design storm :	9.29	10.86	13.21	15.95	17.14	19.12

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Precip estimate, P_{gds} (in.) :	10.90	11.95	13.01	14.07	15.15	18.50
Scaling precipitation, P_{sd} (in.) :	12.54	13.74	14.96	16.18	17.42	18.50
Total precip for design storm :	21.13	23.16	25.21	27.27	29.36	31.18

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of Long Duration Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision

JTS, 12/09/2016

Comparison to PMP for general storm. Ref: HMR-57, Map 1 - NW.

Input

General storm, 24-hour PMP = 18.5 in.

Frequency / design step :	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Scaling precipitation, P_{sd} (in.) :	11.35	12.54	13.74	14.96	16.18	17.42
Percentage of 24-hr PMP (%):	61.3	67.8	74.3	80.8	87.5	94.2

Note: Per Tech Note 3, page 8: For IDF = PMF, use PMP > Step 6.

Peak rainfall intensity for design storm.

Peak rainfall intensity (in/hr) = (total storm precip) x (peak intensity factor)

peak intensity factor = 0.12340 for Climatic Region 14

*(from **Multipliers** worksheet)* Hyetograph no. 17

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Total precip for design storm :	9.29	10.86	13.21	15.95	17.14	19.12
Peak storm intensity (in/hr) :	1.15	1.34	1.63	1.97	2.11	2.36

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Total precip for design storm :	21.13	23.16	25.21	27.27	29.36	31.18
Peak storm intensity (in/hr) :	2.61	2.86	3.11	3.37	3.62	3.85

Total storm multipliers for long duration storm hyetographs

MDW, 10/13/09

Regions	Hyetograph	Total storm multiplier	Peak intensity factor
5	14	1.4643	0.11756
151-142	15	1.6215	0.09124
15-154	15	1.6215	0.09124
31-32	16	1.4153	0.13280
14	17	1.6854	0.12340
147-77-07	18	1.2545	0.21360
13	19	1.4473	0.19620

This project :

Region	Hyetograph	Multiplier	Factor
14	17	1.6854	0.12340
	Input	*Input*	*Input*

Precipitation Magnitude-Frequency Gridded Data Set Lookup Calculator

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(360) 570-3450
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This Work Book contains a Visual Basic for Applications macro that interpolates precipitation magnitude from gridded data set files. The user inputs the latitude and longitude of the location of interest, the precipitation duration (2-hours, 6-hours, or 24-hours), and the interpolation method. Clicking the ***Calculate*** button runs the macro and outputs the Climatic Region Number, L-Moment Statistics, and Precipitation Magnitude-Frequency Statistics below.

User Inputs		
Latitude (Decimal Degrees)	47.5199	
Longitude (Decimal Degrees)	120.87919	
Duration (hours)	2	(Enter 2, 6, or 24)
Grid Cell Interpolation Method	1	(Enter 0 for Center of Grid-Cell or 1 for Inverse Distance Weighting)

Project Name	Eightmile Lake

Calculate

Program Output	
Climatic Region Number	14
Mean Annual Precipitation (inches)	65.1
At-Site Mean (inches)	0.726
L-Cv	0.1414
L-Skew	0.2074
Hondo	-0.150

Precipitation Magnitude Frequency Output, 2-Hour Duration	
Precipitation Frequency	
10-Year	0.97
25-Year	1.13
100-Year	1.39
Step 1	1.73
Step 2	1.89
Step 3	2.19
Step 4	2.52
Step 5	2.89
Step 6	3.30
Step 7	3.75
Step 8	4.26
Program Status Message	*Successful*

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of **Short Duration** Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision
JTS, 12/09/2016

Project data:	*Input*		*Input*	
Dam location:	T 24 N, R 16E, Section 33; 10 miles W of Levenworth, WA			
Watershed Lat/Long:	47.5199	deg. N	-120.8792	deg. W (> 3 decimal places)
Watershed elevation:	6026	feet		(Lat/Long and elev for centroid of watershed)
Climatic Region:	14			(MGS Look-up Calculator)
Mean Annual Precip:	65.1	inches		(MGS Look-up Calculator)
Duration of interest:	2	hours		(Index for short duration storm)
Design Step:	8			(Worksheet from Tech Note 2)
Drainage area:	6	sq.miles.		(Compare to small watershed < 1 sq.mile.)
	Input			

Key equations :

Precipitation estimates are calculated from gridded data set files by the MGS Look-up Calculator (the "Calculator" tab in this workbook) using the four-parameter Kappa probablility distribution. The specific equations are described in more detail in the following references :

Schaefer MG, Barker BL, Taylor GH and Wallis JR, Regional Precipitation-Frequency Analysis and Spatial Mapping of Precipitation for 24-Hour and 2-Hour Durations in Western Washington, prepared for Washington State Department of Transportation, Report WA-RD 544.1, MGS Engineering Consultants, March 2002.

Schaefer MG, Barker BL, Taylor GH and Wallis JR, Regional Precipitation-Frequency Analysis and Spatial Mapping of Precipitation for 24-Hour and 2-Hour Durations in Eastern Washington, prepared for Washington State Department of Transportation, MGS Engineering Consultants, January 2006.

The calculations were extended to the Dam Safety storms by the update to Technical Note 3.
The gridded data sets are provided by Ecology along with this spreadsheet and look-up calculator.

Scaling precipitation, P_{sd} = DF * P_{gds} Use design factor = 1.15 *Input*

where: P_{gds} = estimated 2-hr precip for selected frequency, inches
DF = design factor; DF = 1.15 for new dams
P_{sd} = scaling precip for 2-hr index period, inches

Total storm precip = (scaling precip for 2-hr index) x (multiplier from mass curve for 4-hr storm)
multiplier for 4-hr storm = 1.0910 for Climatic Region 14
*(from **Multipliers** worksheet)* Hyetograph no. 6

This project :

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Precip estimate, P_{gds} (in.) :	0.97	1.13	1.39	1.73	1.89	2.19
Scaling precipitation, P_{sd} (in.) :	1.11	1.30	1.59	1.99	2.18	2.52
Total precip for design storm :	1.22	1.41	1.74	2.17	2.38	2.75

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Precip estimate, P_{gds} (in.) :	2.52	2.89	3.30	3.75	4.26	7.26
Scaling precipitation, P_{sd} (in.) :	2.90	3.32	3.79	4.32	4.90	7.26
Total precip for design storm :	3.16	3.63	4.14	4.71	5.34	7.92

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Worksheet for Computation of Short Duration Precipitation Magnitude-Frequency Curve
Reference: Technical Note 3, Oct 2009 revision
JTS, 12/09/2016

Comparison to PMP for local storm (thunderstorm). Ref: HMR-57, Fig. 11.19 and 11.12, Table 11.4.

	Input	
Local storm, 1-hour PMP =	6.6	in.
2-hour PMP = 110% x 1-hr =	7.3	in.

Frequency / design step :	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Scaling precipitation, P_{sd} (in.) :	2.52	2.90	3.32	3.79	4.32	4.90
Percentage of 2-hr PMP (%) :	34.7	39.9	45.8	52.3	59.4	67.5

Note: Per Tech Note 3, page 10: For IDF = PMF, use PMP > Step 6.

Basin average precipitation for large watershed.

Drainage area = 6 sq.miles. (Compare to small watershed < 1 sq.mile.)

Basin avg. precip = 92 % of total storm point precip.
*(from **Multipliers** worksheet)*

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Total storm point precip :	1.22	1.41	1.74	2.17	2.38	2.75
Basin avg total storm precip :	1.12	1.30	1.60	2.00	2.19	2.53

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Total storm point precip :	3.16	3.63	4.14	4.71	5.34	7.92
Basin avg total storm precip :	2.91	3.34	3.81	4.33	4.92	7.29

Peak rainfall intensity for design storm.

Peak rainfall intensity (in/hr) = (total storm precip) x (peak intensity factor)
peak intensity factor = 2.99172 for Climatic Region 14
*(from **Multipliers** worksheet)* Hyetograph no. 6

Frequency / design step :	10 yr	25 yr	100 yr	Step 1	Step 2	Step 3
Basin avg total storm precip :	1.12	1.30	1.60	2.00	2.19	2.53
Peak storm intensity (in/hr) :	3.34	3.89	4.79	5.98	6.54	7.57

Frequency / design step :	Step 4	Step 5	Step 6	Step 7	Step 8	PMP
Basin avg total storm precip :	2.91	3.34	3.81	4.33	4.92	7.29
Peak storm intensity (in/hr) :	8.71	9.98	11.39	12.96	14.71	21.80

Total storm multipliers for short duration storm hyetographs
MDW, 10/13/09

Regions	Hyetograph	Total storm multiplier	Peak intensity factor
5	5	1.2050	2.23068
151-142	5	1.2050	2.23068
15-154	5	1.2050	2.23068
31-32	5	1.2050	2.23068
14-147-13	6	1.0910	2.99172
77-07	7	1.0350	3.50136

This project :

Region	Hyetograph	Multiplier	Factor
14	6	1.0910	2.99172
	Input	*Input*	*Input*

Areal adjustment factors for short duration storm hyetographs
MDW, 9/11/09

Refs :
Tech Note 3 (2009 update), Table 1 on page 9
Schaefer, Extreme Storms; Figure 16 on page 70

Basin average precipitation for large watershed.

Drainage area (sq.miles)	Percentage of point precip (%)
< 1	100
1 < 2	100
2 < 3	99
3 < 5	96
5 < 7	92
7 < 10	89
> 10	85

This project :

Drainage area = 6 sq.miles. (Compare to small watershed < 1 sq.mile.)

Basin avg. precip = 92 % of total storm point precip.
Input

Appendix E
Snowmelt Calculation Worksheet

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Calculate snowmelt during rain-on-snow events
JTS, 02/15/17

Snowmelt calculations for sub-basins within Eightmile Lake watershed

References :

Corps of Engineers. **Runoff from Snowmelt**. EM 1110-2-1406. USACE. 1998.
WSDOT. **Hydraulics Manual**. M 23-03. WSDOT. 2010. Section 2-4.1 on pages 2-5 to 2-6.

Key equations:

Snowmelt = [(LW rad + Conv + rain melt) (T_{air} - 32)]
+ [SW rad + ground melt]

where : Conv = 0.0084 k V_{air} ; k = f (% forest cover)
use V_{air} = 18 mph
checking : 80 % forest cover
Conv = 0.045 *OK*

Rainmelt = 0.007 P_r

% forest	k	SW rad
0	1.0	0.07
10	1.0	0.07
20	0.9	0.07
30	0.8	0.07
40	0.7	0.07
50	0.6	0.07
60	0.5	0.07
70	0.4	0.07
80	0.3	0.05
90	0.3	0.03
100	0.3	0.03

coefficients :

	24-hr values :		18-hr values :	72-hr values :
LW rad	0.029	in. / day F	0.022	0.087
Conv	0.0084	in. / day mph F	0.0063	0.0252
rain melt	0.007	in. / in. F	0.007	0.007
SW rad	0.07	in. / day	0.053	0.21
grnd melt	0.02	in. / day	0.015	0.06

Calculation procedure :

1) Identify elevation zones in increments of 1000 feet where snow may occur. Determine area and % of sub-basin for each elevation zone.
2) Estimate snowpack depth and water content for each elevation zone (represents upper limit for snowmelt runoff).
3) Estimate air temperature for highest elevation. Estimate air temperature lapse rate : 5.5 deg F per 1000 feet elevation change. Calculate average air temperature for each elevation zone.
4) Estimate R_{18} and R_{72} from design precipitation worksheets. Estimate typical wind velocity W from climatological data. If not available, estimate W = 18 mph.
5) Calculate M_{18} and M_{72} for each elevation zone. Calculate weighted average (weighted by % area) snowmelt depths M_{18} and M_{72} for the entire sub-basin.
6) Add snowmelt to rainfall to get total storm precipitation available for runoff.

Average January temperature = 26 deg F at Leavenworth, WA
Average March/April temperature 44 deg F at Leavenworth, WA

Snowmelt calculations for sub-basins within Eightmile Lake watershed

Snowmelt calculations for Eightmile Lake

Sub-basin drainage area =	6	acres / sq.miles			
Highest elevation =	7980	feet	Temperature =	32.0	deg F
Average wind velocity =	17	miles/hour			
Reservoir elevation =	4670	feet	Temperature =	50.2	deg F
Zone 1 base elev. =	6500	feet	Average temp. =	36.1	deg F
Zone 2 base elev. =	5500	feet	Average temp. =	42.9	deg F
Zone 3 base elev. =	4500	feet	Average temp. =	48.4	deg F

Frequency/design step:		100 yr	Step 1	Step 5	Step 7	Step 8
Rainfall :						
Intermediate :	R_{18} =	6.26	7.59	11.49	13.97	15.31
Long duration:	R_{72} =	13.21	15.95	23.16	27.27	29.36

Elevation Zone **1** :

Elevations =	6500	feet to	7980	feet		
Zone drainage area =	1.93	acres / sq.miles	forest cover =	10	% forest	
% of sub-basin =	32.2	%	conv k =	1.0		
Air temperature =	36.1	deg F.	SW rad =	0.07	in. / day	
Snowpack depth =	10.0	feet =	120	inches		
Water content =	20	% =	24.0	inches		

Frequency/design step :		100 yr	Step 1	Step 5	Step 7	Step 8
Snowmelt (inches):						
Intermediate :	M_{18} =	0.77	0.81	0.92	0.99	1.03
% of snow water content =		3.2	3.4	3.8	4.1	4.3
revised M_{18} =		0.77	0.81	0.92	0.99	1.03
weighted M_{18} =		0.248	0.260	0.296	0.318	0.331
Long duration:	M_{72} =	2.74	2.82	3.03	3.14	3.20
% of snow water content =		11.4	11.8	12.6	13.1	13.4
revised M_{72} =		2.74	2.82	3.03	3.14	3.20
weighted M_{72} =		0.883	0.908	0.974	1.012	1.031

Snowmelt calculations for Eightmile Lake

Elevation Zone **2** :

Elevations =	5500	feet	to	6500	feet			
Zone drainage area =	2.48	acres / sq.miles				forest cover =	50	% forest
% of sub-basin =	41.3	%				conv k =	0.6	
Air temperature =	42.9	deg F.				SW rad =	0.07	in. / day
Snowpack depth =	5.0	feet	=	60	inches			
Water content =	20	%	=	12.0	inches			

Frequency/design step :		100 yr	Step 1	Step 5	Step 7	Step 8
Snowmelt (inches):						
Intermediate :	M_{18} =	1.48	1.58	1.88	2.07	2.17
% of snow water content =		12.3	13.2	15.7	17.2	18.1
revised M_{18} =		1.48	1.58	1.88	2.07	2.17
weighted M_{18} =		0.612	0.654	0.777	0.855	0.897
Long duration:	M_{72} =	5.02	5.23	5.78	6.10	6.25
% of snow water content =		41.9	43.6	48.2	50.8	52.1
revised M_{72} =		5.02	5.23	5.78	6.10	6.25
weighted M_{72} =		2.076	2.163	2.390	2.519	2.585

Elevation Zone **3** :

Elevations =	4500	feet	to	5500	feet			
Zone drainage area =	1.59	acres / sq.miles				forest cover =	75	% forest
% of sub-basin =	26.5	%				conv k =	0.4	
Air temperature =	48.4	deg F.				SW rad =	0.06	in. / day
Snowpack depth =	3.0	feet	=	36	inches			
Water content =	20	%	=	7.2	inches			

Frequency/design step :		100 yr	Step 1	Step 5	Step 7	Step 8
Snowmelt (inches):						
Intermediate :	M_{18} =	1.75	1.90	2.35	2.63	2.79
% of snow water content =		24.3	26.4	32.6	36.6	38.7
revised M_{18} =		1.75	1.90	2.35	2.63	2.79
weighted M_{18} =		0.464	0.504	0.623	0.698	0.739
Frequency/design step :		100 yr	Step 1	Step 5	Step 7	Step 8
Snowmelt (inches):						
Long duration:	M_{72} =	5.64	5.95	6.78	7.25	7.49
% of snow water content =		78.3	82.7	94.2	100.7	104.1
revised M_{72} =		5.64	5.95	6.78	7.20	7.20
weighted M_{72} =		1.494	1.578	1.797	1.908	1.908

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

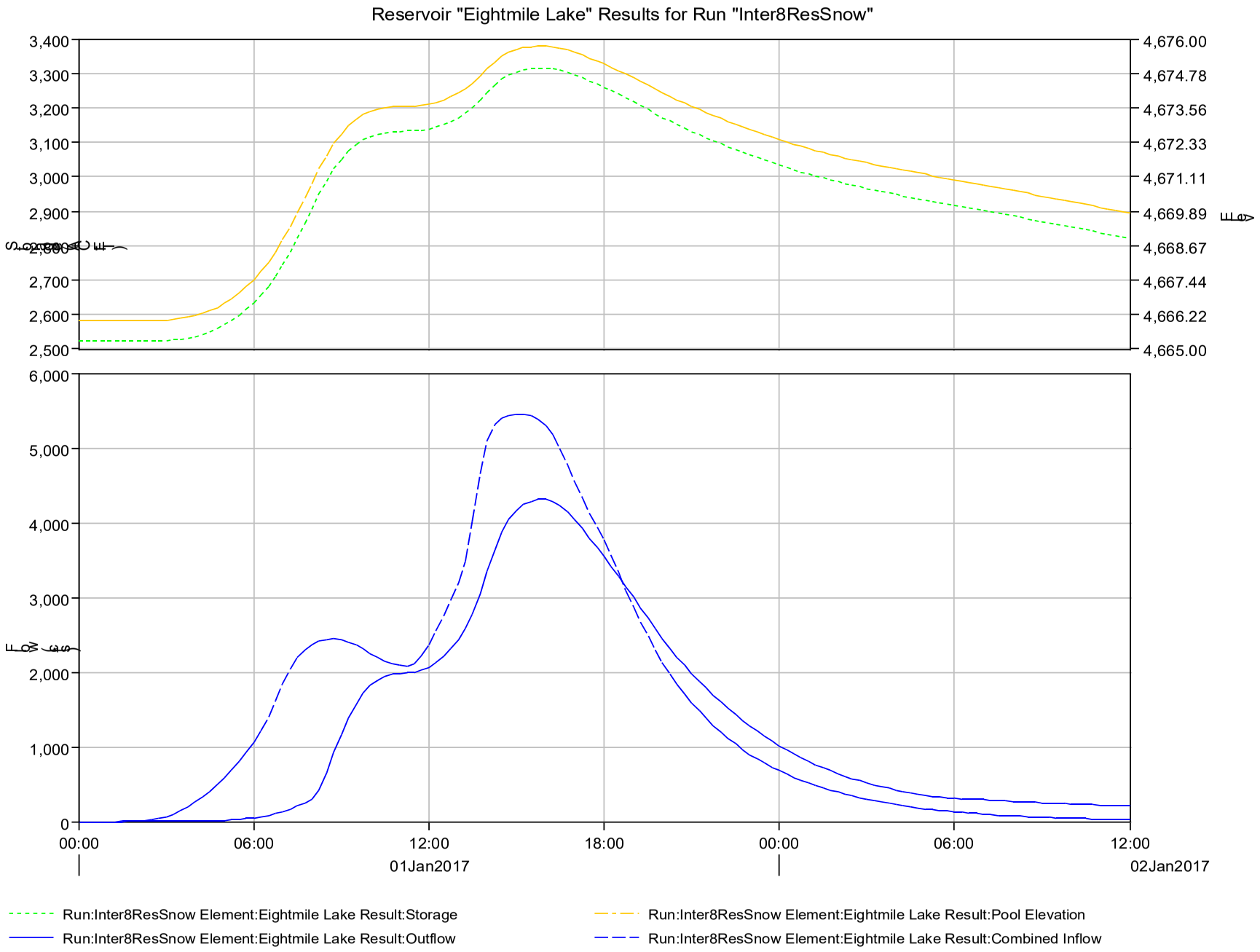
Snowmelt calculations for Eightmile Lake

Snowmelt and design storm precipitation (in inches) for overall sub-basin :

Frequency/design step :		100 yr	Step 1	Step 5	Step 7	Step 8
Intermediate :	M_{18} =	1.32	1.42	1.70	1.87	1.97
	R_{18} =	6.26	7.59	11.49	13.97	15.31
	P_{18} =	7.58	9.01	13.19	15.84	17.28
Long duration:	M_{72} =	4.45	4.65	5.16	5.44	5.52
	R_{72} =	13.21	15.95	23.16	27.27	29.36
	P_{72} =	17.66	20.60	28.32	32.71	34.88

[end for this sub-basin]

Appendix F
HEC-HMS Model Results


Reservoir "Eightmile Lake" Results for Run "Inter8ResSnow"
3,400
3,300
3,200
3,100
3,000
2,900
2,800
2,700
2,600
2,500
4,676.00
4,674.78
4,673.56
4,672.33
4,671.11
4,669.89
4,668.67
4,667.44
4,666.22
4,665.00
6,000
5,000
4,000
3,000
2,000
1,000
0
00:00
06:00
12:00
18:00
00:00
06:00
12:00
01Jan2017
02Jan2017
Run:Inter8ResSnow Element:Eightmile Lake Result:Storage
Run:Inter8ResSnow Element:Eightmile Lake Result:Pool Elevation
Run:Inter8ResSnow Element:Eightmile Lake Result:Outflow
Run:Inter8ResSnow Element:Eightmile Lake Result:Combined Inflow

Project: EightmileLake Simulation Run: Inter8ResSnow

Reservoir: Eightmile Lake

Start of Run:	01Jan2017, 00:00	Basin Model:	EightmileLkResv
End of Run:	02Jan2017, 12:00	Meteorologic Model:	Inter8Snowmelt
Compute Time:	13Apr2017, 07:33:15	Control Specifications:	Intermediate

Volume Units: AC-FT

Computed Results

Peak Inflow:	5447.3 (CFS)	Date/Time of Peak Inflow:	01Jan2017, 15:00
Peak Discharge:	4308.4 (CFS)	Date/Time of Peak Discharge	01Jan2017, 15:45
Inflow Volume:	4462.2 (AC-FT)	Peak Storage:	3314.1 (AC-FT)
Discharge Volume	3728.7 (AC-FT)	Peak Elevation:	4675.7 (FT)

Project: EightmileLake Simulation Run: Inter8ResSnow
Reservoir: Eightmile Lake

Start of Run: 01Jan2017, 00:00 Basin Model: EightmileLkResv
End of Run: 02Jan2017, 12:00 Meteorologic Model: Inter8Snowmelt
Compute Time: 13Apr2017, 07:33:15 Control Specifications:Intermediate

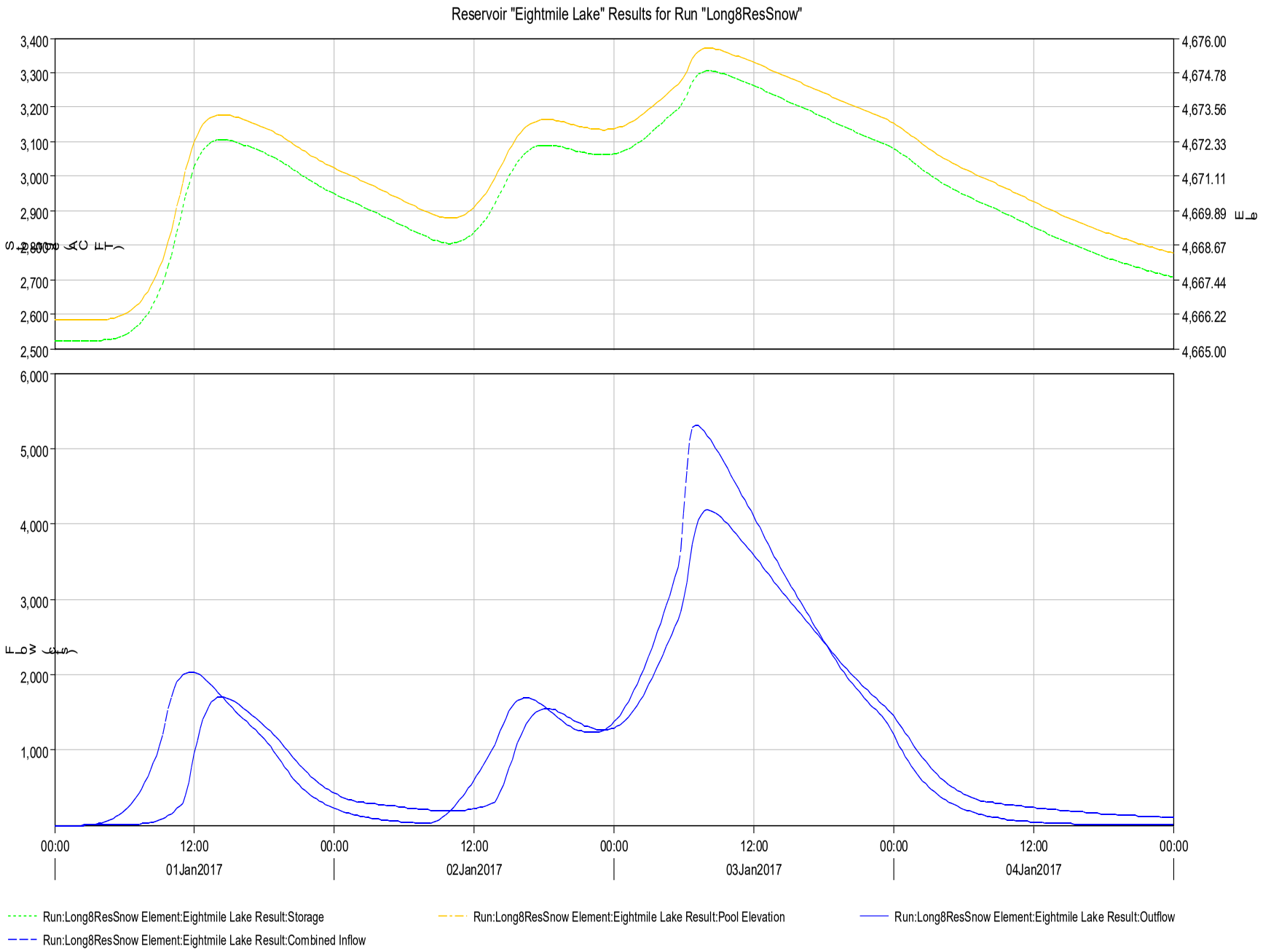
Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	00:00	0.0	2522.6	4666.0	0.0
01Jan2017	00:15	0.0	2522.6	4666.0	0.0
01Jan2017	00:30	0.0	2522.6	4666.0	0.0
01Jan2017	00:45	0.0	2522.6	4666.0	0.0
01Jan2017	01:00	0.0	2522.6	4666.0	0.0
01Jan2017	01:15	0.0	2522.6	4666.0	0.0
01Jan2017	01:30	0.0	2522.6	4666.0	0.0
01Jan2017	01:45	0.2	2522.6	4666.0	0.0
01Jan2017	02:00	1.5	2522.6	4666.0	0.0
01Jan2017	02:15	6.3	2522.7	4666.0	0.0
01Jan2017	02:30	17.2	2522.9	4666.0	0.0
01Jan2017	02:45	35.4	2523.5	4666.0	0.0
01Jan2017	03:00	61.4	2524.5	4666.0	0.1
01Jan2017	03:15	95.6	2526.1	4666.0	0.3
01Jan2017	03:30	139.0	2528.5	4666.1	0.6
01Jan2017	03:45	192.8	2531.9	4666.1	1.2
01Jan2017	04:00	255.7	2536.5	4666.2	2.1
01Jan2017	04:15	326.5	2542.4	4666.3	3.6
01Jan2017	04:30	405.7	2549.9	4666.4	5.9
01Jan2017	04:45	493.5	2559.1	4666.5	9.0
01Jan2017	05:00	589.8	2570.0	4666.6	13.3
01Jan2017	05:15	693.9	2582.9	4666.8	19.1
01Jan2017	05:30	805.2	2598.0	4667.0	26.6
01Jan2017	05:45	925.4	2615.2	4667.2	36.1
01Jan2017	06:00	1060.1	2634.8	4667.5	48.0
01Jan2017	06:15	1214.5	2657.2	4667.7	62.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	06:30	1395.6	2682.7	4668.1	81.2
01Jan2017	06:45	1614.2	2711.8	4668.4	103.9
01Jan2017	07:00	1845.2	2745.2	4668.9	131.9
01Jan2017	07:15	2041.4	2782.2	4669.3	165.4
01Jan2017	07:30	2189.0	2822.1	4669.8	204.0
01Jan2017	07:45	2294.8	2863.8	4670.3	246.7
01Jan2017	08:00	2367.5	2906.4	4670.9	292.7
01Jan2017	08:15	2414.1	2948.6	4671.4	423.7
01Jan2017	08:30	2438.5	2987.6	4671.9	659.3
01Jan2017	08:45	2442.3	3021.8	4672.3	917.5
01Jan2017	09:00	2429.9	3050.6	4672.6	1165.1
01Jan2017	09:15	2403.8	3074.1	4672.9	1385.5
01Jan2017	09:30	2362.6	3092.8	4673.1	1570.5
01Jan2017	09:45	2308.3	3107.0	4673.3	1717.0
01Jan2017	10:00	2249.0	3117.1	4673.4	1824.2
01Jan2017	10:15	2194.4	3123.8	4673.5	1896.8
01Jan2017	10:30	2148.7	3128.0	4673.6	1942.5
01Jan2017	10:45	2112.1	3130.4	4673.6	1968.9
01Jan2017	11:00	2086.9	3131.7	4673.6	1982.7
01Jan2017	11:15	2079.8	3132.3	4673.6	1989.8
01Jan2017	11:30	2116.9	3133.1	4673.6	1998.2
01Jan2017	11:45	2216.3	3134.9	4673.6	2018.0
01Jan2017	12:00	2366.2	3138.4	4673.7	2058.0
01Jan2017	12:15	2549.9	3144.1	4673.7	2121.6
01Jan2017	12:30	2754.2	3151.7	4673.8	2208.4
01Jan2017	12:45	2966.1	3161.0	4674.0	2315.8
01Jan2017	13:00	3192.8	3171.6	4674.1	2440.6
01Jan2017	13:15	3480.2	3183.8	4674.2	2585.9
01Jan2017	13:30	4009.4	3199.5	4674.4	2778.7
01Jan2017	13:45	4656.5	3220.6	4674.7	3044.1
01Jan2017	14:00	5096.0	3244.5	4674.9	3353.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	14:15	5314.1	3266.1	4675.2	3642.4
01Jan2017	14:30	5396.3	3283.2	4675.4	3875.5
01Jan2017	14:45	5430.1	3295.4	4675.5	4044.2
01Jan2017	15:00	5447.3	3303.6	4675.6	4160.6
01Jan2017	15:15	5446.8	3309.1	4675.7	4238.1
01Jan2017	15:30	5426.4	3312.5	4675.7	4285.6
01Jan2017	15:45	5383.7	3314.1	4675.7	4308.4
01Jan2017	16:00	5302.1	3314.0	4675.7	4308.0
01Jan2017	16:15	5172.0	3312.2	4675.7	4282.2
01Jan2017	16:30	4990.4	3308.4	4675.7	4228.2
01Jan2017	16:45	4771.8	3302.6	4675.6	4145.9
01Jan2017	17:00	4548.4	3295.1	4675.5	4040.6
01Jan2017	17:15	4334.0	3286.5	4675.4	3921.2
01Jan2017	17:30	4133.9	3277.4	4675.3	3795.7
01Jan2017	17:45	3945.9	3268.1	4675.2	3669.1
01Jan2017	18:00	3767.4	3258.8	4675.1	3544.2
01Jan2017	18:15	3569.1	3249.5	4675.0	3419.2
01Jan2017	18:30	3336.3	3239.5	4674.9	3287.6
01Jan2017	18:45	3099.3	3228.7	4674.7	3147.5
01Jan2017	19:00	2875.4	3217.4	4674.6	3002.4
01Jan2017	19:15	2667.7	3205.8	4674.5	2857.2
01Jan2017	19:30	2475.4	3194.4	4674.3	2714.9
01Jan2017	19:45	2297.8	3183.1	4674.2	2577.6
01Jan2017	20:00	2133.6	3172.1	4674.1	2446.0
01Jan2017	20:15	1981.7	3161.5	4674.0	2320.9
01Jan2017	20:30	1841.1	3151.2	4673.8	2201.9
01Jan2017	20:45	1711.0	3141.2	4673.7	2089.2
01Jan2017	21:00	1590.7	3131.6	4673.6	1982.3
01Jan2017	21:15	1479.2	3122.4	4673.5	1880.9
01Jan2017	21:30	1376.1	3113.4	4673.4	1784.3
01Jan2017	21:45	1280.6	3104.6	4673.3	1692.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	22:00	1192.1	3096.1	4673.2	1603.9
01Jan2017	22:15	1110.1	3087.6	4673.1	1518.2
01Jan2017	22:30	1034.1	3079.2	4673.0	1435.3
01Jan2017	22:45	963.5	3071.0	4672.9	1355.8
01Jan2017	23:00	898.0	3063.0	4672.8	1279.9
01Jan2017	23:15	837.3	3055.3	4672.7	1207.8
01Jan2017	23:30	780.8	3047.7	4672.6	1139.6
01Jan2017	23:45	728.2	3040.4	4672.5	1075.1
02Jan2017	00:00	679.3	3033.4	4672.4	1014.3
02Jan2017	00:15	633.8	3026.6	4672.3	957.1
02Jan2017	00:30	591.4	3020.0	4672.3	903.3
02Jan2017	00:45	551.9	3013.7	4672.2	852.6
02Jan2017	01:00	515.1	3007.6	4672.1	805.1
02Jan2017	01:15	480.9	3001.7	4672.0	760.6
02Jan2017	01:30	448.8	2996.0	4672.0	718.8
02Jan2017	01:45	418.7	2990.5	4671.9	679.6
02Jan2017	02:00	390.4	2985.2	4671.8	642.8
02Jan2017	02:15	364.1	2980.1	4671.8	608.4
02Jan2017	02:30	339.6	2975.1	4671.7	576.1
02Jan2017	02:45	316.9	2970.3	4671.7	545.8
02Jan2017	03:00	295.7	2965.7	4671.6	517.6
02Jan2017	03:15	275.7	2961.2	4671.5	491.2
02Jan2017	03:30	257.0	2956.8	4671.5	466.6
02Jan2017	03:45	239.5	2952.5	4671.4	443.5
02Jan2017	04:00	222.9	2948.3	4671.4	422.1
02Jan2017	04:15	207.9	2944.3	4671.3	402.3
02Jan2017	04:30	194.0	2940.3	4671.3	383.9
02Jan2017	04:45	181.1	2936.4	4671.2	367.1
02Jan2017	05:00	169.1	2932.6	4671.2	351.7
02Jan2017	05:15	157.8	2928.9	4671.2	337.7
02Jan2017	05:30	147.2	2925.2	4671.1	325.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
02Jan2017	05:45	137.4	2921.5	4671.1	314.7
02Jan2017	06:00	128.2	2917.8	4671.0	306.2
02Jan2017	06:15	119.6	2914.1	4671.0	301.4
02Jan2017	06:30	111.6	2910.3	4670.9	297.1
02Jan2017	06:45	104.2	2906.4	4670.9	292.8
02Jan2017	07:00	97.2	2902.5	4670.8	288.5
02Jan2017	07:15	90.6	2898.5	4670.8	284.1
02Jan2017	07:30	84.6	2894.5	4670.7	279.7
02Jan2017	07:45	78.9	2890.5	4670.7	275.3
02Jan2017	08:00	73.7	2886.4	4670.6	270.9
02Jan2017	08:15	68.8	2882.3	4670.6	266.5
02Jan2017	08:30	64.2	2878.3	4670.5	262.1
02Jan2017	08:45	59.9	2874.2	4670.5	257.7
02Jan2017	09:00	55.8	2870.1	4670.4	253.3
02Jan2017	09:15	52.0	2866.0	4670.4	249.0
02Jan2017	09:30	48.3	2861.9	4670.3	244.7
02Jan2017	09:45	44.5	2857.9	4670.3	240.5
02Jan2017	10:00	41.2	2853.8	4670.2	236.3
02Jan2017	10:15	37.9	2849.8	4670.2	232.1
02Jan2017	10:30	34.9	2845.8	4670.1	228.0
02Jan2017	10:45	32.2	2841.8	4670.1	223.9
02Jan2017	11:00	29.7	2837.9	4670.0	219.9
02Jan2017	11:15	27.4	2834.0	4670.0	215.9
02Jan2017	11:30	25.2	2830.1	4669.9	212.0
02Jan2017	11:45	23.2	2826.3	4669.9	208.1
02Jan2017	12:00	21.2	2822.5	4669.8	204.3


Reservoir "Eightmile Lake" Results for Run "Long8ResSnow"
3,400
3,300
3,200
3,100
3,000
2,900
2,800
2,700
2,600
2,500
4,676.00
4,674.78
4,673.56
4,672.33
4,671.11
4,669.89
4,668.67
4,667.44
4,666.22
4,665.00
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01Jan2017
02Jan2017
03Jan2017
04Jan2017
Run:Long8ResSnow Element:Eightmile Lake Result:Storage
Run:Long8ResSnow Element:Eightmile Lake Result:Pool Elevation
Run:Long8ResSnow Element:Eightmile Lake Result:Outflow
Run:Long8ResSnow Element:Eightmile Lake Result:Combined Inflow

Project: EightmileLake Simulation Run: Long8ResSnow

Reservoir: Eightmile Lake

Start of Run:	01Jan2017, 00:00	Basin Model:	EightmileLkResv
End of Run:	05Jan2017, 00:00	Meteorologic Model:	Long 8 Snowmelt
Compute Time:	13Apr2017, 07:33:39	Control Specifications:	LongStep8Res

Volume Units: AC-FT

Computed Results

Peak Inflow:	5315.3 (CFS)	Date/Time of Peak Inflow:	03Jan2017, 07:00
Peak Discharge:	4183.5 (CFS)	Date/Time of Peak Discharge	03Jan2017, 08:00
Inflow Volume:	9534.6 (AC-FT)	Peak Storage:	3305.3 (AC-FT)
Discharge Volume	8641.0 (AC-FT)	Peak Elevation:	4675.6 (FT)

Project: EightmileLake Simulation Run: Long8ResSnow
Reservoir: Eightmile Lake

Start of Run: 01Jan2017, 00:00 Basin Model: EightmileLkResv
End of Run: 05Jan2017, 00:00 Meteorologic Model: Long 8 Snowmelt
Compute Time: 13Apr2017, 07:33:39 Control Specifications:LongStep8Res

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	00:00	0.0	2522.6	4666.0	0.0
01Jan2017	00:15	0.0	2522.6	4666.0	0.0
01Jan2017	00:30	0.0	2522.6	4666.0	0.0
01Jan2017	00:45	0.0	2522.6	4666.0	0.0
01Jan2017	01:00	0.0	2522.6	4666.0	0.0
01Jan2017	01:15	0.0	2522.6	4666.0	0.0
01Jan2017	01:30	0.0	2522.6	4666.0	0.0
01Jan2017	01:45	0.0	2522.6	4666.0	0.0
01Jan2017	02:00	0.0	2522.6	4666.0	0.0
01Jan2017	02:15	0.0	2522.6	4666.0	0.0
01Jan2017	02:30	0.0	2522.6	4666.0	0.0
01Jan2017	02:45	0.2	2522.6	4666.0	0.0
01Jan2017	03:00	1.1	2522.6	4666.0	0.0
01Jan2017	03:15	3.7	2522.6	4666.0	0.0
01Jan2017	03:30	8.7	2522.8	4666.0	0.0
01Jan2017	03:45	16.1	2523.0	4666.0	0.0
01Jan2017	04:00	26.0	2523.5	4666.0	0.0
01Jan2017	04:15	38.6	2524.1	4666.0	0.1
01Jan2017	04:30	53.4	2525.1	4666.0	0.2
01Jan2017	04:45	69.8	2526.3	4666.0	0.3
01Jan2017	05:00	88.3	2528.0	4666.1	0.5
01Jan2017	05:15	109.7	2530.0	4666.1	0.8
01Jan2017	05:30	134.5	2532.5	4666.1	1.3
01Jan2017	05:45	163.1	2535.5	4666.2	1.9
01Jan2017	06:00	195.6	2539.2	4666.2	2.8
01Jan2017	06:15	232.0	2543.5	4666.3	3.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	06:30	272.2	2548.6	4666.3	5.5
01Jan2017	06:45	317.8	2554.6	4666.4	7.4
01Jan2017	07:00	369.8	2561.5	4666.5	9.9
01Jan2017	07:15	428.7	2569.5	4666.6	13.1
01Jan2017	07:30	494.5	2578.8	4666.7	17.2
01Jan2017	07:45	567.0	2589.3	4666.9	22.2
01Jan2017	08:00	646.1	2601.3	4667.0	28.4
01Jan2017	08:15	731.7	2614.9	4667.2	35.9
01Jan2017	08:30	825.7	2630.2	4667.4	45.1
01Jan2017	08:45	931.7	2647.3	4667.6	56.1
01Jan2017	09:00	1053.5	2666.5	4667.9	69.4
01Jan2017	09:15	1200.2	2688.2	4668.1	85.3
01Jan2017	09:30	1368.6	2712.7	4668.5	104.7
01Jan2017	09:45	1541.7	2740.4	4668.8	127.8
01Jan2017	10:00	1696.5	2770.9	4669.2	155.0
01Jan2017	10:15	1815.1	2803.7	4669.6	185.9
01Jan2017	10:30	1899.4	2837.9	4670.0	219.8
01Jan2017	10:45	1956.9	2872.8	4670.5	256.2
01Jan2017	11:00	1994.4	2907.9	4670.9	294.5
01Jan2017	11:15	2018.2	2942.5	4671.3	393.9
01Jan2017	11:30	2031.1	2974.4	4671.7	571.2
01Jan2017	11:45	2034.2	3002.6	4672.1	767.0
01Jan2017	12:00	2028.3	3026.7	4672.3	958.0
01Jan2017	12:15	2013.7	3046.8	4672.6	1131.7
01Jan2017	12:30	1991.0	3063.3	4672.8	1282.0
01Jan2017	12:45	1960.7	3076.3	4672.9	1406.7
01Jan2017	13:00	1926.2	3086.4	4673.1	1505.9
01Jan2017	13:15	1889.3	3093.9	4673.2	1581.7
01Jan2017	13:30	1850.7	3099.3	4673.2	1636.8
01Jan2017	13:45	1810.3	3102.8	4673.3	1673.9
01Jan2017	14:00	1768.5	3104.9	4673.3	1695.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	14:15	1725.1	3105.7	4673.3	1704.1
01Jan2017	14:30	1680.2	3105.6	4673.3	1702.4
01Jan2017	14:45	1636.9	3104.7	4673.3	1692.6
01Jan2017	15:00	1596.6	3103.1	4673.3	1677.0
01Jan2017	15:15	1556.8	3101.2	4673.2	1657.0
01Jan2017	15:30	1515.5	3098.9	4673.2	1633.5
01Jan2017	15:45	1475.5	3096.4	4673.2	1607.0
01Jan2017	16:00	1438.2	3093.6	4673.1	1578.4
01Jan2017	16:15	1403.7	3090.6	4673.1	1548.5
01Jan2017	16:30	1369.2	3087.6	4673.1	1518.1
01Jan2017	16:45	1332.9	3084.5	4673.0	1486.9
01Jan2017	17:00	1297.2	3081.2	4673.0	1455.0
01Jan2017	17:15	1260.8	3077.9	4673.0	1422.6
01Jan2017	17:30	1222.7	3074.5	4672.9	1389.5
01Jan2017	17:45	1182.3	3071.0	4672.9	1355.6
01Jan2017	18:00	1139.9	3067.4	4672.8	1320.7
01Jan2017	18:15	1095.6	3063.5	4672.8	1284.7
01Jan2017	18:30	1046.7	3059.5	4672.7	1247.1
01Jan2017	18:45	994.5	3055.2	4672.7	1207.7
01Jan2017	19:00	940.6	3050.7	4672.6	1166.4
01Jan2017	19:15	885.5	3045.9	4672.6	1123.4
01Jan2017	19:30	829.5	3040.9	4672.5	1079.0
01Jan2017	19:45	772.5	3035.6	4672.5	1033.3
01Jan2017	20:00	717.5	3030.1	4672.4	986.7
01Jan2017	20:15	666.1	3024.5	4672.3	940.0
01Jan2017	20:30	618.4	3018.9	4672.2	893.7
01Jan2017	20:45	574.4	3013.2	4672.2	848.5
01Jan2017	21:00	533.6	3007.5	4672.1	804.7
01Jan2017	21:15	495.8	3002.0	4672.0	762.6
01Jan2017	21:30	460.8	2996.5	4672.0	722.4
01Jan2017	21:45	428.3	2991.2	4671.9	684.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	22:00	398.2	2986.0	4671.8	647.7
01Jan2017	22:15	370.3	2980.9	4671.8	613.4
01Jan2017	22:30	344.5	2975.9	4671.7	581.0
01Jan2017	22:45	320.5	2971.1	4671.7	550.5
01Jan2017	23:00	298.3	2966.4	4671.6	521.9
01Jan2017	23:15	277.6	2961.9	4671.6	495.1
01Jan2017	23:30	258.4	2957.4	4671.5	470.1
01Jan2017	23:45	240.6	2953.1	4671.4	446.7
02Jan2017	00:00	224.0	2948.9	4671.4	425.0
02Jan2017	00:15	208.7	2944.8	4671.3	404.8
02Jan2017	00:30	194.4	2940.8	4671.3	386.2
02Jan2017	00:45	181.2	2936.9	4671.2	369.0
02Jan2017	01:00	169.0	2933.0	4671.2	353.3
02Jan2017	01:15	157.6	2929.2	4671.2	339.1
02Jan2017	01:30	146.9	2925.5	4671.1	326.5
02Jan2017	01:45	137.1	2921.8	4671.1	315.5
02Jan2017	02:00	127.8	2918.1	4671.0	306.8
02Jan2017	02:15	119.2	2914.4	4671.0	301.7
02Jan2017	02:30	111.2	2910.6	4670.9	297.4
02Jan2017	02:45	103.7	2906.7	4670.9	293.1
02Jan2017	03:00	96.7	2902.8	4670.8	288.7
02Jan2017	03:15	90.2	2898.8	4670.8	284.4
02Jan2017	03:30	84.1	2894.7	4670.7	279.9
02Jan2017	03:45	78.4	2890.7	4670.7	275.5
02Jan2017	04:00	73.1	2886.6	4670.6	271.1
02Jan2017	04:15	68.1	2882.5	4670.6	266.6
02Jan2017	04:30	63.5	2878.4	4670.5	262.2
02Jan2017	04:45	59.2	2874.3	4670.5	257.8
02Jan2017	05:00	55.1	2870.2	4670.4	253.5
02Jan2017	05:15	51.3	2866.1	4670.4	249.1
02Jan2017	05:30	47.7	2862.0	4670.3	244.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
02Jan2017	05:45	44.3	2858.0	4670.3	240.6
02Jan2017	06:00	41.1	2853.9	4670.2	236.3
02Jan2017	06:15	38.2	2849.9	4670.2	232.2
02Jan2017	06:30	35.4	2845.9	4670.1	228.0
02Jan2017	06:45	32.8	2841.9	4670.1	224.0
02Jan2017	07:00	30.4	2838.0	4670.0	220.0
02Jan2017	07:15	28.2	2834.1	4670.0	216.0
02Jan2017	07:30	26.2	2830.2	4669.9	212.1
02Jan2017	07:45	24.2	2826.4	4669.9	208.3
02Jan2017	08:00	24.9	2822.7	4669.8	204.5
02Jan2017	08:15	29.8	2819.0	4669.8	200.9
02Jan2017	08:30	39.6	2815.6	4669.8	197.5
02Jan2017	08:45	54.1	2812.6	4669.7	194.5
02Jan2017	09:00	72.8	2809.9	4669.7	191.9
02Jan2017	09:15	98.2	2807.7	4669.7	189.8
02Jan2017	09:30	128.7	2806.1	4669.6	188.2
02Jan2017	09:45	162.7	2805.3	4669.6	187.4
02Jan2017	10:00	199.5	2805.1	4669.6	187.3
02Jan2017	10:15	238.8	2805.8	4669.6	187.9
02Jan2017	10:30	283.1	2807.3	4669.6	189.4
02Jan2017	10:45	331.1	2809.7	4669.7	191.7
02Jan2017	11:00	381.3	2813.1	4669.7	195.0
02Jan2017	11:15	433.0	2817.4	4669.8	199.3
02Jan2017	11:30	486.2	2822.7	4669.8	204.6
02Jan2017	11:45	543.4	2829.1	4669.9	210.9
02Jan2017	12:00	603.5	2836.5	4670.0	218.4
02Jan2017	12:15	664.9	2845.0	4670.1	227.1
02Jan2017	12:30	727.1	2854.6	4670.2	237.0
02Jan2017	12:45	789.9	2865.2	4670.4	248.2
02Jan2017	13:00	856.3	2877.0	4670.5	260.7
02Jan2017	13:15	925.0	2889.9	4670.7	274.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
02Jan2017	13:30	994.4	2903.8	4670.8	289.9
02Jan2017	13:45	1069.9	2919.0	4671.0	308.6
02Jan2017	14:00	1154.8	2935.1	4671.2	361.5
02Jan2017	14:15	1246.3	2951.6	4671.4	439.0
02Jan2017	14:30	1339.5	2968.3	4671.6	533.3
02Jan2017	14:45	1428.8	2984.8	4671.8	639.6
02Jan2017	15:00	1509.2	3000.7	4672.0	753.3
02Jan2017	15:15	1576.1	3015.8	4672.2	869.5
02Jan2017	15:30	1625.0	3029.7	4672.4	983.3
02Jan2017	15:45	1655.0	3042.2	4672.5	1090.4
02Jan2017	16:00	1673.0	3053.0	4672.7	1187.4
02Jan2017	16:15	1683.4	3062.3	4672.8	1272.9
02Jan2017	16:30	1684.8	3070.0	4672.9	1346.1
02Jan2017	16:45	1679.2	3076.3	4672.9	1407.0
02Jan2017	17:00	1668.4	3081.3	4673.0	1456.1
02Jan2017	17:15	1650.3	3085.1	4673.0	1493.8
02Jan2017	17:30	1626.5	3087.9	4673.1	1520.8
02Jan2017	17:45	1602.0	3089.6	4673.1	1538.4
02Jan2017	18:00	1575.9	3090.6	4673.1	1547.9
02Jan2017	18:15	1547.2	3090.8	4673.1	1550.5
02Jan2017	18:30	1515.5	3090.4	4673.1	1546.9
02Jan2017	18:45	1481.0	3089.5	4673.1	1537.7
02Jan2017	19:00	1446.9	3088.2	4673.1	1523.8
02Jan2017	19:15	1415.0	3086.4	4673.1	1506.4
02Jan2017	19:30	1385.5	3084.4	4673.0	1486.6
02Jan2017	19:45	1358.4	3082.3	4673.0	1465.4
02Jan2017	20:00	1333.5	3080.0	4673.0	1443.3
02Jan2017	20:15	1310.6	3077.8	4673.0	1421.0
02Jan2017	20:30	1289.5	3075.5	4672.9	1398.9
02Jan2017	20:45	1270.0	3073.3	4672.9	1377.2
02Jan2017	21:00	1255.1	3071.1	4672.9	1356.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
02Jan2017	21:15	1246.1	3069.1	4672.9	1337.4
02Jan2017	21:30	1240.3	3067.3	4672.8	1320.5
02Jan2017	21:45	1235.4	3065.8	4672.8	1305.8
02Jan2017	22:00	1231.0	3064.4	4672.8	1292.9
02Jan2017	22:15	1230.0	3063.2	4672.8	1281.9
02Jan2017	22:30	1233.9	3062.3	4672.8	1273.1
02Jan2017	22:45	1242.8	3061.6	4672.8	1267.0
02Jan2017	23:00	1256.5	3061.3	4672.8	1263.9
02Jan2017	23:15	1274.5	3061.3	4672.8	1264.2
02Jan2017	23:30	1299.7	3061.8	4672.8	1268.2
02Jan2017	23:45	1333.2	3062.7	4672.8	1276.7
03Jan2017	00:00	1371.9	3064.1	4672.8	1290.1
03Jan2017	00:15	1413.7	3066.0	4672.8	1308.3
03Jan2017	00:30	1460.8	3068.5	4672.8	1331.3
03Jan2017	00:45	1514.7	3071.4	4672.9	1359.5
03Jan2017	01:00	1575.4	3074.9	4672.9	1393.1
03Jan2017	01:15	1642.3	3079.0	4673.0	1432.6
03Jan2017	01:30	1715.1	3083.6	4673.0	1478.1
03Jan2017	01:45	1793.3	3088.7	4673.1	1529.7
03Jan2017	02:00	1876.6	3094.4	4673.2	1587.4
03Jan2017	02:15	1964.5	3100.7	4673.2	1651.2
03Jan2017	02:30	2056.7	3107.3	4673.3	1719.9
03Jan2017	02:45	2153.0	3114.1	4673.4	1792.6
03Jan2017	03:00	2253.0	3121.2	4673.5	1868.7
03Jan2017	03:15	2356.5	3128.5	4673.6	1947.4
03Jan2017	03:30	2463.2	3135.8	4673.7	2028.5
03Jan2017	03:45	2573.1	3143.2	4673.7	2111.7
03Jan2017	04:00	2685.9	3150.7	4673.8	2196.5
03Jan2017	04:15	2801.2	3158.2	4673.9	2282.9
03Jan2017	04:30	2919.0	3165.7	4674.0	2370.6
03Jan2017	04:45	3039.1	3173.2	4674.1	2459.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
03Jan2017	05:00	3161.3	3180.7	4674.2	2549.2
03Jan2017	05:15	3285.4	3188.2	4674.3	2640.0
03Jan2017	05:30	3430.6	3195.9	4674.4	2733.5
03Jan2017	05:45	3664.3	3204.5	4674.5	2840.9
03Jan2017	06:00	4137.3	3216.7	4674.6	2994.0
03Jan2017	06:15	4716.5	3234.2	4674.8	3218.6
03Jan2017	06:30	5105.3	3254.2	4675.0	3482.4
03Jan2017	06:45	5276.7	3272.5	4675.3	3729.4
03Jan2017	07:00	5315.3	3286.4	4675.4	3919.6
03Jan2017	07:15	5302.1	3295.6	4675.5	4048.3
03Jan2017	07:30	5268.7	3301.2	4675.6	4126.6
03Jan2017	07:45	5224.8	3304.2	4675.6	4168.1
03Jan2017	08:00	5173.5	3305.3	4675.6	4183.5
03Jan2017	08:15	5119.2	3305.1	4675.6	4180.7
03Jan2017	08:30	5063.7	3304.0	4675.6	4165.8
03Jan2017	08:45	5004.2	3302.4	4675.6	4142.4
03Jan2017	09:00	4939.2	3300.2	4675.6	4112.6
03Jan2017	09:15	4872.0	3297.7	4675.6	4077.6
03Jan2017	09:30	4804.4	3295.0	4675.5	4039.1
03Jan2017	09:45	4733.6	3292.0	4675.5	3997.9
03Jan2017	10:00	4661.2	3288.9	4675.5	3954.2
03Jan2017	10:15	4588.8	3285.6	4675.4	3908.9
03Jan2017	10:30	4516.6	3282.3	4675.4	3862.5
03Jan2017	10:45	4448.0	3278.9	4675.3	3815.8
03Jan2017	11:00	4381.1	3275.5	4675.3	3769.5
03Jan2017	11:15	4311.1	3272.1	4675.3	3723.4
03Jan2017	11:30	4239.4	3268.7	4675.2	3676.6
03Jan2017	11:45	4167.4	3265.2	4675.2	3629.2
03Jan2017	12:00	4095.4	3261.6	4675.1	3581.5
03Jan2017	12:15	4023.6	3258.0	4675.1	3533.4
03Jan2017	12:30	3948.5	3254.4	4675.1	3484.8

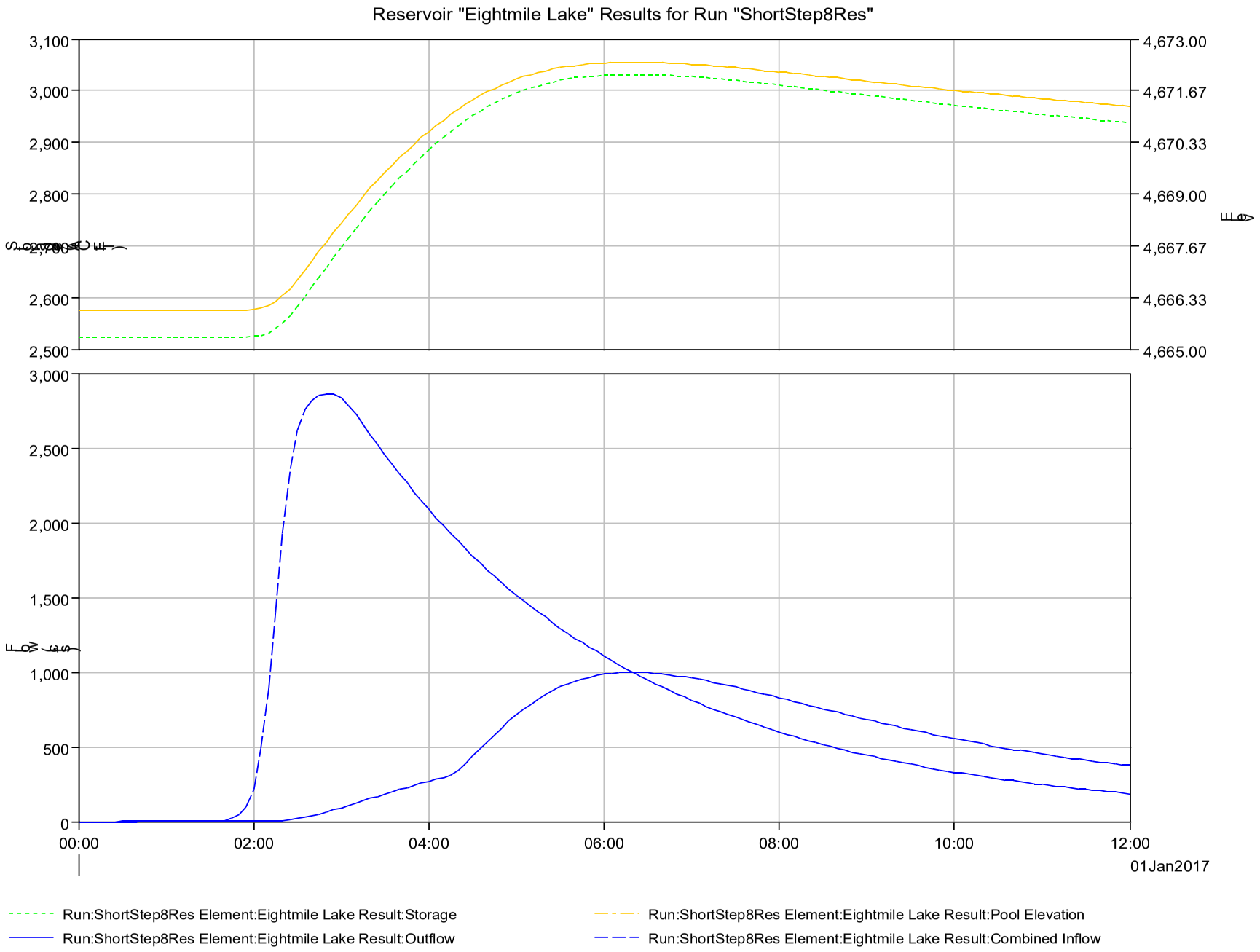
Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
03Jan2017	12:45	3871.9	3250.7	4675.0	3435.2
03Jan2017	13:00	3795.2	3246.9	4675.0	3384.7
03Jan2017	13:15	3718.9	3243.0	4674.9	3333.7
03Jan2017	13:30	3646.1	3239.1	4674.9	3282.7
03Jan2017	13:45	3575.1	3235.2	4674.8	3232.4
03Jan2017	14:00	3504.4	3231.4	4674.8	3182.6
03Jan2017	14:15	3433.7	3227.6	4674.7	3133.2
03Jan2017	14:30	3362.8	3223.7	4674.7	3084.0
03Jan2017	14:45	3294.9	3219.9	4674.6	3035.2
03Jan2017	15:00	3228.4	3216.2	4674.6	2987.1
03Jan2017	15:15	3161.8	3212.4	4674.6	2939.7
03Jan2017	15:30	3094.8	3208.6	4674.5	2892.5
03Jan2017	15:45	3027.2	3204.9	4674.5	2845.4
03Jan2017	16:00	2962.3	3201.1	4674.4	2798.5
03Jan2017	16:15	2898.6	3197.4	4674.4	2752.1
03Jan2017	16:30	2834.6	3193.6	4674.3	2706.2
03Jan2017	16:45	2769.8	3189.9	4674.3	2660.4
03Jan2017	17:00	2704.3	3186.1	4674.2	2614.5
03Jan2017	17:15	2638.1	3182.3	4674.2	2568.2
03Jan2017	17:30	2571.3	3178.4	4674.2	2521.6
03Jan2017	17:45	2507.0	3174.5	4674.1	2474.8
03Jan2017	18:00	2443.7	3170.6	4674.1	2428.4
03Jan2017	18:15	2379.7	3166.7	4674.0	2382.0
03Jan2017	18:30	2318.1	3162.7	4674.0	2335.9
03Jan2017	18:45	2257.5	3158.8	4673.9	2290.1
03Jan2017	19:00	2196.4	3154.9	4673.9	2244.6
03Jan2017	19:15	2137.6	3151.0	4673.8	2199.5
03Jan2017	19:30	2082.5	3147.1	4673.8	2155.2
03Jan2017	19:45	2028.2	3143.2	4673.7	2111.8
03Jan2017	20:00	1972.7	3139.4	4673.7	2068.8
03Jan2017	20:15	1918.9	3135.6	4673.6	2026.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
03Jan2017	20:30	1868.3	3131.8	4673.6	1984.4
03Jan2017	20:45	1821.6	3128.1	4673.6	1943.7
03Jan2017	21:00	1775.4	3124.5	4673.5	1904.1
03Jan2017	21:15	1727.6	3120.9	4673.5	1865.1
03Jan2017	21:30	1681.0	3117.3	4673.4	1826.4
03Jan2017	21:45	1637.1	3113.7	4673.4	1788.3
03Jan2017	22:00	1596.4	3110.2	4673.3	1751.0
03Jan2017	22:15	1558.6	3106.8	4673.3	1714.8
03Jan2017	22:30	1523.5	3103.4	4673.3	1679.7
03Jan2017	22:45	1487.7	3100.1	4673.2	1645.5
03Jan2017	23:00	1446.5	3096.8	4673.2	1611.1
03Jan2017	23:15	1397.8	3093.2	4673.1	1575.1
03Jan2017	23:30	1341.6	3089.4	4673.1	1536.3
03Jan2017	23:45	1278.5	3085.2	4673.0	1493.9
04Jan2017	00:00	1209.1	3080.5	4673.0	1447.5
04Jan2017	00:15	1134.0	3075.3	4672.9	1396.9
04Jan2017	00:30	1056.6	3069.6	4672.9	1342.3
04Jan2017	00:45	981.9	3063.5	4672.8	1284.7
04Jan2017	01:00	912.1	3057.2	4672.7	1225.5
04Jan2017	01:15	847.4	3050.6	4672.6	1165.9
04Jan2017	01:30	787.4	3044.1	4672.6	1107.0
04Jan2017	01:45	731.9	3037.5	4672.5	1049.4
04Jan2017	02:00	680.3	3031.0	4672.4	993.7
04Jan2017	02:15	632.2	3024.5	4672.3	940.1
04Jan2017	02:30	587.8	3018.3	4672.2	888.9
04Jan2017	02:45	546.5	3012.1	4672.2	840.1
04Jan2017	03:00	508.4	3006.1	4672.1	793.9
04Jan2017	03:15	473.1	3000.3	4672.0	750.2
04Jan2017	03:30	440.4	2994.7	4672.0	709.0
04Jan2017	03:45	410.0	2989.2	4671.9	670.2
04Jan2017	04:00	381.8	2983.9	4671.8	633.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
04Jan2017	04:15	355.6	2978.8	4671.8	599.7
04Jan2017	04:30	331.1	2973.8	4671.7	567.7
04Jan2017	04:45	308.0	2969.0	4671.6	537.7
04Jan2017	05:00	286.9	2964.3	4671.6	509.6
04Jan2017	05:15	267.2	2959.8	4671.5	483.5
04Jan2017	05:30	249.1	2955.4	4671.5	459.1
04Jan2017	05:45	232.2	2951.1	4671.4	436.4
04Jan2017	06:00	216.5	2947.0	4671.4	415.3
04Jan2017	06:15	201.9	2942.9	4671.3	395.9
04Jan2017	06:30	188.3	2938.9	4671.3	377.9
04Jan2017	06:45	175.7	2935.1	4671.2	361.5
04Jan2017	07:00	163.9	2931.3	4671.2	346.5
04Jan2017	07:15	152.9	2927.5	4671.1	333.0
04Jan2017	07:30	142.6	2923.8	4671.1	321.2
04Jan2017	07:45	133.1	2920.1	4671.0	311.2
04Jan2017	08:00	124.1	2916.4	4671.0	304.0
04Jan2017	08:15	115.8	2912.7	4671.0	299.7
04Jan2017	08:30	108.1	2908.8	4670.9	295.5
04Jan2017	08:45	100.8	2904.9	4670.9	291.1
04Jan2017	09:00	94.1	2901.0	4670.8	286.8
04Jan2017	09:15	87.8	2897.0	4670.8	282.4
04Jan2017	09:30	81.9	2892.9	4670.7	278.0
04Jan2017	09:45	76.4	2888.9	4670.7	273.5
04Jan2017	10:00	71.2	2884.8	4670.6	269.1
04Jan2017	10:15	66.4	2880.7	4670.6	264.7
04Jan2017	10:30	61.9	2876.6	4670.5	260.3
04Jan2017	10:45	57.7	2872.5	4670.5	255.9
04Jan2017	11:00	53.8	2868.4	4670.4	251.6
04Jan2017	11:15	50.1	2864.3	4670.4	247.3
04Jan2017	11:30	46.7	2860.3	4670.3	243.0
04Jan2017	11:45	43.5	2856.2	4670.3	238.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
04Jan2017	12:00	40.5	2852.2	4670.2	234.6
04Jan2017	12:15	37.7	2848.2	4670.2	230.4
04Jan2017	12:30	35.1	2844.2	4670.1	226.3
04Jan2017	12:45	32.7	2840.3	4670.1	222.3
04Jan2017	13:00	30.4	2836.4	4670.0	218.3
04Jan2017	13:15	28.3	2832.5	4670.0	214.4
04Jan2017	13:30	26.1	2828.7	4669.9	210.6
04Jan2017	13:45	24.3	2824.9	4669.9	206.8
04Jan2017	14:00	22.5	2821.2	4669.8	203.0
04Jan2017	14:15	20.9	2817.5	4669.8	199.3
04Jan2017	14:30	19.5	2813.8	4669.7	195.7
04Jan2017	14:45	18.1	2810.2	4669.7	192.2
04Jan2017	15:00	16.8	2806.6	4669.6	188.7
04Jan2017	15:15	15.6	2803.1	4669.6	185.3
04Jan2017	15:30	14.5	2799.6	4669.5	181.9
04Jan2017	15:45	13.4	2796.2	4669.5	178.6
04Jan2017	16:00	12.4	2792.8	4669.5	175.4
04Jan2017	16:15	11.5	2789.4	4669.4	172.2
04Jan2017	16:30	10.7	2786.1	4669.4	169.1
04Jan2017	16:45	9.9	2782.9	4669.3	166.1
04Jan2017	17:00	9.1	2779.7	4669.3	163.1
04Jan2017	17:15	8.5	2776.5	4669.3	160.1
04Jan2017	17:30	7.8	2773.4	4669.2	157.3
04Jan2017	17:45	7.2	2770.4	4669.2	154.5
04Jan2017	18:00	6.7	2767.3	4669.1	151.7
04Jan2017	18:15	6.2	2764.4	4669.1	149.0
04Jan2017	18:30	5.7	2761.4	4669.1	146.4
04Jan2017	18:45	5.2	2758.5	4669.0	143.8
04Jan2017	19:00	4.8	2755.7	4669.0	141.2
04Jan2017	19:15	4.4	2752.9	4669.0	138.8
04Jan2017	19:30	4.0	2750.2	4668.9	136.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
04Jan2017	19:45	3.7	2747.4	4668.9	133.9
04Jan2017	20:00	3.4	2744.8	4668.9	131.6
04Jan2017	20:15	3.1	2742.1	4668.8	129.3
04Jan2017	20:30	2.9	2739.6	4668.8	127.1
04Jan2017	20:45	2.7	2737.0	4668.8	124.9
04Jan2017	21:00	2.5	2734.5	4668.7	122.8
04Jan2017	21:15	2.3	2732.0	4668.7	120.7
04Jan2017	21:30	2.1	2729.6	4668.7	118.6
04Jan2017	21:45	1.9	2727.2	4668.6	116.6
04Jan2017	22:00	1.8	2724.9	4668.6	114.6
04Jan2017	22:15	1.6	2722.6	4668.6	112.7
04Jan2017	22:30	1.5	2720.3	4668.6	110.8
04Jan2017	22:45	1.4	2718.0	4668.5	109.0
04Jan2017	23:00	1.3	2715.8	4668.5	107.2
04Jan2017	23:15	1.2	2713.7	4668.5	105.4
04Jan2017	23:30	1.2	2711.5	4668.4	103.7
04Jan2017	23:45	1.1	2709.4	4668.4	102.0
05Jan2017	00:00	1.0	2707.4	4668.4	100.3


Reservoir "Eightmile Lake" Results for Run "ShortStep8Res"
3,100
3,000
2,900
2,800
2,700
2,600
2,500
4,673.00
4,671.67
4,670.33
4,669.00
4,667.67
4,666.33
4,665.00
3,000
2,500
2,000
1,500
1,000
500
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
01Jan2017
Run:ShortStep8Res Element:Eightmile Lake Result:Storage
Run:ShortStep8Res Element:Eightmile Lake Result:Pool Elevation
Run:ShortStep8Res Element:Eightmile Lake Result:Outflow
Run:ShortStep8Res Element:Eightmile Lake Result:Combined Inflow

Project: EightmileLake Simulation Run: ShortStep8Res

Reservoir: Eightmile Lake

Start of Run:	01Jan2017, 00:00	Basin Model:	EightmileLkResv
End of Run:	01Jan2017, 12:00	Meteorologic Model:	ShortStep8Res
Compute Time:	13Apr2017, 07:34:02	Control Specifications:	ShortStep8Res

Volume Units: AC-FT

Computed Results

Peak Inflow:	2864.1 (CFS)	Date/Time of Peak Inflow:	01Jan2017, 02:50
Peak Discharge:	997.0 (CFS)	Date/Time of Peak Discharge	01Jan2017, 06:20
Inflow Volume:	887.3 (AC-FT)	Peak Storage:	3031.4 (AC-FT)
Discharge Volume	471.9 (AC-FT)	Peak Elevation:	4672.4 (FT)

Project: EightmileLake Simulation Run: ShortStep8Res
Reservoir: Eightmile Lake

Start of Run: 01Jan2017, 00:00 Basin Model: EightmileLkResv
End of Run: 01Jan2017, 12:00 Meteorologic Model: ShortStep8Res
Compute Time: 13Apr2017, 07:34:02 Control Specifications:ShortStep8Res

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	00:00	0.0	2522.6	4666.0	0.0
01Jan2017	00:05	0.0	2522.6	4666.0	0.0
01Jan2017	00:10	0.0	2522.6	4666.0	0.0
01Jan2017	00:15	0.0	2522.6	4666.0	0.0
01Jan2017	00:20	0.0	2522.6	4666.0	0.0
01Jan2017	00:25	0.0	2522.6	4666.0	0.0
01Jan2017	00:30	0.0	2522.6	4666.0	0.0
01Jan2017	00:35	0.0	2522.6	4666.0	0.0
01Jan2017	00:40	0.0	2522.6	4666.0	0.0
01Jan2017	00:45	0.0	2522.6	4666.0	0.0
01Jan2017	00:50	0.1	2522.6	4666.0	0.0
01Jan2017	00:55	0.2	2522.6	4666.0	0.0
01Jan2017	01:00	0.3	2522.6	4666.0	0.0
01Jan2017	01:05	0.4	2522.6	4666.0	0.0
01Jan2017	01:10	0.4	2522.6	4666.0	0.0
01Jan2017	01:15	0.4	2522.6	4666.0	0.0
01Jan2017	01:20	0.5	2522.6	4666.0	0.0
01Jan2017	01:25	0.6	2522.6	4666.0	0.0
01Jan2017	01:30	1.2	2522.6	4666.0	0.0
01Jan2017	01:35	3.1	2522.6	4666.0	0.0
01Jan2017	01:40	8.0	2522.6	4666.0	0.0
01Jan2017	01:45	18.9	2522.7	4666.0	0.0
01Jan2017	01:50	42.5	2522.9	4666.0	0.0
01Jan2017	01:55	93.5	2523.4	4666.0	0.0
01Jan2017	02:00	220.0	2524.5	4666.0	0.1
01Jan2017	02:05	486.7	2526.9	4666.1	0.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	02:10	890.5	2531.7	4666.1	1.1
01Jan2017	02:15	1400.0	2539.5	4666.2	2.9
01Jan2017	02:20	1928.2	2551.0	4666.4	6.2
01Jan2017	02:25	2362.8	2565.7	4666.6	11.6
01Jan2017	02:30	2615.9	2582.7	4666.8	19.0
01Jan2017	02:35	2755.5	2601.1	4667.0	28.2
01Jan2017	02:40	2817.7	2620.0	4667.3	38.9
01Jan2017	02:45	2850.4	2639.2	4667.5	50.8
01Jan2017	02:50	2864.1	2658.5	4667.8	63.8
01Jan2017	02:55	2856.8	2677.7	4668.0	77.5
01Jan2017	03:00	2830.6	2696.7	4668.3	91.9
01Jan2017	03:05	2785.1	2715.4	4668.5	106.8
01Jan2017	03:10	2726.1	2733.6	4668.7	122.0
01Jan2017	03:15	2660.0	2751.2	4668.9	137.3
01Jan2017	03:20	2590.5	2768.3	4669.2	152.6
01Jan2017	03:25	2521.4	2784.8	4669.4	167.9
01Jan2017	03:30	2454.0	2800.7	4669.6	183.0
01Jan2017	03:35	2388.5	2816.1	4669.8	198.0
01Jan2017	03:40	2324.7	2830.9	4669.9	212.8
01Jan2017	03:45	2262.9	2845.2	4670.1	227.3
01Jan2017	03:50	2202.7	2859.0	4670.3	241.6
01Jan2017	03:55	2144.1	2872.2	4670.5	255.6
01Jan2017	04:00	2087.4	2885.0	4670.6	269.3
01Jan2017	04:05	2032.0	2897.3	4670.8	282.7
01Jan2017	04:10	1978.4	2909.1	4670.9	295.7
01Jan2017	04:15	1926.2	2920.4	4671.0	311.9
01Jan2017	04:20	1875.4	2931.3	4671.2	346.5
01Jan2017	04:25	1826.1	2941.5	4671.3	389.3
01Jan2017	04:30	1778.0	2951.0	4671.4	436.0
01Jan2017	04:35	1731.4	2960.0	4671.5	484.4
01Jan2017	04:40	1686.1	2968.2	4671.6	532.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	04:45	1641.9	2975.9	4671.7	580.6
01Jan2017	04:50	1599.1	2982.9	4671.8	626.7
01Jan2017	04:55	1557.3	2989.3	4671.9	670.6
01Jan2017	05:00	1516.7	2995.1	4672.0	712.0
01Jan2017	05:05	1477.3	3000.4	4672.0	750.6
01Jan2017	05:10	1438.8	3005.1	4672.1	786.2
01Jan2017	05:15	1401.3	3009.4	4672.1	818.7
01Jan2017	05:20	1364.8	3013.1	4672.2	848.3
01Jan2017	05:25	1329.2	3016.5	4672.2	874.8
01Jan2017	05:30	1294.8	3019.4	4672.3	898.3
01Jan2017	05:35	1261.2	3022.0	4672.3	919.0
01Jan2017	05:40	1228.5	3024.1	4672.3	936.8
01Jan2017	05:45	1196.8	3026.0	4672.3	952.1
01Jan2017	05:50	1165.8	3027.5	4672.4	964.9
01Jan2017	05:55	1135.8	3028.8	4672.4	975.3
01Jan2017	06:00	1106.5	3029.7	4672.4	983.5
01Jan2017	06:05	1078.0	3030.5	4672.4	989.6
01Jan2017	06:10	1050.3	3031.0	4672.4	993.8
01Jan2017	06:15	1023.3	3031.3	4672.4	996.2
01Jan2017	06:20	997.1	3031.4	4672.4	997.0
01Jan2017	06:25	971.6	3031.3	4672.4	996.3
01Jan2017	06:30	946.8	3031.0	4672.4	994.2
01Jan2017	06:35	922.6	3030.6	4672.4	990.8
01Jan2017	06:40	899.1	3030.1	4672.4	986.3
01Jan2017	06:45	876.2	3029.4	4672.4	980.8
01Jan2017	06:50	854.0	3028.7	4672.4	974.3
01Jan2017	06:55	832.3	3027.8	4672.4	966.9
01Jan2017	07:00	811.3	3026.8	4672.3	958.8
01Jan2017	07:05	790.7	3025.8	4672.3	950.1
01Jan2017	07:10	770.8	3024.6	4672.3	940.7
01Jan2017	07:15	751.4	3023.4	4672.3	930.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	07:20	732.4	3022.1	4672.3	920.5
01Jan2017	07:25	714.1	3020.8	4672.3	909.7
01Jan2017	07:30	696.1	3019.5	4672.3	898.6
01Jan2017	07:35	678.7	3018.0	4672.2	887.2
01Jan2017	07:40	661.7	3016.6	4672.2	875.6
01Jan2017	07:45	645.2	3015.1	4672.2	863.7
01Jan2017	07:50	629.1	3013.6	4672.2	851.7
01Jan2017	07:55	613.4	3012.0	4672.2	839.5
01Jan2017	08:00	598.2	3010.5	4672.1	827.3
01Jan2017	08:05	583.3	3008.9	4672.1	815.0
01Jan2017	08:10	568.8	3007.3	4672.1	802.7
01Jan2017	08:15	554.8	3005.7	4672.1	790.3
01Jan2017	08:20	541.1	3004.0	4672.1	778.0
01Jan2017	08:25	527.7	3002.4	4672.0	765.7
01Jan2017	08:30	514.7	3000.8	4672.0	753.5
01Jan2017	08:35	502.0	2999.1	4672.0	741.3
01Jan2017	08:40	489.7	2997.5	4672.0	729.2
01Jan2017	08:45	477.7	2995.8	4672.0	717.2
01Jan2017	08:50	466.0	2994.2	4671.9	705.3
01Jan2017	08:55	454.6	2992.5	4671.9	693.5
01Jan2017	09:00	443.5	2990.9	4671.9	681.9
01Jan2017	09:05	432.6	2989.2	4671.9	670.4
01Jan2017	09:10	422.1	2987.6	4671.9	659.0
01Jan2017	09:15	411.8	2986.0	4671.8	647.8
01Jan2017	09:20	401.8	2984.3	4671.8	636.7
01Jan2017	09:25	392.1	2982.7	4671.8	625.8
01Jan2017	09:30	382.6	2981.1	4671.8	615.1
01Jan2017	09:35	373.3	2979.5	4671.8	604.5
01Jan2017	09:40	364.3	2977.9	4671.8	594.1
01Jan2017	09:45	355.5	2976.4	4671.7	583.9
01Jan2017	09:50	347.0	2974.8	4671.7	573.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2017	09:55	338.6	2973.2	4671.7	563.9
01Jan2017	10:00	330.5	2971.7	4671.7	554.2
01Jan2017	10:05	322.6	2970.2	4671.7	544.7
01Jan2017	10:10	314.9	2968.6	4671.6	535.4
01Jan2017	10:15	307.3	2967.1	4671.6	526.2
01Jan2017	10:20	300.0	2965.6	4671.6	517.2
01Jan2017	10:25	292.8	2964.1	4671.6	508.4
01Jan2017	10:30	285.9	2962.7	4671.6	499.8
01Jan2017	10:35	279.1	2961.2	4671.5	491.3
01Jan2017	10:40	272.4	2959.7	4671.5	483.0
01Jan2017	10:45	266.0	2958.3	4671.5	474.9
01Jan2017	10:50	259.7	2956.9	4671.5	467.0
01Jan2017	10:55	253.5	2955.4	4671.5	459.2
01Jan2017	11:00	247.6	2954.0	4671.5	451.6
01Jan2017	11:05	241.7	2952.6	4671.4	444.2
01Jan2017	11:10	236.0	2951.2	4671.4	436.9
01Jan2017	11:15	230.5	2949.9	4671.4	429.8
01Jan2017	11:20	225.1	2948.5	4671.4	422.9
01Jan2017	11:25	219.8	2947.1	4671.4	416.1
01Jan2017	11:30	214.7	2945.8	4671.4	409.5
01Jan2017	11:35	209.6	2944.4	4671.3	403.1
01Jan2017	11:40	204.7	2943.1	4671.3	396.8
01Jan2017	11:45	200.0	2941.8	4671.3	390.7
01Jan2017	11:50	195.3	2940.5	4671.3	384.8
01Jan2017	11:55	190.8	2939.2	4671.3	379.0
01Jan2017	12:00	186.3	2937.9	4671.3	373.4

Appendix G
Spillway Channel Capacity Worksheet

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Channel capacity, compare critical flow with uniform flow

Eightmile Lake-JTS, 11.28.2016

Note : Tinted boxes indicate user input required.

Key equations :

Channel geometry :

Cross section area : $A = b\,y + Z_{avg}\,(y^2)$

Top width : $T = b + (Z_R + Z_L)(y)$

Wetted perimeter : $P_w = b + (Z_{Rdiag} + Z_{Ldiag})(y)$

Hydraulic radius : $R_h = A / P_w$

Hydr. mean depth : $y_m = A / T$

Side slopes : $Z_{avg} = 1/2\ (Z_R + Z_L)$

$Z_{diag} = (Z_i^2 + 1)^{1/2}$

Channel bed slope : S_o = elev.diff. / L

Hydr. friction slope : S_f = W.L.diff. / L

Channel freeboard (Ref: Part IV, pg. 4-16) :

Required: $FB_{req} = 2.0 + (0.025 * V * y^{1/3})$

Available: $FB_{avail} = Y_{max} - y_i$

Excess : $FB_{exs} = (Y_{max} - y_i) - FB_{req}$

Critical flow conditions :

Velocity : $V^2 = g * y_m$

Discharge $Q = V * A * (1 - \%\ obstr / 100)$

Uniform flow conditions :

Velocity : $V = (1.486 / \mathbf{n})\ R_h^{2/3}\ S_f^{1/2}$

Discharge $Q = V * A * (1 - \%\ obstr / 100)$

Froude Number : $Fr^2 = (V^2) / (g * y_m)$

$Fr_{unif} = V_{unif} / V_{crit}$

Roughness coefficient (**n** value) for riprap :

Abt equation, steep bed slope :

$\mathbf{n} = 0.0456\ [(D_{50}\ S_o)^{0.159}]$

Anderson eqn, mild bed slope :

$\mathbf{n} = 0.0395\ [(D_{50})^{1/6}]$

Channel reach location and description : **[Verify:]** Spillway down face of dam from crest to downstream toe.

Description of hydraulics : **[Verify:]** Super-critical flow down dam face, draw-down from critical flow at crest. Hydraulic profile S2 **[verify]**; see Henderson, Open Channel Flow, pg. 111.

Channel geometry : *Input*

bottom width, b =	99	ft.
right side slope Z_R =	0.0	
Z_{Rdiag} =	1.00	
left side slope Z_L =	0.0	
Z_{Ldiag} =	1.00	
Z_{avg} =	0.0	
% obstruction =	0	%
channel efficiency =	1.00	

Input

Elevations and hydraulic gradients :

Channel length =	18	ft.
Bed, upstream =	4671.0	ft.
Bed, downstream =	4665.0	ft.
S_o =	0.333	ft/ft.
WL, upstream =	4671.0	ft.
WL, downstream =	4665.0	ft.
S_f =	0.333	ft/ft.

Input

Bed material = Concrete

Riprap D_{50} = 1 in.

riprap **n** = 0.038 (steep)

riprap **n** = 0.026 (mild)

Roughness **n** = 0.030 *Input*

Ref: WSDOT / Brater & King / Haan *et al*

Input

Dam crest elev. = 4671.0 ft.

Y_{max} = 0.0 ft.

Eightmile Lake (Icicle and Peshastin Irrigation Districts)

Channel capacity, compare critical flow with uniform flow
Eightmile Lake-JTS, 11.28.2016

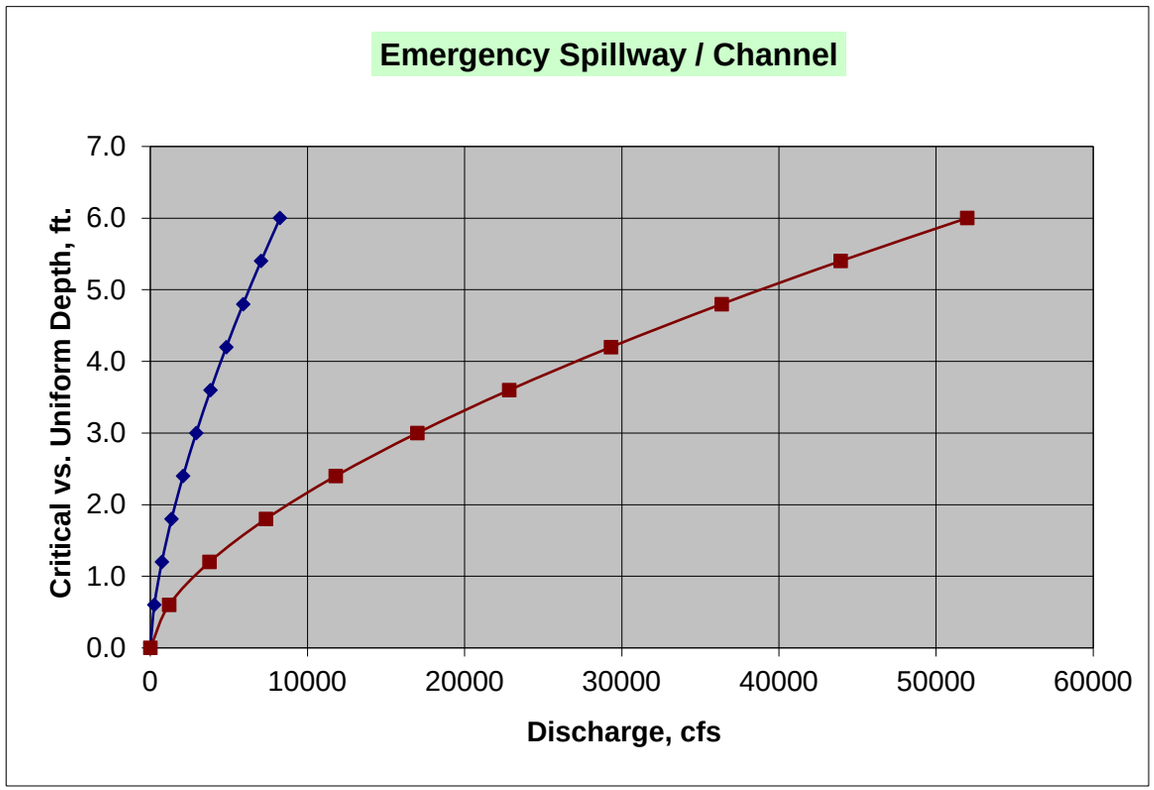
Input
"y" incr. = 0.60 ft.

						Critical flow :		Uniform flow :	
y (ft.)	A (sq.ft.)	T (ft.)	P_w (ft.)	R_h (ft.)	y_m (ft.)	V_{crit} (ft/sec)	Q_{crit} (cfs)	V_{unif} (ft/sec)	Q_{unif} (cfs)
0	0	99	99	0	0	0	0	0	0
0.60	59.40	99.00	100.20	0.59	0.60	4.4	261.1	20.2	1198.8
1.20	118.80	99.00	101.40	1.17	1.20	6.2	738.5	31.8	3775.8
1.80	178.20	99.00	102.60	1.74	1.80	7.6	1356.7	41.3	7363.5
2.40	237.60	99.00	103.80	2.29	2.40	8.8	2088.7	49.7	11801.8
3.00	297.00	99.00	105.00	2.83	3.00	9.8	2919.1	57.2	16987.8
3.60	356.40	99.00	106.20	3.36	3.60	10.8	3837.2	64.1	22846.3
4.20	415.80	99.00	107.40	3.87	4.20	11.6	4835.5	70.5	29318.5
4.80	475.20	99.00	108.60	4.38	4.80	12.4	5907.8	76.5	36356.1
5.40	534.60	99.00	109.80	4.87	5.40	13.2	7049.4	82.2	43918.8
6.00	594.00	99.00	111.00	5.35	6.00	13.9	8256.4	87.5	51971.6

y (ft.)	V_{crit} (ft/sec)	FB_{req} (ft.)	FB_{exs} (ft.)	V_{unif} (ft/sec)	FB_{req} (ft.)	FB_{exs} (ft.)	Froude no.	regime
0	0	2	-2	0	2	-2		
0.60	4.4	2.1	-2.7	20.2	2.4	-3.0	4.59	Super
1.20	6.2	2.2	-3.4	31.8	2.8	-4.0	5.11	Super
1.80	7.6	2.2	-4.0	41.3	3.3	-5.1	5.43	Super
2.40	8.8	2.3	-4.7	49.7	3.7	-6.1	5.65	Super
3.00	9.8	2.4	-5.4	57.2	4.1	-7.1	5.82	Super
3.60	10.8	2.4	-6.0	64.1	4.5	-8.1	5.95	Super
4.20	11.6	2.5	-6.7	70.5	4.8	-9.0	6.06	Super
4.80	12.4	2.5	-7.3	76.5	5.2	-10.0	6.15	Super
5.40	13.2	2.6	-8.0	82.2	5.6	-11.0	6.23	Super
6.00	13.9	2.6	-8.6	87.5	6.0	-12.0	6.29	Super

Channel capacity, compare critical flow with uniform flow

y (ft.)	Q_{crit} (cfs)	Q_{unif} (cfs)
0	0	0
0.6	261.1	1198.8
1.2	738.5	3775.8
1.8	1356.7	7363.5
2.4	2088.7	11801.8
3.0	2919.1	16987.8
3.6	3837.2	22846.3
4.2	4835.5	29318.5
4.8	5907.8	36356.1
5.4	7049.4	43918.8
6.0	8256.4	51971.6



This spreadsheet was developed by engineers in the Dam Safety Office of the Washington State Department of Ecology. It is made available to other engineers as part of our technical assistance efforts.

This spreadsheet is intended for use by Professional Engineers only, or by junior engineers under the supervision of a Professional Engineer. Engineers using this spreadsheet must make sure that these calculations are correctly applied to their project.

Dam owners and design engineers are reminded that they retain full responsibility for the safety of their structures. Also, the design engineer retains full responsibility for the completeness and adequacy of his or her design. Neither the State of Washington, the Department of Ecology, nor Ecology's reviewing engineer(s) are authorized to accept any of the design engineer's professional responsibility and/or potential liability in this regard.

Be sure to read the instruction paper (Instruct.doc) before using this and the accompanying spreadsheets.

If you have any questions regarding the use of this spreadsheet or about Dam Safety's review of your project, please feel free to contact us at :

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Appendix H
Opinion of Probable Project Costs

Opinion of Probable Costs
Eightmile Lake Storage Restoration

ITEM	UNIT	UNIT COST	QTY	COST (LOW)
Install Monitoring Equipment[1]				
Install Staff Gage / Lake Level Monitoring (Transducer Type)[1]	EA	$0	0	$0
Install Staff Gage / Discharge Monitoring and Develop Rating[1]	EA	$0	0	$0
Subtotal - Install Monitoring Equipment				**$0**
Site Preparation				
Clear Wood and Debris from Dam	LS	$6,000	1	$6,000
Clearing and Tree Removal	AC	$12,000	0.5	$6,000
Install and Maintain Temporary Erosion and Sediment Controls	LS	$15,000	1	$15,000
Install and Maintain Dewatering System	LS	$10,000	1	$10,000
Install and Maintain Other Pollution Controls	LS	$5,000	1	$5,000
Subtotal - Site Preparation				**$42,000**
Demolition of Existing Facilities				
Demolish and Remove Ex Concrete/Rock Masonry Dam and Cutoff Walls	LS	$8,000	1	$8,000
Demolish and Remove Ex Slide Gate and Appurtenances	LS	$500	1	$500
Excavate for Removal of Ex Low-Level Outlet Pipeline	CY	$50	2,250	$112,500
Demolish and Remove Ex Low-Level Outlet Pipeline	LS	$5,000	1	$5,000
Subtotal - Demolition of Existing Facilities				**$126,000**
Install Low-level Outlet and Valves				
Install Buried 30-inch HDPE Low-Level Outlet Pipeline	LF	$200	418	$83,600
Install Buried 24-inch HDPE Low-Level Outlet Pipeline	LF	$150	11	$1,650
Encase Pipe in Reinforced Concrete Under Dam	CY	$1,000	28	$28,000
Excavate Additional Material to Install Low-level Outlet Pipeline	CY	$50	1,325	$66,250
Place Processed On-site Bedding Around Low-level Outlet Pipeline	CY	$30	200	$6,000
Place Backfill Over Low-level Outlet Pipeline	CY	$20	3,300	$66,000
Install Submerged 30-inch HDPE Low-Level Outlet Pipeline	LF	$250	373	$93,250
Install Debris Rack at Pipe Inlet	EA	$5,000	1	$5,000
Install Air Release Valve	EA	$3,000	1	$3,000
Install Vacuum Pump and Connection	EA	$5,000	1	$5,000
Install 24-inch Gate Valve for Isolation with Stem Extension	EA	$45,000	1	$45,000
Install 24-inch Plug Valve on Low-level Outlet	EA	$30,000	1	$30,000
Install Isolation Valve Enclosure	LS	$10,000	1	$10,000
Sump Pump for Isolation Valve Enclosure	EA	$1,000	1	$1,000
Install Control Valve Enclosure	LS	$5,000	1	$5,000
Subtotal - Install Low-level Outlet and Valves				**$449,000**
Rebuild Dam and Embankment				
Loose Rock Removal for Dam Construction	CY	$50	720	$36,000
Hard Rock Removal for Dam Construction	CY	$110	1,680	$184,800
Place Reinforced Concrete for Dam	CY	$1,000	140	$140,000
Additional On-site Excavation for Embankment Material	CY	$50	480	$24,000
Place Embankment Material	CY	$40	2,750	$110,000
Place Gabions with Native Rock and Slush Concrete	CY	$350	180	$63,000
Place Native Rock for Armoring	CY	$40	820	$32,800
Subtotal - Rebuild Dam and Embankment				**$591,000**
Automate Valves to Optimize Releases				
Motorized Valve Actuator	EA	$20,000	1	$20,000
Power Supply (Solar Panels and Battery Pack), Controls, Communication	EA	$25,000	1	$25,000
Repeater Station[1]	EA	$0	0	$0
Subtotal - Automate Valves to Optimize Releases				**$45,000**

Opinion of Probable Costs
Eightmile Lake Storage Restoration

ITEM	UNIT	UNIT COST	QTY	COST (LOW)
Construction Subtotal - All Work[2]				**$1,253,000**
Mobilization Costs (Assumes Use of Helicopter)[2]				**$515,000**
General Mobilization/Demobilization	10.0%			$125,300
Helicopter Mobilization/Demobilization/Rental	LS	$390,000	1	$390,000
ConstructionTotal[2]				**$1,768,000**
Contingency - LOW	20.0%			$353,600
Contingency - HIGH	40.0%			$707,200
Engineering, Permitting and Administration	20.0%			$353,600
Sales Tax	8.2%			$144,976
Total Project Cost - LOW[2, 3]				**$2,620,000**
Total Project Cost - HIGH[2, 3]				**$2,974,000**

Notes:
1) Cost associated with installing monitoring equipment and telemetry connection to IPID are included in the opinion of probable project costs for the Alpine Lakes Optimization and Automation project, as reported in the *Feasibility Study: Alpine Lakes Optimization and Automation* (Aspect 2017) and are not included here.
2) Subtotals and totals are rounded to the nearest $1,000.
3) Costs are represented in May 2017 dollars. Actual costs may vary based on labor rates, equipment costs, and materials costs at the time of construction.

