

**STATE OF WASHINGTON DEPARTMENTS OF ECOLOGY AND HEALTH
PERMIT APPLICATION for RECLAIMED WATER USE**

For Office Use Only:

Date Received _____

Application/Permit No. _____

This application is for a _____

**RECEIVED****APR 24 2018****DEPARTMENT OF ECOLOGY**☐ New Reclaimed Water Use Permit☒ Renewal☐ Modification of permit # _____

as required in accordance with the provisions of Chapters 90.46 RCW. All questions must be answered completely and accurately to be considered for coverage. If a question does not apply, answer with NA.

SECTION A. GENERAL INFORMATION

A-I. PERMITTEE: ☒ Public ☐ Private UBI No. _____

Name of Utility or Business: City of Blaine	Is the operator also the owner? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Name of Operator: City of Blaine
Primary Contact Name: Ravyn Whitewolf	Operator Primary Contact Name: Christina Ness
Title: Director, Public Works	Title: Lead Operator, LPWRF
Phone No: 360-332-8820	Phone No: 360-332-3718
E-mail Address rwhitewolf@cityofblaine.com	E-mail Address cness@cityofblaine.com
Primary Mailing Address 'Blaine Public Works, 1200 Yew Ave	Primary Mailing Address Blaine Public Works, 1200 Yew Ave
City Blaine Zip + 4 98230	City Blaine Zip + 4 98230
BILLING INFORMATION (if different from primary contact)	
Business/Company Name City of Blaine	Phone No. 360-332-8820
Mailing Address Blaine Public Works, 1200 Yew Ave	City Blaine Zip + 4 98230

A-II. Provide a narrative description and map of the entire project – not just the treatment facility.

☒ **Check** this box if there are attached submittals for this section.

A-III. WASTEWATER DISCHARGE MANAGEMENT: ☐ Check here if the other required forms are attached.

Permits for reclaimed water are issued in combination with any required NPDES or state wastewater discharge permits. Check the boxes in column below to determine which (if any) wastewater discharge permit application forms apply for this facility. Note that unless 100% of the water generated will be reclaimed AND used, wastewater discharge applications must also be required. Permit application forms are available on Ecology's website.

- ☐ All wastewater is generated, treated and used on site. No wastewater discharges from this site.
- ☒ Wastewater discharges to waters of the US. NPDES PERMIT REQUIRED
- ☐ Wastewater discharges to land or ground water. STATE WASTE DISCHARGE PERMIT REQUIRED. ECY 040-179.
- ☐ This facility discharges industrial process wastewater for treatment at a publicly owned treatment works. STATE PRETREATMENT PERMIT REQUIRED. ECY 040-177.
- ☐ The only discharge from this site is reclaimed water meeting state standards (see Section V below).
- ☐ Facility discharges reclaimed water to a drywell, drainfield, or an infiltration system that uses perforated pipe to discharge to the subsurface and complies with the Underground Injection Control Program (UIC) regulations, 173-218 WAC.

A-IV. RECLAIMED WATER PRODUCTION: Section B required ☐ Check here if Attached.

Primary Treatment Facility Contact: Christina Ness		Title: Lead Operator, LPWRF	
E-mail Address: cness@cityofblaine.com		Phone No. 360-332-3718	
Mailing Address: Blaine Public Works, Lighthouse Point Water Reclamation Facility, 1200 Yew Ave		City Blaine	Zip + 4 98230
Check type(s) of reclaimed water quality produced. <input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class B <input type="checkbox"/> Class C <input type="checkbox"/> Class D		For ground water recharge, surface water augmentation or wetlands check additional treatment or water quality requirements achieved. <input type="checkbox"/> Nitrogen reduction <input type="checkbox"/> Drinking water standards <input type="checkbox"/> Surface water standards <input type="checkbox"/> Wetland standards <input type="checkbox"/> Reverse osmosis <input type="checkbox"/> Other - Explanation attached	

Provide the status of each required submittal below. If submittal does not apply to your facility, enter NA.

Submittal	Title	Date	Attached	Submitted	Approved
Reclaimed Water Engineering Report	Technical Memorandum/Engineering Report -Revision 1	July 31, 2013	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reliability Assessment			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: The engineering report above is the report required in the State Water Reclamation and Reuse Standards Publication #97-023.

- ☐ **Check** this box if there are multiple engineering submittals for different treatment processes or sites. Attach a list of these specific submittals to include coverage under this permit

A-V. RECLAIMED WATER USE: Section D Required ☐ Check here if attached.

Check all categories of use of reclaimed water.

☐ Industrial or commercial uses☒ Land application (irrigation)☐ Impoundments☐ Groundwater recharge by surface percolation☐ Wetlands☐ Streamflow augmentation☐ Direct aquifer recharge☐ Other - Explanation attached☐ Indirect use (controlled)☐ Mitigation for new appropriative water rights**A-VI. WATER RIGHT IMPAIRMENT INFORMATION**

State law requires that facilities that reclaim water shall not impair existing water rights downstream of any freshwater discharge points from such facilities unless compensation or mitigation is agreed to by the holder of the affected water right.

Does diversion of reclaimed water result in impairment of existing downstream water rights?

☒ No ☐ Yes

If yes, briefly describe method of compensation or mitigation of the affected water right(s).

A-VII. SUMMARY OF REQUIRED SUBMITTALS

Provide the status of each required submittal below. If submittal does not apply to your facility, enter NA.

Submittal	Title	Date	Attached	Submitted	Approved
Water Right Impairment Analysis	N.A.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User Contracts	Reclaimed Water Service and Use Area Agreement between City of Blaine and Semiahmoo Resort Company L.C.C, and Reclaimed Water Service and Use Area Agreement between City of Blaine and Gleneagle Villas Condominium Association	6/30/2011 and 6/6/2013	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Water System's Cross Connection Control Plan			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☒ **Check** this box if there are multiple submittals under the above categories for use sites or uses.**Attach** a list of these specific submittals for coverage under this permit.

A-VIII. CERTIFICATION BY PERMITTEE:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Ravyn Whitewolf

Director; Public Works _____

Printed Name of Person Signing Below

Title


Signature of Applicant

4/17/18

Date Applicant Signed

NOTE: Applications must be signed as follows: A.) For corporation, by a principal executive officer of at least the level of vice president; B.) For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or C.) For a municipality, state, federal, or other public facility, by either a principal executive officer or ranking elected official.

A-IX. SUBMITTAL INSTRUCTIONS:

A complete application must contain all required forms for source control, discharges and reclaimed water use. The Departments of Ecology and Health may request additional information regarding water quality and the location, rate and purposes of use. Information from other submittals attached must reference submittal name, date and page number.

Submit the completed application forms to the appropriate Ecology regional office and to the Department of Health at the addresses listed below.

Washington State Department of Ecology (see map below for regional offices)	
Ecology Southwest Regional Office Water Quality Program Attn: Permit Coordinator PO Box 4775 Olympia, WA 98504-7775	Phone: 360-407-6279
Ecology Northwest Regional Office Water Quality Program Attn: Permit Coordinator 3190 - 160 th Avenue SE Bellevue, WA 98008-5452	Phone: 425-649-7201
Ecology Central Regional Office Water Quality Program Attn: Permit Coordinator 15 West Yakima Avenue, Suite 200 Yakima, WA 98902-3401	Phone: 509-457-7105
Ecology Eastern Regional Office Water Quality Program Attn: Permit Coordinator N. 4601 Monroe, Suite 100 Spokane, WA 99205-1295	Phone: 509-329-3537
Washington State Department of Health Office of Drinking Water, Suite #1500 Attn: Mamdouh El-Aarag, Water Reclamation & Reuse Program 16021 E. Indiana Avenue, Spokane Valley, Washington 99216	Phone: 509-329-2148

Headquarters (Lacey) 360-407-6000

If you are speech or hearing impaired, call 711 or 1-800-833-6388 for TTY



**STATE OF WASHINGTON DEPARTMENTS OF ECOLOGY AND HEALTH
PERMIT APPLICATION for RECLAIMED WATER USE**

SECTION B. RECLAIMED WATER PRODUCTION

Complete a separate section B for each treatment facility site covered under this permit. All questions must be answered completely and accurately to be considered for coverage. If a question does not apply, answer NA.

B-I. TREATMENT FACILITY SITE INFORMATION:

Facility: Lighthouse Point Water Reclamation Facility	
Primary Contact: Christina Ness	Title: Lead Operator
E-mail Address: cness@cityofblaine.com	Phone No. 360-332-3718
Mailing Address: Blaine Public Works, 1200 Yew Ave	City: Blaine Zip + 4 98230
Provide latitude and longitude points where reclaimed water leaves the treatment facility: Latitude 48.979444. Longitude 122.801389	
Provide directions to site from nearest hwy or city/town: Head north on I-5, take exit 276, which is the last exit in the USA, then go through the roundabout and head west under the interstate. On the other side of the interstate is another roundabout, and exit that one onto Marine Drive, which is the first exit heading west, down the hill and across the railroad tracks. We are the only buildings on the North side of Marine Drive, and a bit over a quarter mile from the tracks. There is ample parking across the street, and the main entrance is on the first building you see.	
There is a button to the left of the double glass doors that will alert us you are there.	

B-II. CLASS OF RECLAIMED WATER PRODUCED AT THIS FACILITY:

- ☒ Class A ☐ Class B ☐ Class C ☐ Class D
☐ Other Process / Water Quality Limits (explain):

B-III. EXISTING PERMITS: List all existing environmental permits at this location by type, issue date, expiration date, and permit number. If no existing permits, enter NONE.

Type of Permit	Issued (date)	Expires (date)	Permit Number
NPDES	May 10, 2013	Sept. 1, 2018	WA0022641

B-IV. LIST ALL SOURCES OF WATER TREATED TO RECLAIMED WATER AT THIS SITE:

Type of Water	Where Generated	Volume Treated	Percentage of Total
Untreated Domestic Sewage	<input type="checkbox"/> On-site <input type="checkbox"/> Off-site		
Secondary Effluent	<input checked="" type="checkbox"/> On-site <input type="checkbox"/> Off-site	Permitted for 0.72 MGD	46.8% of LPWRF permitted capacity
Storm Water	<input type="checkbox"/> On-site <input type="checkbox"/> Off-site		
Industrial Process Water	<input type="checkbox"/> On-site <input type="checkbox"/> Off-site		
Commercial Use Water	<input type="checkbox"/> On-site <input type="checkbox"/> Off-site		
Agricultural Industrial Process Water	<input type="checkbox"/> On-site <input type="checkbox"/> Off-site		
Other:	<input type="checkbox"/> On-site <input type="checkbox"/> Off-site		

B-V. INFORMATION ON INDUSTRIAL AND COMMERCIAL FACILITIES DISCHARGING TO SOURCE WATER.

Identify all industries and large commercial facilities discharging to the source water for the reclamation plant by name, type of industry, address telephone number and contact name. Attach additional sheets if needed.

Industry/Facility Name:	Semiahmoo Resort Hotel	Blaine School District Office	
Type:	Hospitality	Public Education Facilities	
State Permit #:	N.A.	N.A.	
Street Address:	9565 Semiahmoo Parkway	765 H Street	
Mailing Address:	9565 Semiahmoo Parkway, Blaine WA 98230	765 H Street, Blaine WA 98230	
Telephone:	360-318-2053	360-332-5881	
Contact Name:	Greg St Pierre	Ron Spanjer- Superintendent	
E-mail Address:	gstpierre@semiahmoo.com	rspanjer@blainesd.org	

B-VI. TREATMENT PROCESSES USED TO PRODUCE RECLAIMED WATER AT THIS SITE:

Check (✓) all unit processes used to produce reclaimed water at this site. Enter the # of units.