APPENDIX D

Alpine Lakes Optimization and Automation Feasibility Study

FEASIBILITY STUDY

Alpine Lakes Optimization and Automation

Prepared for:
Chelan County Natural Resources Department

Project No. 120045 • April 30, 2018 Final

Aspect CONSULTING

earth + water

FEASIBILITY STUDY

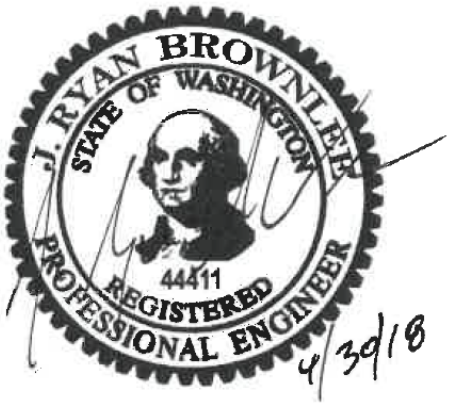
Alpine Lakes Optimization and Automation

Prepared for:
Chelan County Natural Resources Department

This project was funded by the Washington State Department of Ecology, Office of Columbia River, Grant Number WROCR-VER1-ChCoNR-00002

Project No. 120045 • April 30, 2018 Final

Aspect Consulting, LLC



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Contents

Executive Summary **ES-1**

Introduction **1**
Icicle Work Group 1
Scope of Work 2

Background **3**
Prior Studies 3
Concurrent Studies 4
Pilot Release 4
LiDAR Topographic Mapping 4
Eightmile Lake Storage Improvements Feasibility Study 4
Water Management Strategy Overview for Alpine Lakes 4
Release Period 4
Release Flows 5

Existing Conditions **8**
LiDAR Results, Stage-Storage Summary 8
Existing Infrastructure Summary 8
Lake / Reservoir Infrastructure 8
Repeater Sites 9
Site Investigation 10

Conceptual Design for Automation **12**
Design Constraints 12
Construction Access 12
Construction Equipment 12
Construction Timing 12
Power Supply 12
Communications and Controls 13
Security 13
Durability 13
Aesthetics 13
Design Criteria for Release Automation 14
Operations and Maintenance 14
Reliability 14
Release Scenarios 14
Automation Infrastructure Improvements 15

Monitoring Equipment 15
Outlet Works Improvements 15
Gate Actuators and Automation 19
Power Supply 22
Capital Cost Estimates 24

Environmental Considerations, Permitting Strategies and Potential Project Impacts 26

Property Ownership 26
Aesthetic Impacts 26
Communications Equipment 26
Enclosure 27
Permitting 27

References 29

Limitations 31

List of Tables

1 Release Period Scenarios 5
2 Observed Release Quantities 6
3 Alpine Lakes Storage Volume Estimates 8
4 Alpine Lakes Infrastructure Summary 9
5 Gate Actuator Force Measurements 11
6 Operational Scenarios 15
7 Equipment Power Loads 23
8 Equipment Runtime Duration 23
9 Solar and Battery Sizing for Summer/Fall Operation 24

List of Figures

1 Project Location, Vicinity Map
2 Stage-Storage Relationships
3 Radio Repeater Analysis
4 Typical Automation Equipment Configuration
5 Solar Exposure Analysis
6 Aesthetic Impacts, Square Lake Automation
7 Aesthetic Impacts, Klonaqua Lake Automation
8 Aesthetic Impacts, Eightmile Lake Automation
9 Aesthetic Impacts, Colchuck Lake Automation
10 Aesthetic Impacts, Snow Lakes Automation

List of Appendices

A Technical Memorandums: 2016 and 2017 Alpine Lakes Flow Augmentation Pilot Studies

B LiDAR Technical Data Report, Alpine Lake, Washington

C Radio Repeater Background Information

D Conceptual Engineering Drawings

E Preliminary Equipment Selection, Vendor Data

F Equipment Sizing Calculations

G Opinions of Probable Cost

Executive Summary

Project Overview

This feasibility study was conducted by Aspect Consulting, LLC (Aspect) and Anchor QEA, LLC (Anchor) under contract with the Chelan County Natural Resources Department (CCNRD) in close coordination with the Icicle Work Group (IWG). The IWG has been co-convened by CCNRD and the Washington State Department of Ecology (Ecology) Office of Columbia River (OCR) to identify and evaluate projects that will improve management of water in the Icicle Creek Sub-basin and improve instream flow conditions in lower Icicle Creek.

This project was funded by the Washington State Department of Ecology, Office of Columbia River (Grant Number WROCR-VER1-ChCoNR-00002).

The nine Guiding Principles related to implementation of water resource projects within the Icicle Basin adopted by the IWG include: 1) broad benefits to streamflow, 2) promotion of sustainable hatchery system, 3) fulfillment of tribal treaties, 4) improvement to municipal and domestic supplies, 5) improvement to agricultural reliability, 6) protection of aquatic and terrestrial habitat, 7) legal compliance, 8) protection of non-treaty harvest, and 9) compliance with wilderness acts and management plans.

The intent of this feasibly study is to determine whether fatal flaws exist related to optimizing and automating water storage at the seven alpine lakes managed by the Icicle-Peshastin Irrigation District (IPID) and the U.S. Fish and Wildlife Service (USFWS). This included acquisition of field data (e.g., LiDAR mapping), performing pilot releases (e.g., manual optimized-release pursuant to the guiding principles), and progressing the engineering of automation improvements to a conceptual design level (10% engineering). Refined costs and permitting strategies were also explored.

Currently, release from the Alpine Lakes is manually controlled by IPID and USFWS staff hiking into the lakes to periodically manage release from existing manmade infrastructure. In drought years, water is released from all of the lakes to meet IPID and Leavenworth National Fish Hatchery (LNFH) demand. In non-drought years, partial release occurs which results in water remaining in the lakes (subject to additional drawdown periods for maintenance). Automation would allow for additional release from the lakes in non-drought years in a manner that maximizes efficiency in an optimized manner.

Two related studies are being completed concurrently with this study, including improvements and restoration of outlet controlling works at upper Snow Lake and Eightmile Lake, respectively.

Findings

Overall Findings

Based on results of the 2016 and 2017 Pilot Release Studies (Pilot Release Studies), in conjunction with refined storage estimates from LiDAR, and refined engineering developed herein, instream flow augmentation of on the order of 90 cubic feet per second (cfs)[1] and 6,670 acre-feet per year[2] may be released from the lakes in an automated fashion to improve instream flows in Icicle Creek. Water could be adaptively managed with automation but is generally expected to be available for approximately 90 days from mid-July through mid-October.

Typical improvements needed to facilitate automated release include outlet works modification (gate modification or replacement), installation of electronic motorized gate actuators, programable controls, power generation equipment (e.g., solar panels, batteries), communications equipment (e.g., radio modem, directional antennae), and enclosures consisting of modest (e.g., 6-foot square) cast-in-place reinforced concrete shed buildings with faux rock finished exteriors.

No fatal flaws related to optimization or automation were identified during the course of this study; however, continued property owner coordination and acquisition access to land for repeater sites is recommended prior to commencing design and construction. This includes coordination with a private property owner (Johnson's), who owns the proposed Wedge Mountain repeater site, and the U.S. Forest Service (USFS), who owns the existing Icicle Repeater site. If one or both repeater sites cannot be acquired, the project may still be viable. However, this may require stronger radio signals (e.g., 25 watt in lieu of 5 watt) or alternative means of communication, which were not evaluated herein.

Feasibility level costs for automation have been estimated at $876,000,[3] which include both direct hard costs (construction) and softs costs (design and permitting).

Due to the harsh environmental conditions (extreme heat / cold), equipment design life is expected to be shorter than comparable improvements; therefore, operations and maintenance costs will be higher than usual. For example, electrical equipment and batteries will have shorter design life than customary installation and require more frequent maintenance and replacement. Annual operations and maintenance costs are estimated at approximately $35,700.

[1] Release flows of up to 90 cfs were observed during 2016 pilot release; however, significantly higher release flows may be possible during lake-full conditions. Release flows were limited to 75 cfs during the 2017 pilot release to extend the duration of benefit later into the Icicle low-flow period.

[2] 6,670 acre-feet represents the combined storage volume of Square, Klonaqua, Eightmile and Colchuck. Additional storage volume of approximately 12,730 acre-feet is available in Upper and Lower Snow Lakes. These lakes are already operated each year to augment LNFH operations. Some additional augmentation or instream flow benefit is possible with a tradeoff in refill potential if the following year is a drought.

[3] These costs include the infrastructure necessary for permanent monitoring and control of release from all lakes; however, costs associated with gate replacement and automation at Eightmile and valve replacement at Upper Snow Lakes are excluded (accounted for in separate studies).

LiDAR Mapping Findings

LiDAR data collected at each lake was processed using topographic analysis software (AutoCAD Civil3D). Stage-storage relationship curves were developed from LiDAR for each lake. A summary of active storage volumes calculated based on LiDAR analysis is provided in Table ES-1.

Table ES-1. Alpine Lakes Storage Volume Estimates

Lake Name	Maximum Normal Stage (feet)	Minimum Normal Stage (feet)	Operational Range (feet)	Active Storage Volume (acre-feet)[1]
Square	4,985	4,954	31	2,130
Klonaqua[2]	5,094	5,066	28	1,690
Eightmile	4,667	4,644	23	1,370
Colchuck	5,563	5,546	17	1,480
Upper Snow	5,433	5,273	160	12,590
Lower Snow	5,429	5,427	2	140

Notes:

1) Active storage volume represents the bathymetric volume between maximum normal stage (e.g., spillway elevation) and minimum normal stage (e.g., invert of low level outlet works). Additional dead storage is available in all lakes below manmade controlling works. Further, active storage volumes do not account for additional release volumes which may occur due to natural seepage.

2) Volumes stated represent Lower Klonaqua Lake only. Prior study indicates that approximately 2,450 acre-feet of storage may be available in Upper Klonaqua lake (which would require 50 feet of drawdown).

2016 Pilot Release Findings

The objective of the 2016 pilot release was to simulate optimized release from the IPID-managed Alpine Lakes to meet guiding principles, to the extent feasible while balancing 2016 IPID maintenance objectives and tributary fish protection issues raised by the Instream Flow Subcommittee of the IWG. Key findings are as follows:

- Flow augmentation using over 6,400 acre-feet of water stored in Alpine Lakes reservoirs can significantly enhance stream flows in the Historic Channel of Icicle Creek.
- While flow augmentation is not a total solution for achieving the IWG's flow targets in the Historic Channel, it might account for about one-third of the solution, based on 2016 results.
- Augmentation flows up to 90 cfs extended Historic Channel flows above the 100 cfs target for 3 weeks of the 9-week low-flow period in 2016, during a period when flows would have otherwise dropped below the target.
- Augmentation flows equaled between 31 and 78 percent of late-season discharge in the Historic Channel.
- Quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonal falling hydrograph. However, flow augmentation

can slow the rate of decline, prolonging the period of time when flows remain above the 100 cfs target.

2017 Pilot Release Findings

The objectives of the 2017 pilot release were to confirm the 2016 findings and to address data gaps. In contrast to the 2016 pilot release, the approach for the 2017 pilot release consisted of preserving water in storage longer in the season by limiting combined releases from the lakes to 75 cfs.

- Findings of the 2016 Pilot Study were generally confirmed. No fatal flaws were identified.
- Flow augmentation releases available from storage in the Alpine Lakes nearing 6,500 acre-feet were confirmed to significantly enhance stream flows in the Historic Channel of Icicle Creek.
- While flow augmentation is not a total solution for achieving the IWG's flow targets in the Historic Channel, it may account for over half the volume needed to meet the target.
- Quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonally falling hydrograph. However, flow augmentation can slow the rate of decline, prolonging the period when flows remain above the target. Specifically, during the 2017 Pilot Study:
  - Augmentation flows of up to 75 cfs improved flows in the Historic Channel by about one half during critical low-flow periods.
  - Augmentation flows increased flows in the Historic Channel of Icicle Creek to above the 100 cfs target for about 10 days.
  - Augmentation flows equaled up to 95 percent of discharge in the Historic Channel during critical low-flow periods.
- Winter augmentation opportunities are limited by lack of sufficient inflows to replace summer and fall storage releases and, at Eightmile Lake, by seepage losses from storage.

Recommendations and Next Steps

Automating and optimizing water storage at the seven Alpine Lakes offers an efficient and cost-effective way to improve management of water in the Icicle Creek Sub-basin. It is recommended that IPID and the USFWS continue to work with the IWG to implement a project that includes the following:

- Install permanent monitoring equipment to improve monitoring of lake levels and release rates from the lakes managed by IPID and USFWS.
- Repair existing gates and control structures at Snow, Square, Lower Klonaqua, and Colchuck Lakes.

- Automate releases by installing motorized actuators on the valve on the penstock at Upper Snow Lake and the gates at Square Lake, Lower Klonaqua Lake, Eightmile Lake, and Colchuck Lake.
- Install repeater stations and telemetry equipment needed to provide for remote control of valves and gates.
- Replace the existing dam at Eightmile Lake and replace the existing low-level outlet and gate with a siphon and gate, as recommended in the *Eightmile Lake Storage Restoration Feasibility Study* (Anchor and Aspect, 2018), being prepared concurrent with this study.
- Replace the existing valve at Upper Snow Lake, as recommended in the *Snow Lakes Valve Replacement Value Engineering Draft Report* (Reclamation, 2015).

The next steps toward implementation would include:

- Improve accuracy of Icicle Creek discharge monitoring in the Historic Channel by obtaining real-time stream flow measurements at Structure 2 (located at the head of the Historic Channel).
- Determine benefits and impacts of release flows on bull trout habitat in French and Leland creeks that drain Square and Klonaqua lakes, respectively. Additionally, investigate whether release flows above the interim 10 cfs target would not be detrimental after September 15. These lakes hold nearly half the water physically available for flow augmentation, and releases above 10 cfs in late season would provide greater flexibility to manage flow augmentation to Icicle Creek.
- Improve the understanding of the fate of flow augmentation water including lag effects due to stream channel storage. Evaluate gaining/losing characteristics of tributaries draining reservoirs and mainstem Icicle Creek.
- Coordinate with USFWS to improve understanding of releases from Snow Lakes.
- Coordinate with USFWS, IPID, Cascade Orchards Irrigation Company, and the City of Leavenworth to quantify diversions occurring upstream of the Historic Channel. Perform property owner negotiation, including submitting preliminary special use permit, for USFS site.
- Completion of Programmatic Environmental Impact Study (PEIS).
- Perform additional communications testing if land associated with preferred communications radio repeaters is unsuccessful. If needed, evaluate modifications that could be made to mitigate for communications related changes if needed.
- Negotiate with landowners (Johnson’s and USFS) regarding use of their lands for permanent repeater site installations.
- Perform engineering design and cost estimating of improvements.
- Negotiate trust water agreement and obtain a new secondary use permit from Ecology for instream flow benefit.

- Continue monitoring of flow and water quality in Icicle Creek and key bull trout tributaries (e.g., French Creek, Leland Creek) as part of continuing pilot release.

Introduction

The Chelan County Natural Resources Department (CCNRD), Icicle and Peshastin Irrigation Districts (IPID), and the Icicle Work Group (IWG) requested that Aspect Consulting, LLC (Aspect) and Anchor QEA, LLC (Anchor) provide an evaluation of the automation of infrastructure related to seven naturally-occurring alpine lakes (Alpine Lakes) which have been enhanced to operate as reservoirs by the U.S. Fish and Wildlife Service (USFWS)/Bureau of Reclamation (Reclamation) and IPID. The Alpine Lakes are part of the Alpine Lakes Wilderness, which is managed by the U.S. Forest Service (USFS).

This report serves to provide a feasibility-level analysis to identify potential fatal flaws and to outline future steps required to proceed with design (Project). This report summarizes recent data collection efforts, preliminary equipment selection and sizing, describes permitting strategy and describes visual impacts resulting from the potential improvements. A Project Vicinity Map is provided as Figure 1.

Icicle Work Group

The IWG has been co-convened by CCNRD and Washington State Department of Ecology (Ecology) Office of Columbia River (OCR) to identify and evaluate projects that will improve management of water in the Icicle Creek Sub-basin and improve instream flow conditions in the lower Icicle Creek. Automation and optimization of the Alpine Lakes is one of several projects being considered by the IWG.

The IWG has adopted nine Guiding Principles intended to guide the identification of water management solutions that lead to implementation of high-priority water resource projects within the Icicle Creek drainage. The nine Guiding Principles include:

1. Streamflow that:
    a. Provides passage
    b. Provides healthy habitat
    c. Serves channel formation function
    d. Meets aesthetic and water quality objectives
    e. Is resilient to climate change
2. Sustainable hatchery that:
    a. Provides healthy fish in adequate numbers
    b. Is resource efficient
    c. Significantly reduces phosphorus loading
    d. Has appropriately screened diversion(s)

    e. Does not impede fish passage

3. Tribal Treaty and federally protected fishing/harvest rights are met at all times.
4. Provide additional water to meet municipal and domestic demand.
5. Improved agricultural reliability that:
    a. Is operational
    b. Is flexible
    c. Decreases risk of drought impacts
    d. Is economically sustainable
6. Improves ecosystem health including protection and enhancement of aquatic and terrestrial habitat.
7. Comply with state and federal law.
8. Protect Non-Treaty Harvest.
9. Comply with the Wilderness Act of 1964, the Alpine Lakes Wilderness Act of 1976, and the Alpine Lakes Wilderness Management Plan.

This Project is expected to meet all of the guiding principles by helping to sustain streamflows in certain reaches of Icicle Creek during key low-flow periods.

Scope of Work

The scope of work of this study includes feasibility level investigation of automation improvements at the six Alpine Lakes that are operated as reservoirs: Square, Klonaqua, Eightmile, and Colchuck lakes (IPID-managed) and Upper and Lower Snow lakes (USFWS/Reclamation-managed). A seventh lake (Nada) is related to the Alpine Lakes but was excluded from the scope of this Project because it does not contribute appreciable storage volumes and is managed differently than the other lakes.

The project scope of work was completed under the following tasks:

1. **Feasibility Level Design** – Summarize infrastructure improvements necessary for automated release (gates, actuators, measurements, telemetry, and embankment improvements).
2. **Evaluation of Infrastructure Improvements and Identification of Constraints**
3. **Create Conceptual Design Drawings** – Create conceptual design drawings, showing location and general layout of major materials and equipment in plan view.
4. **Project Cost Estimates –** Estimate probable costs for the improvements outlined in the conceptual design.
5. **Aesthetic Impacts –** Develop illustrated rendering of improvements.
6. **Permitting Strategy**

Background

The Alpine Lakes were enhanced to operate as reservoirs by Reclamation and IPID in the 1920s. The following provides background on water management of the lakes under both existing and future conditions.

Prior Studies

The *Water Storage Report, Wenatchee River Basin* (Anchor, 2011), provided a summary of potential water storage projects and conservation projects intended to increase water supply and instream flows in the Wenatchee River Basin. One of the projects that was identified and evaluated as part of that study was the potential for increasing water storage in Upper and Lower Snow Lakes and automating releases.

The evaluation of water storage at Snow Lakes presented in Anchor (2011) relied on information provided in the *Management Recommendations for Reservoir Releases from Upper Snow Lake: Leavenworth National Fish Hatchery* (Wurster, 2006). That report provided an assessment of inflows, storage, and releases from Upper Snow Lake. Recommendations were provided regarding the timing and duration of releases to optimize flow benefits with the reliability of refill in Upper Snow Lake.

The *Multi-purpose Storage Assessment in the Wenatchee River Watershed* (Montgomery Water Group, 2006), preceded the Anchor (2011) and provided a broad scale overview of storage opportunities in the Wenatchee River Basin. This study identified the various Alpine Lakes (Klonaqua, Square, Colchuck, Eightmile, Snow, and Nada) as potential opportunities for additional storage.

Anchor and Aspect prepared a report, *Eightmile Lake Storage Restoration Appraisal Study* (Eightmile Lake Appraisal Study; Anchor and Aspect, 2015). The evaluation provided in that report was based on initial work completed by Gravity Consulting (Gravity) and Forsgren Associates (Forsgren), summarized in the draft *Icicle Irrigation District Instream Flow Improvement Options Analysis Study* (Forsgren, 2014). The work completed by Forsgren and Gravity included bathymetric and topographic surveys of the lake, adjacent shoreline, and dam facilities and an evaluation of storage volumes based key control elevations.

Aspect and Anchor also prepared a report, *Appraisal Study Alpine Lakes Optimization and Automation* (Alpine Lakes Appraisal Study; Aspect and Anchor, 2015), concurrent with Anchor and Aspect (2015). The Alpine Lakes Appraisal Study evaluated the potential for optimizing releases by automating gates that could be operated remotely by IPID and USFWS. The report concluded that there would be high refill probability at most of the Alpine Lakes, developed conceptual cost estimates for automating lake releases, and identified the potential need for a future feasibility study (this study).

Concurrent Studies

Pilot Release

Optimized manual releases from the Alpine Lakes were performed during the summers of 2016 and 2017 to characterize the effects of releases on Icicle Creek at various control locations (Pilot Release Studies). Results of the Pilot Release Studies are appended to this report (Appendix A).

LiDAR Topographic Mapping

Following the 2016 Pilot Release Study, Light Detection and Ranging (LiDAR) was collected in October 2016 by Quantum Spatial of Corvallis, Oregon. The scope of LiDAR collected included approximately 1,500 acres encompassing Square, Lower Klonaqua, Colchuck, Upper and Lower Snow, and Nada lakes at drawn-down conditions. The LiDAR collection report is provided as Appendix B.

Eightmile Lake Storage Improvements Feasibility Study

Improvements to Eightmile Lake are being evaluated by Anchor and Aspect concurrent with this study. An existing dam consists of a concrete/rock-masonry structure and an earthen embankment. The earthen embankment has eroded at the left edge of the concrete/rock-masonry structure. Due to erosion of the embankment, the dam can now only store water to an elevation of approximately 4,667 feet and IPID can only access approximately 1,375 acre-feet of storage. Further, the current facilities are old and in need of significant repairs. The release gate is damaged and is very difficult to open and close. The low-level outlet pipeline is collapsing in multiple locations and the capacity has been limited as a result.

Improvements planned for Eightmile Lake include replacement of the existing dam with a new dam, spillway, and low-level outlet facilities that meet the following objectives:

- Allow for IPID to store water to the historical spillway elevation of 4,671 feet and access the full capacity allowed by IPID's water right (2,500 acre-feet of storage);
- Improve operation of the facilities; and
- Replace the existing facilities with facilities that that meets current requirements of the Washington State Department of Ecology Dam Safety Office (DSO).

Water Management Strategy Overview for Alpine Lakes

There are various water management strategies (both existing and proposed) associated with operation of the Alpine Lakes. Release strategies involve both release period (time of year) and release quantities.

Release Period

Under existing conditions, IPID manages the lakes in a manner that meets their operational needs and reduces drought-related risk. This generally involves releasing

water from at least one lake per year and alternating between lakes amongst years. During drought years, IPID may release water from two or more lakes, as needed to maintain diversions from Icicle Creek during the late part the irrigation season or when needed for maintenance.[4] A detailed characterization of current operation is provided in Aspect and Anchor (2015).

To meet the IWG Guiding Principles, two enhanced release strategies have been identified to make additional use of combined lake storage and associated release in the future. With both strategies, water management includes drawdown of all lakes each year to the extent that they may be reliably refilled. The Seasonal Release strategy would provide for release from Alpine lakes during the driest period only with release commencing in July and ending in late September or early October.[5] The Year-round Release strategy would include multiple release and refill periods throughout the year. The various release period scenarios are illustrated in Table 1 below.

Table 1. Release Period Scenarios

<table>
<tr><th>Lake</th><th>Existing</th><th>Optimized Seasonal Release</th><th>Optimized Year-round Release</th></tr>
<tr><td>Square</td><td rowspan="4">one release per lake every 4 years, on average</td><td rowspan="5">one release per lake per year</td><td rowspan="4">one to two releases per lake per year</td></tr>
<tr><td>Klonaqua</td></tr>
<tr><td>Eightmile</td></tr>
<tr><td>Colchuck</td></tr>
<tr><td>Upper Snow</td><td rowspan="2">one release per year</td><td rowspan="2">one release per year</td></tr>
<tr><td>Lower Snow</td></tr>
</table>

Release Flows

Square, Klonaqua, Colchuck and Eightmile (IPID-Managed Lakes)

Each lake has various limitations on release flow quantity at various stages. The controlled range of flow releases from the four IPID-managed lakes is approximately 5 to 25 cfs for most lakes, with as high as 50 cfs possible.

Based upon the Pilot Release Studies, release quantities observed at various lakes and stages are shown in Table 2.

[4] IPID typically performs maintenance on lakes once they are drawn down. Periodic needs for special maintenance may dictate the need for special operation of lakes out of sequence.
[5] Individual lakes would have different exact release periods within this general window.

Table 2. Observed Release Quantities

Lake	Peak Observed Lake Full (cfs)[1]	Drawdown Conditions		
		Observed Flow (cfs)[2]	Stage (ft H_2O)	Estimated Gate Position
Square	35[3]	10	-27.5	Partially Open
Klonaqua	37	1	-23.5	Fully Open
Eightmile[4]	22	2.5[5]	-19.0	Fully Open
Colchuck	28	2	-11.0	Fully Open

Notes:

Higher release flows may be possible during lake-full conditions. Release flows were limited to for stream gauging / safety purposes during pilot releases.

[2] Observed flows at lake discharge during drawdown conditions with gate near maximum degree of open during pilot releases.

[3] Flows as high as 35 cfs were estimated by extrapolating values beyond rating of section (25-cfs limit on measured flows).

[4] IPID has observed that the release capacity from Eightmile Lake was recently reduced over the historical capacity due to partial or full collapse of the low-level outlet pipe at multiple locations.

[5] The release flow of 2.5 cfs is entirely attributed to seepage (i.e., not flowing through the gate, but rather seeping through the ground under the dam.)

During the Pilot Release Studies, observed conditions indicate that relatively modest initial gate settings (e.g., 6-inch gate adjustment) were necessary to achieve flows approaching 25 cfs (or higher). As lake levels dropped, larger gate adjustments were necessary to maintain flows at those levels. As expected, lake levels ultimately dropped sufficiently that peak flows could no longer be maintained with gates fully open. Results of the Pilot Release Studies, including flow release quantities by month, are provided in Figures 6 and 7 of Appendix A.

The primary conclusion from the 2016 Pilot Release Study was that a wide range of controlled flow release is achievable (e.g., 0 cfs to 25 cfs or higher from each lake) within the first 3 to 4 weeks of releases. After that period, the upper limit of releasable flow decreases as the lake level drops.

The results of the 2016 Pilot Release Study were confirmed during the 2017 Pilot Release Study. A key conclusion of the 2017 Pilot Release was that while quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonally falling hydrograph, flow augmentation slowed the rate of decline and prolonged the period when flows remained above the target. Augmentation flow during the 2017 release slowed the rate of the seasonally falling hydrograph by an average of about 1 cfs per day, delaying the date when Icicle flows would otherwise diminish to below the 100 cfs target by approximately 10 days.

Upper and Lower Snow (USFWS/Reclamation-Managed Lakes)

USFWS, in association with Reclamation, manages releases from Snow Lakes to enhance water supply to the Leavenworth National Fish Hatchery (LNFH). LNFH is operated by the USFWS under an agreement with Reclamation as mitigation for impacts from the operation of Grand Coulee Dam. Currently, the USFWS releases water from Upper Snow Lake through a controlled low-level outlet tunnel and pipe to Nada Lake during the late summer. Water flows through Nada Lake and eventually merges with Snow Creek, a tributary to Icicle Creek.

Under full lake level conditions, water from Upper Snow Lake spills over or passes through a small dam structure (Upper Snow Lake Dam) to Lower Snow Lake, and from Lower Snow Lake over a small dam structure (Lower Snow Lake Dam) to Snow Creek. During the late summer, when controlled releases draw down Upper Snow Lake, the water from Lower Snow Lake can be higher than the water level in Upper Snow Lake. As a result, water can flow the opposite direction from Lower Snow Lake through the Upper Snow Lake Dam and into Upper Snow Lake.

Controlled releases from Upper Snow Lake to Nada Lake are limited to approximately 55 cfs by the size of the existing butterfly valve that is used to control those releases. The USFWS and Reclamation are currently exploring options for replacement of the existing valve and related appurtenances to restore flows to historic release conditions. This would allow for full access of water rights that authorize a release of up to 85 cfs by both the USFWS and IPID.

Existing Conditions

Existing conditions were characterized in the Alpine Lakes Appraisal Study (Aspect and Anchor, 2015). Since the completion of that study, new information has been collected (e.g., additional site visits, topographic mapping, etc.). A summary of pertinent information related to existing conditions at each of the Alpine Lakes considered for automation and optimization is provided below.

LiDAR Results, Stage-Storage Summary

LiDAR data collected at each lake was processed using topographic analysis software (AutoCAD Civil3D). Stage-storage relationship curves were developed from LiDAR for each lake and are provided as Figure 2. A summary of active storage volumes calculated based on LiDAR analysis is provided in Table 3 below.

Table 3. Alpine Lakes Storage Volume Estimates

Lake Name	Maximum Normal Stage (feet)	Minimum Normal Stage (feet)	Operational Range (feet)	Active Storage Volume[1] (acre-feet)
Square	4,985	4,954	31	2,130
Klonaqua[2]	5,094	5,066	28	1,690
Eightmile	4,667	4,644	23	1,370
Colchuck	5,563	5,546	17	1,480
Upper Snow	5,433	5,273	160	12,590
Lower Snow	5,429	5,427	2	140

Notes:
1) Active storage volume represents the bathymetric volume between maximum normal stage (e.g., spillway elevation) and minimum normal stage (e.g., invert of low level outlet works). Additional dead storage is available in all lakes below manmade controlling works. Further, active storage volumes do not account for additional release volumes which may occur due to natural seepage.
2) Volumes stated represent Lower Klonaqua Lake only. Prior study indicates that approximately 2,450 acre feet of storage may be available in Upper Klonaqua lake (which would require 50-feet of drawdown).

Existing Infrastructure Summary

Lake / Reservoir Infrastructure

Existing operational infrastructure at each lake is described in the Alpine Lakes Appraisal Study (Aspect and Anchor, 2015) which has been updated with new information. A summary of pertinent infrastructure is provided in Table 4.

Table 4. Alpine Lakes Infrastructure Summary

Lake Name	Dam / Embankment Type		Outlet Works / Control	
Square	Concrete/Rock-Masonry Dam and Spillway	Approx. 85 ft Length x 2 ft Width	5 ft Wide x 7 ft Tall Tunnel	30-inch Circular Gate mounted in Tunnel
Lower Klonaqua	Concrete/Rock-Masonry Dam and Spillway and Earthen / Rock Embankment	Approx. 100 ft Length x 8 ft Crest Width	30-inch Pipe	30-inch Circular Gate mounted in Vertical Gate Chamber
Eightmile Lake	Concrete/Rock-Masonry Dam and Spillway and Earthen / Rock Embankment	Approx. 95 ft Overall Length, width / composition varies	Buried Piped, Various Size / Material	30-inch Circular Gate mounted on Rock Masonry Tower (collapsed)
Colchuck	Concrete Dam and Spillway	Approx. 40 ft Length	Buried Piped	30-inch Rectangular Gate mounted on Rock Masonry Tower
Upper Snow	Rubble Masonry	Approx. 110 ft Length	Tunnel	Gate Valve, 24-inch Butterfly Valve[1]
Lower Snow	Embankment	Approx. 40ft Length	Flap Gate at Upper Snow Lake Dam, Spill at Lower Snow Lake Dam	

USFWS is exploring options which may increase butterfly valve to 36-inch diameter.

Repeater Sites

IPID operates several base stations and repeater sites under two FCC licenses (call signs WQKS355 and WQKR961). An existing radio repeater at Blag Mountain (approximately 7 miles east of Leavenworth, elevation 4,500 feet) is frequently used by IPID. This repeater is identified as Location 2 under FCC Call Sign WQKR961 and is listed with an estimated signal strength of 45 watts.[6] This repeater has line of sight to several key points including:

- IPID Peshatin Headworks
- Icicle Ridge Repeater
- Wedge Mountain Site

[6] IPID District staff has stated that they can typically receive signals from Blag mountain at Eightmile Lake and Colchuck due to the high power signal (45 watt) of the transceiver – despite line-of-sight not being available. At times, IPID is able to transmit signals from Colchuck to the Blag mountain repeater using small handheld radios (5 watt).

The IPID Peshastin Headworks is located several miles up US Route 97 / Peshastin Creek. According to IPID, this facility is relevant due to the main connection to the IPID supervisory control and data acquisition (SCADA) system. This facility could be used to transmit data to other locations within the District or to an internet connection if desired.

The Icicle Ridge Repeater (MGRS 10TFT6856772797) is owned and operated by the USFS and is located approximately 4 miles west of Leavenworth and approximately 7 miles northeast of Eightmile Lake, at an elevation of approximately 6,800 feet. This station is equipped with a 50-watt collinear antenna with a listed height of 6 meters (~20 feet). The site includes onsite power generation (400-watt solar), 500 watt-hours of batteries, and a storage shed. The site is inaccessible by vehicle; however, there is a helipad at the site.

According to Mr. Howard Banks of the USFS (Icicle Repeater facility manager), the equipment has limited capacity for expansion; however, there may be room at the site for additional towers, etc.[7] This site is a candidate location for a new repeater to send and receive signals from the four IPID-managed lakes. It may also be possible to send and receive signals from Snow Lakes and LNFH at this location, although this has not been evaluated.

Wedge Mountain is located approximately 5 miles southwest of Leavenworth and approximately 3 miles northeast of Snow Lakes, at elevation of 5,000 feet. Property at this site (Parcel ID 231703000050) is owned by Robert and Nancy Johnson of Leavenworth, and is a candidate location for a new repeater to Snow Lakes and LNFH. This site may also be conducive to sending and receiving communications from more distant lakes (e.g., Square, Klonaqua, Colchuck and Eightmile) if more powerful signals (e.g., 25 watt signals rather than 5 watt signals) are transmitted from those locations.

Radio repeater sites, including base stations, are identified on Figure 3. Background information related to existing repeater sites is provided in Appendix C.

Site Investigation

A site investigation was performed on October 7, 2016, by Aspect, Anchor, and IPID personnel. The purpose of this investigation was to observe each lake during drawn-down conditions and collect additional data and measurements necessary for completing this feasibility study. Data collected during site investigation included gate operation force measurements. This was performed to establish a baseline for actuator torque and provide as a check on existing gate condition.

The amount of force required to lift or lower gates during drawdown conditions at each lake varies dramatically and is provided in Table 5. The gates at Square, Klonaqua, and Colchuck currently operate using a manual hand wheel operator attached to the gate stem. The estimated torque applied to each of these gate stems to operate the gate was developed based on gear ratios and leverage available at each manual actuator.

[7] Personal communications, telephone conversation, Tony Jantzer and Howard Banks, March 8, 2017.

Table 5. Gate Actuator Force Measurements

Lake Name	Approximate Operating Force (lbs)	Gear Ratio / Description	Estimated Torque Applied to Stem (ft-lbs)
Square	40	18-inch hand crank 3.5-gear 10-inch gear 6-inch gear 18-inch gear to stem	457
Klonaqua	12	24-inch hand crank 5-inch gear 19-inch gear to stem	115
Colchuck	6	28-inch handwheel	7

The stem and hand-wheel operator used to open and close the gate at Eightmile Lake were damaged by ice when the rock-masonry gate tower was destroyed. The damaged hand-wheel operator has since been removed. As a result, opening and closing the gate requires the use of a log as a come along, which is physically challenging.

Eightmile Lake was not visited as part of the October 2016 site investigation since improvements to that structure are being considered under a separate feasibility study. Thsee improvements will likely include replacement of the existing gate and low-level outlet pipe with a new pipeline and valves. Flow from through the low-level outlet will be controlled by a plug valve near the pipe outlet. A gate valve on the pipeline at the dam will allow for isolation of the pipeline below the dam. Additionally, Upper and Lower Snow lakes were not visited as part of the October 2016 site investigation since the USFWS is working directly with Reclamation to replace the outlet control valve as part of maintenance activities.

The gates at Klonaqua, Colchuck, and Eightmile are likely due for replacement; however, IPID's preference is to perform additional inspection of the gate at Square Lake before proceeding with replacement of that gate.

Conceptual Design for Automation

Automation will be accomplished through installation of motorized actuators with onsite power generation (e.g., solar panels). Due to the remote setting in a federally-designated wilderness area, special design criteria and constraints must be considered.

Design Constraints

Various constraints limit the degree and frequency to which adjustments to gates via motorized actuators are made:

Construction Access

The Alpine Lakes are all located in the Alpine Lakes Wilderness Area, so access is limited to foot trails (i.e., there are no roads) and helicopter. Eightmile and Colchuck lakes are accessible by trails that can be hiked within a half-day (less than 5 miles), while Square and Klonoqua lakes are much further (more than 10 miles) from the nearest road or parking area.

In addition to their remote location, gates at Klonoqua and Square lakes are physically constrained: the gate at Klonaqua is located inside a narrow access vault and the gate at Square is located inside a tunnel. The operators are more accessible than the gates themselves. The design of the project will have to consider relatively tight access constraints and limit impact of the proposed improvements on the Wilderness Area.

According to their easement agreement with the USFS, IPID can access the lakes via helicopter for maintenance activities. The USFS completed an Environmental Assessment in 1981 evaluating this access and finding no conflict with the environment (USFS, 1981). In order to limit the cost of constructing the proposed improvements, equipment and materials needed for this Project will likely need to be hauled in via a relatively small helicopter, or by foot.

Construction Equipment

The installation of automating equipment, replacement of gates, placement of solar panels and batteries or other power supply equipment, and installation of enclosures will all likely be completed with hand tools and/or light equipment. Due to the construction access constraints described above, we expect that all work will be completed without the aid of heavy construction equipment.

Construction Timing

Work required to automate the release equipment at each lake is expected to occur when the lakes are fully drawn down, at the end of the summer or early in the fall. The lakes are at high elevations where snow and freezing temperatures typically occur as early as late October and last until May. Therefore, we expect the work window for completing the improvements will be limited to late September and early October.

Power Supply

The remote setting of the lakes in a wilderness area dictates that alternative power supply options be considered for automatic gate operation. At a minimum, battery power is

anticipated in conjunction with onsite power generation (e.g., solar, micro-hydropower). Constraints on solar power generation include seasonal direct sunlight (southern exposure) including likely excessive snow cover for much of the year. Constraints on other forms of energy, such as micro-hydropower, include seasonal freezing potential and release period constraints coupled with adequate driving head. Reliability considerations related to power supply should be accounted for commensurate with industry standards (e.g., providing sufficient level of amp-hours supply at adequate voltage to meet certain conditions in the event of onsite power generation failure).

Communications and Controls

The purpose of the Project is to provide for automated and optimized releases from the lakes to enhance the benefit of the releases to instream flows and downstream uses. Therefore, some measure of programable control and logic is necessary. Onsite manual operation of gates is also necessary independent of automation along with a programmed fail-close system. Furthermore, to meet the IWG Guiding Principles, the magnitude and timing of releases from the lakes will depend on Icicle Creek flow conditions, which are monitored outside the wilderness area. For this reason, some frequent measure of communications is necessary to maintain optimized release.

Remote communication options include radio, cellular, and satellite. Constraints related to cellular include poor, weak, or non-existent signal; these constraints cannot be mitigated economically.[8] Satellite communications is constrained by commercial satellite availability and coverage, particularly with respect to obstructions relative to horizon, weather, and other factors. Radio communications is constrained by signal strength / frequency, FCC licensing, relative line of sight, and distance.

Security

Although access to the release sites is limited, security concerns (e.g., vandalism, attractive nuisance) should be considered. At a minimum, facilities should be designed such that equipment cannot be easily adjusted (e.g., actuators and associated controls are either inaccessible or reasonably locked out) or damaged.

Durability

Dramatic climatic conditions are present, including extreme high and low temperatures, deep snow and freezing conditions, high flow and runoff conditions, and wood debris. At a minimum, facilities should be designed to withstand anticipated natural events in addition to a reasonable amount of human tampering.

Aesthetics

Existing visible features associated with manual release from the lakes includes cast iron manual actuators (e.g., Square, Klonaqua, Colchuck), dams (all lakes), concrete / rock-masonry structures (all lakes) and small shed buildings (Snow Lakes). While no discrete minimum measure of aesthetic quality has been established as criteria, aesthetic considerations related to environmental impacts are included under the scope of this

[8] Cellular was tested during Appraisal Study and was deemed infeasible at that time. Additional cellular towers within the project vicinity may be necessary to accommodate cellular service which cannot be predictably expected within the lifespan of this project.

study. It is anticipated that aesthetic modifications to new or replaced infrastructure should be as natural looking as is feasible. Visual impacts should be similar in nature and magnitude to existing improvements, or otherwise concealed from view or camouflaged to look natural.

Design Criteria for Release Automation

Operations and Maintenance

To justify capital expenditures of this Project, operations and maintenance costs should be minimized to the extent feasible. For example, operations and maintenance costs associated with new infrastructure should not approach the alternative cost needed to achieve the same goal with manual labor (i.e., performing manual periodic adjustments on the lakes in lieu of automation). Mechanical/electrical elements (e.g., actuator, controls, communications equipment) should operate with limited repair and maintenance for at least 10 years, with replacement of equipment not necessary sooner than 15 years.

The existing gates have operated for approximately 50 to 60 years.[9] It is reasonable to expect that new comparable gates or valves would have a design life this long with periodic maintenance (at least every 5 years). Batteries are only expected to last 3 to 5 years with lifespan highly dependent on frequency and manner of use; batteries are expected to be a recurring maintenance expense. Due to the remote setting, ease of repairs of faulty/failed equipment is low, particularly during the winter months as many of the lakes are practically inaccessible between November and May.

Reliability

Automated releases will contribute to increased instream flow quantities in Icicle Creek during the late summer low-flow period, which is intended to mitigate for existing and future water uses as part of the IWG guiding principles. Therefore, the need for reliability of automated releases is relatively high. Reliability risk may be mitigated by redundancy (e.g., redundant batteries, alternative controls).

Release Scenarios

Four operational scenarios are being considered amongst two operational alternatives and two release schemes (Table 6). Within each alternative, two operational schemes were considered (daily adjustment vs. weekly adjustment). These scenarios were primarily developed to establish bookends for the purpose of identifying potential infrastructure sizing / configuration ramifications. Operational Alternative 1 includes seasonal release only whereas Operational Alternative 2 includes the option s for multiple releases year-round.[10]

[9] It is estimated that gates may have been last replaced in the 1960s or 1970s.

[10] It is anticipated that only one or two lakes may be operated during a multiple release operational alternative (e.g., wintertime release) and that release flow quantity may be minimal (e.g., 5 to 10 cfs)

Table 6. Operational Scenarios

Operational Scheme	Alternative 1 (Single Release)	Alternative 2 (Multiple Release)
Operational Scheme A (Daily Adjustment)	Scenario 1A	Scenario 2A
Operational Scheme B (Weekly Adjustment)	Scenario 1B	Scenarios 2B

Ramifications of the two operational scenarios include potential tradeoffs in cost vs benefits and anticipated risk. For example, Scenarios 1A and 1B (single release) would involve higher refill probabilities than Scenarios 2A and 2B (multiple release), which would involve releasing water closer to the end of the refill season. Scenarios 1A and 2A (daily adjustment) will require greater power considerations than Scenarios 1B and 2B (weekly adjustment).

Automation Infrastructure Improvements

It is anticipated that automation is feasible within the prescribed criteria and constraints with adequately sized and configured infrastructure. Typical automation improvement concepts have been developed and are shown in Figure 4. Conceptual design of automation improvements for individual lakes has also been developed, as described below and illustrated in the conceptual engineering drawings (10% design level) in Appendix D. Preliminary equipment selections included in the design are described below[11] and sample equipment information (vendor resources) is provided for reference as Appendix E.

Monitoring Equipment

Automation will rely on automated monitoring of conditions (lake stage and discharge flow). Options for monitoring equipment were explored in the *Appraisal Study Alpine Lakes Automation and Optimization* and have not been progressed as part of this study. Improvements will generally consist of installation of pressure transducers, staff gages, and rated release channel sections.[12] Costs associated with these improvements vary by lake and are included in cost estimates as part of this Project.

Outlet Works Improvements

The outlet works at the lakes being considered for automation and optimization of releases typically consist of some type of low-level outlet conveyance (pipeline or tunnel)

[11] Final equipment selections will be made at time of construction based upon engineering design specifications. Vendor cut sheets provided herein are intended to provide examples of products which may meet preliminary criteria.

[12] Temporary monitoring equipment (staff gates and pressure transducers) were installed during the 2016 pilot release however more permanent solutions will be required in conjunction with automation improvements.

and control infrastructure (gates / valves) needed to manage releases.[13] In some cases, existing outlet works are in suitable operating condition; cost for upgrade or replacement of the equipment is likely to exceed the benefit of replacing the equipment. In other instances, modest improvement to outlet works infrastructure is warranted to improve operation and make the facilities compatible with automation improvements.

Square

Square lake has a well-functioning outlet tunnel and gate. The tunnel was constructed through bedrock and appears to be stable. The gate and operator appear to have been installed within the last 40 to 50 years and are still in very good condition. It is not anticipated that major improvements will be necessary to these facilities to accommodate automation; however, the gate has not been fully inspected. A full inspection of outlet gate should be performed during preliminary design phase, when the lake is fully drawn down, so that full operation of the gate can be observed and both sides of the gate can be inspected.

Three options are available to facilitate automation:

- **Option 1**: equipping the existing manual operator with new motorized actuator. The advantages of this option includes minimal capital cost and utilization of existing gears and leveraging available.
- **Option 2:** replacement of existing manual actuator and stem with new stem and motorized actuator. One advantage of this option includes removal of existing cast iron gears which may be more maintenance intensive. One disadvantage of this option is that the new actuator would likely have to be larger to lift the gate without the use of existing gears and leveraging equipment. New equipment would need to be capable of providing approximately 500 ft-lbs of torque.
- **Option 3:** full gate replacement with new motorized actuator. The challenge to this option is that the existing gate is mounted in a tunnel that is difficult to access. The gate stem extends to the actuator through a small opening drilled in the bedrock above the tunnel. Replacement of the gate and stem could be very difficult, but additional inspection is needed to determine whether replacement is warranted.

We expect that the IPID and IWG would select Option 2, replacement of stem and actuator only, as the preferred option based on IPID's stated assessment that the existing gate is in satisfactory working condition.

Klonaqua

Klonaqua outlet works consist of a 30-inch diameter concrete pipe (inferred from asbuilt), low-level outlet pipeline, and a positive seating circular canal-style gate installed in a reinforced concrete vertical gate chamber. The condition of this infrastructure is variable with much of the conduit and gate chamber in satisfactory condition. The gate

[13] Two parallel studies are being performed to explore outlet works improvements at both Eightmile Lakes and Snow Lakes; therefore, upgrades to outlet works associated with those lakes have not been included in this study.

itself does not seal and should be replaced with a similar style gate. IPID has indicated that approximately 20 feet of the outlet pipe (nearest the outlet channel) has partially collapsed and is due for maintenance and repair. IPID has plans to repair the collapsed section of the low-level outlet pipe.

Eightmile

Eightmile lake outlet works consist of a 30-inch diameter low level outlet pipeline constructed of a variety of materials and a circular canal-style gate installed at the inlet to the pipeline. During most conditions, the gate is submerged in the lake and is exposed to ice, floating debris, and other potentially damaging conditions. The gate and low-level outlet pipe inlet are protected by a debris rack. The gate stem was originally supported by a rock-masonry gate tower. A hand-wheel operator mounted on top of the gate tower, above the water surface of the lake, was used to open and close the gate. However, the gate tower was sheared off by ice within the last 20 years. The damaged hand-wheel operator was removed. The gate is now operated by a long chain attached to the gate stem ad a come along. Fully opening and closing the gate is a challenge. In addition, the existing low-level outlet pipe, which consists of segments of corrugated metal, log stave, and wood stave pipe are collapsing. The collapse of portions of wood stave pipe has reduced the capacity of releases from the lake and is a major concern for IPID.

Improvements to the dam, outlet works, and controls at Eightmile Lake are being studied concurrently and recommendations for these facilities will be identified in the *Eightmile Lake Restoration Project Feasibility Study* (Anchor and Aspect, 2018). Recommended improvements will include:

- A new reinforced concrete and earthern/rock embankment dam with a spillway constructed with concrete and rock-filled gabions.
- A new 30-inch diameter low-level outlet pipe constructed of high-density polyethylene pipe that will extend from a point deeper in the lake to an outlet location further down the outlet channel. The low-level outlet pipe will operate by gravity during the early part of the season and will operate as a siphon in the later part of the season, when the water level is drawn down below the elevation of the high point in the pipeline at the dam.
- The pipe will neck down to 24 inches in diameter at the dam and an isolation valve, air-release valve, and vacuum pump/priming equipment will be installed in a valve chamber at the high point in the pipeline on the downstream side of the new dam structure.
- Releases from the pipe will be controlled by a 24-inch plug valve, located in a valve enclosure near the pipe outlet. The plug valve will be throttled to control the release rate. Locating the control valve near the pipe outlet will allow for the pipeline to remain primed when lake levels are low. The valve will include an electronic actuator that will be powered by batteries and a solar panel, similar to power for automation at the other lakes.

Colchuck

The outlet works at Colchuck Lake consist of two segments of low-level outlet pipe of variable size and material (assumed to be corrugated metal pipe based on visible features)

with a rectangular style gate positioned in the lake adjacent to a free-standing gate tower. The first segment of pipe extends from a deeper part of the lake to the gate tower, which is installed in a relatively shallow part of the lake adjacent to the dam structure. The rock-masonry gate tower includes a rock-masonry well at the bottom which connects the first segment of low-level outlet pipe to the gate. The gate controls flow to the second segment of outlet pipe, which conveys water from the gate to an outlet in the channel downstream of the lake. The gate is fully submerged in the lake under most operating conditions. When the lake is fully drawn down, the gate tower, gate, and lake bottom around the tower and gate are fully exposed. A manual hand-wheel gate actuator is mounted on top of the gate tower and is accessible by a wooden plank or footbridge from the shoreline of the lake.

Because the gate is positioned in the lake, it is exposed to ice, floating debris (such as logs which often accumulate), and other potentially damaging conditions. Existing conditions do not support winter-time operation as the gate stem is typically encased in ice when the lake freezes over. In spite of the exposure to potentially damaging conditions, the gate is still in relatively good operating condition.

Recommended improvements to the outlet works at Colchuck Lake include:

- Replacement of the gate with a new gate of similar size and operation with an electronic actuator.
- Replacement of the gate tower with a new riser or manhole type structure that will protect and provide access to the new gate, actuator, and controls. The structure could consist of pre-cast manhole sections or a riser pipe with a cast-in-place concrete base and a weathertight, locking lid. The riser or manhole structure would also connect the two segments of low-level outlet pipe.

Upper Snow

Upper Snow Lake controlling works consist of a tunnel (estimated 160 foot deep), an outlet pipe that extends from a block plugging the tunnel to a discharge point on a rocky slope above Nada Lake, a valve house built into the hillside at the end of the tunnel above Nada Lake, and several valves that control flow from the tunnel through the pipeline to Nada Lake. The primary control valve is a 24-inch butterfly valve that is throttled to control flow through the pipeline to Nada Lake. The outlet works are generally in good operating condition; however, the control valve and associated pipe at the discharge end of the system are currently limited to release flows of approximately 55 cfs, which is less than the combined release rights for the lake held by Reclamation and IPID.

The USFWS and Reclamation are exploring options to replace the existing butterfly valve to increase flows to 85 cfs. Additional improvements recommended for automation and optimization of releases from Upper Snow Lake would include installing an electronic actuator with the new valve, control equipment, batteries, and solar power to enable remote control of the valve by the USFWS[14].

[14] Improvements to Snow Lakes controlling works (valve, mechanical actuator, controls, power supply and communications) are being planned by Bureau of Reclamation, Technical Service Center in Denver, Colorado. The scope of improvements considered by Reclamation are generally consistent

Lower Snow

When the low-level outlet from Upper Snow Lake is closed and the water level in Upper Snow Lake is near the full level, water is released from upper Snow Lake to Lower Snow Lake over and through a dam structure between the two lakes. The dam structure includes a flap gate that was originally designed to allow water to flow from Upper Snow Lake to Lower Snow Lake, but prevent flow in the reverse. Water also spills over the dam structure at Upper Snow Lake to Lower Snow Lake. The flap gate is no longer water tight and allows for water to flow through the dam in both directions. When Upper Snow Lake is lowered by opening the low-level outlet to Nada Lake, the water in Lower Snow Lake can be higher than the water level in Upper Snow Lake and water can flow backwards through the dam from Lower Snow Lake to Upper Snow Lake.

Lower Snow Lake also has a small rock-masonry dam at its outlet. No low-level outlet facilities are functioning at this dam, so the water level in Lower Snow Lake is generally controlled by spilling over the dam crest. Under current operation, water levels in Lower Snow Lake only vary a few feet from the dam crest elevation. Consequently, the active storage volume in Lower Snow Lake is small and is really only accessible when Upper Snow lake is drawn-down sufficiently to allow back flow through the existing flap gate at the Upper Snow Lake Dam. No discrete automation or improvement to outlet works is proposed for Lower Snow Lake as part of this Project.

Gate Actuators and Automation

Automation would consist of installing motorized actuators on the release gates and/or valves at each lake. Motorized actuators would be controlled by programable control equipment capable of communicating with a computer or telephone from a remote location.[15]

Actuators

Due to the remote conditions and other power constraints, direct current (DC)-powered actuators would be required. As identified in the Appraisal study, several manufacturers are available, including Auma, Limitorque and Rotork. For the purpose of this study, Rotork actuators were considered; however, a final manufacturer and model would be selected during the detailed design and construction phases. Features associated with Rotork actuator include a self-contained waterproof enclosure, integrated datalogger, manual handwheel actuator (backup), oil bath lubrication, position control, and encapsulated stem.

Conceptual actuator sizing was performed using Rotork design resources. Based upon a 30-inch diameter circular canal style gate with 30 feet of effective head, a thrust of approximately 6,000 lbs thrust was calculated. Required torque (torque applied to gate stem) of approximately 70 ft-lbs was calculated by applying a stem factor of 0.012 (based

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with those presented herein however additional coordination is required to ensure consistency between planning efforts.

[15] Local motorized operator interface manual control override would be provided in addition to remote capabilities.

on 1.5 inches diameter stem, 4 threads per inch and frictional factors provided by manufacturer).

A variety of DC powered actuators are available ranging in voltage, horsepower, torque, speed, etc. The smallest actuator available is 24-volt, 1/3 hp which applies 20 ft-lbs of torque at 18 rpm. Typically, gearboxes ranging from 1:1 ratio up to 6:1 ratio can be added, thereby increasing torque delivered (at lower overall speeds).

Rotork model IQD10 at 48 rpm provides 20 ft-lbs of torque which is increased to 102 ft-lbs with Rotork model IB4 gearbox (6:1 ratio), which would be sufficient for any of the lakes including Square (assuming gate replacement), Klonaqua, Colchuck and Eightmile. The Rotork ID10 actor has a motor horsepower of 1/3 hp with 7 amps motor load.

At 48 rpm, 6:1 gear ratio, and 1/4-inch thread spacing (4 threads per inch), it is estimated that an operation duration of 30 seconds per inch of gate adjustment would be required to adjust the gates. Based upon the results of the 2016 Pilot Release Study, daily adjustments of up to 6 inches may be required (Scenarios 1A and 2A) or weekly adjustment of up to 12 inches for Scenarios 1B and 2B.

An exception to the required sizing may exist at Square Lake, should the existing gate be left in place. Field measurements indicate that approximately 40 ft-lbs of force applied to the handwheel operator is required to raise the gate during lake-empty conditions. Considering current gearing and mechanical advantage, this force translates to approximately 460 ft-lbs of torque, which exceeds the limits of 24V actuators provided by Rotork. In order to provide torque of that magnitude, a 110V model would be necessary, which may be excessive from a power budget perspective (i.e., ten 12V batteries would be required in parallel).

If the gate is left in place, it is recommended that a 24V actuator be selected in conjunction with either the existing gears or with replacement gears that provide similar mechanical advantage. The tradeoff with this approach is significantly longer run-time per adjustment. For example, under this scenario, a 24V, 48 rpm motorized actuator could be installed with standard 6:1 gearbox on existing manual actuator. The existing actuator requires approximately 32 revolutions per inch of stem rise, hence the actuator would operate for approximately 4 minutes per inch of stem adjustment which is within limits of power budget assumptions.

Calculations associated with motorized actuator sizing are provided in Appendix F.

Programable Dataloggers / Controllers

The motorized actuator at each valve or gate would be controlled by a programable data logger/controller. The logger/controller would send and receive signals from the actuator and be connected to external communications, such as a phone or computer modem, as well as other monitoring equipment (e.g., water level/pressure transducers). For the purpose of this Project, Campbell Scientific equipment is being evaluated including a Model CR1000 Controller which provides for logging and control of multiple connected devices, including transducers and actuators. The programmable data logger/controller would be operated through an interface (e.g., RTU) which would include additional logic and programming function.

Operator Interface

Several operator interface options will be available for gate adjustments. The primary method for this application would be remote operation through a remote personal computer positioned at a base station (e.g., remote terminal unit (RTU) at IPID or LNFH). Campbell Scientific Loggernet software (or similar) provides for simplified configuration and programming for CR1000 Controllers and could be used in this application.

Other options for gate operation include the following:

- Automated direct adjustment of each gate using an on-site actuator remote in close proximity (e.g., Rotork remote control);
- Automated direct adjustment of each gate using an on-site terminal unit connected to the data logger/controller. (e.g., laptop computer or tablet wired to the data logger); and
- Manual handwheel adjustment/override.

Communications

Available options for communications include both satellite and radio. A radio repeater analysis was performed by Aspect in 2015 and is considered feasible. No satellite coverage analysis has been performed, but it is anticipated that satellite may also be viable.[16] For the purpose of this study, it has been assumed that communications for remote control of automated valves and gates would be via radio. Radio communications includes the use of base stations at each lake, IPID, and LNFH, and repeater stations.

The primary radio communications method considered for this Project is high frequency (UHF / VHF) radio at IPID and USFS established frequencies, which were evaluated as part of the 2015 Alpine Lakes Appraisal Study (See Figure 3). In general, direct radio communications coverage from the lakes to base stations are inconsistent without benefit of repeaters. IPID often sends and receives radio signals from some lakes, including Colchuck and Eightmile, using their existing repeater at Blag Mountain. However, limitations of this practice have not been explored. As evaluated in the 2015 Alpine Lakes Appraisal Study, radio repeater stations could be installed at intermediate high points outside the Wilderness area but within the Project vicinity to offer line-of-sight communications between lake locations and base station(s).

Radio repeater stations are very common in remote areas and are relatively inexpensive to install. Infrastructure consists of tower (anchored mast or structural frame), omni-

[16] Iridium Communications operates the Iridium satellite constellation which includes 66 active satellites to provide voice and data communications form satellite phones and transceiver units around the globe. In this case, the Iridium transceiver unit 9522B would be used. There would be a required data plan with ongoing fees – however benefits include potential greater flexibility and lower power use than radio options. An alternative vendor (Hughes / Immersat) may also be explored. Iridium is IP based whereas Hughes is not. The primary consideration related to satellite is coverage which, at minimum requires limited obstructions below 30-degree horizon. Sites could also have their own IP address allowing for login from any internet capable workstation.

directional antenna, radio transceiver (estimated 50 watt) and onsite power generation (solar panel and battery).

From a technical perspective, the preferred arrangement of new radio repeater stations includes a new radio repeater station at the Icicle Ridge site, a new radio repeater station at the Wedge Mountain site, and retention of existing IPID radio repeater infrastructure at Blag Mountain. Each new radio repeater station could be operated by IPID and added to the existing IPID FCC license. In addition to radio repeater station(s), a new radio base station could be added to USFWS facilities at LNFH to allow for independent communications and control of Snow Lakes release by USFWS.[17] Use of an IPID repeater at Wedge Mountain could be arranged through inter-agency agreement between USFWS and IPID for joint use of a new Wedge Mountain Repeater for operation of USFWS-managed lakes.[18] As an alternative, a new Wedge Mountain repeater could be owned and operated by the USFWS and licensed under National Telecommunications and Information Administration (NTIA) processing.

While not anticipated, permitting and property ownership constraints may limit the construction of radio repeaters at either of the preferred locations. In this case, radio communications may still be possible to / from the lakes with either repeater using strong base station transmitters (e.g., 25 watt radio transceivers).

It is recommended that additional field radio survey be conducted to test high power (e.g., 25 watt) signals between the more distant lakes and Wedge Mountain and between Snow Lakes and the Icicle Repeater, in conjunction with the Blag Mountain repeater and Peshastin base station.[19]

Power Supply

Due to remote site conditions, onsite power generation (DC) will be necessary. Readily available communications and controls equipment is typically provided in 12V DC, however the smallest DC motorized actuator considered as part of this study is available in 24V DC. This will require power regulation to step down from 24V to 12V which is inefficient but satisfactory.

A power budget was performed to conduct preliminary solar panel sizing and battery bank configuration. Power needs increase as a function of gate adjustment frequency and duration, communications frequency and other factors. Assumptions included in the power budget consist of the following:

- Gate adjustments may be limited to 5 minutes.
- Solar panels may be unavailable or unreliable during winter months.

[17] Other configurations may be possible. For example, base station at LNFH could be avoided through internet connection and agreement between IPID, or USFW could own / operate the Wedge mountain repeater in lieu of IPID.

[18] IPID and USFW have shared rights associated with Snow Lakes. Currently USFW is performing mainteancne activities on existing release form Snow lakes to resort flows from 55 cfs to 85 cfs historical flows such that both IPID and USFS can have access to existing storage rights in Snow Lakes.

[19] If additional communications survey are performed, scope should include coordination with USFW and possibly be expanded to test satellite communications.

A summary of power loads by equipment type for both active and quiescent are provided in Table 7.

Table 7. Equipment Power Loads

Equipment	Active Draw (A)	Quiescent Draw (A)
Datalogger	0.01	0.0006
Pressure transducer	0.08	0.00008
RotorQ Actuator	7	0
24Vdc to 12Vdc regulator		0.00093
Crydom Solid State Relay	0.01	0
RF320 VHF radio transciever	1.2	0.025
RF500M radio modem	0.015	0.00035

Power consumption varies by the duration of operation of each unit, which varies dependent upon whether daily or weekly gate adjustments are performed. Equipment runtime duration is provided in Table 8.

Table 8. Equipment Runtime Duration

	Daily Adjustment (seconds / day)		Weekly Adjustment (seconds / week)	
Equipment	active	quiescent	active	quiescent
Datalogger	7.08	292.92	5.3	294.7
Pressure transducer	1.5	298.5	1.5	298.5
RotorQ Actuator	300	86100	300	604500
24Vdc to 12Vdc regulator		86400		86400
Crydom Solid State Relay	300	86100	300	604500
RF320 VHF radio transciever	600	85800	600	604200
RF500M radio modem	600	85800	600	604200

Power supply will be provided through onsite solar generation stored in 12V batteries. Power requirements for both daily and weekly adjustments were evaluated for both summer-only and year-round operations. Solar panel sizing was determined by daylight hours available (per month based on latitude, solar exposure, obstructions) and power draw. Further, a power reduction factor was applied to account for reducing rated battery amp-hours due to temperature drop in the winter months.

Daily solar resource availability (kWh/m2/Day) was determined from us of Photovoltaic Solar Resource provided by National Renewable Energy Laboratory (U.S. Department of Energy, 2008), see Figure G1 of Appendix F. Daily average solar resource value by month is provided in Figure 5.

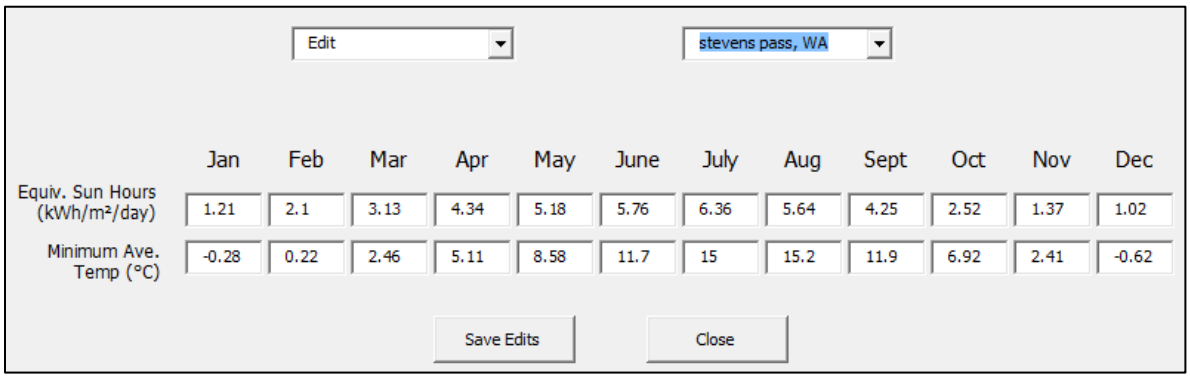

Figure 5. Solar Exposure Analysis

The combination of solar power generation and power consumption based on four scenarios is provided in Table 9.

Table 9. Solar and Battery Sizing for Summer/Fall Operation

Coms/Adjust Frequency	Daily		Weekly	
	Solar Size (Watts)	Battery Size (Ahr)	Solar Size (Watts)	Battery Size (Ahr)
Summer Only	13	29	7	16
Year-round	52	207	27	117

Capital Cost Estimates

Capital Costs

Opinions of probable costs were developed for implementation of the proposed Project and includes both hard costs (costs related to construction) and soft costs (costs related to engineering, planning, and administration). A detailed opinion of probable implementation costs or capital costs with quantities is included in Appendix G.

Hard costs include direct construction costs such as capital improvements and sales tax. Hard costs were estimated at approximately $875,000[20] using detailed quantities in conjunction with unit pricing from several available resources including RS Means (Costworks), APWA/SPU data, WSDOT unit bid tabulation (parametric estimating), experience with similar projects (analogous estimating), and engineering judgement. The following assumptions were made in development of hard costs for this Project:

- Washington state sales tax = 8.2 percent (Washington State Department of Revenue, based on location of project site); and
- Construction Contingency = 25 percent

[20] Costs associated with gate improvements and automation at Eightmile lake are excluded from this study and are covered in the *Feasibility Study Eightmile Lake Improvements (expected 2017).* Furthermore, control valve improvements at Snow Lakes are excluded from these costs – however, automation improvements at Snow Lakes are included in this estimate.

Soft costs include planning, engineering, permitting, miscellaneous overhead, and other administrative and non-construction costs. For purposes of this project, soft costs were estimated as 20 percent of the hard costs.

Operations and Maintenance Costs

Average annual ongoing operations and maintenance (O&M) costs of $37,500 have been estimated based on periodic routine maintenance and replacement of mechanical equipment, staff time required to operate equipment, electrical/power costs needed to operate pump infrastructure. While some O&M costs would be relatively consistent on a yearly basis (e.g., routine exercise of isolation valves), some mechanical items have relatively short life expectancy compared to the design life of the project and will require periodic repair/refurbishment or replacement (e.g., 25-year design life of mechanical equipment). Other equipment is epected to have relatively short life expectancy (e.g., 10 years for electrical equipment and 5-years for batteries). For the purpose of this estimate, O&M costs have been converted to average annual dollar amounts despite likely year over year variations in costs as indicated. The opinion of probable long-term O&M costs is included in Appendix G.

Environmental Considerations, Permitting Strategies and Potential Project Impacts

Property Ownership

Discussions regarding use of both repeater stations have commenced; however, no formal negotiations have taken place. The two repeater sites under consideration are the USFS site and the Johnson's for Icicle Ridge and Wedge Mountain, respectively.

On February 21, 2017, Aspect met with Rob Johnson and Robin John of Post Hotel, who own the Wedge Mountain property. They expressed willingness to engage in future discussions about the use of the property and stated that they are not opposed to the concept. Conditions they expressed consist of access security, market compensation for use of land, aesthetics and not unreasonably encumbering future use of the site. If they choose to utilize the site in the future for another purpose (e.g., a guest amenity such as a lookout), they may request that the radio equipment be installed on any new permeant structure rather than as a standalone site appurtenance.

On March 8, 2017, Tony Jantzer spoke with Howard Banks of the USFS supervisory electronics tech of Region 6. According to Mr. Banks, the existing Icicle Ridge repeater equipment is fully built-out and there is likely no extra room for equipment on the existing mast. The USFS may be open to IPID using adjacent space for a new repeater under a Special Use Permit. Tony is working with Kevin Smith, who is the special use permit writer for Region 6 to discuss permitting. A copy of the special use permit application is provided in Appendix C.

Aesthetic Impacts

Project impacts related to aesthetics are expected with automation improvements. Some impacts may be mitigated through enclosures with natural appearance (e.g., faux rock or decorative enclosures) whereas other improvements may be visible but concealed with natural features (e.g., solar / radio antenna concealed in tree). Improvements are illustrated in Figures 6 through 10.

Communications Equipment

Onsite remote power and communications will be provided by a combination of solar panels and a directional antenna which must remain exposed (thereby visible) to maintain functionality. The most dramatic power supply scenario includes a 50-watt solar panel, which is relatively modest in size (approximately 30 x 24 inches). In most cases, 20-watt solar panels will be sufficient, which are less than half that size. Radio signal will rely on directional yagi antenna which are relatively small in size (approximately 36 inches in length and 12 inches tall). Both the radio antenna and solar panels have an industrial appearance which is unavoidable; however, it is anticipated that both units could be tree mounted, which will aid in concealment.

Enclosure

Many enclosure options are feasible, and consist of a wide variety of materials and configurations. Criteria involved in selection of enclosure type include security, durability, aesthetic value, and fire resistance.

Typical remote site enclosures for monitoring equipment could follow the USGS measurement and computation of streamflow manual which consists of vertical corrugated metal pipe with silo roof. This would be an economical solution for most sites with an appearance that is familiar to outdoors enthusiasts. This configuration however would have an industrialized appearance which may be less favorable than other options.

Another option that may provide high aesthetic value would be decorative stamped reinforced concrete which would provide maximum benefit from multiple perspectives, including security and fire protection. Many modern concrete techniques are available to help create natural appearance including stamping, pigment, and acid stain.

Permitting

A variety of state, local, and federal agency permit authorizations will be required to facilitate construction of automation improvements. These permits are being coordinated through programmatic environmental impact study (PEIS) which is scheduled for comment period in 2018. A summary of key permits is provided below.

Clean Water Act Section 404 review

Work within jurisdictional waters of the US requires a U.S. Army Corps of Engineers (Corps) Nationwide Permit (NWP) / NEPA Categorical Exclusion (CatEx) are the likely level of regulatory compliance for this project. Compliance with General Conditions 20 would require completion of a preconstruction notification (PCN), acknowledging potentially eligible resources pursuant to the National Historic Preservation Act; however, given the nature of the activities, it is anticipated that minimal review would be required and would most likely apply only to activities proposed at Eightmile Lake. PCN is fulfilled by filling out the Washington State Joint Aquatic Resources Permit Application (JARPA).

Corps permit evaluation will address consistency with Endagered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, National Historic Preservation Act, and Fish and Wildlife Coordination Act (federal action) – which are triggerd by Federal action. Review is anticipated to be relatively straightforward for the proposed project activities. USFS would most likely serve as the federal lead agency responsible for demonstrating applicable compliance with federal regulations at lakes where a special use permit is deemed necessary.

USFS Special Use Permit

Work on USFS lands not covered by easement requires special use permit by USFS which is likely required at Snow Lake and Square Lake, use of Icicle Ridge Repeater site and possibly Colchuck Lake.

IPID has requested and obtained copies of special use permit applications regarding use of the Icicle Ridge Repeater site and is in contact with local Forest Service staff who maintain this facility.

CWA Section 401 Water Quality Certification

Project may be subject to Section 401 of CWA. There is a streamlined review process (e.g., approval letter issued when Clean Water Act NWP conditions are adhered to).

Federal Communications Commission

Federal Communications Commission (FCC) approval may be required for radio repeater placement. Federal review consistency likely to be addressed by work completed by Corps or USFS as indicated in Note 3. IPID currently operates existing repeater and base stations under FCC licensure. Relocating existing and adding new repeater and base sites to existing licenses is permissible and processed through

Ecology Water Right Permit

A new water right permit issued by Department of Ecology will be required for adding instream flows as secondary uses.

WDFW Hydraulic Project Approval

Hydraulic Project Approval is required for any work affecting bed/flow of state waters. Jurisdiction and permitting authority is with Washington State Department of Fish and Wildlife.

WDNR Aquatic Use Authorization

Work within state aquatic lands. Compliance handled through the JARPA review process and expected to be minimal.

Chelan County Shoreline Substantial Development Permit/Conditional Use Permit

Work within state shorelands). May not be required. Need to confirm with Chelan County. IPID would be the applicant, but presumably PEIS and related federal permits/approvals would provide information needed to make permit decision if required.

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Limitations

Work for this project was performed for the Chelan County Natural Resources Department (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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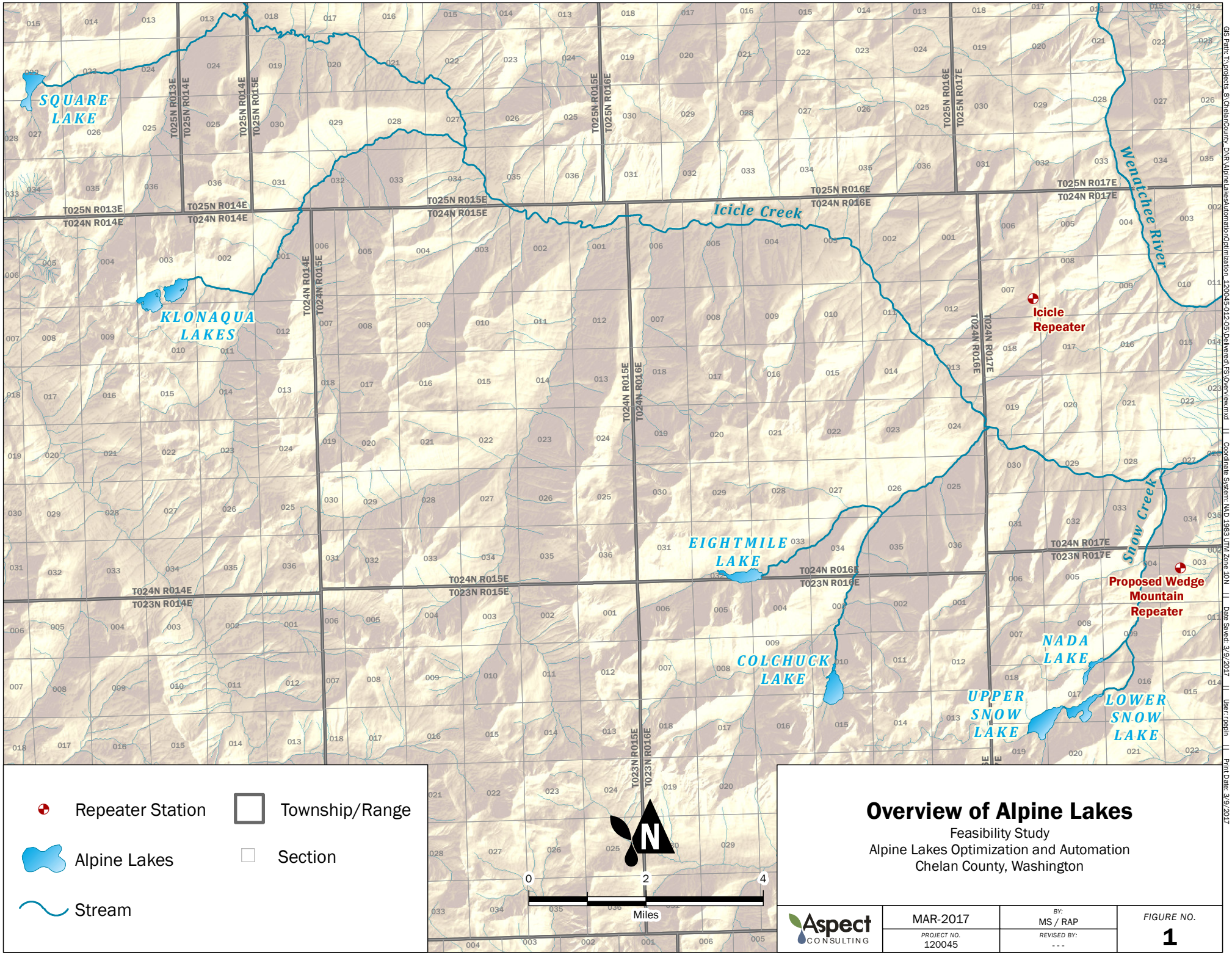
FIGURES



Overview of Alpine Lakes

Feasibility Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

Aspect CONSULTING	MAR-2017	BY: MS / RAP	FIGURE NO. 1
	PROJECT NO. 120045	REVISED BY: ---	

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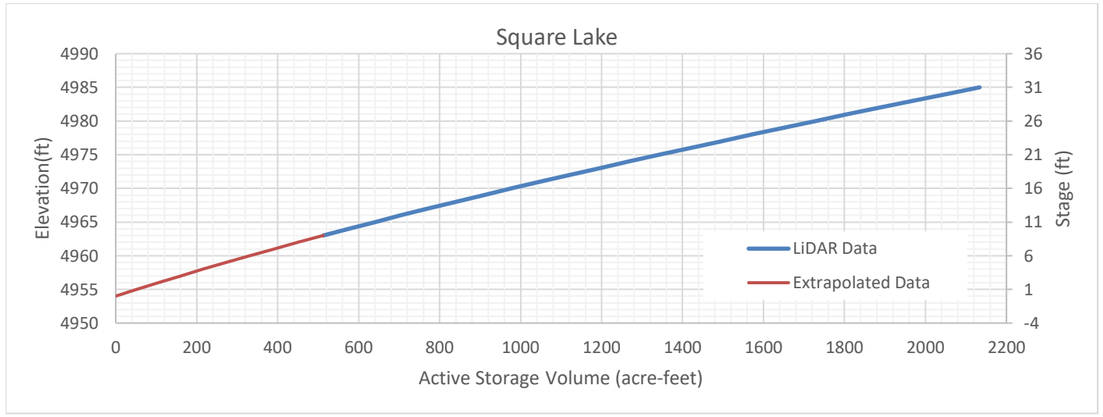
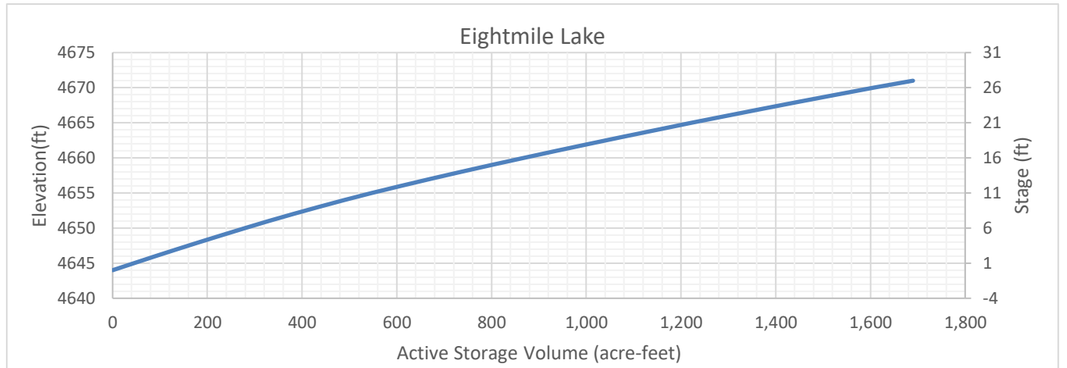
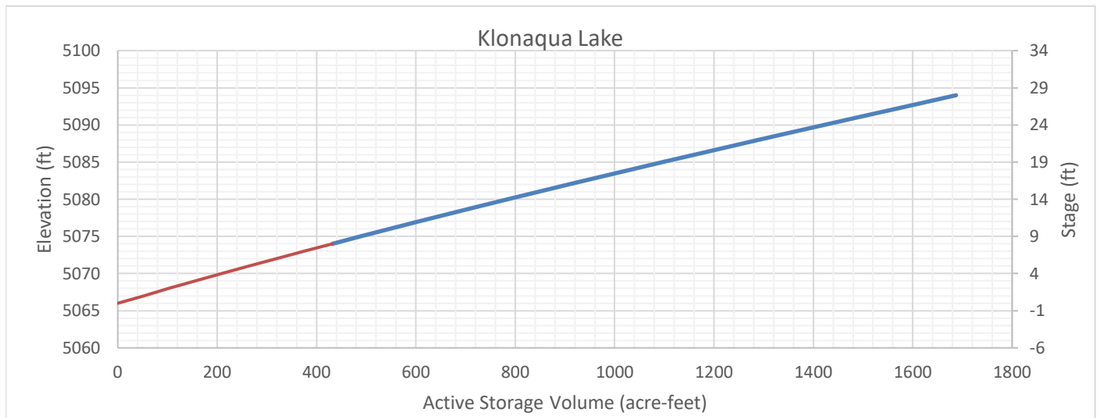
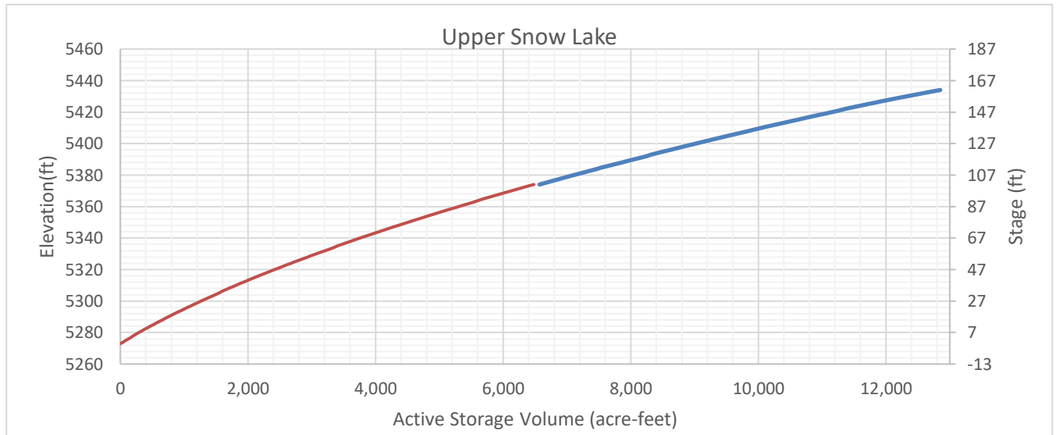
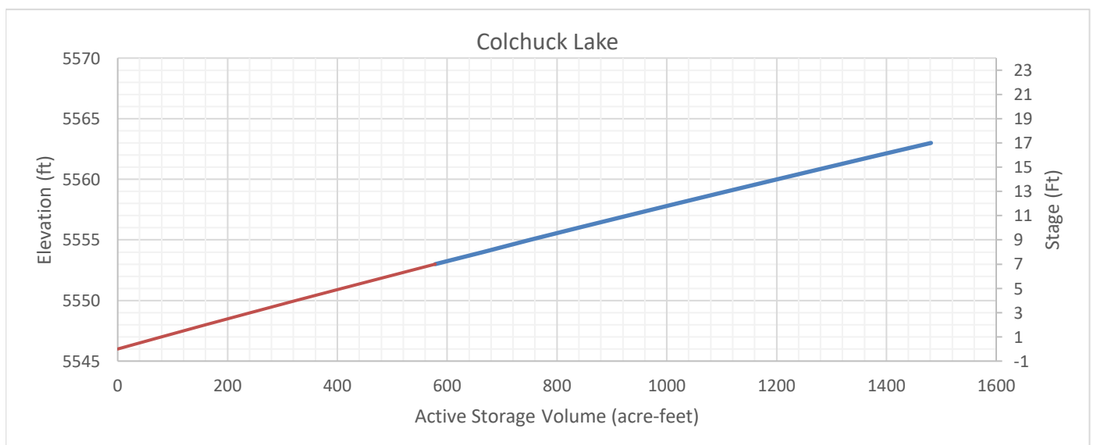
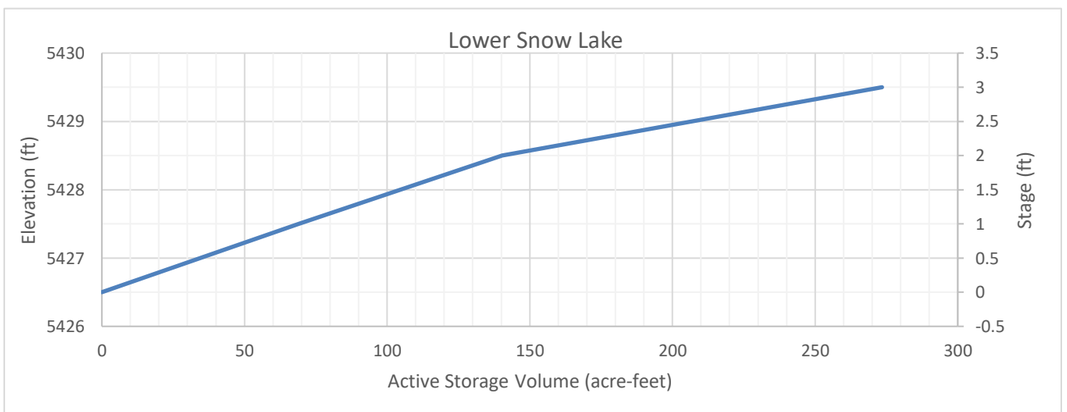






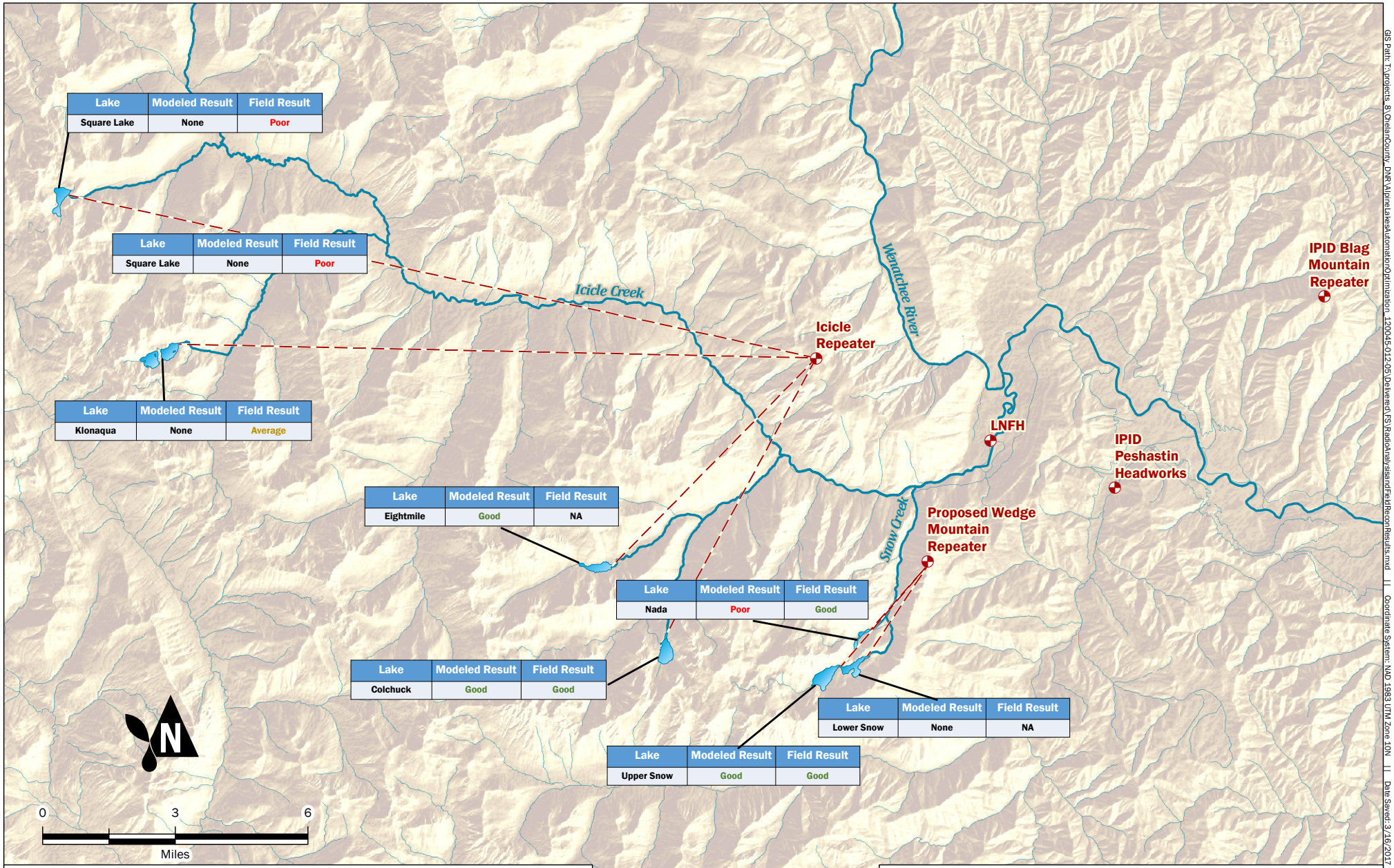






Aspect Consulting
4/30/2018
V:\120045 Chelan County\Deliverables\Alpine Lakes Optimization and Automation\Figures\Figure 2 - Stage-Storage.xlsx

Figure 2
Stage-Storage Relationships
Alpine Lakes Automation Feasibility
Chelan County, WA



Radio Analysis and Field Recon Results

Feasibility Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

Aspect CONSULTING	MAR-2017	BY: MS / RAP	FIGURE NO. 3
	PROJECT NO. 120045	REVISED BY: JRB / RAP	

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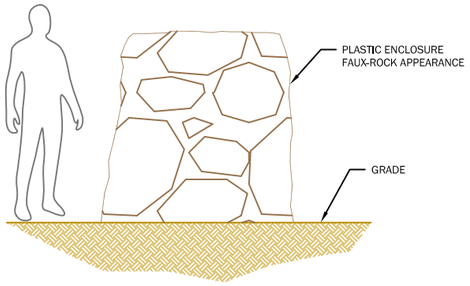
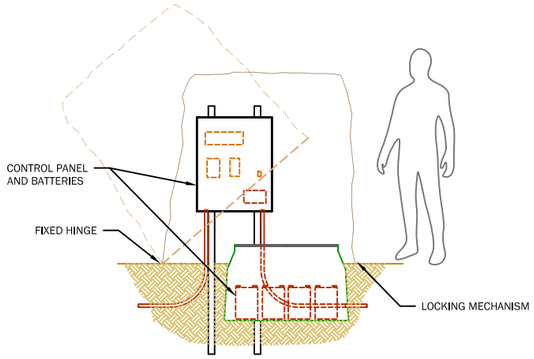
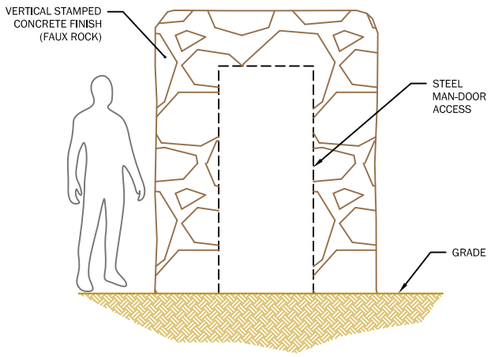


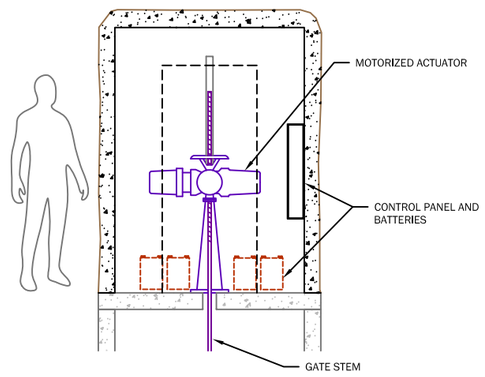
Molded Plastic Rock Enclosure
(FRONT VIEW)



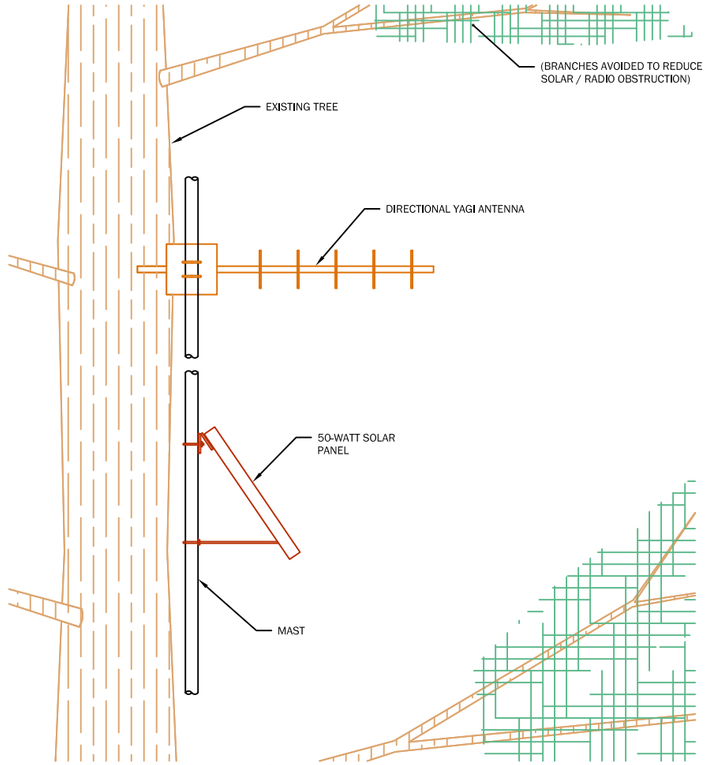
Molded Plastic Rock Enclosure
(SECTION VIEW)



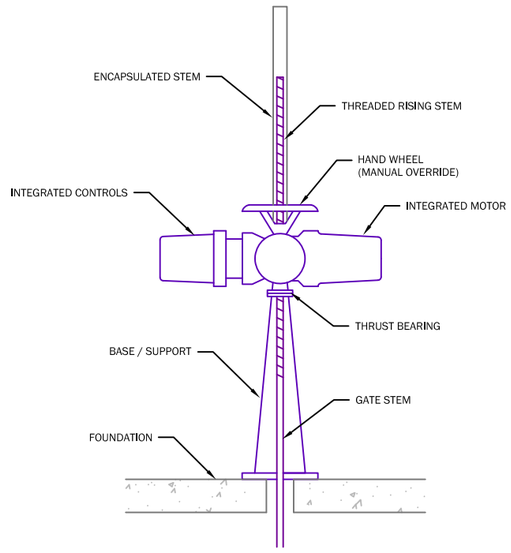
Stamped Concrete Enclosure
(FRONT VIEW)



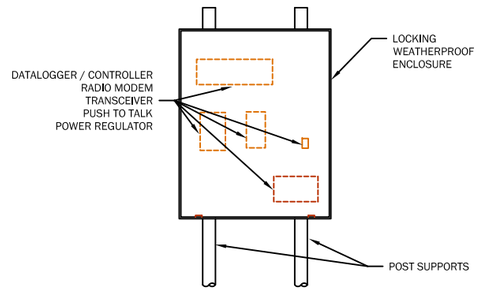
Stamped Concrete Enclosure
(SECTION VIEW)



Solar Panel / Antenna



Motorized Actuator



Control Panel

REV:	DESCRIPTION	DATE	APPR.
-	-	-	-

REVISED BY: -
DRAWN BY: SCC
DESIGNED BY: -
PROJECT NUMBER: 000000
REVISION: -
DATE: JUL 2016

Aspect CONSULTING

Typical Improvements

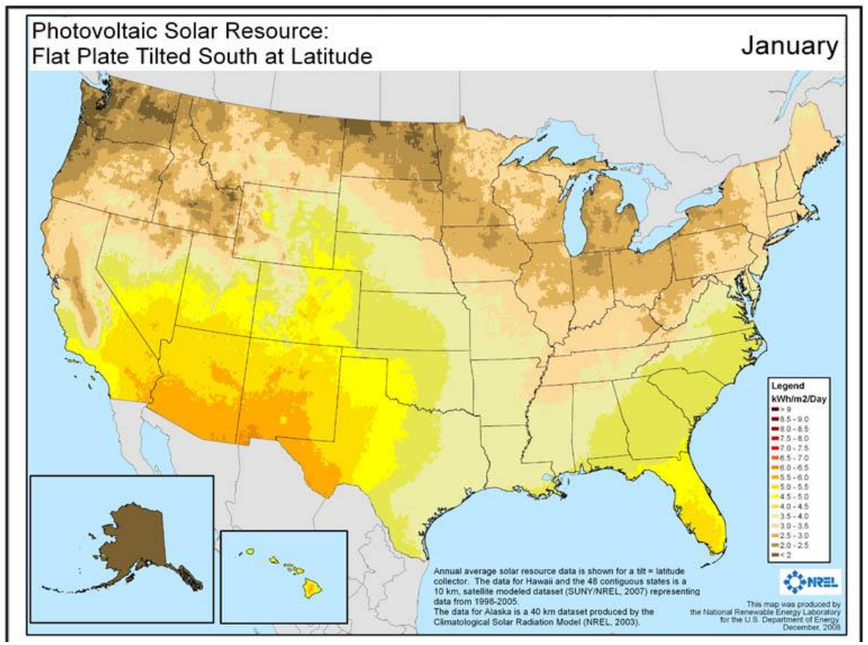
Alpine Lakes Automation
Leavenworth, Washington

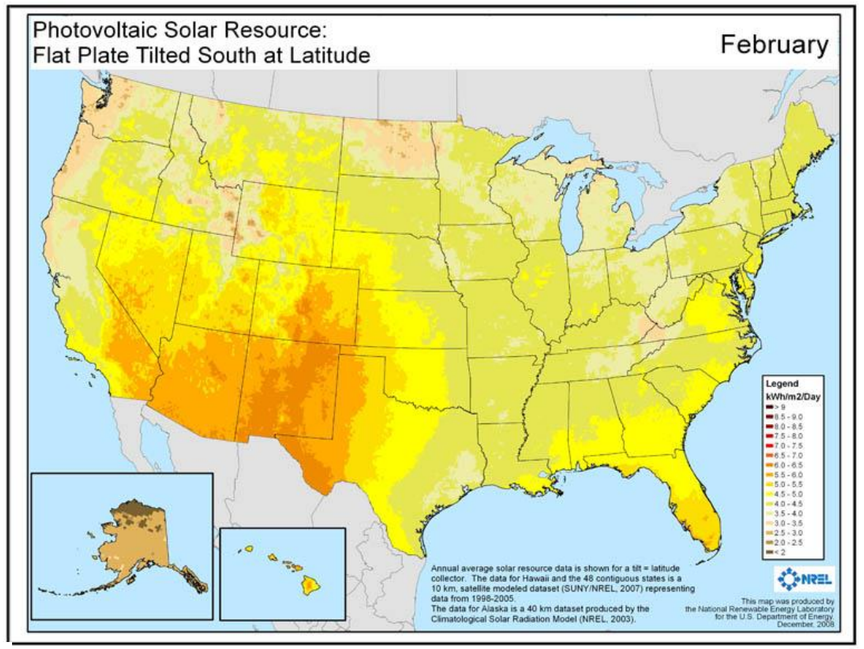
SHEET REFERENCE NUMBER:

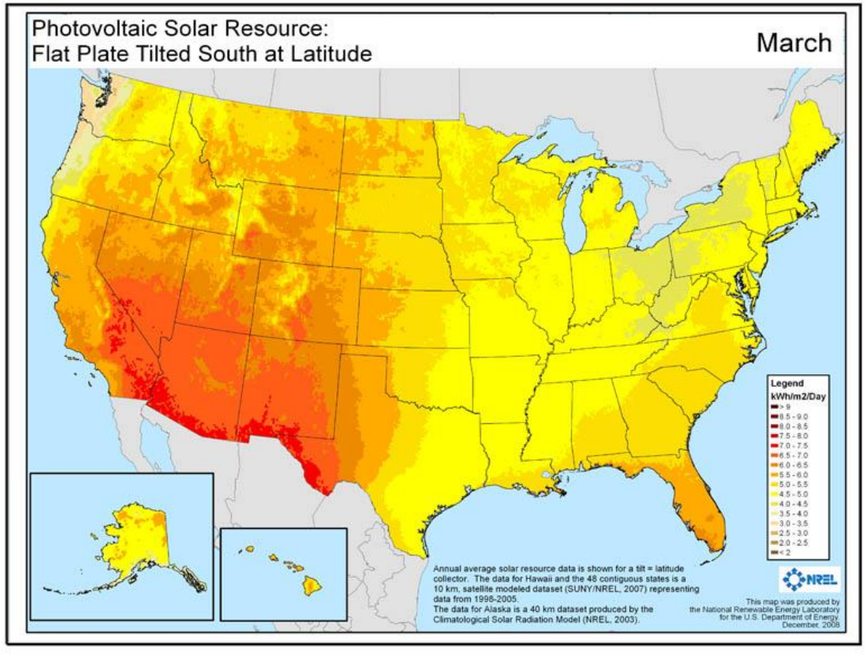
Fig 4

SHEET OF

CAD Path: R:\Projects\Chelan County Natural Resources-120045\Alpine Lakes\Feasibility Design\CAD\Figures Aesthetic\dwg Typical Improvement || Date Saved: Mar 16, 2017 2:44pm || User: rbrownlee







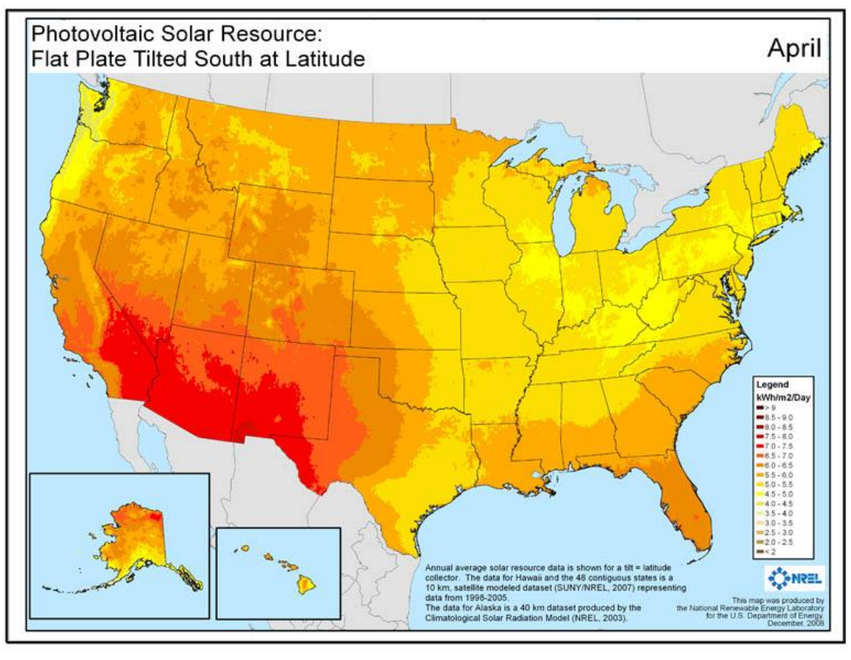
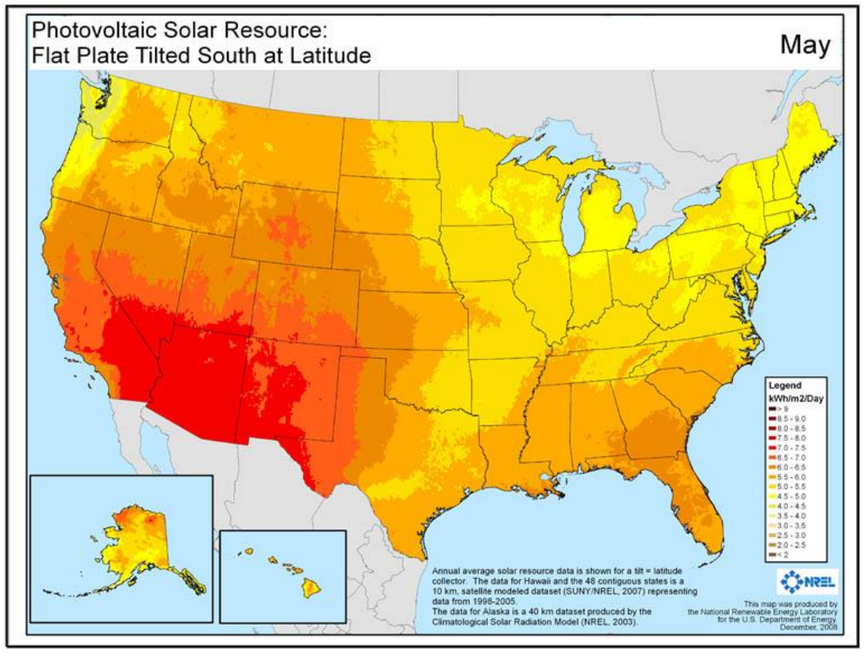
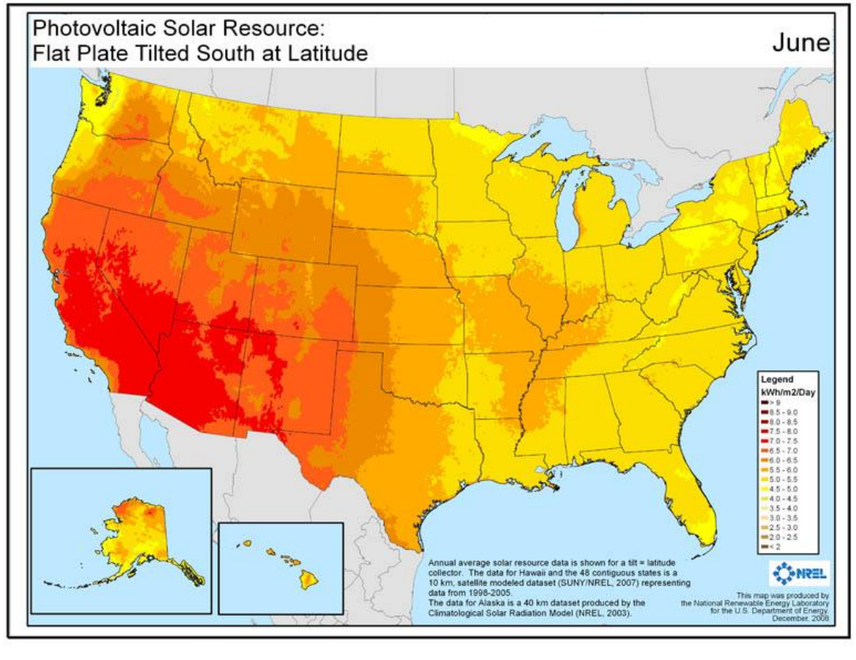
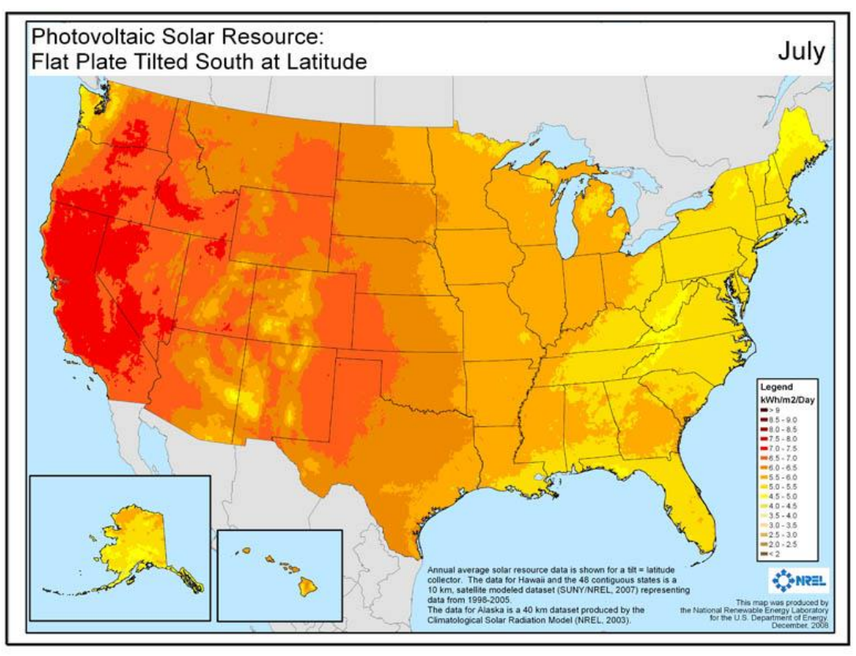


Figure 5
Photovaltaic Solar Data
Alpine Lakes Automation Feasibility
Project No. 120045, Alpine Lakes, Chelan County, WA







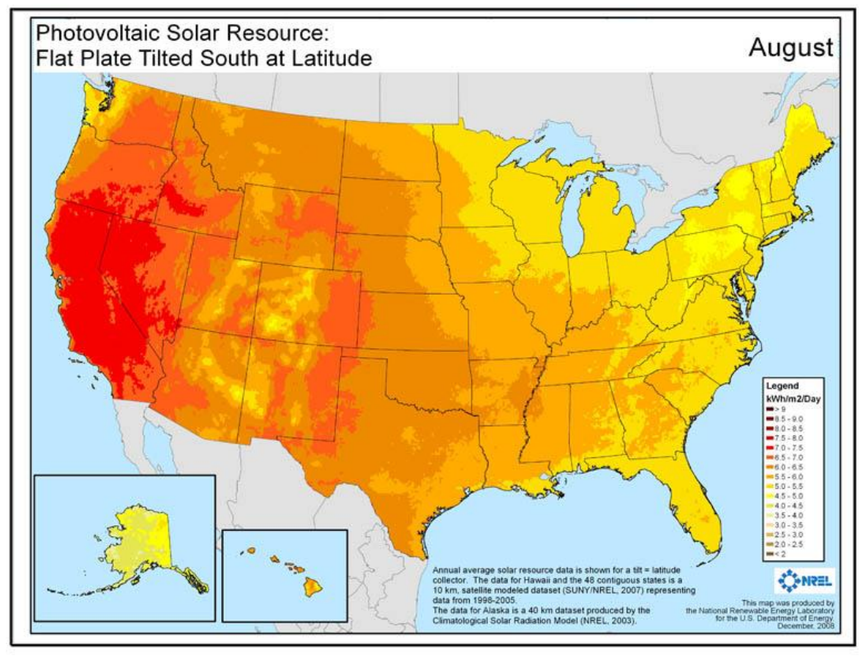
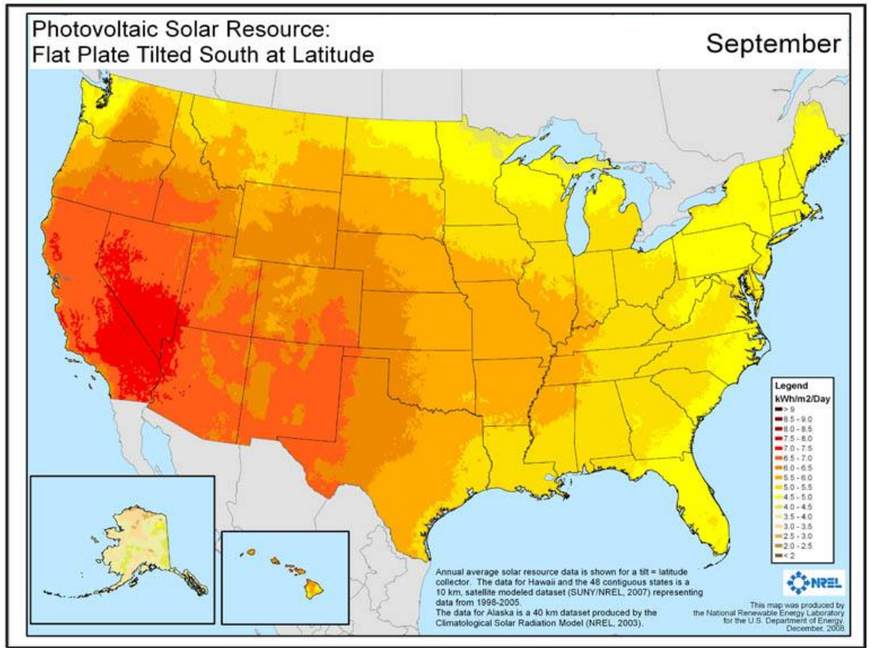
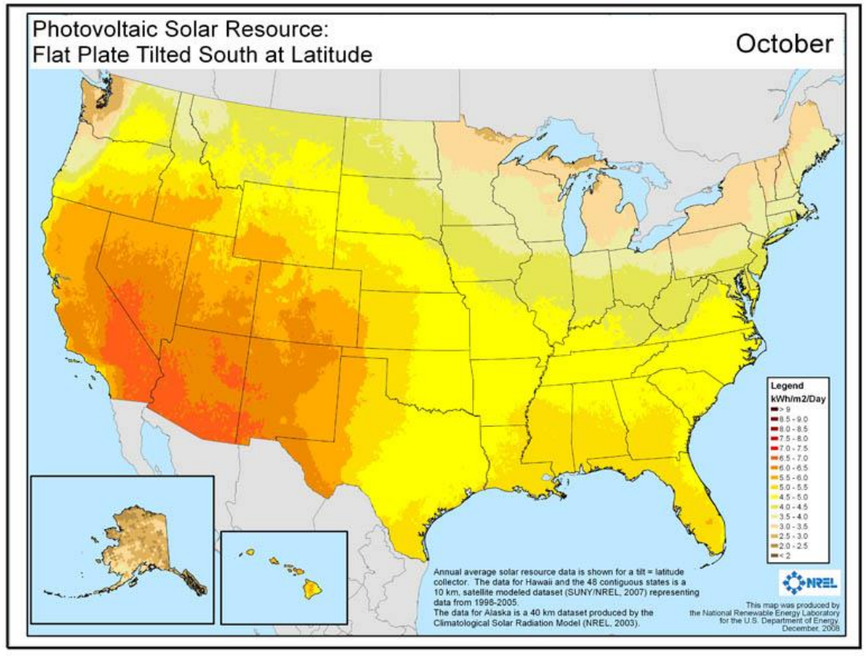
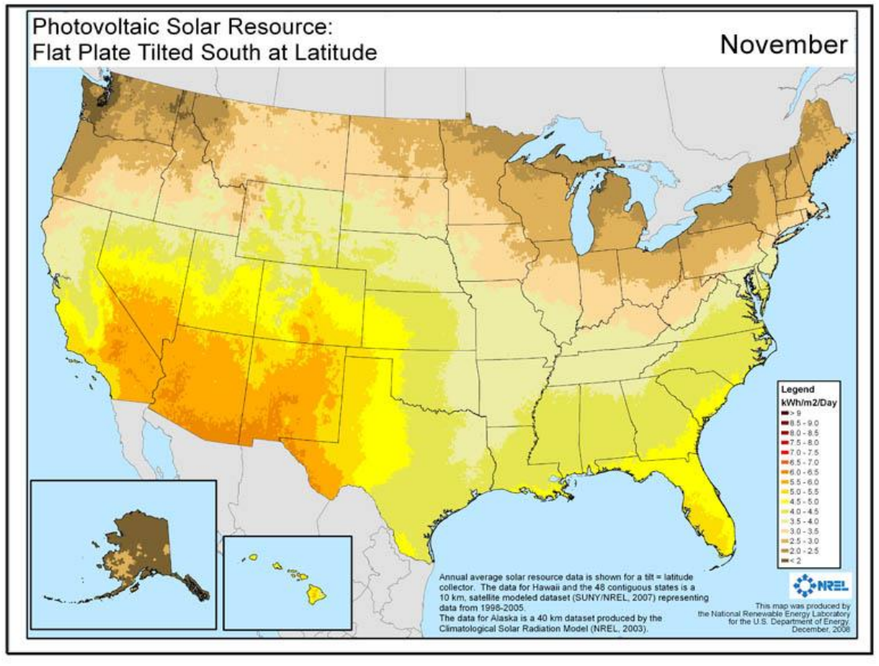


Figure 5
Photovaltaic Solar Data







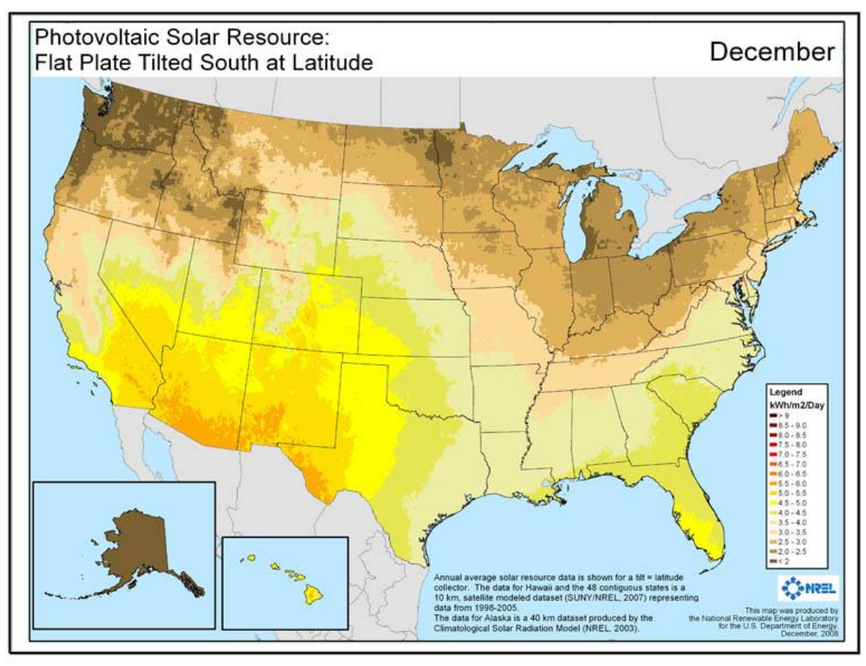


Figure 5
Photovaltaic Solar Data

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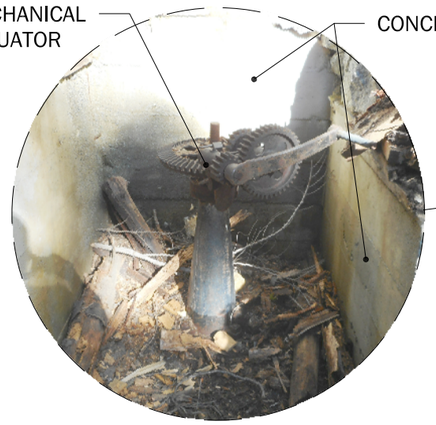
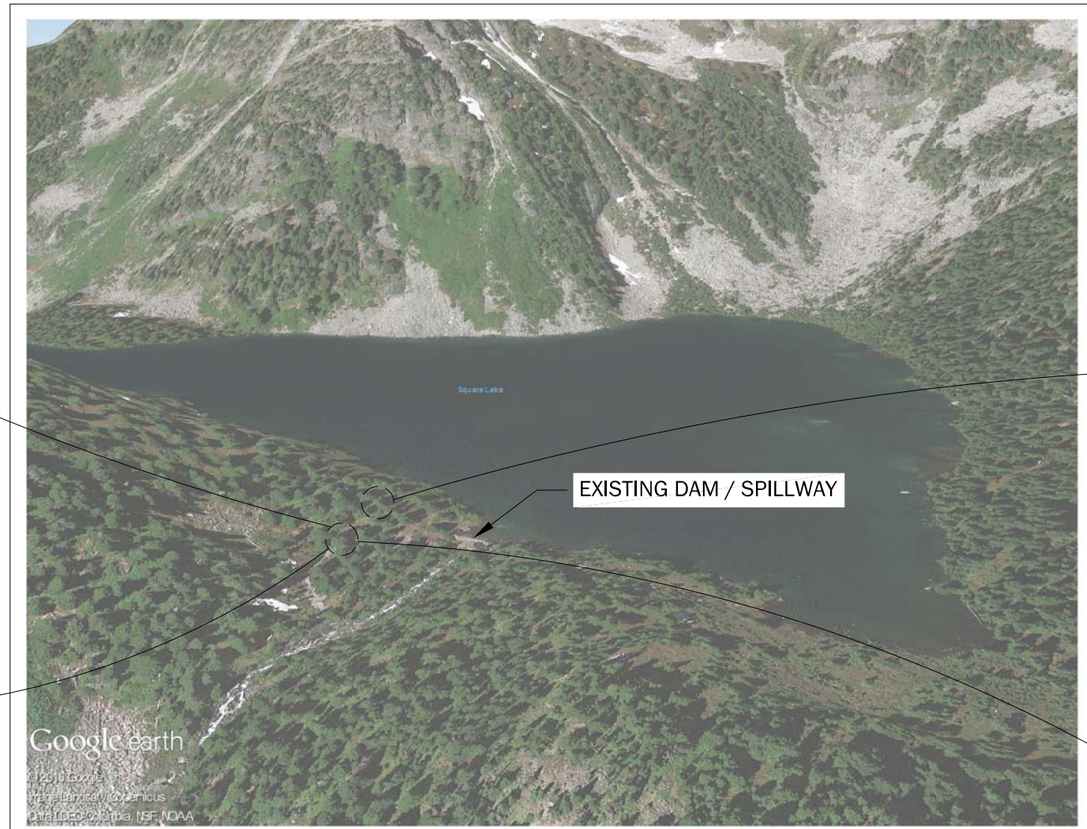
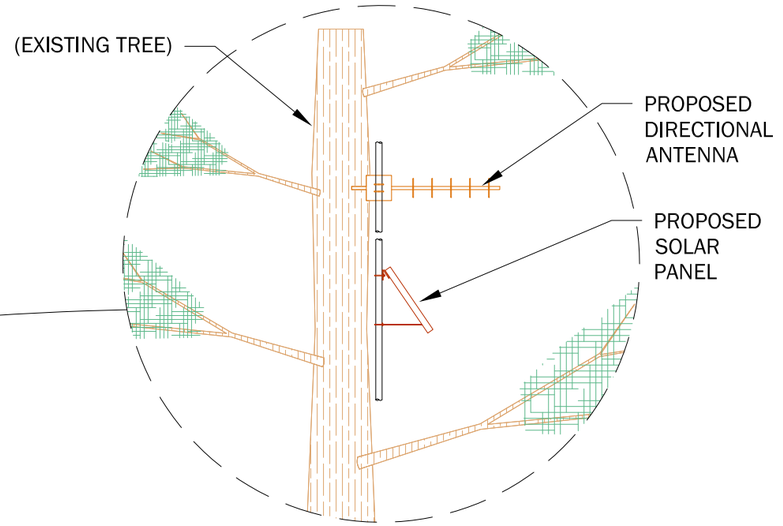
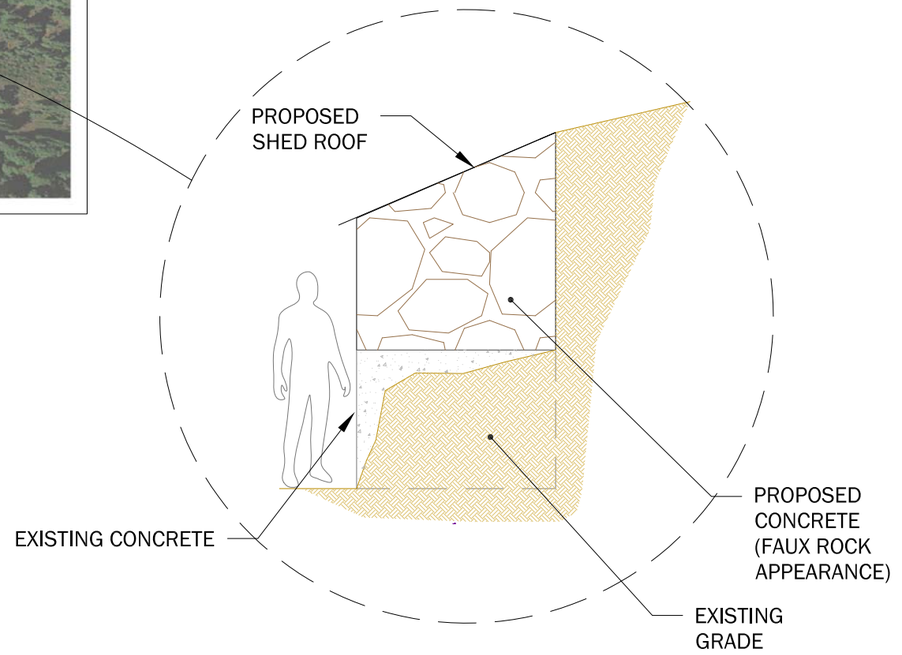




ORTHOGRAPHIC AERIAL SITE VIEW

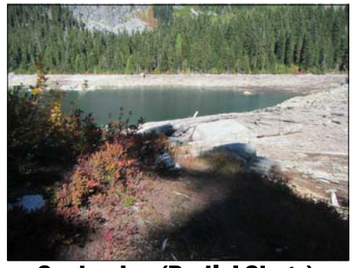
PROPOSED





DRAWN-DOWN APPEARANCE

July (Full Stage)



September (Partial Stage)

August (Partial Stage)

October (Empty Stage)

Aesthetic Impacts
Square Lake Automation

Feasibility Study, Alpine Lakes Automation Improvements
Leavenworth, Washington

Aspect CONSULTING	Mar-2017	BY: JRB	FIGURE NO. 6
	PROJECT NO. 120045	REVISED BY: -	

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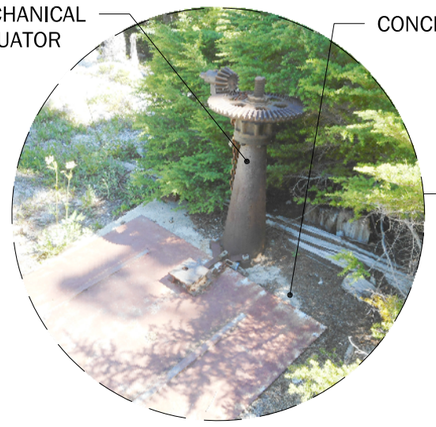

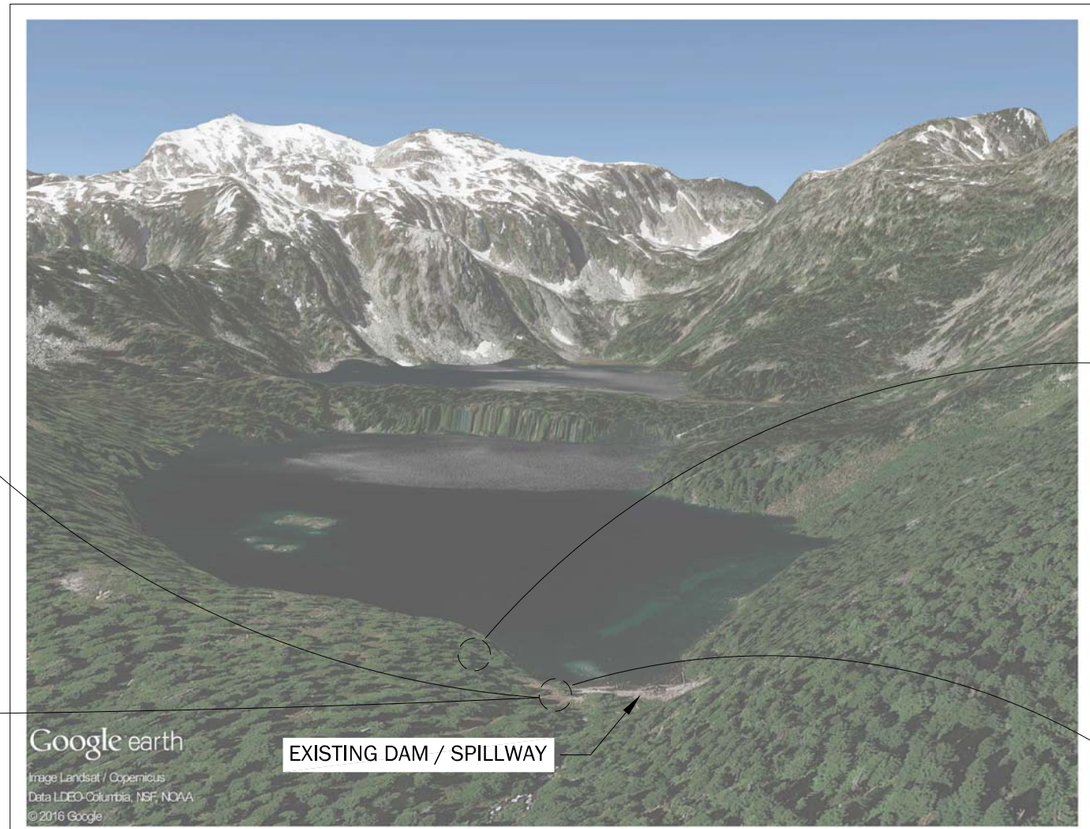

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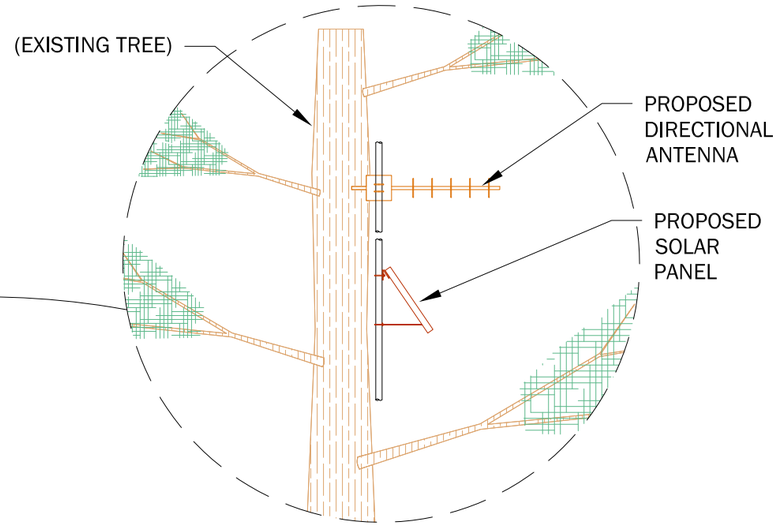

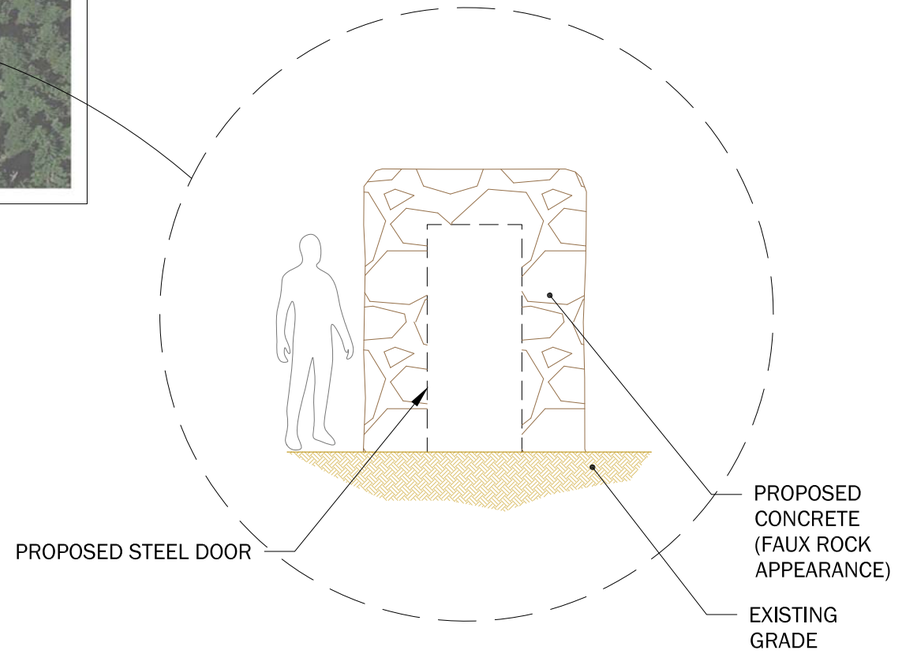

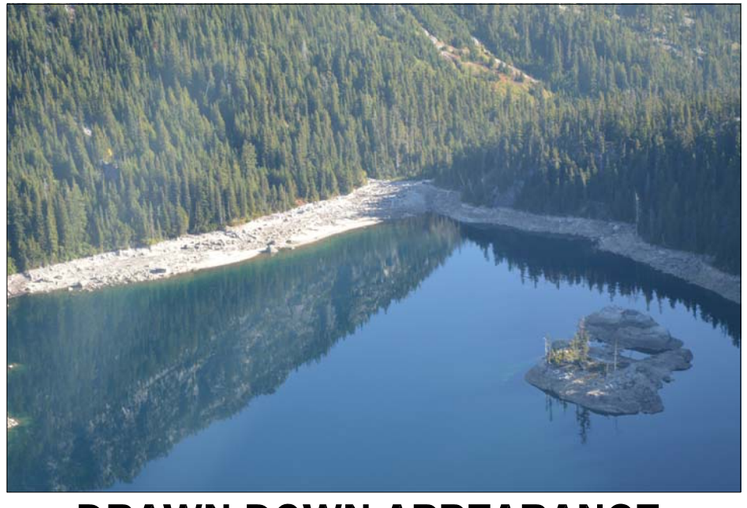

DRAWN-DOWN APPEARANCE

July (Full Stage)

September (Partial Stage)

August (Partial Stage)

October (Empty Stage)

Aesthetic Impacts
Klonaqua Lake Automation

Feasibility Study, Alpine Lakes Automation Improvements
Leavenworth, Washington

Aspect CONSULTING	Mar-2017	BY: JRB	FIGURE NO. 7
	PROJECT NO. 120045	REVISED BY: -	

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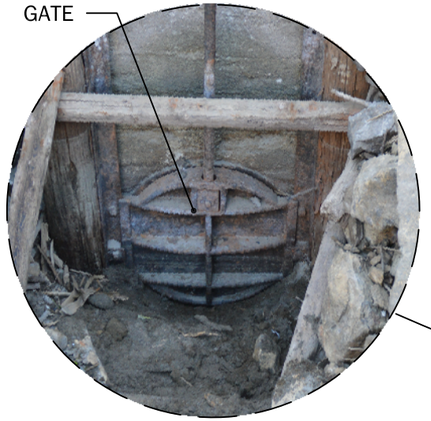

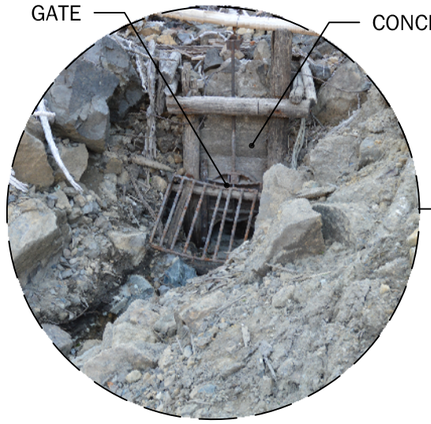

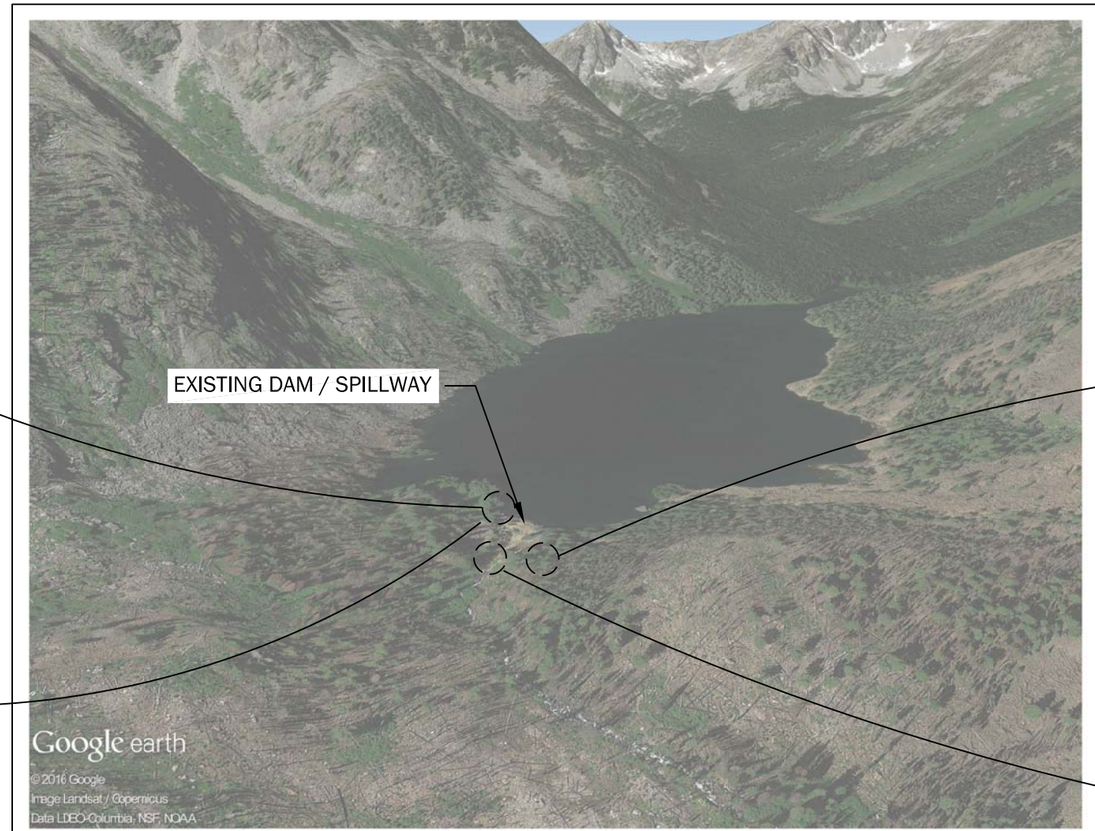

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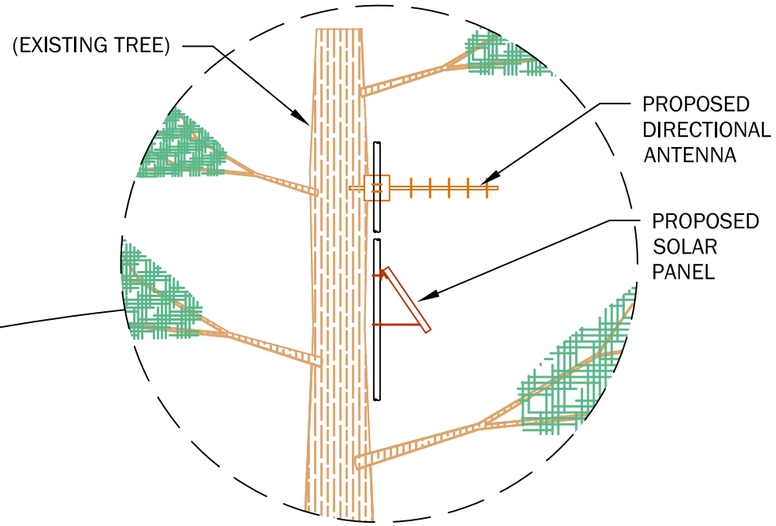

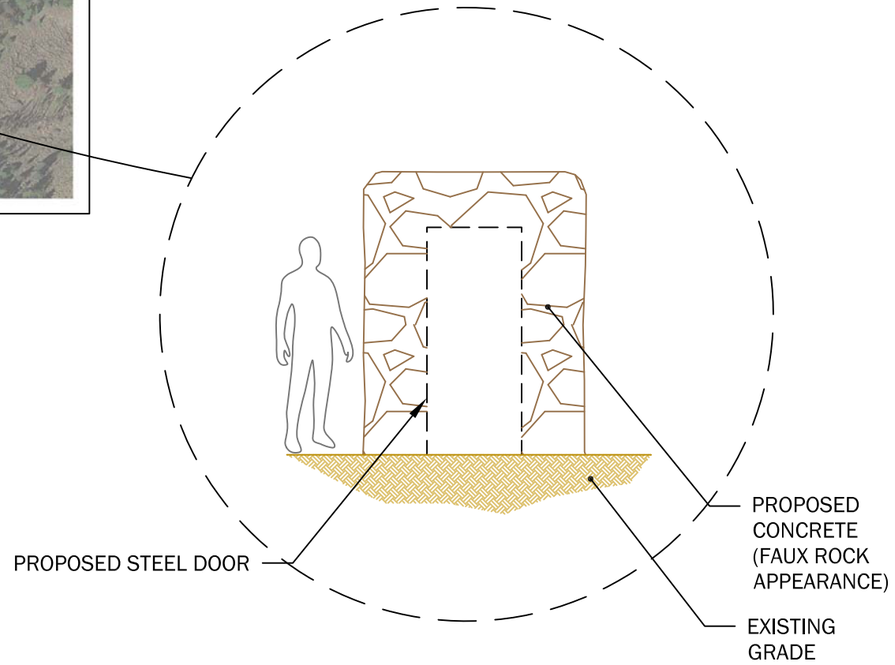

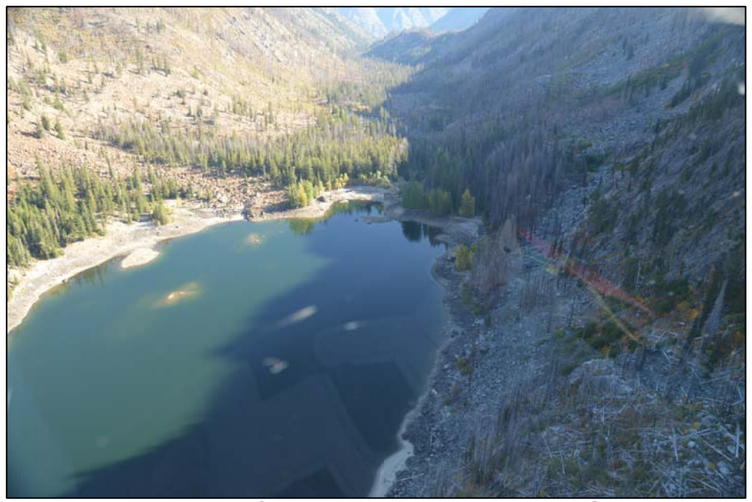

DRAWN-DOWN APPEARANCE

July (Full Stage)

September (Partial Stage)

August (Partlal Stage)

October (Empty Stage)

Aesthetic Impacts
Eightmile Lake Automation

Feasibility Study, Alpine Lakes Automation Improvements
Leavenworth, Washington

Aspect Consulting	Mar-2017	JRB	FIGURE NO.
	PROJECT NO. 120045	REVISED BY: -	8

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ORTHOGRAPHIC AERIAL SITE VIEW

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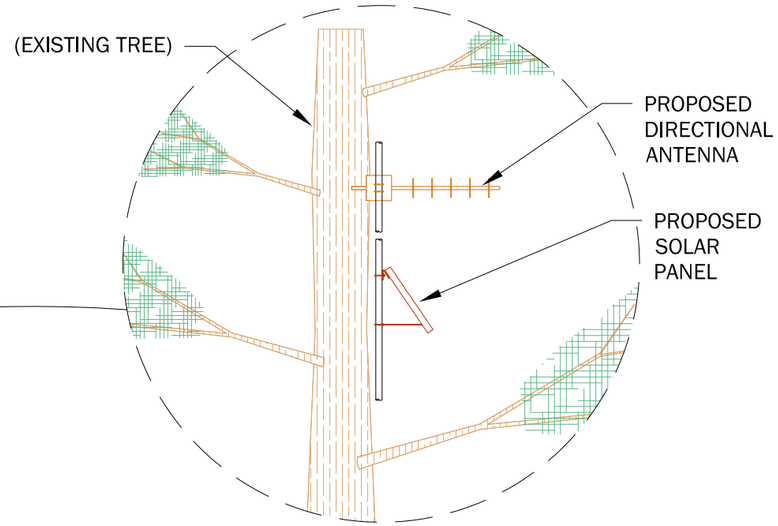

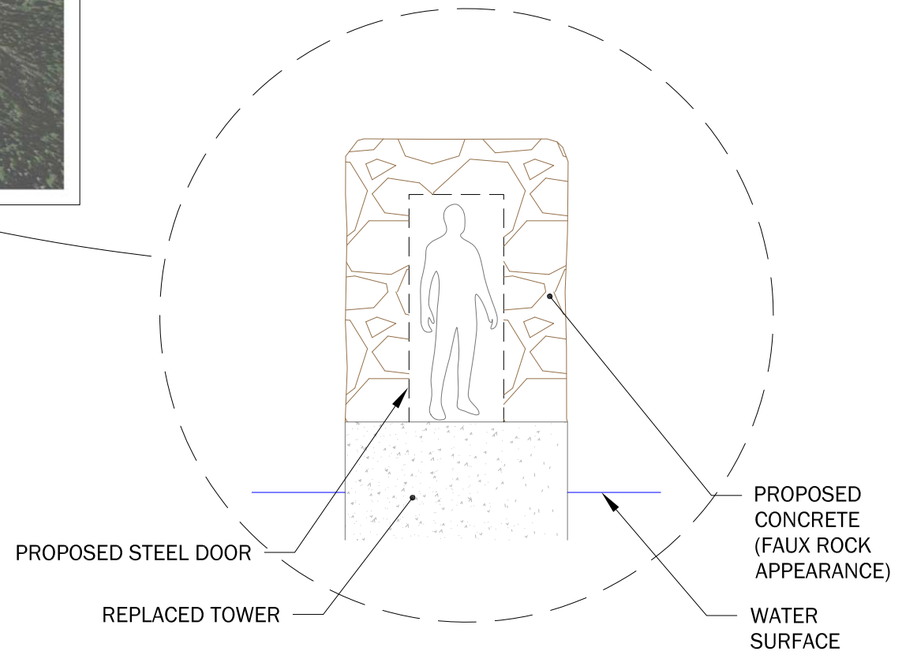

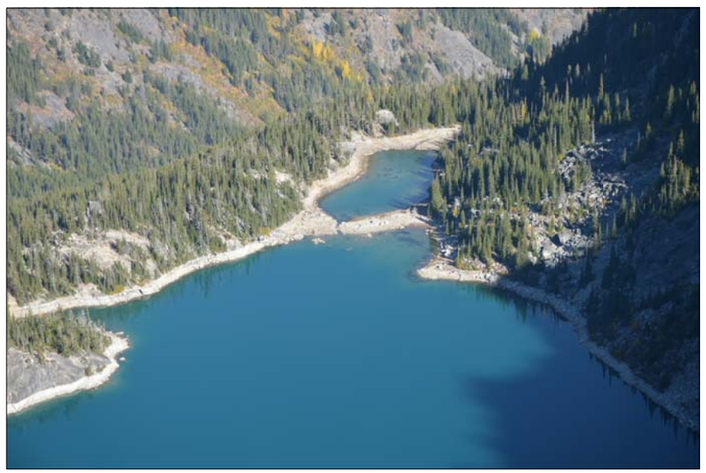

DRAWN-DOWN APPEARANCE

July (Full Stage)

September (Partial Stage)

August (Partial Stage)

October (Empty Stage)

Aesthetic Impacts
Colchuck Lake Automation

Feasibility Study, Alpine Lakes Automation Improvements
Leavenworth, Washington

Aspect CONSULTING	Mar-2017	BY: JRB	FIGURE NO. 9
	PROJECT NO. 120045	REVISED BY: -	

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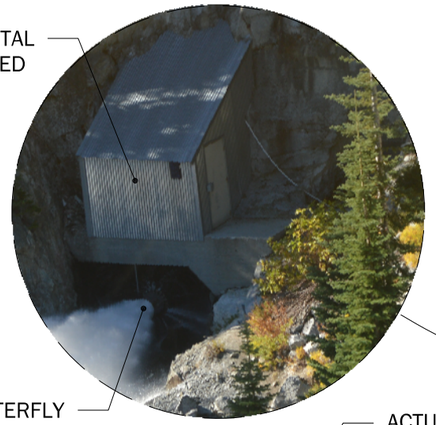
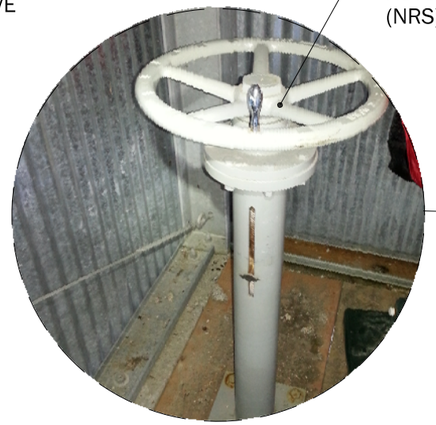
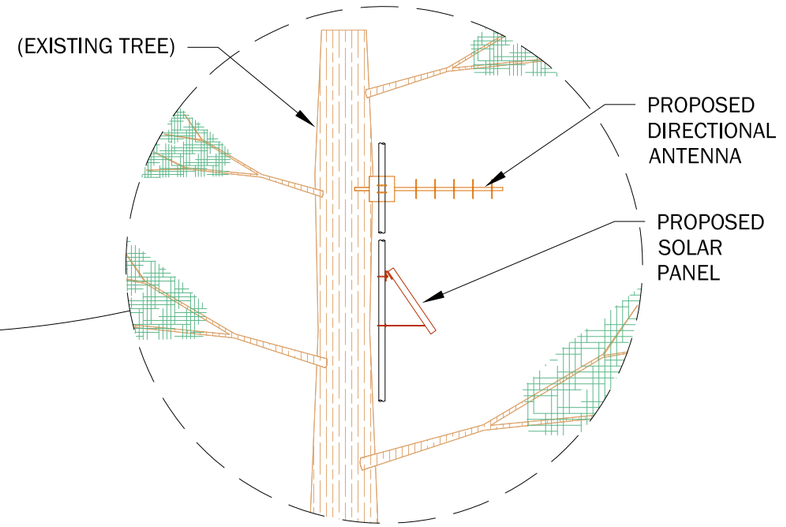
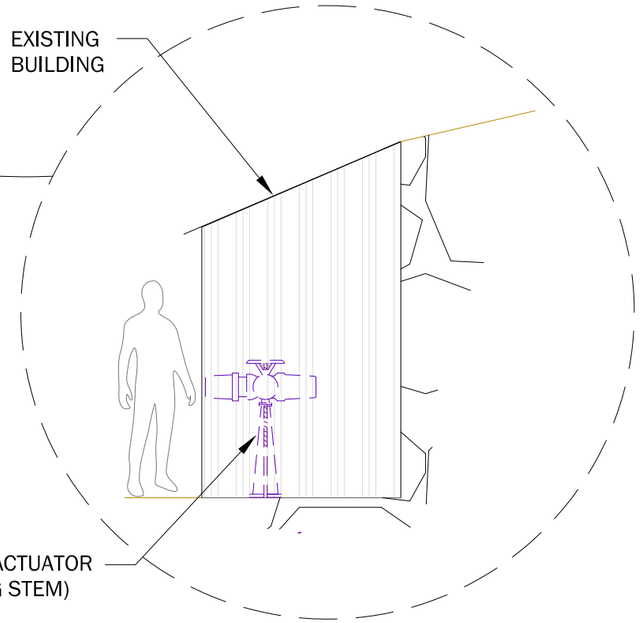




ORTHOGRAPHIC AERIAL SITE VIEW

PROPOSED





DRAWN-DOWN APPEARANCE

Aesthetic Impacts
Snow Lakes Automation

Feasibility Study, Alpine Lakes Automation Improvements
Leavenworth, Washington

Aspect CONSULTING	Mar-2017	BY: JRB	FIGURE NO. 10
	PROJECT NO. 120045	REVISED BY: -	

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APPENDIX A

Technical Memorandums: 2016 and 2017 Alpine Lakes Flow Augmentation Pilot Studies

MEMORANDUM

Project No.: 120455

May 11, 2017

To: Mike Kaputa, Director, Chelan County Natural Resources Department

From:

Bill Sullivan, LHG, CWRE
Senior Hydrogeologist
bsullivan@aspectconsulting.com

Re: **Alpine Lakes 2016 Flow Augmentation Pilot Study**

Executive Summary

Aspect Consulting, LLC (Aspect) conducted the Alpine Lakes 2016 Flow Augmentation Pilot Study (Study) to assess the effects of augmenting stream flows in Icicle Creek using water stored by the Icicle-Peshastin Irrigation District (IPID) in five mountain reservoirs. It was launched in response to discretionary trust water donations of stored water by IPID coinciding with planned reservoir maintenance activities. The Study was coordinated by Chelan County Natural Resources Department to understand benefits and impacts and potential fatal flaws associated with the proposed Alpine Lakes Optimization, Modernization, and Automation Project (Project).

The Project is being developed by the multi-stakeholder Icicle Work Group's (IWG) as part of the Icicle Creek Water Resource Management Strategy (Strategy) to achieve diverse benefits in the Icicle Creek drainage. A Guiding Principle of the Strategy is achieving adequate stream flows in the Historic Channel of lower Icicle Creek with the goal of maintaining flows in the Historic Channel of at least 100 cubic feet per second (cfs) during average years and 60 cfs during drought years.

The Study included installation of stage and outflow monitoring equipment at four reservoirs to support management of water release from storage to augment stream flows, as well as coordination with the U.S. Fish and Wildlife Service (USFWS) on their operations of Snow and Nada Lakes. Icicle Creek flows were monitored and adjustments were made to augmentation flows on a weekly basis during 14 weeks in Summer and early Fall 2016. Key findings of the Study include:

- Flow augmentation using over 6,400 acre-feet (ac-ft) of water stored in Alpine Lakes reservoirs can significantly enhance stream flows in the Historic Channel of Icicle Creek;
- While flow augmentation is not a total solution for achieving the IWG's flow targets in the Historic Channel, it might account for about one-third of the solution based on 2016 results;

- Augmentation flows up to 90 cfs extended Historic Channel flows above the 100 cfs target for 3 weeks of the 9 week low-flow period in 2016 when flows would have otherwise dropped below the target;
- Augmentation flows equaled between 31 and 78 percent of late season discharge in the Historic Channel; and
- Quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonal falling hydrograph. However, flow augmentation can slow the rate of seasonal decline, prolonging the period of time when flows remain above the target.

No fatal flaws were identified and a follow-on study is recommended to confirm and improve on findings of the 2016 Study and to resolve data gaps. Key recommendations for follow on study include:

- Improve accuracy of Icicle Creek discharge estimates in the Historic Channel by obtaining real-time stream flow measurements collected at Structure 2 (located at the head of the Historic Channel);
- Initiate study to assess impacts of release flows on Bull Trout habitat in French and Leland creeks that drain Square and Klonaqua lakes. Determine whether release flows above 10 cfs are detrimental after September 15. These lakes hold nearly half the water physically available for flow augmentation, and releases greater than 10 cfs in late season would provide greater flexibility to manage flow augmentation in Icicle Creek; and
- Improve understanding of the fate of flow augmentation water. Evaluate gaining/losing characteristics of tributaries draining reservoirs and mainstem Icicle Creek. Coordinate with USFWS to improve understanding of releases from Snow Lakes. Coordinate with USFWS, IPID, Cascade Orchards Irrigation Company, and the City of Leavenworth to quantify diversions occurring upstream of the Historic Channel.

A detailed discussion of project background, methods, findings, and conclusions follows.

Introduction

Aspect Consulting, LLC (Aspect) conducted the Alpine Lakes 2016 Flow Augmentation Pilot Study (Study) to assess the effects of augmenting stream flows in Icicle Creek using water stored by the Icicle-Peshastin Irrigation District (IPID) in five mountain reservoirs.

The multi-stakeholder Icicle Work Group (IWG) is comprised of diverse agricultural, conservation, and recreational interests, Tribes, and local, state, and federal agencies. The IWG developed the Icicle Creek Water Resource Management Strategy (Strategy) by consensus of its members to improve instream flows in Icicle Creek. The Strategy outlines nine Guiding Principles to achieve diverse benefits. The Adequate Streamflow principle sets a target flow of 100 cubic feet per second (cfs) during low-flow periods in non-drought years and 60 cfs during drought years in a reach known as the Historic Channel of lower Icicle Creek. The flow target is intended to be measured at the Leavenworth National Fish Hatchery (LNFH) Structure 2, located at river mile (RM) 3.8 that lies at the head of the Historic Channel of Icicle Creek (described below).

One of the proposed actions identified in the Strategy is the Alpine Lakes Reservoir Optimization and Automation Project that involves releasing water from five reservoirs to augment flows in Icicle Creek. These reservoirs are Square, Klonaqua, Eightmile, Colchuck, and Snow lakes.

The Study was launched in response to discretionary trust water donations of stored water by IPID coinciding with planned reservoir maintenance activities. It was coordinated by Chelan County Natural Resources Department to understand benefits and impacts and potential fatal flaws associated with the proposed Alpine Lakes Optimization and Automation Project.

The Study was funded under Grant Number WROCR-VER1-ChCoNR-00002 sourced from the Washington State Department of Ecology (Ecology) Office of Columbia River (OCR).

Background

Basin Description

Icicle Creek drains an area of about 243 square miles of undeveloped mountainous terrain west of Leavenworth in Chelan County, Washington (Subbasin; Figure 1). Icicle Creek drains to the Wenatchee River at Leavenworth. The majority of its drainage area lies within the Alpine Lakes Wilderness Area on land managed by the U.S. Forest Service (USFS). The lowermost section is moderately developed and includes recreational and residential development, agriculture, lodging, and the LNFH.

The Icicle is a snowpack-driven watershed with high flows occurring during spring freshet and low flows in late Summer (primarily September) and Fall. Two stream gauges are present on Icicle Creek (Figure 1). The U.S. Geological Survey (USGS) operates a gauge (12458000) at RM 5.8 located upstream of Snow Creek having a period of record from 1993 to present. Ecology operates a gauge (45B070) at RM 2.2 having a period of record from 2007 to present. Additionally, the USFWS is in the process of establishing stream measurement recording at Structure 2.

Numerous mountain and alpine lakes are present in the Icicle Subbasin. These are naturally formed lakes, the largest of which were modified to store water prior to Wilderness Area designation. The Icicle's major tributaries originate from the larger lakes. These include French Creek draining Klonaqua Lake; Leland Creek draining Square Lake; Mountaineer Creek draining Eightmile Lake and Colchuck Lake; and Snow Creek draining Upper and Lower Snow Lakes. Major lakes and tributaries are shown on Figure 1.

Icicle-Peshastin Irrigation District

The IPID diverts surface water from Icicle and Peshastin Creek drainages for irrigation of lands between Leavenworth and Cashmere. IPID holds diversionary rights from Icicle and Snow Creeks at the IPID diversion located at RM 5.7 (Figure 1) during irrigation season at a rate up to 117.71 cfs under Water Right Certificates S4-35002JC, S4*35002ABBJ, having priority date of 1910 and Certificate 1082 having priority date of 1919.

IPID also has water rights to store water in the five aforementioned reservoirs located within the Alpine Lakes Wilderness Area for the purpose of providing irrigation water during times of drought or when Icicle Creek flows are insufficient to meet IPID's diversionary needs. These reservoirs are discussed below.

Reservoirs

The five naturally-formed lakes within the Alpine Lakes Wilderness Area were modified beginning in the 1920s to store water for irrigation and fish propagation. Locations of the reservoirs are shown on Figure 1.

Four of the reservoirs are operated by IPID (Square, Klonaqua, Eightmile, and Colchuck lakes) and one reservoir is operated by the USFWS and U.S. Bureau of Reclamation (USBOR). Square and Klonaqua Lakes were modified by excavating a tunnel (Square) and buried pipe (Klonaqua) to access water below the natural level of the lakes. Colchuck Lake was modified by excavating a channel connecting two natural lake basins. All four lakes have small dams (5 to 10 feet high) constructed to enhance storage. Upper Snow Lake Reservoir is operated to support the LNFH and also stores water for IPID. Water is accessed in Upper Snow Lake using a tunnel/pipe bored through rock. The outlet lies below the natural water level of Upper Snow Lake. There is no dam.

IPID and USFWS/BOR operate these facilities under easements with USFS that were established when the land was transferred to USFS during the Wilderness Area designation. These easements allow IPID and USFWS staff access and to perform maintenance activities.

Previously, only rough estimates were available for water volumes held in active storage in the reservoirs due to limited information on lake bed bathymetry and freeboard (vertical distance from invert of outlet to overflow).

Reservoir Operations

In average runoff years, water is released on a rotational basis from one of the four reservoirs operated by IPID. IPID typically only receives water from Upper Snow Lake during drought years under a partial subordination agreement with USFWS. Water is typically released from some or all the reservoirs in drought years to augment downstream water supply.

To operate these reservoirs, IPID and USFWS staff hike to their respective lakes to manually turn hand wheels and valves that operate head gates. USFWS demand from Snow Lakes ranges from about 20 cfs in July to about 50 cfs during September. The control valve at the outlet to Upper Snow Lake currently limits the release rate to about 55 cfs.

Because of the time and cost required to adjust head gates, adjustments are generally made infrequently or only at the beginning and end of the season. The hand wheel operator at Eightmile Lake was destroyed when the dam partially washed out several decades ago. Adjusting this gate requires using scuba equipment when the lake is full, which further limits IPID's ability to adjust outflows. Stored water in Eightmile Lake also seeps through the north end of the lake where an ancient landslide serves as a natural impoundment. For this reason, IPID's water right includes water stored in Eightmile Lake lying below the invert of the outlet pipe.

Prior to this Study, there was no instrumentation installed to measure reservoir stage or discharge rates at the four lakes managed by IPID. At Upper Snow Lake, USFWS collects reservoir stage and release flow data using existing instrumentation.

Leavenworth National Fish Hatchery

The LNFH is located in the lower section of Icicle Creek at about RM 2.7 (Figure 1). The facility was constructed in the 1930s to mitigate impacts to anadromous fish runs impacted by the construction of Grand Coulee Dam. The LNFH continuously diverts surface and groundwater at a rate of about 50 cfs for fish propagation. Surface water is diverted a rate of about 42 cfs from Icicle Creek using a diversion located at RM 4.5. The balance of water used by LNFH is withdrawn from a well field at the hatchery tapping an aquifer in hydraulic continuity with Icicle Creek.

An artificial channel known as the Hatchery Channel was constructed to periodically divert water from Icicle Creek to hydrate the aquifer supplying the well field. Water is diverted to the Hatchery Channel by a hydraulic control structure (Structure 2) that spans the width of the mainstem Creek at RM 3.8.

Effluent from the hatchery is discharged at a rate of about 50 cfs to the mainstem Icicle Creek below the outlet of the Hatchery Channel at RM 2.7, creating a bypass reach on Icicle Creek of about almost 2 miles. This bypass reach includes the natural channel of Icicle Creek downstream of Structure 2, known as the Historic Channel.

Flow Augmentation

The 2016 Pilot Study provided flow augmentation to Icicle Creek using water donated to trust by IPID for the purpose of benefitting instream flows. Methods used in the Study and findings are discussed below.

Trust Water Donations

In 2016, IPID requested to temporarily donate five of its Alpine Lakes reservoir storage water rights into Ecology's Trust Water Right Program pursuant to RCW 90.42.080 that encourages water right holders to donate water rights for instream flow purpose. In April, Ecology accepted donations for Certificate Nos. 5527, 1227, 1228, 1229, and 1591 for the purpose of benefitting instream flow from July 11 to October 15, 2016. The donated water was to be made available by releasing water from the five lakes managed by IPID and leaving it instream for environmental benefit during the 2016 low-water season. Table 1 shows quantities of water placed into trust.

Table 1. Quantities Donated to Trust Water Program for 2016*

Lake Name	Quantity of Water (acre-feet)
Square Lake	2,000
Klonaqua Lake	2,500
Eightmile Lake	1,600
Colchuck Lake	2,500
Snow Lakes	1,000
Total Donated to Trust	9,600

*Donation period July 11 to October 15, 2016 for instream flow purpose.

The timing of trust water donations was coordinated to align with planned maintenance of IPID

reservoirs, which required lake levels to be drawn down by Fall 2016 for repair and inspection. This presented an opportunity to conduct the 2016 Flow Augmentation Pilot Study.

Project Objectives and Constraints

Prior to commencing this Study, IWG's Instream Flow Subcommittee developed and agreed on the following objectives and constraints for the Project:

- Meet a target flow of 100 cfs in the Historic Channel as measured at Structure 2, consistent with IWG's Guiding Principles. Meeting this target was intended to be adaptive based on actual flows verified on a weekly basis;
- Release about 700 ac-ft from Colchuck Lake by September 1 to drawdown the reservoir supporting planned IPID maintenance;
- Release the peak flow from Eightmile Lake early to accommodate design inspection of the submerged head gate structure. This was initially assumed to be about 1,350 ac-ft of storage over the period of about 1 month. The IWG estimated this would accommodate about 250 ac-ft to be released via natural seepage at a rate of about 3 cfs for remainder of season. No weekly adjustments were planned for Eightmile due to the submerged head gate control;
- Limit release flows to about 10 cfs after September 15 from Square and Klonaqua lakes to protect Bull Trout spawning habitat in Leland and French creeks;
- Limit initial flow augmentation release from Upper Snow Lake to about 5 cfs continuously due limitations of the control valve. This would ensure USFWS could release sufficient water for operations at LNFH. This was to be adaptive later in the season, depending on LNFH water needs; and
- Significant ramping changes to the rate of water released from storage at a given reservoir should be avoided and minimized to 5 to 10 cfs per week in late Summer and early Fall.

Additional Project objectives were to release as much donated trust water as possible in support of engineering inspections at each site, and for conducting bathymetric surveys of the lakes.

These criteria were followed to the extent possible during the Study.

Methods

Overview

Key elements of the Study consisted of establishing Project objectives and constraints (described above), installing monitoring instrumentation at the four lakes operated by IPID, management of flow augmentation releases to meet Icicle target flows, and analysis of data to evaluate the effects on instream flows in the Historic Reach. A detailed methodology is contained in the Quality Assurance Project Plan (QAPP) (Aspect, 2016) as submitted to Ecology.

Instrumentation and Monitoring

Prior to this Study, there was no mechanism to measure discharge rates from lakes or monitor changes in lake stage. To prepare for releasing flow augmentation water, Aspect and IPID installed reservoir stage and outflow release rate measurement instrumentation at Square, Klonaqua, Eightmile, and Colchuck lakes during the week of July 11, 2016. Because there are no roads,

helicopter support was contracted to perform lifts of equipment and to ferry staff. This work was completed with IPID supervision under its easements to reservoir sites in accordance with a Work Plan submitted by IPID to the USFS.

Reservoir Stage Height Monitoring

Continuous recording instrumentation was installed in each lake to track changes in reservoir stage resulting from flow augmentation releases and inputs from precipitation and runoff. Tracking water level changes supported flow augmentation management by allowing estimates to be made for volumes remaining in storage, and supported the Project objective of ensuring reservoirs were sufficiently drawn down in time for inspection. Lake stage monitoring also enabled development of stage-volume relationships when combined with bathymetric survey data that had already been collected (Eightmile Lake) or were scheduled for collection using LiDAR in October 2016. At the beginning of the Study on July 11, all four reservoirs were full and overflowing from runoff.

Pressure transducer and temperature data loggers were installed for continuous recording. A means to visually record reservoir stage was also installed at each site. Because the pressure transducer data loggers are not barometrically compensated, recording barometer instruments were installed at two sites (Square and Eightmile).

Methods to install lake stage monitoring instruments varied by location. Colchuck and Eightmile lakes have reservoir control structures that enabled affixing a 1.25-inch-diameter galvanized pipe to the concrete head gate tower (Colchuck) and head gate vault (Klonaqua). The pipes were extended to depths at or near the bottom of the headgate. Pressure transducers were placed inside the pipes near the bottom. Holes were drilled at intervals into the pipes to allow free communication with the surrounding lake water. Staff plates were affixed to the outside of the pipes to provide a visual means of recording stage. A water level meter was also stored and used at Klonaqua Lake to manually measure water level changes in the head gate vault.

At Square and Eightmile lakes, pressure transducers were anchored to the lake bed at depths estimated to be at or below the active storage freeboard (below the invert of the outlet). These were connected to the shoreline by a communication cable encased in PVC conduit terminating in a watertight container above the high water mark. Installation of staff gauges was not possible at these lakes. Instead, a benchmark was established as a reference point to visually measure water level changes on the shoreline using a laser level and stadia rod.

Locking metal boxes were established in discrete locations to store equipment needed throughout the Study, including laser level and stadia rod, water level meter, barometer data loggers, and hand tools.

Release Flow Monitoring

Release flow monitoring equipment was installed at the four lakes managed by IPID to establish a means of measuring outflow rates. Water stored in the lakes was released using outlet pipes controlled by head gates. Because outflow rates vary with lake level for a given head-gate position, it was necessary to establish rated stream gauging sections in the outlet channels. This allowed for the head gate position to be adjusted until the desired outflow rate was achieved.

Rated stream gauging sections were established in outlet channels by installing a staff plate affixed to vertical bedrock outcrop or a rod driven into the streambed. Discharge from the lake was measured at varied rates by changing head gate positions to adjust outflow. Discharge was determined using a velocity meter and area-velocity measurement (Rantz, et al.,1982). Staff plate measurements (stage) were recorded for each measured discharge rate to create rating curves.

Rating curves developed for the outlet channels at the four lakes managed by IPID are shown on Figure 2. Rating curves predict discharge from measured stages and discharge rates based on an empirical mathematic formula. Time constraints during the installation period limited the number of measured discharge points that could be collected to three to five points per rating curve. Safety considerations limited the ability to measure high flows at some sites. Additionally, because the reservoirs were overflowing with runoff, there was no opportunity to measure low-discharge conditions at several sites. Discharge rates lying outside the range of measured data in the rating curves shown on Figure 2 were extrapolated.

Using rating curves to predict discharge, desired outflow rates were set by adjusting the head gate until the staff plate read the correct stage.

Flow Augmentation Management

Flow augmentation management followed a weekly cycle consisting of monitoring discharge in Icicle Creek and adaptively adjusting flows released from storage with the goal of maintaining Icicle Creek flows in the Historic Channel above 100 cfs.

Flows in Icicle Creek were originally intended to be measured directly at Structure 2 because it is located at the head of the Historic Channel. However, access to real-time discharge data measured by USFWS at Structure 2 was not available. Instead, real-time flows recorded at Ecology's Gauge located downstream of the LNFH outfall were used as a proxy for flows at Structure 2. We subtracted 50 cfs from Ecology's measurements to account for water used at LNFH that bypasses the Historic Channel.

Lake-specific discharge rates and flow augmentation release plans were developed on a weekly basis during the Study by Aspect and the Chelan County Department of Natural Resources. In setting these rates, we considered the 100 cfs target flow, water remaining in storage, other Project objectives, and constraints. Once a flow augmentation plan was developed for a given week, it was communicated to IWG stakeholders for review a few days prior to implementation. Chelan County staff spent the following week hiking into the lakes to adjust head gates to match desired outflows. Data collected at each lake included outlet channel discharge (upon arrival--before setting desired outflows—and departure), visual measurements, pressure transducer lake level data, photographs, and other observations. These data were used to determine how quickly outflow had decreased since the last head gate adjustment, estimate volumes of water released from storage, and estimate volumes remaining in storage. These data were then considered for developing flow augmentation plans for subsequent weeks.

Findings

Flow augmentation from the five lakes began on July 11 and continued to nearly the end of the trust water donation period on October 6.

Augmentation Flows and Volumes

Estimated volumes of water released from storage, and ranges of augmentation flows during the Study, are shown on Figure 3. A total of approximately 6,427 ac-ft of water was released from storage, providing cumulative augmentation flow to Icicle Creek ranging from 6 to 90 cfs. A hydrograph of cumulative augmentation flows is shown on Figure 4.

Augmentation Flows

Peak cumulative augmentation flow was limited to 90 cfs by reservoir infrastructure and the Project objective to avoid steep ramp-ups/draw-downs of water released into tributaries.

Peak discharge rates from individual lakes during the Study ranged from 12 cfs at Upper Snow Lake to 35 cfs at Square Lake (Figure 3). Peak discharge rates ranged between 20 and 25 cfs at Klonaqua, Eightmile and Colchuck lakes under lake full conditions. Higher outflow rates were temporarily observed at Colchuck Lake during development of the rated sections but were not measured, out of consideration for safety.

At Upper Snow Lake, flow augmentation discharge was limited to 5 cfs for most of the Study because the existing control valve has a capacity of about 55 cfs, of which LNFH operations require up to 50 cfs (i.e., discharge available for flow augmentation was limited to about 5 cfs). However, augmentation flows from Snow Lakes were increased in October to 12 cfs when LNFH demand decreased.

Augmentation Volumes

Volumes of water released from each lake ranged from about 950 ac-ft in Upper Snow Lake to 1,936 ac-ft in Square Lake (Figure 3).

The active storage volume in three of the lakes was nearly or completely drawn down by the end of the Study: Klonaqua (1,006 ac-ft), Eightmile (1,452 ac-ft), and Colchuck (1,083 ac-ft) lakes. Outlet structures in these lakes were exposed or nearly exposed above the water line and outflows had diminished to less than 2 cfs. Although water remained in active storage in Snow Lakes, IPID's trust water donation was exhausted by the end of the Study.

About 250 ac-ft of active storage remained in Square Lake at the end of the Study, and the outlet structure was about 4 to 5 feet below water. Active storage remained in Square Lake because late season outflows were limited, preventing use of all the water in storage. The Project objective of protecting Bull Trout habitat in Leland Creek limited outflows to 10 cfs after September 15.

Approximately 1,300 ac-ft of IPID's trust water donation remained in storage at the end of the study in Klonaqua and Colchuck lakes. Most of this volume was physically inaccessible due to elevations of outlet structures that lie above the stored water.

Lake Drawdown and Effects on Outflow Rates

Figure 5 shows lake hydrographs with stage measured by continuous recording datalogger, periodic manual measurements, and the depth of lake outlet pipe/tunnel inverts estimated from field inspection. Because the depths of outlet inverts were not known when pressure transducers were installed, one of the transducers was placed at a depth a few feet higher than the invert. Water level changes occurring at depths deeper than the transducer were not recorded by transducer dataloggers

but were collected by periodic manual measurements. At Colchuck Lake, the transducer was set about 4 feet above the outlet invert due to head gate construction. The Colchuck hydrograph exhibits a flat line beginning the second week of September that is not indicative of lake stage but rather represents the period when the transducer was no longer submerged.

Drawdown characteristics of lakes were identified by examining changes in lake stage. Drawdown characteristics depend on lake bed geometry, lake volume relative to outlet discharge rate, and water inputs to the lake (runoff, groundwater). Drawdown characteristics of Snow Lakes were not assessed.

The steady declining stage drawdown curve observed for Eightmile Lake on Figure 5 was due to its head gate position, which remained fixed throughout the study and permitted continuous seepage of water through the lake bed to Eightmile Creek. Drawdown curves at Square, Klonaqua, and Colchuck lakes were much steeper and became steeper when flow augmentation releases were increased during the third week in August. At the end of the season, lake stage was seen as increasing due to heavy regional precipitation beginning the second week of October.

Table 2 shows drawdown rates for the lakes which can be used to predict how long it will take to draw down active storage. Eightmile Lake drained slowest at a constant rate of 0.2 ft/day for discharge rates between about 3 and 20 cfs. Square Lake also drained slowly at a rate of 0.3 ft/day for a discharge rate of 15 cfs (attributable to its large volume). The drawdown rate at Square lake tripled to 1.0 ft/day when flows increased to 35 cfs.

Table 2. Lake Stage Drawdown Rates

Lake Name	Drawdown Rate (ft/day)	Discharge Rate (cfs)
Square Lake	0.3	15
	1.0	35
Klonaqua Lake	0.7	15
Eightmile Lake	0.2	3 to 20
Colchuck Lake	0.6	20
Snow Lakes	Water levels not measured	n/a

If no adjustments were made to head gates, the rate of discharge from lakes declined with lake stage due to decreased driving head and lake bottom geometry. Figure 4 shows that cumulative augmentation flows began declining immediately after weekly head gate adjustments were made. Figure 4 also shows that augmentation flows declined faster as lake levels were drawn down. When lakes were nearly full in July, the cumulative augmentation flow decreased at a rate of about 0.5 cfs per day from about 27 cfs on July 14 to 17 cfs on August 2 (Figure 4). When lakes were nearly empty in late August and early September, cumulative augmentation flows decreased at a much faster rate of about 3 cfs per day.

Effects of Augmentation on Historic Channel Flows

A hydrograph for the Historic Channel during the study period is shown on Figure 6. This hydrograph includes natural and augmentation flows. Comparing 2016 to the period of record for the USGS gauge, 2016 was approximately an average runoff year. Figure 6 also contains the hydrograph showing the cumulative flow augmentation and a hyetograph for precipitation (as rainfall) occurring at the nearest weather recording station, the Fish lake SNOTEL site located in the adjacent Cle Elum River drainage.

Icicle flows in the Historic Channel were about 300 cfs when the Study began the week of July 11 and decreased to about 120 cfs by the end of the first week in August.

Flow augmentation began the week of July 11 with modest cumulative releases from storage averaging about 22 cfs through July. Flow augmentation was increased the week of August 8 to about 60 cfs and increased again during the week of August 22 to about 90 cfs. Augmentation flows then decreased for the balance of the study primarily due to diminishment of stored water. September augmentation flows that began at about 75 cfs had decreased to 20 cfs during the last two weeks in September and first week of October. Flow augmentation ceased on October 6.

Weekly averages for flow augmentation rates and Historic Channel flows during the study period are shown on Figure 7. Flow augmentation during the low flow months of August and September equaled between 31 and 78 percent of total discharge in the Historic Channel.

Augmentation Increased Historic Channel Flows

Augmentation flows increased Historic Channel flows. Increased augmentation flows are attributed to the "peaks" in the Historic Channel hydrograph seen on Figure 6 during the weeks of August 8 and August 22.

Increases in augmentation flows during the first two weeks in August did not result in a one-for-one increase in Historic Channel flows. During this period, augmentation flows were increased by about 43 cfs, yet the Historic Channel hydrograph shows only a short-lived increase of about 20 cfs occurring the week of August 8. The difference in magnitude between flow augmentation and its effect on streamflow in the Icicle is attributed to a portion of augmentation water going to storage along the miles of creek bed between the storage sites and stream gauge.

The portion of augmentation water going to stream bed storage appears to have decreased by the week of August 22 when augmentation flows were increased by 46 cfs and Historic Channel flows temporarily increased by about 70 cfs. The difference is attributed to the contemporaneous increase of water released by USFWS from Snow Lakes and a temporary decrease in IPID's diversion rate. There was no precipitation recorded during that week.

Peaks in the Historic Channel hydrograph occurring the weeks of July 18, September 19, and October 3 were attributed to precipitation events. The peak occurring the week of August 29 was also attributed to precipitation; however, the effect on Icicle flows was magnified by the 70 cfs flow augmentation rate occurring at that time.

Augmentation Slowed the Seasonal Falling Hydrograph

Flow augmentation appears to have slowed the rate of the Icicle's seasonal falling hydrograph.

Figure 8 shows the observed Historic Channel hydrograph, cumulative flow augmentation hydrograph, and an estimate of what the Historic Channel hydrograph might have looked like in the absence of augmentation flows. The latter was derived by subtracting the cumulative augmentation flows from the observed Historic Channel hydrograph.

In the absence of flow augmentation, the Icicle's seasonal falling hydrograph is estimated to have decreased at a rate of about 7 to 8 cfs per day through July into the first week in August. Flow augmentation is estimated to have slowed the seasonal falling hydrograph by about 1 cfs per day to about 6 to 7 cfs per day (Figure 8). The significant increase in augmentation the week of August 8 delayed the timing of when Historic Channel flows would have diminished to below the 100 cfs target by 1 week.

Augmentation Prolonged the Target Flow

Flow augmentation increased the period of time that the target flow was met by about one third.

The estimate hydrograph for Historic Channel flows without flow augmentation indicates discharge would have dropped below the 100 cfs target beginning August 8 and remained below the target until significant precipitation began about October 8—a period of about 9 weeks (Figure 8). The observed Historic Channel hydrograph indicates augmentation flows slowed the seasonal falling hydrograph by about 1 cfs per day, delaying the date when Icicle flows would have otherwise diminished to below the 100 cfs target by one week.

Data Gaps

The following data gaps were identified from the 2016 Pilot Study:

- Real time flows for the Historic Channel measured at Structure 2 were not available. Ecology's Icicle Gauge was used as a proxy by subtracting 50 cfs, estimated to represent diversions by LNFH that bypass the Historic Channel.
- Rating curves developed for lake outlet channels require more streamflow measurements to increase accuracy. Rating curves should contain at least six measured points at various stage/discharge conditions. Existing rating curves are missing measured discharge points for high and low flow conditions. This increases error when using rating curves to record and establish release flows because low flow and high flow conditions must be extrapolated from the portions of the curves that are developed using measured data.
- Interpreting effects of flow augmentation on Icicle Creek was complicated by precipitation events. The nearest precipitation recording station is the Fish Lake Snotel located in the Cle Elum River Basin, which is between 9 and 24 miles from the Study lakes.
- The fate of water released from storage is not fully understood. It appears some portion of augmentation water may be going to storage along the tributary and mainstem Icicle Creek streambeds as indicated by the lack of a one-for-one relationship between water released from storage and the Icicle Creek stream gauges. The effects of inputs from upstream sources and diversions by upstream water users are not fully understood.
- Impacts of flow releases on Bull Trout habitat in French and Leland creeks likely require additional study. The Project objective to avoid releases from storage over 10 cfs into these

creeks after September 15 limited the flow augmentation options available to meet the late season Historic Channel flow target.

Conclusions

The 2016 Pilot Study provided promising results that water stored in Alpine Lakes reservoirs can be used to effectively enhance stream flows in the Historic Channel. There were no fatal flaws identified. While flow augmentation is not a total solution for achieving the IWG's flow targets in the Historic Channel, it may account for about one third of the solution based on the results of this Study. A follow on study is recommended to confirm and improve on findings of the 2016 Pilot Study and to resolve data gaps:

- No fatal flaws were identified.
- Augmentation flows of up to 90 cfs extended Icicle Creek flows in the Historic Channel above the 100 cfs target for 3 weeks. This represents about one third of the nine-week low flow period during 2016, which is considered an average runoff year. Augmentation flows equaled between 31 and 78 percent of late season discharge in the Historic Channel.
- Increased augmentation flows during the weeks of August 8 and August 22 resulted in higher flows in the Icicle as indicated by temporary peaks in the hydrograph.
- Quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonal falling hydrograph. However, flow augmentation can slow the rate of decline, prolonging the period when flows remain above the target. Augmentation flows slowed the seasonal falling hydrograph by about 1 cfs per day, delaying the date when Icicle flows would have otherwise diminished to below the 100 cfs target by one week.
- Over 6,400 ac-ft of water was released from storage for flow augmentation between July 11 and October 6. Nearly all physically available water was used for flow augmentation (about 250 ac-ft remained in Square Lake). About 1,300 ac-ft of trust water quantity was not physically accessible from both Klonaqua and Colchuck lakes.

Recommendations

The following are recommended for a follow-on study:

- Improve accuracy of accounting for discharge in the Historic Channel by measuring flows at Structure 2, as opposed to using the Ecology Gauge as a proxy. USFWS is currently in the process of equipping Structure 2 for access to real time flows.
- Improve rating curves. Collect additional streamflow measurements at lake outlets to increase accuracy of rating curves for rated sections at low and high flow conditions. High flows should be collected in the Spring when water is available to release from storage and low flows should be collected in the Fall when baseflows are present.
- Establish a precipitation recording station closer to the reservoirs (preferably within the Alpine Lakes Wilderness) to improve measurement of the magnitude and timing of precipitation to understand its effects on stream flows.
- Initiate study to determine impacts of release flows on Bull Trout habitat in French and Leland Creeks that drain Square and Klonaqua Lakes and whether release flows exceeding 10 cfs could be tolerated after September 15. These lakes hold nearly half the physically

available water for flow augmentation. Releases greater than 10 cfs in late season would provide greater flexibility to manage flow augmentation to Icicle Creek during the low flow month of September.

- Improve understanding of the fate of flow augmentation water. Evaluate gaining/losing characteristics of tributaries draining reservoirs and mainstem Icicle Creek. Coordinate with USFWS to improve understanding of releases from Snow Lakes. Coordinate with USFWS, IPID, Cascade Orchards Irrigation Company, and the City of Leavenworth to quantify diversions occurring upstream of the Historic Channel.
- Account for declining outflow rates from reservoirs as the lakes are drawn down. Cumulative outflow rates decreased at a rate of 0.5 cfs per day when lakes were full. This rate increased to about 3 cfs per day as the lakes neared empty. Because these lakes are remote and can reasonably be visited on foot only once per week, flow augmentation planning should consider adjusting outflow rates to account for these changes. Automating control structures to make minor adjustments to head gates every few days would mitigate decreasing outflow rates.
- In average water years, consider limiting early season releases from storage to save water for later in the season. However, more water should be released earlier from Square Lake to avoid water remaining in storage at the end of the season due to flow in Leland Creek that are limited to 10 cfs after September 15. Leakage and the inability to control the submerged head gate at Eightmile Lake limit options for retaining stored water. Repairing the Eightmile Lake dam may increase conservation of stored water allowing greater flexibility for water management to meet late season flow targets.

References

Aspect Consulting, LLC (Aspect), 2016, Quality Assurance Project Plan for Alpine Lakes Flow Augmentation, June, 2016.

Rantz, S.E. et al., 1982, Measurement and Computation of Streamflow: Volume 1, Measurement of Stage and Discharge, Geological Survey Water-Supply Paper 2175, USGS, Washington.