Treatment Process	✓	Unit Process	# of Units	
Preliminary Treatment	<input type="checkbox"/>	Manually Operated Bar Screens		
	<input type="checkbox"/>	Mechanically Operated Bar Screens		
	<input checked="" type="checkbox"/>	Fine Screen – Size:	2	
	<input type="checkbox"/>	Comminutor/Grinder		
	<input type="checkbox"/>	Grit removal		
	<input type="checkbox"/>	Pre-Aeration		
	<input checked="" type="checkbox"/>	Odor Control	2	
	<input checked="" type="checkbox"/>	Flow Measurement	5	
	<input type="checkbox"/>	Flow Equalization		
	<input type="checkbox"/>	Septage or Other Hauled Wastes		
	<input type="checkbox"/>	Other:(specify)		
Primary Treatment	<input type="checkbox"/>	Sedimentation Tanks/Clarifiers		
	<input type="checkbox"/>	Septic Tanks		
	<input type="checkbox"/>	Other (Specify)		
Secondary Treatment Biological Oxidation	<input checked="" type="checkbox"/>	Activated Sludge	Conventional	2
	<input type="checkbox"/>		Batch Treatment (SBR)	
	<input type="checkbox"/>		Extended Aeration	
	<input type="checkbox"/>		Package Plant	
Post Secondary Treatment	<input type="checkbox"/>	Coagulation		
	<input type="checkbox"/>	Flocculation		
	<input type="checkbox"/>	Sedimentation		
	<input type="checkbox"/>	Filtration	High-Rate Rapid Sand Filter	
	<input type="checkbox"/>		Continuous Backwash Upflow	
	<input type="checkbox"/>		Rotating Filter Disk	
	<input type="checkbox"/>		Compressible Fiber Filter	
	<input type="checkbox"/>		Traveling Bridge Filter	
	<input type="checkbox"/>		Membrane Filter <input type="checkbox"/> Microfiltration <input checked="" type="checkbox"/> Ultrafiltration	
	<input checked="" type="checkbox"/>	Membrane Bioreactor <input type="checkbox"/> Microfiltration <input checked="" type="checkbox"/> Ultrafiltration		4
<input type="checkbox"/>	Other: (specify)			
Advanced Treatment	<input type="checkbox"/>	Nanofiltration		
	<input type="checkbox"/>	Reverse Osmosis		
	<input type="checkbox"/>	Other (specify)		

Disinfection	<input type="checkbox"/>	Chlorine Gas	
	<input checked="" type="checkbox"/>	Hypochlorite	4
	<input type="checkbox"/>	Ultraviolet Light	
	<input type="checkbox"/>	Ozone	
	<input type="checkbox"/>	Other (specify):	
On-Site Storage	<input type="checkbox"/>	Lined Pond	
	<input type="checkbox"/>	Unlined Pond	
	<input type="checkbox"/>	Covered Tank	
	<input type="checkbox"/>	Other (specify):	
Chemical Additives <input type="checkbox"/> List attached	<input checked="" type="checkbox"/>	List <u>all</u> chemical additives associated with the treatment processes (e.g. alum for coagulation, chlorine for oxidation). Attach list if needed. Sodium Hypochlorite 12 1/2%	
Other Treatment (Specify)	<input checked="" type="checkbox"/>	Anoxic basins- alkalinity recovery	2
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		

B-VII. FACILITY DIAGRAM

Attach a sketch, aerial photograph, or map, including scale, of the treatment facility showing the following:

<input checked="" type="checkbox"/>	✓	Check items shown on the attachment.
<input checked="" type="checkbox"/>		Approximate overall dimensions of the facility
<input checked="" type="checkbox"/>		A properly labeled line drawing of all water and wastewater flows including direction of flow
<input checked="" type="checkbox"/>		All chemical storage areas <i>N/A</i>
<input checked="" type="checkbox"/>		All discharge point(s) and receiving water(s)
<input checked="" type="checkbox"/>		All sludge (or biosolids) storage, processing or disposal areas
<input type="checkbox"/>		
<input type="checkbox"/>		

B-VIII. CHARACTERISTICS OF RECLAIMED WATER PRODUCED

Enter X for parameters known to be present in the reclaimed water, or S for parameters suspected to be present. Provide data for all X or S. Mark NA for parameters that are not of concern at this facility.

☐ **New** Treatment Facility – Estimate concentrations based on design.

☐ **Existing** facility - Use actual operating data for the last year of operation where available - indicated by (✓)

X/S	Actual data ✓	Parameter	Concentration			# of Analyses	Analytical Method	Detection Limit
			Minimum	Maximum	Average			
	<input checked="" type="checkbox"/>	BOD (5 day)	0	4 mg/L	0.26 mg/L	52	5210B 21st ed	2 mg/L
	<input type="checkbox"/>	COD						
	<input type="checkbox"/>	Total Organic Carbon						
	<input checked="" type="checkbox"/>	Total Suspended Solids	0	23 mg/L	.59 mg/L	52	2540D-97	5 mg/L
	<input type="checkbox"/>	Total Dissolved Solids						
	<input type="checkbox"/>	Conductivity						
	<input checked="" type="checkbox"/>	pH	6.6	7.3	6.96	245	4500-H+ B2000	.05
	<input checked="" type="checkbox"/>	Ammonia-N	.05 mg/L	6.7 mg/L	1.47 mg/L	12	4500-NH3 D-97	.05 mg/L
	<input checked="" type="checkbox"/>	Total Kjeldahl N	0.6 mg/L	8.2 mg/L	2.47 mg/L	12	351.2	.1 mg/L
	<input checked="" type="checkbox"/>	Nitrate + Nitrite-N	0.66 mg/L	21.05 mg/L	10.89 mg/L	12	300.0 N+N	0.1 mg/L
	<input checked="" type="checkbox"/>	Total Nitrogen-N	4.97 mg/L	22 mg/L	13.42 mg/L	12	Calc.	
	<input type="checkbox"/>	Ortho-phosphate- P						
	<input checked="" type="checkbox"/>	Total-phosphate-P	1.45 mg/L	4.95 mg/L	3.62 mg/L	12	Calc	
	<input checked="" type="checkbox"/>	Total Residual Chlorine	0.51 mg/L	2.56 mg/L	1.08 mg/L	64	4500-Cl D-2000	.01 mg/L
	<input type="checkbox"/>	Free Residual Chlorine						
	<input checked="" type="checkbox"/>	Total Coliform	0	0	0	245	9222-B (M-endo)	1 cfu/100 ml
	<input type="checkbox"/>	Dissolved Oxygen	7.9 mg/L	9.2 mg/L	8.42 mg/L	64	SM 4500 og	0.1 mg/L
	<input type="checkbox"/>	Total Oil and Grease	2.1 mg/L	4 mg/L	2.24 mg/L	6	1664A	1400 ug/L
	<input type="checkbox"/>	Calcium						
	<input type="checkbox"/>	Chloride						
	<input type="checkbox"/>	Fluoride						
	<input type="checkbox"/>	Magnesium						
	<input type="checkbox"/>	Potassium						
	<input type="checkbox"/>	Sodium						