Limitations

Work for this project was performed for Chelan County Natural Resources Department (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

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Attachments:
Figure 1 – Icicle Creek Sub-Basin
Figure 2 – Outlet Channel Rating Curves
Figure 3 – Flow Augmentation, Volumes, and Flow Rates
Figure 4 – Cumulative Augmentation Flow
Figure 5 – Lake Hydrographs
Figure 6 – Historic Channel Hydrograph
Figure 7 – Augmentation Contribution to Historic Channel
Figure 8 – Effects of Augmentation on Historic Channel Flow

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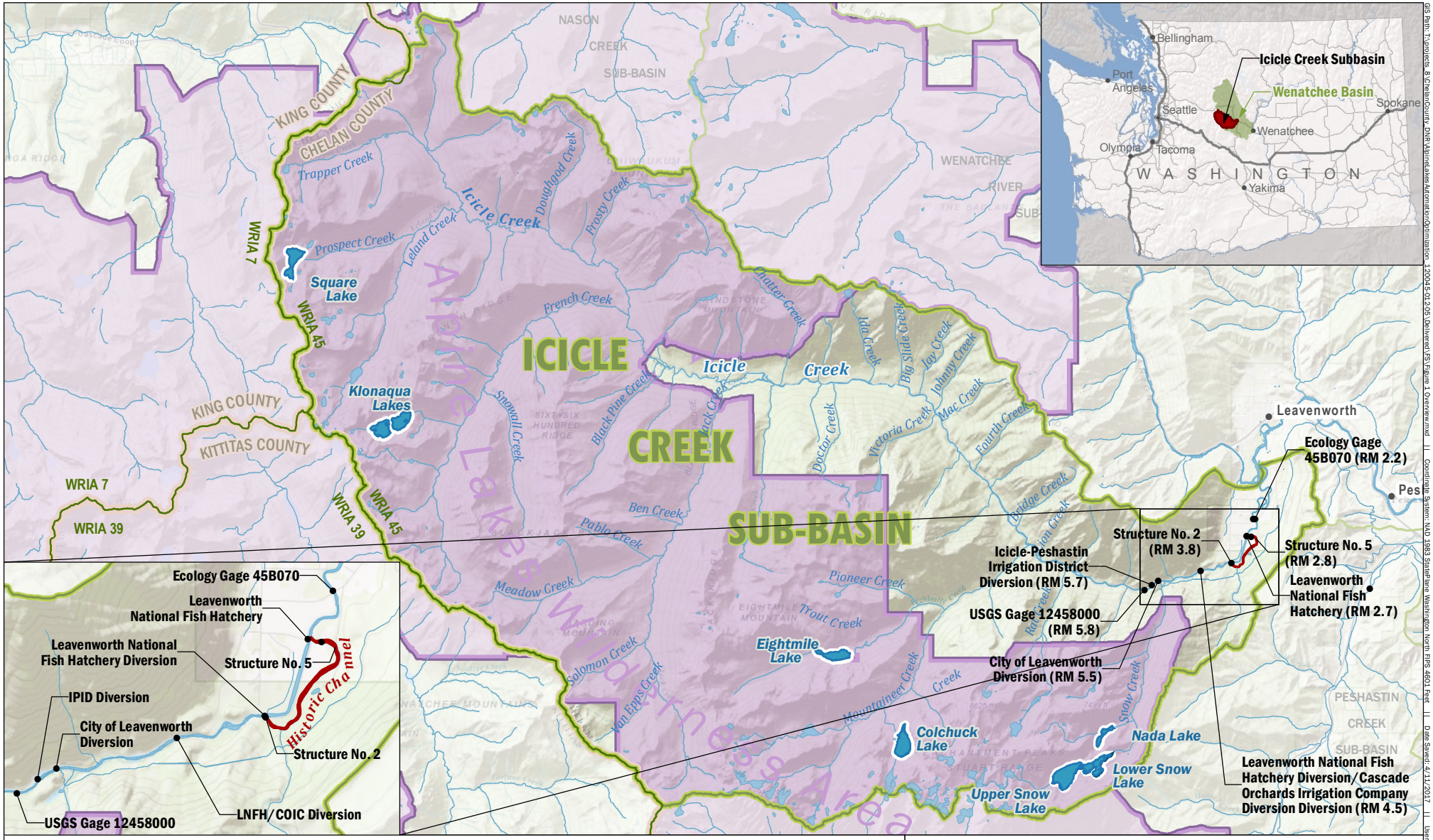
FIGURES



Icicle Creek Sub-Basin

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

Aspect CONSULTING	APR-2017	BY: EAC / BC	FIGURE NO. 1
	PROJECT NO. 120045	REVISED BY: ---	

Basemap Layer Credits || Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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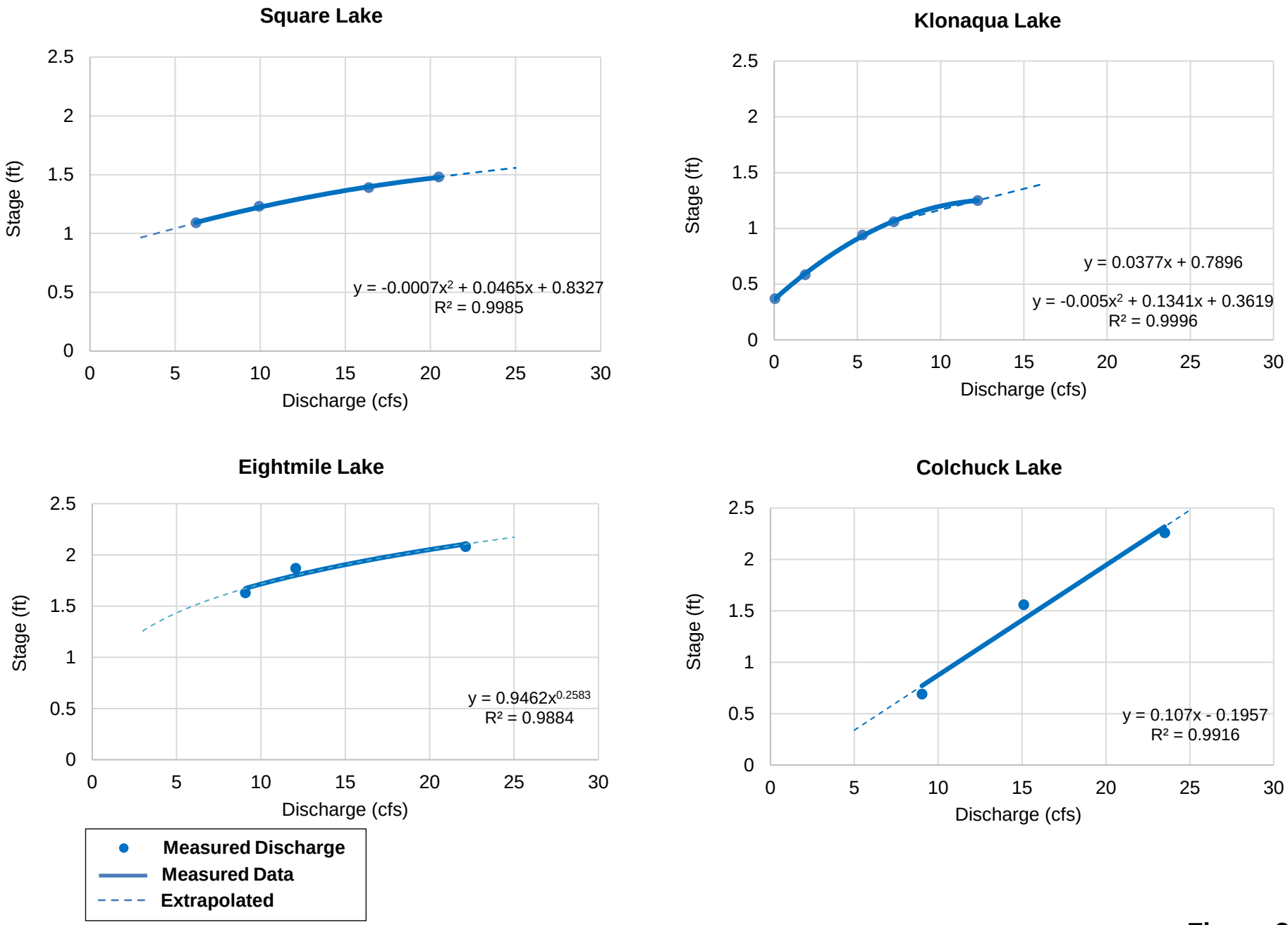

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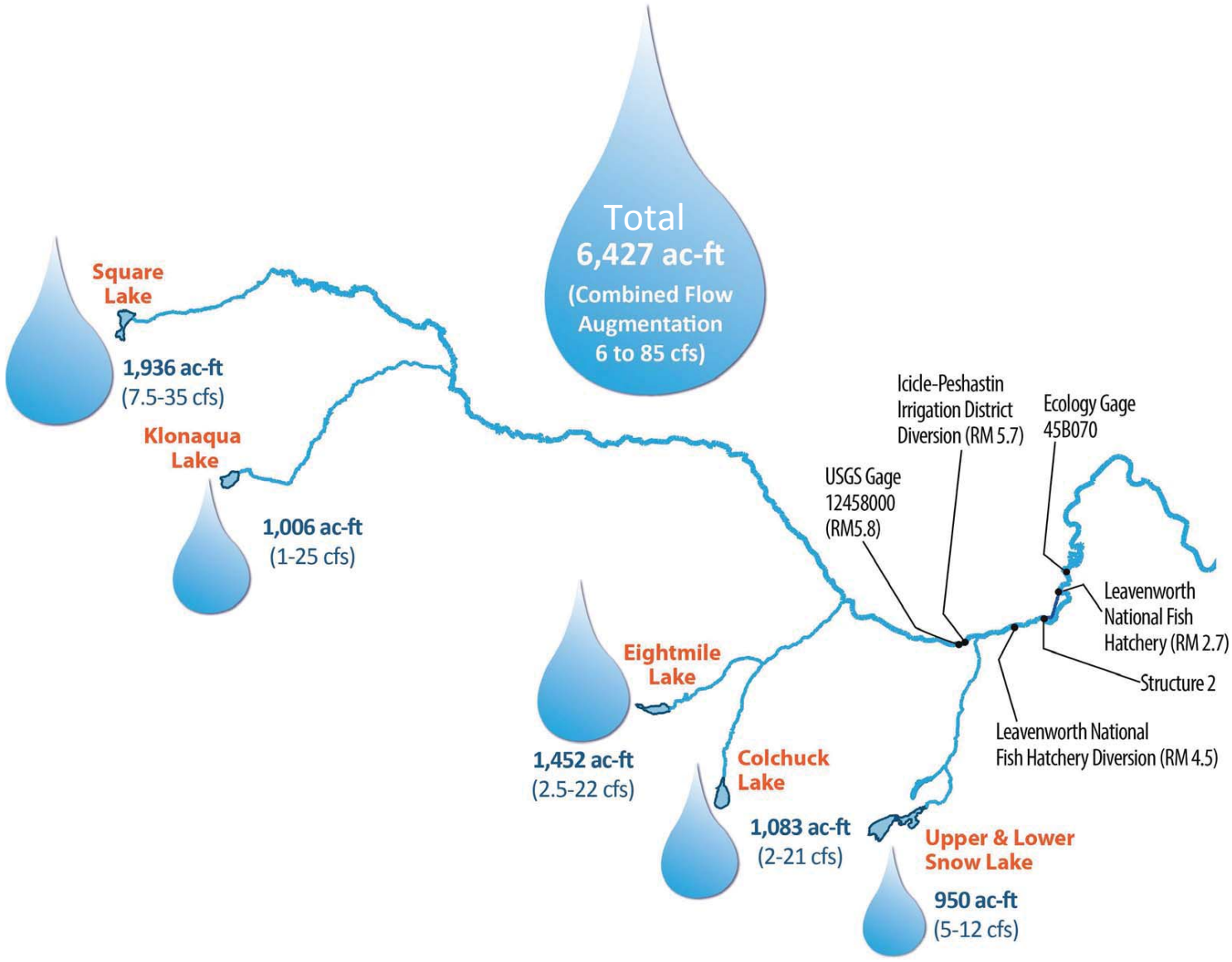
Figure 2
Outlet Channel Rating Curves
Project No. 120045, Alpine Lakes Optimization and Automation, Chelan County, WA



Flow Augmentation, Volumes, and Flow Rates

Feasibility Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

Aspect CONSULTING	APR-2017	BY: BC / EAC	FIGURE NO. 3
	PROJECT NO. 120045	REVISED BY: ---	

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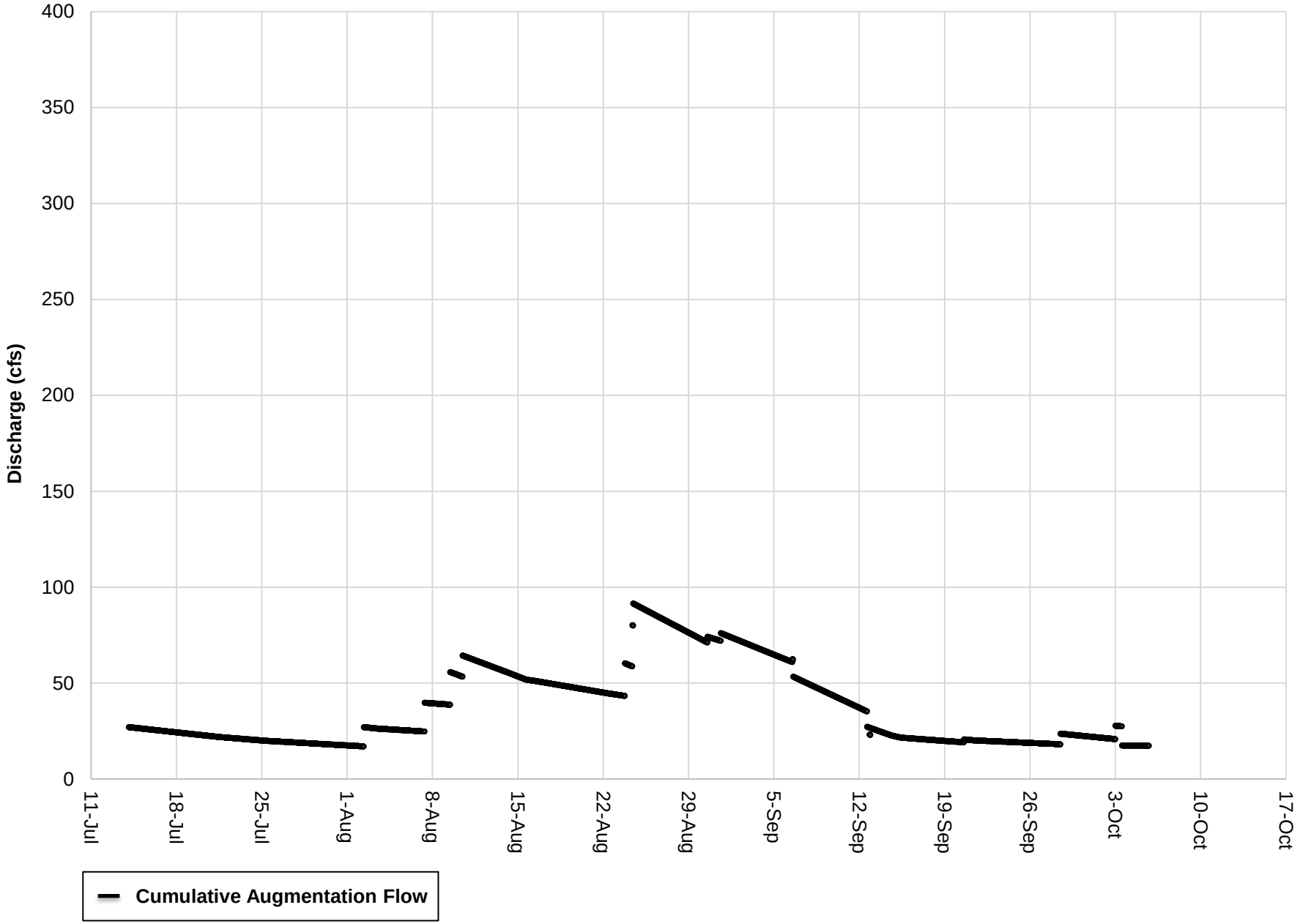

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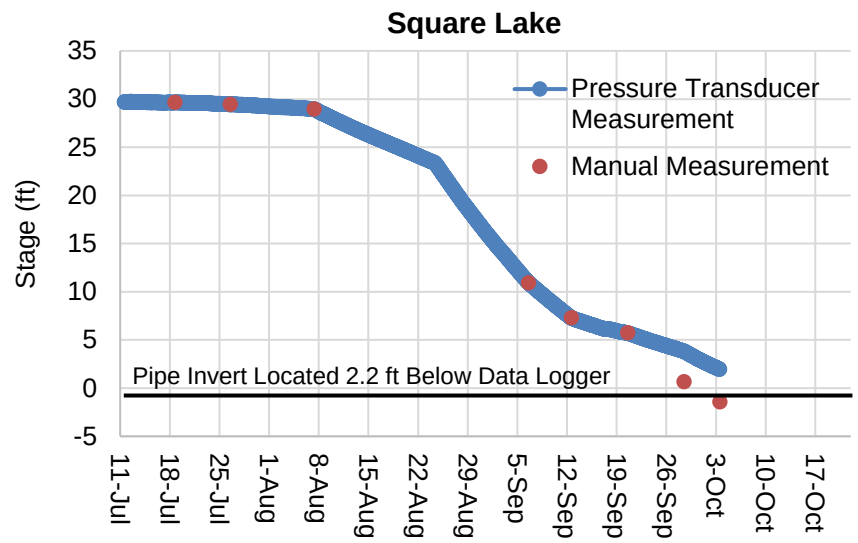
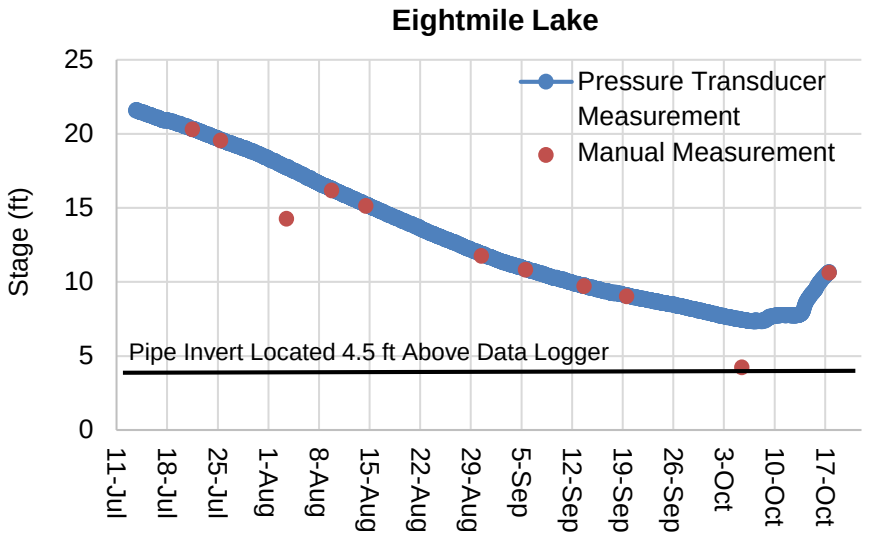
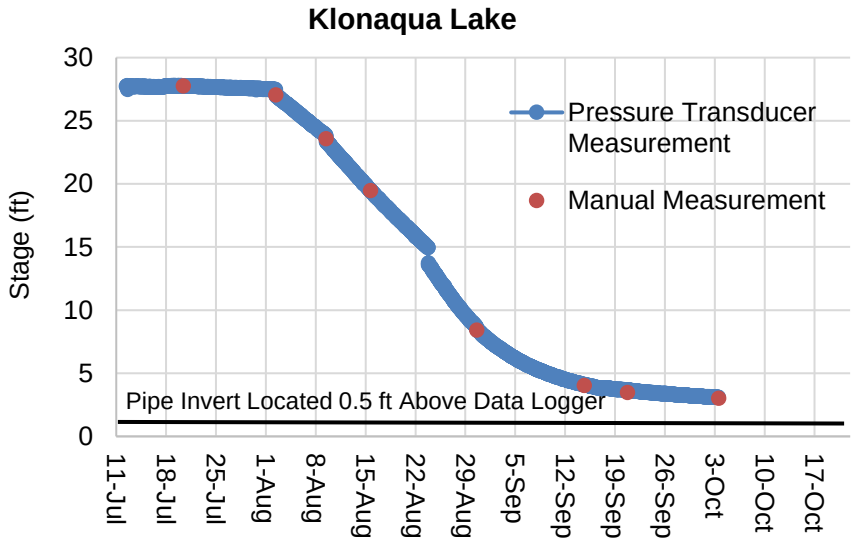
Figure 4
Cumulative Augmentation Flow
Project No. 120045, Alpine Lakes Optimization and Automation, Chelan County, WA







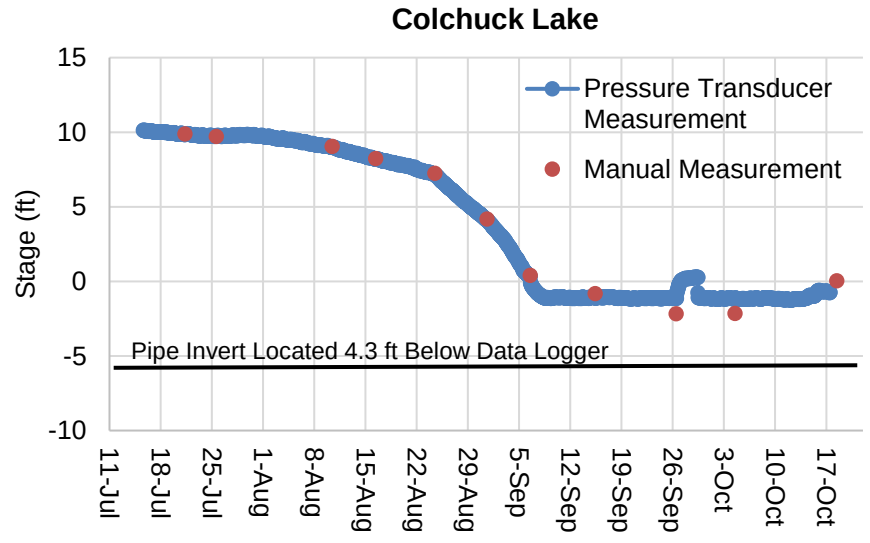


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Figure 5
Lake Hydrographs
Project No. 120045, Alpine Lakes Optimization and Automation, Chelan County, WA

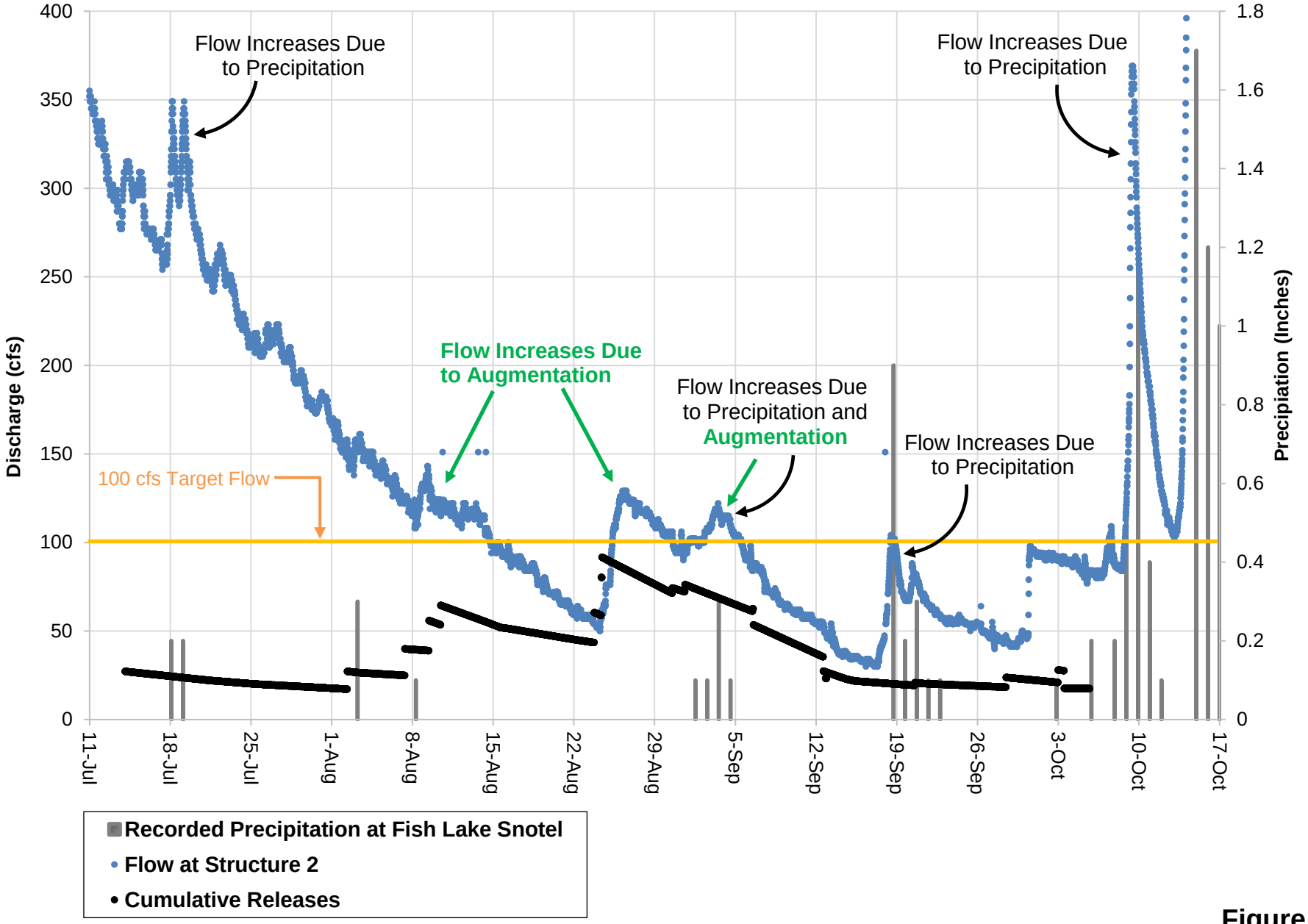

Figure 6
Historic Channel Hydrograph
Alpine Lakes Optimization and Automation Chelan County, WA

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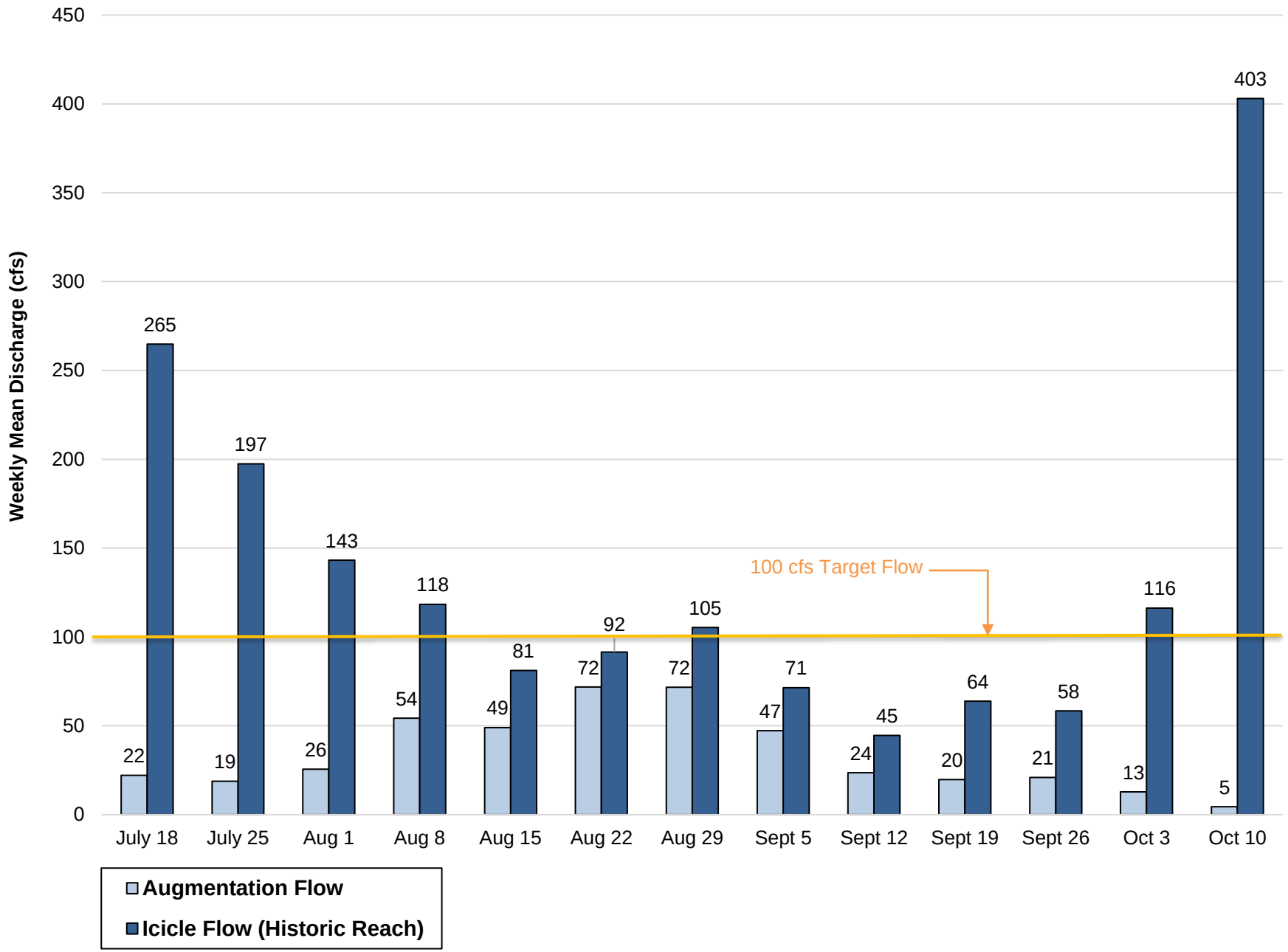

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Figure 7
Augmentation Contribution to Historic Channel
Project No. 120045, Alpine Lakes Optimization and Automation, Chelan County, WA

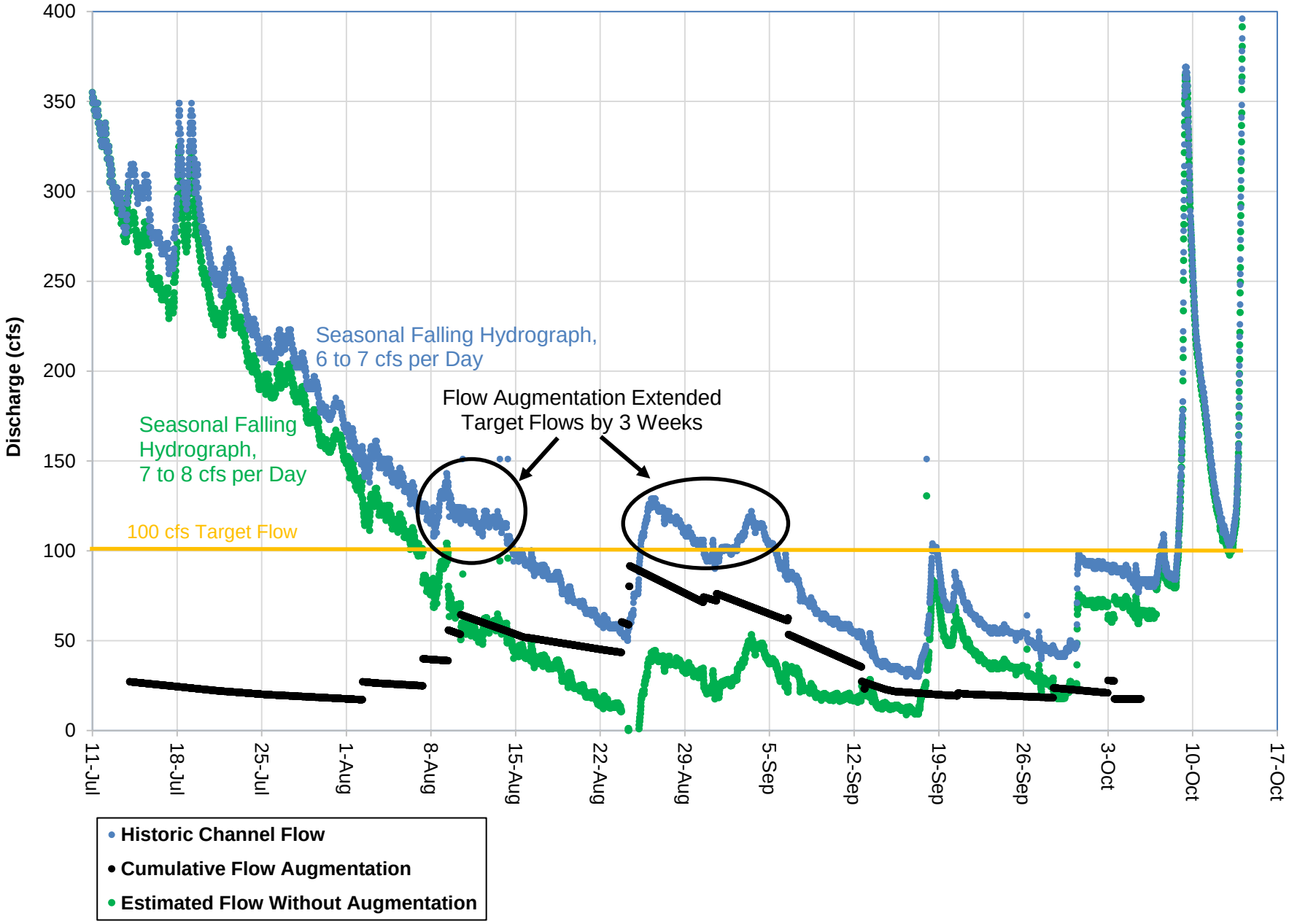

Figure 8

Effects of Augmentation on Historic Channel Flow

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Project No. 120045, Alpine Lakes Optimization and Automation, Chelan County, WA

MEMORANDUM

Project No.: 120455

April 17, 2018

To: Mike Kaputa, Director, Chelan County Natural Resources Department

From:

Bill Sullivan, LHG, CWRE
Senior Hydrogeologist
bsullivan@aspectconsulting.com

Dan Haller, PE, CWRE
Principal Water Resources Engineer
dhaller@aspectconsulting.com

Re: **Alpine Lakes 2017 Flow Augmentation Pilot Study**

Executive Summary

Aspect Consulting, LLC (Aspect) conducted the Alpine Lakes 2017 Flow Augmentation Pilot Study (2017 Pilot Study) as a continuation to the 2016 Flow Augmentation Pilot Study (2016 Pilot Study). The 2016 Pilot Study (Aspect, 2017a) demonstrated that managed release of water stored in five Alpine Lakes reservoirs substantially benefits late-season instream flows in the Historic Channel of Icicle Creek (Figure 1). The 2017 Pilot Study was conducted to confirm the benefit of flow augmentation on instream flows in the Historic Channel and to address data gaps and implement recommendations from the 2016 Pilot Study.

Both the 2016 and 2017 Pilot Studies were coordinated by the Chelan County Natural Resources Department (County) to understand benefits and impacts and potential fatal flaws associated with the proposed Alpine Lakes Optimization, Modernization, and Automation Project (Project). The Project is being developed by the multi-stakeholder Icicle Work Group (IWG) as part of the Icicle Creek Water Resource Management Icicle Strategy (Icicle Strategy) to achieve diverse benefits in the Icicle Creek drainage. A Guiding Principle of the Icicle Strategy is achieving adequate stream flows in the Historic Channel of lower Icicle Creek with the goal of maintaining at least 100 cubic feet per second (cfs) during average years and 60 cfs during drought years.

The 2017 Pilot Study was conducted in response to the Icicle-Peshastin Irrigation District (IPID) electing to donate up to 9,600 acre-feet of water stored in five Alpine Lakes reservoirs to Washington State's Trust Water Program for instream flow benefit. The Trust Water Donation period ran from July through October and coincided with planned reservoir maintenance activities.

The 2017 Pilot Study included maintenance and repair of reservoir stage and outflow monitoring equipment at four reservoirs to support management of water released from storage to augment stream flows, as well as coordination with the U.S. Fish and Wildlife Service (USFWS) on their operations of Snow and Nada Lakes and the Leavenworth National Fish Hatchery (LNFH). Icicle Creek flows were monitored and augmentation flows were adjusted on a weekly basis for 12 weeks during the Summer and early Fall of 2017.

Key findings of the 2017 Pilot Study include:

- Findings of the 2016 Pilot Study were generally confirmed. No fatal flaws were identified.
- Flow augmentation releases available from storage in Alpine Lakes nearing 6,500 acre-feet (ac-ft), were confirmed to significantly enhance stream flows in the Historic Channel of Icicle Creek.
- While flow augmentation is not a total solution for achieving the IWG's flow targets in the Historic Channel, it may account for over one half the volume needed to meet the target.
- Quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonally falling hydrograph. However, flow augmentation can slow the rate of decline, prolonging the period when flows remain above the target. Specifically, during the 2017 Pilot Study:
  - Augmentation flows of up to 75 cfs improved flows in the Historic Channel by about one half during critical low flow periods.
  - Augmentation flows increased flows in the Historic Channel of Icicle Creek to above the 100 cfs target for about 10 days.
  - Augmentation flows equaled up to 95 percent of discharge in the Historic Channel during critical low flow periods.
- Winter augmentation opportunities are limited by lack of sufficient inflows to replace summer and fall storage releases and, at Eightmile Lake, by seepage losses from storage.

Although no fatal flaws were identified, a follow-on study is recommended to confirm and improve on findings of the 2016 and 2017 Pilot Studies and to resolve remaining data gaps. Key recommendations include:

- Improve accuracy of Icicle Creek discharge estimates in the Historic Channel by collecting manual stream flow measurements to validate/calibrate existing methods of estimating discharge. This could preclude the need to obtain real-time data from Structure 2.
- Continue providing support to the Washington Department of Fish and Wildlife (WDFW) in assessing impacts of augmentation release flows on Bull Trout habitat in French and Leland creeks, which drain Square and Klonaqua lakes. WDFW initiated a study in 2017 to assess impacts of release flows and identified several data gaps in its summary report (WDFW, 2018; Appendix A).
  - Evaluate opportunities to provide greater temperature benefits in Icicle tributaries by performing lake depth temperature profiles.
  - Conduct additional habitat and fish presence studies to create an adaptive release model that can aid in timing and magnitude of release for both tributary and mainstem Icicle Creek benefit
- Improve understanding of the fate of flow augmentation water, including lag effects due to stream channel storage:

- Evaluate gaining/losing characteristics of the tributaries draining reservoirs and the mainstem Icicle Creek.
- Coordinate with USFWS to improve understanding of releases from Snow Lakes.
- Coordinate with USFWS, IPID, Cascade Orchards Irrigation Company, and the City of Leavenworth to quantify diversions occurring upstream of the Historic Channel.

Introduction

Aspect Consulting, LLC (Aspect) conducted the Alpine Lakes 2017 Flow Augmentation Pilot Study (2017 Pilot Study) to assess the effects of augmenting stream flows in Icicle Creek using water stored by the Icicle-Peshastin Irrigation District (IPID) in five mountain reservoirs. The 2017 Pilot Study was conducted as a continuation of the 2016 Flow Augmentation Pilot Study (2016 Pilot Study; Aspect, 2017a) in response to discretionary trust water donations of stored water by IPID coinciding with planned reservoir maintenance activities.

Both the 2016 and 2017 Pilot Studies were coordinated by the Chelan County Natural Resources Department (County) to understand benefits and impacts and potential fatal flaws associated with the proposed Alpine Lakes Optimization, Modernization, and Automation Project (Project).

The Project is being developed by the multi-stakeholder Icicle Work Group (IWG), which is comprised of diverse agricultural, conservation, and recreational interests, Tribes, and local, state, and federal agencies. The IWG developed the Icicle Creek Water Resource Management Icicle Strategy (Icicle Strategy) by consensus of its members to improve instream flows in Icicle Creek. The Icicle Strategy outlines nine Guiding Principles to achieve diverse benefits. The Adequate Streamflow principle sets a target flow of 100 cubic feet per second (cfs) during low-flow periods in non-drought years and 60 cfs during drought years in the Historic Channel of lower Icicle Creek. The flow target is intended to be measured at the Leavenworth National Fish Hatchery (LNFH) Structure 2, located at river mile (RM) 3.8 that lies at the head of the Historic Channel of Icicle Creek (described below).

The 2017 Pilot Study was funded under Grant Number WROCR-VER1-ChCoNR-00002 sourced from the Washington State Department of Ecology (Ecology) Office of Columbia River (OCR).

Background

The first flow augmentation pilot study was completed in 2016 (Aspect, 2017a). As part of the 2016 Pilot Study, outflow and lake level monitoring equipment was installed at the four Alpine Lakes managed as reservoirs by IPID (Square, Klonaqua, Eightmile, and Colchuck lakes). Water released from those reservoirs, and from Snow Lakes, contributed to instream flows in Icicle Creek under IPID's trust water donation. Key findings of the 2016 study included:

- Over 6,400 ac-ft of water released from storage at peak rates up to 90 cfs.
- Augmentation flows equaled between 31 and 78 percent of discharge in the Historic Channel during critical low flow periods.
- Augmentation was found to be insufficient to keep up with the seasonally falling hydrograph and will not present a total solution for achieving the IWG's flow targets in the Historic

Channel. However, augmentation did slow the rate of seasonally decline, prolonging the period when flows remained above the target by about one third, or 3.5 weeks.

Based on the success of the 2016 Pilot Study in demonstrating beneficial impacts of augmentation on Historic Channel flows, the 2017 Pilot Study was implemented to confirm findings, address data gaps, and implement recommendations.

Basin Description

Icicle Creek drains an area of about 243 square miles of undeveloped mountainous terrain west of Leavenworth in Chelan County, Washington (Subbasin; Figure 1). Icicle Creek drains to the Wenatchee River at Leavenworth. The majority of its drainage area lies within the Alpine Lakes Wilderness Area on land managed by the U.S. Forest Service (USFS). The lowermost section is moderately developed and includes recreational and residential development, agriculture, lodging, and the LNFH.

The Icicle is a snowpack-driven watershed with high flows occurring during spring freshet and low flows in late Summer (primarily September) and Fall. Two stream gauges are present on Icicle Creek (Figure 1). The U.S. Geological Survey (USGS) operates a gauge (12458000) at RM 5.8 located upstream of Snow Creek having a period of record from 1993 to present. Ecology operates a gauge (45B070) at RM 2.2 having a period of record from 2007 to present. Additionally, the USFWS is in the process of establishing stream measurement recording at Structure 2.

Numerous mountain and alpine lakes are present in the Icicle Subbasin. These are naturally formed lakes, the largest of which were modified to store water prior to Wilderness Area designation. The Icicle's major tributaries originate from the larger lakes. These include French Creek draining Klonaqua Lake; Leland Creek draining Square Lake; Mountaineer Creek draining Eightmile Lake and Colchuck Lake; and Snow Creek draining Upper and Lower Snow Lakes. Major lakes and tributaries are shown on Figure 1.

Icicle-Peshastin Irrigation District

The IPID diverts surface water from Icicle and Peshastin Creek drainages for irrigation of lands between Leavenworth and Cashmere. IPID holds diversionary rights from Icicle and Snow Creeks at the IPID diversion located at RM 5.7 (Figure 1) during irrigation season at a rate up to 117.71 cfs under Water Right Certificates S4-35002JC, S4*35002ABBJ, having priority date of 1910 and Certificate 1082 having priority date of 1919.

IPID also has water rights to store water in the five aforementioned reservoirs located within the Alpine Lakes Wilderness Area for the purpose of providing irrigation water during times of drought or when Icicle Creek flows are insufficient to meet IPID's diversionary needs. These reservoirs are discussed below.

Reservoirs

The five naturally-formed lakes within the Alpine Lakes Wilderness Area were modified beginning in the 1920s to store water for irrigation and fish propagation. Locations of the reservoirs are shown on Figure 1.

Four of the reservoirs are operated by IPID (Square, Klonaqua, Eightmile, and Colchuck lakes) and one reservoir is operated by the USFWS and U.S. Bureau of Reclamation (USBOR). Square and Klonaqua Lakes were modified by excavating a tunnel (Square) and buried pipe (Klonaqua) to access water below the natural level of the lakes. Colchuck Lake was modified by excavating a channel connecting two natural lake basins. All four lakes have small dams (5 to 10 feet high) constructed to enhance storage. Upper Snow Lake Reservoir is operated to support the LNFH and also stores water for IPID. Water is accessed in Upper Snow Lake using a tunnel/pipe bored through rock. The outlet lies below the natural water level of Upper Snow Lake. There is no dam.

IPID and USFWS/BOR operate these facilities under easements with USFS that were established when the land was transferred to USFS during the Wilderness Area designation. These easements allow IPID and USFWS staff access and to perform maintenance activities.

The 2016 Pilot Study provided updated estimates for active storage volumes based on monitoring of discharge rates released from storage (Aspect, 2017a) and improved bathymetry derived from LiDAR data collected in Fall of 2016 after active storage in reservoirs had been drained down (Aspect, 2017b).

Reservoir Operations

In average runoff years, water is released on a rotational basis from one of the four reservoirs operated by IPID. IPID typically only receives water from Upper Snow Lake during drought years under a partial subordination agreement with USFWS. Water is typically released from some or all the reservoirs in drought years to augment downstream water supply.

To operate these reservoirs, IPID and USFWS staff hike to their respective lakes to manually turn hand wheels and valves that operate head gates. USFWS demand from Snow Lakes ranges from about 20 cfs in July to about 50 cfs during September. The control valve at the outlet to Upper Snow Lake currently limits the release rate to about 55 cfs.

Because of the time and cost required to adjust head gates, adjustments are generally made infrequently or only at the beginning and end of the season. The hand wheel operator at Eightmile Lake was destroyed due to erosion and log debris. Adjusting this gate requires using scuba equipment when the lake is full, which further limits IPID's ability to adjust outflows. Stored water in Eightmile Lake also seeps through the north end of the lake where an ancient landslide serves as a natural impoundment. For this reason, IPID's water right includes water stored in Eightmile Lake lying below the invert of the outlet pipe.

Prior to the 2016 Pilot Study, there was no instrumentation installed to measure reservoir stage or discharge rates at the four lakes managed by IPID. At Upper Snow Lake, USFWS collects reservoir stage and release flow data using existing instrumentation.

Leavenworth National Fish Hatchery

The LNFH is located in the lower section of Icicle Creek at about RM 2.7 (Figure 1). The facility was constructed in the 1930s to mitigate impacts to anadromous fish runs impacted by the construction of Grand Coulee Dam. The LNFH continuously diverts surface and groundwater at a rate of about 50 cfs for fish propagation. Surface water is diverted a rate of about 42 cfs from Icicle

Creek using a diversion located at RM 4.5. The balance of water used by LNFH is withdrawn from a well field at the hatchery tapping an aquifer in hydraulic continuity with Icicle Creek.

An artificial channel known as the Hatchery Channel was constructed to periodically divert water from Icicle Creek to hydrate the aquifer supplying the well field. Water is diverted to the Hatchery Channel by a hydraulic control structure (Structure 2) that spans the width of the mainstem Creek at RM 3.8.

Effluent from the hatchery is discharged at a rate of about 50 cfs to the mainstem Icicle Creek below the outlet of the Hatchery Channel at RM 2.7, creating a bypass reach on Icicle Creek of about almost 2 miles. This bypass reach includes the natural channel of Icicle Creek downstream of Structure 2, known as the Historic Channel.

Flow Augmentation

The 2017 Pilot Study provided flow augmentation to Icicle Creek using water donated to trust by IPID for the purpose of benefitting instream flows.

Trust Water Donations

In April 2017, IPID temporarily donated five of its Alpine Lakes reservoir storage water rights into Ecology's Trust Water Right Program, pursuant to RCW 90.42.080 that encourages water right holders to donate water rights for instream flow purpose. In April 2017, Ecology accepted donations for Certificate Nos. 5527, 1227, 1228, 1229, and 1591 for the purpose of benefitting instream flow through March 2018. The donated water was to be made available by releasing water from the five lakes managed by IPID and USFWS and leaving it instream for environmental benefit during the 2017 low-water season. Table 1 shows quantities of water placed into trust.

Table 1. Quantities Donated to Trust Water Program in 2017

Lake Name	Annual Quantity of Water (acre-feet)	Instantaneous Rate (cfs)
Square Lake	2,000	40*
Klonaqua Lake	2,500	25
Eightmile Lake	1,600	25
Colchuck Lake	2,500	50
Snow Lakes	1,000	25
Total Donated to Trust	9,600	-

*Increased from 10 cfs for 2017.

The timing of trust water donations was coordinated to align with planned maintenance of IPID-operated reservoirs, which required lake levels to be drawn down by Fall 2017 for repair and inspection.

The instantaneous quantities donated represent the filling rates of the certificated water rights. Water can be released by IPID at higher rates under RCW 90.03.030. Higher releases were documented during the pilot to achieve downstream flow augmentation goals.

Project Objectives and Constraints

Objectives of the **2017** Pilot Study included:

- Maintain/repair existing monitoring equipment installed at lakes for the 2016 Pilot Study to measure outflow channel discharge and lake stage.
- Collect additional stream flow measurements to improve rating curves developed for outflow channels and define maximum operational discharge rates from outlet structures.
- Download data loggers and analyze lake stage data from October 2016 to July 2017.
- Assess the assumption that flows through the Historic Channel can be reliably estimated from discharge measured at Ecology's gauge located downstream of LNFH by subtracting 50 cfs from the recorded flows to account for hatchery diversions and return flows that bypass the Historic Channel.
- Draw down active storage in Square Lake for inspection by IPID.
- Maintain County staff safety in remote and difficult environment.
- Support the Washington Department of Fish and Wildlife (WDFW) monitoring of stream flows and temperatures in French and Leland Creeks (tributaries draining Klonaqua and Square Lakes) during periods when water is released form storage to assess impacts of releases on Bull Trout habitat.

The 2017 Pilot Study adhered to the goals and constraints agreed by the IWG's Instream Flow Subcommittee, to the extent practicable:

- Meet a target flow of 100 cfs in the Historic Channel as measured at Structure 2, consistent with IWG's Guiding Principles. Meeting this target was intended to be adaptive based on actual flows verified on a weekly basis.
- Release peak flow from Eightmile Lake early to accommodate design inspection and natural seepage. No weekly discharge adjustments could be made due to the submerged headgate.
- Limit release flows to about 10 cfs after September 15 from Square and Klonaqua lakes to protect Bull Trout spawning habitat in Leland and French creeks.
- Limit initial flow augmentation releases from Upper Snow Lake to about 5 cfs continuously due to limitations of the control valve that is shared with USFWS to support operations at LNFH. This was to be adaptive later in the season, depending on LNFH water needs.
- Avoid significant ramping changes to the rate of water released from storage at a given reservoir to about 5 to 10 cfs per week in late Summer and early Fall.

Methods

Key elements of the Study consisted of establishing Project objectives and constraints (described above), maintaining monitoring instrumentation at the four lakes operated by IPID, management of flow augmentation releases, and analysis of data to evaluate the effects of augmentation on instream flows in the Historic Reach. A detailed methodology is contained in the Quality Assurance Project Plan (QAPP) (Aspect, 2017c) as submitted to Ecology. Additional details regarding monitoring

equipment installation and initial streamflow rating curve development are detailed in the 2016 Pilot Study (Aspect, 2017a).

Pre-season Reconnaissance

Aspect conducted a reconnaissance trip to Eightmile and Colchuck lakes on July 8, 2017, to assess the condition of monitoring equipment installed in 2016, and to support planning for the one-day site visit.

One-Day Site Visit and Pilot Startup

On July 19, 2017, Aspect and IPID staff visited each of the four reservoirs managed by IPID. Helicopter support was contracted to perform lifts of equipment and to ferry staff. This work was completed with IPID supervision under its easements to reservoir sites in accordance with a Work Plan submitted by IPID to the USFS.

At each reservoir, monitoring equipment installed in 2016 was inspected and repaired (as needed), and onsite data loggers monitoring lake level, water temperature, and barometric pressure were downloaded and redeployed (these were left in place at the end of the 2016 Pilot Study). Discharge was measured at each lake outlet over a range of flow rates to improve rating curves developed in 2016 for the outlet channels. Maximum operational discharge rates were also estimated from manual stream flow measurements. At Square Lake, the data logger used to record lake level was relocated to a location deeper than the invert of the lake outlet. Finally, head gates were opened as needed to support flow augmentation.

Reservoir Monitoring

Water level (stage) and volume in each reservoir were recorded continuously from July 2016 to October 2017. This period includes the entire duration of the 2016 and 2017 Pilot Studies and the interval between, when active storage releases ceased and reservoir levels were allowed to recover.

Changes in reservoir stage were measured in each of the four Alpine Lakes managed as reservoirs by IPID using continuous recording pressure transducer data loggers backed up by visual measurements during the Study. Pressure transducer data loggers were located underwater, near or below the invert elevation of the lake outlets. Because the pressure transducer data loggers were not barometrically compensated, continuous recording barometers were installed at two sites (Square and Eightmile). Visual water level measurements involved reading staff gauges installed at Klonaqua and Colchuck lakes and using a laser level/stadia rod at Square and Eightmile lakes where staff gauges could not be used.

Access to Colchuck and Eightmile lakes was restricted during much of the 2017 Pilot Study due to the Jack Creek Fire. When access to the lakes was restored in October, the pressure transducer and staff gauge at Colchuck Lake were exposed above the water and a tape measure was used during the final visual measurement taken on October 14. Lake stage-volume relationships (Aspect, 2017b) were used throughout the 2017 Pilot Study to monitor volumes remaining in active storage based on lake level measurements. Tracking volumes in storage was important to balance leaving sufficient water for flow augmentation later in the Study while ensuring lake levels were drawn down for facility inspection. At the beginning of the Study on July 19, all five reservoirs were full and overflowing from runoff. To support maintenance and inspection, IPID did not install stop logs at Eigthmile Lake, resulting in an initial lake level more than 1 foot lower than 2016.

Data loggers installed in the lakes also recorded water temperature. Temperature data were provided to WDFW to better understand temperatures of water being released to tributaries from Square and Klonaqua lakes (WDFW, 2018; Appendix A). WDFW found that water temperatures recorded by these data loggers appeared to be colder than water discharging to the outlet channels. Possible explanations for this include 1) the data logger at Square Lake was about 8 feet lower than the invert to the outlet and 2) the data logger at Klonaqua Lake was located inside an access vault (i.e., shaded from the sun).

Augmentation Flow Monitoring

Water stored in the lakes was released using outlet pipes controlled by head gates. Outflow rates from storage were estimated using rated stream gauging sections at the four outflow channels managed by IPID. Rated sections consist of a staff gauge and rating curve developed from several manual streamflow measurements collected at varying discharge rates.

Rated stream gauging sections were established in each outlet channel in 2016 by installing a staff plate affixed to vertical bedrock outcrop or a rod driven into the streambed. Discharge from the lake was measured at varied rates by changing head gate positions to adjust outflow. Discharge was determined using a velocity meter and area-velocity measurement (Rantz, et al.,1982). Staff plate measurements (stage) were recorded for each measured discharge rate to create rating curves. Refer to Aspect (2017a) for further background and discussion about developing these rating curves.

Rating curves developed from the 2016 Pilot Study data were updated with additional discharge data collected during the 2017 Pilot Study (Figure 2). The staff gauge and rating curves were used to determine discharge at a given outlet. Desired outflow rates were set by adjusting the head gate until the staff gauge read the stage corresponding to the desired flow.

Flow Augmentation Management

Prior to the 2017 Pilot Study, a plan was developed to release water from storage based on stream flow conditions observed in Icicle Creek during the 2016 Pilot Study and storage volume and outflow rate characteristics at each lake. Findings from the 2016 Pilot Study indicate the total volume of water stored in the lakes was not sufficient to prevent Historic Channel flows from dropping below the 100 cfs target for most of the low flow season. With this in mind, the 2017 Pilot Study approach to flow augmentation management was focused on conserving stored water so more would be available later in the season.

Consistent with the 2016 Pilot Study, lake-specific discharge rates and flow augmentation release plans were developed on a weekly basis by Aspect and the County. In setting these rates, we considered the 100 cfs target flow, water remaining in storage, and other Project objectives and constraints. Once a flow augmentation plan was developed for a given week, it was communicated to IWG stakeholders for review prior to implementation. County staff spent the following week hiking into the lakes to adjust head gates to match desired outflows and collect data. Data collected at each lake included outlet channel discharge (upon arrival—before setting desired outflows—and departure), visual measurements, pressure transducer lake level data, photographs, and other observations. These data were used to determine how quickly outflow had decreased since the last head gate adjustment, estimate volumes of water released from storage, and estimate volumes remaining in storage. These data were then considered when developing flow augmentation plans for subsequent weeks.

In 2017, access to Square Lake was impeded by hazardous trail conditions requiring two County staff during a single trip which limited the number and timing of site visits due to staffing constraints. Additionally, access to Colchuck and Eightmile lakes were restricted during much of the study period due to the Jack Creek Fire.

Findings

Flow augmentation from the five lakes began on July 19 and continued until the planned completion date of October 11 (85 days).

Augmentation Flows and Volumes

Estimated volumes of water released from storage, and ranges of augmentation flows during the Study are shown on Figure 3. A total of approximately 6,470 ac-ft of water was released from storage during the Study, providing cumulative augmentation flow rates to Icicle Creek ranging from 8 to 75 cfs per week. A hydrograph of cumulative augmentation flows from all five lakes is shown on
Figure 4.

Augmentation Flows

Peak cumulative augmentation flow was limited to 75 cfs to conserve stored water for later in the season and to comply with the Study objective to avoid steep ramp ups/drawdowns of water released into tributaries.

Flow augmentation began on July 19 with modest cumulative releases from storage, averaging about 12 cfs through the remainder of July (Figure 4). Augmentation was increased in the first week of August to 25 and then about 46 cfs. Releases were maintained at approximately this level until the third week of August, when they were increased to a peak of 75 cfs. Augmentation flows then decreased for the remainder of the Study due to declining driving head in the lakes (lake stage) as storage depleted. Declining augmentation flows were increased twice in September. Augmentation flows declined to about 23 cfs by the end of September. Augmentation flows were accounted for through October 11.

Peak augmentation flows from each lake are shown on Figure 3. Up to 35 cfs was released at Square Lake, 25 cfs at Klonaqua Lake, 12 cfs at Eightmile Lake, and 20 cfs at Colchuck Lake.

At Upper Snow Lake, flow augmentation discharge was limited to 5 cfs for most of the 2017 Pilot Study because the existing control valve has a capacity of about 55 cfs, of which LNFH operations require up to 50 cfs (i.e., discharge available for flow augmentation was limited to about 5 cfs). After LNFH demand had ceased, flows from Snow Lakes continued for 3 days ending October 4 so that about 50 cfs was attributed to augmentation flows to allow IPID to release the full volume donated to trust (Figure 4).

Maximum Operational Discharge Rates

A goal of the 2017 Pilot Study was to estimate maximum operational discharge rates at each of the lake outlets to determine the peak rate at which flow augmentation could feasibly occur under lake-full conditions. These were used to plan augmentation release rates. Discharge rates were estimated during the site visit on July 19 by collecting a manual stream flow measurement at the highest discharge that could be safely measured given channel conditions. The maximum flow rates

measured were 33 cfs at Square Lake, 37 cfs at Klonaqua Lake, and 29 cfs at Colchuck Lake. Because the initial water level was lower in 2017, the maximum discharge rate at Eightmile Lake was based on the peak discharge measured in 2016, estimated at 22 cfs.

Augmentation Volumes

The total volume of water released from storage during the Study was estimated from outflow monitoring to be 6,470 ac-ft, which was similar to the 6,427 ac-ft released during the 2016 study.

Water volumes released from each lake are shown on Figure 3. The active storage volume in each of the lakes was nearly drawn down by the end of the Study: Square Lake (2,211 ac-ft), Klonaqua Lake (956 ac-ft), Eightmile Lake (981 ac-ft), and Colchuck Lake (1,321 ac-ft). Outlet structures in these lakes were at or within several feet of the water line and individual lake outflows had diminished.

An estimated total of about 400 ac-ft remained in active storage in Square, Klonaqua, and Colchuck Lakes at the end of the 2017 Pilot Study. About half of the remaining water left in storage was in Colchuck Lake, which was inaccessible for much of the season due to the Jack Creek Fire.

Although total volumes released were similar between 2016 and 2017, volumes released from individual lakes varied. In 2017, about 275 ac-ft more was released from Square Lake (about 2 feet of additional drawdown); about 238 ac-ft more was released from Colchuck Lake, which had a higher initial water level and was drawn down about 1 foot lower than in 2016; and about 471 ac-ft less was released from Eightmile Lake, which had an initial water level more than 1 foot lower than in 2016. Additionally, a storm in October 2016 increased Eightmile Lake levels to the point where the lake discharged through the head gate, increasing the volume of water released from storage; this did not occur in 2017.

Considering active storage volumes were nearly completely drawn down in each of the lakes, results of the 2017 Pilot Study confirm the total active storage among the five lakes is in the range of about 6,500 to 7,000 ac-ft including IPID's trust donation volume of 1,000 ac-ft in Snow Lakes. The higher range of estimated volume considers about 400 ac-ft remained in storage at the end of the Study. Active storage volumes estimated using bathymetric surveys derived from LiDAR and acoustical data (Aspect, 2017b) are about 7,700 ac-ft, including the trust volume at Snow Lakes. The difference in active storage volume estimated using outflow monitoring and bathymetry is about 10 percent when water remaining in storage at the end of the Study is considered. Contributing to this difference is error associated with:

- Streamflow measurement equipment used to build rating curves
- Analytical methods used to develop rating curves
- Interpretation of rating curves
- Lake stage estimates
- Outlet pipe elevation estimates
- Bathymetry data collection methods
- Bathymetry data analysis and volumetric estimates

Despite about 400 ac-ft remaining in active storage among the lakes, cumulative augmentation flows had decreased to less than 10 cfs by the end of the Study. This suggests the instream flow benefit of accessing the final few hundred acre feet of stored water could be limited.

Assuming the five lakes contain between 6,500 to 7,000 ac-ft of active storage, about 2,600 to 3,100 ac-ft of IPID's 9,600 ac-ft trust water donation could be inaccessible in an average water year due to elevations of outlet structures that lie above the stored water. However, multiple fill opportunities in some years, or IPID options during drought years to siphon water from lower than normal inlet elevations, could increase this volume.

Lake Stage and Drawdown

At the beginning of the 2017 Pilot Study, lake levels were full, which was consistent with the start with the 2016 Pilot Study (except for Eightmile Lake, which was slightly more than one foot lower in 2017 than in 2016). Active storage in the lakes was nearly completely drawn down during the Study. Table 2 shows total drawdown levels for both study years and estimated active storage height at each lake. Active storage height was estimated by collecting manual measurements during low water at Square, Klonaqua, and Colchuck lakes and estimates from 2016 were updated as needed. Active storage height at Eightmile Lake was estimated based on information from IPID. Active storage height at Snow Lakes was not assessed.

Table 2. Maximum Drawdown During 2016 and 2017 Studies

Lake Name	Estimated Active Storage Height (ft)	Maximum Drawdown in 2016 (ft)	Maximum Drawdown in 2017 (ft)
Square Lake	32	27.9	30.0
Klonaqua Lake	28	24.7	24.7
Eightmile Lake	17	14.1	13.9
Colchuck Lake	16.5	12.0	13.1
Snow Lake	Not Measured	N/A	N/A

In 2017, Square and Colchuck lakes were drawn down by about 2 feet and 1 foot more, respectively than in 2016. The other lakes were drawn down about the same as in 2016. After the head gate becomes exposed above the water line, drawdown in Eightmile Lake is controlled by seepage only.

Figure 5 shows lake hydrographs for the 2017 Pilot Study with stage measured by continuous recording datalogger, periodic manual measurements, and the depth of lake outlet pipe/tunnel inverts estimated from field inspection. Lake hydrographs shown on Figure 6 encompass the 2016 Pilot Study, 2017 Pilot Study, and the interval between studies.

Drawdown characteristics of lakes were identified by examining changes in lake stage. Drawdown characteristics depend on lake bed geometry, lake volume relative to outlet discharge rate, and water inputs to the lake (runoff, groundwater). Drawdown characteristics of Snow Lakes were not assessed. The steady declining stage drawdown curve observed for Eightmile Lake (Figure 5) was due to its head gate position, which remained fixed throughout the study and continuous seepage of water occurring through the lake bed to Eightmile Creek.

Drawdown curves at Square, Klonaqua, and Colchuck lakes were steeper than Eightmile Lake and became steeper when flow augmentation releases were increased. Compared to 2016, lake hydrographs during the 2017 Pilot Study show a more gradual drawdown, consistent with efforts to decrease peak release flows and conserve stored water for flow augmentation later in the season (Figure 6). Unlike 2016, lake stage did not increase toward the end of the 2017 Pilot Study, as no significant precipitation occurred during this period.

At Colchuck Lake, the transducer was set about 4 feet above the outlet invert due to the head gate configuration. No data were recorded once the water level dropped below 4 feet above the outlet invert. Additionally, restricted access to Eightmile Lake due to the Jack Creek fire prevented retrieval of barometric data, which was needed to adjust continuous water level data at Colchuck Lake. This resulted in no reliable water level record at Colchuck Lake for October (Figure 5). Water level in Colchuck Lake during October was interpolated based on the last available barometrically-compensated transducer data point and the final visual measurement.

The Jack Creek Fire also resulted in less water being released from Colchuck Lake than planned, as lack of access precluded head gate adjustments needed to maintain targeted outflow rates. At the end of the study, the water level in Colchuck Lake was approximately 3.4 feet above the outlet invert.

Lake Drawdown and Effects on Outflow Rates

Table 3 shows drawdown rates for the five reservoirs, which can be used along with the 2016 study results (Aspect, 2017a) to estimate how long it will take to draw down active storage.

Table 3. Lake Stage Drawdown Rates

Lake Name	Average Drawdown Rate (ft/day)	Average Discharge Rate (cfs)
Square Lake	0.4	16
Klonaqua Lake	0.5	9
Eightmile Lake	0.2	7
Colchuck Lake	0.3	12
Snow Lakes	Water levels not measured	n/a

Eightmile Lake drew down slowest at a rate of about 0.2 ft/day with an average discharge rate of about 7 cfs. Klonaqua Lake drained fastest, at a rate of about 0.5 feet per day and an average discharge of 9 cfs.

If no adjustments were made to head gates, the rate of discharge from the lakes declined with lake stage due to decreased driving head and lake bottom geometry. Figure 4 shows that cumulative augmentation flows began declining immediately after weekly head gate adjustments were made. Following the start of peak cumulative augmentation flow on August 21, flows decreased by about 3 cfs per day. Figure 4 also shows that augmentation flows declined faster as lake levels were drawn down. When lakes were relatively full in early August, the cumulative augmentation flows decreased at a rate of about 1.0 cfs per day, from about 46 cfs on August 6 to about 40 cfs on August 12 (Figure 4). When lakes were nearly empty in mid to late September, cumulative

augmentation flows initially set at about 44 cfs, similar to early August augmentation flows, decreased at a faster rate of about 1.6 cfs per day.

Year-Round Lake Stage

The pressure-transducer data loggers also recorded lake stage during the period between studies (October 2016 to July 2017; Figure 7). Following closure of the head gates in October 2016, water levels in Square, Klonaqua, and Colchuck lakes recovered gradually. The lakes did not fill to overflow levels until February (Klonaqua Lake) and May (Square and Colchuck lakes).

Lake stage in Eightmile Lake recovered more rapidly than the other three lakes in response to precipitation (increase of approximately 14 feet in 2 weeks). However, by mid-November, seepage from Eightmile Lake overcame the inflow rate and the lake level began to drop, falling about 12 feet until lake levels began to recover in February. Declining water levels during the winter are assumed to be the result of precipitation transitioning to snow, limiting runoff to the lake while seepage from the lake continued.

The potential for Eightmile Lake to draw down significantly in winter due to seepage losses despite the head gate being closed could limit its value as a source for winter augmentation flows. Square and Colchuck lakes may only fill completely after the snow melts in spring, potentially limiting the ability to use these lakes as winter flow augmentation sources, especially when below-average precipitation accumulations are expected.

Effects of Augmentation on Historic Channel Flows

A hydrograph of estimated flows in the Historic Channel at Structure 2 during the 2017 Pilot Study is shown on Figure 7. This hydrograph was developed based on recorded flow measurements at the Ecology Gauge at RM 2.2 and subtracting 50 cfs to account for LNFH withdrawals and diversions upstream of this gauge. The hydrograph reflects ambient and augmentation flows. Based on the period of record from the USGS gauge, 2017 was an average runoff year in Icicle Creek. Figure 7 also contains the hydrograph showing the cumulative flow augmentation and a hyetograph for precipitation (as rainfall) occurring at the nearest weather station, the Fish Lake SNOTEL site located in the adjacent Cle Elum River drainage.

Icicle flows in the Historic Channel were about 200 cfs when the 2017 Pilot Study began on July 19 and decreased to about 100 cfs in mid-August.

Weekly averages for flow augmentation rates and Historic Channel flows during the 2017 Pilot Study period are shown on Figure 8. Flow augmentation during the low flow months of August and September equaled between 15 and 95 percent of total discharge in the Historic Channel.

Augmentation Increased Historic Channel Flows

Consistent with the 2016 Pilot Study, augmentation flows increased Historic Channel flows in 2017. Increased augmentation flows are indicated by the small “peaks” in the Historic Channel hydrograph during the weeks of August 2, 16, and 30 (Figure 7). Although not intended for flow augmentation, the peak in the Historic Channel hydrograph of about 45 cfs occurring the week of July 26 is the result of USFWS initiating releases from Snow Lakes. Augmentation releases also contributed to Historic Channel flows by slowing the naturally-declining hydrograph, prolonging

the target flow period, and improving overall discharge. This decreased the difference between the estimate hydrograph for conditions without augmentation and the 100 cfs minimum flow target.

Increases in augmentation flows in August did not result in a one-for-one increase in Historic Channel flows. For example, when augmentation flows were increased by 31 cfs the week of August 2, 36 cfs the week of August 16, and 21 cfs the week of August 30, the Historic Channel hydrograph responded with short-lived increases (peaks) of 23 cfs, 15 cfs, and 12 cfs, respectively, before returning to pre-augmentation-increase levels and gradually declining flow trends (Figure 7). The difference in magnitude between flow augmentation and its effect on streamflow in Icicle Creek is attributed primarily to a portion of augmentation water going to storage along the miles of creek bed between the reservoirs and the Ecology Gauge. Some of this water is temporarily stored in channels and wetlands and as shallow groundwater in the hyporheic zone. A portion of the water is also likely lost to evaporation and transpiration by riparian vegetation.

The peaks observed in the hydrograph for the Historic Channel during 2017 are smaller than observed during the 2016 study. This is consistent with the different augmentation management approach for 2017 that initiated smaller increases in augmentation flows to minimize significant ramp-ups, and to conserve stored water for the late season.

Late-season precipitation events had a much greater influence on the hydrograph than the August increases to augmentation flows. Peaks in the Historic Channel hydrograph occurring the weeks of September 20 and 27, and October 4, were attributed to precipitation events (Figure 7). Precipitation events increased Historic Channel flows by about 47 to 63 cfs. The hydrograph peak occurring the week of September 27 appears considerably higher than peaks resulting from the other two precipitation events; much of this increase was because IPID had ceased its approximately 100 cfs diversion in the 2 days prior to the precipitation event. As with increased augmentation flows, precipitation events had only short-term impacts to stream flows, and flows quickly returned to a low flow state. For the 2017 Pilot Study, there were no circumstances when augmentation flows were intentionally reduced to conserve stored water.

Augmentation Slowed the Seasonally Falling Hydrograph

Consistent with the 2016 Pilot Study, flow augmentation appears to have slowed the rate of Icicle Creek's natural, seasonally falling hydrograph. Figure 9 shows the observed Historic Channel hydrograph (estimated based on the Ecology Gauge minus 50 cfs), cumulative flow augmentation hydrograph, and an estimate of what the Historic Channel hydrograph might have looked like in the absence of augmentation flows (estimated hydrograph). The latter was derived by subtracting the cumulative augmentation flows from the observed Historic Channel hydrograph. While the estimated hydrograph is generally consistent with average year flows based on the Ecology gauge period of record, it appears to underestimate the lowest flows that remain above 25 cfs during average years.

In the absence of flow augmentation, the seasonally falling hydrograph is estimated, based on the estimated hydrograph to have decreased at a rate of about 13 cfs per day from July 19 through the end of July (Figure 9). This rate is estimated to have decreased to about 4 cfs per day through August as discharge approaches base flows.

With limited augmentation through the end of July, the rate of decline of the seasonally falling hydrograph was effectively unchanged from the estimated (non-augmentation) hydrograph, with decreases in augmented flows of about 13 cfs per day. As releases were progressively increased starting in August, there was an improvement in the rate of decline of the augmented flow hydrograph relative to the estimated (non-augmentation) hydrograph of about 1 cfs per day, from an estimated 4 cfs per day without augmentation to about 3 cfs per day observed with augmentation (Figure 9).

Augmentation Prolonged the Target Flow

Flow augmentation increased the period of time that the target flow was met by about 10 days, or about 15 percent of the time when flows were estimated to have otherwise been below the target.

The estimated hydrograph for Historic Channel flows without flow augmentation indicates discharge would have dropped below the 100 cfs target beginning August 5 and largely remained below the target until a week after the 2017 Pilot Study had concluded, when significant precipitation began—a period of about 10 weeks (Figure 9). The observed Historic Channel hydrograph indicates augmentation flows slowed the seasonally falling hydrograph by about 1 cfs per day, delaying the date when Icicle Creek flows would have otherwise diminished to below the 100 cfs target by 10 days.

The 10-day period that augmentation is estimated to have prolonged target flows is less than the period estimated in 2016. This difference is partly explained by a change in the approach to augmentation management that sought to conserve stored water for later in the season during the 2017 Pilot Study. Additionally, the period when flows are estimated have been below the target in 2017 (10 weeks) is longer than in 2016 (9 weeks) due to the onset of significant precipitation occurring earlier in 2016.

Augmentation Decreased the Target Flow Deficit

Augmentation improved overall discharge in the Historic Channel, decreasing the difference between the estimated hydrograph without augmentation and the 100 cfs target.

Evaluation of the estimated, non-augmentation hydrograph indicates about 10,300 ac-ft would have been required to sustain flows at the 100 cfs target during the low flow period between August 5 and the end of the Study on October 11. About 6,000 ac-ft of augmentation water flowed through the Historic Channel during this period. With flow augmentation, the deficit between observed flows and the 100 cfs target decreased to approximately 4,300 ac-ft over this period—augmentation water made up over half the volume needed to meet the flow target. This improvement to Historic Channel flows is consistent with results of the 2016 Pilot Study that estimated augmentation increased the period flows are above the target by about one third.

Further beneficial effects of augmentation on Historic Channel flows could be realized by minimizing releases from storage in July and early August that were initiated before flows dropped below the 100 cfs target. Between 400 and 500 ac-ft of augmentation water was released from storage at the start of the 2017 Pilot Study before flows dropped below the 100 cfs target on August 5. Had that 400 to 500 ac-ft been retained, augmentation releases could have been increased later in the season by 10 cfs for about 20 to 25 days.

Estimating Flows through the Historic Channel

An objective of the 2017 Pilot Study was to confirm assumptions used to estimate stream flows in the Historic Channel.

Real time flows for the Historic Channel measured at Structure 2 were not available. The Ecology Gauge at RM 2.2 was used as a proxy by subtracting 50 cfs from the recorded flow measurements, estimated to represent diversions by LNFH that bypass the Historic Channel and return downstream. Upon conclusion of the Study, USFWS provided 2017 daily mean discharge data for the Historic Channel measured through Structure 2. These data were compared to our assumption of the Ecology Gauge minus 50 cfs.

Figure 10 contains hydrographs for our estimated flows through the Historic Channel using the Ecology Gauge minus 50 cfs assumption and USFWS measurements at Structure 2. The data sets show strong agreement until flows dropped to about 130 cfs on August 10. From that point, USFWS-estimated flows were generally higher by up to about 20 cfs through August and September.

A single manual streamflow measurement was collected on August 25 in the Historic Channel, about 100 feet downstream of Structure 2 (Figure 10). The manual measurement indicated discharge of 87 cfs, compared to our estimate of 80 cfs and the USFWS estimate of 90 cfs (daily mean). These limited data suggest our assumption using the Ecology Gauge minus 50 cfs may underestimate flows in the Historic Channel, especially when flows are near or below the 100 cfs flow target. Considering that the USFWS estimates are daily mean values, include rounding error and error associated with manual streamflow measurement of at least 3 percent, our assumption appears to be sufficiently valid (and conservative) for analyzing effects of augmentation on Historic Channel flows. Additional data collection will be required to refine this conclusion and to resolve differences between the methods used to estimate flows.

Data Gaps

The following data gaps were identified based on the 2016 and 2017 Pilot Studies:

- **Real-time flows for the Historic Channel measured at Structure 2 were not available.** Ecology's Icicle Creek Gauge at RM 2.2 was used as a proxy by subtracting 50 cfs from the recorded flow, to account for estimated diversions by LNFH that bypass the Historic Channel. It is not clear why there were differences between Historic Channel flows based on our estimates using the Ecology Gauge and the USFWS measurements at Structure 2.
- **The fate of flow augmentation water is not fully understood.** Lag effects due to stream channel storage reduce the impact of augmentation flows in the Historic Channel. The effects of inputs from upstream sources and diversions by upstream water users are not fully understood.
- **The effects of augmentation water on stream flow in Icicle Creek are not fully understood.** Interpretation of the data were complicated by precipitation events and the absence of precipitation-recording stations within the Icicle Creek basin. The nearest precipitation recording station is the Fish Lake SNOTEL located in the Cle Elum River Basin, which is between 9 and 24 miles from the Alpine Lakes reservoirs.

- **Evaluation of impacts of flow releases on Bull Trout habitat** in French and Leland creeks is ongoing and will require additional study (WDFW, 2018).

Conclusions

The 2017 Pilot Study, in combination with data collected during the 2016 Pilot Study, provided promising results that water stored in the Alpine Lakes reservoirs can be used to effectively enhance stream flows in the Historic Channel. There were no fatal flaws identified. While flow augmentation from the Alpine Lakes reservoirs is not a total solution for achieving the IWG's flow targets in the Historic Channel, these studies indicate it may increase the period flows are above the target by about one third and account for over one half the volume required to meet the flow target. A follow up study is recommended to confirm and improve on findings of the 2017 Pilot Study and to resolve data gaps.

The following is a summary of conclusions from the 2017 Pilot Study, with comparisons to the 2016 Pilot Study:

- No fatal flaws were identified.
- Between 6,500 and 7,000 ac-ft are available for release from storage. An estimated total of 6,470 acre-feet was released from storage, which is about the same as that released during the 2016 Pilot Study.
- Nearly all the water in active storage was released, and active storage in all lakes was nearly drawn down. About 400 ac-ft remained in active storage amongst the lakes. Storage volumes estimated in 2016 were confirmed in 2017.
    - Storages volumes estimated by monitoring outflow rates in 2017 (~6,500 ac-ft) are within 10 percent of volumes previously estimated using bathymetric survey based on LiDAR and acoustical data (~7,700 ac-ft; Aspect, 2017b) when the volume remaining in active storage at the end of the Study (~400 ac-ft) is considered.
- The full volume in active storage may not be available for effective flow augmentation. Although about 400 ac-ft remained available in storage amongst the lakes, cumulative augmentation flows had decreased to less than 10 cfs when lake levels were drawn down at the end of the Study. This augmentation rate is not sufficient to substantially close the gap between late season low flows in Icicle Creek and the 100 cfs.
- Between 2,600 and 3,100 ac-ft of water donated to trust was not physically accessible from the lakes using existing reservoir infrastructure.
- While total volumes released in 2017 were about the same as in 2016, release volumes differed significantly at several lakes.
    - About 300 ac-ft more was released from Square Lake than in 2016 and the lake was drawn to within 2 feet of the outlet invert. Drawing down Square Lake was a priority to support inspection of the facility.
    - About 200 ac-ft more was released from Colchuck Lake primarily because a higher water level at the beginning of the study in 2017 allowed more releases.

  - About 500 ac-ft less was released from Eightmile Lake than in 2016. Outflows from Eightmile in the late season are controlled by natural seepage and the headgate that was set to a fixed position at the beginning of the Study. The lower volume released in 2017 is attributed to initiating the study more than 1 week later than the 2016 Pilot Study, an initial water level 1 foot lower than in 2016, and decreased inflows (precipitation and runoff) during the study period.

- Planned augmentation was not optimized due to limited access to lakes. This delayed making adjustments, contributing to about 400 ac-ft remaining in active storage at the end of the Study. Access to Square Lake by foot was inhibited by hazardous trail conditions, and access to Colchuck and Eigthmile lakes was limited for much of the season by the Jack Creek Fire.
- Quantities of water released for flow augmentation are not adequate to reverse or even keep up with the seasonally falling hydrograph. However, flow augmentation can slow the rate of decline, prolonging the period when flows remain above the target. Augmentation flows slowed rate of the seasonally falling hydrograph by an average of about 1 cfs per day, delaying the date when Icicle flows would have otherwise diminished to below the 100 cfs target by approximately 10 days.
- Augmentation flow rates were managed to conserve stored water so more would be available later in the season than in 2016. While this approach improved late season flows, it resulted in a lower peak augmentation rate and fewer days when flows were maintained above the 100 cfs target.
  - Augmentation flows of up to 75 cfs improved flows in the Historic Channel by about one half during critical low flow periods.
  - Augmentation extended Icicle Creek flows in the Historic Channel above the 100 cfs target for about 10 days compared to 3 weeks in 2016.
  - Augmentation flows equaled between 15 and 95 percent of discharge in the Historic Channel during critical low flow periods.
  - Augmentation releases account for over one half the volume needed to meet the 100 cfs flow target in the Historic Channel. The total volume of augmentation water flowing through the Historic Channel during the low flow period of about 6,000 ac-ft made up over half the difference between the estimate hydrograph without augmentation and the 100 cfs target of 10,300 ac-ft.
- Data gaps identified in 2016 were addressed, including:
  - Rating curves for outlet channels were improved by collecting additional discharge measurements to increase the accuracy of outflow rates and volume estimates. Rating curves still require improvement, specifically at the lower end of flow ranges.
  - Informing impacts of flow releases on Bull Trout habitat in French and Leland Creeks (WDFW, 2018).
- The method used to estimate flow in the Historic Channel during 2016 and 2017 appears valid for the purpose of this Study. However, differences between flows estimated using the Ecology Gauge (minus 50 cfs) and those estimated by the USFWS at Structure 2 require further refinement, validation, and calibration.

- Lag effects due to stream channel storage reduce the effects of augmentation flows in the Historic Channel. Flows released from storage were not proportional to changes observed in the Historic Channel hydrograph, and peaks in the hydrograph resulting from significant increases to augmentation flows were relatively small. More study is needed to understand the fate and timing of water released from storage.
- Minimal head gate operation may be required to maintain augmentation flows. Precipitation events had only short-term impacts to stream flows, suggesting there may be no need to close gates to conserve water following precipitation events. Once opened, head gates remained open for the duration of the study but required periodic adjustment (opened more) to maintain augmentation flow rates.
- Winter augmentation opportunities are limited. Lake hydrographs for the winter of 2016-2017 suggest storage volumes are less than 6,500 ac-ft. After filling in response to precipitation, Eightmile Lake emptied due to seepage in mid-winter, when precipitation turned to snow, and did not fill again until spring. Square and Colchuck lakes did not fill completely until the spring snow melt.

Recommendations

The following are recommended for a follow-on study to improve confidence in findings of the 2016 and 2017 Pilot Studies:

- With additional study, our assumption for using the Ecology Gauge minus 50 cfs could be used to accurately estimate flows in the Historic Channel, precluding the need to equip Structure 2 to collect real-time data. Data collection, including LNFH surface and groundwater diversion rates and discharge rates of return flows to Icicle Creek, could be used in conjunction with additional streamflow measurements taken downstream of Structure 2 to refine our assumption, especially during low-flow periods.
- Improve understanding of the fate of flow augmentation water. Lag effects due to stream channel storage reduce the impact of augmentation flows in the Historic Channel. Evaluate gaining/losing characteristics of tributaries draining the reservoirs and of mainstem Icicle Creek. Coordinate with USFWS to improve understanding of releases from Snow Lakes. Continue coordination with USFWS, IPID, Cascade Orchards Irrigation Company, and the City of Leavenworth to quantify diversions occurring upstream of the Historic Channel.
- Establish a precipitation recording station closer to the reservoirs (preferably within the Alpine Lakes Wilderness) to improve measurement of the magnitude and timing of precipitation to understand its effects on stream flows.
- Continue improving rating curves. Increase the accuracy of outlet channel discharge rate estimates for low flows by measuring stream flows in the fall.
- Account for declining outflow rates from reservoirs due to drawdown. Flow augmentation planning should consider adjusting outflow rates to account for changes on at least a weekly basis. Automating control structures to make minor adjustments to head gates every few days would mitigate decreasing outflow rates.
- Consider limiting early season releases from storage to save water for later in the season. Both the 2016 and 2017 studies showed there is not enough augmentation water in storage to meet

the 100 cfs target for the entire low-flow season. Therefore, substantial augmentation occurring before flows drop below the 100 cfs target should be avoided to conserve water for later in the season:

  - Releases from Square Lake should be prioritized earlier in the augmentation season to avoid water remaining in storage at the end of the season. Flows in Leland Creek, which drains Square Lake, are limited to 10 cfs after September 15.
  - Leakage and the inability to control the submerged head gate at Eightmile Lake limit options for retaining stored water. Repairing the Eightmile Lake dam may increase conservation of stored water allowing greater flexibility for water management to meet late season flow targets.

- Augmentation could be increased by improving infrastructure to access the full trust donation volume. Additional study will be required to evaluate potential improvements to infrastructure.
- Continue to support WDFW in assessing impacts of release flows on Bull Trout habitat in French and Leland creeks that drain Square and Klonaqua lakes based on WDFW (2018):
  - Evaluate opportunities to provide greater temperature benefits in Icicle tributaries by performing lake depth temperature profiles.
  - Conduct additional habitat and fish presence studies to create an adaptive release model that can aid in timing and magnitude of release for both tributary and mainstem Icicle Creek benefit

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Washington Department of Fish and Wildlife (WDFW), 2018, Alpine Lakes Flow Augmentation Pilot Study 2017, Icicle Creek Tributary Monitoring Report, Washington Department of Fish and Wildlife Water Science Team Habitat Program- Science Division, January 2018.

Limitations

Work for this project was performed for the Chelan County Natural Resources Department (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

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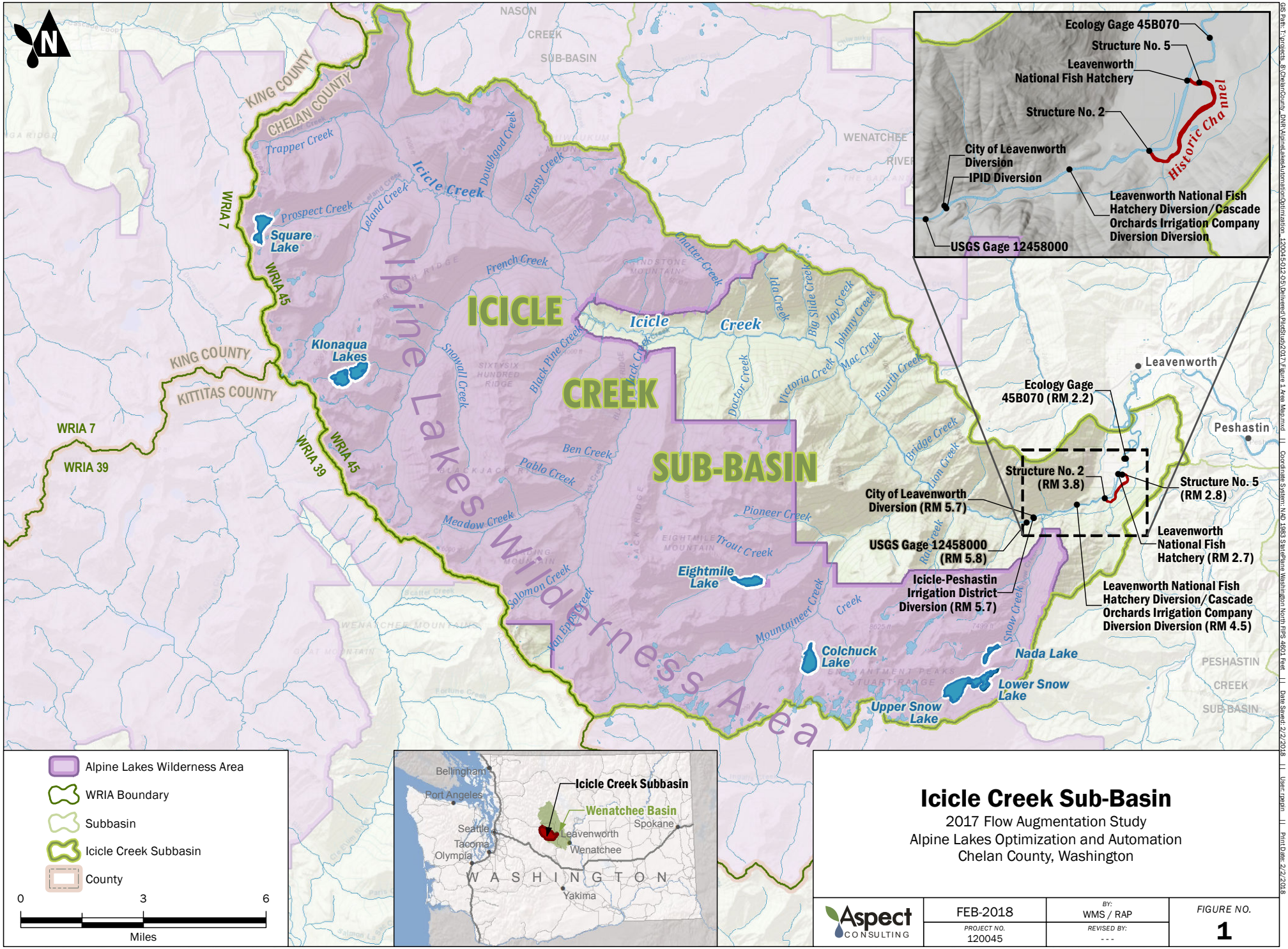
Attachments:
Figure 1 – Icicle Creek Sub-Basin
Figure 2 – Stage-Flow Curves
Figure 3 – 2017 Flow Augmentation, Volumes, and Flow Rates
Figure 4 – Cumulative Augmentation Flow
Figure 5 – 2017 Lake Hydrographs
Figure 6 – Year Round Hydrograph
Figure 7 – Historic Channel Hydrograph
Figure 8 – Augmentation Contribution to Historic Channel
Figure 9 – Effects of Augmentation on Historic Channel Flow
Figure 10 – USFWS Measured Flows at Structure 2
Appendix A – WDFW (2018) Icicle Creek Tributary Monitoring Report

FIGURES



Icicle Creek Sub-Basin

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

Aspect Consulting	FEB-2018	BY: WMS / RAP	FIGURE NO. 1
	PROJECT NO. 120045	REVISED BY: ---	

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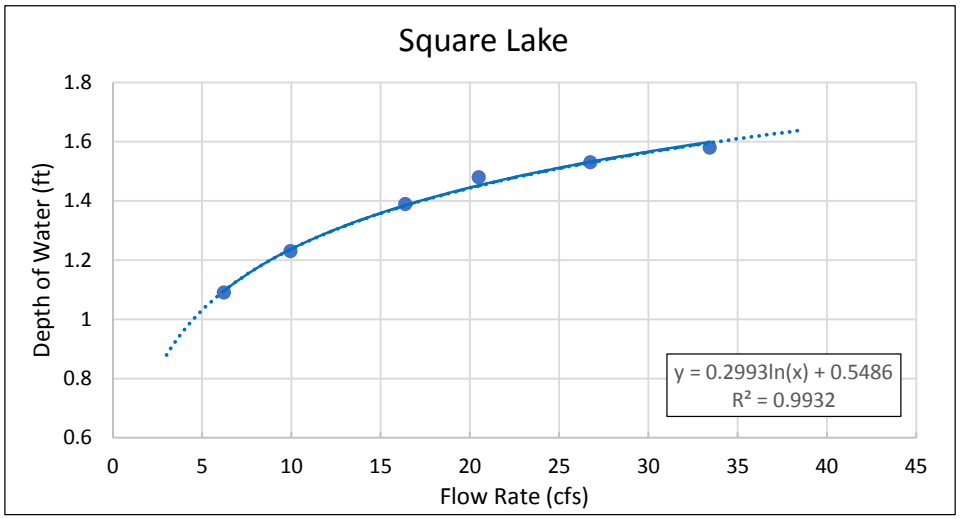

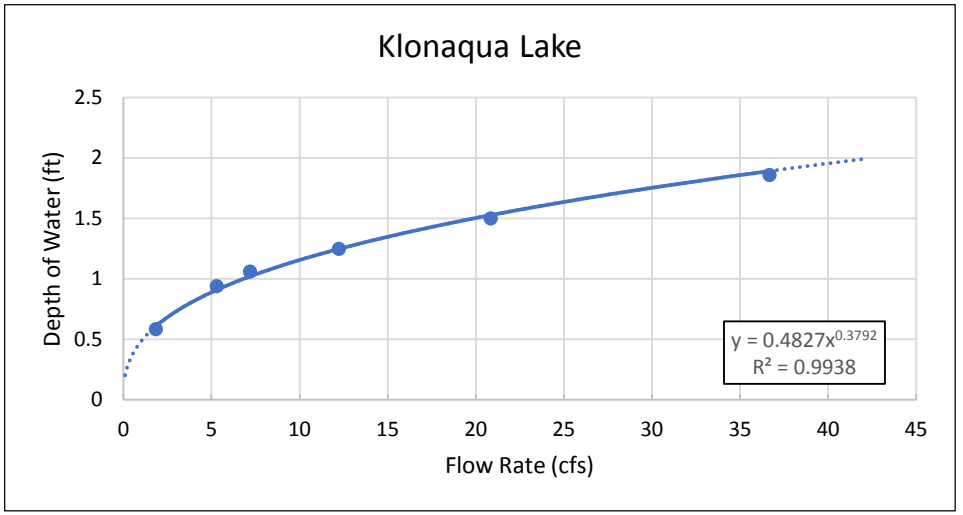

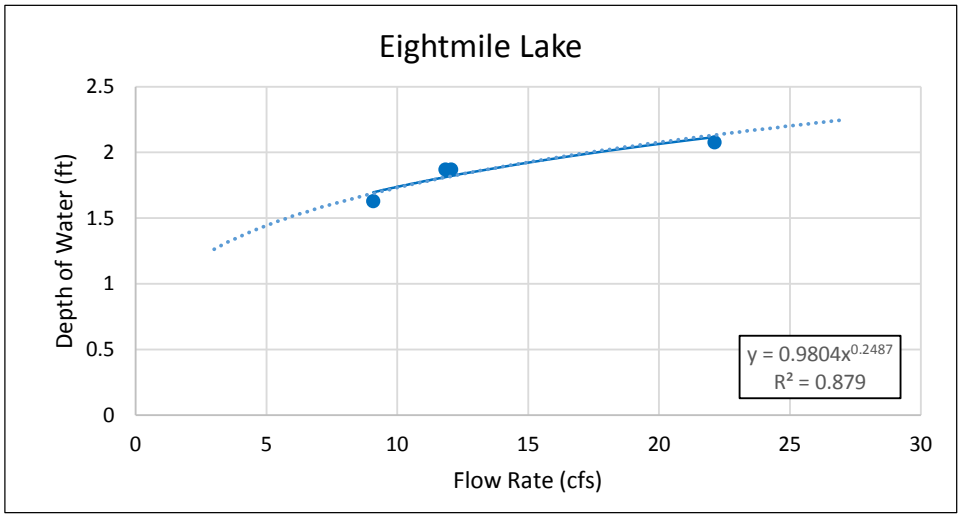

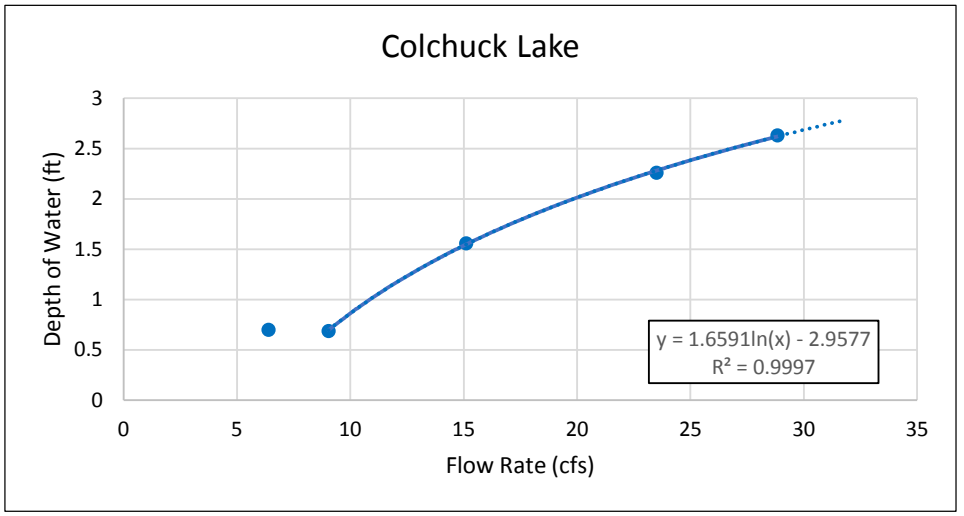

Measured Discharge — Measured Discharge Curve — Extrapolated

Stage-Flow Curves

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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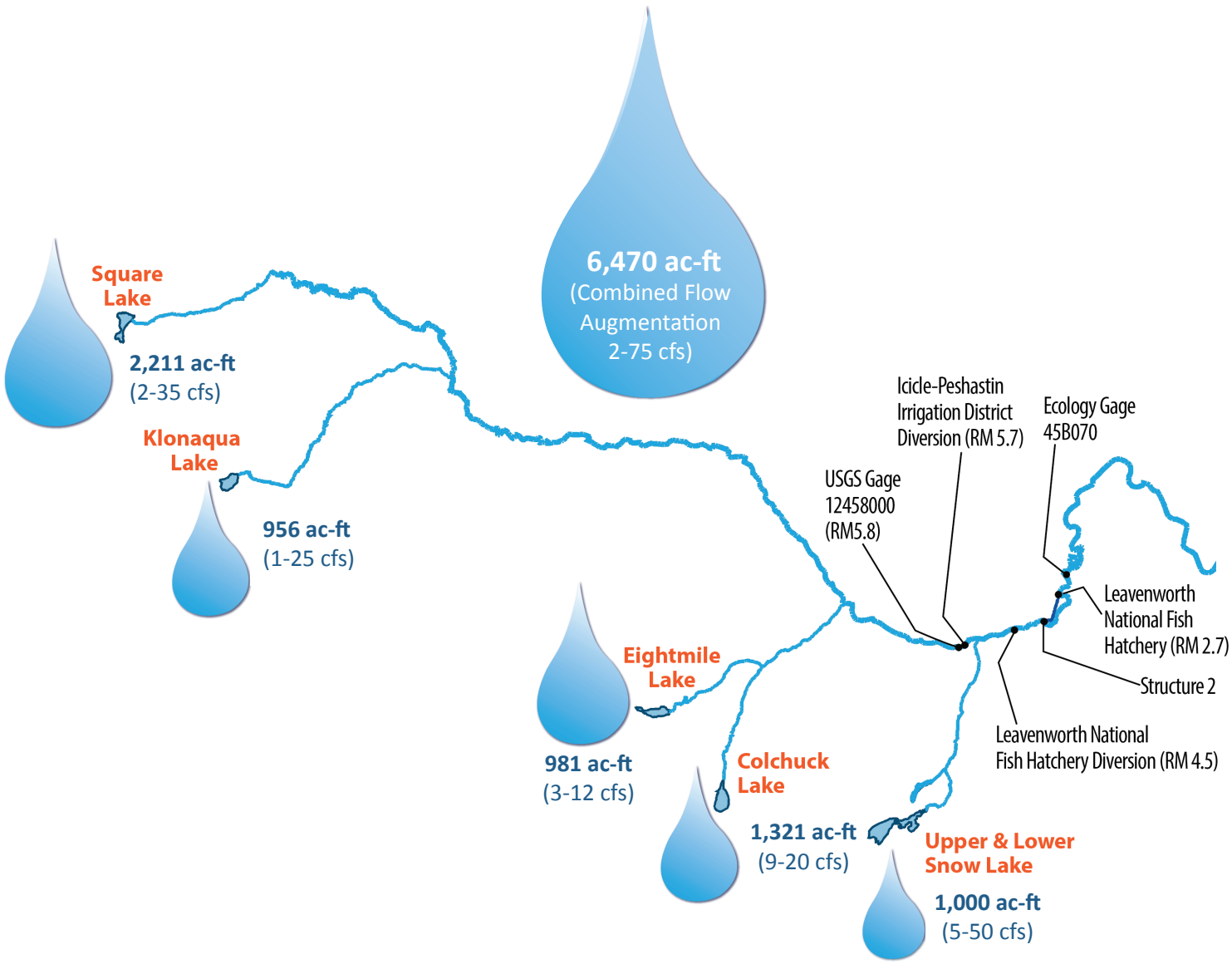

2017 Flow Augmentation, Volumes and Flow Rates

Feasibility Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

Aspect CONSULTING	NOV-2017	BY: WMS / EAC	FIGURE NO. 3
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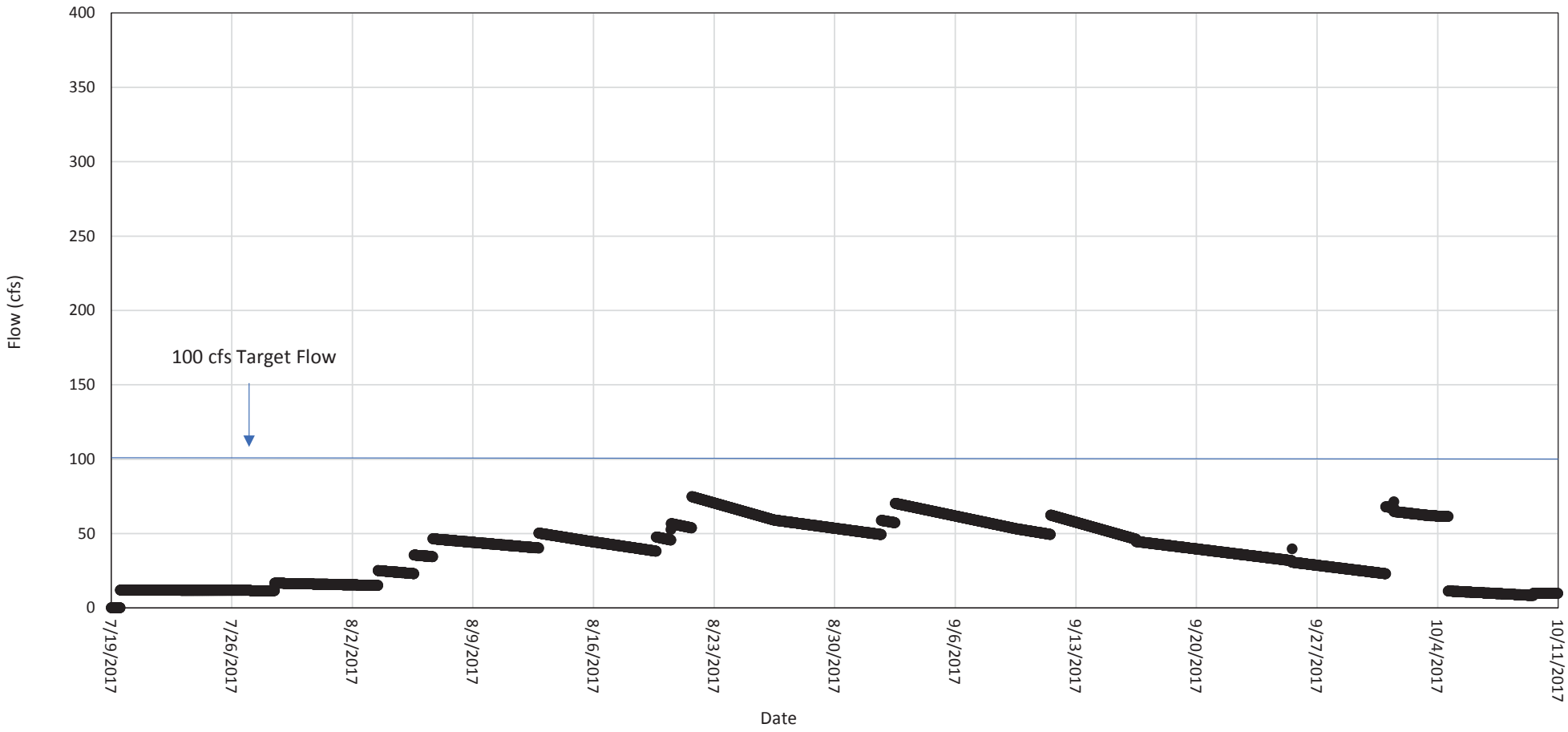

Cumulative Augmentation Flow

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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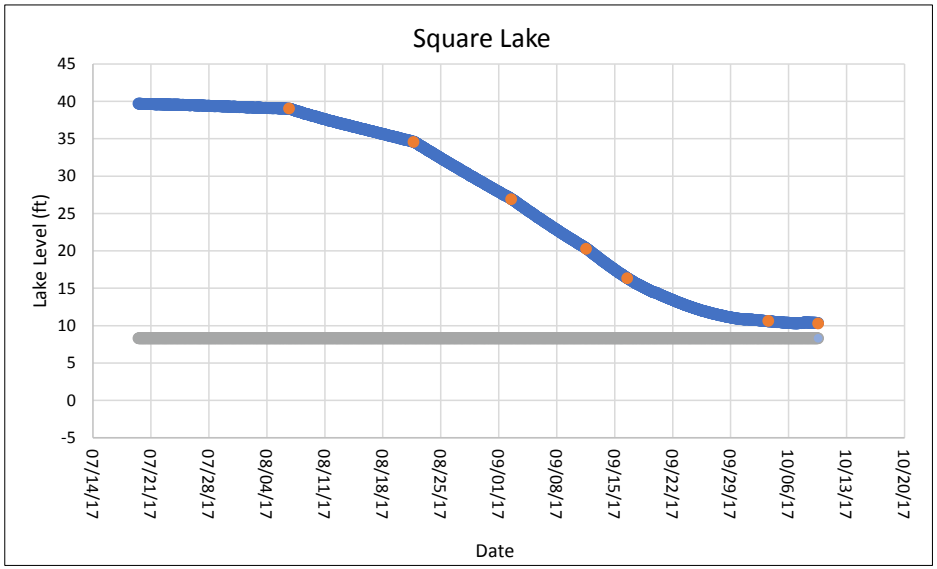

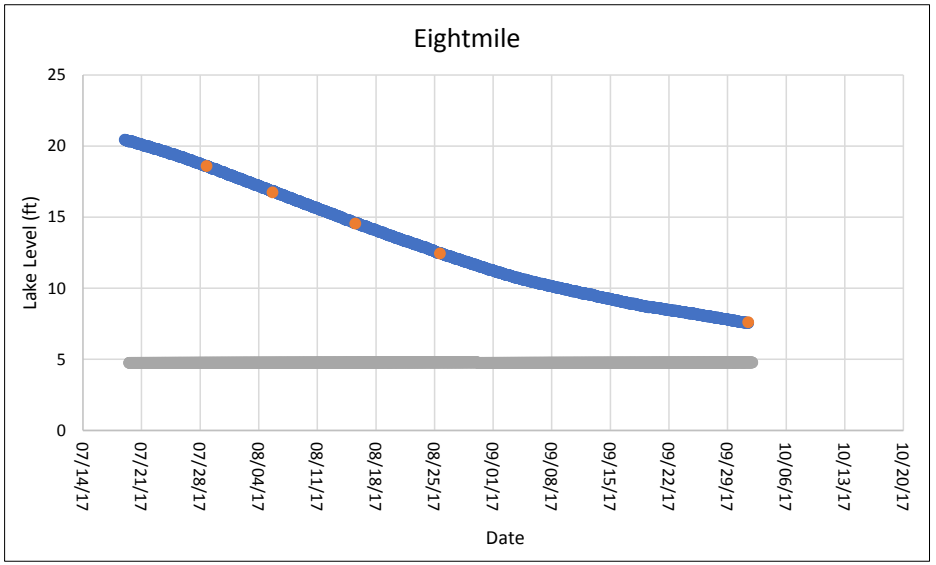

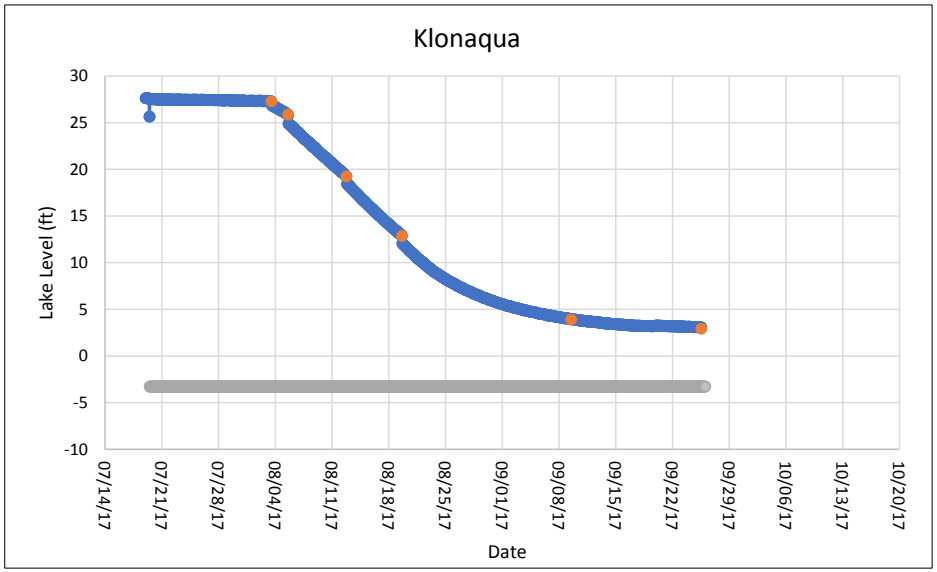

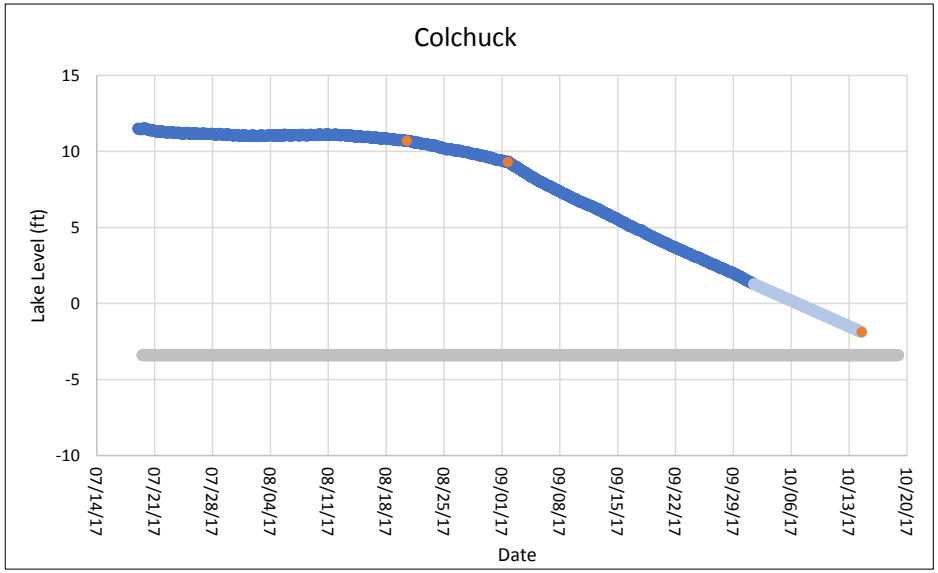

Pressure Transducer Measurement

Manual Measurement

Estimated Lake Stage

Invert

Note: Transducers are located at y = 0 for all hydrographs.

2017 Lake Hydrographs

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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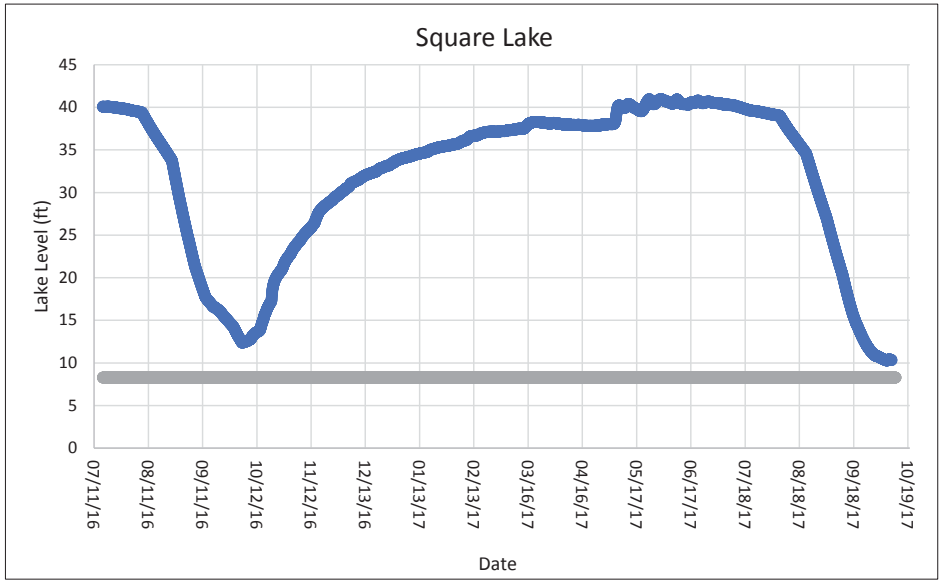

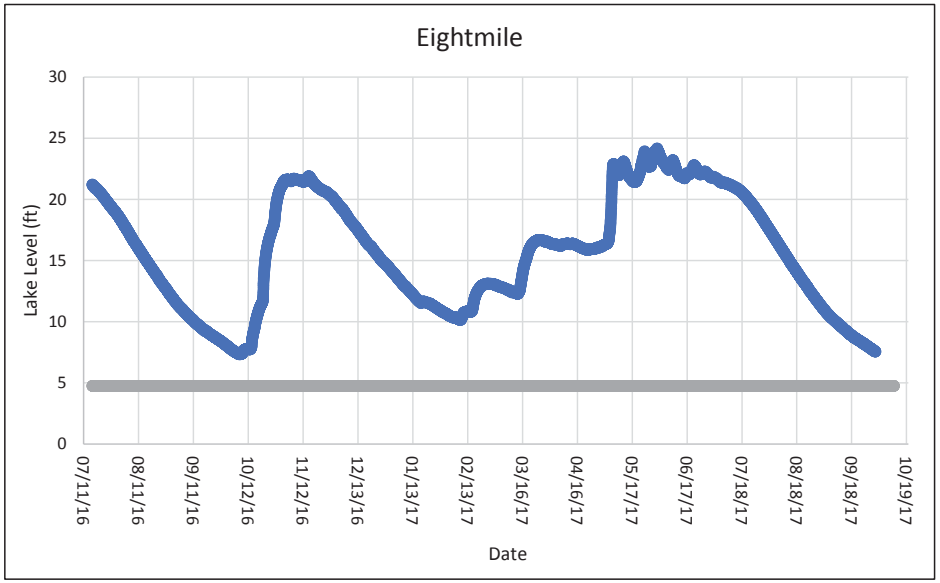

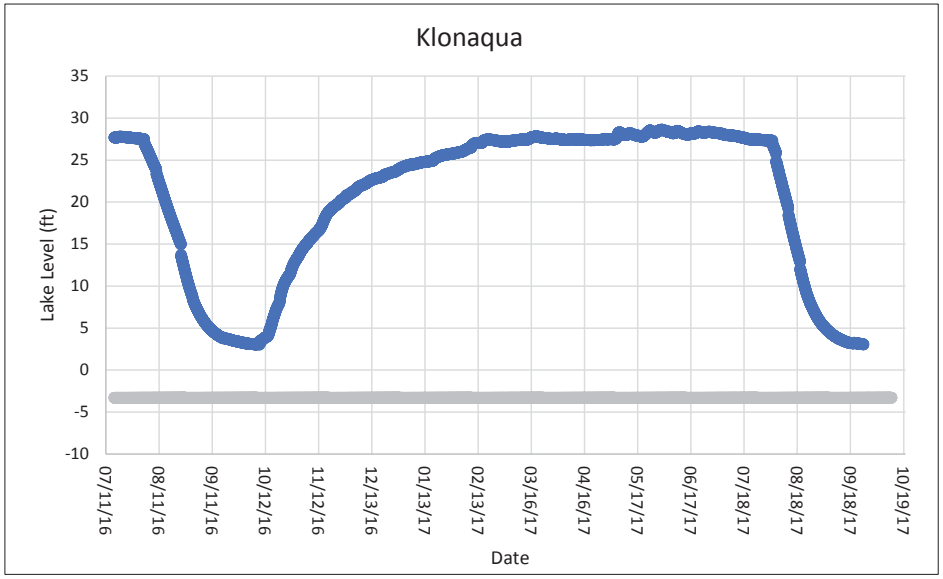

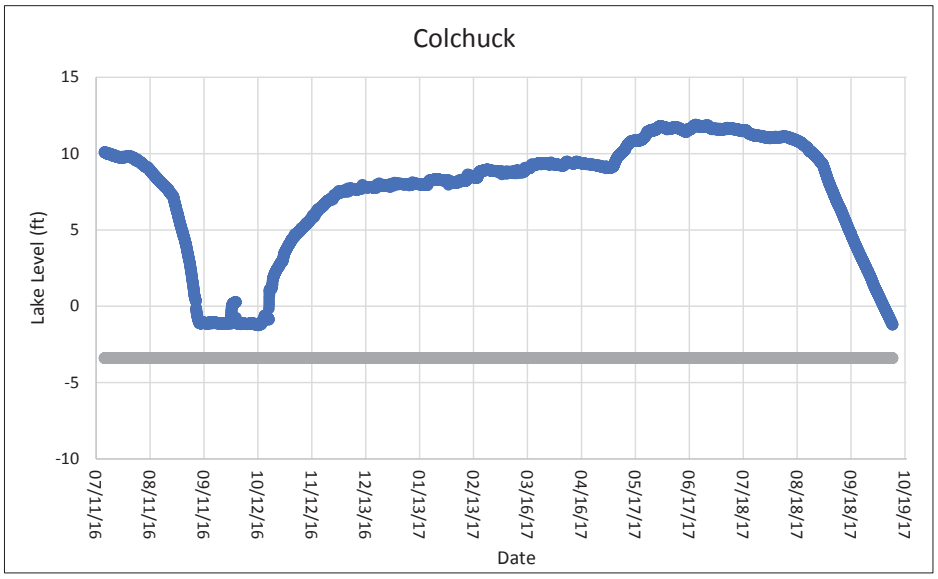

Pressure Transducer Measurement

Invert

Year Round Hydrograph

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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	PROJECT NO. 120045	REVISED BY: ---	

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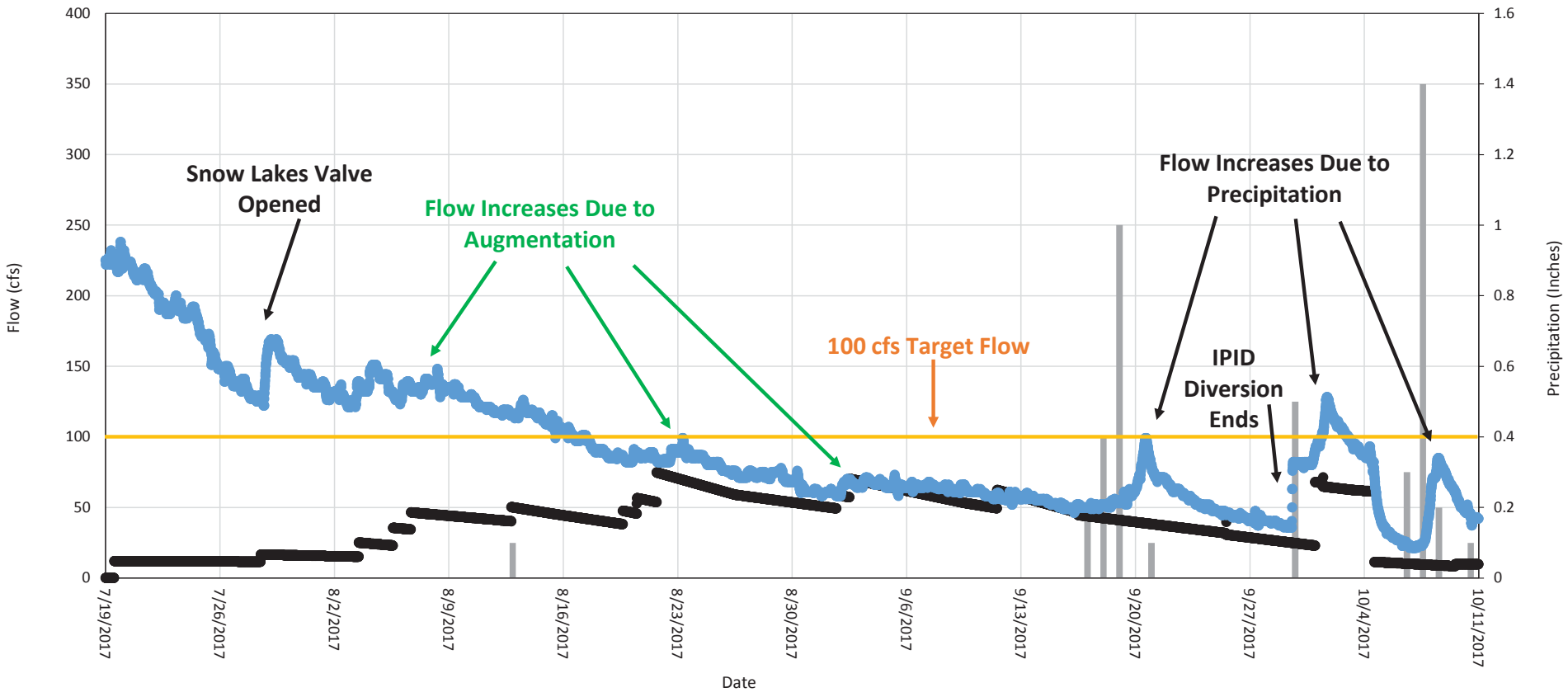

Recorded Precipitation at Fish Lake Snotel

Flow at Structure 2

Cumulative Augmentation Flow

Historic Channel Hydrograph

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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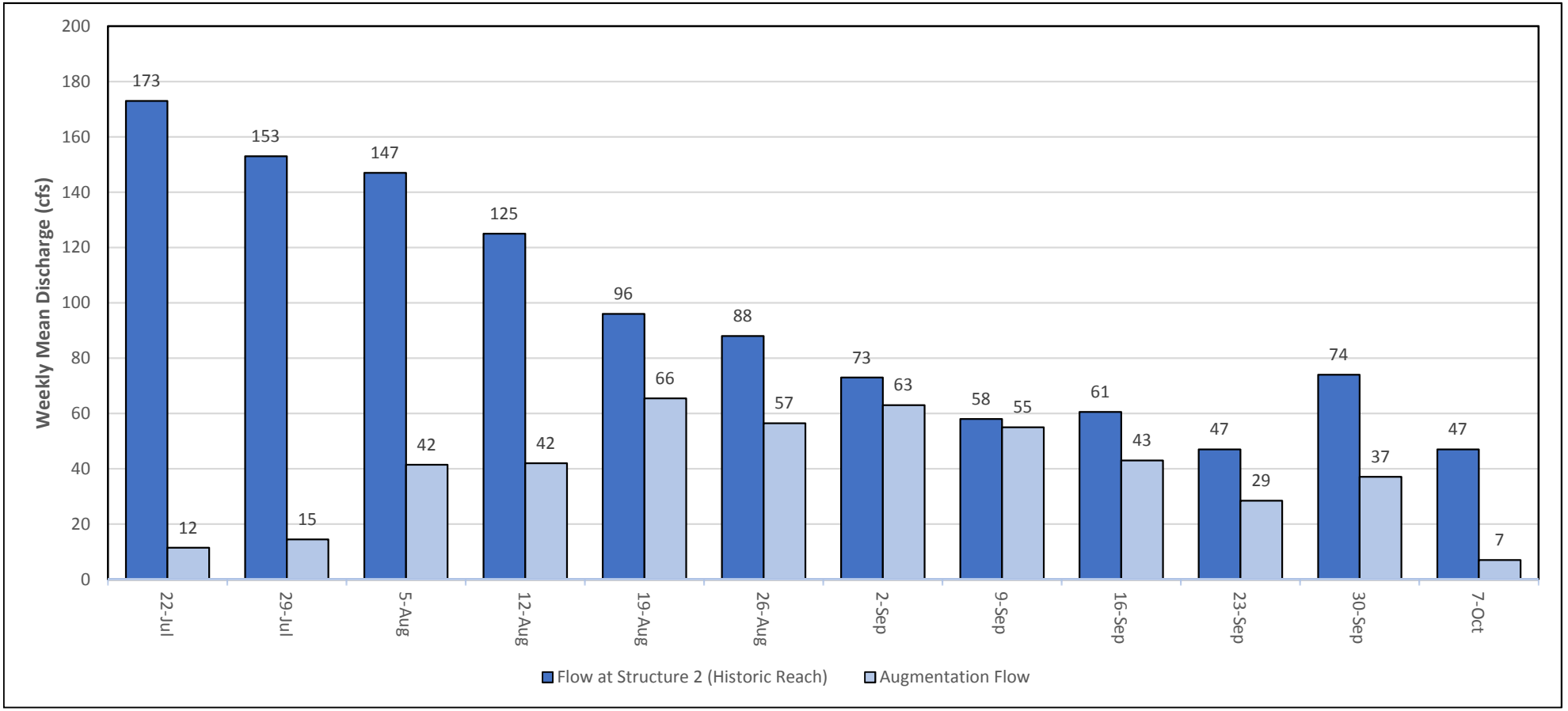

Augmentation Contribution to Historic Channel

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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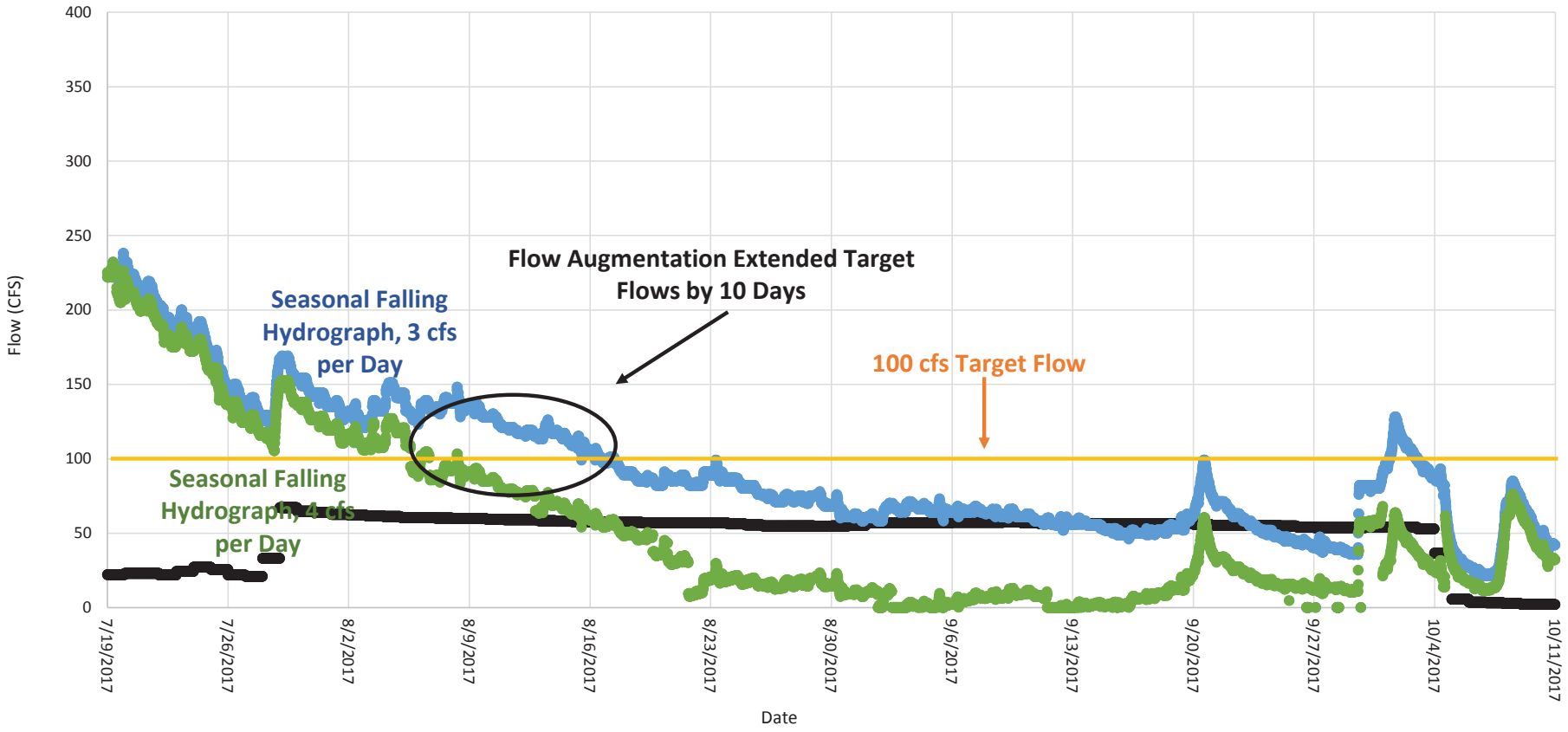

Flow at Structure 2

Estimated Flow without Augmentation

Effects of Augmentation on Historic Channel Flow

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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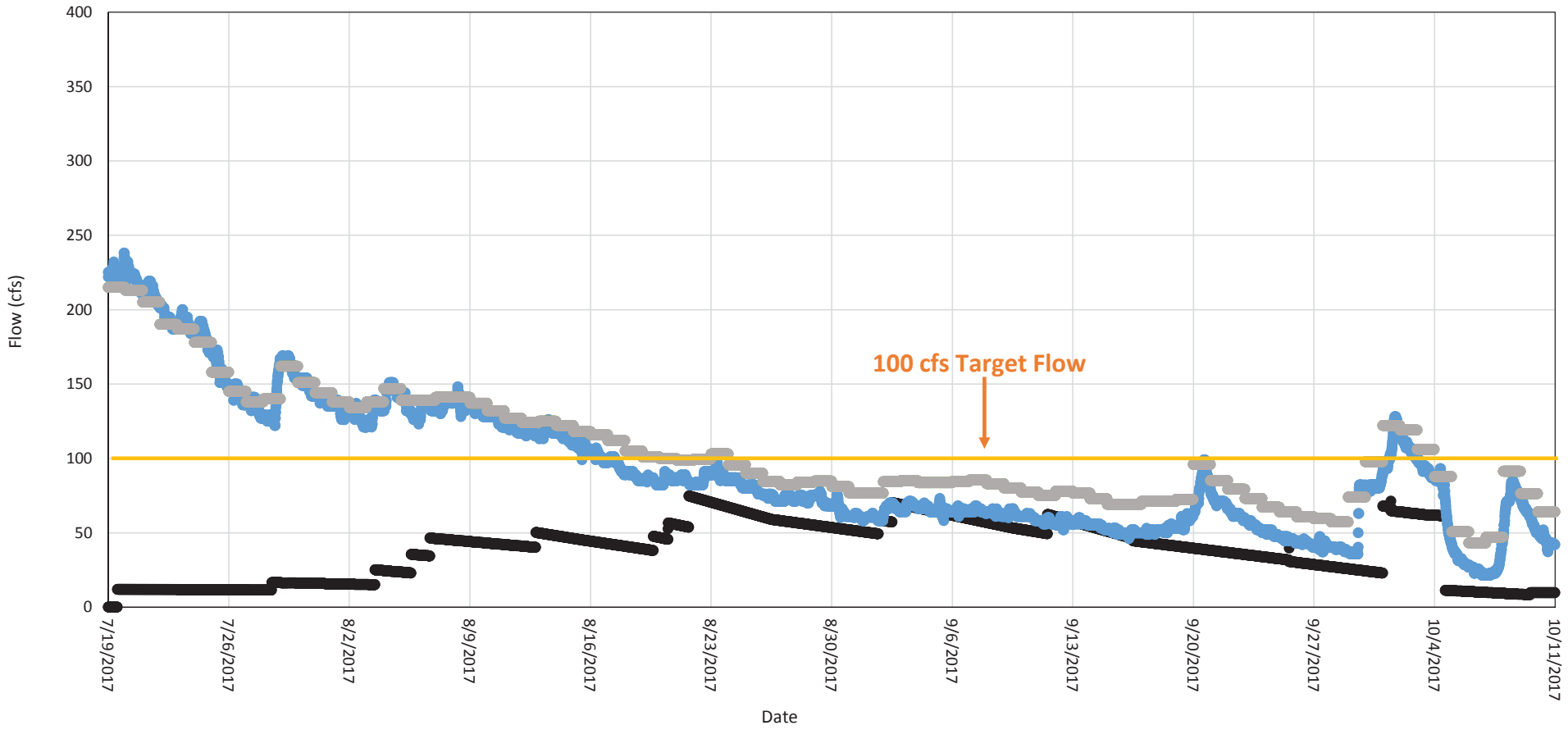

Structure 2 Flows Estimated from Ecology Gauge

USFWS Measured Flows at Structure 2

Cumulative Augmentation Flow

USFWS Measured Flows at Structure 2

2017 Flow Augmentation Study
Alpine Lakes Optimization and Automation
Chelan County, Washington

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APPENDIX A

WDFW (2018)
Icicle Creek Tributary
Monitoring Report

Alpine Lakes Flow Augmentation Pilot Study 2017

Icicle Creek Tributary Monitoring Report

Washington Department of Fish and Wildlife
Water Science Team
Habitat Program – Science Division

Robert Granger

Javan Bailey, Steven Boessow, Kiza Gates, Jonathan Kohr, and Cole Provence

January 17, 2018

Table of Contents

List of Figures…… p ii

List of Tables……. p iii

Introduction…… p 1

2016 Pilot Study Monitoring Data……. p 1

Study Area…….. p 2

Methods:

Discharge…… p 5

Water Temperature……. p 6

Water Chemistry……. p 6

Results:

French Creek Discharge…….. p 7

French Creek Water Temperature……... p 9

French Creek Water Chemistry……..... p 13

Leland Creek Discharge…… p 13

Leland Creek Water Temperature……. p 16

Leland Creek Water Chemistry……. p 18

Discussion…….. p 20

List of References…….. p 22

List of Figures

Figure 1. Map of the French Creek watershed including monitoring locations……. p 3

Figure 2. Map of the Leland Creek watershed including monitoring locations……. p 4

Figure 3. Cole Provence measuring discharge on French Creek (RM 4.25) October 17, 2017. p 5

Figure 4. Kiza Gates and Javan Bailey measuring discharge on Leland Creek July 25, 2017... p 5

Figure 5. Jonathan Kohr and Javan Bailey deploying a water temperature logger in Icicle Creek July 26, 2017……..... p 6

Figure 6. Robert Granger preparing a water temperature logger for deployment in Icicle Creek upstream of Leland Creek July 26, 2017……. p 6

Figure 7. French Creek daily mean discharge hydrograph at RM 4.25…….. p 7

Figure 8. Klonaqua Lake daily mean augmentation flow release hydrograph……... p 8

Figure 9. Combined hydrographs for French Creek (RM 4.25), Klonaqua Lake augmentation flow releases, and estimated natural hydrograph for French Creek at RM 4.25…..……... p 9

Figure 10. French Creek and Klonaqua Creek daily mean water temperature near confluence..... p 10

Figure 11. Water temperature of augmentation flow releases from Klonaqua Lake, French Creek, and Klonaqua Creek (lake temperature data courtesy of Aspect Consulting)……... p 11

Figure 12. Klonaqua lake augmentation flow, Snowall Creek water temperature, and French Creek water temperature…… p 12

Figure 13. Icicle Creek daily mean water temperature near confluence with French Creek (RM 0.10)……... p 12

Figure 14. Leland Creek daily mean discharge hydrograph at RM 0.10…….. p 14

Figure 15. Square Lake daily mean augmentation flow release hydrograph…… p 15

Figure 16. Combined hydrographs for Leland Creek (RM 0.10), Square Lake augmentation flow releases, and estimated natural hydrograph for Leland Creek at RM 0.10……..... p 16

Figure 17. Square Lake augmentation flow, Leland Creek water temperature, and Prospect Creek water temperature near confluence…….. p 17

Figure 18. Augmentation flow releases from Square Lake, Leland Creek water temperature, and Prospect Creek water temperature (lake temperature data courtesy of Aspect Consulting)….. p 17

Figure 19. Icicle Creek daily mean water temperature near confluence with Leland Creek… p 18

List of Tables

Table 1. 2016 flow data for the French and Leland Creek watersheds……... p 2

Table 2. 2016 water chemistry data for the French and Leland Creek watersheds……. p 2

Table 3. French Creek watershed data logger locations…….. p 3

Table 4. Leland Creek watershed data logger locations…….. p 4

Table 5. Snowall Creek and French Creek manual discharge measurements…….. p 11

Table 6. French Creek watershed water chemistry……... p 13

Table 7. Leland Creek watershed water chemistry……... p 19

Table 8. Icicle Creek discharge and water chemistry data summary upstream of confluence with Leland Creek…….. p 19

Introduction

Following preliminary data collection efforts during the Alpine Lakes Flow Augmentation Pilot Study in 2016, it was determined that additional data was needed in order to gain a better understanding of the influence of augmentation flows on tributaries to Icicle Creek. Two tributaries (French and Leland Creek), which deliver flow to Icicle Creek from Klonaqua and Square Lake (respectively) were identified as priorities in the data collection effort. Prior to the 2016 augmentation effort, concerns regarding bull trout populations residing in these Icicle Creek tributaries prompted discussions regarding additional data needs to inform management decisions of flow releases from the Alpine Lakes. In response to those discussions, and preliminary monitoring and observations in 2016, a monitoring strategy was developed for the 2017 Pilot Study.

The primary goals of the monitoring strategy were to better understand the natural flow and temperature regimes in French and Leland creeks, and to identify how augmentation flows influence those regimes. To achieve this, the monitoring strategy incorporated a network of continuous flow and water temperature monitoring devices deployed at key sites intended to capture the range of conditions throughout the French and Leland creek watersheds. Additional data collection included spot measurements of various water chemistry parameters as well as manual flow and water temperature measurements.

In late-July of 2017, WDFW Water Science Team staff implemented the monitoring strategy, which began prior to augmentation releases from Klonaqua and Square lakes, and continued through mid-October after augmentation was completed for the season. Note that all River Mile (RM) estimates are approximate.

2016 Monitoring Data

In 2016 monitoring efforts were minimal, but provided initial orientation of the French and Leland Creek watersheds, and were necessary in developing a more robust monitoring strategy for the 2017 Pilot Study. Discharge, water temperature, and water chemistry data were collected at several sites in the French and Leland Creek drainages (including one site on Icicle Creek). Table 1 provides a summary of flow and water temperature data collected at transect locations. Table 2 provides water chemistry data collected at those same locations. The 2016 data are limited in nature and are not used for comparison to 2017 data in this report, however are provided for reference.

Table 1. 2016 flow data for the French and Leland Creek watersheds.

Icicle Creek Tributary Flow Monitoring 2016				
Date	**Creek Name**	**River Mile**	**Discharge (cfs)**	**Water Temp (°C)**
09/19/16	French Creek	0.10	12.56	8.70
09/19/16	French Creek	2.85	13.53	8.50
09/19/16	French Creek	5.50	6.50	8.10
09/19/16	Klonaqua Creek	0.10	2.98	8.60
09/20/16	Leland Creek	1.60	10.30	7.60
09/20/16	Prospect Creek	0.20	8.92	8.60
09/21/16	Leland Creek	0.10	19.24	5.90
09/21/16	Icicle Creek	28.0	7.86	6.00
10/25/16	French Creek	2.85	83.50	4.80
10/25/16	French Creek	4.45	47.91	5.10
11/04/16	Leland Creek	0.10	53.81	4.40
11/04/16	Icicle Creek	28.0	50.98	4.80

Table 2. 2016 water chemistry data for the French and Leland Creek watersheds.

Icicle Creek Tributary Water Chemistry Monitoring 2016								
Date	**Stream**	**River Mile**	**pH**	**Conductivity (µS)**	**Total Dissolved Solids (ppm)**	**Salinity (ppm)**	**DO %**	**DO mg/L**
09/19/16	French Creek	0.10	8.58	51.50	36.50	25.00	N/A	N/A
09/19/16	French Creek	2.85	8.16	51.60	36.60	25.00	N/A	N/A
09/19/16	French Creek	5.50	8.22	35.60	25.20	17.80	N/A	N/A
09/19/16	Klonaqua Creek	0.10	7.91	22.20	14.30	12.20	N/A	N/A
09/20/16	Leland Creek	1.60	8.24	43.80	31.10	21.10	N/A	N/A
09/20/16	Prospect Creek	0.20	8.13	27.60	19.60	14.60	N/A	N/A
09/21/16	Leland Creek	0.10	8.26	36.50	25.90	16.90	N/A	N/A
09/21/16	Icicle Creek	28.0	8.09	31.50	22.30	14.80	N/A	N/A
10/25/16	French Creek	2.85	8.16	40.20	28.60	19.50	93.60	11.98
10/25/16	French Creek	4.45	7.99	28.90	20.50	14.30	92.50	11.79
11/04/16	Leland Creek	0.10	8.98	32.30	22.90	14.10	92.00	11.93
11/04/16	Icicle Creek	28.0	8.08	21.80	15.40	9.80	89.50	11.40

2017 Study Area

French Creek Watershed

French Creek is a right bank tributary to Icicle Creek at RM 21.6. The reach of primary interest was from the confluence with Icicle Creek to just upstream of the confluence with Klonaqua Creek, which is a left bank tributary to French Creek at RM 5.35. Locations were selected for

continuous flow and water temperature monitoring to capture the influence of augmentation flows delivered from Klonaqua Lake via Klonaqua Creek into French Creek, and ultimately Icicle Creek (Table 3 and Figure 1). Additional monitoring was conducted in Snowall Creek, a right bank tributary to French Creek at RM 4.35.

Table 3. French Creek watershed data logger locations.

Creek Name	Location	Data Logger Type
Icicle Creek	100 meters DS of French Creek	Water Temperature
Icicle Creek	50 meters US of French Creek	Water Temperature
French Creek	RM 0.10	Water Temperature
French Creek	RM 4.25	Water Level and Temperature
French Creek	RM 4.25	Barometric Pressure and Temperature
Snowall Creek	25 meters US of French Creek	Water Temperature
French Creek	RM 4.45	Water Temperature
French Creek	RM 5.50	Water Temperature
Klonaqua Creek	RM 0.10	Water Temperature

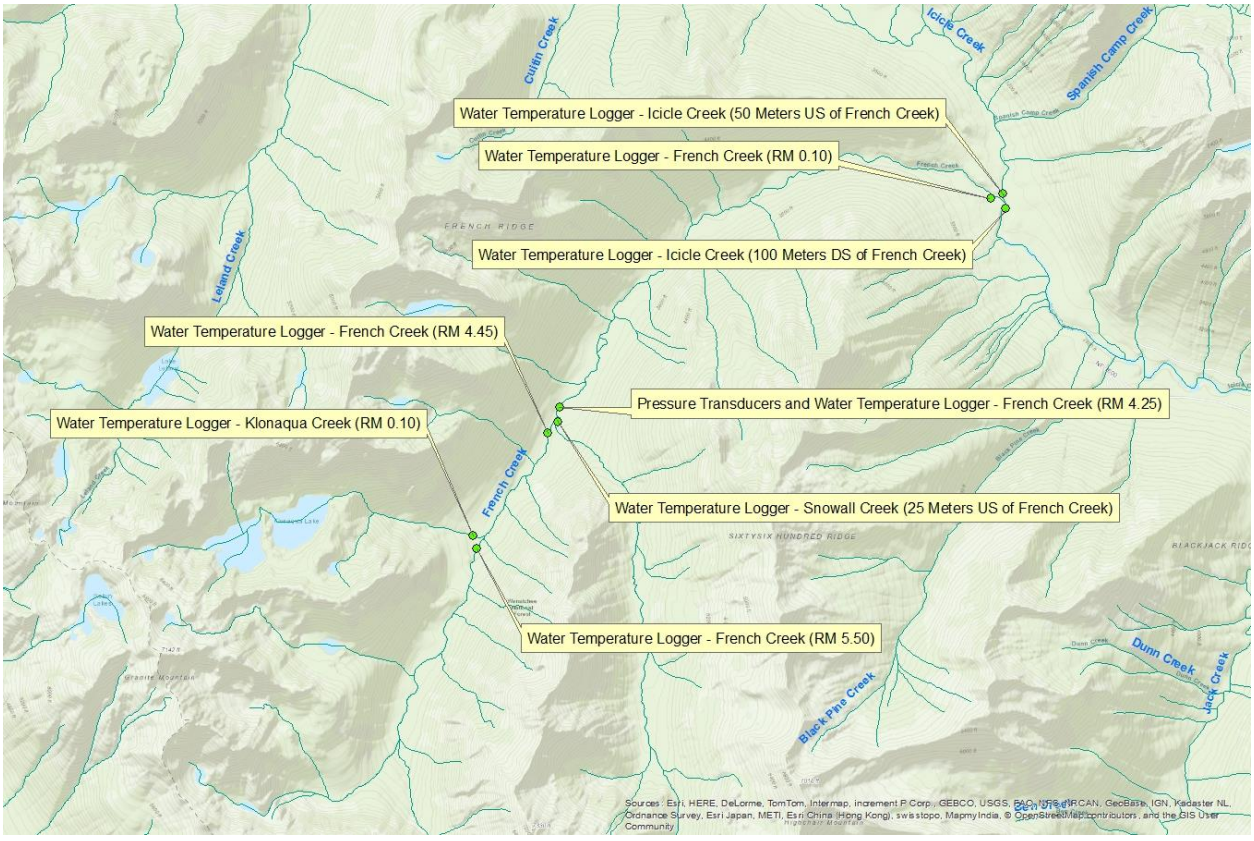

Figure 1. Map of the French Creek watershed including monitoring locations.

Leland Creek Watershed

Leland Creek is a right bank tributary to Icicle Creek at RM 27.9. The primary reach of interest was from the confluence with Icicle Creek to just upstream of the confluence with Prospect Creek, which is a left bank tributary to Leland Creek at RM 1.50. The following locations (Table 4 and Figure 2) were selected for continuous flow and water temperature monitoring to capture the influence of augmentation flows delivered from Square Lake via Prospect Creek into Leland Creek, and ultimately Icicle Creek.

Table 4. Leland Creek watershed data logger locations.

Creek Name	Location	Data Logger Type
Icicle Creek	25 meters DS of Leland Creek	Water Temperature
Icicle Creek	40 meters US of Leland Creek	Water Temperature
Leland Creek	RM 0.10	Water Level and Temperature
Leland Creek	RM 0.10	Barometric Pressure and Temperature
Leland Creek	RM 1.40	Water Temperature
Leland Creek	RM 1.60	Water Temperature
Prospect Creek	RM 0.20	Water Temperature

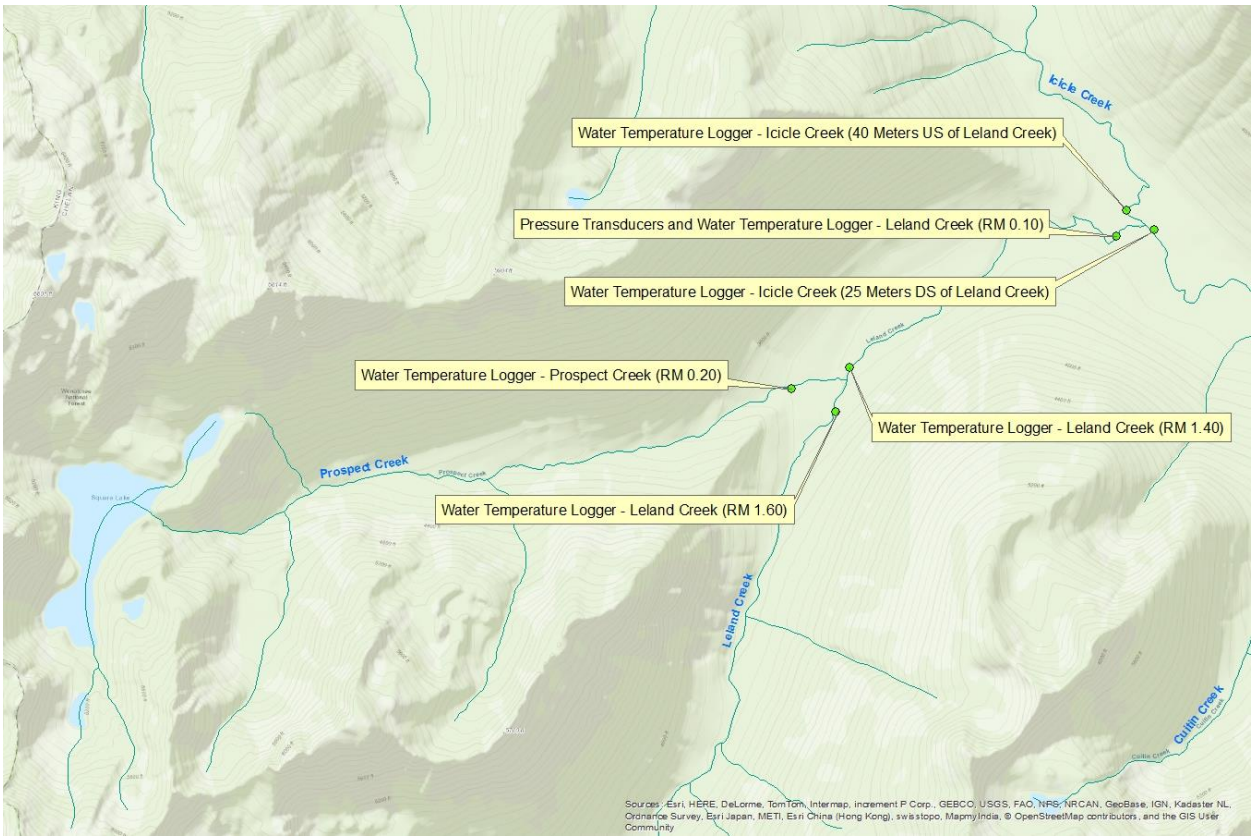

Figure 2. Map of the Leland Creek watershed including monitoring locations.

Methods

Continuous Discharge

Continuous discharge was obtained for French Creek (RM 4.25), and Leland Creek (RM 0.10). HOBO U20-001-04 Water Level Loggers (pressure transducers) were deployed instream for absolute pressure and water temperature readings (15-minute logging intervals) at locations determined to be of suitable depth, and not subject to becoming dewatered or lost to a high flow event. HOBO U20-001-04 Water Level Loggers were also deployed out of water at both locations, and adjacent to instream data loggers for barometric pressure and ambient temperature readings (15-minute logging intervals). Barometric pressure compensation was used to correct for error in water level readings associated with changes in atmospheric conditions.

Pressure transducers were deployed in French Creek during the initial site visit on July 27, and retrieved on October 17, 2017. Pressure transducers were deployed in Leland Creek on July 25, and retrieved on October 18, 2017. A total of five site visits were conducted throughout the deployment period for both French and Leland creeks to obtain manual discharge measurements. In addition, a reference water level measurement was obtained during each site visit for; 1) conversion of pressure data to water level (stage height), and 2) establishing discharge rating curves for each location.

Manual discharge measurements were obtained by extending a 100 ft. measuring tape perpendicular to the flow, and secured to both stream banks (Figures 3 and 4). Twenty-five to thirty depth and velocity measurements were collected along the transect using a HACH FH950 portable flow meter and graduated top setting wading rod. Depth and velocity measurements were then used to calculate total discharge (Cubic Feet per Second). Reference water level measurements, and the manual discharge calculations were used to obtain a stage/discharge relationship (rating curve). The rating curve was then applied to the continuous stage data to develop hydrographs for each of the two sites.

Figure 3. Cole Provence measuring discharge on French Creek (RM 4.25) October 17, 2017.

Figure 4. Kiza Gates (left) and Javan Bailey (right) measuring discharge on Leland Creek (RM 0.10) July 25, 2017.

Water Temperature Monitoring

Eight sites in the French Creek watershed were selected for continuous water temperature monitoring, and six sites were selected in the Leland Creek watershed. At each of the fourteen sites, either one or two HOBO Pro v2 water temperature loggers were deployed and programmed to record at 15-minute logging intervals. At sites where pressure transducers were deployed and already recording water temperature, an additional temperature logger was deployed as a secondary in the event of lost or failed equipment. Water temperature data was compared between each pair of data loggers deployed at a given site for reading accuracy. Only two sites had a single temperature logger deployed; Snowall Creek near the mouth and French Creek at RM 4.45.

Temperature loggers were secured to an object on the bank with a lightweight nylon rope then submerged below the water surface utilizing anything that was naturally available (Figures 5 and 6). Temperature loggers in the French Creek watershed were deployed between July 26 and 27, and retrieved on October 17, 2017. Temperature loggers in the Leland Creek watershed were deployed between July 25 and 26, and retrieved on October 18, 2017.

Figure 5. Jonathan Kohr (left) and Javan Bailey (right) deploying a water temperature logger in Icicle Creek downstream of French Creek July 26, 2017.

Figure 6. Robert Granger preparing a water temperature logger for deployment in Icicle Creek upstream of Leland Creek July 26, 2017.

Water Chemistry

Water chemistry data was collected when manual discharge measurements were conducted, and included water temperature (°C), dissolved oxygen (mg/L), pH, conductivity (µS), total dissolved solids (ppm), and salinity (ppm). Either a SPER SCIENTIFIC Dissolved Oxygen Pen – 855045, or a YSI 550A Dissolved Oxygen meter was used for DO measurements depending on availability. The other water chemistry parameters (pH, conductivity, total dissolved solids, and salinity) were collected using an Oakton PCTestr 35 Multi-Parameter pocket tester. All

instrumentation was calibrated prior to collecting measurements and compared for accuracy. Single point measurements were obtained with each manual discharge measurement.

Results

French Creek Discharge

Continuous stage data was collected for French Creek (RM 4.25) from July 27 through October 17, 2017 (Figure 7). The peaks in the hydrograph during the month of August are associated with valve adjustments for augmentation flow releases from Klonaqua Lake. The first valve adjustment occurred on August 3, 2017 with additional adjustments occurring periodically throughout August and into September. Peak daily mean flow occurred on August 6 at 48.27 cfs when approximately 20.31 cfs (daily mean) was released from Klonaqua Lake. The receding limbs of the hydrograph between peaks are associated with a drop in lake levels and head pressure between valve adjustments. Peaks in the hydrograph in the months of September and October are associated with natural events and not augmentation releases.

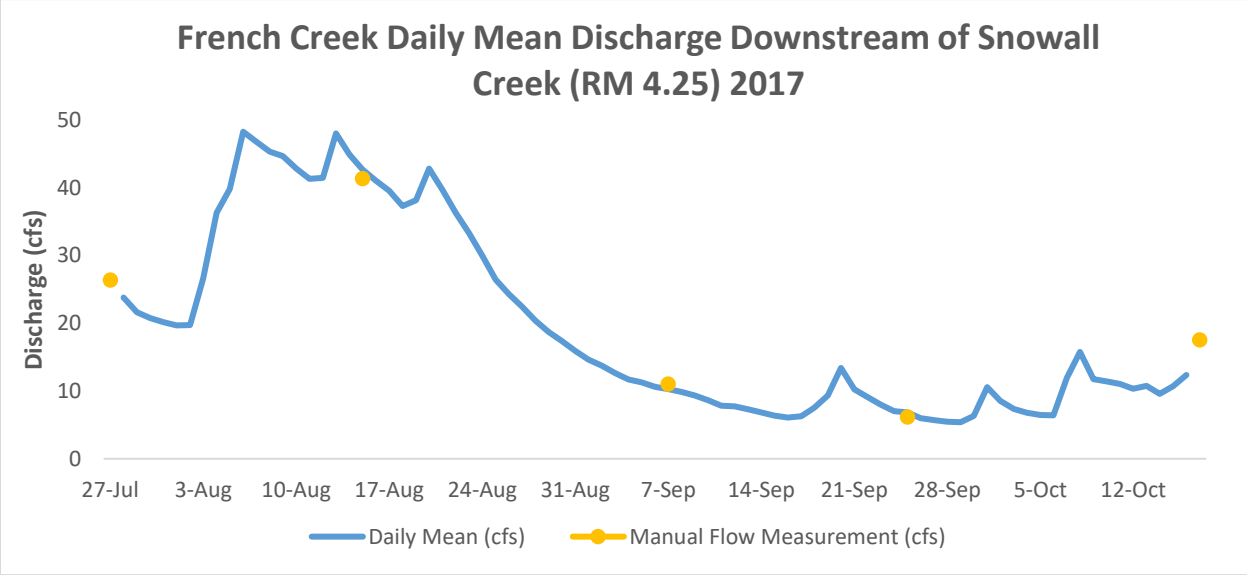

Figure 7. French Creek daily mean discharge hydrograph at RM 4.25. Manual discharge measurements used to develop the rating curve are indicated by yellow dots.

Discharge and flow rate data were provided by Aspect Consulting for augmentation releases from Klonaqua Lake in 2017 (Figure 8). Peak flow releases occurred in the month of August and tapered off into the month of September, with the greatest daily mean volume of water (24.43 cfs) being released on August 13.

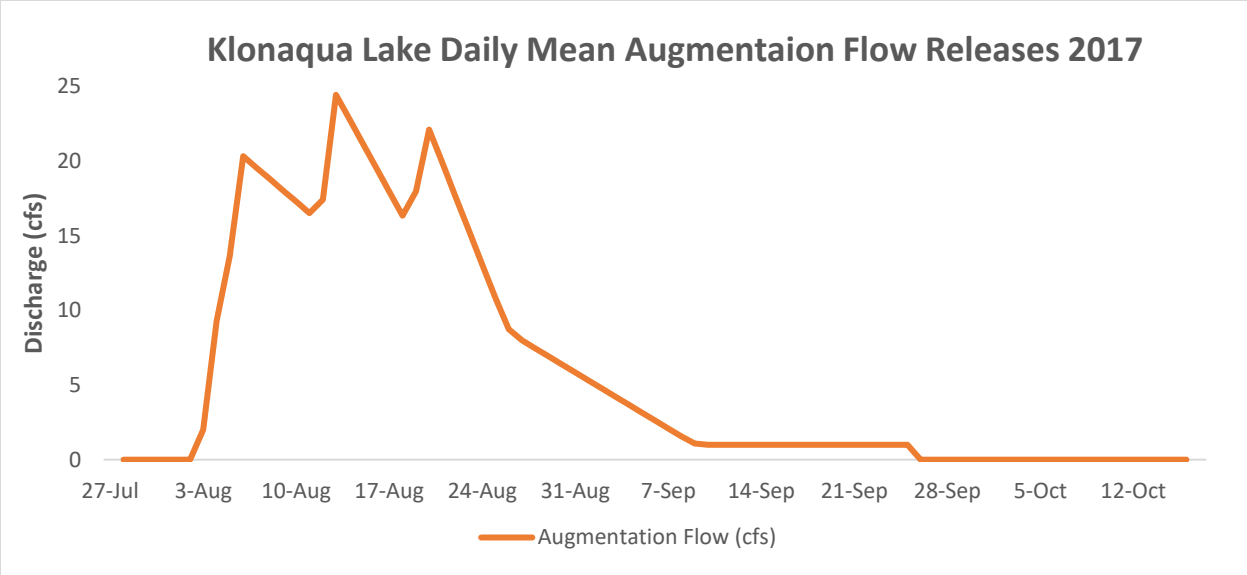

Figure 8. Klonaqua Lake daily mean augmentation flow release hydrograph (data courtesy of Aspect Consulting).

To estimate the natural hydrograph, daily mean augmentation discharge data were deducted from the daily mean discharge data collected at French Creek at RM 4.25 (Figure 9). Essentially, the estimated natural hydrograph is the expected discharge in Leland Creek without augmentation flows. Three hydrographs of daily mean discharge were developed; 1) French Creek at RM 4.25, 2) Klonaqua Lake augmentation flow releases, and 3) an estimated natural hydrograph for French Creek at RM 4.25.

As expected the estimated natural hydrograph follows a typical pattern seen in snowmelt-driven systems in which higher flows in early summer gradually taper off to base flows later in the season as snowpack declines. An estimated natural base flow of around 5.0 cfs was reached mid-September with flow increases occurring due to natural events in late-September to mid-October.

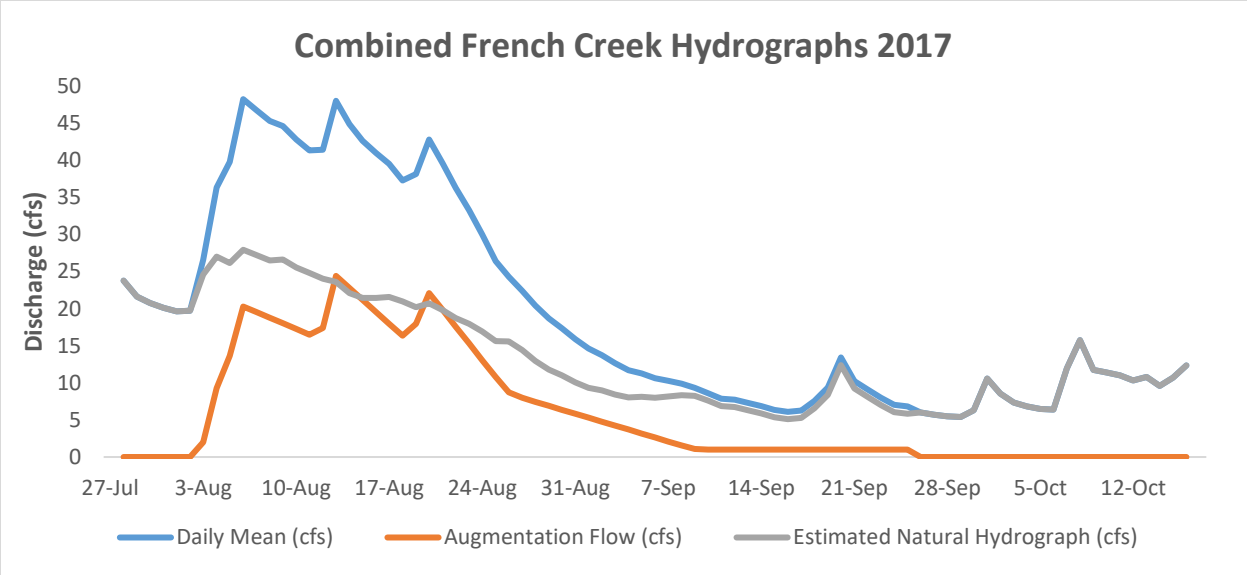

Figure 9. Combined hydrographs for French Creek (RM 4.25), Klonaqua Lake augmentation flow releases, and estimated natural hydrograph for French Creek at RM 4.25.

French Creek Water Temperature

To determine the influence of augmentation flow releases on water temperature in French Creek, water temperature data loggers were deployed within French Creek upstream and downstream of the confluence with Klonaqua Creek, as well as in Klonaqua Creek at RM 0.10. There was an increase in water temperature in French Creek downstream of Klonaqua Creek during the augmentation period (Figure 10). Although there is generally a slight warming trend in French Creek downstream of Klonaqua Creek prior to the augmentation period, the degree of warming is much greater during augmentation.

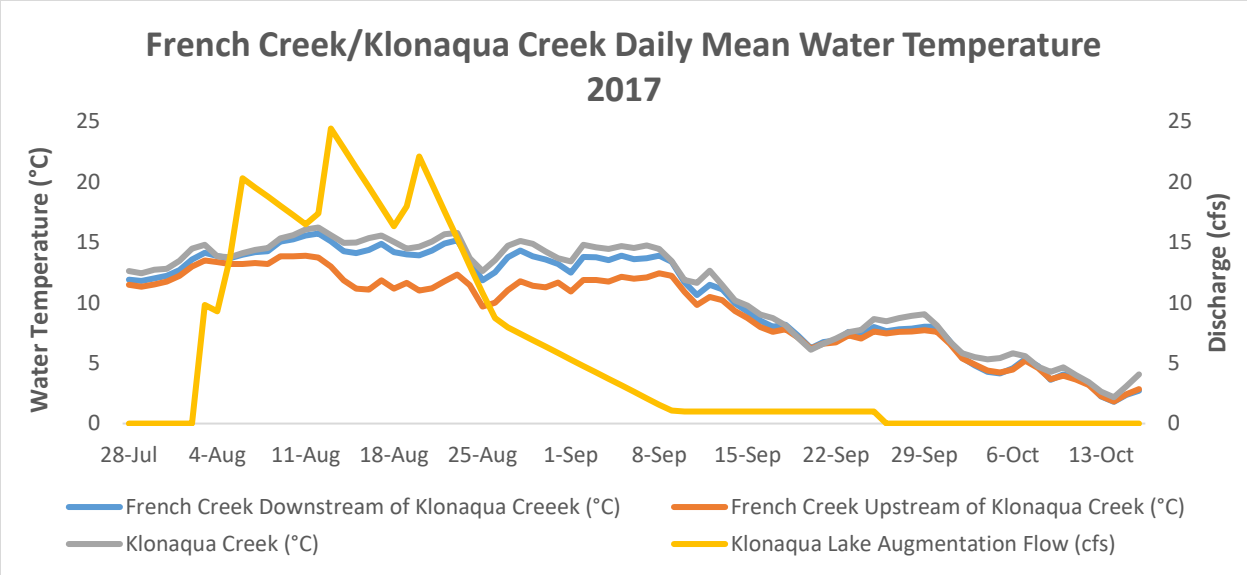

Figure 10. French Creek and Klonaqua Creek daily mean water temperature near confluence. The yellow line indicates the augmentation flow from Klonaqua Lake.

The warming trend observed in French Creek can be explained by an increase in water temperature in Klonaqua Lake during the augmentation period. Lake temperature data (provided by Aspect Consulting) suggests a relationship between lowering of lake levels associated with augmentation releases, and an increase in water temperature (Figure 11). Daily mean water temperature in Klonaqua Lake reached a high of 17.74° C in mid-August during the peak of augmentation releases. Increased water temperature in Klonaqua Lake resulted in a warming trend in French Creek downstream of Klonaqua Creek by more than 3.0° C (daily mean) at times during this period, and daily mean peaks between 15.0° and 16.0° C from August 9 through August 13.

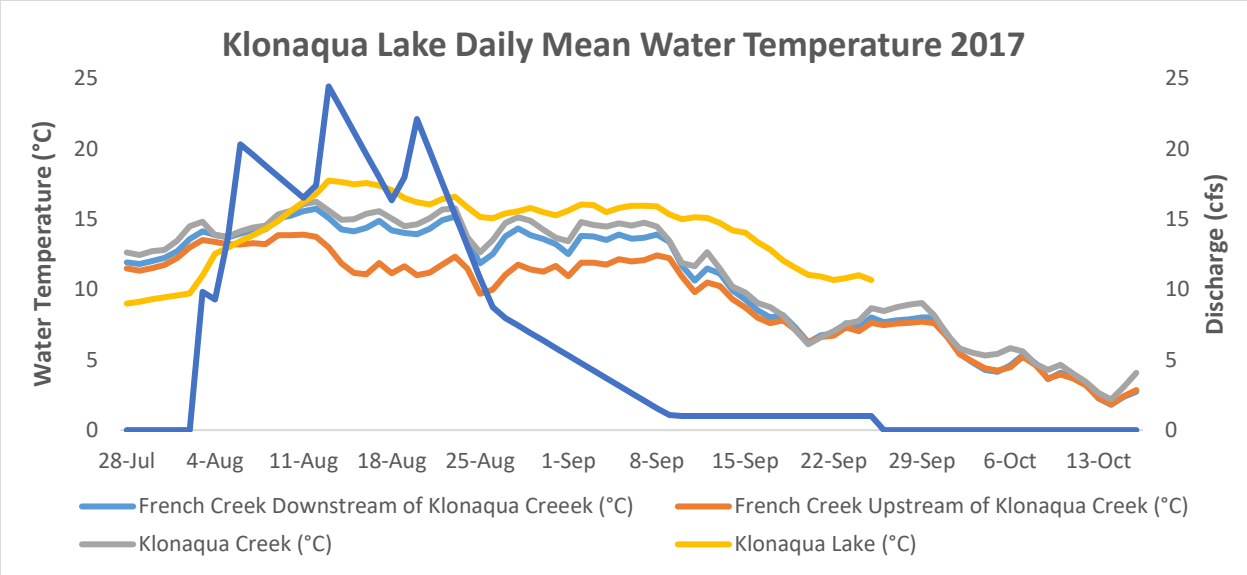

Figure 11. Water temperature of augmentation flow releases from Klonaqua Lake, French Creek, and Klonaqua Creek (lake temperature data courtesy of Aspect Consulting). The blue line indicates the augmentation flow from Klonaqua Lake.

Snowall Creek

Snowall Creek appears to contribute significant flows to French Creek. Manual discharge measurements during the 2017 monitoring period indicated, at times, more than thirty percent of the flow in French Creek at RM 4.25 could be attributed to Snowall Creek (Table 5).

Table 5. Snowall Creek and French Creek manual discharge measurements.

Date	Snowall Creek Discharge Near Mouth (cfs)	French Creek Discharge at RM 4.25 (cfs)	Snowall Creek Percent of French Creek Discharge
07/27/17	8.85	26.37	34
08/15/17	3.76	41.35	9
09/07/17	2.43	11.03	22
09/26/17	1.92	6.16	31
10/17/17	3.83	17.55	22

In addition, Snowall Creek daily mean water temperature was considerably cooler than any of the French Creek temperature monitoring sites (Figure 12). It was thought that Snowall Creek would have had a cooling effect on French Creek, compensating for the warming trend associated with augmentation flows. However, Snowall Creek had very little influence on French Creek water temperature during peak augmentation releases (Figure 12).

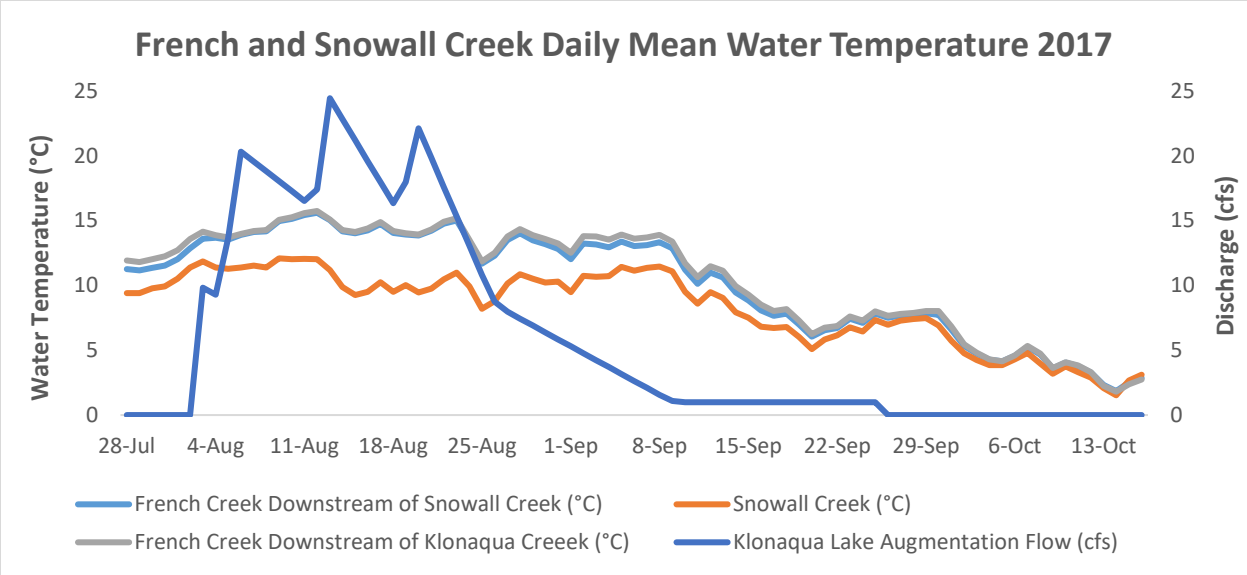

Figure 12. Klonaqua lake augmentation flow, Snowall Creek water temperature, and French Creek water temperature. The blue line indicates the augmentation flow from Klonaqua Lake.

Icicle Creek water temperature was relatively unaffected by augmentation flow releases from Klonaqua Lake (Figure 13). During peak augmentation releases (early-to-late August), water temperature remained relatively consistent among sites with around 1.0° C of variability. Outside of the augmentation period, French Creek generally remained slightly cooler than either Icicle Creek sites.

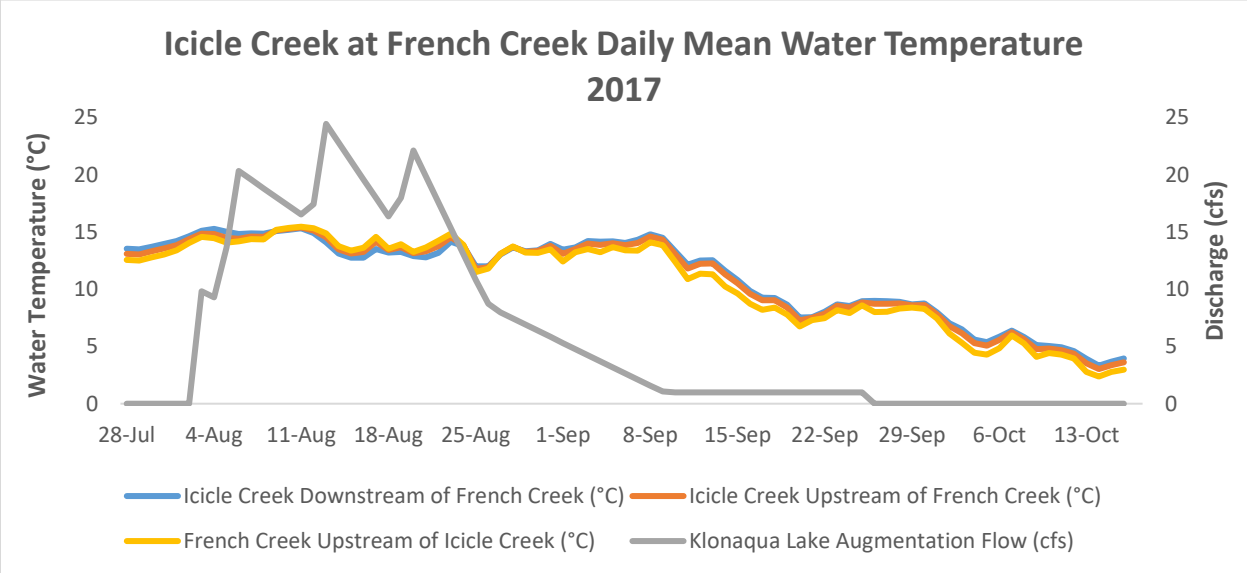

Figure 13. Icicle Creek daily mean water temperature near confluence with French Creek (RM 0.10). The grey line indicates the augmentation flow from Klonaqua Lake.

French Creek Water Chemistry

Water chemistry data collection in the French Creek watershed represents spot measurements of water chemistry and is purely informational at this time (Table 6). Water temperature data was collected in French Creek upstream of Klonaqua Creek on only one occasion (07/27/17), and this was outside of the augmentation period. To detect a change in water chemistry associated with augmentation flow releases, additional data collection is required in French Creek upstream of Klonaqua Creek during augmentation.

Table 6. French Creek watershed water chemistry.

Date	Creek Name	Location	DO (%)	DO (mg/L)	pH	EC (µS)	TDS (ppm)	Salinity (ppm)
07/27/17	French Creek	RM 4.25		11.4	8.00	36.10	25.50	20.60
07/27/17	Snowall Creek	25 meters US of French Creek		11.9	8.22	63.80	45.30	33.20
07/27/17	Klonaqua Creek	RM 0.10		11.2	7.82	22.40	15.90	15.60
07/27/17	French Creek	RM 5.50		10.3	7.78	24.80	17.60	16.10
08/15/17	French Creek	RM 4.25		10.6	7.80	33.80	23.80	20.80
08/15/17	Snowall Creek	25 meters US of French Creek		11.3	8.26	83.50	59.30	43.30
08/15/17	Klonaqua Creek	RM 0.10		9.9	7.72	13.00	9.20	12.10
09/07/17	French Creek	RM 4.25		*8.6	8.00	47.40	33.70	27.20
09/07/17	Snowall Creek	25 meters US of French Creek		10.4	8.36	93.70	66.60	49.50
09/07/17	Klonaqua Creek	RM 0.10		*9.1	7.54	18.60	13.20	14.60
09/26/17	French Creek	RM 4.25	84.5	10.1	8.02	65.50	46.60	33.60
09/26/17	Snowall Creek	25 meters US of French Creek	89.2	10.8	8.46	102.00	72.50	51.20
09/26/17	Klonaqua Creek	RM 0.10	88.3	10.4	7.99	33.80	24.00	18.40
10/17/17	French Creek	RM 4.25	91.7	11.5	6.99	51.80	36.70	23.70
10/17/17	Snowall Creek	25 meters US of French Creek	94.3	11.9	7.33	86.70	61.40	39.10
10/17/17	Klonaqua Creek	RM 0.10	88.5	11.1	6.60	39.70	28.20	18.60

*****Relatively low values are likely attributable to an un-calibrated dissolved oxygen meter.

Leland Creek Discharge

Continuous discharge data was collected for Leland Creek (RM 0.10) from July 25 through October 18, 2017 (Figure 14). The peaks in the hydrograph in the month of August through mid-September are associated with valve adjustments for augmentation flow releases from Square Lake. Peak daily mean flow occurred on August 22 at 36.98 cfs when approximately 32.28 cfs (daily mean) of augmentation flow was released from Square Lake. The first valve adjustment occurred on August 6, 2017, with additional adjustments occurring periodically through the latter part of September. The receding limbs of the hydrograph between peaks are associated with a drop in lake levels and head pressure between valve adjustments. Peaks in the hydrograph in the

latter part of September and during October are associated with natural events and not augmentation releases.

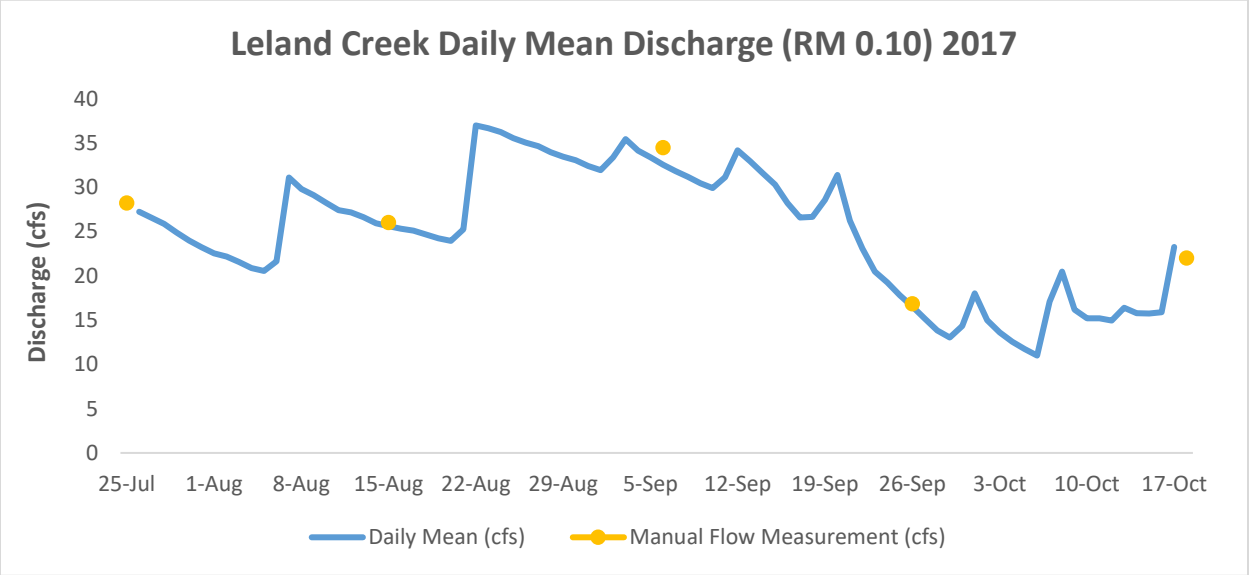

Figure 14. Leland Creek daily mean discharge hydrograph at RM 0.10. Manual discharge measurements used to develop the rating curve are indicated by yellow dots.

Discharge and flow rate data were provided by Aspect Consulting for augmentation releases from Square Lake in 2017 (Figure 15). Peak flow releases occurred during the latter part of August through mid-September, with the greatest daily mean volume of water (approximately 33.6 cfs) being released on September 3.

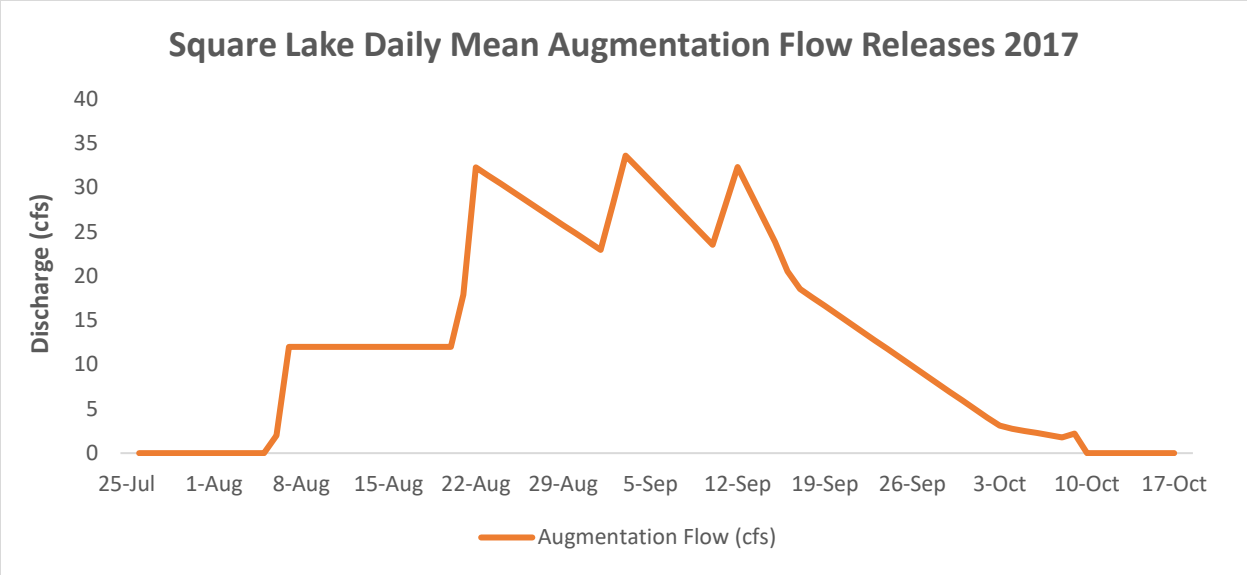

Figure 15. Square Lake daily mean augmentation flow release hydrograph (data courtesy of Aspect Consulting).

To estimate the natural hydrograph, augmentation discharge data from Square Lake were deducted from the discharge data collected at Leland Creek at RM 0.10 (Figure 16). The estimated hydrograph is the expected discharge in Leland Creek without augmentation flows. Three hydrographs of daily mean discharge were developed; 1) Leland Creek at RM 0.10, 2) Square Lake augmentation flow releases, and 3) an estimated natural hydrograph for Leland Creek at RM 0.10.

Unlike French Creek, deducting the augmentation discharge data from the Leland Creek discharge data did not produce a hydrograph representative of what is expected under natural conditions. Review of the hydrographs, and the discharge data used to develop them indicates a delay in travel time of augmentation flow from Square Lake to lower Leland Creek. A probable explanation for this is the presence of side channels and wetlands in Prospect and Leland Creek that increased retention time for the augmentation flow before it reached the downstream data logger at RM 0.10. Based on manual field measurements and known augmentation releases from Square Lake, a reasonable estimate of a natural base flow in Leland is 6 to 7 cfs occurring mid-to-late September. A manual discharge measurement on September 26 indicated 16.81 cfs in lower Leland Creek. On that date approximately 9.83 cfs (daily mean) of augmentation flow was being delivered from Square Lake, which equates to an estimated 6.98 cfs of natural flow.

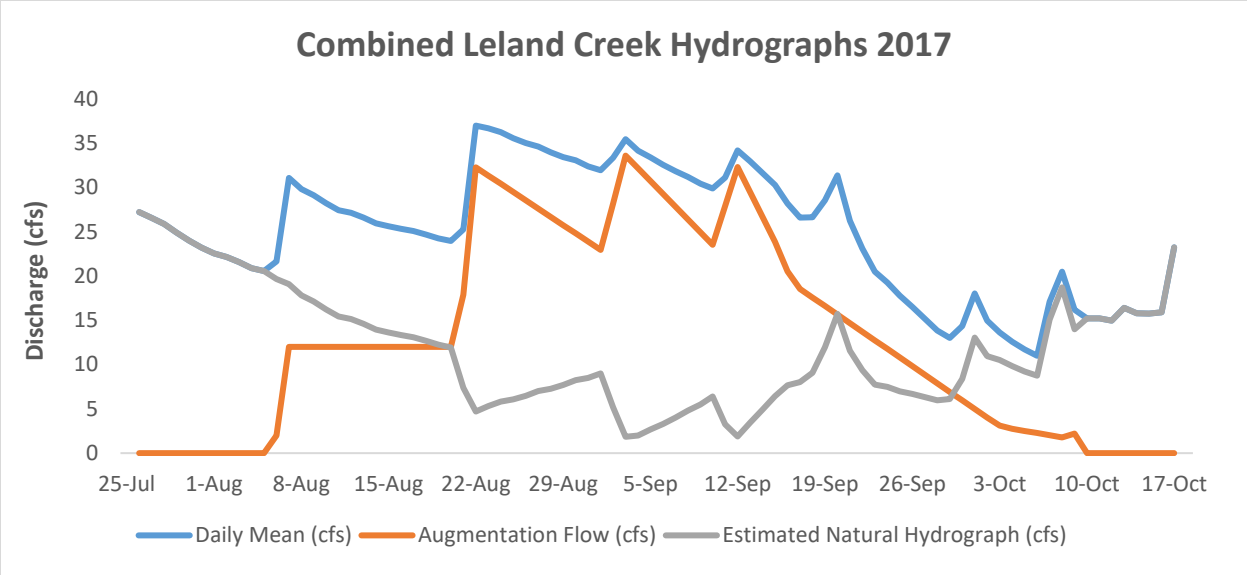

Figure 16. Combined daily mean hydrographs for Leland Creek (RM 0.10), Square Lake augmentation flow releases, and estimated natural hydrograph for Leland Creek at RM 0.10.

Leland Creek Water Temperature

To determine the influence of augmentation flow releases from Square Lake on Leland Creek water temperature, data loggers were deployed in Leland Creek upstream and downstream of the confluence with Prospect Creek, as well as in Prospect Creek at RM 0.20. There was an initial decrease in water temperature in Leland Creek downstream of Prospect Creek when approximately 12 cfs of augmentation flow was released from Square Lake on August 6 (Figure 17). Following this brief period of cooling, water temperature in Leland Creek increased considerably when augmentation flow was increased to approximately 32 cfs on August 22. This trend continued until late-September when augmentation flow began to diminish.

Although there appears to be a slight natural warming trend in Leland Creek downstream of Prospect Creek prior to the augmentation period, the degree of warming is much greater during peak augmentation. Water temperature data for Leland Creek downstream of Prospect Creek indicate an increase in water temperature (daily mean), at times, approaching 5.0° C during peak augmentation. On September 7, Leland Creek water temperature upstream of Prospect Creek was 10.78° C, while downstream at RM 0.10 the daily mean water temperature was 15.51° C.

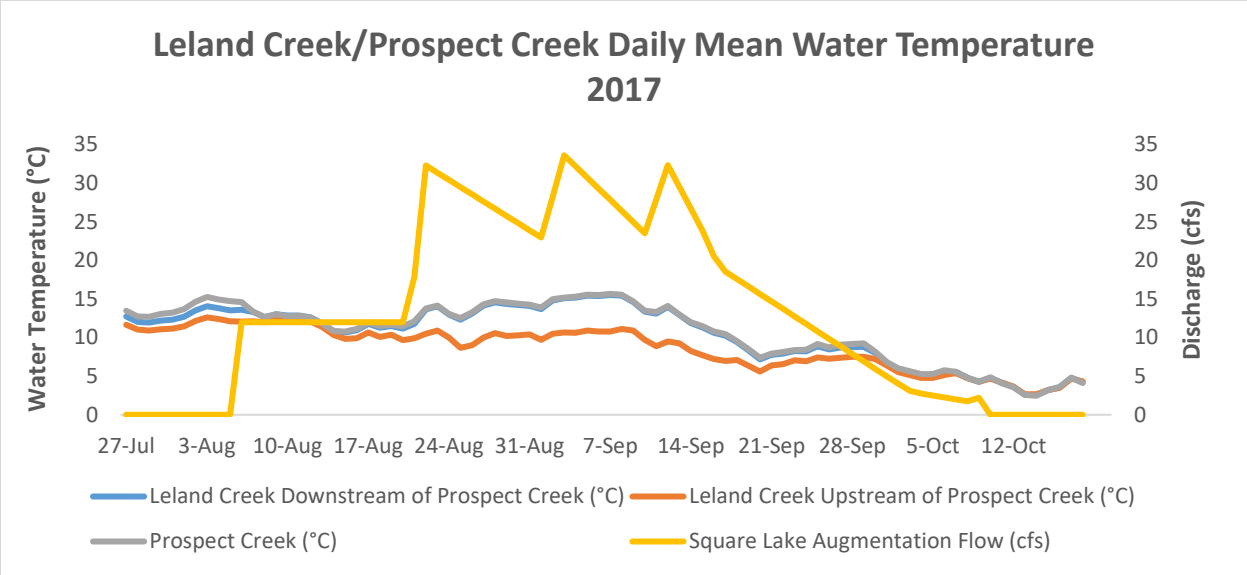

Figure 17. Square Lake augmentation flow, Leland Creek water temperature, and Prospect Creek water temperature near confluence.

Square Lake water temperature data (provided by Aspect Consulting) suggests there are questions remaining about the warming trend observed in Leland Creek during the augmentation period. Lake water temperatures were considerably cooler than either creek throughout much of the augmentation period (Figure 18). The large difference in water temperature readings between Square Lake, and Prospect and Leland creeks may be explained by the location of the temperature logger relative to the outflow of the lake.

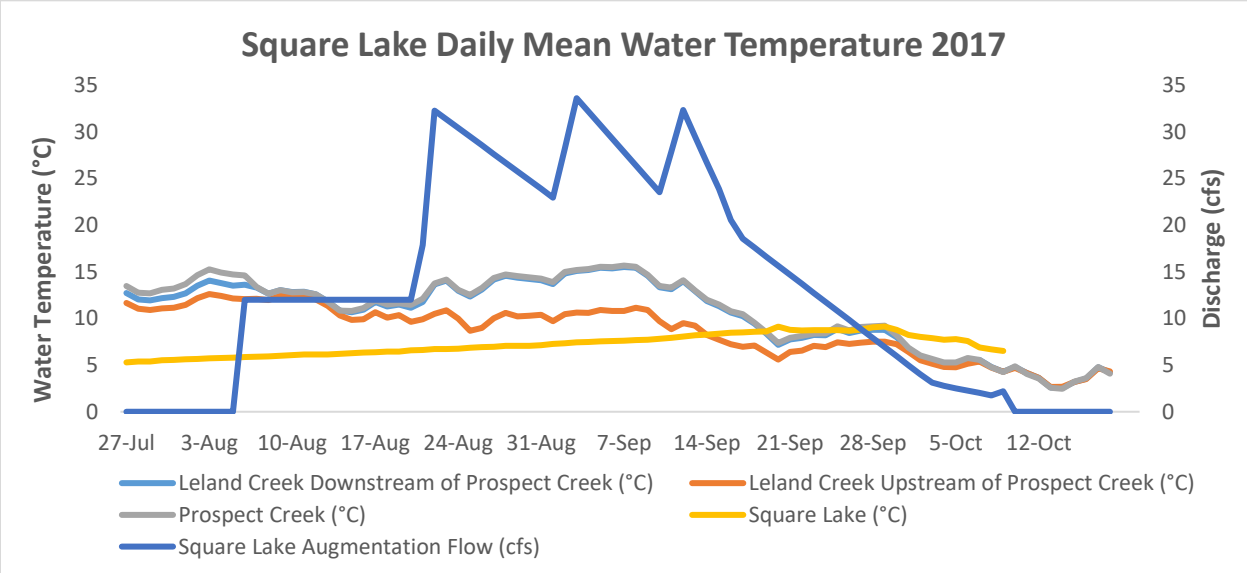

Figure 18. Augmentation flow releases from Square Lake, Leland Creek water temperature, and Prospect Creek water temperature (lake temperature data courtesy of Aspect Consulting).

Icicle Creek water temperature was relatively unaffected by augmentation releases from Square Lake, other than some initial cooling during the first two weeks of augmentation as seen in Leland Creek (Figure 19). During peak augmentation releases (late-August through mid-September), water temperature in Icicle Creek and Leland Creek remained relatively consistent among sites with around 1.0° C of variability. Near the end of the augmentation period water temperature appeared to equilibrate between sites.

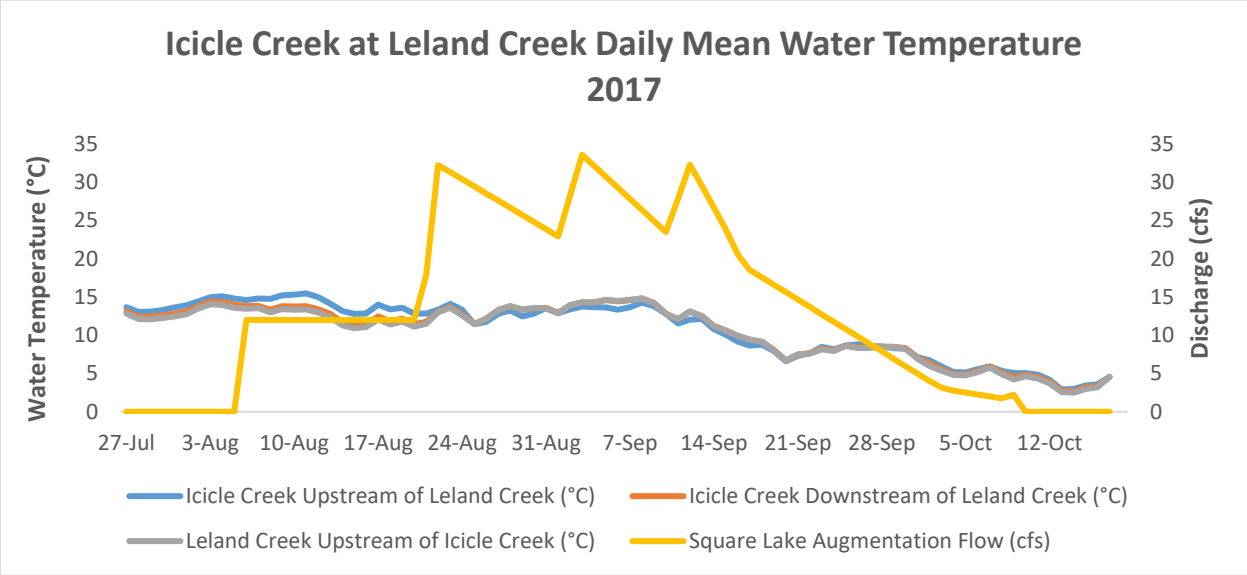

Figure 19. Icicle Creek daily mean water temperature near confluence with Leland Creek. The yellow line indicates the augmentation flow from Square Lake.

Leland Creek Water Chemistry

Water chemistry data collected in the Leland Creek watershed represents spot measurements of water chemistry and is purely informational at this time (Table 7). Water chemistry data was collected in Prospect Creek, and Leland Creek upstream of Prospect on only two dates (07/25/17 and 10/18/17), both of which were outside of the augmentation period. Additional data collection is required to perform an in-depth analysis of the effects of augmentation flow releases from Square Lake on Leland Creek water chemistry.

Table 7. Leland Creek watershed water chemistry.

Date	Creek Name	Location	DO (%)	DO (mg/L)	pH	EC (µS)	TDS (ppm)	Salinity (ppm)
07/25/17	Leland Creek	RM 0.10		11.0	8.50	33.70	23.90	21.40
07/25/17	Leland Creek	RM 1.60		9.5	7.96	37.10	26.30	22.60
07/25/17	Prospect Creek	RM 0.20		9.6	7.69	21.70	15.50	16.10
08/15/17	Leland Creek	RM 0.10	91.2	10.2	7.94	35.30	25.10	19.20
09/06/17	Leland Creek	RM 0.10		10.0	8.05	28.00	19.80	19.10
09/26/17	Leland Creek	RM 0.10		n/a	7.21	37.70	26.70	18.90
10/18/17	Leland Creek	RM 0.10		12.8	8.24	37.70	26.70	17.70
10/18/17	Leland Creek	RM 1.60		12.8	8.47	39.30	27.80	18.40
10/18/17	Prospect Creek	RM 0.20		12.4	9.68	32.90	22.80	14.90

Icicle Creek at confluence with Leland Creek

Additional measurements were obtained on Icicle Creek upstream of the confluence with Leland Creek that were not included in the initial monitoring strategy, but were collected out of relative convenience when accessing Leland (Table 8). Of particular interest is that this reach of Icicle Creek experienced extremely low flows from mid-August through late-September in 2017. On September 6 a manual flow measurement indicated less the 3.0 cfs in this reach of Icicle Creek. On the same date Leland Creek was contributing 34.47 cfs to Icicle Creek downstream of this site, with approximately 29.27 cfs (daily mean) of that value being attributed to augmentation flow from Square Lake.

Table 8. Icicle Creek discharge and water chemistry data summary upstream of confluence with Leland Creek.

Icicle Creek (upstream of Leland Creek) Discharge and Water Chemistry Data 2017							
Date	Discharge (cfs)	Water Temperature (°C)	DO (mg/L)	pH	EC (µS)	TDS (ppm)	Salinity (ppm)
07/26/17	10.32	11.3	8.9	8.00	25.30	17.90	16.00
08/15/17	4.77	11.2	10.1	8.00	30.40	21.70	17.50
09/06/17	2.87	13.8	9.7	8.00	33.70	23.90	21.10
09/26/17	3.73	9.0	n/a	7.70	34.40	24.40	18.10
10/18/17	25.64	4.4	12.6	8.62	26.70	18.80	11.90

Discussion

French Creek

Discharge from Klonaqua Lake augmentation releases, and French Creek were used to develop an estimated natural hydrograph. There may be some imprecision with volume of flow, but the general shape of the estimated hydrograph appears to follow a pattern expected in a naturally functioning snowmelt-driven system. Some general suggestions can be made of how lake releases might be managed in the future.

Sharp increases and rapid declines in the hydrograph associated with augmentation releases drove conditions away from what is expected to be a normative hydrograph, particularly in the month of August. During peak augmentation releases the estimated natural discharge was as much as doubled. This creates the potential for side channels and wetlands to be watered and subsequently dewatered as flows rapidly decline. Fish that move into these habitats may be at risk of being isolated from the main channel with the erratic behavior in the hydrograph. Augmentation releases that mimic the natural hydrograph are preferable, and may allow fish to move volitionally to and from these habitats.

An increase in water temperature in French Creek downstream of Klonaqua Creek appears to be associated with lowering of lake levels during the augmentation period. Klonaqua Lake water temperature increased dramatically during the peak of augmentation releases. This resulted in a temperature increase in French Creek downstream of Klonaqua Creek of more than 3.0° C (daily mean) at times, with daily mean peaks reaching as high as 15.7° C. Bull trout require water temperatures of less than 15.0° C (59.0° F) for rearing, and less than 9.0° C (48.0° F) for spawning (Wydoski and Whitney 2003). Future augmentation efforts will, ideally, maintain water temperatures that are well within the requirements for all bull trout life stages and not disrupt the natural temperature regime. While a temperature increase in French Creek was observed, augmentation flows appear to have had little effect on Icicle Creek water temperature at the monitoring sites.

Spot measurements of water chemistry in French Creek indicated DO and pH were maintained at levels within the tolerable range of salmonids during the augmentation period. Ideal DO levels are greater than 11 ppm (or mg/L) year-round and become lethal at levels less than 6 ppm, while the ideal range for pH is between 6.0 and 8.5 (Kidd 2011). However, with a warming trend such as seen in French Creek during augmentation, there is potential for DO levels to drop with increased water temperature. Additional data are needed to detect a change in water chemistry associated with augmentation flows, and routine water chemistry monitoring should be conducted during future augmentation releases to ensure any changes are minimal.

Leland Creek

An attempt to derive a hydrograph representing natural conditions for Leland Creek using the available discharge data was unsuccessful. However, the discharge data obtained for Square Lake augmentation releases, and lower Leland Creek provide insight into how this system

functions hydrologically. There was clearly a delay in the timing of flow from the point of release at Square Lake to lower Leland Creek that can likely be explained by the presence of side channels and wetlands that increase the retention period of augmentation flows. Similar to observations in French Creek, sharp increases and rapid declines in the hydrograph associated with valve adjustments and lowering lake levels resulted in erratic flow and water level changes that may be detrimental to fish. Managing flow releases to better mimic a natural hydrograph may be a better option, and allow movement of fish freely to and from side channel habitats that can become isolated as flows decline. This may be more complex in Leland Creek as there are still questions remaining about travel time of augmentation flows and a natural hydrograph.