<input type="checkbox"/>	Sulfate						
<input type="checkbox"/>	Barium (total)						
<input checked="" type="checkbox"/>	Cadmium (total)	.0001 mg/L	.0005 mg/L	.0032 mg/L	4	3113B	.0005 mg/L
<input type="checkbox"/>	Copper (total)	.007 mg/L	.047 mg/L	.0142 mg/L	4	3113B	.002 mg/L
<input type="checkbox"/>	Iron (total)						
<input checked="" type="checkbox"/>	Lead (total)	0.0005 mg/L	0.0005 mg/L	0.0005 mg/L	4	3113B	0.0005 mg/L
<input type="checkbox"/>	Manganese (total)						
<input checked="" type="checkbox"/>	Mercury	0.00038 ug/L	0.000682 ug/L	0.00053 ug/L	4	EPA 1631E	0.0005 ug/L
<input checked="" type="checkbox"/>	Selenium	0.002 mg/L	0.002 mg/L	0.002 mg/L	4	3113B	0.002 mg/L
<input checked="" type="checkbox"/>	Silver (total)	0.002 mg/L	0.002 mg/L	0.002 mg/L	4	3113B	0.002 mg/L
<input checked="" type="checkbox"/>	Zinc (total)	0.093 mg/L	0.21 mg/L	0.176 mg/L	4	3113B	0.015 mg/L

Facility: Blaine LPWRF

B-IX. ADDITIONAL CHARACTERISTICS OF RECLAIMED WATER PRODUCED

Contact the appropriate Ecology regional office to check on additional testing requirements. List Parameters Not Included Above. Enter X for parameters which are known to be present in the reclaimed water. S for parameters suspected to be present in the reclaimed water. Provide data for all parameters marked. This section should address all organic chemical constituents expected such as volatile organic and synthetic organic compounds, pesticides, herbicides and fungicides; radionuclide and disinfection byproducts that may be generated in the disinfection process.

X/S	Actual data ✓	Parameter	Concentration			# of Analyses	Analytical Method	Detection Limit
			Minimum	Maximum	Average			
	<input type="checkbox"/>							
	<input type="checkbox"/>							
	<input type="checkbox"/>							
	<input type="checkbox"/>							
	<input type="checkbox"/>							
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<input type="checkbox"/>								
<input type="checkbox"/>								

B-X. RECLAIMED WATER PRODUCTION VOLUME

Provide the following information regarding reclaimed water production at this facility :

Maximum Production Capacity: ¹ Design MGD	0.72 MGD
Average Flow(Maximum month) Design MGD	0.72 MGD
Total Annual Volume of Reclaimed Water Available For Use (MG)	87.84 Million Gallons
Estimate Actual Annual Volume of Reclaimed Water Used (MG)	9.965 MG (2017)
Date Began Operation	June 2013
Date of Last Upgrade	July 2010 Plant commisioned
Date Planned Upgrades	
Describe how influent flow is measured: We have two Siemens magmeters installed between the influent pumps and the drum screens. One for the large influent pumps, and the other for the smaller influent pumps. The total daily flow is transmitted to SCADA and stored in our historian.	
Describe how effluent flows are measured: We have one Siemens magmeter installed downstream from our effluent pumps. Again, the total daily flow is transmitted to our SCADA and stored in our historian.	
Attach actual flow records for the last year (if available) NPDES forms attached	

B-XI. FACILITY ALARMS. Describe how the following alarm features are provided. If referencing information in an engineering report or other submittal, give name of submittal, date and page number of information. Attach additional sheets if needed.

Required Alarms	How Provided
Loss of power from normal power supply	Tied in to our SCADA which sends an alarm message to our autodialer, which then calls out the operator on stand-by after hours. Also notifies plant phone during working hours. All of the above have battery backup.
Alarms independent of normal power supply	All plant PLC's, SCADA and the autodialer are connected to uninterruptable power sources that condition the power as well as providing battery backup
Master Alarm Inter-connect all site alarms Who is notified?Operator	SCADA notifies plant personnel during work hours and operator on stand=by after hours
Master alarm to remote service location Who is notified? Operator	SCADA receives the information from the remote PLC's and notifies plant personnel during working hours, and the designated operator on stand by duty after hours

B-XII. FACILITY RELIABILITY. In the table below, indicate (✓) which reliability requirements are used at this facility. One or more reliability features are required for each category. If the treatment category does not apply to this facility, write NA.

Reliability Category	✓	Option
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¹ "Maximum production capacity" refers to the amount of reclaimed water that a treatment facility is designed to produce at peak output and 24-hour production.

Power Supply	Check which of the following are provided (at least one required)	
	<input checked="" type="checkbox"/>	Alarm and standby power source
	<input checked="" type="checkbox"/>	Alarm & automatically actuated short term storage or disposal
	<input type="checkbox"/>	Automatically actuated long term storage
	<input type="checkbox"/>	Approved other - specify
Emergency Storage or Disposal	Check which of the following are provided (at least one required)	
	<input type="checkbox"/>	Long term storage on-site. No disposal options
	<input checked="" type="checkbox"/>	Emergency short-term storage with approved disposal option
	<input type="checkbox"/>	Approved other – specify
Biological Treatment	Check which of the following are provided (at least one required)	
	<input checked="" type="checkbox"/>	Alarm and multiple units treating entire flow with one not in service
	<input checked="" type="checkbox"/>	Alarm, short-term storage or disposal and standby equipment
	<input type="checkbox"/>	Alarm and long-term storage or disposal provisions
	<input type="checkbox"/>	Automatic diversion to long-term storage or disposal.
	<input type="checkbox"/>	Approved other – specify
Secondary Sedimentation	Check which of the following are provided (at least one required)	
	<input type="checkbox"/>	Multiple units treating entire flow with one unit not in service.
	<input type="checkbox"/>	Standby sedimentation unit process
	<input type="checkbox"/>	Approved long-term storage or disposal provisions
		Approved other – specify MBR's- no secondary sedimentation
Coagulation	Check which of the following are provided (all four are required).	
	<input checked="" type="checkbox"/>	Standby chemical feeders
	<input checked="" type="checkbox"/>	Adequate chemical storage and conveyance facilities
	<input checked="" type="checkbox"/>	Adequate reserve chemical supply
	<input checked="" type="checkbox"/>	Automatic dosage control

Facility: Blaine LPWRF

Coagulation (continued)	Check which of the following are provided (at least one required)	
	<input type="checkbox"/>	Alarm and multiple units treating entire flow with one not in service.
	<input type="checkbox"/>	Alarm, short-term storage or disposal and standby equipment.
	<input type="checkbox"/>	Alarm and long-term storage or disposal provisions
	<input type="checkbox"/>	Automatic diversion to long-term storage or disposal provisions.
	<input checked="" type="checkbox"/>	Approved other – specify MBR's- no coagulation installed
Filtration	Check which of the following are provided (at least one required)	
	<input checked="" type="checkbox"/>	Alarm and multiple units treating entire flow with one not in service.
	<input checked="" type="checkbox"/>	Alarm, short-term storage or disposal and standby equipment.
	<input type="checkbox"/>	Alarm and long-term storage or disposal provisions
	<input type="checkbox"/>	Automatic diversion to long-term storage or disposal provisions.
	<input type="checkbox"/>	Approved other – Specify

Reverse Osmosis	Check which of the following are provided (at least one required)	
	<input type="checkbox"/>	Alarm and multiple units treating entire flow with one not in service.
	<input type="checkbox"/>	Alarm, short-term storage or disposal and standby equipment.
	<input type="checkbox"/>	Alarm and long-term storage or disposal provisions
	<input type="checkbox"/>	Automatic diversion to long-term storage or disposal provisions.
<input type="checkbox"/>	Approved other – Specify	
Ultraviolet Disinfection	Check which of the following are provided (at least one required)	
	<input type="checkbox"/>	Alarm and multiple units treating entire flow with one not in service.
	<input type="checkbox"/>	Alarm, short-term storage or disposal and standby equipment.
	<input type="checkbox"/>	Alarm and long-term storage or disposal provisions
	<input type="checkbox"/>	Automatic diversion to long-term storage or disposal provisions.
<input type="checkbox"/>	Approved other – Specify	
Chlorine Disinfection	Check which of the following are provided (all six are required).	
	<input checked="" type="checkbox"/>	Standby chlorinator
	<input checked="" type="checkbox"/>	Standby chlorine supply
	<input type="checkbox"/>	Manifold system to connect chlorine cylinders
	<input type="checkbox"/>	Chlorine scales
	<input type="checkbox"/>	Automatic switchover to full chlorine cylinders
	<input checked="" type="checkbox"/>	Continuous measuring and recording of chlorine residual
	Check which of the following are provided (at least one required)	
	<input type="checkbox"/>	Alarm and standby chlorinator
	<input checked="" type="checkbox"/>	Alarm, short-term storage or disposal and standby equipment.
	<input type="checkbox"/>	Alarm and long-term storage or disposal provisions
	<input type="checkbox"/>	Automatic diversion to long-term storage or disposal provisions.
	<input type="checkbox"/>	Alarm and multiple point chlorination. Each point has independent power source, separate chlorinator and separate chlorine supply.
<input checked="" type="checkbox"/>	Approved other – specify We use Sodium Hypochlorite-12.5%	

**STATE OF WASHINGTON DEPARTMENTS OF ECOLOGY AND HEALTH
PERMIT APPLICATION for RECLAIMED WATER USE**

SECTION C. RECLAIMED WATER DISTRIBUTION

NOTE: Complete a separate form C for each reclaimed water distribution system under this permit.

C-I. DISTRIBUTOR INFORMATION:

Treatment Facility Providing Reclaimed Water :	
Water Distributor: Lighthouse Point Water Reclamation Facility	Is the distributor also the owner of the treatment facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no attach a copy of the agreement used to control the water distribution and use.
Primary Contact Name: Christina Ness	
Title: Lead Operator, Lighthouse Point Water Reclamation Facility	

Phone No: 360-332-3718	<input type="checkbox"/> Agreement attached .
E-mail Address: cness@cityofblaine.com	
Primary Mailing Address Blaine Public Works, 1200 Yew ave	
City Blaine Zip + 498230	

C-II CLASS OF RECLAIMED WATER DISTRIBUTED: ☒ A ☐ B ☐ C ☐ D ☐
 Other Process / Water Quality Limits (explain):

C-III. TOTAL WATER SUPPLY AVAILABLE FROM THIS DISTRIBUTION SYSTEM:

Source of Water	Average Daily Flow (MGD)
Reclaimed Water Produced	0.1557MGD for 2017 reclaimed water season
Other Water Distributed in this system: <input type="checkbox"/> Surface Water <input type="checkbox"/> Ground Water <input type="checkbox"/> Storm Water <input type="checkbox"/> Drinking Water <input type="checkbox"/> Other:	(enter total)
Reclaimed Water Recovered From Aquifer Storage	0
TOTAL	0.1557 MGD

Facility: LPWRF

**STATE OF WASHINGTON DEPARTMENTS OF ECOLOGY AND HEALTH
 PERMIT APPLICATION for RECLAIMED WATER USE**

SECTION D. RECLAIMED WATER USE

NOTE: Complete a separate form D for each reclaimed water customer (water user) under this permit. For subdivisions with a number of residential users, a single form may be used.

D-I. GENERAL INFORMATION:

Name of Customer (Water User)		
Site Address: Semiahmoo Golf Course & Country Club 8720 Semiahmoo Parkway (If no address describe the location)	City Blaine	Zip + 4 98230
Provide a legal description with latitude and longitude if known.		