While Square Lake water temperature remained significantly cooler than either Leland Creek or Prospect Creek throughout much of the augmentation period, Leland Creek water temperature downstream of Prospect Creek increased by nearly 5.0° C (daily mean) at times during peak augmentation. It is possible that the water temperature logger in Square Lake was at a different depth relative to the of outflow of Square Lake resulting in temperature readings much lower than observed in Prospect and Leland creeks. Further evaluation is needed to determine the source of this warming trend and how this increase might be mitigated in the event augmentation continues in the future. As with French Creek, maintaining a water temperature regime in the Leland Creek watershed that is within the requirements for bull trout is of the utmost importance during any future augmentation efforts. The observed water temperature increase in Leland Creek associated with augmentation flows appeared to have little influence on Icicle Creek at monitoring sites near the confluence of the two creeks.

Spot measurements of water chemistry collected in the Leland Creek were limited to site visits at RM 0.10 during the augmentation period. Additional data is needed in Prospect Creek, and Leland upstream of Prospect to detect potential changes in water chemistry associated with augmentation flows. However, the water chemistry data collected indicates DO and pH levels remained within the tolerable range for salmonids. As with French Creek, water chemistry should be routinely monitored during future augmentation efforts to ensure levels remain within the tolerable range for bull trout.

References

(Kidd) Holmen, S.A., R. Beaston, and J. St. Pierre. 2011. Scappoose bay watershed water quality monitoring report 2008-2010. Scappoose Bay Watershed Council Water Quality Report June 2011, Warren, OR. www.scappoosebay-wc.org

Wydoski, R. S., and R. R. Whitney. 2003. Inland Fishes of Washington. 2nd ed. American Fisheries Society and University of Washington Press, Seattle, Washington, pp. 94-97.

APPENDIX B

LiDAR Technical Data Report, Alpine Lake, Washington

December 2, 2016

Alpine Lakes, Washington

LiDAR Technical Data Report

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Table of Contents

Introduction 1
Deliverable Products 2
Acquisition 4
Planning 4
Airborne LiDAR Survey 5
Ground Control 6
Monumentation 6
Ground Survey Points (GSPs) 7
Processing 9
LiDAR Data 9
Feature Extraction 11
Contours 11
Results & Discussion 12
LiDAR Density 12
LiDAR Accuracy Assessments 16
LiDAR Absolute Accuracy 16
LiDAR Relative Vertical Accuracy 18
Certifications 19
Selected Images 20
Glossary 22
Appendix A - Accuracy Controls 23

Cover Photo: A view looking south at Colchuck Lake in the North Cascades. The image was created from the LiDAR bare earth model overlaid with the LiDAR point cloud and colored by NAIP imagery.

INTRODUCTION

This photo taken by QSI acquisition staff shows a view of Snow Lake within the Alpine Lakes Area of Interest.

In July 2016, Quantum Spatial (QSI) was contracted by Aspect Consulting to collect Light Detection and Ranging (LiDAR) data in the fall of 2016 for four areas of interest (AOIs)comprising the Alpine Lakes project area in Washington State. Data were collected to aid Aspect Consulting in assessing the topographic and geophysical properties of the study area to support the Alpine Lakes Optimization and Automation Appraisal Study.

This report accompanies the delivered LiDAR data and documents contract specifications, data acquisition procedures, processing methods, and analysis of the final dataset including LiDAR accuracy and density. Acquisition dates and acreage are shown in Table 1, a complete list of contracted deliverables provided to Aspect Consulting is shown in Table 2, and the project extent is shown in Figure 1.

Table 1: Acquisition dates, acreage, and data types collected on the Alpine Lakes, Washington site

Project Site	Contracted Acres	Buffered Acres	Acquisition Dates	Data Type
Alpine Lakes, Washington	1,500	2,022	10/19/2016	LiDAR

Deliverable Products

Table 2: Products delivered to Aspect Consulting for the Alpine Lakes, Washington site

Alpine Lakes Products Projection: Washington State Plane North – FIPS Zone 4601 Horizontal Datum: NAD83(HARN) Vertical Datum: NAVD88 (GEOID09) Units: U.S. Survey Feet	
Points	LAS v 1.2 • All Classified Returns (Ground, Default, Water)
Rasters	3.0 Foot ESRI Grids • Bare Earth Model • Highest Hit Model
Vectors	Shapefiles (*.shp) • Project Boundary • LiDAR Tile Index • Total Area Flown Shape • Water's Edge Polygon Drawing Files (*.dwg) • Contours (2 ft)

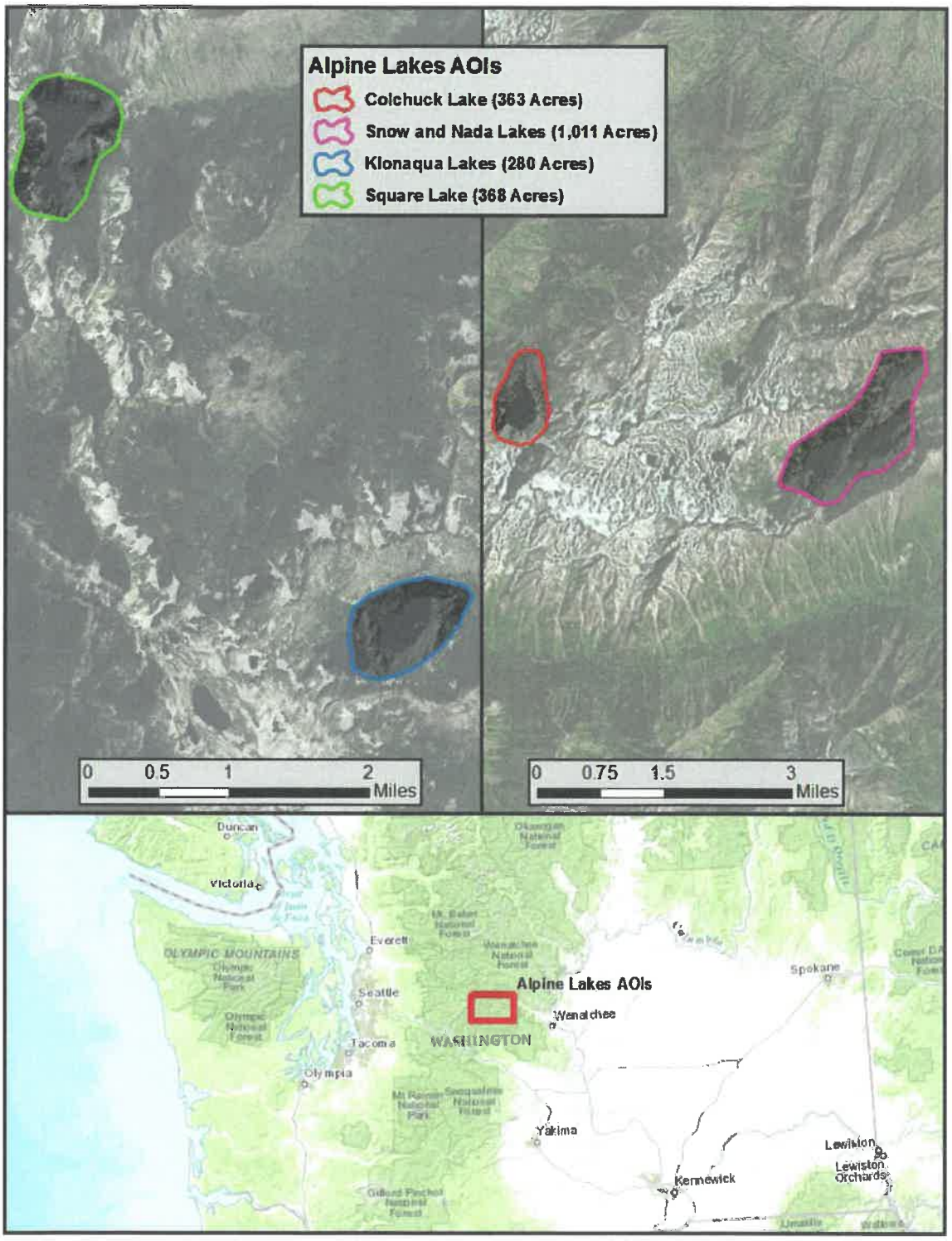

Figure 1: Location map of the Alpine Lakes site in Washington State

QSI's Cessna Caravan

Planning

In preparation for data collection, QSI reviewed the project area and developed a specialized flight plan to ensure complete coverage of the Alpine Lakes LiDAR study area at the target point density of ≥8.0 points/m^2 (0.74 points/ft^2). Acquisition parameters including orientation relative to terrain, flight altitude, pulse rate, scan angle, and ground speed were adapted to optimize flight paths and flight times while meeting all contract specifications.

Factors such as satellite constellation availability and weather windows must be considered during the planning stage. The survey was not conducted until late October when lakes were in full drawdown, yet before the onset of snow in the project area. Any weather hazards or conditions affecting the flight were continuously monitored due to their potential impact on the daily success of airborne and ground operations. In addition, logistical considerations including ground survey access to the remote location, and potential air space restrictions were reviewed. Due to the extremely remote nature of the project site, QSI utilized WSRN[1] CORS station QMAR in combination with one newly established monument to achieve 13 nautical mile GPS baselines.

[1]Washington State Reference Network http://www.wsrn3.org/

Airborne LiDAR Survey

The LiDAR survey was accomplished using a Leica ALS80 system mounted in a Cessna Caravan. Table 3 summarizes the settings used to yield an average pulse density of ≥8 pulses/m^2 over the Alpine Lakes project area. The Leica ALS80 laser system can record unlimited range measurements (returns) per pulse. It is not uncommon for some types of surfaces (e.g., dense vegetation, water, or snow) to return fewer pulses to the LiDAR sensor than the laser originally emitted. The discrepancy between first return and overall delivered density will vary depending on terrain, land cover, and the prevalence of water bodies. All discernible laser returns were processed for the output dataset.

Table 3: LiDAR specifications and survey settings

LiDAR Survey Settings & Specifications	
Acquisition Dates	October 19, 2016
Aircraft Used	Cessna Caravan
Sensor	Leica ALS80
Survey Altitude (AGL)	1600 m
Swath Width	857 m
Target Pulse Rate	142.8 - 346.6 kHz
Pulse Mode	Multiple Pulses in Air (MPiA)
Laser Pulse Diameter	35 cm
Mirror Scan Rate	52.0 Hz
Field of View	40°
GPS Baselines	≤13 nm
GPS PDOP	≤3.0
GPS Satellite Constellation	≥6
Maximum Returns	Unlimited
Intensity	8-bit, scaled to 16-bit
Resolution/Density	Average 8 pulses/m^2
Accuracy	$RMSE_Z \leq 15$ cm

Leica ALS80 LiDAR sensor

All areas were surveyed with an opposing flight line side-lap of ≥50% (≥100% overlap) in order to reduce laser shadowing and increase surface laser painting. To accurately solve for laser point position (geographic coordinates x, y and z), the positional coordinates of the airborne sensor and the attitude of the aircraft were recorded continuously throughout the LiDAR data collection mission. Position of the aircraft was measured twice per second (2 Hz) by an onboard differential GPS unit, and aircraft attitude was measured 200 times per second (200 Hz) as pitch, roll and yaw (heading) from an onboard inertial measurement unit (IMU). To allow for post-processing correction and calibration, aircraft and sensor position and attitude data are indexed by GPS time.

Ground Control

Ground control surveys, including monumentation and ground survey points (GSPs) were conducted to support the airborne acquisition. Ground control data were used to geospatially correct the aircraft positional coordinate data and to perform quality assurance checks on final LiDAR data.

QSI-Established Monument

Monumentation

The spatial configuration of ground survey monuments provided redundant control within 13 nautical miles of the mission areas for LiDAR flights. Monuments were also used for collection of ground survey points using real time kinematic (RTK) survey techniques.

Monument locations were selected with consideration for satellite visibility, field crew safety, and optimal location for GSP coverage. QSI utilized one existing CORS station and established one new monument for the Alpine Lakes, Washington LiDAR project (Table 4, Figure 2). New monumentation was set using 5/8" x 30" rebar topped with stamped 2 ½ " aluminum caps. QSI's professional land surveyor, Evon Silvia (WAPLS#53957) oversaw and certified the establishment of all monuments.

Table 4: Monuments established for the Alpine Lakes, Washington acquisition. Coordinates are on the NAD83 (HARN) datum.

Monument ID	Latitude	Longitude	Ellipsoid (meters)
ALPINE_01	47° 28' 33.92814"	-120° 39' 18.63201"	501.273
WSRN CORS Station QMAR	47° 46' 30.34411"	-120° 57' 55.97402"	812.470

To correct the continuously recorded onboard measurements of the aircraft position, QSI concurrently conducted multiple static Global Navigation Satellite System (GNSS) ground surveys (1 Hz recording frequency) over each monument. During post-processing, the static GPS data were triangulated with nearby Continuously Operating Reference Stations (CORS) using the Online Positioning User Service (OPUS[2]) for precise positioning. Multiple independent sessions over the same monument were processed to confirm antenna height measurements and to refine position accuracy.

Monuments were established according to the national standard for geodetic control networks, as specified in the Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standards for geodetic networks.[3] This standard provides guidelines for classification of monument quality at the 95% confidence interval as a basis for comparing the quality of one control network to another. The monument rating for this project is shown in Table 5.

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[2] OPUS is a free service provided by the National Geodetic Survey to process corrected monument positions. http://www.ngs.noaa.gov/OPUS.

[3] Federal Geographic Data Committee, Geospatial Positioning Accuracy Standards (FGDC-STD-007.2-1998). Part 2: Standards for Geodetic Networks, Table 2.1, page 2-3. http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part2/chapter2

Table 5: Federal Geographic Data Committee monument rating for network accuracy

Direction	Rating
1.96 * St Dev $_{NE}$:	0.020 m
1.96 * St Dev $_{z}$:	0.020 m

For the Alpine Lakes, Washington LiDAR project, the monument coordinates contributed no more than 2.8 cm of positional error to the geolocation of the final ground survey points and LiDAR, with 95% confidence.

Ground Survey Points (GSPs)

Ground survey points were collected using real time kinematic (RTK) survey techniques. A Trimble R7 base unit was positioned at a nearby monument to broadcast a kinematic correction to a roving Trimble R6 GNSS receiver. All GSP measurements were made during periods with a Position Dilution of Precision (PDOP) of ≤ 3.0 with at least six satellites in view of the stationary and roving receivers. When collecting RTK data, the rover records data while stationary for five seconds, then calculates the pseudorange position using at least three one-second epochs. Relative errors for any GSP position must be less than 1.5 cm horizontal and 2.0 cm vertical in order to be accepted. See Table 6 for Trimble unit specifications.

GSPs were collected in areas where good satellite visibility was achieved on paved roads and other hard surfaces such as gravel or packed dirt roads. GSP measurements were not taken on highly reflective surfaces such as center line stripes or lane markings on roads due to the increased noise seen in the laser returns over these surfaces. GSPs were collected within as many flightlines as possible; however the distribution of GSPs depended on ground access constraints and monument locations and may not be equitably distributed throughout the study area (Figure 2).

Table 6: Trimble equipment identification

Receiver Model	Antenna	OPUS Antenna ID	Use
Trimble R6 GNSS	Integrated GNSS Antenna R6	TRMR6	Rover
Trimble R7	Zephyr GNSS Geodetic Model 2 RoHS	TRM57971.00	Static

Lack of access and the remote nature of the project area prevented GSP collection within the project area of interest. GSPs were recorded in a nearby area meeting the requirements described above (Figure 2), and the LiDAR acquisition was adjusted to include coverage of that area. Because adjustments to ground control are generally consistent within a single mission, these GSPs could be used to vertically control the LiDAR despite being outside the project area of interest.

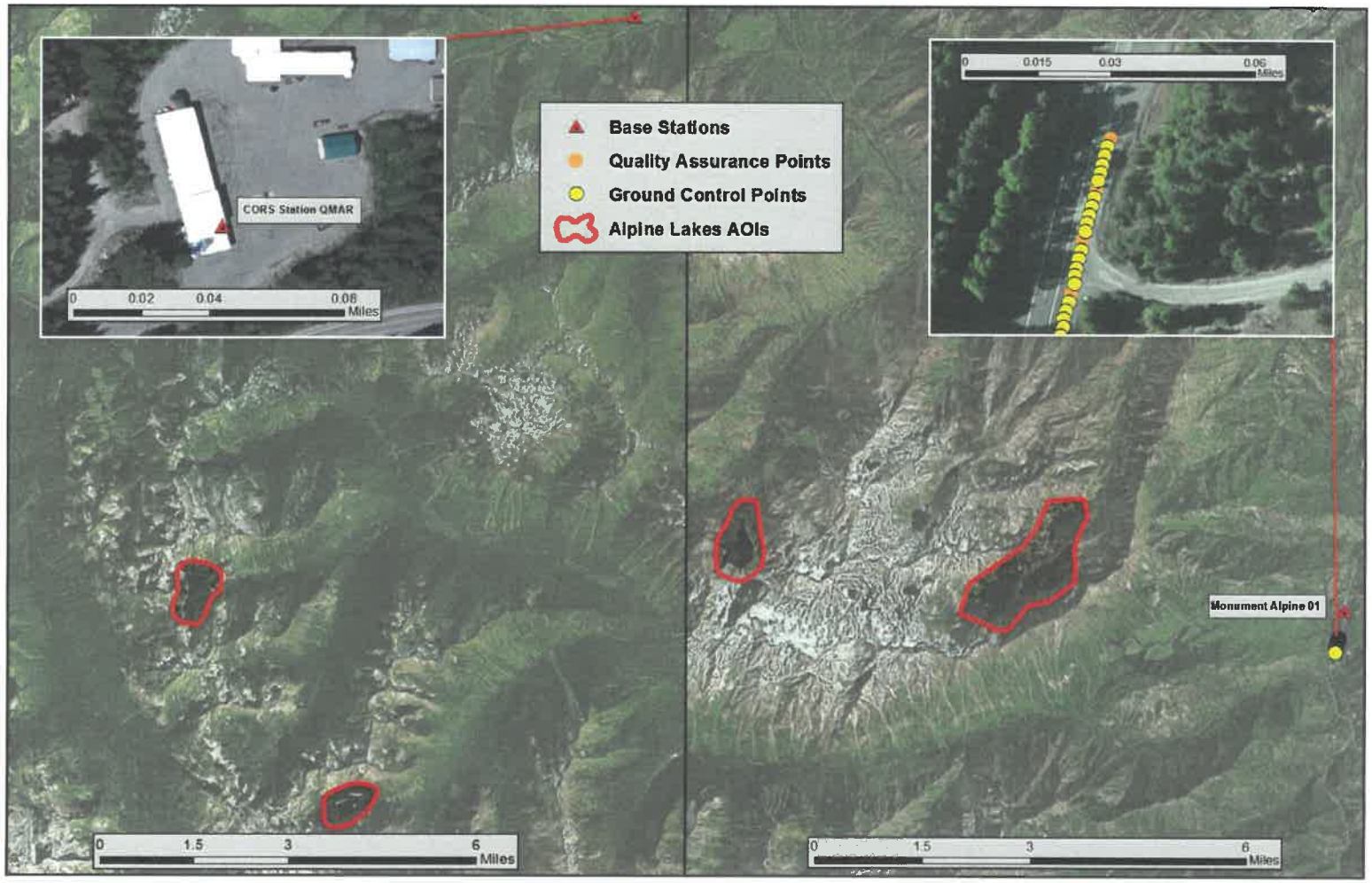
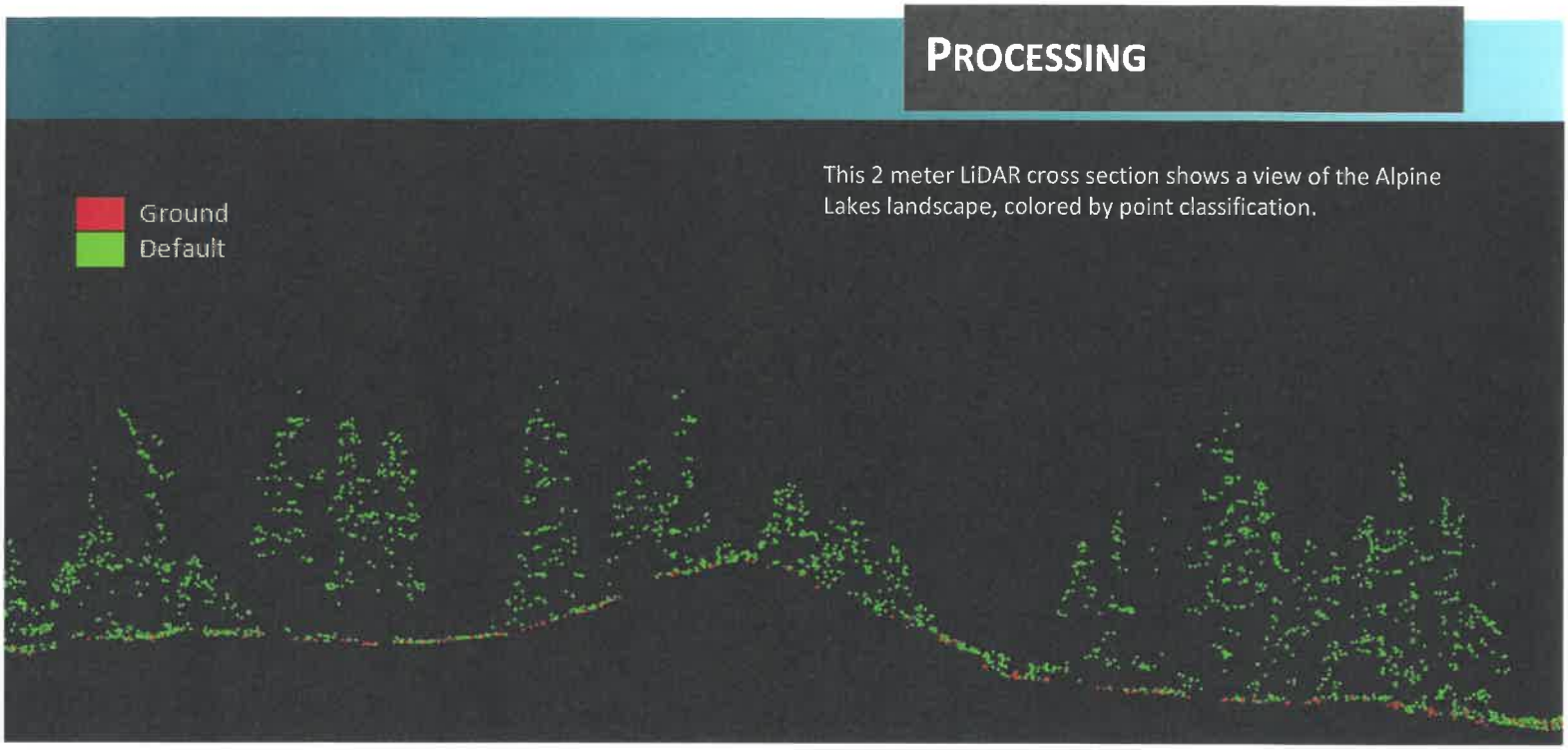


Figure 2 : Ground Survey Location Map



This 2 meter LiDAR cross section shows a view of the Alpine Lakes landscape, colored by point classification.

LiDAR Data

Upon completion of data acquisition, QSI processing staff initiated a suite of automated and manual techniques to process the data into the requested deliverables. Processing tasks included GPS control computations, smoothed best estimate trajectory (SBET) calculations, kinematic corrections, calculation of laser point position, sensor and data calibration for optimal relative and absolute accuracy, and LiDAR point classification (Table 7). Processing methodologies were tailored for the landscape. Brief descriptions of these tasks are shown in Table 8.

Table 7: ASPRS LAS classification standards applied to the Alpine Lakes, Washington dataset

Classification Number	Classification Name	Classification Description
1	Default/Unclassified	Laser returns that are not included in the ground class, composed of vegetation and anthropogenic features
2	Ground	Laser returns that are determined to be ground using automated and manual cleaning algorithms
9	Water	Laser returns that are determined to be water using automated and manual algorithms

Table 8: LiDAR processing workflow

LiDAR Processing Step	Software Used
Resolve kinematic corrections for aircraft position data using kinematic aircraft GPS and static ground GPS data. Develop a smoothed best estimate of trajectory (SBET) file that blends post-processed aircraft position with sensor head position and attitude recorded throughout the survey.	Waypoint Inertial Explorer v.8.6
Calculate laser point position by associating SBET position to each laser point return time, scan angle, intensity, etc. Create raw laser point cloud data for the entire survey in *.las (ASPRS v. 1.2) format. Convert data to orthometric elevations by applying a geoid correction.	Waypoint Inertial Explorer v.8.6 Leica Cloudpro v. 1.2.2
Import raw laser points into manageable blocks (less than 500 MB) to perform manual relative accuracy calibration and filter erroneous points. Classify ground points for individual flight lines.	TerraScan v.16
Using ground classified points per each flight line, test the relative accuracy. Perform automated line-to-line calibrations for system attitude parameters (pitch, roll, heading), mirror flex (scale) and GPS/IMU drift. Calculate calibrations on ground classified points from paired flight lines and apply results to all points in a flight line. Use every flight line for relative accuracy calibration.	TerraMatch v.16
Classify resulting data to ground and other client designated ASPRS classifications (Table 7). Assess statistical absolute accuracy via direct comparisons of ground classified points to ground control survey data.	TerraScan v.16 TerraModeler v.16
Generate bare earth models as triangulated surfaces. Generate highest hit models as a surface expression of all classified points. Export all surface models as ESRI GRIDs format at a 3.0 foot pixel resolution.	TerraScan v.16 TerraModeler v.16 ArcMap v. 10.2

Feature Extraction

Contours

Contour generation from LiDAR point data required a thinning operation in order to reduce contour sinuosity. The thinning operation reduced point density where topographic change is minimal (i.e., flat surfaces) while preserving resolution where topographic change was present. Contour key points were selected from the ground model every 20 feet with the spacing decreased in regions with high surface curvature. Generation of contour key points eliminated redundant detail in terrain representation, particularly in areas of low relief, and provided for a more manageable dataset. Contours were produced through TerraModeler by interpolating between the contour key points at even elevation increments.

Elevation contour lines were then intersected with ground point density rasters and a confidence field was added to each contour line. Contours which crossed areas of high ground point density have high confidence levels, while contours which crossed areas of low ground point density have low confidence levels. Areas with low ground point density are commonly beneath buildings and bridges, in locations with dense vegetation, over water, and in other areas where laser penetration to the ground surface was impeded (Figure 3). Special care was taken to exclude false contours triangulating across lakes within the project area. Water's edge breaklines were drawn to enforce contour generation up to the water's edge, as well as to classify water within the LiDAR point cloud.

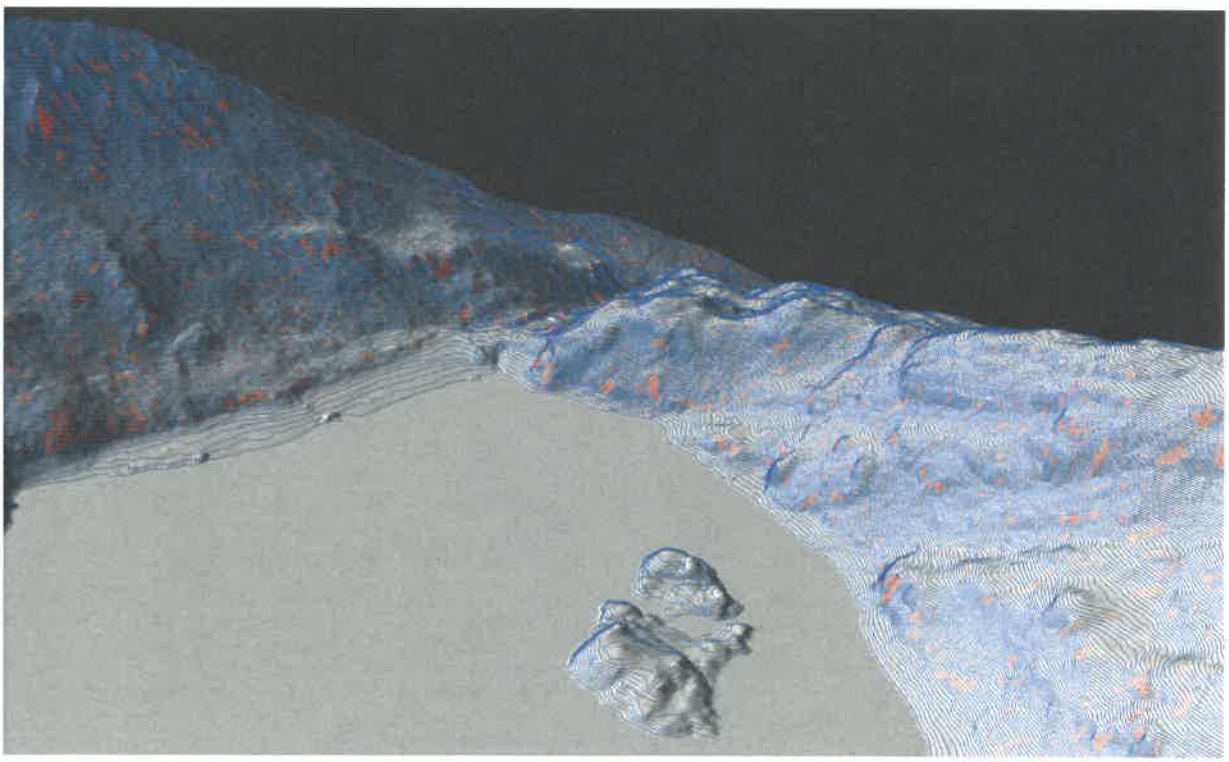
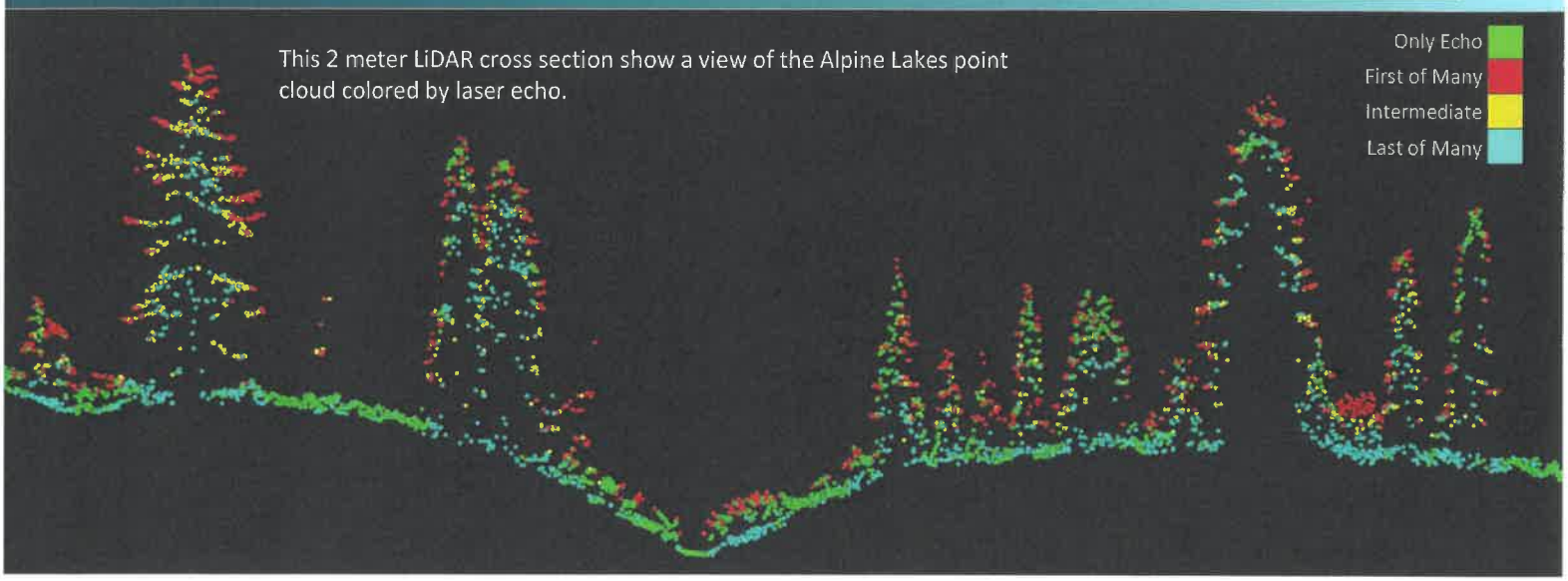


Figure 3: Contours draped over the Alpine Lakes, Washington bare earth elevation model. Blue contours represent high confidence while the red contours represent low confidence.



LiDAR Density

The acquisition parameters were designed to acquire an average first-return density of 8 points/m^2 (0.74 points/ft^2). First return density describes the density of pulses emitted from the laser that return at least one echo to the system. Multiple returns from a single pulse were not considered in first return density analysis. Some types of surfaces (e.g., breaks in terrain, water and steep slopes) may have returned fewer pulses than originally emitted by the laser. First returns typically reflect off the highest feature on the landscape within the footprint of the pulse. In forested or urban areas the highest feature could be a tree, building or power line, while in areas of unobstructed ground, the first return will be the only echo and represents the bare earth surface.

The density of ground-classified LiDAR returns was also analyzed for this project. Terrain character, land cover, and ground surface reflectivity all influenced the density of ground surface returns. In vegetated areas, fewer pulses may penetrate the canopy, resulting in lower ground density.

The average first-return point density value of LiDAR data for the Alpine Lakes project was 1.16 points/ft^2 (12.52 points/m^2) while the average ground classified point density value was 0.18 points/ft^2 (1.98 points/m^2) (Table 9). The statistical and spatial distributions of first return densities and ground classified return densities per 100 m x 100 m cell are portrayed in Figure 4 through Figure 7.

Table 9: Average LiDAR point densities

Classification	Point Density
First-Return	1.16 points/ft^2 12.52 points/m^2
Ground Classified	0.18 points/ft^2 1.98 points/m^2

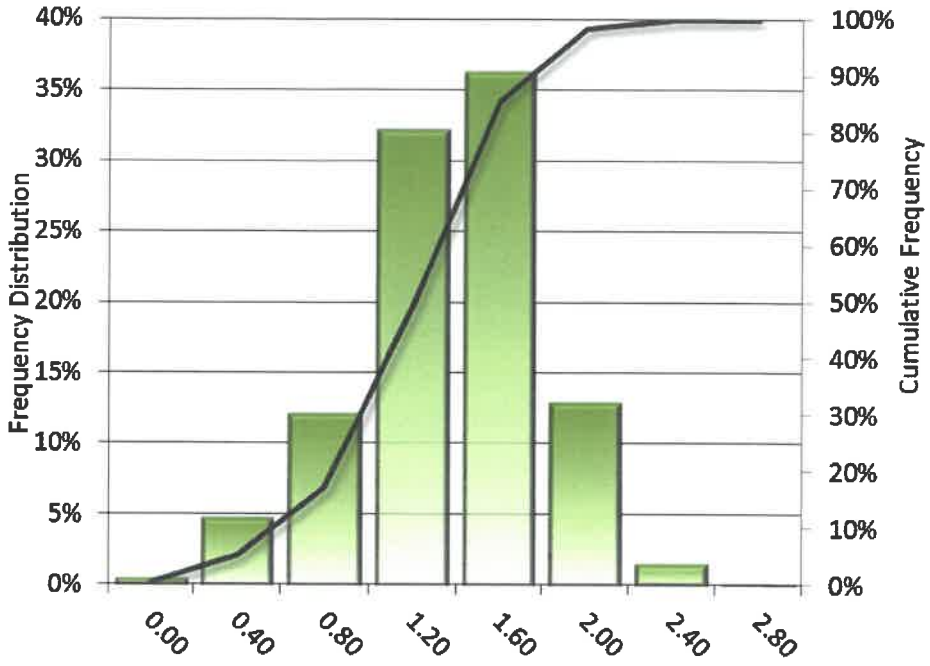


Figure 4: Frequency distribution of first return point density values per 100 x 100 m cell

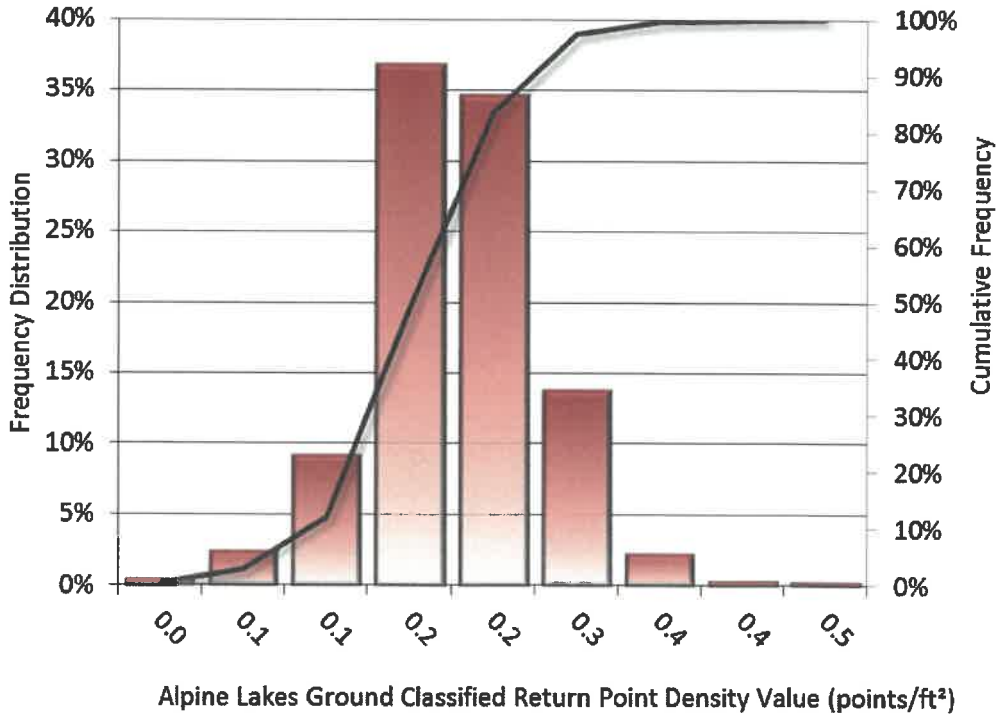


Figure 5: Frequency distribution of ground-classified return point density values per 100 x 100 m cell

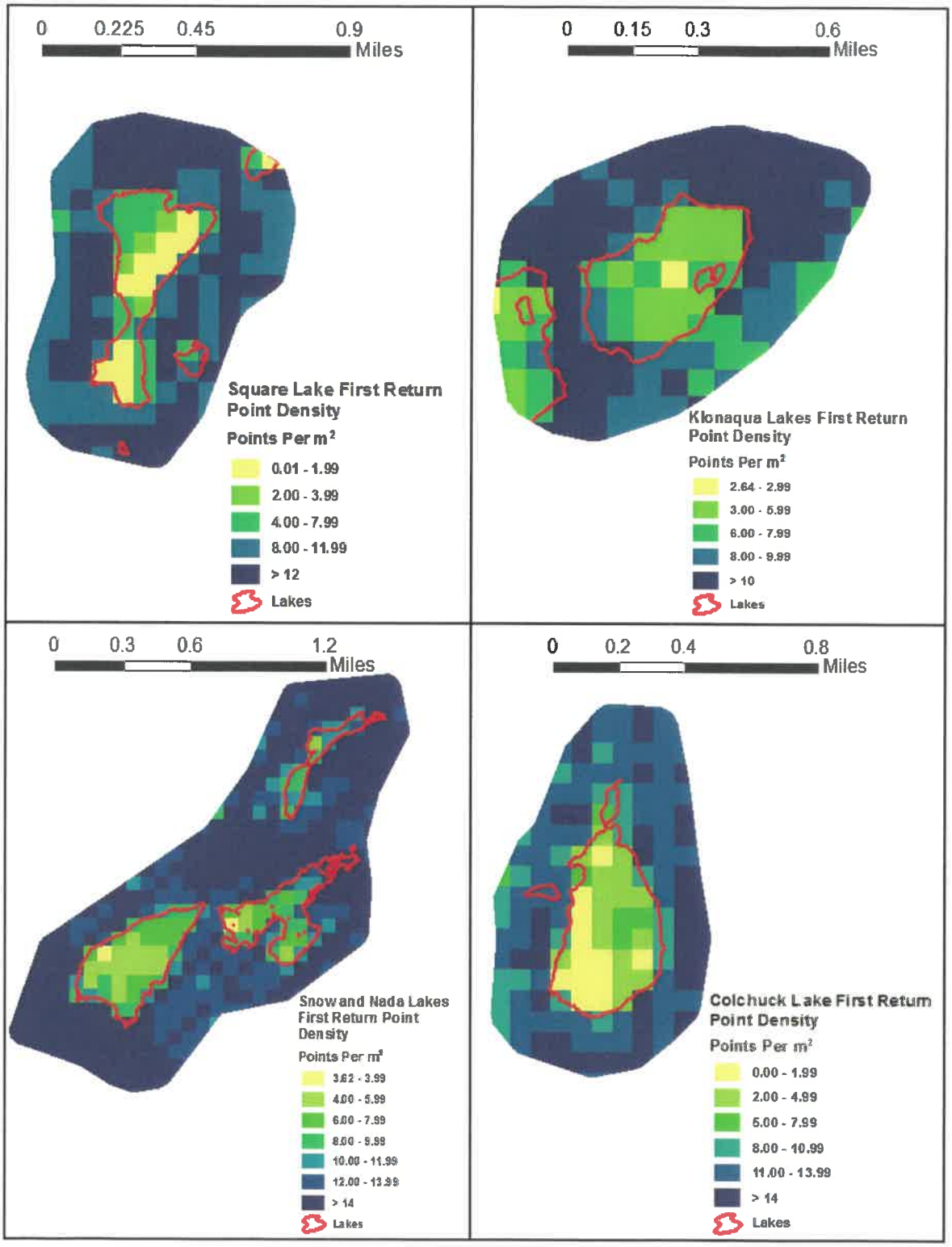


Figure 6: First return point density map for the Alpine Lakes, Washington sites (100 m x 100 m cells)

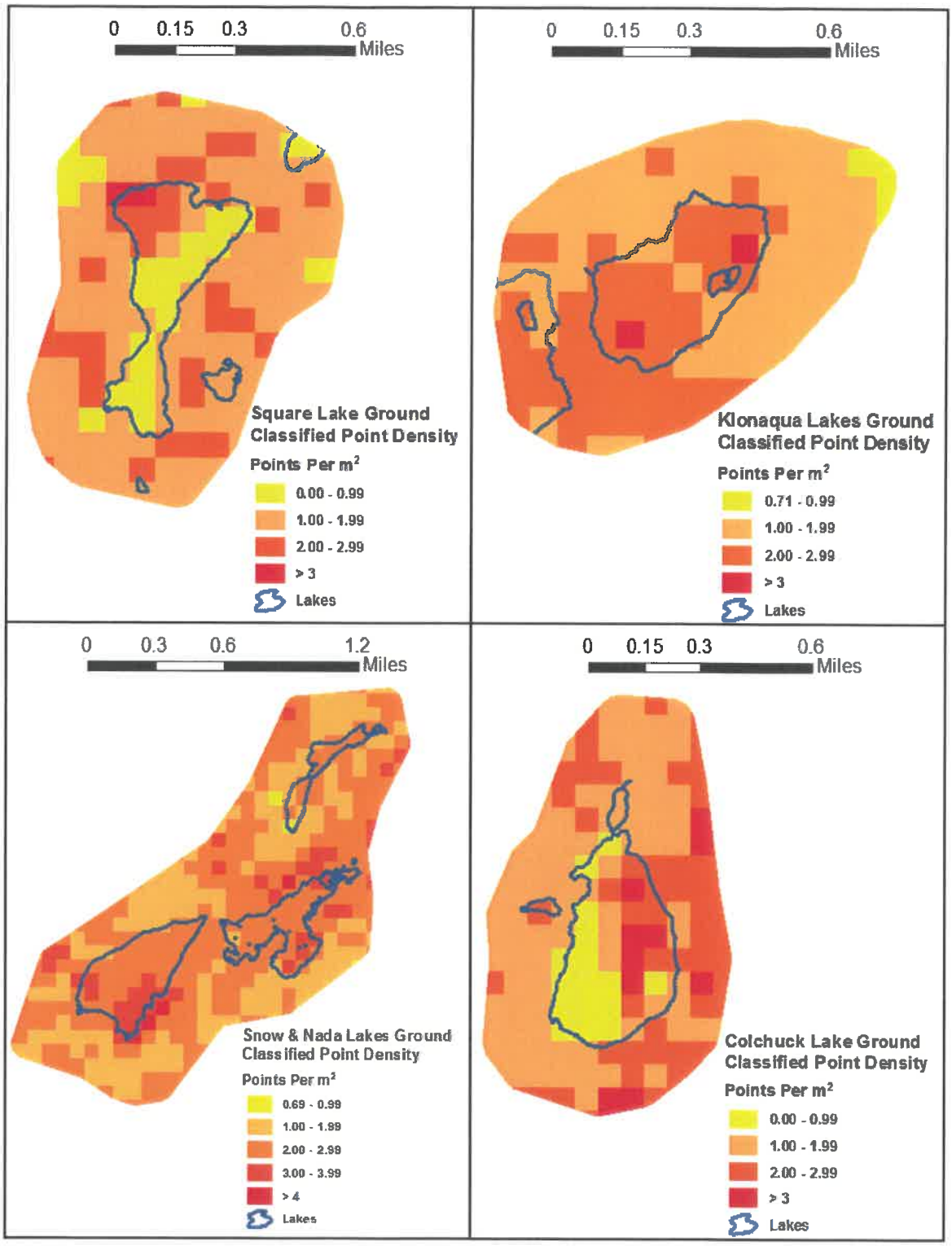


Figure 7: Ground point density map for the Alpine Lakes, Washington sites (100 m x 100 m cells)

LiDAR Accuracy Assessments

The accuracy of the LiDAR data collection can be described in terms of absolute accuracy (the consistency of the data with external data sources) and relative accuracy (the consistency of the dataset with itself). See Appendix A for further information on sources of error and operational measures used to improve relative accuracy.

LiDAR Absolute Accuracy

Absolute accuracy was assessed using Non-Vegetated Vertical Accuracy (NVA) reporting designed to meet guidelines presented in the FGDC National Standard for Spatial Data Accuracy[4]. NVA compares known ground quality assurance point data collected on open, bare earth surfaces with level slope (<20°) to the triangulated surface generated by the LiDAR points. NVA is a measure of the accuracy of LiDAR point data in open areas where the LiDAR system has a high probability of measuring the ground surface and is evaluated at the 95% confidence interval (1.96 * RMSE), as shown in Table 10.

The mean and standard deviation (sigma σ) of divergence of the ground surface model from quality assurance point coordinates are also considered during accuracy assessment. These statistics assume the error for x, y and z is normally distributed, and therefore the skew and kurtosis of distributions are also considered when evaluating error statistics. For the Alpine Lakes survey, 21 quality assurance points were withheld in total resulting in a non-vegetated vertical accuracy of 0.120 feet (0.037 meters) (Figure 8).

QSI also assessed absolute accuracy using 104 ground control points. Although these points were used in the calibration and post-processing of the LiDAR point cloud, they still provide a good indication of the overall accuracy of the LiDAR dataset, and therefore have been provided in Table 10 and Figure 9.

Table 10: Absolute accuracy results

Absolute Accuracy		
	Quality Assurance Points (NVA)	**Ground Control Points**
Sample	21 points	104 points
NVA (1.96*RMSE)	0.120 ft 0.037 m	0.146 ft 0.044 m
Average	0.003 ft 0.001 m	0.011 ft 0.003 m
Median	0.000 ft 0.000 m	0.011 ft 0.004 m
RMSE	0.061 ft 0.019 m	0.074 ft 0.023 m
Standard Deviation (1σ)	0.063 ft 0.019 m	0.074 ft 0.023 m

[4] Federal Geographic Data Committee, ASPRS POSITIONAL ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA EDITION 1, Version 1.0, NOVEMBER 2014. http://www.asprs.org/PAD-Division/ASPRS-POSITIONAL-ACCURACY-STANDARDS-FOR-DIGITAL-GEOSPATIAL-DATA.html.

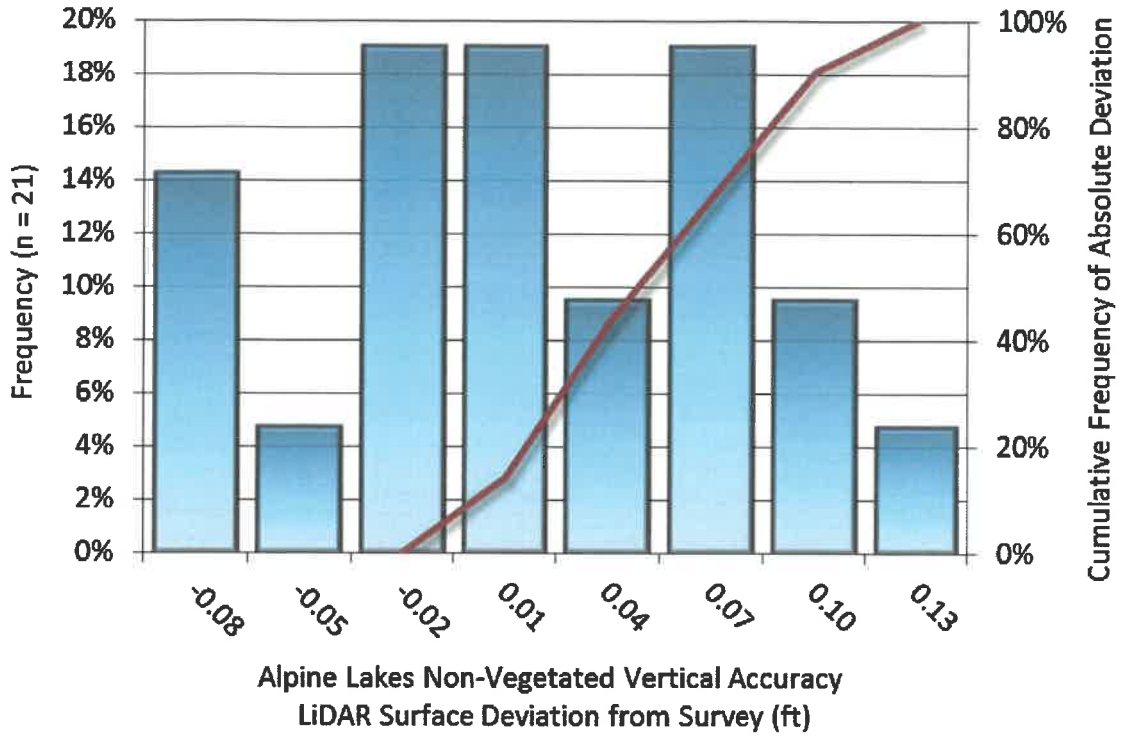


Figure 8: Frequency histogram for LiDAR surface deviation from quality assurance point values

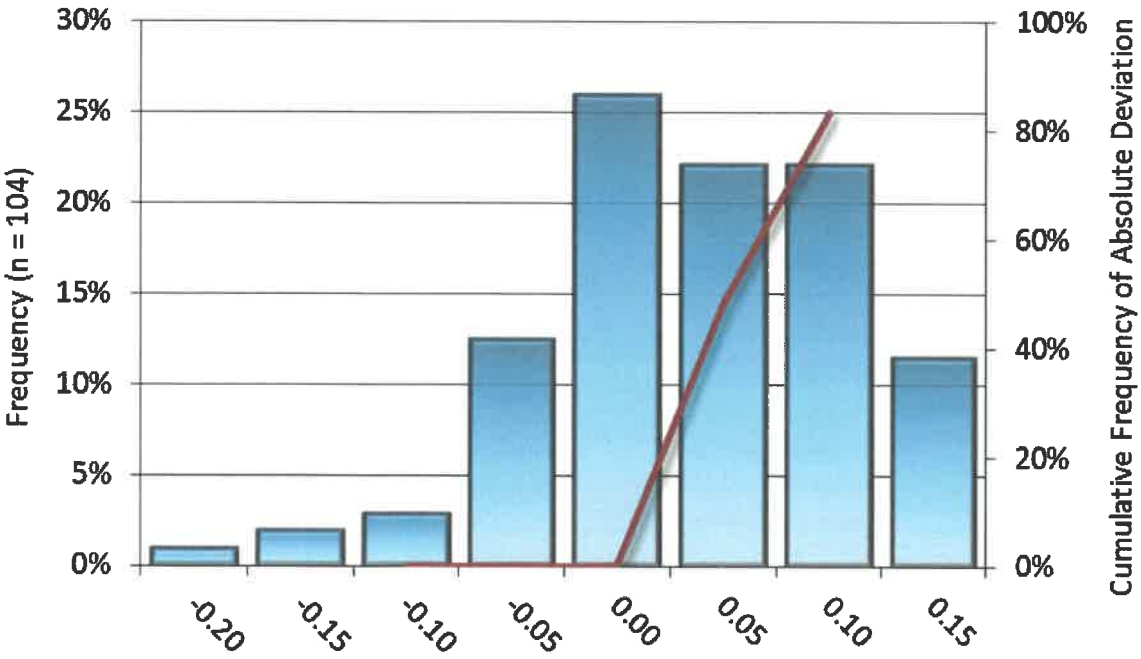


Figure 9: Frequency histogram for LiDAR surface deviation from ground control point values

LiDAR Relative Vertical Accuracy

Relative vertical accuracy refers to the internal consistency of the data set as a whole: the ability to place an object in the same location given multiple flight lines, GPS conditions, and aircraft attitudes. When the LiDAR system is well calibrated, the swath-to-swath vertical divergence is low (<0.10 meters). The relative vertical accuracy was computed by comparing the ground surface model of each individual flight line with its neighbors in overlapping regions. The average (mean) line to line relative vertical accuracy for the Alpine Lakes LiDAR project was 0.215 feet (0.066 meters) (Table 11, Figure 10).

Table 11: Relative accuracy results

Relative Accuracy	
Sample	25 surfaces
Average	0.215 ft 0.066 m
Median	0.217 ft 0.066 m
RMSE	0.216 ft 0.066 m
Standard Deviation (1σ)	0.022 ft 0.007 m
1.96σ	0.043 ft 0.013 m

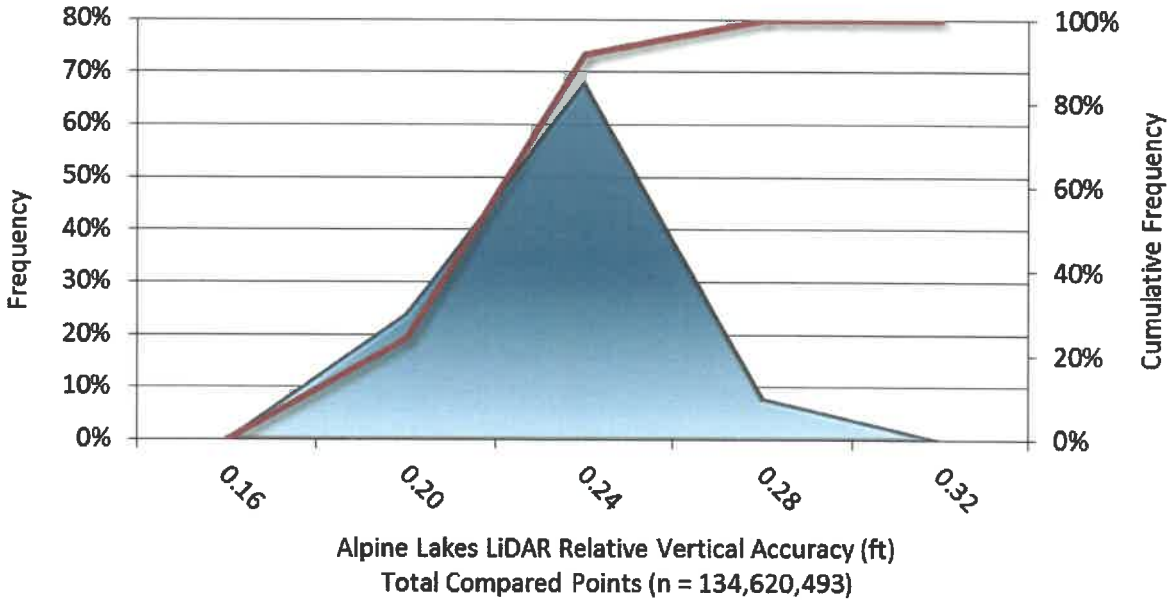


Figure 10: Frequency plot for relative vertical accuracy between flight lines

CERTIFICATIONS

Quantum Spatial, Inc. provided LiDAR services for the Alpine Lakes, Washington project as described in this report.

I, Adam Meyer, have reviewed the attached report for completeness and hereby state that it is a complete and accurate report of this project.

Adam Meyer Dec 1, 2016

Adam Meyer
Project Manager
Quantum Spatial, Inc.

I, Evon P. Silvia, PLS, being duly registered as a Professional Land Surveyor in and by the state of Washington, hereby certify that the methodologies, static GNSS occupations used during airborne flights, and ground survey point collection were performed using commonly accepted Standard Practices. Field work conducted for this report was conducted on October 15, 2016.

Accuracy statistics shown in the Accuracy Section of this Report have been reviewed by me and found to meet the "National Standard for Spatial Data Accuracy".

Evon P. Silvia Dec 1, 2016

Evon P. Silvia, PLS
Quantum Spatial, Inc.
Corvallis, OR 97333

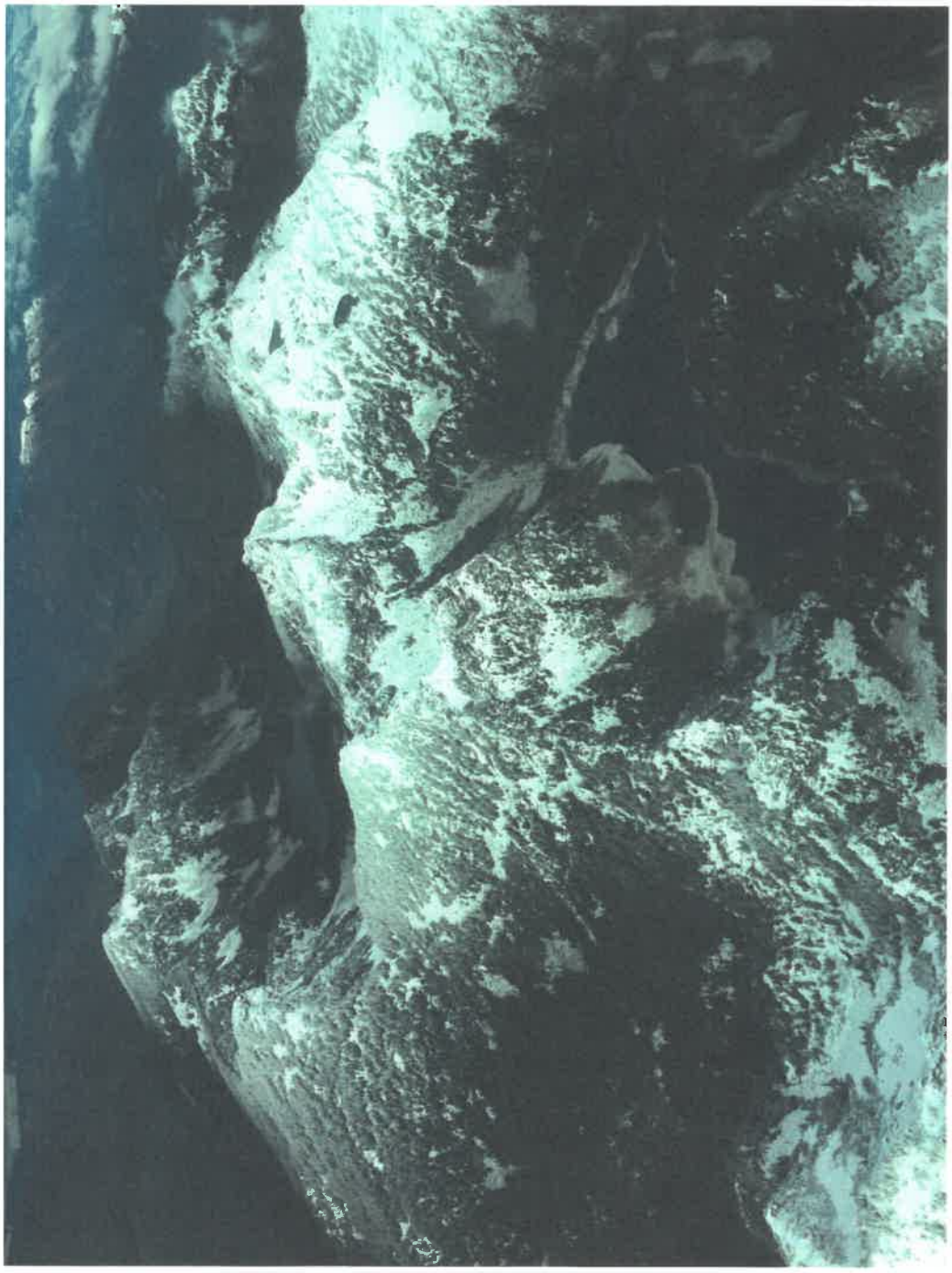


Figure 11: The above image is an aerial photo of Square Lake in the Alpine Lakes AOI. The photo was taken by QSI acquisition staff.

Figure 12: The above image is an aerial photo of Upper Snow Lake taken by the QSI acquisition team.

GLOSSARY

1-sigma (σ) Absolute Deviation: Value for which the data are within one standard deviation (approximately 68th percentile) of a normally distributed data set.

1.96 * RMSE Absolute Deviation: Value for which the data are within two standard deviations (approximately 95th percentile) of a normally distributed data set, based on the FGDC standards for Non-vegetated Vertical Accuracy (NVA) reporting.

Accuracy: The statistical comparison between known (surveyed) points and laser points. Typically measured as the standard deviation (sigma σ) and root mean square error (RMSE).

> **Absolute Accuracy:** The vertical accuracy of LiDAR data is described as the mean and standard deviation (sigma σ) of divergence of LiDAR point coordinates from ground survey point coordinates. To provide a sense of the model predictive power of the dataset, the root mean square error (RMSE) for vertical accuracy is also provided. These statistics assume the error distributions for x, y and z are normally distributed, and thus we also consider the skew and kurtosis of distributions when evaluating error statistics.
>
> **Relative Accuracy:** Relative accuracy refers to the internal consistency of the data set; i.e., the ability to place a laser point in the same location over multiple flight lines, GPS conditions and aircraft attitudes. Affected by system attitude offsets, scale and GPS/IMU drift, internal consistency is measured as the divergence between points from different flight lines within an overlapping area. Divergence is most apparent when flight lines are opposing. When the LiDAR system is well calibrated, the line-to-line divergence is low (<10 cm).
>
> **Root Mean Square Error (RMSE):** A statistic used to approximate the difference between real-world points and the LiDAR points. It is calculated by squaring all the values, then taking the average of the squares and taking the square root of the average.

Data Density: A common measure of LiDAR resolution, measured as points per square meter.

Digital Elevation Model (DEM): File or database made from surveyed points, containing elevation points over a contiguous area. Digital terrain models (DTM) and digital surface models (DSM) are types of DEMs. DTMs consist solely of the bare earth surface (ground points), while DSMs include information about all surfaces, including vegetation and man-made structures.

Intensity Values: The peak power ratio of the laser return to the emitted laser, calculated as a function of surface reflectivity.

Nadir: A single point or locus of points on the surface of the earth directly below a sensor as it progresses along its flight line.

Overlap: The area shared between flight lines, typically measured in percent. 100% overlap is essential to ensure complete coverage and reduce laser shadows.

Pulse Rate (PR): The rate at which laser pulses are emitted from the sensor; typically measured in thousands of pulses per second (kHz).

Pulse Returns: For every laser pulse emitted, the number of wave forms (i.e., echos) reflected back to the sensor. Portions of the wave form that return first are the highest element in multi-tiered surfaces such as vegetation. Portions of the wave form that return last are the lowest element in multi-tiered surfaces.

Real-Time Kinematic (RTK) Survey: A type of surveying conducted with a GPS base station deployed over a known monument with a radio connection to a GPS rover. Both the base station and rover receive differential GPS data and the baseline correction is solved between the two. This type of ground survey is accurate to 1.5 cm or less.

Post-Processed Kinematic (PPK) Survey: GPS surveying is conducted with a GPS rover collecting concurrently with a GPS base station set up over a known monument. Differential corrections and precisions for the GNSS baselines are computed and applied after the fact during processing. This type of ground survey is accurate to 1.5 cm or less.

Scan Angle: The angle from nadir to the edge of the scan, measured in degrees. Laser point accuracy typically decreases as scan angles increase.

Native LiDAR Density: The number of pulses emitted by the LiDAR system, commonly expressed as pulses per square meter.

Relative Accuracy Calibration Methodology:

Manual System Calibration: Calibration procedures for each mission require solving geometric relationships that relate measured swath-to-swath deviations to misalignments of system attitude parameters. Corrected scale, pitch, roll and heading offsets were calculated and applied to resolve misalignments. The raw divergence between lines was computed after the manual calibration was completed and reported for each survey area.

Automated Attitude Calibration: All data were tested and calibrated using TerraMatch automated sampling routines. Ground points were classified for each individual flight line and used for line-to-line testing. System misalignment offsets (pitch, roll and heading) and scale were solved for each individual mission and applied to respective mission datasets. The data from each mission were then blended when imported together to form the entire area of interest.

Automated Z Calibration: Ground points per line were used to calculate the vertical divergence between lines caused by vertical GPS drift. Automated Z calibration was the final step employed for relative accuracy calibration.

LiDAR accuracy error sources and solutions:

Type of Error	Source	Post Processing Solution
GPS (Static/Kinematic)	Long Base Lines	None
	Poor Satellite Constellation	None
	Poor Antenna Visibility	Reduce Visibility Mask
Relative Accuracy	Poor System Calibration	Recalibrate IMU and sensor offsets/settings
	Inaccurate System	None
Laser Noise	Poor Laser Timing	None
	Poor Laser Reception	None
	Poor Laser Power	None
	Irregular Laser Shape	None

Operational measures taken to improve relative accuracy:

Low Flight Altitude: Terrain following was employed to maintain a constant above ground level (AGL). Laser horizontal errors are a function of flight altitude above ground (about 1/3000th AGL flight altitude).

Focus Laser Power at narrow beam footprint: A laser return must be received by the system above a power threshold to accurately record a measurement. The strength of the laser return (i.e., intensity) is a function of laser emission power, laser footprint, flight altitude and the reflectivity of the target. While surface reflectivity cannot be controlled, laser power can be increased and low flight altitudes can be maintained.

Reduced Scan Angle: Edge-of-scan data can become inaccurate. The scan angle was reduced to a maximum of ±15° from nadir, creating a narrow swath width and greatly reducing laser shadows from trees and buildings.

Quality GPS: Flights took place during optimal GPS conditions (e.g., 6 or more satellites and PDOP [Position Dilution of Precision] less than 3.0). Before each flight, the PDOP was determined for the survey day. During all flight times, a dual frequency DGPS base station recording at 1 second epochs was utilized and a maximum baseline length between the aircraft and the control points was less than 13 nm at all times.

Ground Survey: Ground survey point accuracy (<1.5 cm RMSE) occurs during optimal PDOP ranges and targets a minimal baseline distance of 4 miles between GPS rover and base. Robust statistics are, in part, a function of sample size (n) and distribution. Ground survey points are distributed to the extent possible throughout multiple flight lines and across the survey area.

50% Side-Lap (100% Overlap): Overlapping areas are optimized for relative accuracy testing. Laser shadowing is minimized to help increase target acquisition from multiple scan angles. Ideally, with a 50% side-lap, the nadir portion of one flight line coincides with the swath edge portion of overlapping flight lines. A minimum of 50% side-lap with terrain-followed acquisition prevents data gaps.

Opposing Flight Lines: All overlapping flight lines have opposing directions. Pitch, roll and heading errors are amplified by a factor of two relative to the adjacent flight line(s), making misalignments easier to detect and resolve.

APPENDIX C

Radio Repeater Background Information

REFERENCE COPY
This is not an official FCC license. It is a record of public information contained in the FCC's licensing database on the date that this reference copy was generated. In cases where FCC rules require the presentation, posting, or display of an FCC license, this document may not be used in place of an official FCC license.

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: ICICLE IRRIGATION DISTRICT

ATTN: JOEL TEELEY
ICICLE IRRIGATION DISTRICT
5594 WESCOTT DRIVE
PO BOX 371
CASHMERE, WA 98815

Call Sign	File Number
WQKR961	

Radio Service
IG - Industrial/Business Pool, Conventional

Regulatory Status
PMRS

Frequency Coordination Number

FCC Registration Number (FRN): 0018582478

Grant Date	Effective Date	Expiration Date	Print Date
08-27-2009	08-27-2009	08-27-2019	

STATION TECHNICAL SPECIFICATIONS

Fixed Location Address or Mobile Area of Operation

Loc. 1 **Address:** 5594 Wescott Drive
City: Cashmere **County:** CHELAN **State:** WA
Lat (NAD83): 47-31-09.0 N **Long (NAD83):** 120-29-47.0 W **ASR No.:** **Ground Elev:** 276.0

Loc. 2 **Address:** Blagg Mountain
City: Cashmere **County:** CHELAN **State:** WA
Lat (NAD83): 47-36-25.0 N **Long (NAD83):** 120-30-35.0 W **ASR No.:** **Ground Elev:** 1180.0

Loc. 3 **Area of operation**
Operating within a 32.0 km radius around fixed location 2

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
1	1	000456.67500000	FX1	1		11K0F2D 11K0F3D 11K0F3E	40.000	40.000	20.0	s-387.0	08-27-2010
2	1	000451.67500000	FB2	1		11K0F2D 11K0F3D 11K0F3E	45.000	45.000	40.0	395.0	08-27-2010

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

FCC 601-LM
August 2007

Licensee Name: ICICLE IRRIGATION DISTRICT

Call Sign: WQKR961 **File Number:** **Print Date:**

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
3	1	000456.67500000	MO	30		11K0F2D 11K0F3D 11K0F3E	6.000	6.000			08-27-2010
3	1	000451.67500000	MO	30		11K0F2D 11K0F3D 11K0F3E	6.000	6.000			08-27-2010

Control Points

Control Pt. No. 1

Address: 5594 Wescott Drive

City: Cashmere **County:** CHELAN **State:** WA **Telephone Number:** (509)782-2561

Associated Call Signs

Waivers/Conditions:

NONE

Reference Copy

REFERENCE COPY
This is not an official FCC license. It is a record of public information contained in the FCC's licensing database on the date that this reference copy was generated. In cases where FCC rules require the presentation, posting, or display of an FCC license, this document may not be used in place of an official FCC license.

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: ICICLE IRRIGATION DISTRICT

ATTN: JOEL TEELEY
ICICLE IRRIGATION DISTRICT
5594 WESCOTT DRIVE
PO BOX 371
CASHMERE, WA 98815

Call Sign	File Number
WQKS355	

Radio Service
IG - Industrial/Business Pool, Conventional

Regulatory Status
PMRS

Frequency Coordination Number

FCC Registration Number (FRN): 0018582478

Grant Date	Effective Date	Expiration Date	Print Date
08-31-2009	08-31-2009	08-31-2019	

STATION TECHNICAL SPECIFICATIONS

Fixed Location Address or Mobile Area of Operation

Loc. 1 **Address:** RTU #1 - .89 mi NE of
City: Peshastin **County:** CHELAN **State:** WA
Lat (NAD83): 47-34-41.8 N **Long (NAD83):** 120-35-43.8 W **ASR No.:** **Ground Elev:** 406.0

Loc. 2 **Address:** RTU #2 - 1.81 mi S of
City: Peshastin **County:** CHELAN **State:** WA
Lat (NAD83): 47-32-29.4 N **Long (NAD83):** 120-36-49.8 W **ASR No.:** **Ground Elev:** 354.0

Loc. 3 **Address:** RTU #3 - .98 mi SE of
City: Peshastin **County:** CHELAN **State:** WA
Lat (NAD83): 47-33-18.0 N **Long (NAD83):** 120-35-42.0 W **ASR No.:** **Ground Elev:** 339.0

Loc. 4 **Address:** RTU #4 - 3.69 mi E of
City: Peshastin **County:** CHELAN **State:** WA
Lat (NAD83): 47-31-40.8 N **Long (NAD83):** 120-32-00.6 W **ASR No.:** **Ground Elev:** 427.0

Loc. 5 **Address:** RTU #5 - 4.84 mi SE of
City: Peshastin **County:** CHELAN **State:** WA
Lat (NAD83): 47-31-08.4 N **Long (NAD83):** 120-31-45.6 W **ASR No.:** **Ground Elev:** 333.0

Loc. 6 **Address:** RTU #6 - 1.21 mi W of
City: Peshastin **County:** CHELAN **State:** WA
Lat (NAD83): 47-31-01.3 N **Long (NAD83):** 120-29-44.8 W **ASR No.:** **Ground Elev:** 268.0

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

FCC 601-LM
August 2007

Licensee Name: ICICLE IRRIGATION DISTRICT

Call Sign: WQKS355 **File Number:** **Print Date:**

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
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2	1	000456.67500000	FXO	1		11K0F2D 11K0F3D 11K0F3E	6.000	6.000	3.0	-435.0	08-31-2010
3	1	000456.67500000	FXO	1		11K0F2D 11K0F3D 11K0F3E	6.000	6.000	3.0	-464.0	08-31-2010
4	1	000456.67500000	FXO	1		11K0F2D 11K0F3D 11K0F3E	6.000	6.000	3.0	-312.0	08-31-2010
5	1	000456.67500000	FXO	1		11K0F2D 11K0F3D 11K0F3E	6.000	6.000	3.0	-393.0	08-31-2010
6	1	000456.67500000	FXO	1		11K0F2D 11K0F3D 11K0F3E	6.000	6.000	3.0	-409.0	08-31-2010

Control Points

Control Pt. No. 1

Address: 5594 Wescott Drive

City: Cashmere **County:** CHELAN **State:** WA **Telephone Number:** (509)782-2561

Associated Call Signs

Waivers/Conditions:

NONE

Reference Copy

Location Details - ICICLE RIDGE

General | Details | Antenna | Contact | Rules | Alerts | Repeaters

Health Status: Auto (rules)

ID: ICICLERIDGE

Name: ICICLE RIDGE

ESN:

MGRS: 10TFT6856772797

Lat / Lon: 47.586667 -120.758056

Elevation (m): 2079

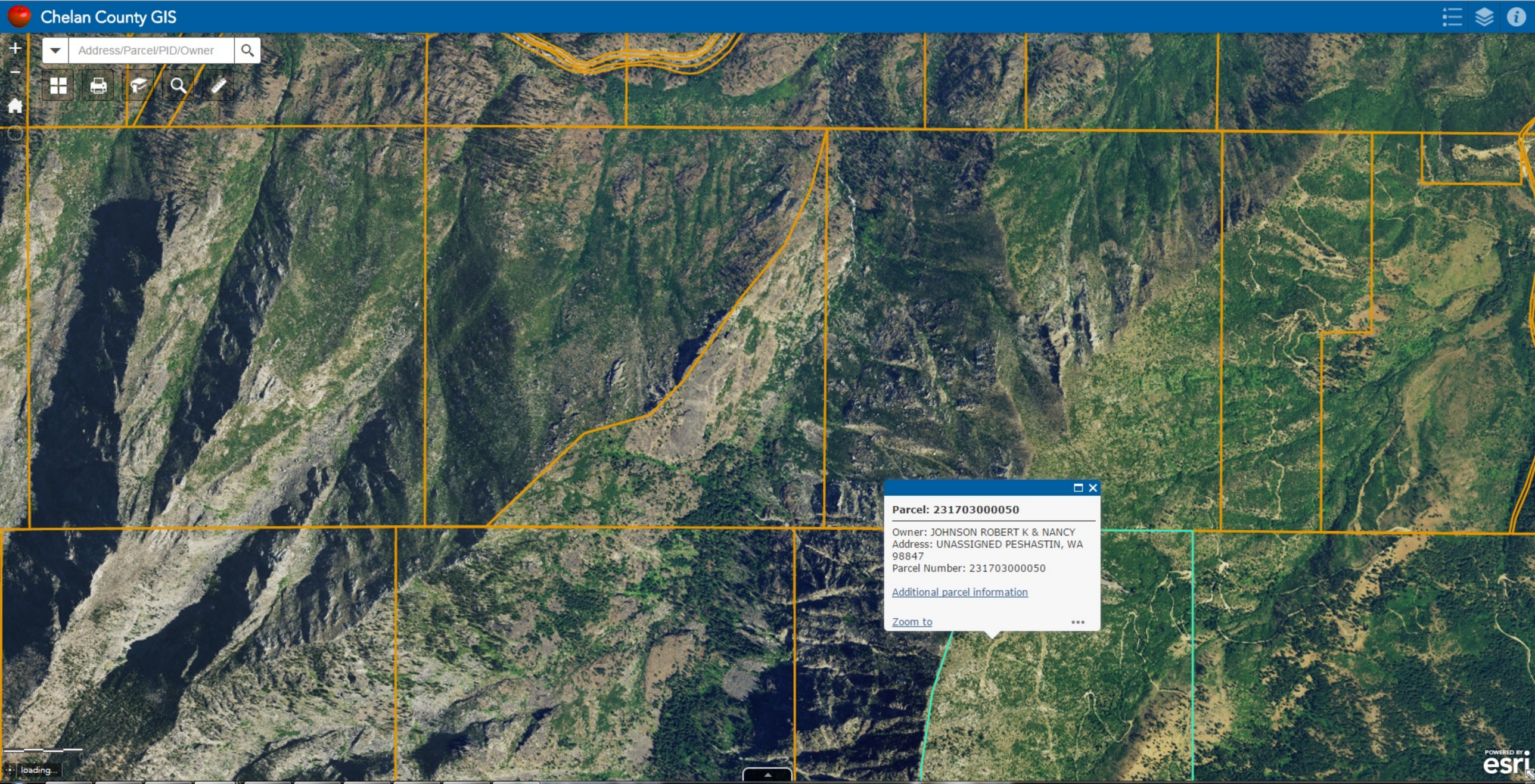
Forest: Okanogan-Wenatchee National Forest

About
Dashboard
Admin
Help
Fourth of July Creek
Bridge Creek
Location Summary - ICICLE RIDGE
General
Data
Repeaters
Status: UNMONITORED
Updated: 4/8/2014, 6:15:43 AM
Reasons:
Lat/Lon: 47.5866670, -120.758056
MGRS: 10TFT6856772797
Region: R6-Pacific Northwest
Forest:
Okanogan-Wenatchee National Forest
Zoom to
Show Coverage
Location Details
Leavenworth
Leavenworth Golf Club
Repeaters
Layers
Legend
Tools
Placemarks
Coverage
esri

Location Details - ICICLE RIDGE

General | Details | Antenna | Contact | Rules | Alerts | Repeaters

Tx Antenna:	Collinear
Dbi:	6
Antenna Height Meters:	6
Antenna Azth:	ND
Txpo Watts:	50


Chelan County GIS
Address/Parcel/PID/Owner
Parcel: 231703000050
Owner: JOHNSON ROBERT K & NANCY
Address: UNASSIGNED PESHASTIN, WA 98847
Parcel Number: 231703000050
Additional parcel information
Zoom to
loading...
esri

APPENDIX D

Conceptual Engineering Drawings

(SQUARE LAKE)

(DAM / SPILLWAY)

(OUTLET CHANNEL)

0+50

1+00

1+50

2+00

2+50

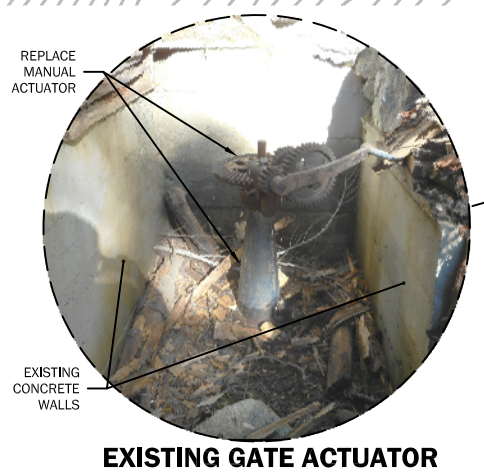
3+00

3+50

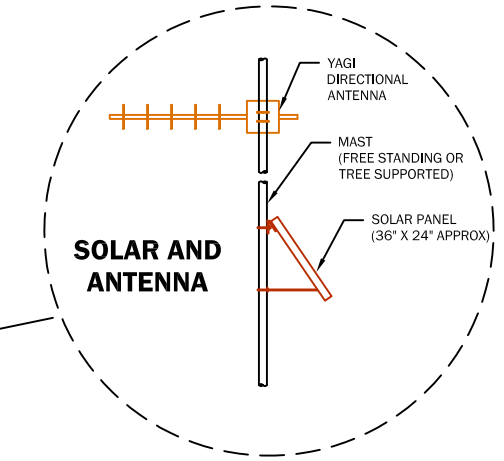
4+00

4+50

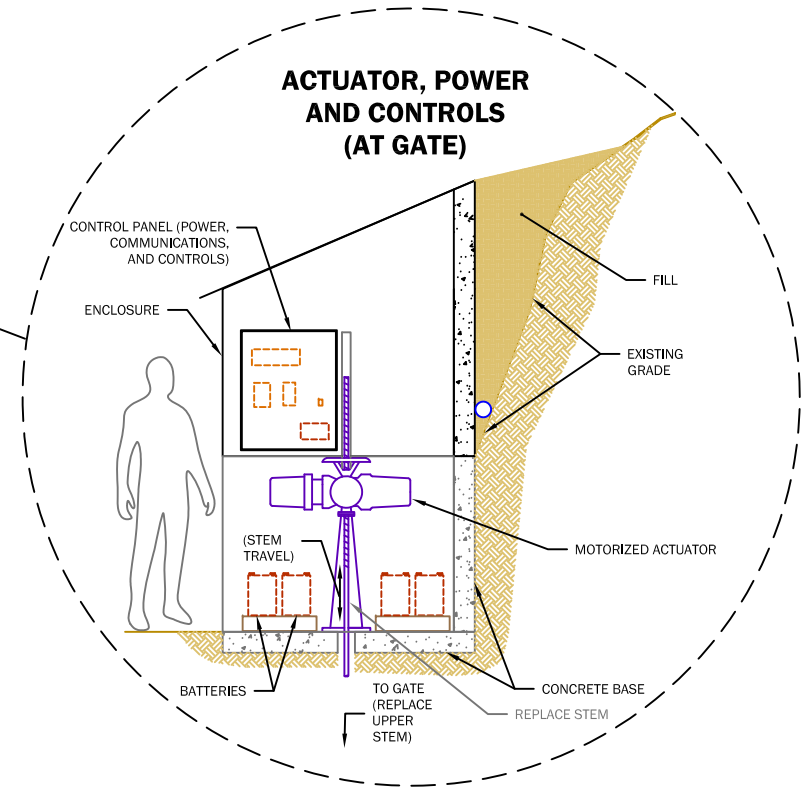
4+68



EXISTING GATE ACTUATOR



SOLAR AND ANTENNA

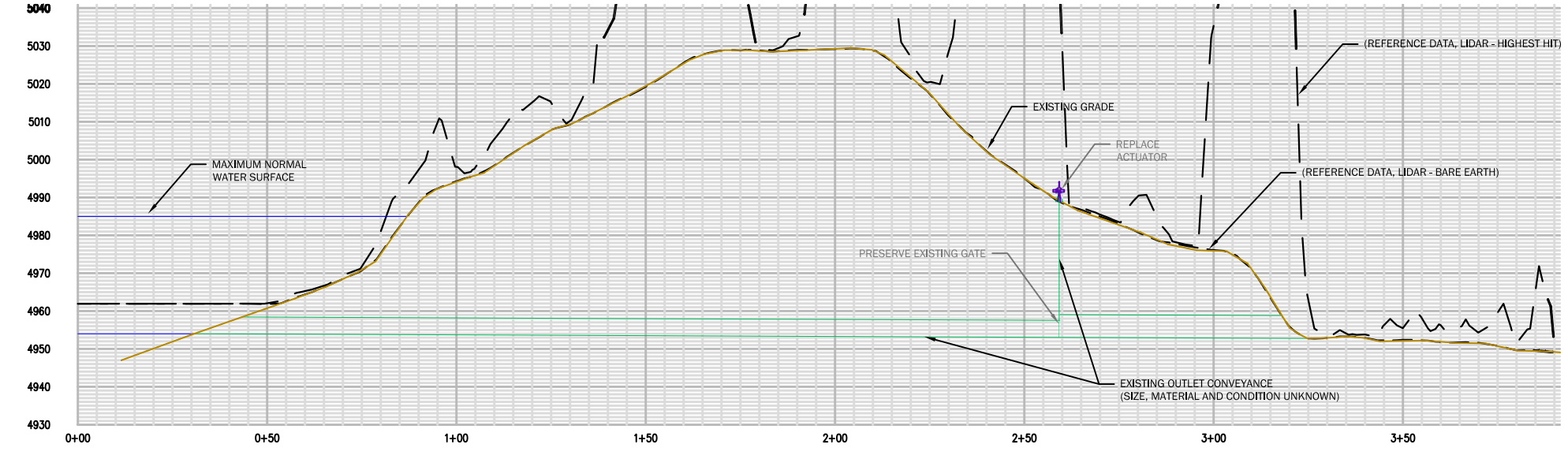


ACTUATOR, POWER AND CONTROLS (AT GATE)

Plan

20' 10' 0 20' 40'

SCALE: 1"=20'



Profile

20' 10' 0 20' 40'

SCALE: 1"=20'

EXISTING FEATURES (TOPOGRAPHY AND STRUCTURES) THIS VIEW ARE APPROXIMATELY SHOWN AND HAVE BEEN GENERATED BASED UPON LIDAR REFERENCE DATA IN CONJUNCTION WITH FIELD RECORDS

DRAFT

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

REVISED BY: -

DRAWN BY: SCC

DESIGNED BY: -

PROJECT NUMBER: 000000

REVISION: -

DATE: FEB 2017

Aspect CONSULTING

Conceptual Improvements Square Lake

Alpine Lakes Automation Feasibility

Leavenworth, Washington

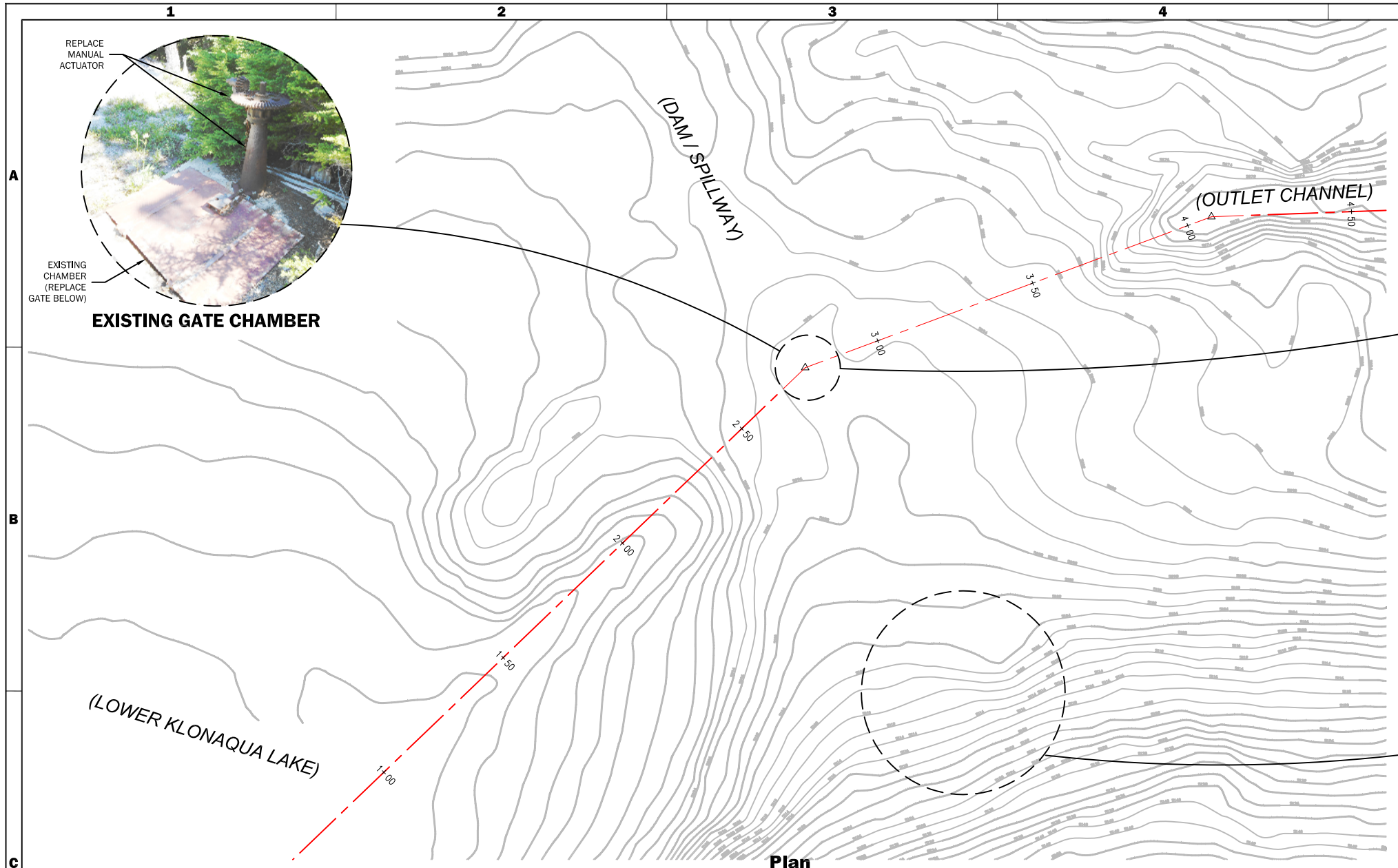
SHEET REFERENCE NUMBER:

C01

SHEET **1** *OF* **3**

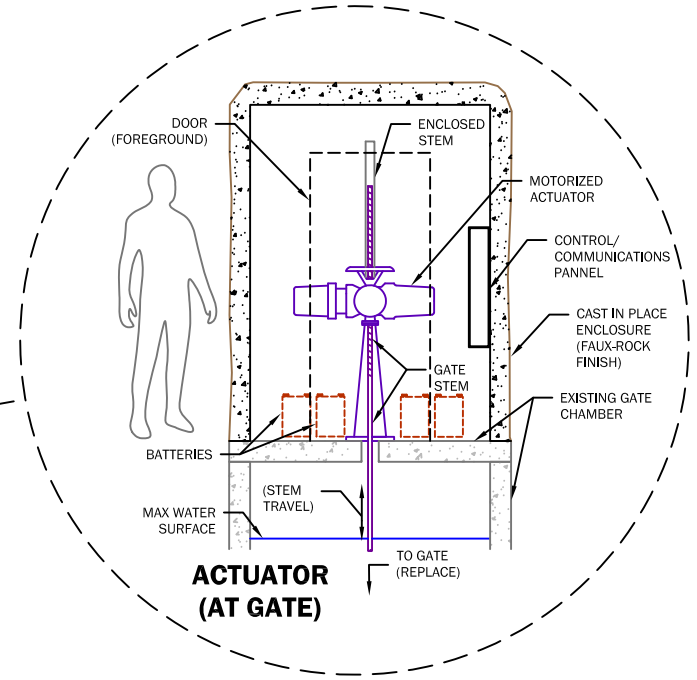
CAD Path:H:\Projects\Chelan County Natural Resources-120045\Alpine Lakes\Feasibility Design\CAD\Square\squaresp-sc01.dwg Square Plan || Date Saved: May 12, 2017 8:40am || User: dcrowlee

EXISTING GATE CHAMBER

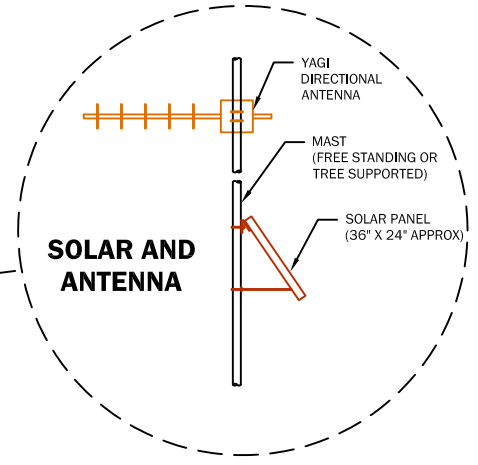


Plan

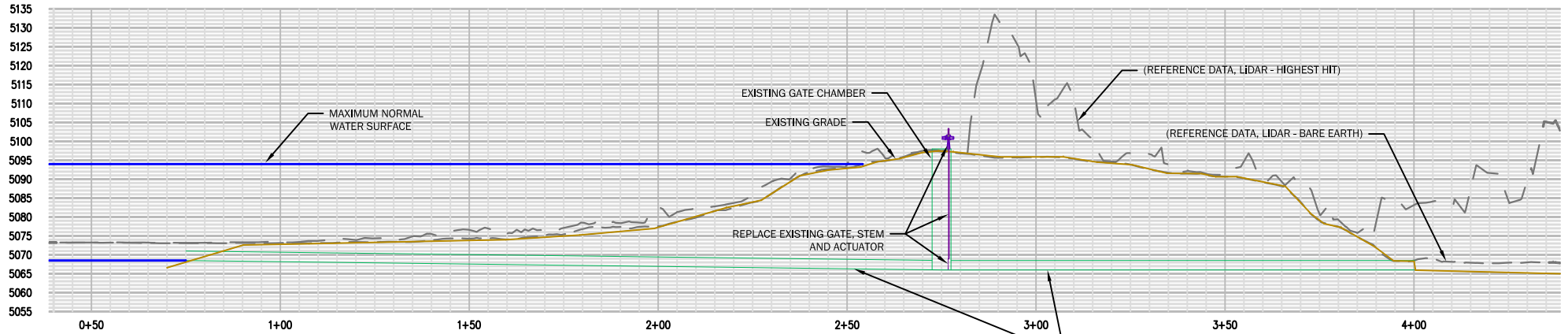
20' 10' 0 20' 40'
SCALE: 1"=20'



ACTUATOR (AT GATE)



SOLAR AND ANTENNA



Profile

20' 10' 0 20' 40'
SCALE: 1"=20'

EXISTING FEATURES (TOPOGRAPHY AND STRUCTURES) THIS VIEW ARE APPROXIMATELY SHOWN AND HAVE BEEN GENERATED BASED UPON LIDAR REFERENCE DATA IN CONJUNCTION WITH FIELD RECORDS

DRAFT

REV	DESCRIPTION	DATE	APPR
-	-	-	-

REVISED BY: -
DRAWN BY: SCC
DESIGNED BY: -
PROJECT NUMBER: 000000
REVISION: -
DATE: FEB 2017

Aspect CONSULTING

Conceptual Improvements
Klonaqua Lake

Alpine Lakes Automation Feasibility
Leavenworth, Washington

SHEET REFERENCE NUMBER:
C02
SHEET **2** *OF* **3**

CAD Path:I:\Projects\Chelan County Natural Resources\220045\Alpine Lakes\Feasibility Design\CAD\Klonaqua\Klonaqua-exhibit2.dwg Klonaqua Plan || Date Saved: May 12, 2017 8:37am || User: ccrownlee

(COLCHUCK LAKE)

(DAM / SPILLWAY)

(OUTLET CHANNEL)

2+00

2+50

3+00

3+50

REPLACE MANUAL ACTUATOR AND TOWER

EXISTING GATE TOWER

SOLAR AND ANTENNA

YAGI DIRECTIONAL ANTENNA

MAST (FREE STANDING OR TREE SUPPORTED)

SOLAR PANEL (36" X 24" APPROX)

DOOR (FOREGROUND)

ENCLOSED STEM

MOTORIZED ACTUATOR

CONTROL/ COMMUNICATIONS PANNEL

CAST IN PLACE ENCLOSURE (FAUX-ROCK FINISH)

GATE STEM

CAST IN PLACE CONCRETE GATE TOWER

BATTERIES

MAX WATER SURFACE

(STEM TRAVEL)

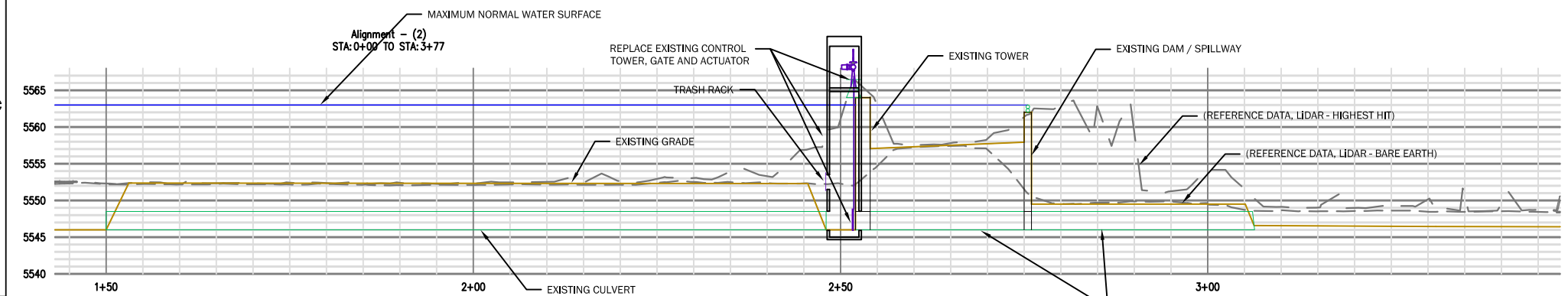
TO GATE (REPLACE)

ACTUATOR (AT GATE)

Plan

10' 5' 0 10' 20'

SCALE: 1"=10'



Profile

10' 5' 0 10' 20'

SCALE: 1"=10'

EXISTING FEATURES (TOPOGRAPHY AND STRUCTURES) THIS VIEW ARE APPROXIMATELY SHOWN AND HAVE BEEN GENERATED BASED UPON LIDAR REFERENCE DATA IN CONJUNCTION WITH FIELD RECORDS

DRAFT

REV:	DESCRIPTION	DATE	APPR
-	-	-	-

REVISED BY: -

DRAWN BY: SCC

DESIGNED BY: -

PROJECT NUMBER: 000000

REVISION: -

DATE: FEB 2017

Aspect CONSULTING

Conceptual Improvements
Colchuck Lake

Alpine Lakes Automation Feasibility
Leavenworth, Washington

SHEET REFERENCE NUMBER:

C03

SHEET **3** *OF* **3**

CAD Path: H:\Projects\Chelan County Natural Resources-120045\Alpine Lakes\Feasibility Design\CAD\Colchuck\Colchuck-v1.dwg Colchuck Plan || Date Saved: May 12, 2017 8:38am || User: rbonelee

APPENDIX E

Preliminary Equipment Selection, Vendor Data

rotork®
Controls

IQ range DC actuators

Motor data for IQ range DC actuators

Publication number E130E_DC0807
Date of issue 08/07

As part of on-going product development, Rotork reserve the right to change specification without prior notice.
Published data maybe subject to change.
The name Rotork is a registered trademark. Rotork recognises all registered trademarks. Published and produced in the UK by Rotork Controls Ltd.