Primary Contact: Vance Much	Title: Director; Turf Management
Phone No:360-371-0606	E-mail Address:
Mailing Address: 8720 Semiahmoo Parkway	City Blaine Zip + 4 98230
Name of Reclaimed Water Distributor (Purveyor): City of Blaine, Lighthouse Point Water Reclamation Facility	Is the customer (water user) the same as the: Treatment facility owner (Permittee) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Distributor (purveyor) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, attach a copy of the agreements used to control the use. <input type="checkbox"/> Agreement attached
Name of Drinking Water System Purveyor:City of Blaine	Name of Cross Connection Control Program Administrator: Frank Arnett

D-II. DESCRIPTION OF USE OF RECLAIMED WATER:

1. The volume of reclaimed water use at this site is ☐ Estimated ☒ Metered
2. Describe the uses of reclaimed water at this site. Using available flow records and other available information, allocate the average flows among the various use categories. For each type of reclaimed water use at this site, enter the permitted capacity, average flows and acreage.
☒ Same as Section C - IV of this application ☐ Additional information is attached.
3. Describe any plans to modify the use of reclaimed water at this site.
☒ No modifications ☐ Description attached.

D-III. SITE ACCESS AND NOTIFICATION OF USE

In the table below, indicate (✓) which methods are used at this area to notify the public of reclaimed water use.

<input checked="" type="checkbox"/>	Check which of the following are provided:
<input checked="" type="checkbox"/>	Advisory signs posted at location
<input type="checkbox"/>	Advisory signs posted on tank trucks
<input type="checkbox"/>	Advisory signs posted in storage areas
<input type="checkbox"/>	Written notices. Check who receives notification: <input type="checkbox"/> General Public <input type="checkbox"/> Employees <input type="checkbox"/> Residents <input type="checkbox"/> Customers
<input type="checkbox"/>	Golf course score cards
<input type="checkbox"/>	Identification of areas not designated for reclaimed water use. Check which apply: <input checked="" type="checkbox"/> Buildings <input checked="" type="checkbox"/> Drinking fountains <input checked="" type="checkbox"/> Eating areas <input type="checkbox"/> Passing vehicles <input type="checkbox"/> Other (Specify): _____
<input checked="" type="checkbox"/>	Purple color coding: Check which apply: <input checked="" type="checkbox"/> Pipes <input checked="" type="checkbox"/> Valves <input checked="" type="checkbox"/> Outlets
<input type="checkbox"/>	Training programs: <input type="checkbox"/> Employees <input type="checkbox"/> Residents <input type="checkbox"/> Customers <input type="checkbox"/> Truck use <input type="checkbox"/> Other (Specify): _____

D-IV. CROSS CONNECTION CONTROL

Check which of the following apply:	
<input checked="" type="checkbox"/>	Reclaimed water use area is serviced only with reclaimed water
<input type="checkbox"/>	Reclaimed water use area is serviced with both reclaimed and potable water
Answer all questions below where dual potable and reclaimed water systems exist.	
1.	All public water systems servicing this area are actively implementing and enforcing cross-connection control plans. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2.	All cross-connection control programs have been accepted by the Department of Health. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.	How many illegal cross-connections were identified during the last reporting period (permit)? 0 a. How many of these were eliminated? N.A. b. Attach description of any cross-connections found and efforts to eliminate. <input type="checkbox"/> Attached

D-V. BEST MANAGEMENT PRACTICES (FOR SITE USE OF RECLAIMED WATER)

- ☒ All reclaimed water is used at this site is consumed on site. Site has no discharges.
- ☐ Site has the following discharges of reclaimed water to waters of the state.
- ☐ Aquifer recharge by: ☐ Surface percolation ☐ Direct injection
- Note: If not owned by the Permittee, a separate permit application may be required for this discharge.
- ☐ Discharges to surface waters or to wetlands discharging to surface waters. NPDES PERMIT REQUIRED
Enter existing permit number (if any) _____.
- ☐ This site uses reclaimed water for industrial process wastewater which is then discharged to a publicly owned treatment works. STATE PRETREATMENT PERMIT REQUIRED. ECY 040-177.
- ☐ Discharges to wetlands that discharge to ground water. STATE WASTE DISCHARGE PERMIT REQUIRED. ECY 040-179.

In the table below, indicate (✓) which methods are used at this area to regulate reclaimed water use.

Category	✓	Option
General Site Management		Check which of the following are provided:
	<input type="checkbox"/>	Other water used at this reclaimed water use site. Check all that apply: <input type="checkbox"/> Public potable water system <input type="checkbox"/> Private well <input type="checkbox"/> Surface water
	<input checked="" type="checkbox"/>	Site access is <input type="checkbox"/> unrestricted <input checked="" type="checkbox"/> restricted to public <input type="checkbox"/> restricted to most employees
	<input checked="" type="checkbox"/>	Rules prohibit the spraying with reclaimed water.
	<input checked="" type="checkbox"/>	Reclaimed water is confined to use areas. Set back distance:
	<input checked="" type="checkbox"/>	Rules prohibit hose bibs on reclaimed water lines.
	<input checked="" type="checkbox"/>	Use of reclaimed water is secured (authorized personnel only).
	<input checked="" type="checkbox"/>	Rules prohibit ponding of reclaimed water.
	<input type="checkbox"/> Other restrictions (specify): <input type="checkbox"/> Additional information is attached.	
Impoundments & Storage Ponds	<input type="checkbox"/>	Site has lined impoundments (ponds) with reclaimed water.
	<input checked="" type="checkbox"/>	Site has unlined impoundments (ponds) with reclaimed water. Describe method of seepage control. Bentonite mixed in soil lining pond when built <input type="checkbox"/> attached
	<input type="checkbox"/>	Describe method to prevent breeding of vectors (for health protection). <input type="checkbox"/> attached
	<input type="checkbox"/>	Describe method to prevent odor, slime, poor aesthetics. <input type="checkbox"/> attached
	<input type="checkbox"/>	Describe ground water monitoring (if any): <input type="checkbox"/> attached
	<input type="checkbox"/>	Other (Specify): <input type="checkbox"/> Additional information is attached.

Irrigation Uses	<input type="checkbox"/>	Site has irrigation uses. <input checked="" type="checkbox"/> Seasonal use <input type="checkbox"/> Year round use <input type="checkbox"/> Landscape <input type="checkbox"/> Agriculture
	<input type="checkbox"/>	Type of irrigation <input checked="" type="checkbox"/> Spray irrigation <input type="checkbox"/> Flood irrigation <input type="checkbox"/> Surface drip system <input type="checkbox"/> Subsurface drip system <input type="checkbox"/> Other (specify): _____
	<input type="checkbox"/>	Hydraulic loading rates determined as follows: Check method boxes below: <input type="checkbox"/> By water balance <input type="checkbox"/> By other method Describe: _____ <input type="checkbox"/> Calculations attached <input type="checkbox"/> Submitted previously <input type="checkbox"/> Approved
	<input type="checkbox"/>	Application is controlled. Check methods of control. <input type="checkbox"/> Irrigation schedule (if available) attached. <input type="checkbox"/> Apply only when crops are growing. <input checked="" type="checkbox"/> Apply at night or when public is not present. <input type="checkbox"/> High wind cutoff to irrigation controls at <input type="checkbox"/> 15 mph <input type="checkbox"/> 25 mph <input checked="" type="checkbox"/> No application when ground is frozen <input type="checkbox"/> Use temperature set point <input checked="" type="checkbox"/> No application when ground in saturated <input type="checkbox"/> Use moisture sensors <input type="checkbox"/> Other (specify): _____
	<input type="checkbox"/>	Describe ground water monitoring <div style="text-align: right;"><input type="checkbox"/> Additional information is attached</div>

D-VI. LAND APPLICATION AND GROUNDWATER RECHARGE

1. For land application and groundwater recharge sites, attach a topographic map (USGS 7.5 minute) showing the following information:
 - a. Surface water drainage systems with ¼ mile of the site
 - b. All wells within 1 mile of the site
 - c. Any discharge points
 - d. Land uses and zoning adjacent to the site
 - e. Groundwater gradient
 - ☒ Map attached
2. Describe soils at this site using information from local soil survey reports. ☐ Additional information attached.
3. Describe local geology and hydrogeology within one mile of this site. ☐ Additional information attached.

D-VII. GROUNDWATER INFORMATION

If groundwater monitoring is required or available, provide measurements from monitoring wells or supply wells in the area of the groundwater recharge or irrigation. Provide the location of each well on a map. Attach well logs and well I.D. # when available. Copy this page for each well.

Well ID Number: _____

☐ New Reclaimed Water Site – Background
 ☐ Existing Site

Parameter	Concentration			# of Analyses	Analytical Method	Detection Limit
	Minimum	Maximum	Average			
BOD (5 day)						
COD						
Total Organic Carbon						
Total Suspended Solids						
Total Dissolved Solids						
Conductivity						
pH						
Ammonia-N						
Total Kjeldahl N						
Nitrate + Nitrite-N						
Total Nitrogen-N						
Ortho-phosphate- P						
Total-phosphate-P						
Total Residual Chlorine						
Free Residual Chlorine						
Total Coliform						
Dissolved Oxygen						
Total Oil and Grease						
Calcium						
Chloride						
Fluoride						
Magnesium						
Potassium						
Sodium						
Sulfate						
Barium (total)						
Cadmium (total)						
Copper (total)						
Iron (total)						
Lead (total)						
Manganese (total)						
Mercury						
Selenium						
Silver (total)						
Zinc (total)						
Water Level						

D-VIII. RECLAIMED WATER USE CAPACITY ALLOCATION

Using available flow records and other available information, allocate the average flows among the various use categories. For each type of reclaimed water use, enter the permitted capacity, average flows and acreage.

Use Category	Sub-Category	Capacity (MGD)	Average Flow (MGD)	Area (acres)
Water Production	Treatment Plant Uses		0.05 MGD	4
Industrial Use	Process & Product Production			
	Cooling Use			
	Other			
Commercial Use	Toilet flushing			
	Fire protection			
	Other			
Public Access Land Application (irrigation)	Golf Course		0.1509 MGD for 64 days in 2017	61.5 acres
	Residential			
	Parks & Playgrounds			
	Schools			
	Cemeteries			
	Other			
Agricultural Land Application (irrigation)	Food Crops			
	Grass, Pasture			
	Other			
Groundwater Recharge	Surface Percolation			
	Direct Injection			
Wetlands	Constructed Treatment (aesthetic/polishing)			
	Beneficial Use (created)			
	Natural (restore)			
Surface Water	Augmentation			
Municipal Uses	Sewer Cleaning			
	Street Cleaning			
	Construction Compaction			
	Other			
Other (specify)	Decorative ponds		0.0048MGD for 64 days in 2017	< 1 acre
TOTAL			1.607 MGD	<66.5 Acres