Electric Motor Performance Data for IQD New Generation Actuators - DC Power Supplies

Publication number E130E_DC0807
Date of issue 08/07

Introduction

This guide provides IQD motor data for standard class F, 15 minute rated actuators at the following DC supply voltages:

24V 48V 110V

Actuator performance is limited by supply voltage due to current switching limitations. Refer to motor data tables.
The IQD actuator range is generally described in publication E110E. For IQD control and monitoring refer to publication E120E

Glossary

- Rated Torque – Corresponds to 100% torque switch setting
- Locked rotor – motor starting and stalled condition
- Rated Amps – current at 100% torque switch setting
- Average (nominal) load – Corresponds to 33% of rated torque.
- Efficiency – electrical efficiency of the actuator motor.

Design criteria

Motors designed for operation of valve actuators require special consideration. As continuous running is not a requirement with isolating and "inching" or regulating duty valves, motors need only be short duty time rated. Valve load can vary dramatically across stroke and from stroke to stroke as process and valve conditions change. Varying from light running to rated torque with a facility to exceed rated in unseating "sticky" valves, actual motor loading has no constant. To apply traditional motor protection to actuator motors is therefore flawed, leading to spurious tripping or no protection at all. Rotork recognise the special nature of actuator motors and have therefore designed the IQD motor and control package with this unique duty at the forefront.

IQD Motor Design

IQD motors are of a low inertia, permanent magnet design. In its standard form they are class F insulated, rated 15 minutes at average load. The motor torque/speed characteristic has been designed to fulfill the following requirements:

- High locked rotor torque in comparison with that required to operate and seat the valve. Rotork are able to guarantee actuator performance at +/-10% of nominal voltage, however in common with all DC motors of this type, speed will vary with load and voltage.
- Low inertia, high starting torque motor combined with the lost motion drive, allows the motor to reach full speed with maximum available torque before the drive is applied to the valve, ensuring unseating for all except jammed valves.
- Maintenance free for the life of the actuator.

IQD motor protection

The primary protection for the motor is torque switch protection. By measuring the actuator output torque and comparing it to the open and close torque switch setting, the motor will be de-energised when the set torque is reached. This method provides the only comprehensive means of motor *and* valve protection.

IQD motors also incorporate over temperature protection using thermostats that will de-energise the motor if the duty cycle exceeds actuator rating. Testing has shown that using motor mounted thermostats offer better protection than traditional thermal overload relays as they respond directly to motor temperature and therefore are more closely linked to the motor thermal characteristic.

IQD control protection will prevent motor stall in the event of valve jamming *.

*If "torque switch bypass" or "Boost" open torque has been set the actuator will develop torque in excess of rated and can stall in attempting to unseat a jammed valve. If the actuator stalls, jammed valve protection will trip the motor within 4 seconds.

Power supply cable sizing
As a minimum requirement, cables must be sized to ensure volt drop does not exceed 10% of nominal supply voltage at locked rotor current.

Fuse selection
Due to the unique nature of the motor duty and taking in to account the comprehensive control protection of the IQD, sizing of fuses or trip devices should be based on protecting the power cable connected to the actuator. If required, sizing trip devices to disconnect after 5 seconds at locked rotor current may enhance protection. This will reduce the risk of severe motor heating under stall conditions while preventing spurious trips under normal operation. It should be noted that sizing trip devices in this manner may not be possible while meeting other criteria and is purely designed to meet extreme fault conditions such as jammed contactor when standard control protection cannot de-energise the motor. All other operating conditions will be catered for by the standard IQD control protection.

DC power systems
Rotork can supply failsafe charger/battery and solar powered backup systems for use with IQD and IQT-24V DC range actuators. Please apply.

Motor Options
IQD motors are available with extended duty cycles. Please apply.

24VDC

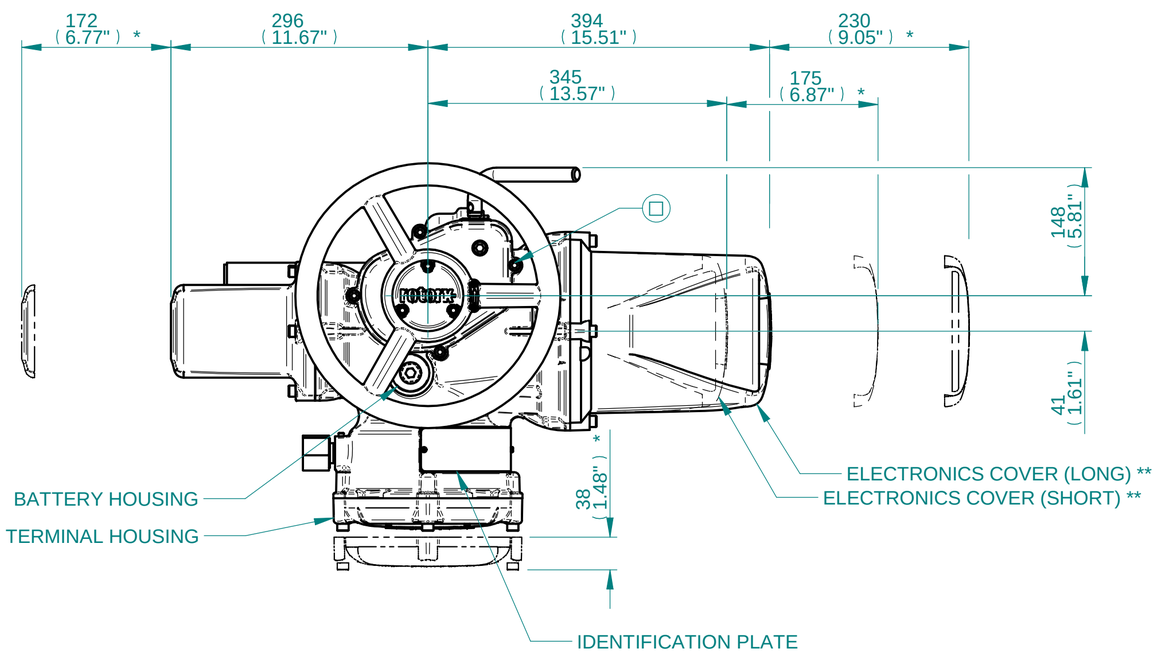
Size	Actuator	Rated Torque		Stall Current (A)	Rated Torque	Motor Average Load	
	rpm	Nm	Ft lbf	Cold Motor	Amps	Amps	KW
IQD10	18	34	25	50.5	19.2	7	0.21
	24	34	25	50.5	19.2	7	0.21
	36	31	23	50.5	19.2	7	0.21
	48	27	20	50.5	19.2	7	0.21

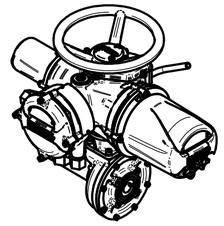
48VDC

Size	Actuator	Rated Torque		Stall Current (A)	Rated Torque	Motor Average Load	
	rpm	Nm	Ft lbf	Cold Motor	Amps	Amps	KW
IQD10	18	34	25	11	5.4	1.8	0.08
	24	34	25	11	5.4	1.8	0.08
	36	31	23	11	5.4	1.8	0.08
	48	27	20	11	5.4	1.8	0.08
IQD12	18	68	50	22.4	7.5	5.1	0.2
	24	68	50	22.4	7.5	5.1	0.2
	36	61	45	22.4	7.5	5.1	0.2
	48	54	40	22.4	7.5	5.1	0.2
IQD18	24	108	80	51	29.6	10.5	0.51

110VDC

Size	Actuator	Rated Torque		Stall Current (A)	Rated Torque	Motor Average Load	
	rpm	Nm	Ft lbf	Cold Motor	Amps	Amps	KW
IQD10	18	34	25	4.7	2.1	0.9	0.08
	24	34	25	4.7	2.1	0.9	0.08
	36	31	23	4.7	2.1	0.9	0.08
	48	27	20	4.7	2.1	0.9	0.08
IQD12	18	68	50	10.9	4.7	2.3	0.2
	24	68	50	10.9	4.7	2.3	0.2
	36	61	45	10.9	4.7	2.3	0.2
	48	54	40	10.9	4.7	2.3	0.2
IQD18	24	108	80	24	12.8	4.5	0.51
IQD20	18	163	120	19	6.3	4.9	0.34
	24	163	120	19	6.3	4.9	0.34
	36	136	100	19	6.3	4.9	0.34
	48	108	80	19	6.3	4.9	0.34
IQD25	18	305	225	31.9	10.2	7	0.61
	24	305	225	31.9	10.2	7	0.61
	36	257	190	31.9	10.2	7	0.61
	48	203	150	31.9	10.2	7	0.61





ISOMETRIC VIEW
(SCALE 1:12)

NOTES:

:DIMENSIONS WITH '*' INDICATE COVER REMOVAL ALLOWANCE

:ELECTRONICS COVER OPTION "**" WILL VARY DEPENDING ON CONFIGURATION

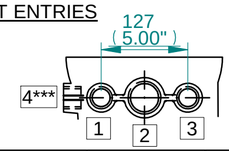
:NETT WEIGHT = 47kg/103lbs

: ⬡ = OIL FILLER/DRAIN PLUG

:THE INTERFACE PROVIDED FOR MOUNTING THE ACTUATOR OR SECOND STAGE GEARBOX ONTO THE VALVE SHOULD CONFORM TO GOOD ENGINEERING PRACTICES, ENSURING ADEQUATELY TOLERANCED LIMITS FOR PARALLELISM, PERPENDICULARITY AND CONCENTRICITY.

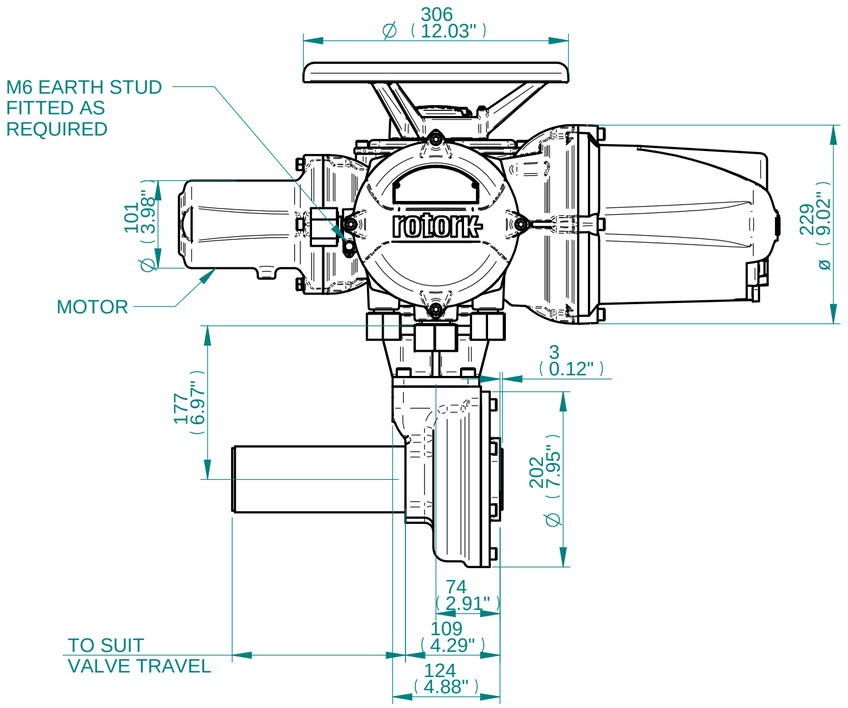
:ROTORK CANNOT BE HELD LIABLE FOR DAMAGE TO OUR EQUIPMENT CAUSED BY EXCESSIVE LOADING FROM COVER TUBES. (SEE ALSO E156E)

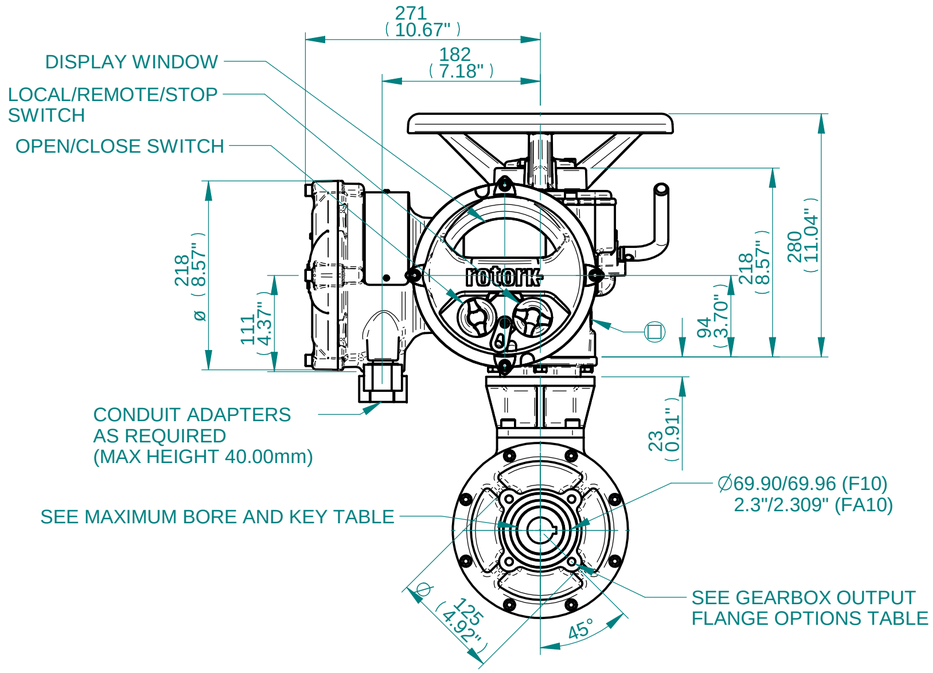
CONDUIT ENTRIES



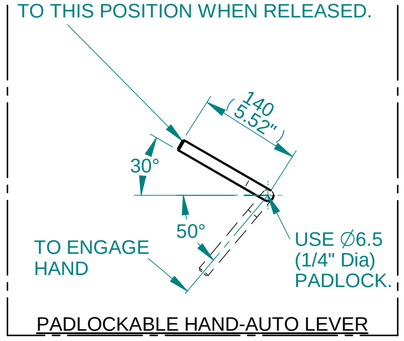
	Hole 1	Hole 2	Hole 3	Hole 4***
Size	As Required	As Required	As Required	As Required
Plugged	As Required	As Required	As Required	As Required
Gland	As Required	As Required	As Required	As Required

***HOLE 4 IS OPTIONAL





Scale 1:6



PADLOCKABLE HAND-AUTO LEVER

Actuator Size: IQ10/12/18, IB4, F10/FA10	Gearbox output flange options									Maximum Bore & Key		
Title IQ10/12/18, TOP HANDWHEEL, IB4, F10/FA10, Ratios 2:1,3:1,4:1 & 6:1 Installation Details	**Designation**	F10	-	-	-	FA10	-	-	-	**Key form**	∅ Bore	Key size
	No. Holes	4	-	-	-	4	-	-	-	**Rectangle (BS4235)**	40	12 X 8
Drawn JLF Checked NJC Date 11-MAR-15	**Hole size**	M10	-	-	-	3/8" UNC	-	-	-	**Rectangle (ANSI B17.1)**	1-5/8"	3/8 X 1/4"
Ref SALES Project Ref QUOTATION	**PCD**	102	-	-	-	4"	-	-	-	**Square (ANSI B17.1)**	1-1/2"	3/8"

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Rotork Controls Limited
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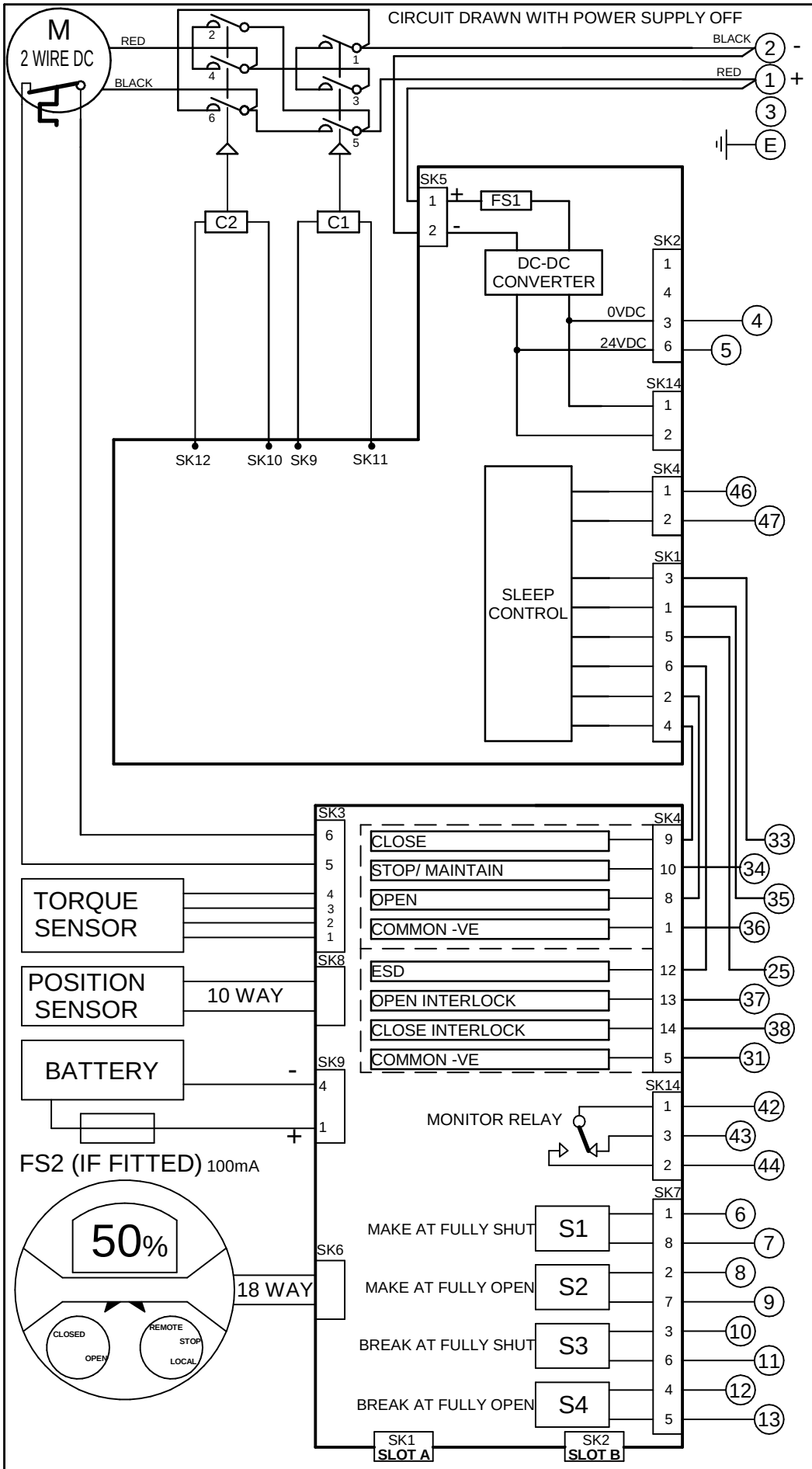
Telephone 01225-733200

Issue	Description
1	First Issue

Scale: 1:5 THIRD ANGLE PROJECTION

A2	Drawing Number	Issue No	Sheet No
	II1THWIB4STD	1	1 of 1



FOR TYPICAL REMOTE CONTROL DETAILS, SEE DOCUMENT
RWS100

VOLTAGE OPTIONS	
VOLTAGE	SIZE
110VDC	10,12,18,20,25
48VDC	10,12,18
24VDC	10

REFER TO SHEET 2 FOR NOTES & OPTION PCB'S IF FITTED

Iss	Date	Chkd	Revision Details
1	240413	PJW	FIRST ISSUE
2	240614	MR	SHEET 2, NOTE 1 UPDATED

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ENGLAND
Tel:01225-733200

ROTORK CONTROLS INC
ROCHESTER
NY 14624, USA
Tel:585-247-2304

IQ DC SOLAR BASIC DIAGRAM

Drawn by: JC1
Date : 240413
Base WD: 150B0000
Job No : - -
MI No : - -

Circuit Diagram Number
150B0000
B1 C1 B2 C2

Issue No 2

Sheet 1 of 2

NO OPTIONS FITTED

NOTES

1.FUSES:
-FS1 - 6A anti-surge
-Actuator rated voltage specified on nameplate. Voltage tolerance +/-10%, applies for rated torque performance; duty cycle and speed is not guaranteed.

2.REMOTE CONTROL:
-For typical remote control circuits refer to:
  -RWS indicated or PUB002-041.
-For DC and AC control, connect –ve/0V to terminal 36.
-(For negative switch / positive common, refer to RWS indicated).
-Control signal threshold voltages:
  -DC: “on” ≥16Vdc / “off” ≤8Vdc, max 60Vdc.
  -AC: “on” ≥60Vac / “off” ≤40Vac, max 120Vac.
-Control signal duration to be 300ms minimum.
-Maximum current drawn from remote control signals is:
  -8mA at 24Vdc or 12mA at 120Vac.
-Supply provided on terminals 4 & 5:
  -Intended for remote control.
  -Max external load 5W at 24Vdc / 5VA at 120Vac

3.INDICATION:
-For typical position, status and alarm indication see PUB002-041.
-“S” contacts are user configurable and are shown in their default setting.
-Refer to PUB002-040 for functions and configuration instructions.
-Monitor Relay indicates actuator availability for remote control (shown “unavailable”). It can be configured to exclude local/remote selection.
-Refer to PUB002-040 for monitored functions and configuration instructions.
-Voltage applied to indication contacts must not exceed 150Vac
-Individual Switch current must not exceed 3.5A inductive, 5A resistive and no more than 8A in total for all 4 contacts.

4.BATTERY:
-Battery maintains local and remote “S” contact indication only.
-Refer to installation manual for approved replacement battery types.

5.DC:
-Default for sleep mode is ENABLE.
-To disable sleep mode connect 5 to 46 & 4 to 47.
-Sleep mode can also be disabled by moving link LK1 from SOLAR to NORM.
-Actuator will remain powered up at all times while supply is present.
-24VDC will be lost when in sleep mode.
-If customer supply is needed to wake actuator link LK3 must be moved to CUST for maintained customer supply.

See Sheet 1 for all Revision details/information

Circuit Diagram Number	Issue No	Sheet
150B0000	2	2 of 2

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Sizing Guide Search

Seating Torque
93.55 Nm 69 lbsft

Seating Thrust
26.33 kN 5919 lbsf

Rising Stem Diameter (RS)
mm ins

OR

Non Rising Stem Diameter (NRS)
mm ins

Number of Turns
0 Turns

Stroke Time
0 Secs

Stroke Time Tolerance
50 %+ 50 %-

Power Supply
DC 24V

Options
- [ ] Hazardous Area
- [ ] Watertight
- [ ] Failsafe

Output Flange
Any

Range
- [ ] ALL
- [x] IQD3
- [ ] IQ3
- [ ] IQS3

Reset Search

Output Performance

Combination	Rated Torque		Rated Thrust		Resultant Thrust		Stroke Time
	Nm	lbsft	kN	lbsf	kN	lbsf	Secs (60 Hz)
IQD10/IB4	138	102	53.00	12000	11812.27	8750	0.0

Available Output Flanges (ISO5210 "F" & MSS SP-102 "FA")	Available Enclosures		Weight	
	Hazardous	Watertight	Kg	Lbs
F10/FA10	Yes	Yes	52.66	116

Stem Acceptance	Max Bore		Min Bore		Fail Safe
	mm	in	mm	in	
Rising Stem	45	1.75	-	-	No
Non Rising Stem	40	1.63	-	-	

Actuator Performance

Size	Rated Torque		Output RPM	Rating	
	Nm	lbsft	RPM (60Hz)	Starts / Hour	
IQD10	27	20	48	60	

Available for power supply			Available Enclosures		Weight	
1-Phase AC	3-Phase AC	DC	Hazardous	Watertight	Kg	Lbs
No	No	DC 24V DC 48V DC 110V	Yes	Yes	36.32	80

Handwheel	Type	Ratio	Turns	Rimpull	
		(:1)	(per stroke)	N	Lbsf
Standard	Direct	1.0	-	122	28
Option 1	Geared	5.0	-	87	20

Sales/Technical Information: IQD - Direct Current (DC)

Gearbox Performance

Size	Rated Torque		Ratio	MA	Weight	
	Nm	Lbsft	(:1)		Kg	Lbs
IB4	542	400	6	5.1	16.34	36

Sales/Technical Information: IB Motorised

Enter your specific requirements and click 'Add to enquiry'

Fields marked with an * are required.

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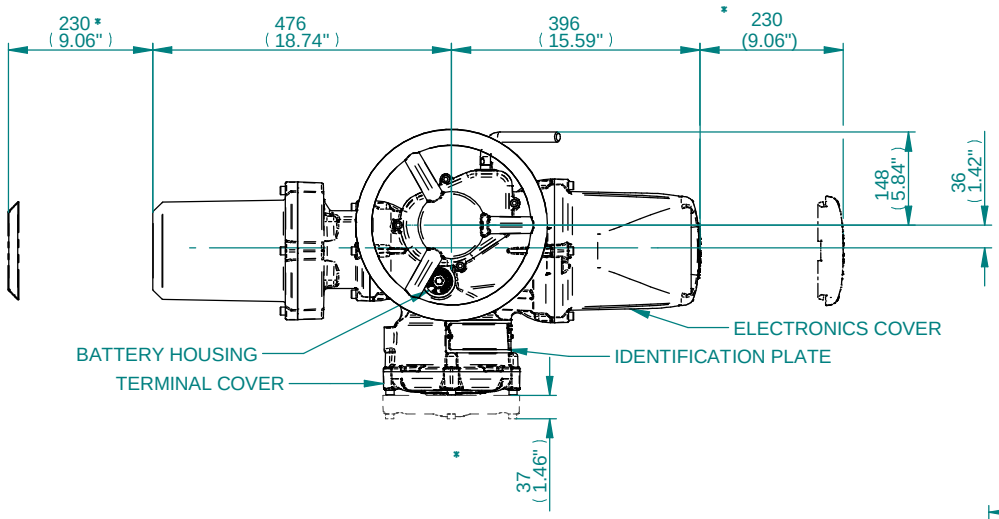
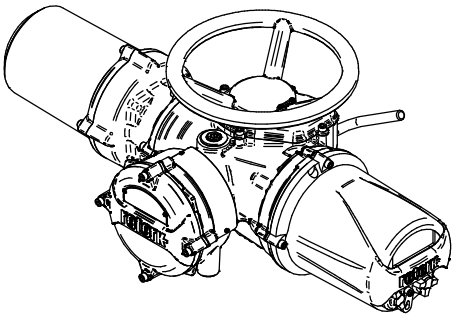
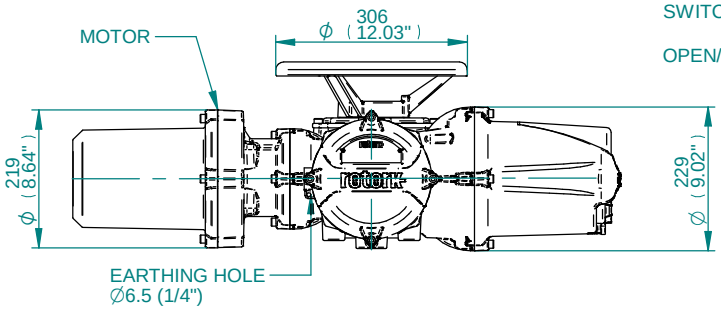
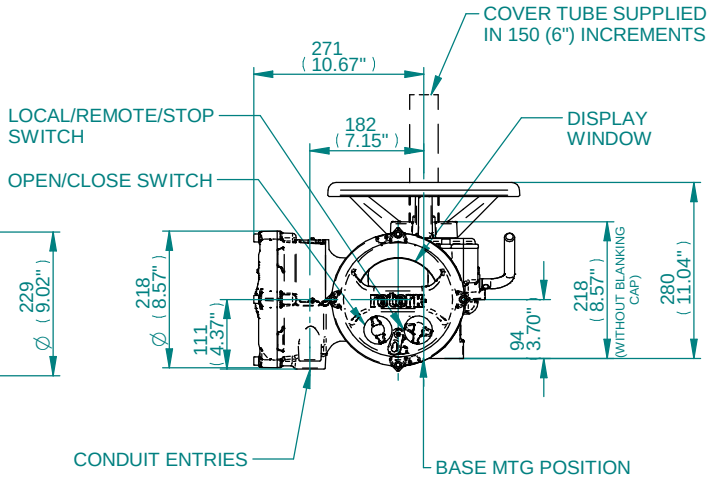
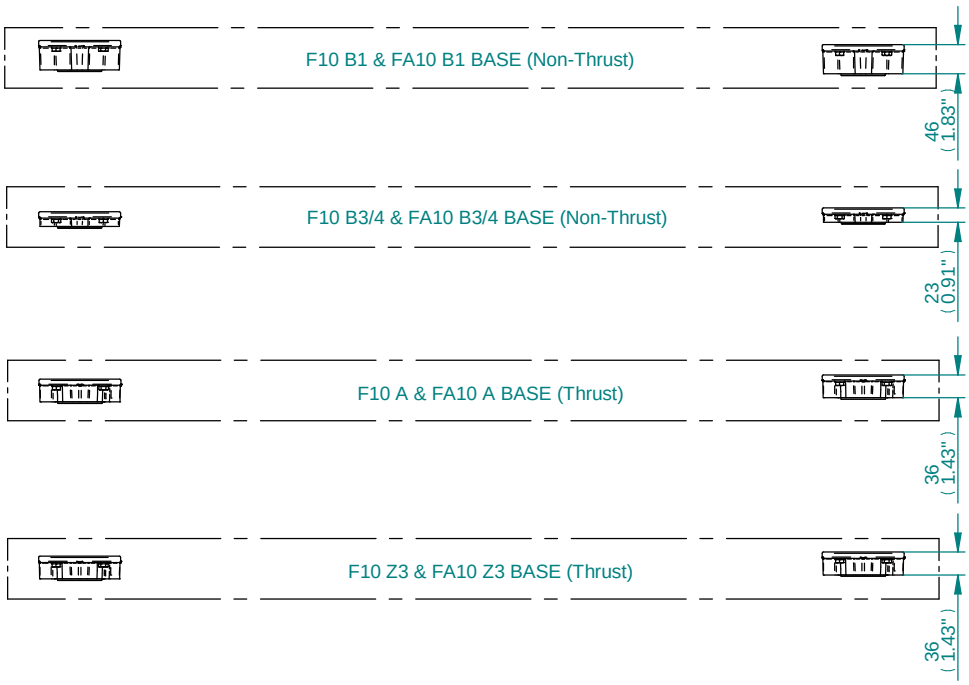
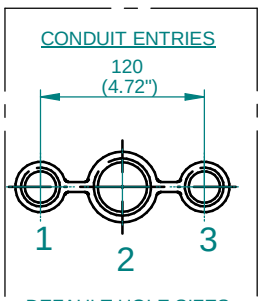








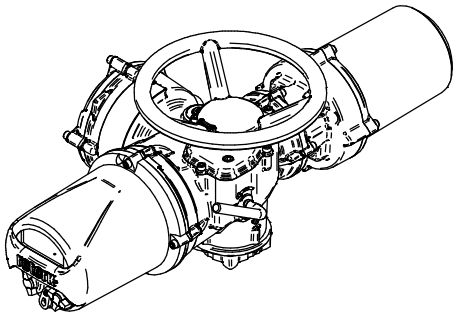




DEFAULT HOLE SIZES:

HOLES 1 & 3 TAPPED M25

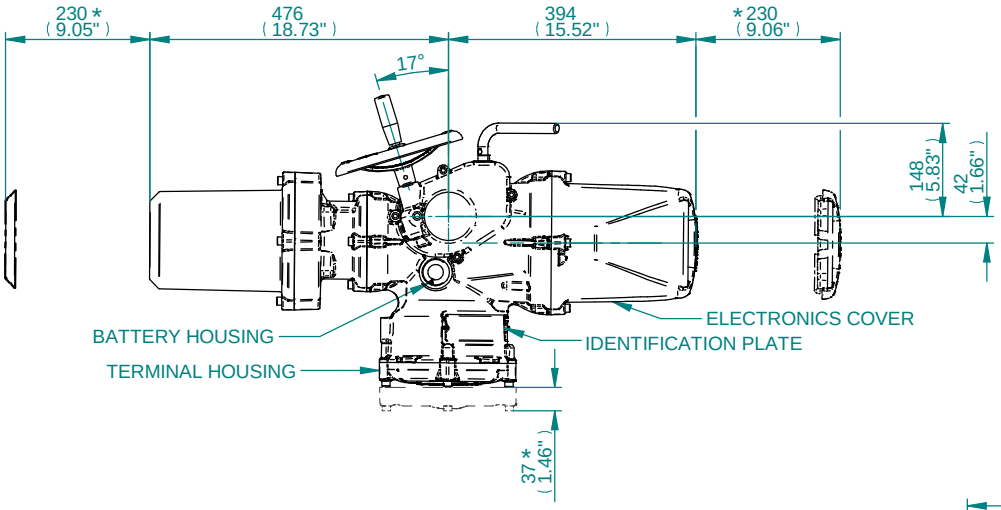
HOLE 2 TAPPED M40

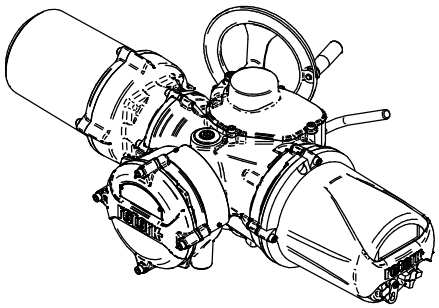


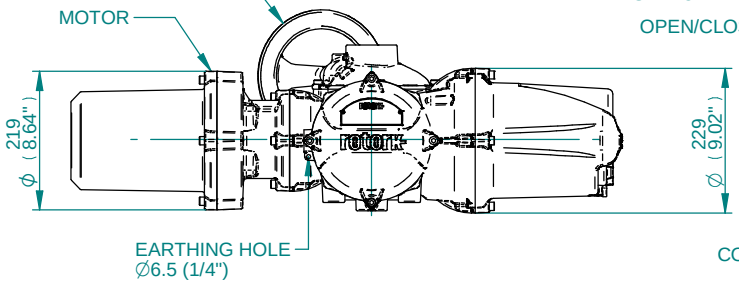
NOTES

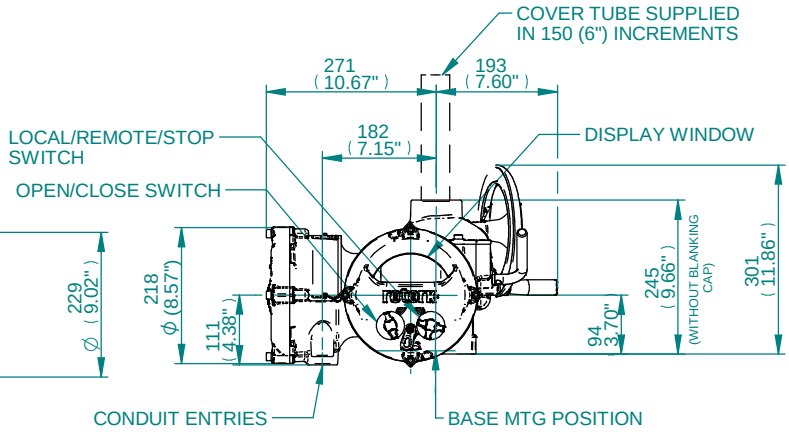
1. FOUR BASE OPTIONS ARE DETAILED TO SUIT THE RELEVANT COUPLING ARRANGEMENT.
2. THE REQUIRED BASE FOR THE SIDE & END VIEWS SHOULD BE LOADED TO MTG POSITION INDICATED.
3. '*' REMOVAL ALLOWANCE REQUIRED.

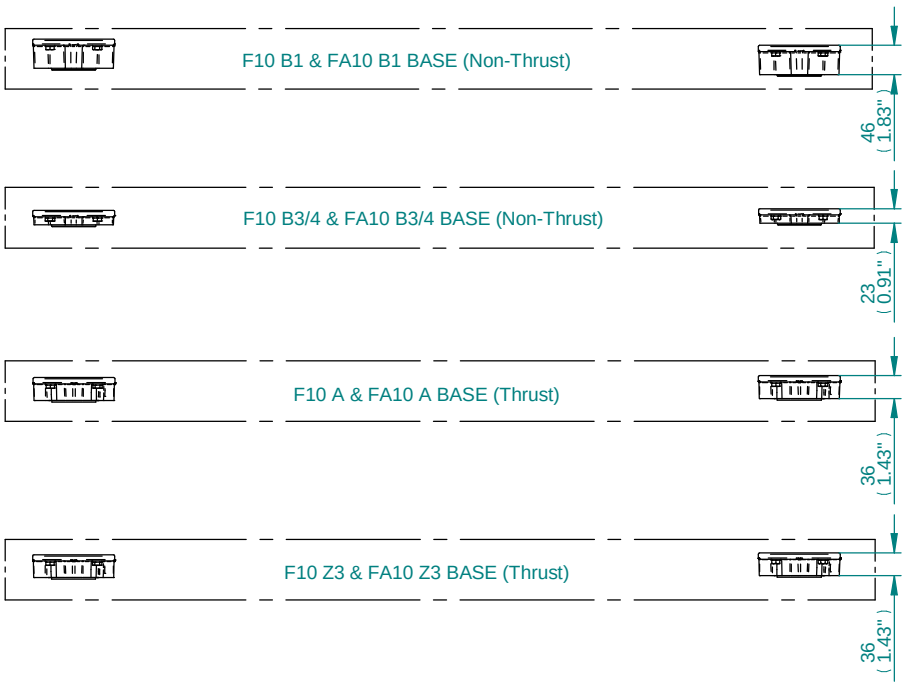
Title	Date	A4 Doc Number	Ver No	Scale	Sheet No
DIMENSIONAL DATA SHEET FOR IQD3 (Sizes 10-18) WITH TOP HANDWHEEL	030215	IQD3-1SP-BC	1	1:12	1 of 4

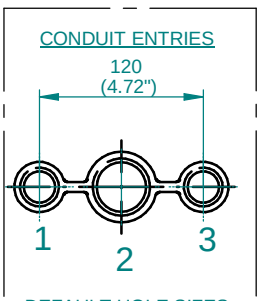








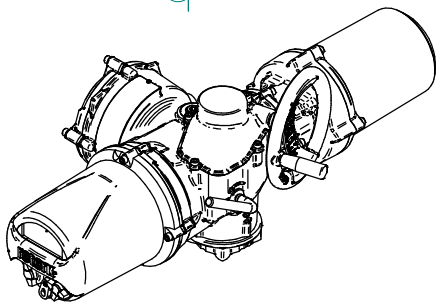




DEFAULT HOLE SIZES:

HOLES 1 & 3 TAPPED M25

HOLE 2 TAPPED M40



NOTES

1. FOUR BASE OPTIONS ARE DETAILED TO SUIT THE RELEVANT COUPLING ARRANGEMENT.
2. THE REQUIRED BASE FOR THE SIDE & END VIEWS SHOULD BE LOADED TO MTG POSITION INDICATED.
3. '*' REMOVAL ALLOWANCE REQUIRED.

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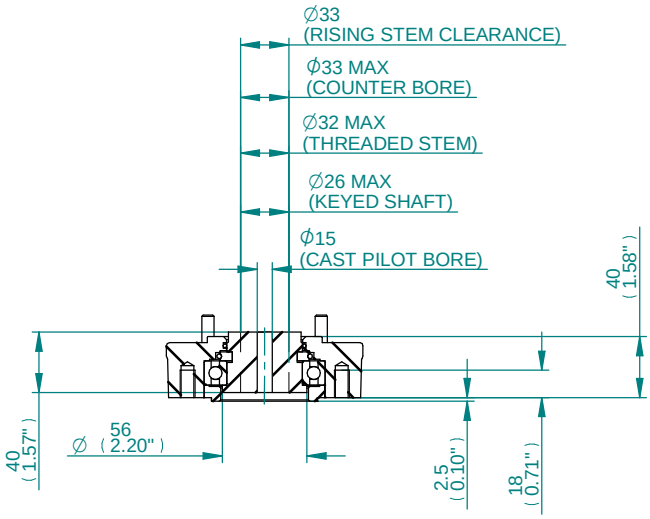
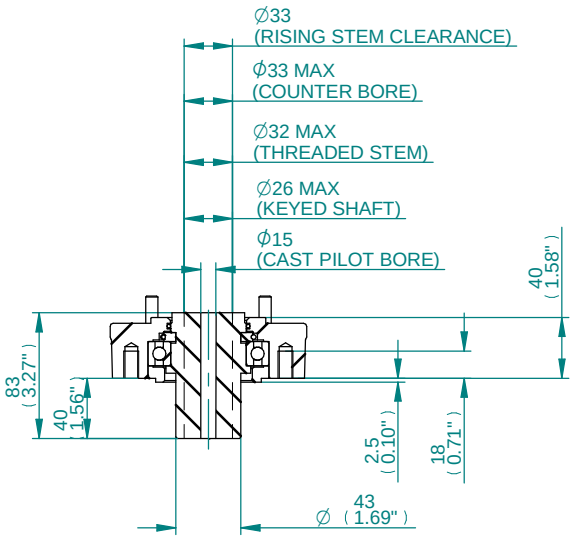
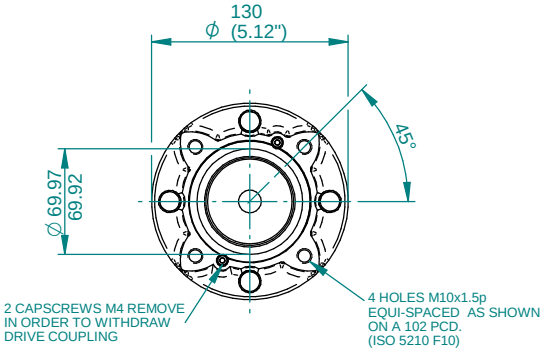


TYPE 'A' COUPLING DETAILS

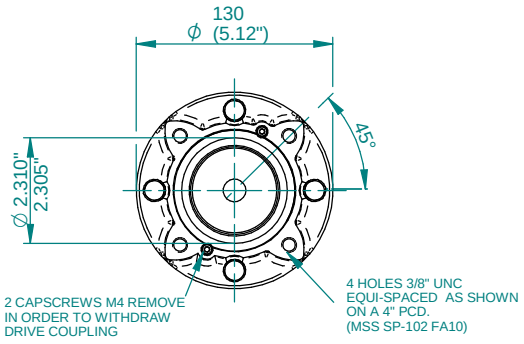


TYPE 'Z3' COUPLING DETIALS

NOTE : COUPLINGS WITHOUT PILOT BORE AVAILABLE IF SPECIFIED WITH ORDER.



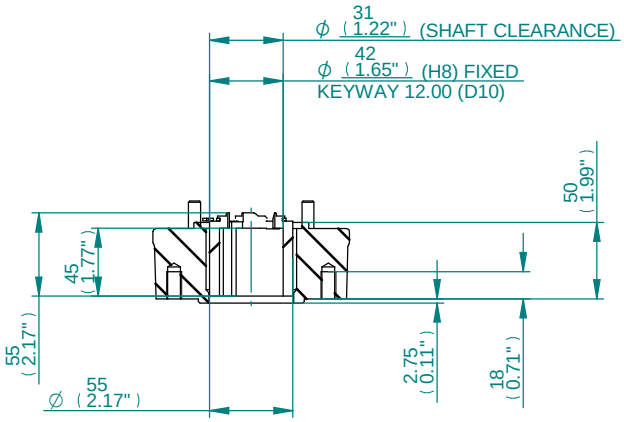
F10 BASE DETAILS
FOR 'A' & 'Z3' COUPLINGS



FA10 BASE DETAILS
FOR 'A' & 'Z3' COUPLINGS

IQ3 SIZE 10-18 THRUST BASES

Title	Date	A4	Doc Number	Ver No	Scale	Sheet No
DIMENSIONAL DATA SHEET FOR F10/FA10 BASE & COUPLING OPTIONS	030215		IQD3-1SP-BC	1	1:5	3 of 4



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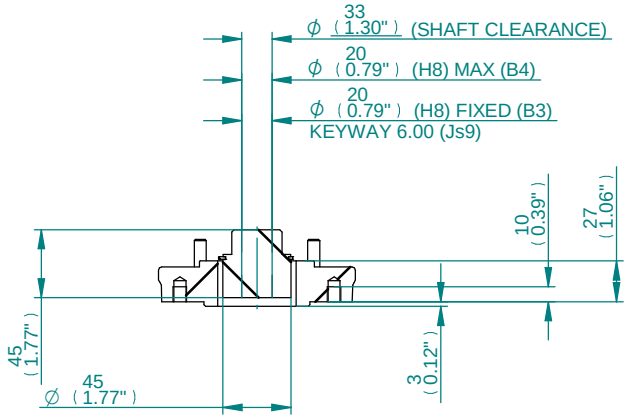
COUPLING DETAILS



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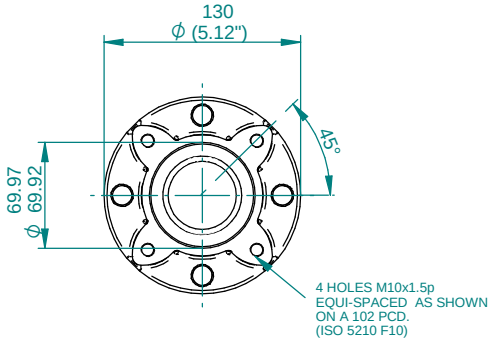
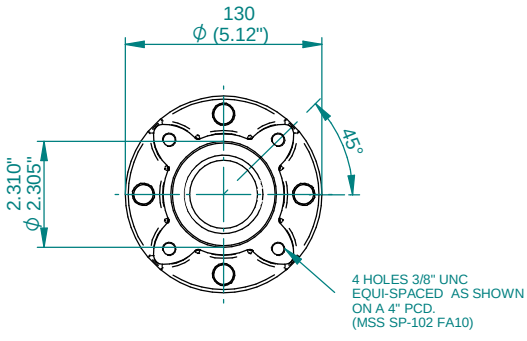
COUPLING DETAILS



F10 BASE DETAILS
FOR 'B1' & 'B3/B4' COUPLINGS



FA10 BASE DETAILS
FOR 'B1' & 'B3/B4' COUPLINGS

IQ3 SIZE 10-18
NON-THRUST BASES

Title	Date	A4	Doc Number	Ver No	Scale	Sheet No
DIMENSIONAL DATA SHEET FOR F10/FA10 BASE & COUPLING OPTIONS	030215		IQD3-1SP-BC	1	1:5	4 of 4

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

CR1000

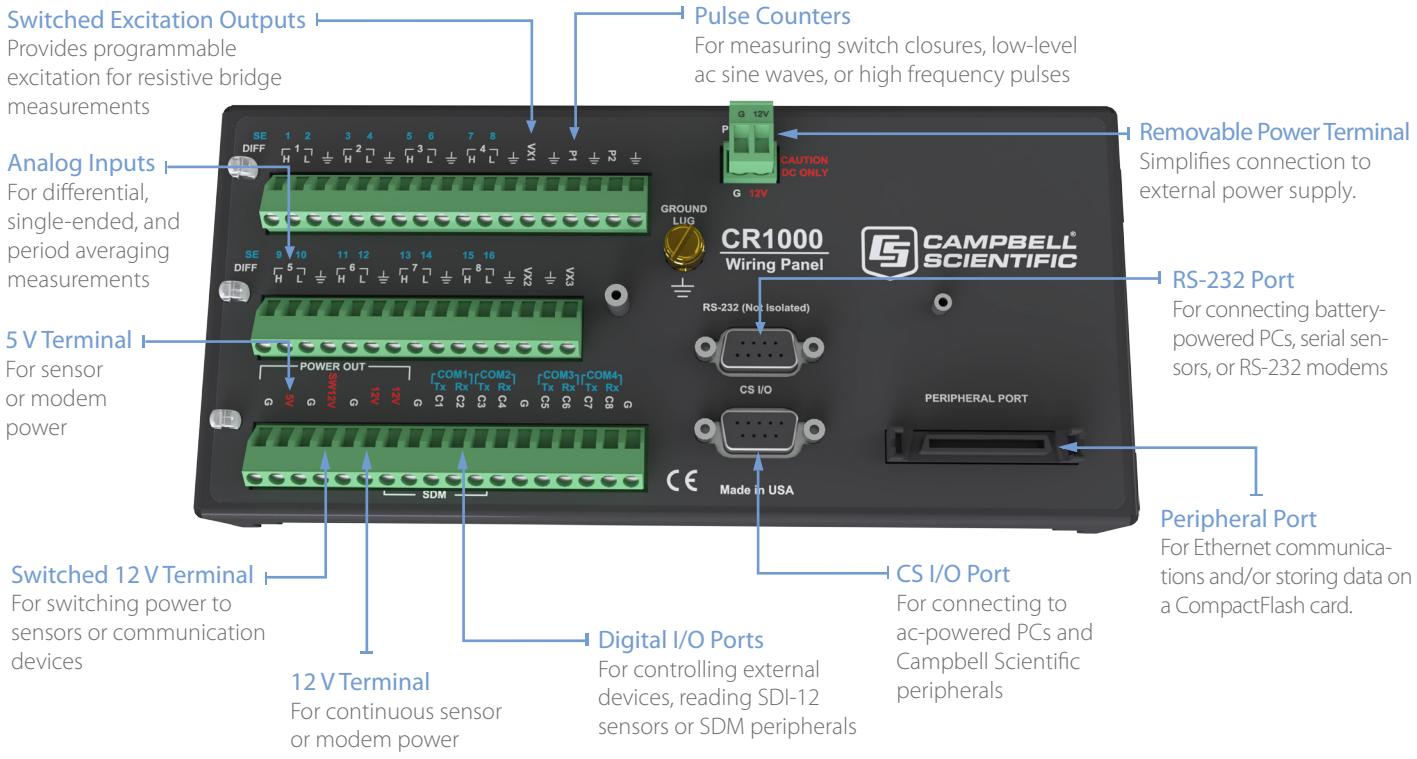
Measurement and Control Datalogger

Rugged, Reliable, and Ready for any Application

More info: **435.227.9120**
campbellsci.com/cr1000

CR1000 Measurement and Control Datalogger

The CR1000 provides precision measurement capabilities in a rugged, battery-operated package. It consists of a measurement and control module and a wiring panel. Standard operating range is -25° to +50°C; an optional extended range of -55° to +85°C is available.



Benefits and Features

- 4 MB memory*
- Program execution rate of up to 100 Hz
- CS I/O and RS-232 serial ports
- 13-bit analog to digital conversions
- 16-bit H8S Renesas Microcontroller with 32-bit internal CPU architecture
- Temperature compensated real-time clock
- Background system calibration for accurate measurements over time and temperature changes
- Single DAC used for excitation and measurements to give ratio metric measurements
- Gas Discharge Tube (GDT) protected inputs
- Battery-backed SRAM memory and clock ensuring data, programs, and accurate time are maintained while the CR1000 is disconnected from its main power source
- Serial communications with serial sensors and devices supported via I/O port pairs
- PakBus®, Modbus, DNP3, TCP/IP, FTP, and SMTP protocols supported

Measurement and Control Module

The module measures sensors, drives direct communications and telecommunications, reduces data, controls external devices, and stores data and programs in on-board, non-volatile storage. The electronics are RF shielded and glitch protected by the sealed, stainless steel canister. A battery-backed clock assures accurate timekeeping. The module can simultaneously provide measurement and communication functions. The on-board, BASIC-like programming language supports data processing and analysis routines.

Wiring Panel

The CR1000WP is a black, anodized aluminum wiring panel that is compatible with all CR1000 modules. The wiring panel includes switchable 12 V, redistributed analog grounds (dispersed among analog channels rather than grouped), unpluggable terminal block for 12 V connections, gas-tube spark gaps, and 12 V supply on pin 8 to power our COM-series phone modems and other peripherals. The control module easily disconnects from the wiring panel allowing field replacement without rewiring the sensors. A description of the wiring panel's input/output channels follows.

**Originally, the standard CR1000 had 2 MB of data/program storage, and an optional version, the CR1000-4M, had 4 MB of memory. In September 2007, the standard CR1000 started having 4 MB of memory, making the CR1000-4M obsolete. Dataloggers that have a module with a serial number greater than or equal to 11832 will have a 4 MB memory. The 4 MB dataloggers will also have a sticker on the canister stating "4M Memory".*

Analog Inputs
Eight differential (16 single-ended) channels measure voltage levels. Resolution on the most sensitive range is 0.67 µV.

Pulse Counters
Two pulse channels can count pulses from high level (5 V square wave), switch closure, or low level AC signals.

Switched Voltage Excitations
Three outputs provide precision excitation voltages for resistive bridge measurements.

Digital I/O Ports
Eight ports are provided for frequency measurements, digital control, and triggering. Three of these ports can also be used to measure SDM devices. The I/O ports can be paired as transmit and receive. Each pair has 0 to 5 V UART hardware that allows serial communications with serial sensors and devices. An RS-232-to-logic level converter may be required in some cases.

CS I/O Port
AC-powered PCs and many communication peripherals connect with the CR1000 via this port. Connection to an AC-powered PC requires either an SC32B or SC-USB interface. These interfaces isolate the PC's electrical system from the datalogger, thereby protecting against ground loops, normal static discharge, and noise.

RS-232 Port
This non-isolated port is for connecting a battery-powered laptop, serial sensor, or RS-232 modem. Because of ground loop potential on some measurements (e.g., low level single-ended measurements), AC-powered PCs should use the CS I/O port instead of the RS-232 port (see above).

Peripheral Port
One 40-pin port interfaces with the NL116 Ethernet Interface and CompactFlash Module, the NL121 Ethernet Interface, or the CFM100 CompactFlash® Module.

Switched 12 Volt
This terminal provides unregulated 12 V that can be switched on and off under program control.

Storage Capacity
The CR1000 has 2 MB of flash memory for the Operating System, and 4 MB of battery-backed SRAM for CPU usage, program storage, and data storage. Data is stored in a table format. The storage capacity of the CR1000 can be increased by using a CompactFlash card.

Enclosure/Stack Bracket
A CR1000 housed in a weather-resistant enclosure can collect data under extremely harsh conditions. The 31551 and 31143 stack brackets allow a peripheral to be placed under the mounting bracket, thus conserving space. The 31143 is hinged, allowing easy access to the lower component during wiring or during maintenance.

Communication Protocols
The CR1000 supports the PakBus, Modbus, DNP3, TCP/IP, FTP, and SMTP communication protocols. With the PakBus protocol, networks have the distributed routing intelligence to continually evaluate links. Continually evaluating links optimizes delivery times and, in the case of delivery failure, allows automatic switch over to a configured backup route.

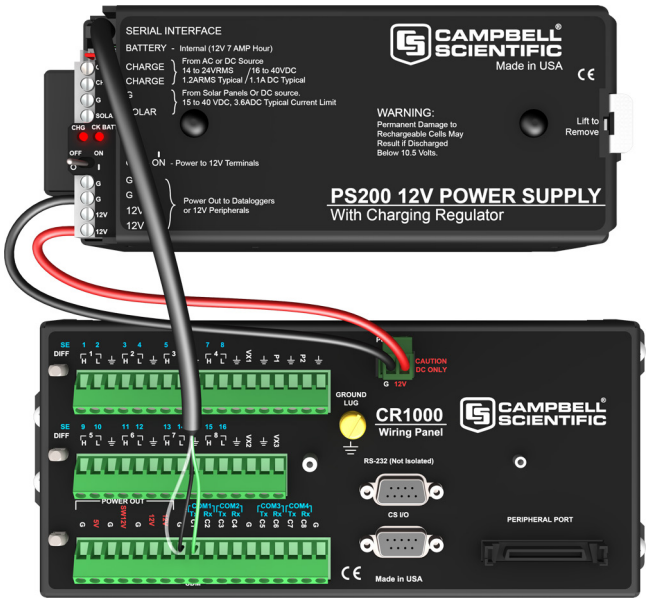
The Modbus RTU protocol supports both floating point and long formats. The datalogger can act as a slave and/or master.

The DNP3 protocol supports only long data formats. The dataloggers are level 2 slave compliant, with some of the operations found in a level 3 implementation.

The TCP/IP, FTP, and SMTP protocols provide TCP/IP functionality when the CR1000 is used in conjunction with an NL240, NL201, NL116, or NL121. Refer to the CR1000 manual for more information.

Power Supplies
Typically, the CR1000 is powered with a PS200, PS150, or BPALK. The PS200 and PS150 provide a 7 Ah sealed rechargeable battery that should be connected to a charging source (either a power converter or solar panel). The BPALK consists of eight non-rechargeable D-cell alkaline batteries with a 7.5 Ah rating at 20°C.

Also available are the BP7, BP12, and BP24 battery, which provide nominal ratings of 7, 12, and 24 Ah, respectively. The BP7 is typically used instead of the PS150 or PS200 when the battery needs to be mounted under the 31143 Hinged Stack Bracket. The BP12 and BP24 batteries are for powering systems that have higher current drain equipment such as satellite transmitters. The BP7, BP12, and BP24 should be connected to a regulated charging source (e.g., a CH200 or CH150 connected to a unregulated solar panel or power converter).



The PS200 (above) and CH200 can monitor charge input voltage, battery voltage, on-board temperature, battery current, and load current.

Communication Options

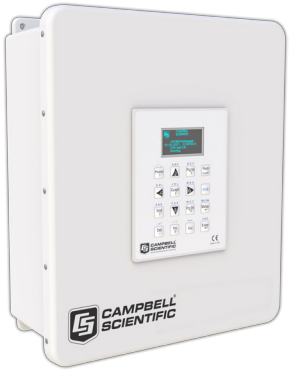
To determine the best option for an application, consider the accessibility of the site, availability of services (e.g., cellular phone or satellite coverage), quantity of data to collect, and desired time between data-collection sessions. Some communication options can be combined—increasing the flexibility, convenience, and reliability of the communications.

Keyboard Display

The CR1000KD can be used to program the CR1000, manually initiate data transfer, and display data. The CR1000KD displays 8 lines by 21 characters (64 by 128 pixels) and has a 16-character keyboard. Custom menus are supported allowing customers to set up choices within the datalogger program that can be initiated by a simple toggle or pick list. One CR1000KD can be carried station to station in a CR1000 network.

Mountable Displays

The CD100 and CD295 can be mounted in an enclosure lid. The CD100 has the same functionality and operation as the CD1000KD, allowing both data entry and display without opening the enclosure. The CD295 displays real-time data only.



The CD100 has a vacuum flourescent display for responsive use through a very wide operating temperature range.

iOS Devices and Android Devices

An iOS device or Android device can communicate with the datalogger or connect to the LoggerNet network using Apps available, at no charge, from the Apple Store or Google Play.

Direct Links

AC-powered PCs connect with the datalogger's CS I/O port using an SC32B or SC-USB interface. These interfaces provide optical isolation. A battery-powered laptop can be attached to the CR1000's RS-232 port via an RS-232 cable—no interface required.

External Data Storage Devices

A CFM100 or NL116 module can store the CR1000's data on an industrial-grade CompactFlash (CF) card. The CR1000 can also store data on an SC115 2 GB Flash Memory Drive.

Short Haul Modems

The SRM-5A RAD Short Haul Modem supports communications between the CR1000 and a PC using a four-wire unconditioned line (two twisted pairs).

Multidrop Interface

The MD485 intelligent RS-485 interface permits a PC to address and communicate with one or more dataloggers over the CABLE2TP two-twisted pair cable. Distances up to 4000 feet are supported.

Internet and IP Networks

Campbell Scientific offers several interfaces that enable the CR1000 to communicate with a PC using TCP/IP.

Radios

Radio frequency (RF) communications are supported using narrowband UHF, narrowband VHF, spread spectrum, or meteor burst radios. Line-of-sight is required for all of our RF options.

Satellite Transmitters

The CR1000 can transmit data using the Argos, Iridium, Inmarsat BGAN, GOES, or Meteosat satellite systems. Satellite telemetry offers an alternative for remote locations where phone lines or RF systems are impractical.

Telephone Networks

The CR1000 can communicate with a PC using landlines or cellular transceivers. A voice synthesized modem enables anyone to call the CR1000 via phone and receive a verbal report of real-time site conditions.

In Virginia, our RF500M Narrowband Radio Modem provides time- and event-driven ALERT data transmission.

Channel Expansion

4-Channel Low Level AC Module

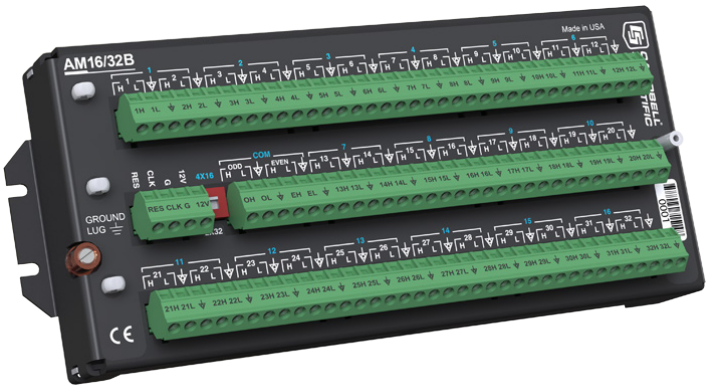
The LLAC4 is a small peripheral device that allows customers to increase the number of available low-level ac inputs by using control ports. This module is often used to measure up to four anemometers, and is especially useful for wind profiling applications.

Synchronous Devices for Measurement (SDMs)

SDMs are addressable peripherals that expand the datalogger's measurement and control capabilities. For example, SDMs are available to add control ports, analog outputs, pulse count channels, interval timers, or even a CANbus interface to the system. Multiple SDMs, in any combination, can be connected to one datalogger.

Multiplexers

Multiplexers increase the number of sensors that can be measured by a CR1000 by sequentially connecting each sensor to the datalogger. Several multiplexers can be controlled by a single CR1000.



The CR1000 is compatible with the AM16/32B (shown above) and AM25T multiplexers.

Software

Starter Software

Our easy-to-use starter software is intended for first time users or applications that don't require sophisticated communications or datalogger program editing. SCWin Short Cut generates straight-forward datalogger programs in four easy steps. PC200W allows customers to transfer a program to, or retrieve data from a CR1000 via a direct communications link.

At www.campbellsci.com/downloads, the starter software can be downloaded at no charge. Our Resource DVD also provides this software as well as PDF versions of our brochures and manuals.

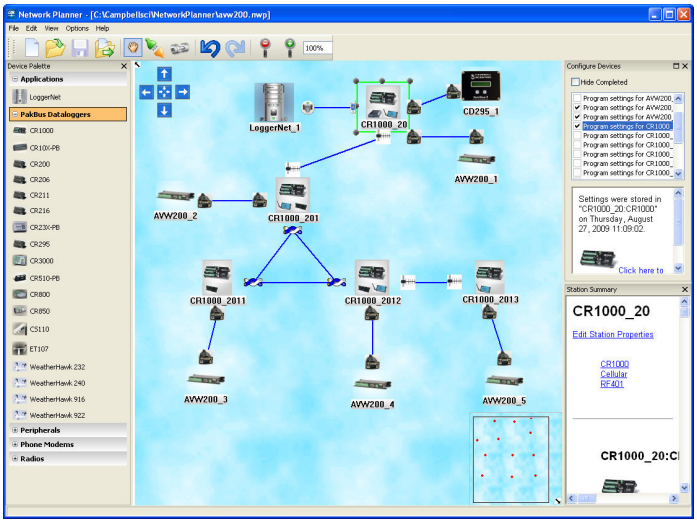
Datalogger Support Software

Our datalogger support software packages provide more capabilities than our starter software. These software packages contains program editing, communications, and display tools that can support an entire datalogger network.

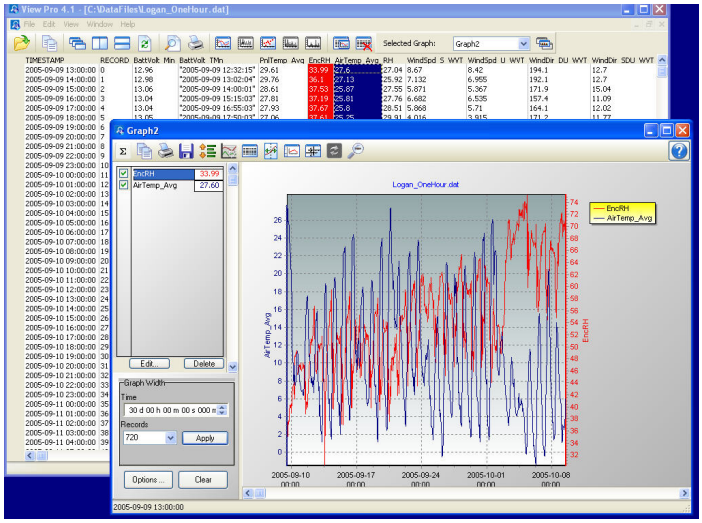
PC400, our mid-level software, supports a variety of telemetry options, manual data collection, and data display. For programming, it includes both Short Cut and the CRBasic program editor. PC400 does not support combined communication options (e.g., phone-to-RF), PakBus® routing, and scheduled data collection.

RTDAQ is an ideal solution for industrial and real-time users desiring to use reliable data collection software over a single telecommunications medium, and who do not rely on scheduled data collection. RTDAQ's strength lies in its ability to handle the display of high speed data.

LoggerNet is Campbell Scientific's full-featured datalogger support software. It is referred to as "full-featured" because it provides a way to accomplish almost all the tasks you'll need to complete when using a datalogger. LoggerNet supports combined communication options (e.g., phone-to-RF) and scheduled data collection.



The Network Planner, included in LoggerNet 4 or higher, generates device settings and configures the LoggerNet network map for PakBus networks.



Both LoggerNet and RTDAQ use View Pro to display historical data in a tabular or graphical format.

Applications

The measurement precision, flexibility, long-term reliability, and economical price of the CR1000 make it ideal for scientific, commercial, and industrial applications.

Meteorology

The CR1000 is used in long-term climatological monitoring, meteorological research, and routine weather measurement applications.

Our rugged, reliable weather station measures meteorological conditions at St. Mary's Lake, Glacier National Park, MT.

Sensors the CR1000 can measure include:

- cup, propeller, and sonic anemometers
- tipping bucket rain gages
- wind vanes
- pyranometers
- ultrasonic ranging sensor
- thermistors, RTDs, and thermocouples
- barometers
- RH probes
- Cooled mirror hygrometers

Agriculture and Agricultural Research

The versatility of the CR1000 allows measurement of agricultural processes and equipment in applications such as:

- plant water research
- canopy energy balance
- plant pathology
- machinery performance
- frost prediction
- crop management decisions
- food processing/storage
- integrated pest management
- irrigation scheduling

This vitaculture site in Australia integrates meteorological, soil, and crop measurements.

Wind Profiling

Our data acquisition systems can monitor conditions at wind assessment sites, at producing wind farms, and along transmission lines. The CR1000 makes and records measurements, controls electrical devices, and can function as PLCs or RTUs. Because the datalogger has its own power supply (batteries, solar panels), it can continue to measure and store data and perform control during power outages. Typical sensors for wind assessment applications include, but are not limited to:

- cup, propeller, and sonic anemometers (up to 10 anemometers can be measured by using two LLAC4 peripherals)
- wind vanes
- thermistors, RTDs, and thermocouples
- barometers
- pyranometers

For turbine performance applications, the CR1000 monitors electrical current, voltage, wattage, stress, and torque.

Photo courtesy npower renewables

A Campbell Scientific system monitors an offshore wind farm in North Wales.

Soil Moisture

The CR1000 are compatible with the following soil moisture measurement technologies:

- **Soil moisture blocks** are inexpensive sensors that estimate soil water potential.
- **Matric water potential sensors** also estimate soil water potential but are more durable than soil moisture blocks.
- **Time-Domain Reflectometry Systems (TDR)** use a reflectometer controlled by the datalogger to accurately measure soil water content. Multiplexers allow sequential measurement of a large number of probes by one reflectometer.
- **Self-contained water content reflectometers** are sensors that emit and measure a TDR pulse.
- **Tensiometers** measure the soil pore pressure of irrigated soils and calculate soil moisture.

Air Quality

The CR1000 can monitor and control gas analyzers, particle samplers, and visibility sensors. The datalogger can also automatically control calibration sequences and compute conditional averages that exclude invalid data (e.g., data recorded during power failures or calibration intervals).

Road Weather/RWIS

Our fully NTCIP-compliant Environmental Sensor Stations (ESS) are robust, reliable weather stations used for road weather/RWIS applications. A typical ESS includes a tower, CR1000, two road sensors, remote communication hardware, and sensors that measure wind speed and direction, air temperature, humidity, barometric pressure, solar radiation, and precipitation.

Water Resources/Aquaculture

Our CR1000 is well-suited to remote, unattended monitoring of hydrologic conditions. Most hydrologic sensors, including SDI-12 probes, interface directly to the CR1000.

Typical hydrologic measurements:

- **Water level** is monitored with incremental shaft encoders, double bubblers, ultrasonic ranging sensors, resistance tapes, strain gage pressure transducers, or vibrating wire pressure transducers. Vibrating wire transducers require an CDM-VW300-series, AVW200-series or another vibrating wire interface.
- **Well draw-down tests** use a pressure transducer measured at logarithmic intervals or at a rate based on incremental changes in water level.
- **Ionic conductivity measurements** use one of the switched excitation ports from the datalogger.
- **Samplers** are controlled by the CR1000 as a function of time, water quality, or water level.
- **Alarm and pump actuation** are controlled through digital I/O ports that operate external relay drivers

A turbidity sensor was installed in a tributary of the Cedar River watershed to monitor water quality conditions for Seattle, Washington.

Vehicle Testing

This versatile, rugged datalogger is ideally suited for testing cold and hot temperature, high altitude, off-highway, and cross-country performance. The CR1000 is compatible with our SDM-CAN interface and GPS16X-HVS receiver.

Vehicle monitoring includes not only passenger cars, but airplanes, locomotives, helicopters, tractors, buses, heavy trucks, drilling rigs, race cars, and motorcycles.

The CR1000 can measure:

- **Suspension**—strut pressure, spring force, travel, mounting point stress, deflection, ride.
- **Fuel system**—line and tank pressure, flow, temperature, injection timing.
- **Comfort control**—ambient and supply air temperature, solar radiation, fan speed, ac on and off, refrigerant pressures, time-to-comfort, blower current.
- **Brakes**—line pressure, pedal pressure and travel, ABS, line and pad temperature.
- **Engine**—pressure, temperature, crank position, RPM, time-to-start, oil pump cavitation.
- **General vehicle**—chassis monitoring, road noise, vehicle position and speed, steering, air bag, hot/cold soaks, wind tunnels, traction, CANbus, wiper speed and current, vehicle electrical loads.

Other Applications

- Eddy covariance systems
- Wireless sensor/datalogger networks
- Fire weather
- Geotechnical
- Mesonet systems
- Avalanche forecasting, snow science, polar, high altitude
- Historic preservation

CR1000 Specifications

Electrical specifications are valid over a -25° to +50°C, non-condensing environment, unless otherwise specified. Recalibration recommended every three years. Critical specifications and system configuration should be confirmed with Campbell Scientific before purchase.

PROGRAM EXECUTION RATE
10 ms to one day @ 10 ms increments

ANALOG INPUTS (SE1-SE16 or DIFF1-DIFF8)
8 differential (DF) or 16 single-ended (SE) individually configuredinput channels. Channel expansion provided by optional analog multiplexers.

RANGES and RESOLUTION: Basic resolution (Basic Res) is the A/D resolution of a single A/D conversion. A DIFF measurement with input reversal has better (finer) resolution by twice than Basic Res.

Range (mV)[1]	*DF Res (µV)*[2]	*Basic Res (µV)*
±5000	667	1333
±2500	333	667
±250	33.3	66.7
±25	3.33	6.7
±7.5	1.0	2.0
±2.5	0.33	0.67

[1]Range overhead of ~9% on all ranges guarantees that full-scale values will not cause over range.
[2]Resolution of DF measurements with input reversal.

ACCURACY[3]:
±(0.06% of reading + offset), 0° to 40°C
±(0.12% of reading + offset), -25° to 50°C
±(0.18% of reading + offset), -55° to 85°C (-XT only)

[3]Accuracy does not include the sensor and measurement noise. Offsets are defined as:
Offset for DF w/input reversal = 1.5•Basic Res + 1.0 µV
Offset for DF w/o input reversal = 3•Basic Res + 2.0 µV
Offset for SE = 3·Basic Res + 3.0 µV

ANALOG MEASUREMENT SPEED:

Integration Type/Code	*Integration Time*	*Settling Time*	*Total Time*[4] *SE w/ No Rev*	*Total Time*[4] *DF w/ Input Rev*
250	250 µs	450 µs	~1 ms	~12 ms
60 Hz[5]	16.67 ms	3 ms	~20 ms	~40 ms
50 Hz[5]	20.00 ms	3 ms	~25 ms	~50 ms

[4]Includes 250 µs for conversion to engineering units.
[5]AC line noise filter.

INPUT NOISE VOLTAGE: For DF measurements with input reversal on ±2.5 mV input range (digital resolution dominates for higher ranges).
250 µs Integration: 0.34 µV RMS
50/60 Hz Integration: 0.19 µV RMS

INPUT LIMITS: ±5 Vdc

DC COMMON MODE REJECTION: >100 dB

NORMAL MODE REJECTION: 70 dB @ 60 Hz when using 60 Hz rejection

INPUT VOLTAGE RANGE W/O MEASUREMENT CORRUPTION: ±8.6 Vdc max.

SUSTAINED INPUT VOLTAGE W/O DAMAGE: ±16 Vdc max.

INPUT CURRENT: ±1 nA typical, ±6 nA max. @ 50°C; ±90 nA @ 85°C

INPUT RESISTANCE: 20 GΩ typical

ACCURACY OF BUILT-IN REFERENCE JUNCTION THERMISTOR (for thermocouple measurements):
±0.3°C, -25° to 50°C
±0.8°C, -55° to 85°C (-XT only)

ANALOG OUTPUTS (VX1-VX3)
3 switched voltage, sequentially active only during measurement.

RANGE AND RESOLUTION:

Channel	*Range*	*Resolution*	*Current Source/Sink*
(VX 1–3)	±2.5 Vdc	0.67 mV	±25 mA

ANALOG OUTPUT ACCURACY (VX):
±(0.06% of setting + 0.8 mV), 0° to 40°C
±(0.12% of setting + 0.8 mV), -25° to 50°C
±(0.18% of setting + 0.8 mV), -55° to 85°C (-XT only)

VX FREQUENCY SWEEP FUNCTION: Switched outputs provide a programmable swept frequency, 0 to 2500 mv square waves for exciting vibrating wire transducers.

PERIOD AVERAGE
Any of the 16 SE analog inputs can be used for period averaging. Accuracy is ±(0.01% of reading + resolution), where resolution is 136 ns divided by the specified number of cycles to be measured.

INPUT AMPLITUDE AND FREQUENCY:

Voltage Gain	*Input Range (±mV)*	*Signal (peak to peak) Min. (mV)*[6]	*Signal (peak to peak) Max (V)*[7]	*Min Pulse Width (µV)*	*Max*[8] *Freq (kHz)*
1	250	500	10	2.5	200
10	25	10	2	10	50
33	7.5	5	2	62	8
100	2.5	2	2	100	5

[6]Signal centered around Threshold (see PeriodAvg() instruction).
[7]With signal centered at the datalogger ground.
[8]The maximum frequency = 1/(twice minimum pulse width) for 50% of duty cycle signals.

RATIOMETRIC MEASUREMENTS
MEASUREMENT TYPES: Provides ratiometric resistance measurements using voltage excitation. 3 switched voltage excitation outputs are available for measurement of 4- and 6-wire full bridges, and 2-, 3-, and 4-wire half bridges. Optional excitation polarity reversal minimizes dc errors.

RATIOMETRIC MEASUREMENT ACCURACY:[9,10, 11]
±(0.04% of Voltage Measurement + Offset)

[9]Accuracy specification assumes excitation reversal for excitation voltages < 1000 mV. Assumption does not include bridge resistor errors and sensor and measurement noise.
[10]Estimated accuracy, ΔX (where X is value returned from the measurement with Multiplier = 1, Offset = 0):
BrHalf() instruction: $\Delta X = \Delta V_1/V_X$
BrFull() instruction $\Delta X = 1000 \cdot \Delta V_1/V_X$, expressed as mV•V^{-1}.
ΔV^{-1} is calculated from the ratiometric measurement accuracy. See Resistance Measurements Section in the manual for more information.
[11]Offsets are defined as:
Offset for DIFF w/input reversal = 1.5•Basic Res + 1.0 µV
Offset for DIFF w/o input reversal = 3•Basic Res + 2.0 µV
Offset for SE = 3•Basic Res + 3.0 µV
Excitation reversal reduces offsets by a factor of two.

PULSE COUNTERS (P1-P2)
2 inputs individually selectable for switch closure, high frequency pulse, or low-level ac. Independent 24-bit counters for each input.

MAXIMUM COUNTS PER SCAN: 16.7x10^6

SWITCH CLOSURE MODE:
Minimum Switch Closed Time: 5 ms
Minimum Switch Open Time: 6 ms
Max. Bounce Time: 1 ms open w/o being counted

HIGH-FREQUENCY PULSE MODE:
Maximum Input Frequency: 250 kHz
Maximum Input Voltage: ±20 V
Voltage Thresholds: Count upon transition from below 0.9 V to above 2.2 V after input filter with 1.2 µs time constant.

LOW-LEVEL AC MODE: Internal ac coupling removes ac offsets up to ±0.5 Vdc.
Input Hysteresis: 12 mV RMS @ 1 Hz
Maximum ac Input Voltage: ±20 V
Minimum ac Input Voltage:

Sine Wave (mV RMS)	*Range(Hz)*
20	1.0 to 20
200	0.5 to 200
2000	0.3 to 10,000
5000	0.3 to 20,000

DIGITAL I/O PORTS (C1-C8)
8 ports software selectable, as binary inputs or control outputs. Provide on/off, pulse width modulation, edge timing, subroutine interrupts / wake up, switch closure pulse counting, high frequency pulse counting, asynchronous communications (UARTs), and SDI-12 communications. SDM communications are also supported.

LOW FREQUENCY MODE MAX: <1 kHz

HIGH-FREQUENCY MODE MAX: 400 kHz

SWITCH-CLOSURE FREQUENCY MAX: 150 Hz

EDGE TIMING RESOLUTION: 540 ns

OUTPUT VOLTAGES (no load): high 5.0 V ±0.1 V; low <0.1

OUTPUT RESISTANCE: 330 Ω

INPUT STATE: high 3.8 to 16 V; low -8.0 to 1.2 V

INPUT HYSTERESIS: 1.4 V

INPUT RESISTANCE: 100 kΩ with inputs <6.2 Vdc
220 Ω with inputs ≥6.2 Vdc

SERIAL DEVICE/RS-232 SUPPORT: 0 TO 5 Vdc UART

SWITCHED 12 VDC (SW-12)
1 independent 12 Vdc unregulated source is switched on and off under program control. Thermal fuse hold current = 900 mA at 20°C, 650 mA at 50°C, 360 mA at 85°C.

EU DECLARATION OF COMPLIANCE
https://s.campbellsci.com/documents/us/compliance/eudoc_cr1000-series.pdf
https://s.campbellsci.com/documents/us/compliance/eudoc_cr1000kd.pdf

COMMUNICATIONS
RS-232 PORTS:
DCE 9-pin: (not electrically isolated) for computer connection or connection of modems not manufactured by Campbell Scientific.
COM1 to COM4: 4 independent Tx/Rx pairs on control ports (non-isolated); 0 to 5 Vdc UART
Baud Rates: selectable from 300 bps to 115.2 kbps.
Default Format: 8 data bits; 1 stop bits; no parity
Optional Formats: 7 data bits; 2 stop bits; odd, even parity

CS I/O PORT: Interface with telecommunications peripherals manufactured by Campbell Scientific.

SDI-12: Digital control ports C1, C3, C5, and C7 are individually configured and meet SDI-12 Standard v 1.3 for datalogger mode. Up to 10 SDI-12 sensors are supported per port.

PERIPHERAL PORT: 40-pin interface for attaching CompactFlash or Ethernet peripherals

PROTOCOLS SUPPORTED: PakBus, AES-128 Encrypted PakBus, Modbus, DNP3, FTP, HTTP, XML, HTML, POP3, SMTP, Telnet, NTCIP, NTP, Web API, SDI-12, SDM.

SYSTEM
PROCESSOR: Renesas H8S 2322 (16-bit CPU with 32-bit internal core running at 7.3 MHz)

MEMORY: 2 MB of flash for operating system; 4 MB of battery-backed SRAM for CPU usage and final data storage; 512 kB flash disk (CPU) for program files.

REAL-TIME CLOCK ACCURACY: ±3 min. per year. Correction via GPS optional.

REAL-TIME CLOCK RESOLUTION: 10 ms

SYSTEM POWER REQUIREMENTS
VOLTAGE: 9.6 to 16 Vdc

INTERNAL BATTERIES: 1200 mAh lithium battery for clock and SRAM backup that typically provides three years of backup

EXTERNAL BATTERIES: Optional 12 Vdc nominal alkaline and rechargeable available. Power connection is reverse polarity protected.

TYPICAL CURRENT DRAIN at 12 Vdc:
Sleep Mode: < 1 mA
1 Hz Sample Rate (1 fast SE meas.): 1 mA
100 Hz Sample Rate (1 fast SE meas.): 6 mA
100 Hz Sample Rate (1 fast SE meas. w/RS-232 communication): 20 mA
Active external keyboard display adds 7 mA (100 mA with backlight on).

PHYSICAL
DIMENSIONS: 23.9 x 10.2 x 6.1 cm (9.4 x 4 x 2.4 in); additional clearance required for cables and leads.

MASS/WEIGHT: 1 kg / 2.1 lb

WARRANTY
3 years against defects in materials and workmanship.

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Campbell Scientific, Inc.
January 18, 2017

CR1000 Specifications

Electrical specifications are valid over a -25° to +50°C, non-condensing environment, unless otherwise specified. Recalibration recommended every three years. Critical specifications and system configuration should be confirmed with Campbell Scientific before purchase.

PROGRAM EXECUTION RATE

10 ms to one day @ 10 ms increments

ANALOG INPUTS (SE1-SE16 or DIFF1-DIFF8)

8 differential (DF) or 16 single-ended (SE) individually configuredinput channels. Channel expansion provided by optional analog multiplexers.

RANGES and RESOLUTION: Basic resolution (Basic Res) is the A/D resolution of a single A/D conversion. A DIFF measurement with input reversal has better (finer) resolution by twice than Basic Res.

Range (mV)[1]	*DF Res (µV)*[2]	*Basic Res (µV)*
±5000	667	1333
±2500	333	667
±250	33.3	66.7
±25	3.33	6.7
±7.5	1.0	2.0
±2.5	0.33	0.67

[1]Range overhead of ~9% on all ranges guarantees that full-scale values will not cause over range.

[2]Resolution of DF measurements with input reversal.

ACCURACY[3]:
±(0.06% of reading + offset), 0° to 40°C
±(0.12% of reading + offset), -25° to 50°C
±(0.18% of reading + offset), -55° to 85°C (-XT only)

[3]Accuracy does not include the sensor and measurement noise. Offsets are defined as:
Offset for DF w/input reversal = 1.5•Basic Res + 1.0 µV
Offset for DF w/o input reversal = 3•Basic Res + 2.0 µV
Offset for SE = 3·Basic Res + 3.0 µV

ANALOG MEASUREMENT SPEED:

Integration Type/Code	*Integration Time*	*Settling Time*	*Total Time*[4] *SE w/ No Rev*	*Total Time*[4] *DF w/ Input Rev*
250	250 µs	450 µs	~1 ms	~12 ms
60 Hz[5]	16.67 ms	3 ms	~20 ms	~40 ms
50 Hz[5]	20.00 ms	3 ms	~25 ms	~50 ms

[4]Includes 250 µs for conversion to engineering units.

[5]AC line noise filter.

INPUT NOISE VOLTAGE: For DF measurements with input reversal on ±2.5 mV input range (digital resolution dominates for higher ranges).
250 µs Integration: 0.34 µV RMS
50/60 Hz Integration: 0.19 µV RMS

INPUT LIMITS: ±5 Vdc

DC COMMON MODE REJECTION: >100 dB

NORMAL MODE REJECTION: 70 dB @ 60 Hz when using 60 Hz rejection

INPUT VOLTAGE RANGE W/O MEASUREMENT CORRUPTION: ±8.6 Vdc max.

SUSTAINED INPUT VOLTAGE W/O DAMAGE: ±16 Vdc max.

INPUT CURRENT: ±1 nA typical, ±6 nA max. @ 50°C; ±90 nA @ 85°C

INPUT RESISTANCE: 20 GΩ typical

ACCURACY OF BUILT-IN REFERENCE JUNCTION THERMISTOR (for thermocouple measurements):
±0.3°C, -25° to 50°C
±0.8°C, -55° to 85°C (-XT only)

ANALOG OUTPUTS (VX1-VX3)

3 switched voltage, sequentially active only during measurement.

RANGE AND RESOLUTION:

Channel	*Range*	*Resolution*	*Current Source/Sink*
(VX 1–3)	±2.5 Vdc	0.67 mV	±25 mA

ANALOG OUTPUT ACCURACY (VX):
±(0.06% of setting + 0.8 mV), 0° to 40°C
±(0.12% of setting + 0.8 mV), -25° to 50°C
±(0.18% of setting + 0.8 mV), -55° to 85°C (-XT only)

VX FREQUENCY SWEEP FUNCTION: Switched outputs provide a programmable swept frequency, 0 to 2500 mv square waves for exciting vibrating wire transducers.

PERIOD AVERAGE

Any of the 16 SE analog inputs can be used for period averaging. Accuracy is ±(0.01% of reading + resolution), where resolution is 136 ns divided by the specified number of cycles to be measured.

INPUT AMPLITUDE AND FREQUENCY:

Voltage Gain	*Input Range (±mV)*	*Signal (peak to peak) Min. (mV)*[6]	*Signal (peak to peak) Max (V)*[7]	*Min Pulse Width (µV)*	*Max*[8] *Freq (kHz)*
1	250	500	10	2.5	200
10	25	10	2	10	50
33	7.5	5	2	62	8
100	2.5	2	2	100	5

[6]Signal centered around Threshold (see PeriodAvg() instruction).

[7]With signal centered at the datalogger ground.

[8]The maximum frequency = 1/(twice minimum pulse width) for 50% of duty cycle signals.

RATIOMETRIC MEASUREMENTS

MEASUREMENT TYPES: Provides ratiometric resistance measurements using voltage excitation. 3 switched voltage excitation outputs are available for measurement of 4- and 6-wire full bridges, and 2-, 3-, and 4-wire half bridges. Optional excitation polarity reversal minimizes dc errors.

RATIOMETRIC MEASUREMENT ACCURACY:[9,10, 11]
±(0.04% of Voltage Measurement + Offset)

[9]Accuracy specification assumes excitation reversal for excitation voltages < 1000 mV. Assumption does not include bridge resistor errors and sensor and measurement noise.

[10]Estimated accuracy, ΔX (where X is value returned from the measurement with Multiplier = 1, Offset = 0):
BrHalf() instruction: $\Delta X = \Delta V_1/V_X$
BrFull() instruction $\Delta X = 1000 \cdot \Delta V_1/V_X$, expressed as mV•V^{-1}.
ΔV^{-1} is calculated from the ratiometric measurement accuracy. See Resistance Measurements Section in the manual for more information.

[11]Offsets are defined as:
Offset for DIFF w/input reversal = 1.5•Basic Res + 1.0 µV
Offset for DIFF w/o input reversal = 3•Basic Res + 2.0 µV
Offset for SE = 3•Basic Res + 3.0 µV
Excitation reversal reduces offsets by a factor of two.

PULSE COUNTERS (P1-P2)

2 inputs individually selectable for switch closure, high frequency pulse, or low-level ac. Independent 24-bit counters for each input.

MAXIMUM COUNTS PER SCAN: 16.7×10^6

SWITCH CLOSURE MODE:
Minimum Switch Closed Time: 5 ms
Minimum Switch Open Time: 6 ms
Max. Bounce Time: 1 ms open w/o being counted

HIGH-FREQUENCY PULSE MODE:
Maximum Input Frequency: 250 kHz
Maximum Input Voltage: ±20 V
Voltage Thresholds: Count upon transition from below 0.9 V to above 2.2 V after input filter with 1.2 µs time constant.

LOW-LEVEL AC MODE: Internal ac coupling removes ac offsets up to ±0.5 Vdc.
Input Hysteresis: 12 mV RMS @ 1 Hz
Maximum ac Input Voltage: ±20 V
Minimum ac Input Voltage:

Sine Wave (mV RMS)	*Range(Hz)*
20	1.0 to 20
200	0.5 to 200
2000	0.3 to 10,000
5000	0.3 to 20,000

DIGITAL I/O PORTS (C1-C8)

8 ports software selectable, as binary inputs or control outputs. Provide on/off, pulse width modulation, edge timing, subroutine interrupts / wake up, switch closure pulse counting, high frequency pulse counting, asynchronous communications (UARTs), and SDI-12 communications. SDM communications are also supported.

LOW FREQUENCY MODE MAX: <1 kHz

HIGH-FREQUENCY MODE MAX: 400 kHz

SWITCH-CLOSURE FREQUENCY MAX: 150 Hz

EDGE TIMING RESOLUTION: 540 ns

OUTPUT VOLTAGES (no load): high 5.0 V ±0.1 V; low <0.1

OUTPUT RESISTANCE: 330 Ω

INPUT STATE: high 3.8 to 16 V; low -8.0 to 1.2 V

INPUT HYSTERESIS: 1.4 V

INPUT RESISTANCE: 100 kΩ with inputs <6.2 Vdc
220 Ω with inputs ≥6.2 Vdc

SERIAL DEVICE/RS-232 SUPPORT: 0 TO 5 Vdc UART

SWITCHED 12 VDC (SW-12)

1 independent 12 Vdc unregulated source is switched on and off under program control. Thermal fuse hold current = 900 mA at 20°C, 650 mA at 50°C, 360 mA at 85°C.

EU DECLARATION OF COMPLIANCE

https://s.campbellsci.com/documents/us/compliance/eudoc_cr1000-series.pdf
https://s.campbellsci.com/documents/us/compliance/eudoc_cr1000kd.pdf

COMMUNICATIONS

RS-232 PORTS:
DCE 9-pin: (not electrically isolated) for computer connection or connection of modems not manufactured by Campbell Scientific.
COM1 to COM4: 4 independent Tx/Rx pairs on control ports (non-isolated); 0 to 5 Vdc UART
Baud Rates: selectable from 300 bps to 115.2 kbps.
Default Format: 8 data bits; 1 stop bits; no parity
Optional Formats: 7 data bits; 2 stop bits; odd, even parity

CS I/O PORT: Interface with telecommunications peripherals manufactured by Campbell Scientific.

SDI-12: Digital control ports C1, C3, C5, and C7 are individually configured and meet SDI-12 Standard v 1.3 for datalogger mode. Up to 10 SDI-12 sensors are supported per port.

PERIPHERAL PORT: 40-pin interface for attaching CompactFlash or Ethernet peripherals

PROTOCOLS SUPPORTED: PakBus, AES-128 Encrypted PakBus, Modbus, DNP3, FTP, HTTP, XML, HTML, POP3, SMTP, Telnet, NTCIP, NTP, Web API, SDI-12, SDM.

SYSTEM

PROCESSOR: Renesas H8S 2322 (16-bit CPU with 32-bit internal core running at 7.3 MHz)

MEMORY: 2 MB of flash for operating system; 4 MB of battery-backed SRAM for CPU usage and final data storage; 512 kB flash disk (CPU) for program files.

REAL-TIME CLOCK ACCURACY: ±3 min. per year. Correction via GPS optional.

REAL-TIME CLOCK RESOLUTION: 10 ms

SYSTEM POWER REQUIREMENTS

VOLTAGE: 9.6 to 16 Vdc

INTERNAL BATTERIES: 1200 mAh lithium battery for clock and SRAM backup that typically provides three years of backup

EXTERNAL BATTERIES: Optional 12 Vdc nominal alkaline and rechargeable available. Power connection is reverse polarity protected.

TYPICAL CURRENT DRAIN at 12 Vdc:
Sleep Mode: < 1 mA
1 Hz Sample Rate (1 fast SE meas.): 1 mA
100 Hz Sample Rate (1 fast SE meas.): 6 mA
100 Hz Sample Rate (1 fast SE meas. w/RS-232 communication): 20 mA
Active external keyboard display adds 7 mA (100 mA with backlight on).

PHYSICAL

DIMENSIONS: 23.9 x 10.2 x 6.1 cm (9.4 x 4 x 2.4 in); additional clearance required for cables and leads.

MASS/WEIGHT: 1 kg / 2.1 lb

WARRANTY

3 years against defects in materials and workmanship.

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August 8, 2016

13855

Easily Key Up a Radio

Quick Links

Overview

The 13855 push-to-talk switch allows a customer an easy method for keying up a radio. The 13855 attaches to a square 10-position connector on the radio-to-modem cable that is supplied with the radio (for example, pn 29201). Pressing the button grounds the radio push-to-talk (PTT) line, which causes the radio to transmit the carrier frequency. This process is useful during radio maintenance and for troubleshooting. For example, it allows a user to sustain a transmission while measuring the forward and reflected radio transmit power with a watt meter.

Images

Specifications

Connector	Square, 10-pin (2x5), 0.100 inch pitch, male
Button	Metal dome button with overlay

Compatibility

The 13855 is compatible with the 29201, 13547, and 12160 cables.

Listed Under

Other Accessories for the following products:

- **RF304** - UHF Radio Transceiver
- **RF302** - UHF Radio Transceiver
- **RF300** - VHF Radio Transceiver
- **RF301** - VHF Radio Transceiver
- **RF303** - UHF Radio Transceiver
- **RF310** - VHF Radio Transceiver
- **RF312** - UHF Radio Transceiver
- **RF313** - UHF Radio Transceiver
- **RF323** - UHF Radio Transceiver
- **RF321** - UHF Radio Transceiver
- **RF320** - VHF Radio Transceiver
- **RF322** - UHF Radio Transceiver

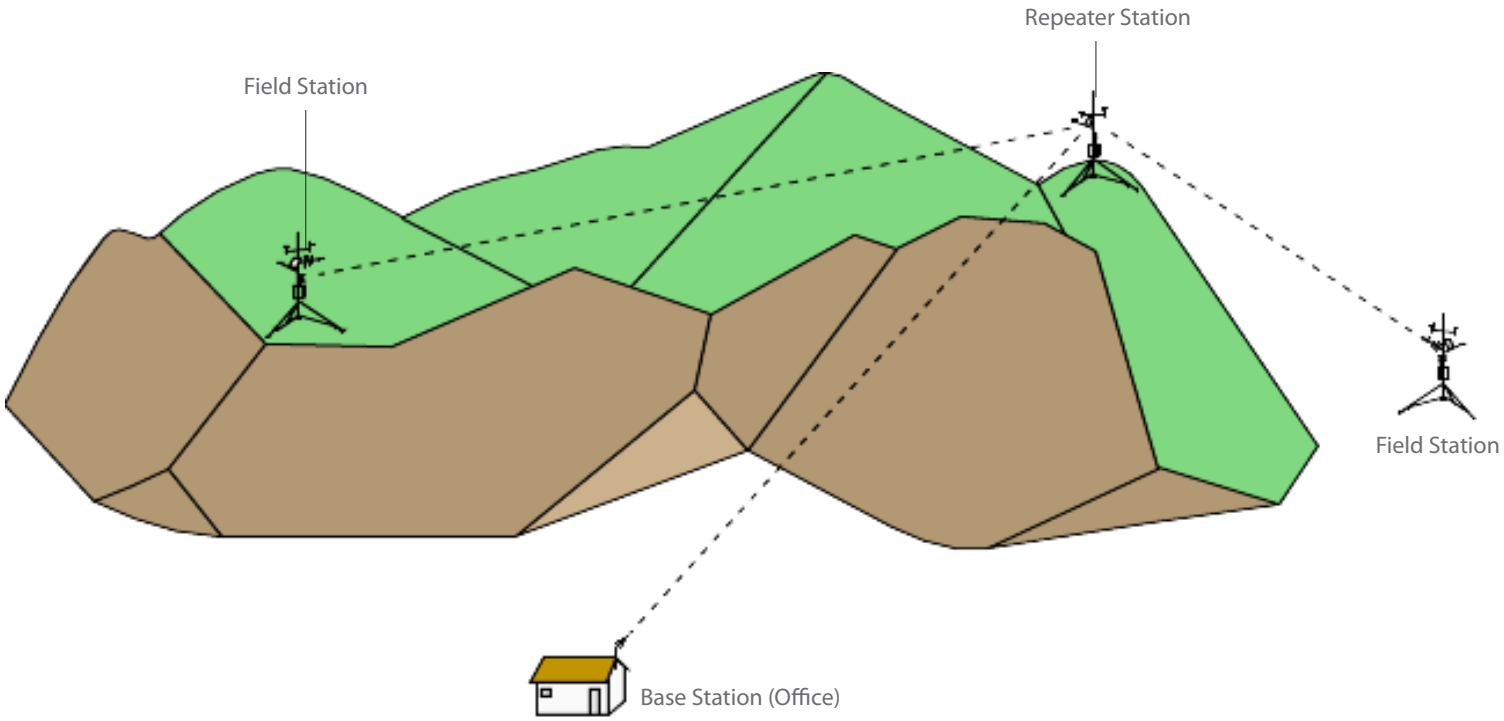
CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Narrowband RF Networks

for remote wireless communications

Stable, long-range,wireless communication

Using narrowband, licensed, UHF/VHF radios



Overview

Campbell Scientific's radiotelemetry (RF) systems support data retrieval from moving vehicles or remote areas where communication via cables is impractical.

Data from field stations are retrieved at a computer base station. The base station can communicate with up to 254 remote stations over a single frequency. A phone modem can also access an RF network.

Field stations and repeater stations can be located to allow communication over long distances and rough terrain. The maximum distance between any two communicating stations is approximately 25 miles and must be line-of-sight (unobstructed by mountains, large buildings, etc.). Longer distances and rough terrain may require intermediate repeater station(s).

RF data transmission hardware includes radios, antennas, and radio modems. Power at the field and repeater stations is provided by sealed rechargeable batteries trickle-charged by solar or ac power.

Benefits and Features

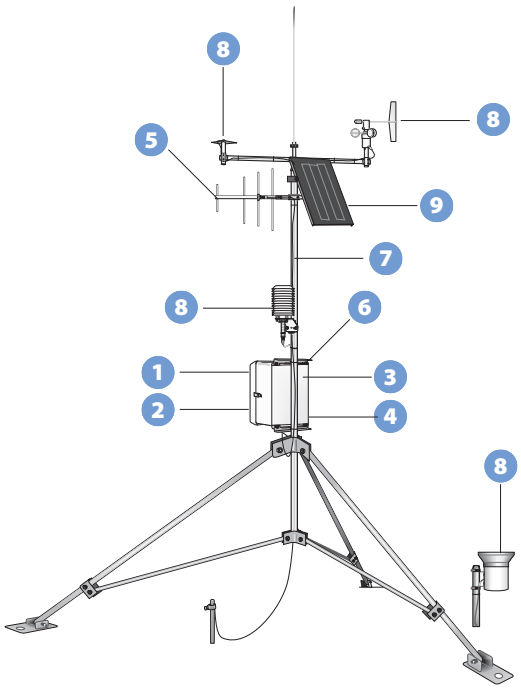
- Measurement sites can be located in areas without phone lines or cellular coverage
- Eliminates cables and cable costs
- Supports local and remote data retrieval
- Allows remote control of datalogger functions

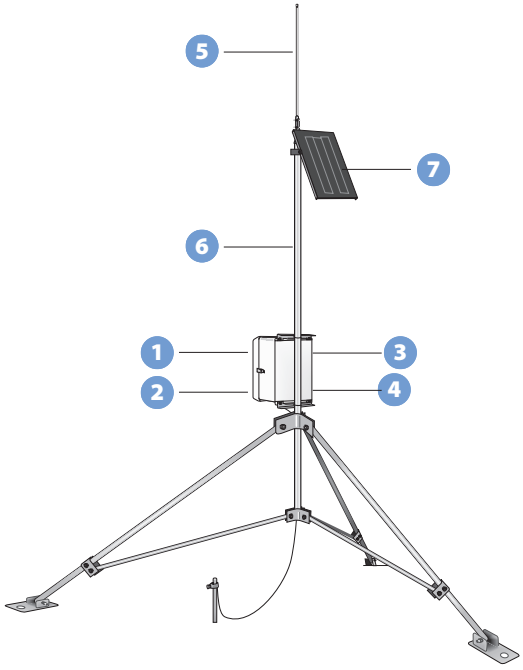
Before ordering radios and antennas, you must submit an application to the Federal Communications Commission (FCC) to acquire an FCC license and be assigned a frequency range. To file for an FCC license on-line, go to http://wireless.fcc.gov/uls and register. Canadian DOC approval is available for radios in the 138 to 174 MHz and 403 to 470 MHz frequency bands only.

Field Station Components

Field stations are located at the measurement site. They can also act as a repeater to extend the range of the network.

1. Datalogger
2. Power supply (5 Ah minimum)
3. RF500M Radio Modem
4. Radio transceiver such as the RF320, RF321, RF322, or RF323
5. Antenna (Yagi directional antenna shown) and antenna cable
6. Environmental enclosure
7. Tripod or tower
8. Sensors and sensor mounts
9. Solar Panel (optional)





Repeater Station Components

Repeater stations act as communication relays between stations that cannot communicate directly due to distance or obstacles.

1. RF500M Radio Modem
2. Radio transceiver such as the RF320, RF321, RF322, or RF323
3. Power supply with charging regulator and null modem ports such as an A100 adapter connected to a CH150 regulator and a user-supplied rechargeable battery
4. Environmental enclosure
5. Omnidirectional antenna and antenna cable
6. Tripod or tower
7. Solar Panel

Computer Base Station Components

Base stations support attended and unattended retrieval of the field station's data and provide communication error checking and data processing. AC power is required. Base stations should contain:

- RF500B Base Station or the RF500M modem and power supply
- Radio transceiver such as the RF320, RF321, RF322, or RF323
- PC running LoggerNet Datalogger Support Software
- Antenna (directional or omnidirectional) and antenna cable

Power Considerations

The location of your site, number of calls, and length of calls affect the power requirements of your system. Information on analyzing your system's power requirements is provided in our Power Supply Overview brochure and the Power Supply application note. You can also contact an applications engineer who will help you determine an appropriate power supply for your system.

CAMPBELL SCIENTIFIC
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January 18, 2017

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

RF500M
Radio Modem

Versatile radio modem

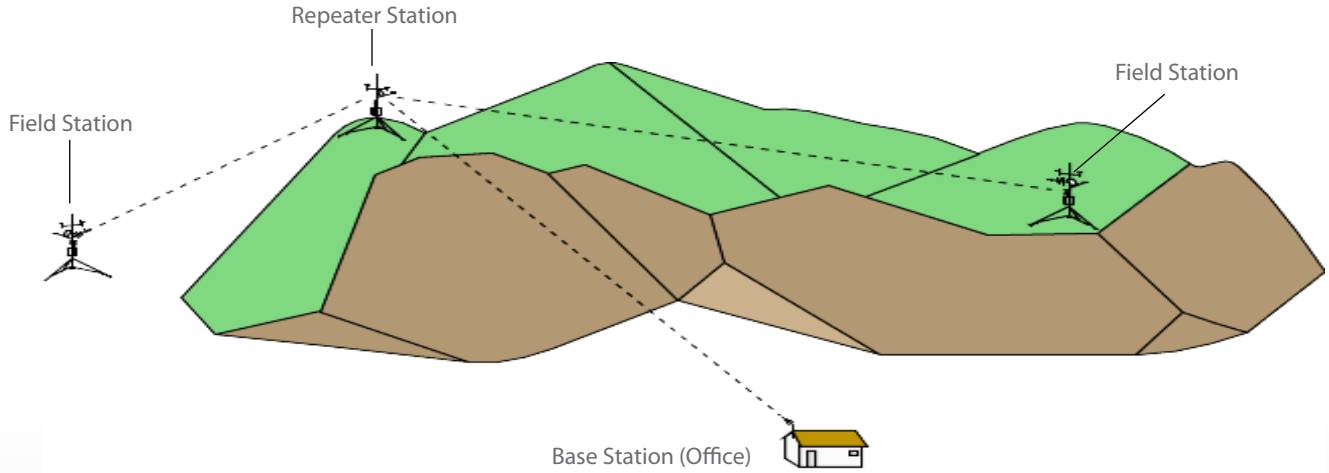
For networks with narrowband, UHF/VHF, licensed radios

Overview

The RF500M serves as a field, repeater, or base station communication interface, generally for our licensed radio applications. It provides an interface between a datalogger or computer and a radio and can be a stand-alone repeater when onsite logging is not required. The RF500M is powered from the CS I/O port or from an external power connection. This modem is software configurable, and has been designed to interface with data telemetry radios such as our RF320-, RF310-, and RF300-series VHF/UHF radios.

Benefits and Features

- Supports multiple radio configurations including our RF320-series, our RF310-series, our RF300-series, and the DataRadio DL-3400 radio
- Uses software instead of hardware modifications to upgrade the operating system (OS) and change RF ID or other settings
- Provides an RS-232 port (DTE) for modem configuration or attachment of an RS-232 radio
- Avoids all collisions within a network, thus increasing polling speeds and reducing overall current drain



Our RF networks require line-of-sight transmission. The mountain in this drawing obstructs line-of-sight with the base station. Use of the repeater station allows the base station to receive data from the field stations.

Ordering Information

Radio Modem

Must choose an OS option and a radio jumper setting option (see below).

RF500M Radio Modem.

OS Options (see discussion at right)

-PB PakBus OS.

-AL ALERT Dual Mode OS.

-DA Dial OS.

Radio Jumper Setting Options

-MJ Jumper for RF320-series or RF310-series radios.

-RJ Jumper for RF300-series radios.

-UJ Jumper for radios purchased directly from DRL.

Temperature Range Options

-ST Standard -25° to +50°C (default).

-XT Extended -55° to +85°C.

Warranty Length Options

-SW Standard one year warranty (default).

-XW Four year warranty extension.

Accessories

10873 9-pin female to 9-pin male serial data cable (6 ft); cable is required to connect RS-232 digital radios.

15966 Wall Charger 12 Vdc, 800 mA Output, 100 to 240 Vac, 50 to 60 Hz with Barrel Plug, 6 ft Cable.

14291 Field Power Cable 12 Vdc Plug to Pigtail (2 ft) connects with a 12 Vdc power supply.

14020 Field Power Cable CS I/O to 12 Vdc Barrel Plug (2 ft) connects with datalogger.

Operating System (OS) Options Descriptions

PakBus OS

Considered the standard for the RF500M, the -PB OS uses TDRF polling to quickly and efficiently move data through a network. Each station can be individually dialed by LoggerNet. This OS is compatible with -TD, -PB, and our current generation of PakBus dataloggers.

ALERT Dual Mode OS

The ALERT (Automated Local Evaluation in Real Time) OS allows for transmission, repeating, and reception of binary ALERT formatted data. It is a derivative of the -PB OS, and therefore supports both ALERT and TDRF communications (allowing true two-way communication with a station). This OS is compatible with the CR200(X)-series, CR800-series, CR1000, and CR3000 dataloggers.

Dial OS

The dial OS works with both mixed-array and PakBus/table-based dataloggers. Each station can be dialed by LoggerNet for downloading data, sending programs, and performing other tasks. Additionally, this OS allows stations to create point-to-point networks for sharing of measurement and control tasks.

Specifications

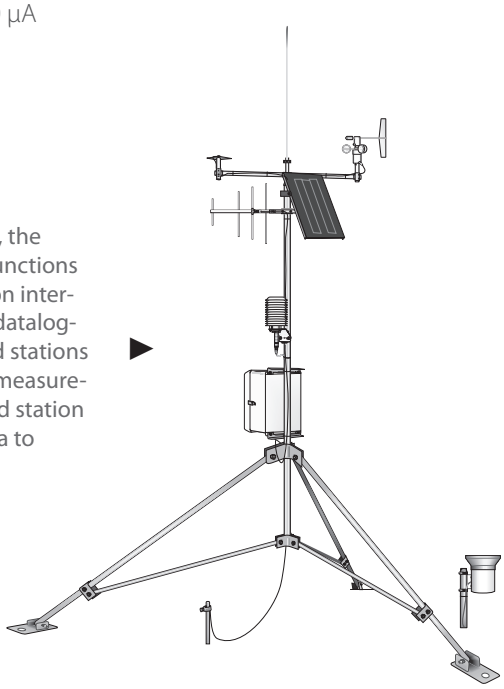
- Voltage: 7 to 20 Vdc
- Dimension: 160 x 95 x 22 mm (6.31 x 3.69 x 0.88 in.)
- Weight: 0.18 kg (0.4 lb)

Current Drain

- Active: <15 mA
- Quiescent: <350 µA

The RF500M can be used as a stand-alone repeater. Repeater stations provide a communication relay between stations that cannot communicate directly due to distance or obstacles. Repeater stations use omnidirectional antennas.

At the field station, the RF500M modem functions as a communication interface between the datalogger and radio. Field stations are located at the measurement site. This field station uses a Yagi antenna to transmit the data.



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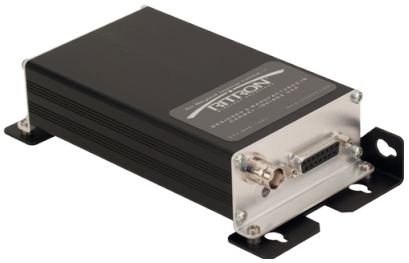
January 4, 2017

RF320

UHF / VHF Radios / RF320



Rugged, Long Range

Long-distance option for communication

Quick Links

Overview

The RF320 is a 136 to 174 MHz radio. Campbell Scientific's RF320-series narrowband UHF/VHF radio transceivers provide a long-distance telemetry option for communicating with remote measurement stations. Each radio includes a configured Ritron DTX-L radio, a mounting bracket, and a cable for connecting the radio to a radio modem. The different models vary by the frequency ranges they support.

Read More ›

Images

Similar Products

RF321 UHF Radio Transceiver

RF322 UHF Radio Transceiver

RF323 UHF Radio Transceiver

Detailed Description

The RF320 is programmed by Campbell Scientific to the frequency that was assigned by the Federal Communications Commission (FCC). This frequency must be specified at time of order so that it can be programmed into the radio.

A user-supplied antenna is required for each radio; contact Campbell Scientific for more information about selecting the antenna and cable. Each radio must also be connected to an RF500M or RF310M radio modem.

Specifications

Ritron Module	DTX-445
FCC ID	AIERIT17-445
Industry Canada ID	1084A-RIT17145
FCC Rule Parts	90
Industry Canada Rule Parts	RSS-119
Frequency Range	136 to 174 MHz
RF Channels	8 independent Tx/Rx frequencies
Synthesizer Step	2.5 kHz
Channel Spacing	12.5 kHz
Frequency Stability	±2.5 PPM (-30° to +60°C)
Input Voltage	9 to 17 Vdc
Antenna Connector	BNC female
Dimensions	14.5 x 7.6 x 3.5 cm (5.7 x 3 x 1.375 in.)
Weight	0.2 kg (7.3 oz)

Current Drain @ 12.5 Vdc

Receive Standby	25 mA
Transmitter	› < 0.9 A (2 W output) › < 1.2 A (5 W output)

Receiver

Receiver Type	12.5 kHz narrowband
Sensitivity	0.25 µV (12 dB SINAD)
Adjacent Channel	-60 dB
Receiver Attack Time	< 10 ms (Tx to Rx)
Noise Squelch Sensitivity	PC adjustable (factory set for -121 dBm)

Transmitter	
RF Power Output	2.0 W or 5.0 W (@ 12.5 Vdc)
Duty Cycle	50% (< 13.5 V, 5 W output, 25°C)
Voice Emissions Designator	10K0F3E
Data Emissions Designator	9K8F1D, 11K0F2D, 11K0F3D
Transmitter Attack Time	< 10 ms

Compatibility

Radio Modems

RF500M	RF310M	RF95A	RF95	RF95T	RF315M
✓	✓				

Radio Base Stations

RF500B	RF310B	RF232A	RF232	RF232T
✓	✓			

Radios

The RF320 is compatible with the RF310 radio.

Datalogger Considerations

Compatible Contemporary Dataloggers

CR200(X) Series	CR800/CR850	CR1000	CR3000	CR9000X
*	✓	✓	✓	

Compatible Retired Dataloggers

CR500	CR510	CR10	CR10X	21X	CR23X	CR9000	CR5000	CR7
✓	✓	✓	✓	✓	✓			✓

Note: *The CR200(X)-series dataloggers are only compatible if the RF500 radio modem is used.*

Documents

Brochures

- RF320-Series Narrowband UHF/VHF Radios
- Narrowband RF Networks
- Data Storage and Retrieval Peripherals

Manuals

- RF320-Series Ritron VHF/UHF Radios

Technical Papers

- Line of Sight Obstruction
- The Link Budget and Fade Margin

Frequently Asked Questions

Number of FAQs related to **RF320**: 2

1. Can an RF500M work with a GPS device for vehicle tracking systems?
   No. The RF500M cannot be directly interfaced with a GPS receiver. However, most Campbell Scientific dataloggers can be interfaced with the output from a GPS receiver and programmed to extract the positional information. This information can then be accessed via an RF500M/RF320 RF link.
2. Can more than one antenna be connected to a single radio?
   It is possible to connect two antennas to a single radio via a properly specified (operating frequency and power handling capability) two-way, 50 ohm RF power divider. One example of this type of power divider is offered by Pasternack. Note that using a device like this will induce additional losses into the system (3 to 4 dB, typically).

1
100V
OUTPUT
7A
+2
CRYDOM
SOLID-STATE RELAY
ASSEMBLED
IN MEXICO
D1D07
4
INPUT
3.5-32V
+3

CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

PS150 and CH150

Power Supply and Charge Controller

Optimized Power Performance

Manages voltage and amperage to protect battery

Overview

The PS150 and CH150 are smart charge controllers that manage amperage and voltage for safe, optimized battery charging from a solar-panel or ac power source. The PS150 includes a 12 Vdc, 7 Ah valve-regulated lead-acid (VRLA) battery, while the CH150 is for use with a separate larger battery such as our BP12, BP24, or a user-supplied battery.

Benefits and Features

- Protects against high-amperage and high-voltage damage to power supply
- Battery reversal protection
- Allows simultaneous connection of two charging sources (e.g., solar panel, ac wall charger)
- ETL listed Class 2 power supply

Technical Description

The PS150 and CH150 are micro-controller-based smart chargers with temperature compensation that optimize battery charging and increase the battery's life. Two input terminals enable simultaneous connection of two charging sources. They also incorporate a maximum power point tracking algorithm for solar inputs that maximize available solar charging resources.

The PS150 and CH150 have several safety features intended to protect the charging source, battery, charger, and load devices. Both the SOLAR – G and CHARGE – CHARGE input terminals incorporate hardware current limits and polarity-reversal protection. A 5 A fuse protects the CHARGE – CHARGE inputs in the event of a catastrophic AC/AC or AC/DC charging source failure. A 4.65 A solid-state circuit breaker protects the 12 V output terminals of the charger in the event of an output load fault. The PS150 and CH150 also have battery-reversal protection, and include ESD and surge protection on all of its inputs and outputs.

Ordering Information

Power Supplies

CH150 12 V Charging Regulator. Choose a warranty option (see below).

PS150 12 V Power Supply with Charging Regulator and 7 Ah Sealed Rechargeable Battery. Choose a warranty option (see below).

Warranty Options (choose one)

-SW Standard 1 Year Warranty. See manual for full warranty policy.

-XW 4 Year Warranty Extension (available only at the time of original product purchase).

12 Vdc Battery Packs for CH150

BP12 12 Ah Sealed Rechargeable Battery with Mounts

BP24 24 Ah Sealed Rechargeable Battery with Mounts

External Battery Cable

6186 Battery Cable for connecting an external 12 Vdc flooded battery such as a deep-cycle marine or RV battery.

Wall Chargers

29796 Wall Charger 24 Vdc 1.67 A Output, 100 to 240 Vac, 1A Input, 5 ft Cable. Must choose a power plug option (see below).

22110 Wall Charger 24 Vdc 1.67 A Output, 100 to 240 Vac, 1 A Input for prewired enclosure. Must choose a power plug option (see below).

Power Plug Options (choose one)

-US US/Canada Plug

-IP 7 International Plugs

Unregulated Solar Panels

Regulated solar panels such as the SP10R are not recommended. Must choose a cable termination option and a mounting option.

SP10 10 W Solar Panel with 15 ft cable

SP20 20 W Solar Panel with 15 ft cable

SP50-L 50 W Solar Panel with user-specified cable length (used with the CH150 only). Enter length, in feet, after the -L. A 20 ft length is typical; maximum length is 50 ft.

Cable Termination Options (choose one)

-PT Cable terminates in stripped and tinned leads for direct connection to the CH150 or PS150.

-PW Cable terminates in a connector that attaches to a prewired enclosure.

-C Cable terminates in a connector that attaches to an ET station or the CS110 Electric Field Meter (only available for the SP10).

Mounting Option (choose one)

-SM Standard Mounting Kit

-EM Extended Mounting Kit

Adapters

Only one adapter can be used at a time.

A100 Null Modem Adapter for powering peripherals and external devices at non-datalogger sites such as repeater stations.

A105 12 V Terminal Expansion Adapter that increases the number of 12 V and ground terminals available on the PS150 or CH150.

Specifications

- EU Declaration of Conformity: https://s.campbellsci.com/documents/us/compliance/eudoc_ch150-ps150.pdf
- Operational Temperature Range*: –40° to +60°C
- Dimensions:

	Height	Length	Width
PS150	10.6 cm (4.2 in)	19.3 cm (7.5 in)	7.6 cm (3 in)
CH150	10 cm (3.9 in)	7.5 cm (3 in)	3.7 cm (1.5 in)

Battery Charging

- FLOAT Charging: $Vbatt(T) = 13.65–(24\ mV) \times (T–25) + (0.24\ mV) \times (T–25)^2$
- Accuracy: ±1% accuracy on charging voltage over -40° to +60°C

CHARGE – CHARGE Terminals (AC or DC Source)

- AC: 18 to 24 V RMS internally limited to 1.2 A RMS
- DC: 16 to 40 Vdc internally limited to 0.85 A dc

SOLAR Terminals (Solar Panel or Other DC Source)

- Input Voltage Range: 15 to 40 Vdc
- Maximum Charging Current: 4.0 A dc typical; 3.1 A dc to 4.8 A dc depending on individual charger

Quiescent Current

- No Charge Source Present: 160 µA at 13.7 Vdc
- No Battery Connected: 930 µA at 30 V input voltage (ac or dc)

Power Out (+12 terminals)

- Voltage: Unregulated 12 V from battery
- 4.65 A solid state circuit breaker
- ETL Listed Class 2 power supply

**VRLA battery manufacturers state that "heat kills batteries" and recommend operating batteries ≤50°C.*

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January 31, 2017

14221

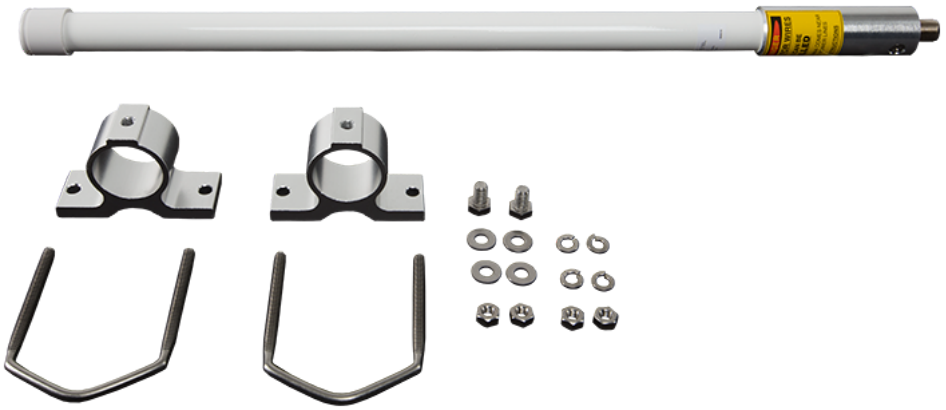
Quick Links

Overview

The 14221 is a 3 dBd omnidirectional antenna for use with many of our spread-spectrum products. The 14221 is suitable for base station use where you need to communicate with multiple stations located in different directions. It is also preferred in mobile applications and in other applications in which the best radio path is not constant, including close-up applications without clear line-of-sight.

Read More ›

Images



14221 antenna with mounting hardware, disassembled

Similar Products

14205 900 MHz 6 dBd Yagi Antenna with Mounting Hardware

14201 900 MHz 9 dBd Yagi Antenna with Mounting Hardware

14203 900 MHz 3 dBd Omnidirectional Antenna without Mounting Hardware

17548 900 MHz 0 dBd Omnidirectional Antenna without Mounting Hardware

14204 900 MHz 0 dBd 1/2 Wave Omnidirectional Antenna with RPSMA Connector

15731 900 MHz 0 dBd 1/4 Wave Omnidirectional Antenna with RPSMA Connector

15730 900 MHz 0 dBd 1/4 Wave Omnidirectional Antenna with RPSMA Connector

15970 900 MHz 1 dBd Omnidirectional Dipole Antenna with Adhesive Mount

Detailed Description

The 14221 is the highest gain, omnidirectional antenna available for our 900 MHz spread spectrum radios that Campbell Scientific offers. This outdoor antenna is ideal for a base station or repeater station where you need to communicate with multiple stations located in different directions. The 14221 is also preferred in mobile applications and in applications where the best radio path is not constant, including close-up applications without clear line-of-sight.

The 14221 requires an antenna cable to connect it to the spread-spectrum radio. (See the Compatibility information for options.)

Specifications

Gain	3 dBd
Frequency Band Supported	902 to 928 MHz
Connector	Type N female
Antenna Type	Omnidirectional, outdoor antenna with mounting hardware
Manufacturer's Model Name	ANTENEX FG9023
Mounting	Mounts to pipes with outer diameters from 3.18 to 6.35 cm (1.25 to 2.5 in.).
Diameter	3.175 cm (1.25 in.) at base
Length	63.5 cm (25 in.)
Weight	383 g (13.5 oz)

Compatibility

Antenna Cables

The following cables can be used:

- COAXNTN-L—connects the antenna to the radio, datalogger, or interface via a surge protector.
- COAXRPSMA-L—connects the antenna to spread-spectrum radios other than the RF450 when surge protection is not required.
- COAXSMA-L—connects the antenna to an RF450 when surge protection is not required.

Mounting Hardware

The antenna includes a rugged FM2 antenna mounting bracket. The mounting bracket will accommodate a pipe with up to 6.5 cm (2.5 in.) outer diameter. A similar antenna, the 14203, does not have mounting hardware and is intended for customers who want to construct an antenna mounting bracket that fits their specific application.

Contemporary Devices

The 14221 is compatible with these current products:

Spread-Spectrum Radios

- RF451
- RF401A
- RF411A
- RF407
- RF412

Dataloggers

- CR206X
- CR211X
- CR6-RF451
- CR6-RF407
- CR6-RF412
- CRVW3-RF451
- CRVW3-RF407
- CRVW3-RF412
- CR300-RF407
- CR300-RF412
- CR310-RF407
- CR310-RF412

Vibrating-Wire Peripherals

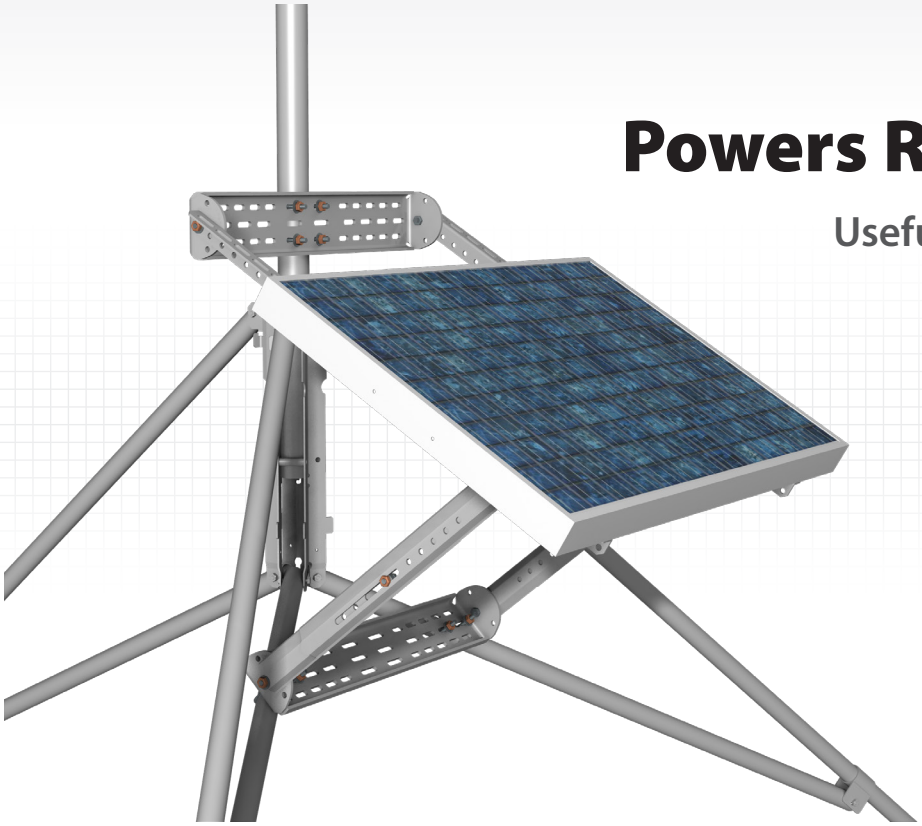
- AVW206
- AVW211

Retired Devices

CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

SP50-L

50 W Solar Panel



Powers Remote Systems

Useful at sites far from ac sources

The SP50 50 W solar panel is a photovoltaic power source capable of recharging batteries. It is used for our CS110 Electric Field Meter or other systems that require 50 W solar panels. The SP50 allows unattended operation of systems in remote locations, far from ac electrical sources.

This solar panel needs to be used with either a 18529 Morningstar SunSaver, CH200, or CH150 regulator. One SP50 can be connected to any of the regulators to provide a peak charge of 50 W. Two SP50 solar panels can be wired in parallel to the charge inputs of the SunSaver 18529 regulator to provide a peak charge of 100 W.

Regulators

CH150/CH200 Charge Controller

The CH150 and CH200 limit charging current to approximately 3.6 A and can precisely charge these battery families: EnerSys Genesis NP Series (BP12, BP24), EnerSys Cyclone Series, Concorde Sun Xtender Series (BP84, PS84), or a custom battery.

18529 MorningStar SunSaver

The 18529 Morning Star SunSaver limits charging current to approximately 10 A and can charge flooded batteries or sealed rechargable batteries such as our BP12, BP2, BP24, and BP84.

Mounting Hardware

The SP50 includes the 31107 Extended Mounting Kit for attaching the solar panel to a Campbell Scientific tripod or tower. The 31107 positions the solar panel approximately 25 cm (10 in) from the tripod or tower, which reduces shadows from other components and guy wires. The zenith angle indicator and the slotted supports simplify installation. The 31107 began shipping with the solar panel in October 2014. This kit may be purchased separately to retrofit existing solar panels.

Ordering Information

Solar Panel

SP50-L 50 W Solar Panel with user-specified cable length. Enter length, in feet, after the -L. A 20 ft length is typical; maximum length is 50 ft. Must choose a cable termination option (see below).

Cable Termination Option (choose one)

-PT Cable terminates in stripped and tinned leads for connection to the CH200 Smart Charge Controller or 18529 regulator.

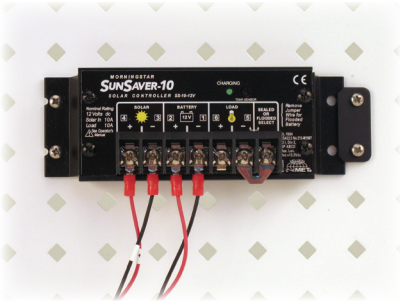
-PW Cable terminates in a connector that attaches to a prewired enclosure.

Regulators

CH200 12 Vdc Charging Regulator

18529 Morning Star SunSaver-10 10A 12V Regulator with 15 ft Battery Cable

CH150 12 Vdc Charging Regulator



18529 Morning Star SunSaver

CH200

Above shows two regulators available for use with the SP50. Regulators must be housed in an environmental enclosure.

Specifications[a]

- Maximum Power: 50 W (100 W peak power when two SP50s are connected to one 18529 regulator)
- Voltage at Peak: 17.5 V
- Current at Peak: 2.9 A
- Dimensions: 83.9 x 53.7 x 5 cm (33 x 21.1 x 2.0 in)
- Weight: 6 kg (13 lb)
- Maximum Wind Speed Rating[b]: 58 m s^{-1} (130 mph)
- Cable Description: 16 AWG, 1-twisted pair

[a]Solar panel characteristics assume 1 kW m^{-2} illumination and 25°C solar panel temperature. Individual panels may vary up to 10%. The output panel voltage increases as the panel temperature decreases.

[b]Assumes the 31107 Extended Mounting Kit is used to mount the SP50 to an adequately anchored tripod or tower.

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October 21, 2016

14201

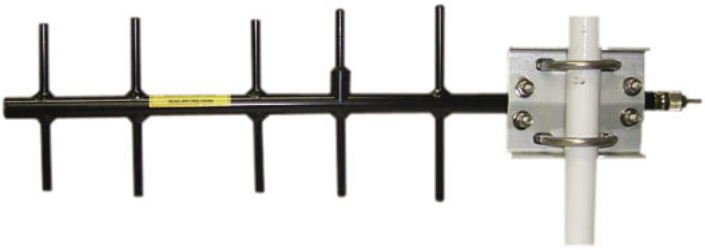
Quick Links

Overview

The 14201 is a high-gain (9 dBd), directional (Yagi) antenna. It is useful for making RF links over longer distances in one direction. This antenna is typically used with sub-315 mW radios such as the RF401A. The 14201 requires an antenna cable to connect it to the spread-spectrum transceiver. (See the Compatibility information for cable options.)

Read More ›

Images



Similar Products

14205 900 MHz 6 dBd Yagi Antenna with Mounting Hardware

14221 900 MHz 3 dBd Omnidirectional Antenna with Mounting Hardware

14204 900 MHz 0 dBd 1/2 Wave Omnidirectional Antenna with RPSMA Connector

15731 900 MHz 0 dBd 1/4 Wave Omnidirectional Antenna with RPSMA Connector

15730 900 MHz 0 dBd 1/4 Wave Omnidirectional Antenna with RPSMA Connector

15970 900 MHz 1 dBd Omnidirectional Dipole Antenna with Adhesive Mount

Detailed Description

The 14201 is a high-gain, Yagi antenna used with our 900 MHz spread spectrum transceivers. This outdoor antenna has a narrow beam width that requires precise aiming. It should be used to communicate with one distant station. The 14201 requires an antenna cable to connect it to the spread spectrum transceiver. (See the Compatibility information for cable options.)

Note: *Because the FCC limits the EIRP of 900 MHz spread-spectrum radios to 36 dBm, using this antenna with an RF450- or RF451-based system requires the user to reduce the radio's transmit power to a setting of 5 or less.*

Specifications

Gain	9 dBd
Frequency Band Supported	900 MHz
Connector	Type N female
Antenna Type	Yagi (directional) with mounting hardware
Manufacturer's Model Name	MAXRAD BMOY8905

Mounting	Mounts to pipes with outer diameters from 3.18 to 6.35 cm (1.25 to 2.5 in.)
Bracket Dimensions	11.5 x 9 x 0.6 cm (4.5 x 3.5 x 0.25 in.)
Overall Length	56.5 cm (22.3 in.)
Longest Element Length	16 cm (6.3 in.)
Weight	0.73 kg (1.6 lb)

Compatibility

Spread-Spectrum Transceivers

Note: *Because the FCC limits the EIRP of 900 MHz spread-spectrum radios to 36 dBm, using this antenna with an RF450- or RF451-based system requires the user to reduce the radio's transmit power to a setting of 5 or less.*

Antenna Cables

The following cables can be used:

- COAXNTN-L—connects the antenna to the radio, datalogger, or interface via a surge protector.
- COAXRPSMA-L—connects the antenna to spread-spectrum radios other than the RF450 when surge protection is not required.
- COAXSMA-L—connects the antenna to an RF450 when surge protection is not required.

Mounting Hardware

The antenna includes mounting hardware that accommodates a pipe of up to 3.18 to 6.35 cm (1.25 to 2.5 in.) outer diameter.

Contemporary Devices

The 14201 is compatible with these current products:

Spread-Spectrum Radios

- RF451
- RF401A
- RF411A
- RF407
- RF412
- RF422

Dataloggers

- CR206X
- CR211X
- CR6-RF451
- CR6-RF407
- CR6-RF412
- CRVW3-RF451
- CRVW3-RF407
- CRVW3-RF412

Vibrating-Wire Peripherals

- AVW206
- AVW211

Retired Devices

The 14201 is compatible with these retired products:

Spread-Spectrum Radios

- RF400
- RF401
- RF430
- RF410
- RF411
- RF431
- RF450
- FGR-115RE and RC

Dataloggers

- CR205
- CR206
- CR210
- CR211

Listed Under

Replacement Parts for the following products:

- **RF400** - 900 MHz Spread Spectrum Radio/Modem
- **RF410** - 922 MHz Spread Spectrum Radio/Modem

Common Accessories for the following products:

- **AVW211** - 922 MHz Wireless 2-Channel Vibrating-Wire Analyzer Module
- **AVW206** - 900 MHz Wireless 2-Channel Vibrating-Wire Analyzer Module
- **RF401A** - 900 MHz Spread-Spectrum Radio
- **RF412** - 922 MHz Spread-Spectrum Radio
- **RF407** - 900 MHz Spread-Spectrum Radio
- **RF411A** - 922 MHz Spread-Spectrum Radio
- **CWB100A** - 922 MHz Wireless Sensor Base for Australia
- **CWB100** - 900 MHz Wireless-Sensor Base
- **CR206X** - Datalogger with 900 MHz Spread-Spectrum Radio
- **CR211X** - Datalogger with 922 MHz Spread-Spectrum Radio
- **CR310** - Datalogger with Ethernet
- **CR300** - Datalogger

Other Accessories for the following products:

- **FGR-115RC** - Freewave 900 MHz Spread Spectrum Radio
- **FGR-115RE** - FREEWAVE 900 MHz, 1 W Spread Spectrum Radio with Ethernet
- **RF401** - 900 MHz Spread-Spectrum Radio
- **RF411** - 922-MHz Spread-Spectrum Radio
- **CR206** - Datalogger with 900 MHz Spread-Spectrum Radio
- **RF431** - 922-MHz Spread-Spectrum Radio
- **RF430** - 900-MHz Spread-Spectrum Radio

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

LoggerNet 4 Series

Datalogger Support Software

loggerNet
Datalogger Support Software

questions & quotes: **435.227.9120**
campbellsci.com/loggernet-packages

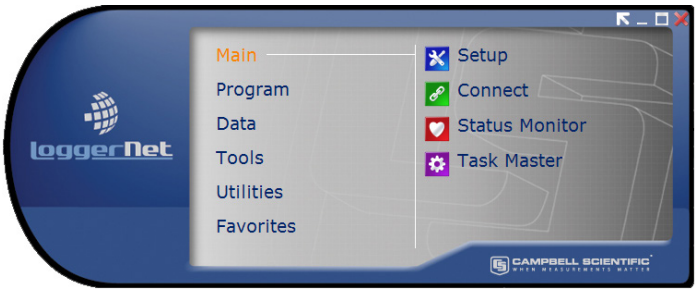
LoggerNet 4 Series

The LoggerNet family of datalogger support software

LoggerNet version 4 is Campbell Scientific's latest offering in its suite of datalogger support software packages. LoggerNet 4 is still built on a solid client/server architecture that allows data to be served to multiple LoggerNet clients simultaneously, while featuring a newly designed user-interface and new or updated clients. While the LoggerNet server does the work of communicating with the datalogger network, the client applications are used to manage the network. This includes network setup, configuration, monitoring, and backup; datalogger programming, maintenance, and data collection; and real-time or historical data display.

Toolbar and Navigation

LoggerNet's Toolbar starts the LoggerNet server and is used to navigate to all the client applications. It has been redesigned to offer quick access to all LoggerNet clients. A new Favorites category has been added to the Toolbar. With the click of a button the Toolbar can be restored down to Favorites view, allowing easy access to those clients most important to your application.



The Toolbar's Full view is shown on top right. The Favorites view reduces the size of the toolbar and provides access to your most-used applications.

LoggerNet Packages

LoggerNet offers a complementary suite of client applications for datalogger programming, data collection, network monitoring and troubleshooting, and data display. This standard package is recommended for those who have datalogger networks that do not require the more advanced features offered in LoggerNet Admin. LoggerNet 30-day Trial version is available for download.

LoggerNet Admin includes tools that are useful for those with large datalogger networks. It provides all the capabilities of LoggerNet, plus it adds network security, network management from a remote PC, LoggerNet service, data export to third party applications, and the ability to launch multiple instances of the same client (for instance, two Connect windows).

LoggerNet Remote is the full suite of LoggerNet Admin client applications that lets you manage an existing datalogger network from a remote PC. LoggerNet Remote does not include the LoggerNet server or the service.

LoggerNet for Linux provides a solution for those who want to run the LoggerNet server in a Linux environment. The package includes a Linux version of the LoggerNet server. At least one copy of LoggerNet Remote must be purchased to use LoggerNet for Linux. LoggerNet Remote's Windows-based clients are used to manage the LoggerNet Linux server and the datalogger network. LoggerNet Linux includes a Debian distribution and two RPM distributions—Red Hat and SUSE.

Setup and Network Configuration

Setup

Setup and EZSetup have been combined into one application, providing you with a choice in setting up the datalogger network. EZSetup walks you through the process for each station step-by-step, while Setup allows you more flexibility and access to more advanced features. You can toggle between the two by pressing a button. When in Setup mode, you can choose to view all devices in the network or the datalogger stations only, to make finding a particular station easy.

New features for Setup include the ability to configure a scheduled datalogger network backup, the File Retrieval tab for scheduling retrieval of image or other files from a datalogger, the Notes tab for creating custom notes for a station, and the ability to cut and paste single devices or a branch of the network to another location in the network map. New file output options include support for CSIXML and incrementing file names with each data collection from a datalogger.

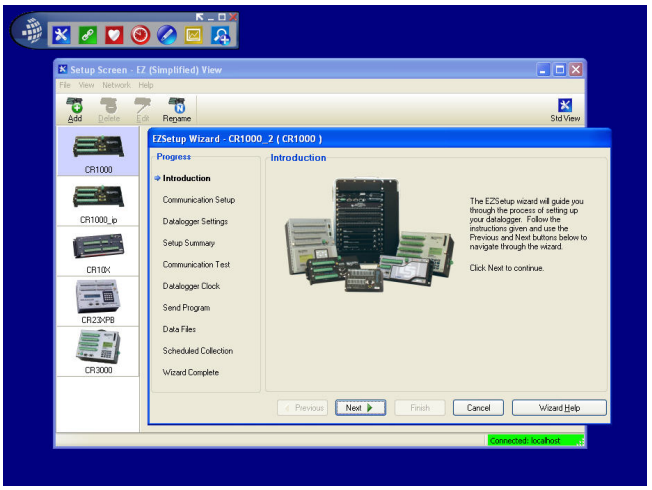
Task Master

The Task Master allows you to set up events (e.g., running a batch file) that occur on a schedule (interval or calendar) or based on some trigger event such as a successful or failed data collection attempt to a datalogger. LoggerNet 4 Task Master now supports sending files via FTP/SFTP and the new "After File Closed" and "After File Retrieved" trigger events.

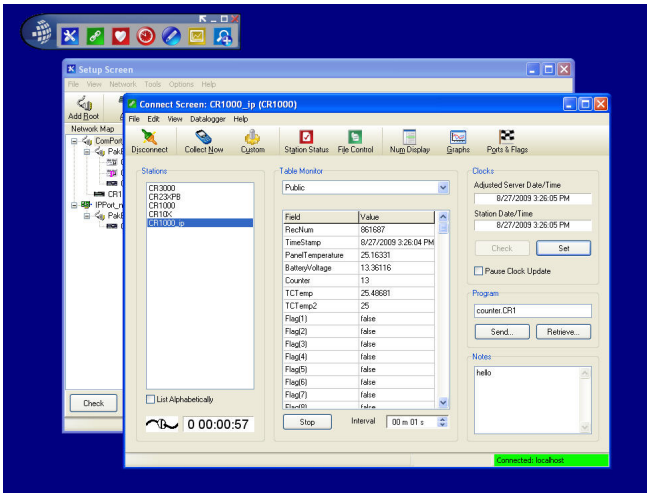
Network Planner

LoggerNet 4 includes the Network Planner, a new tool for designing your PakBus datalogger network. First, PakBus devices are selected from a list and placed on the network design palette. You then use a link tool to draw lines indicating the physical communication links between devices, and an activity tool to indicate activities that will take place between devices (scheduled data collection, call-back, one-way data messages, or get/set variable transactions between dataloggers).

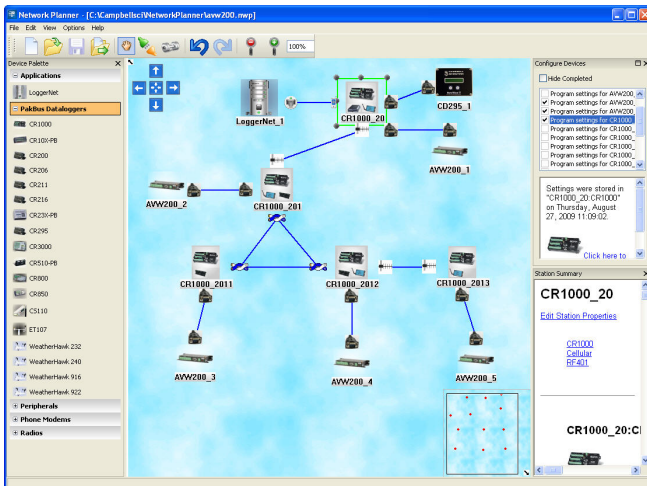
The Network Planner calculates the optimum settings for each device in the network and then allows you to send these settings to the device, or save them for later download via the Network Planner or the Device Configuration Utility. If any change is made to a device in the network, that change is propagated to any other devices in the network that are affected. The configuration can then be imported into LoggerNet's network map, providing a start-to-finish solution for PakBus network setup.



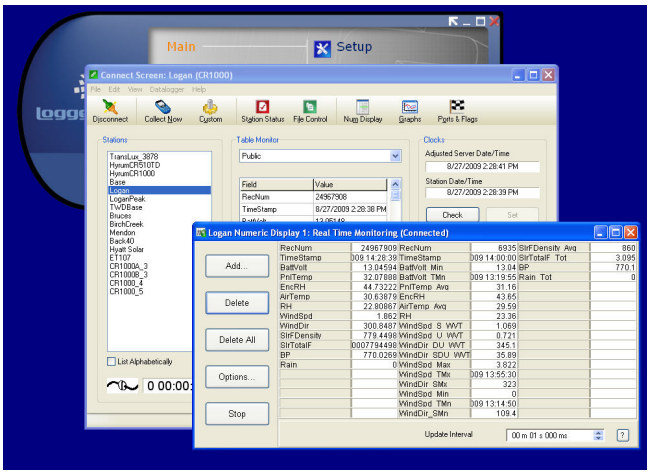
Select the EZSetup to walk through datalogger setup step-by-step.



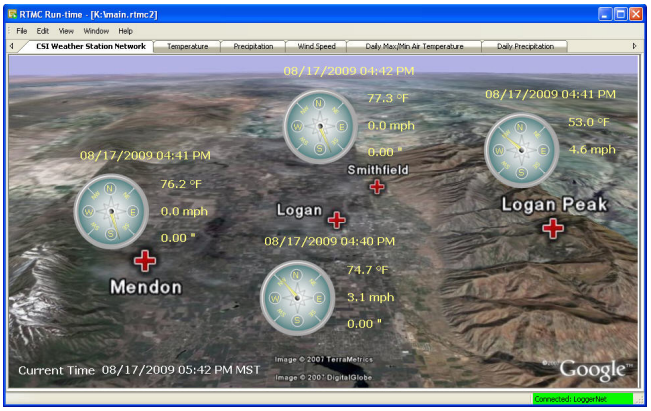
The standard Setup screen along with the Connect screen are shown above. Notes entered in the Setup screen are displayed in the Connect screen (lower right corner).



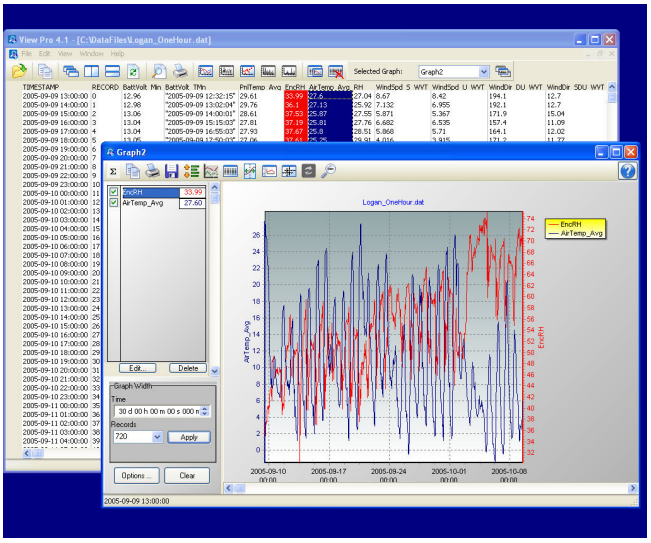
The Network Planner generates device settings and configures the LoggerNet network map for PakBus networks.



The Connect window's numerical monitor displays real-time and historical data.



RTMC simultaneously displays data from any number of dataloggers on one display.



View Pro displays historical data in a tabular or graphical format.

Connect and Datalogger Status

Connect

Connect allows you to perform maintenance on a station (including sending a program and setting the clock) while also viewing important datalogger status information, managing program and other files on a datalogger's CPU, and displaying numerical and graphical data. A new Table Monitor has been designed within the Connect window so that a table can be quickly selected from a drop-down list, and all values from that table displayed. The numerical and graphical displays are fully configurable and now allow saving a configuration that can then be reloaded for the original station or a different station. Any notes that have been added for a station during Setup will be displayed at the bottom right of the Connect window.

Status Monitor

The Status monitor is used to view the communication and data collection status of the overall datalogger network.

Advanced Data Display and File Viewing

RTMC Development, RTMC Run-Time

RTMC is used to create custom displays of real-time data, flags, and ports. It provides digital, tabular, graphical, and Boolean data display objects, as well as alarms. You can combine data from multiple dataloggers on one display. Complex displays can be organized on multi-tabbed windows.

View Pro

View Pro is our newly designed data file viewer. Beginning with LoggerNet 4.1, View Pro can also be used to view data from a LoggerNet database table. Data can be viewed in numeric format or in one of several graphical layouts, including a line graph, X/Y plot, histogram, rainflow, and 2D/3D FFTs. Multiple data files can be opened at once, allowing side-by-side comparison of the data. There is no limit to the number of traces that can be displayed on a graph.

The Zoom feature offers a closer look at important data, and the Statistical window provides the average, standard deviation, minimum, and maximum for all points displayed on a graph. Graphs can be saved to a file (BMP, JPG, WMF, EMF, or PCX). View Pro supports all Campbell Scientific data file types (including the new CSIXML format).

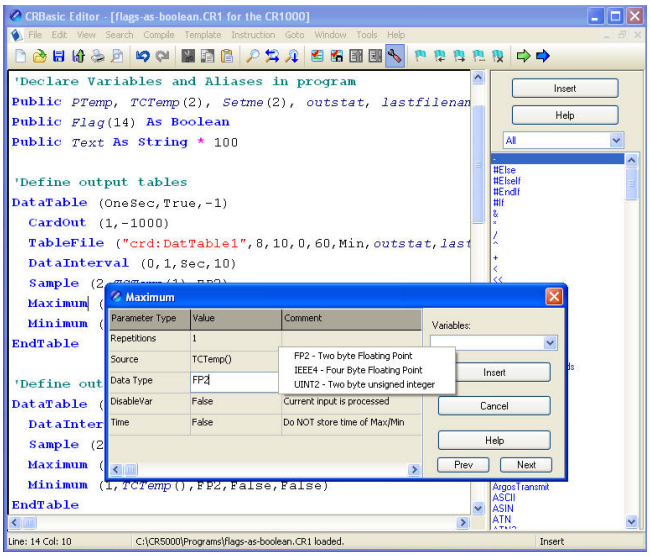
Programming

Full-featured Programming Tools

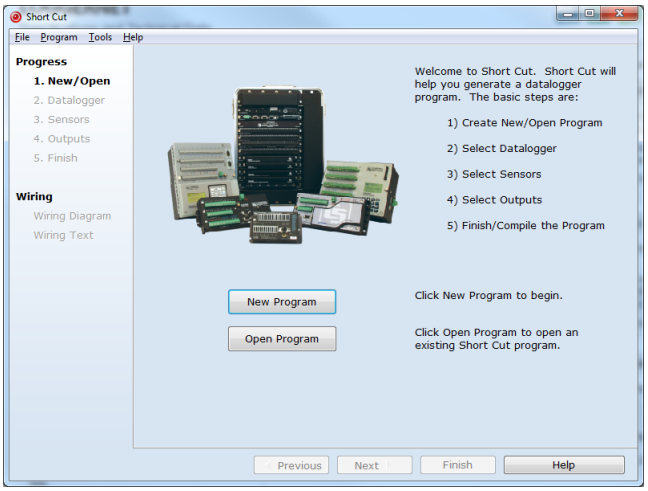
LoggerNet offers two full-featured programming tools—the CRBasic Editor and Edlog. The CRBasic Editor uses syntax similar to BASIC programming language to provide sophisticated programming capabilities for our CR6, CR300, CR200-series, CR800/CR850, CR1000, CR3000, CR5000, and CR9000(X) dataloggers. The CRBasic Editor in LoggerNet 4 includes new functionality to support encrypting a file prior to sending it to the datalogger and support for user-defined functions. Edlog provides programming capabilities for our CR500, CR510, CR10(X), 21X, CR23X, and CR7 dataloggers.

Simple Program Generator

For those who prefer a simpler means of programming their dataloggers, LoggerNet 4 includes Short Cut for Windows (SCWin). SCWin provides a wizard-like interface for generating programs for all Campbell Scientific dataloggers and supports all of the popular sensors we offer, as well as user-created custom sensor files (using an existing sensor file as the starting point). You can use a program as generated by SCWin, or open it in the CRBasic Editor for further editing (for CR6, CR300, CR200-series, CR800, CR850, CR1000, CR3000, CR5000, and CR9000(X) dataloggers).



CRBasic Editor offers keyword and other syntax highlighting and a parameter dialog box with drop-down lists for CRBasic programming.



Short Cut provides a wizard-like interface for generating datalogger programs.

Troubleshooting

Troubleshooter

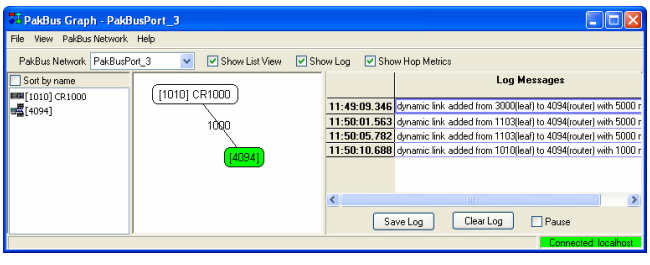
Troubleshooter helps you discover the cause of communication problems. Troubleshooter can be customized to display only the warnings of interest. In addition, you can click on any highlighted warning to bring up a menu that allows you to go to the Setup Screen or Status Monitor to fix the problem, bring up help describing the problem, or, in some cases, fix the problem directly.

PakBus Graph

PakBus Graph provides a graphical display of a PakBus network as known by the LoggerNet server, and quick access to the PakBus settings in LoggerNet and other PakBus devices.

LogTool

The LogTool application is available to view operational log messages for the server as well as the low-level communication between the datalogger and the server.



Troubleshooter, PakBus Graph (shown above), and Log Tool are tools available for monitoring the status of a datalogger network and troubleshooting communication problems within that network.

DevConfig is used to configure dataloggers, communication devices, and programmable sensors.

The RWIS Administrator supports communication with RWIS weather stations such as the one shown above.

Other Applications

Device Configuration Utility (DevConfig)

DevConfig allows you to send new operating systems to dataloggers and other devices with flash memory, configure various PakBus® settings in dataloggers, and edit settings for communication peripherals such as the MD485 and RF401A. DevConfig can now be launched from within LoggerNet, without conflict with the remainder of the datalogger network. The latest DevConfig can be down-loaded from our website.

RWIS Administrator

New in LoggerNet 4 is the RWIS Administrator. With the RWIS Administrator, LoggerNet is able to communicate with any station that implements the NTCIP (National Transportation Communications for ITS Protocol) Environmental Sensor Station interface.

Card Convert

CardConvert is used to convert and save binary data from a microSD card, CompactFlash® (CF) card, or PC Card. It can also perform other conversions. MicroSD cards are compatible with the CR6 datalogger. CF cards are compatible with our CR1000, CR3000, CR5000, and CR9000X dataloggers. PC Cards are compatible with our CR5000 and CR9000X dataloggers.

Split

Split is used to post-process data files and create printed reports. It sorts and combines data based on time or conditions, performs calculations on data values, converts between mixed-array "day of year" calendar dates and more traditional date/time stamps, and generates simple HTML-formatted reports.

Transformer

The Transformer tool converts Edlog programs to CRBasic programs. Specifically, it can convert a CR510 or CR10X program to a CR1000, CR800, or CR850 program, or a CR23X program to a CR3000 program.

Data Filer (LoggerNet Admin and LoggerNet Remote only)

Data Filer is an application used to retrieve data from the LoggerNet server's data cache and save that data to a file. It provides a way to manually retrieve data from a remote LoggerNet server and store the data on the local computer.

Data Export (LoggerNet Admin and LoggerNet Remote only)

Data Export is an application used to export data from the LoggerNet server's data cache to a third party computer program. Data Export "listens" for a request from another application and sends the requested data via a socket connection.

Service Manager (LoggerNet Admin only)

Service Manager is used to install LoggerNet as a service, and to manage the service on the PC. When run as a service, after a power failure, LoggerNet will resume data collection and scheduled task activities when power is restored to the computer—regardless of whether or not a user logs on to the computer.

Security Manager (LoggerNet Admin and LoggerNet Remote only)

Security Manager is used to set up security within the LoggerNet application to restrict access to certain functions. Individual user accounts are set up and assigned one of five levels of security, with different user privileges assigned to each level.

.

LoggerNet Server Monitor (LoggerNet Admin and LoggerNet Remote only)

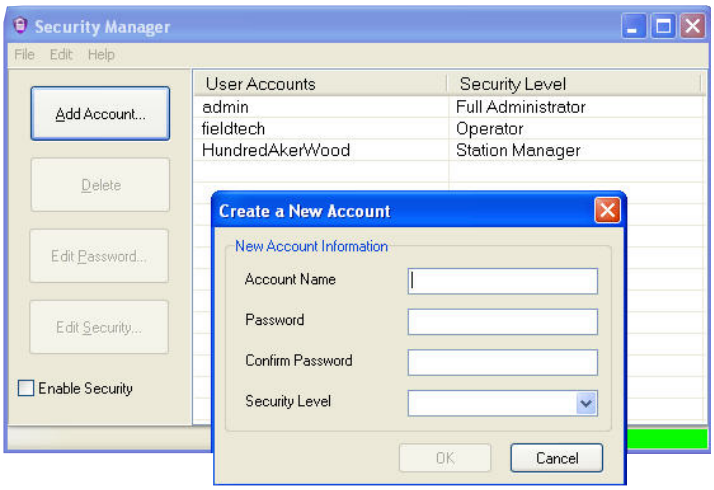
The LoggerNet Server Monitor is a utility that runs minimized with an icon in the Windows Status Area. It monitors the status of a LoggerNet server when it is being run as a service or being run on a remote computer. Multiple instances of the LoggerNet Server Monitor can be launched to monitor more than one server running on remote computers.

Hole Monitor (LoggerNet Admin and LoggerNet Remote only)

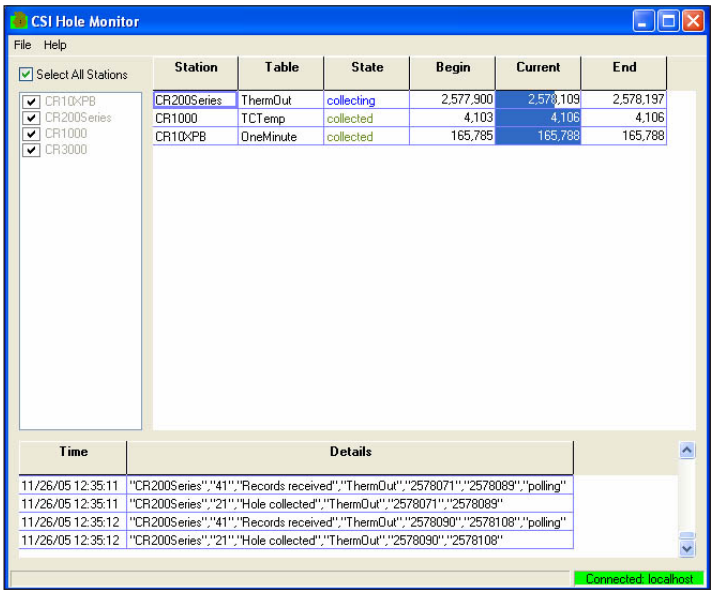
The Hole Monitor is used to monitor the hole collection activity for the dataloggers in a LoggerNet network. Holes are most often encountered with data collected from table-based dataloggers via data advise (data advise is used for data collection in large table-data RF networks). A hole occurs when there are missing records of data in the LoggerNet server's data cache for a datalogger.

CoraScript

CoraScript is a command line scripting tool, which can be used to configure the datalogger network from a command prompt.



Security Manager lets you set up multiple security accounts for access to the datalogger network.



The Hole Monitor lists datalogger stations and collection status for missing records in LoggerNet's data cache.

Requirements and Certificates

- PC Operating System: Windows 10, 8, 7, Vista, or XP (both 32- and 64-bit versions supported)
- Military Certificate of Networthiness (CoN):
  - LoggerNet 4.0 is certified as Cert #201004872
  - LoggerNet 4.x is certified as an upgrade to 4.0 and has ASC CoN ID 12274
  - Expires 1/13/2017

Related Products

Upgrades

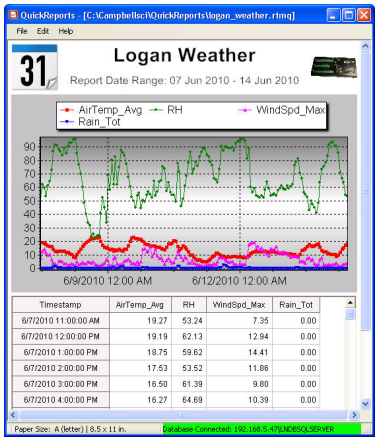
Upgrade pricing is available for current licenses of any version of LoggerNet. Contact Campbell Scientific for details.

Software Developers Kits

LoggerNet-SDK and LoggerNet Server-SDK allow software developers to create custom applications that communicate with the LoggerNet server and through the server to one or more dataloggers. Refer to the Software Development Kit product brochure for more information.

Separately Purchased Clients

Several clients may be purchased to add functionality to our LoggerNet and LoggerNetAdmin software packages. To use the clients, a licensed copy of the datalogger support software needs to be running on a PC. Functions supported by these clients include distributing data to remote files, OPC interface, PC displays, and web browsers. For more information, refer to: www.campbellsci.com/loggernet-clients



LNDB is one of the client application available for use with LoggerNet.

License for Use

LoggerNet is protected by United States copyright law and international copyright treaty provisions. Installation of LoggerNet (including the trial version) constitutes an agreement to abide by the provisions of its licensing agreement. The agreement grants the user a non-exclusive license to use the software in accordance with the following:

(1) The purchase of this software allows you to install and use a single instance of the software on one physical computer or one virtual machine only.

(2) This software cannot be loaded on a network server for the purposes of distribution or for access to the software by multiple operators. If the software can be used from any computer other than the computer on which it is installed, you must license a copy of the software for each additional computer from which the software may be accessed.

(3) If this copy of the software is an upgrade from a previous version, you must possess a valid license for the earlier version of software. You may continue to use the earlier copy of software only if the upgrade copy and earlier version are installed and used on the same computer. The earlier version of software may not be installed and used on a separate computer or transferred to another party.

(4) This software package is licensed as a single product. Its component parts may not be separated for use on more than one computer.

(5) You may make one (1) backup copy of this software onto media similar to the original distribution, to protect your investment in the software in case of damage or loss. This backup copy can be used only to replace an unusable copy of the original installation media.

LoggerNet software or its trial may not be sold, included, or redistributed in any other software or altered in any way without prior written permission from Campbell Scientific.

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Campbell Scientific, Inc.
January 19, 2017

CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

ENC24/30, ENC24/30S

Large Steel Enclosures

Rugged, Versatile

Campbell components mount easily and securely

Overview

The ENC24/30 and ENC24/30S are large steel enclosures that provide additional wiring room. They include a prepunched backplate with one-inch-on-center holes suitable for attaching the datalogger, power supply, communication device, and measurement and control peripherals. The enclosures can be mounted to a building, tower, or other structures, but the users must provide their own mounting. The ENC24/30 is a painted mild-steel version, and the ENC24/30S is a stainless-steel version.

Benefits and Features

- Weather resistant to protect instruments
- Backplate designed so that Campbell Scientific components mount easily and securely

Cable-Entry Options

The ENC24/30 and ENC24/30S can be ordered with one to four 1.5-in. conduit openings or 12 individual cable-entry seals.

Conduit(s)

Multiple cables can be routed through one conduit. A plug included in the 7363 enclosure supply kit can reduce the conduit's internal diameter to 0.5 in. (1.3 cm). The enclosure supply kit also contains the putty used to seal each conduit.

Entry Seals

Entry seals have a more water-tight seal than the conduits. Each entry seal is compressed around one cable. A small vent is included to equalize pressure with the atmosphere. Theses enclosures are fitted with four large, four medium, and four small cable entry seals.

The acceptable cable diameters are:

- Large—0.236 to 0.512 in. (6 to 13 mm)
- Medium—0.231 to 0.394 in. (5.8 to 10 mm)
- Small—0.187 to 0.312 in. (4.75 to 8 mm)

Enclosure Supply Kit

The enclosure supply kit is included with our enclosures, but can be purchased separately. The assembled equipment aids in mounting your equipment inside the enclosure as well as monitoring relative humidity and sealing the enclosure. It includes desiccant packs, humidity indicator card, cable ties, putty, screws, grommets, and a Phillips-head screwdriver.

Ordering Information

Steel Enclosures

ENC24/30 Weather-Proof 24 x 30 Mild Steel Enclosure

ENC24/30S Weather-Proof 24 x 30 Stainless-Steel Enclosure

Enclosure Hole Options

-SC One Conduit for cable entry.

-DC Two Conduits for cable entry.

-TC Three Conduits for cable entry.

-QC Four Conduits for cable entry.

-ES 12 individual-Cable Entry Seals for cable entry.

Accessories

27814 CD100 Mountable Display with Keypad Installed in Enclosure Lid. The CD100 provides the same operation and functionality as the CR1000KD keyboard display.

31551 Enclosure Leg Stack Mounting Kit

31143 Hinged Stack Bracket Kit

10525 Two-pack desiccant holder that mounts to the inside of the enclosure lid.

CS210 Enclosure Humidity Sensor.

6714 Desiccant Four-Unit Bag (Qty 20).

Antenna Cable/Bulkhead Installations

These accessories are offered for enclosures that will house a cellular phone, satellite transmitter, or radio. They allow an antenna to be connected to the outside of the enclosure.

31327 Compatible with the type N-to-type N antenna cable used with the GOES satellite transmitters.

31312 Compatible with the type N-to-RPSMA antenna cable used with the RF401-series spread spectrum radios, CR200(X)-series dataloggers, AVW200-series Interfaces, or CWB100-series wireless bases..

31315 Compatible with the type N-to-SMA antenna cable used with the RF450 radio, LS300G cellular modem, RavenXT-series cellular modems, or Iridium9522 satellite modem.

31330 Compatible with the type N-to-BNC antenna cable used with the ST-21 Argos Satellite Transmitter, RF320-series radios, RF310-series radios, or RF300-series radios.

31321 Compatible with the type N-to-TNC antenna cable used with the HUGHES9502 Inmarsat-BGAN transmitter.

31324 Compatible with the type SMA-to-SMA antenna cable used with the GPS device included with our GOES satellite transmitters, AL200 ALERT transmitter, and Iridium9522B satellite modem.

Specifications

- Dimensions: 61 x 76 x 20 cm (24 x 30 x 8 in)
- Weight: 21 kg (46 lb)

ENC24/30

- Construction: painted, 14-gauge, mild steel with door gasket and stainless steel hinges
- Enclosure Classification: NEMA Type 3R, 4, and 12 (before being modified for cable entry

ENC24/30S

- Construction: formed, 14-gauge, 304 stainless steel with door gasket and stainless steel hinges
- Enclosure Classification: NEMA Type 3R, 4, 12, and 13 (before being modified for cable entry)

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August 1, 2016

MODEL 114 APPLICATION MEASUREMENTS:

Usable dimensions at incremental heights. Diameter is for circular shaped objects at listed heights. The length and width measurements are for rectangular shaped objects at listed heights. When choosing a rock enclosure for an application, note the shape of the rock as well as the application measurements. Measurements are listed in inches.

Height at	Length (max)	Width (max)	Diameter (max)	Notes
4	58	42.5	44	
4	72	4	44	Diagonal measurement; more width available at middle
8	58	41.5	43	
8	71	4	43	Diagonal measurement; more width available at middle
12	57	39.5	42	
12	70	4	42	Diagonal measurement; more width available at middle
16	57	38.5	41	
16	68	4	41	
20	56	37.5	41	
20	67	4	41	Diagonal measurement; more width available at middle
24	53	37.7	40	
24	66	4	40	Diagonal measurement; more width available at middle
28	52	36	39	
28	64	4	39	Diagonal measurement; more width available at middle
32	48	36	38	
32	57	4	38	Diagonal measurement; more width available at middle
36	46	35	38	
36	56	4	38	Diagonal measurement; more width available at middle
40	42	33	36	
40	53	4	36	Diagonal measurement; more width available at middle
44	42	32	35	
44	52	4	35	Diagonal measurement; more width available at middle
48	40	32	34	
48	50	4	34	Diagonal measurement; more width available at middle
52	38	31	34	
52	48	4	34	Diagonal measurement; more width available at middle
56	38	28	28	
56	45	4	28	Diagonal measurement; more width available at middle
58	39	28	28	
58	40	4	28	Diagonal measurement; more width available at middle

OUTDOOR CONCRETE STYLES

OLD WORLD PALETTE

Distressed finishes, stone surfaces and warm, masculine colors evoke the Old World style. Concrete gives you the ability to imitate the timeworn appeal of the pathways and patios of Tuscan and Mediterranean-style homes, while conveying a sense of New World permanence.

COLORS + FINISHES

Marsh Brown

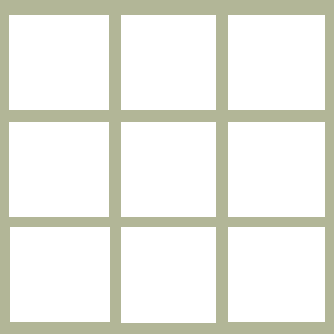
Spicy Mustard

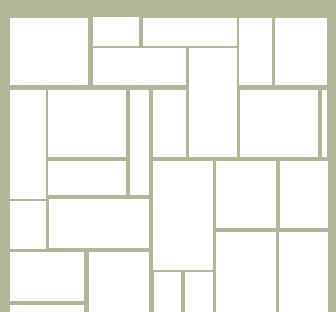
Urban Nature

Baked Terra Cotta

SHAPES & PATTERNS

You can achieve an Old Word style using concrete by incorporating small tiles or stone-like patterns for hardscape surfaces.

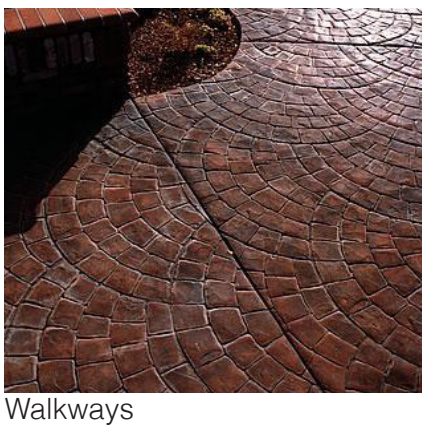




OUTDOOR OLD WORLD ELEMENTS

Patios

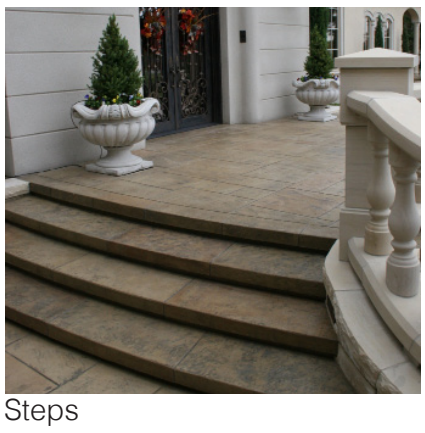
Driveways

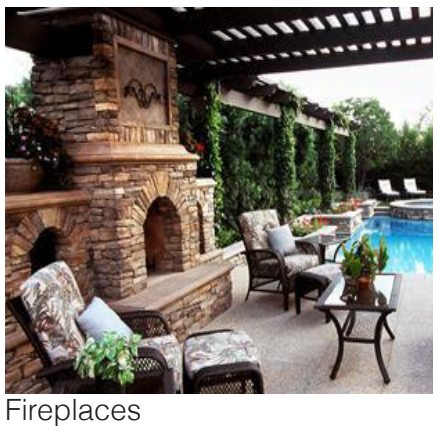

Walkways

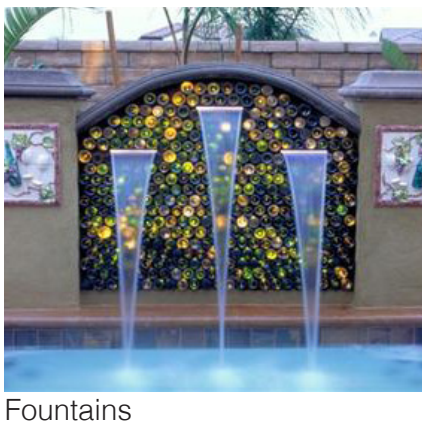
Walls

Outdoor kitchens

Fire pits


Steps


Fireplaces


Fountains

TEXTURES

Fractured Earth Seamless Stamp

European Fan Paver

For more concrete design ideas, visit:
www.concretenetwork.com/outdoor

ConcreteNetwork.com

PHOTO: www.estudioarque.com; COLORS: www.benjaminmoore.com; ELEMENTS: www.tomralstonconcrete.com, www.gkrete.com, www.brickform.com, California Decorative Concrete, www.tomralstonconcrete.com, www.greenscenelandscape.com, www.ozarkpatternedconcrete.com, www.greenscenelandscape.com, www.greenscrenelandscape.com; TEXTURES: www.scofield.com

OUTDOOR CONCRETE STYLES

RANCH/RUSTIC PALETTE

Concrete in rich earth-tone colors and rough stonelike textures contributes to the rustic charm of ranch, farmhouse and country home styles. Using stains and dyes, it's also possible to "antique" existing concrete and give it an aged, weathered look.

COLORS + FINISHES

Rio Rancho Clay

Van Buren Brown

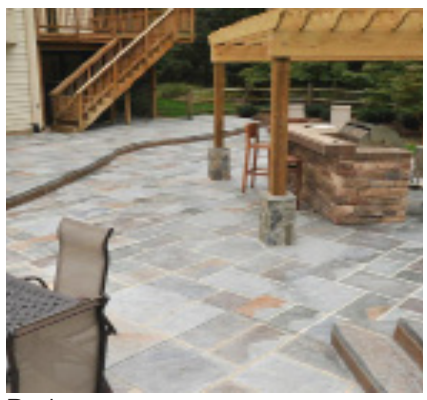
Glacial Till

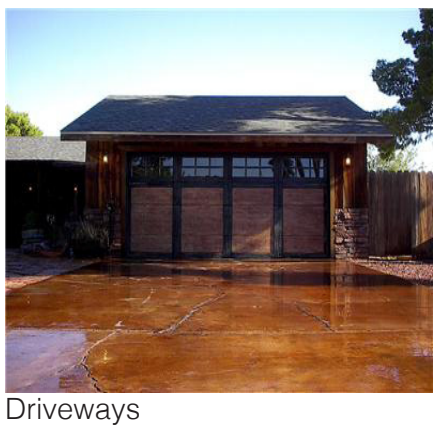
Morning Light

SHAPES & PATTERNS

You can achieve a ranch or rustic style using concrete by incorporating irregular stone-like patterns or large organic spaces for hardscape surfaces.

OUTDOOR RANCH/RUSTIC ELEMENTS


Patios


Driveways

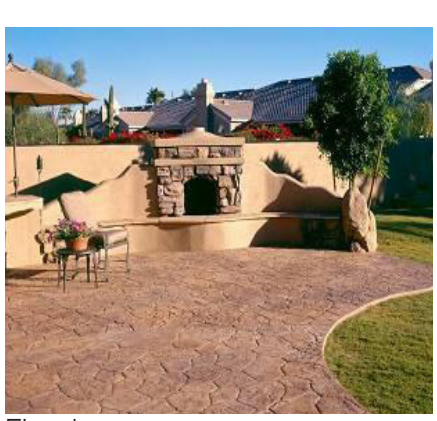
Walkways

Walls

Outdoor kitchens

Fire pits

Steps


Fireplaces

Water features

TEXTURES

Ashlar Stone

Vermont Slate

For more concrete design ideas, visit:
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ConcreteNetwork.com

PHOTO: www.progressiveconcrete.com; COLORS: www.benjaminmoore.com; ELEMENTS: www.salzanoconcrete.com, Pizzazz Painting, Verlennich Masonry and Concrete, www.flex-c-ment.com, www.nehardscapes.com, www.matrixrock.com, www.nehardscapes.com.com, www.progressiveconcrete.com, www.elementsofconcrete.com; TEXTURES: www.scofield.com

OUTDOOR CONCRETE STYLES

TRADITIONAL PALETTE

Formal brick-lined and stone pathways often grace the exteriors of traditional homes. This same classic, unfussy style can be replicated in concrete by incorporating formal details such as scalloped edges, brick-patterned borders and symmetrical lines.

COLORS + FINISHES

Brick Red

Midnight Oil

Gibraltar Cliffs

Gray Lake

SHAPES & PATTERNS

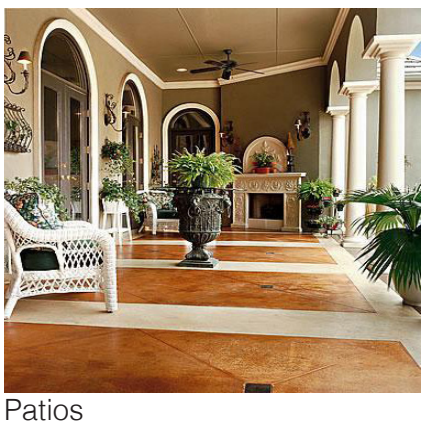
You can achieve a traditional style using concrete by incorporating repeating brick and natural cut patterns for hardscape surfaces.

TEXTURES

English Yorkstone

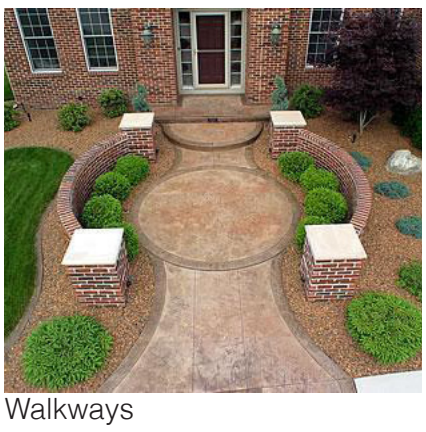
London Slate

OUTDOOR TRADITIONAL ELEMENTS



Patios

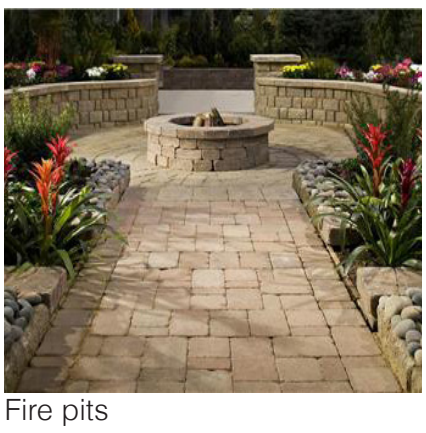
Driveways



Walkways

Walls

Outdoor kitchens



Fire pits

Steps

Fireplaces

Water features

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PHOTO: www.actionconcreteservices.com; COLORS: www.benjaminmoore.com; ELEMENTS: www.bomanite.com, www.ozarkpatternedconcrete.com, www.actionconcreteservices.com, www.flex-c-ment.com, www.nehardscapes.com, www.belmanpaversandconcrete.com, www.ozarkpatternedconcrete.com, www.greenscenelandscape.com, www.uniqueconcretenj.com; TEXTURES: www.scofield.com

OUTDOOR CONCRETE STYLES

TROPICAL PALETTE

Concrete is a natural fit for the beachy sand-and-sea vibe of an oceanside home. Colored in natural browns and sandy hues, concrete complements the vibrant turquoise blues and palm-tree greens of a tropical setting.

COLORS + FINISHES

Green Thumb

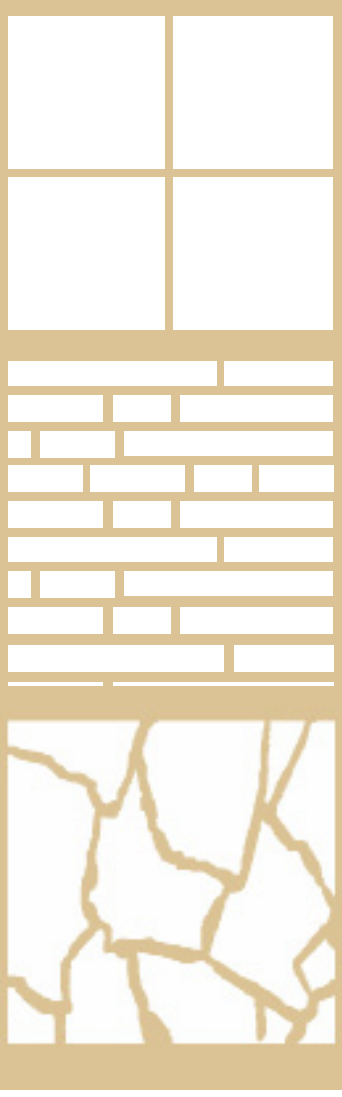
Tropical Oasis

Shortbread

Gotham

SHAPES & PATTERNS

You can achieve a tropical style using concrete by incorporating subtle geometric-shaped or random stone patterns for hardscape surfaces.



TEXTURES

Pine Interlocking

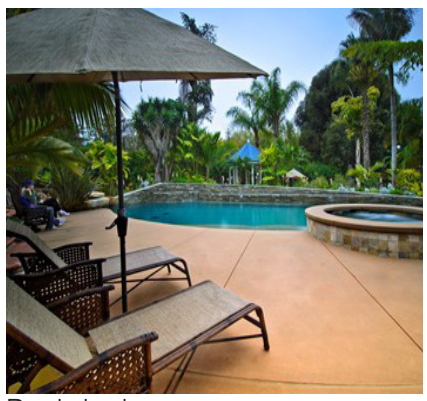
Canyon Stone

OUTDOOR TROPICAL ELEMENTS

Patios

Driveways

Walkways



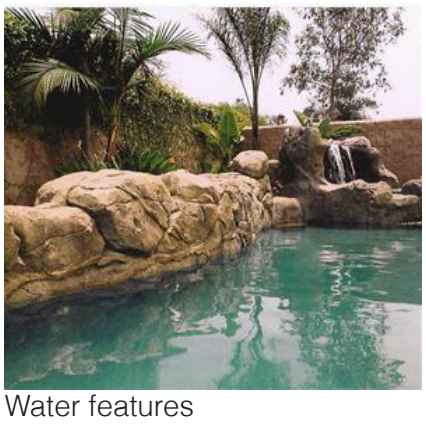
Pool decks

Outdoor kitchens

Fire pits

Steps

Fireplaces



Water features

For more concrete design ideas, visit:
www.concretenetwork.com/outdoor/

ConcreteNetwork.com

PHOTO: www.greenscreenlandscaping.com; COLORS: www.benjaminmoore.com; ELEMENTS: www.innovativeconcretedesign.net, www.concretenetwork.com, www.a1concretedesigns.com, www.concretenetwork.com, www. concretenetwork.com, www.concretencounters.com, www.kemiko.com, www.craftsmanshipworkshop.com, www.authenticenvironments.com; TEXTURES: www.scofield.com

APPENDIX F

Equipment Sizing Calculations

Table G-1 - Alpine Lakes Power Consumption

Project No. 120045, Alpine Lakes, Chelan County, WA

System	Communication interval (days)	Gate adjustment interval (days)	Daily power drawdown (Ahr)	Summer Battery size (Ahr)	Summer Solar Size (W)	All Year Battery Size (Ahr)	All Year Solar Size (W)	Radio Repeater daily drawdown (Ahr)	Summer Battery size (Ahr)	Summer Solar Size (W)	All Year Battery Size (Ahr)	All Year Solar Size (W)
VHF Telemetry	1	1	1.654	28.95	13	206.76	52	1.812	31.72	13	226.54	52
Hughes Immarsat	1	1	0.871	15.25	6	108.92	25					
Iridium Satellite	1	1	0.788	13.80	6	98.55	23					
VHF Telemetry	2	2	1.237	21.65	9	154.62	35	1.218	21.32	9	152.25	35
Hughes Immarsat	2	2	0.468	8.20	4	58.55	14					
Iridium Satellite	2	2	0.424	7.42	3	53.03	12					
VHF Telemetry	7	7	0.939	16.43	7	117.38	27	0.793	13.88	6	99.14	23
Hughes Immarsat	7	7	0.181	3.16	2	22.57	6					
Iridium Satellite	7	7	0.164	2.87	2	20.51	5					

Notes

For this latitude Campbell Scientific recommends 336 hr battery reserve, this is used for Summer sizing

all year sizing assumes solar panel is burried in the snow for 100 consecutive days

All estimates are for 24Vdc systems except repeater, which is 12Vdc

ROTORK CONTROL SLUICE GATE SIZING CALCULATIONS

Customer: Aspect Consulting - Taylor Dayton

Gate Location: Wenatchee 24" C-10 Canal Gate

Required Data | Computed Data

1 CALCULATE TOTAL LIFTING FORCE F (THRUST)

F = 62.4 * A * P * f + W

f = Coefficient of Friction (0.6 for sluice gates)

H=	21.25	in.	Length of gate in inches
W =	21.25	in.	Width of gate in inches
A =	3.14	sq ft.	Area of gate in square feet
P =	30.00	ft	Efective head of water in feet
W =	300	lb	Total weight of gate and stem in pounds

Thrust: 3,822 lbs

2 CALCULATE TORQUE REFER TO ROTORK PUB. NO.AE 2/0.2 8/93

TORQUE = STEM FACTOR X F (THRUST)

Stem Type	Rising=R Non-Rising=NR	R
Rotating Stem	Y=Yes N=No	N
Stem Diameter -- in.		1.50
Stem -- TPI		4
Number of Starts		1
Lead		1/4
Stem Factor		0.012

TORQUE = 45 ftlb

3 DATA FOR ROTORK SIZING CD

TORQUE	45	ftlb	
THRUST	3,822	lb	
STEM DIA	1.50	in	
STROKE	300	sec	12 inches/minute
TURNS	85		
TOLERANCE	50	?+ / - stroke time %	

ROTORK CONTROL SLUICE GATE SIZING CALCULATIONS

Customer: Aspect Consulting - Taylor Dayton

Gate Location: Wenatchee 30" C-10 Canal Gate

Required Data | Computed Data

1 CALCULATE TOTAL LIFTING FORCE F (THRUST)

F = 62.4 * A * P * f + W

f = Coefficient of Friction (0.6 for sluice gates)

H=	26.60	in.	Length of gate in inches
W =	26.60	in.	Width of gate in inches
A =	4.91	sq ft.	Area of gate in square feet
P =	30.00	ft	Efective head of water in feet
W =	400	lb	Total weight of gate and stem in pounds

Thrust: 5,919 lbs

2 CALCULATE TORQUE REFER TO ROTORK PUB. NO.AE 2/0.2 8/93

TORQUE = STEM FACTOR X F (THRUST)

Stem Type	Rising=R Non-Rising=NR	R
Rotating Stem	Y=Yes N=No	N
Stem Diameter -- in.		1.50
Stem -- TPI		4
Number of Starts		1
Lead		1/4
Stem Factor		0.012

TORQUE = 69 ftlb

3 DATA FOR ROTORK SIZING CD

TORQUE	69	ftlb	
THRUST	5,919	lb	
STEM DIA	1.50	in	
STROKE	300	sec	12 inches/minute
TURNS	106		
TOLERANCE	50	?+ / - stroke time %	

APPENDIX G

Opinions of Probable Cost

Table H-1 - Opinion of Probable Costs

Project No. 120045, Alpine Lakes, Chelan County, WA

ITEM	UNIT	UNIT COST	SQUARE LAKE QUANTITY	SQUARE LAKE COST	KLONOQUA LAKES QUANTITY	KLONOQUA LAKES COST	EIGHTMILE LAKE QUANTITY	EIGHTMILE LAKE COST	COLCHUCK LAKE QUANTITY	COLCHUCK LAKE COST	SNOW LAKES QUANTITY	SNOW LAKES COST
Install Monitoring Equipment												
Install Staff Gage / Lake Level Monitoring	EA	$5,000	1	$5,000	1	$5,000	1	$5,000	1	$5,000	0	$0
Install Staff Gage / Discharge Monitoring and Develop Rating	EA	$6,500	1	$6,500	1	$6,500	1	$6,500	1	$6,500	0	$0
Subtotal - Install Monitoring Equipment				**$11,500**		**$11,500**		**$11,500**		**$11,500**		**$0**
Gate Modifications												
Remove Existing Gate	LS	(Varies)	0	$0	1	$5,000	0	$0	1	$2,500	0	$0
Modify Existing Gate Appurtenances	LS	(Varies)	1	$3,500	0	$0	0	$0	0	$0	0	$0
Gate Tower	LS	(Varies)	0	$0	0	$0	0	$0	1	$24,000	0	$0
Install 30-inch Diameter Slide Gate	EA	$25,000	0	$0	1	$25,000	0	$0	1	$25,000	0	$0
Subtotal - Existing Control Gate Modifications				**$3,500**		**$30,000**		**$0**		**$51,500**		**$0**
Automate Gates/Valves to Optimize Releases												
Motorized Valve or Gate Actuator	EA	$20,000	1	$20,000	1	$20,000	0	$0	1	$20,000	1	$20,000
Power, Controls and Communications	EA	$25,000	1	$25,000	1	$25,000	0	$0	1	$25,000	1	$25,000
Controls Enclosure	LS	(Varies)	1	$11,000	1	$11,000	0	$0	1	$11,000	0	$0
Repeater Station	EA	$20,600	0.25	$5,150	0.25	$5,150	0.25	$5,150	0.25	$5,150	1	$20,600
Base Station	EA	$18,400	0.25	$4,600	0.25	$4,600	0.25	$4,600	0.25	$4,600	1	$18,400
Subtotal - Automate Gate to Optimize Releases				**$65,750**		**$65,750**		**$9,750**		**$65,750**		**$84,000**
Subtotal - All Work				**$80,750**		**$107,250**		**$21,250**		**$128,750**		**$84,000**
Mobilization Costs (Assumes Use of Helicopter)				**$31,056**		**$33,044**		**$26,594**		**$34,656**		**$11,300**
Miscellaneous Mobilization/Demobilization	7.5%			$6,056		$8,044		$1,594		$9,656		$6,300
Helicopter Mobilization/Demoblization/Rental				$25,000		$25,000		$25,000		$25,000		$5,000
Construction Subtotal				**$111,806**		**$140,294**		**$47,844**		**$163,406**		**$95,300**
Contingency	25.0%			$27,952		$35,073		$11,961		$40,852		$23,825
Engineering, Permitting and Administration	20.0%			$22,361		$28,059		$9,569		$32,681		$19,060
Sales Tax	8.2%			$13,294		$16,681		$5,689		$19,429		$11,331
Total Project Cost				**$175,413**		**$220,107**		**$75,062**		**$256,368**		**$149,516**

Table H-2 - Operations and Maintenance Cost Estimate

Project No 120045, Alpine Lakes, Chelan County, WA

O&M Element	Unit Cost	Unit	Qty	Total Cost	Notes
Actuators				**$7,700**	
Preventative Maintenance				**$1,700**	
Labor	$7,500	year	0.20	$1,500	100 hours labor @ $75 / hr, Once every 5-years
Equipment	$100	year	1.00	$100	nominal hand toolls and equipment / year
Materials	$500	year	0.20	$100	$500 materials, Once every 5-years
Operations				**$2,000**	
Labor	$50	hr	40.00	$2,000	40 hours of operational labor (system), yearly
Repair / Replacement (Labor, Equipment, Materials)				**$4,000**	
Actuators	$100,000	year	0.04	$4,000	Replacement cost of actuator, 25-year estimated life
Electrical Equipment (Controls and Communications)				**$20,450**	
Preventative Maintenance				**$2,200**	
Labor	$10,000	year	0.20	$2,000	100 hours labor @ $100 / hr, Once every 5-years
Equipment	$100	year	1.00	$100	nominal hand toolls and equipment / year
Materials	$500	year	0.20	$100	$500 materials, Once every 5-years
Operations				**$1,000**	
Labor	$50	hr	20.00	$1,000	40 hours of operational labor (controls troubleshooting), yearly
Repair / Replacement (Labor, Equipment, Materials)				**$17,250**	
Controls and Communications Equipment	$125,000	year	0.10	$13,000	Replacement cost of equipment, 10-year estimated life
Solar Panel Replacement	$2,500	year	0.10	$250	Replacement solar panel, 10-year estimated life
Batteries	$20,000	year	0.20	$4,000	Replacement battery banks, 5-year estimated life
Monitoring Equipment				**$1,550**	
Preventative Maintenance				**$1,000**	
Labor	$5,000	year	0.20	$1,000	40 hours labor @ $125 / hr, Once every 5-years
Repair / Replacement (Labor, Equipment, Materials)				**$550**	
Transducer Replacement	$5,000	year	0.10	$500	Transducer replacement, every 10-years
Staff Gage Replacement	$1,000	year	0.05	$50	Repair / Replace Staff Gage, Every 20-years
Miscellaneous				**$6,000**	
Operations and Maintenance				**$6,000**	
Labor (Misc System Operation)	$50	hr	40.00	$2,000	40 hours misc labor @$50, yearly
Equipment (Helicopter Support)	$15,000	year	0.20	$3,000	3-days misc. helicopter support, every 5-years
Materials and Equipment (Misc.)	$1,000	year	1.00	$1,000	$1,000 materials and equipment, yearly
Total				**$35,700**	