Lighthouse Point Water Reclamation Facility

Vicinity Maps

Process Schematics and

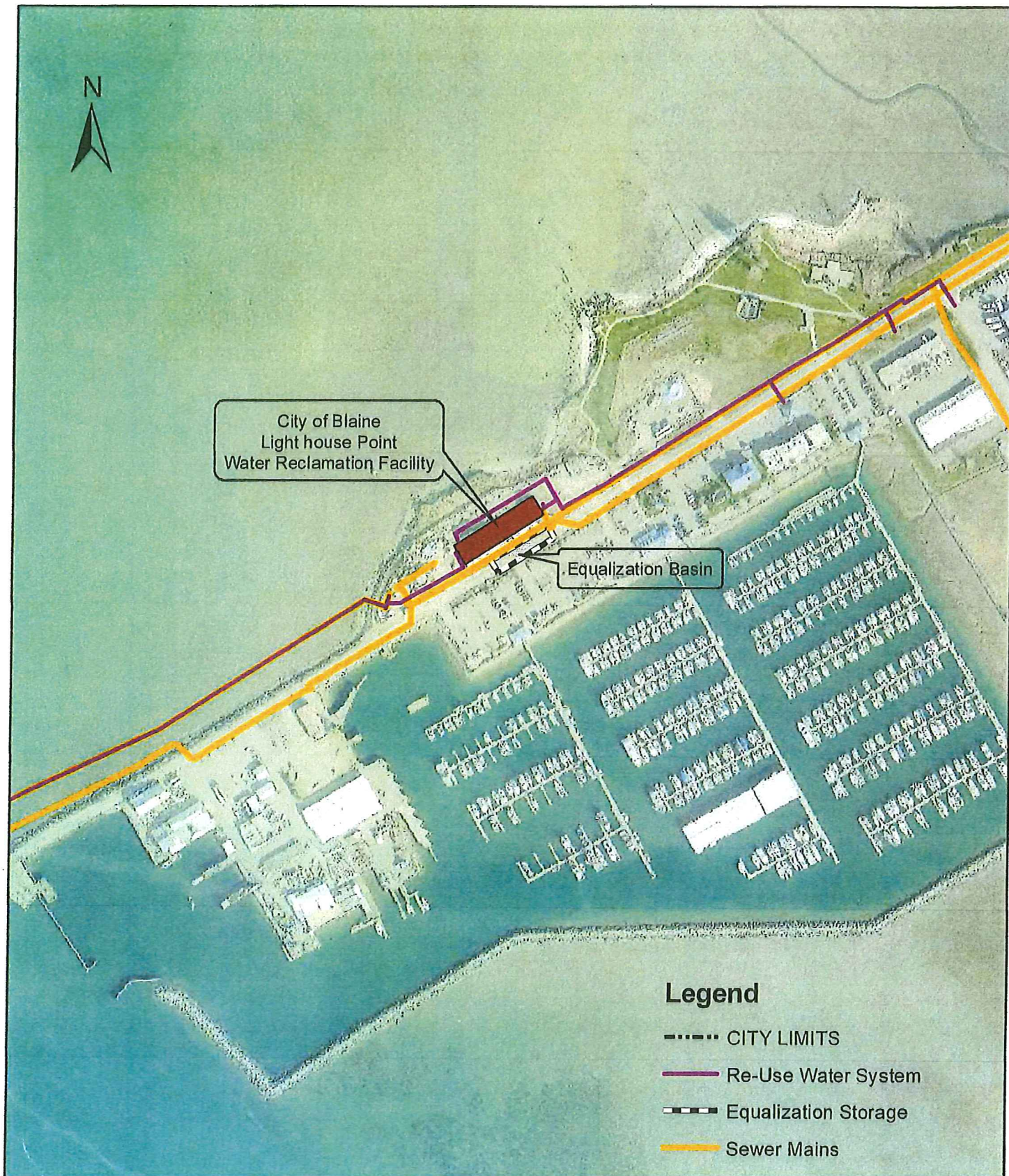
Semiahmoo distribution system maps



0 750 1,500 3,000 4,500 6,000 Feet

CITY OF BLAINE LPWRF
1 MILE RAIUS TOPOGRAPH MAP

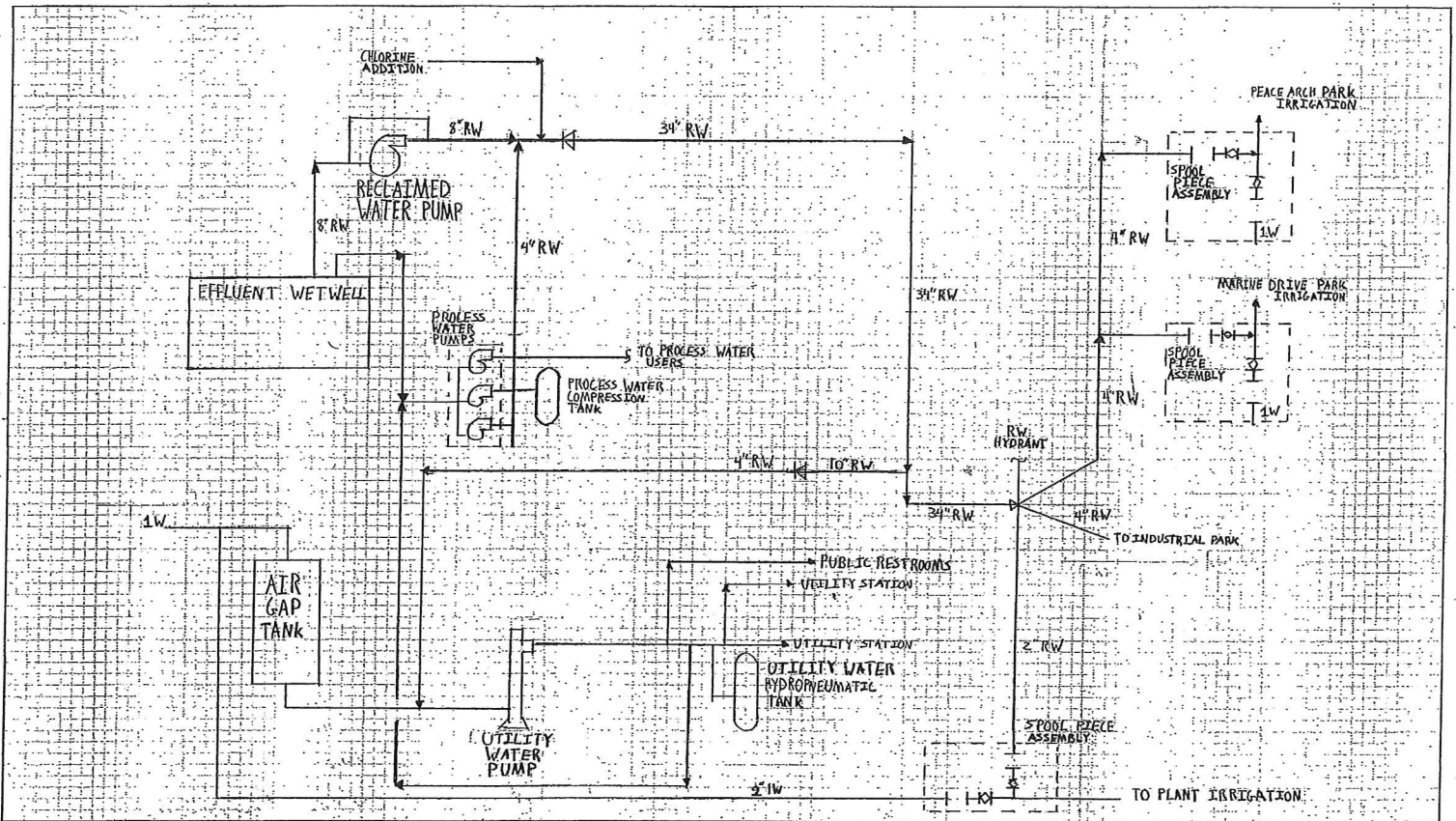


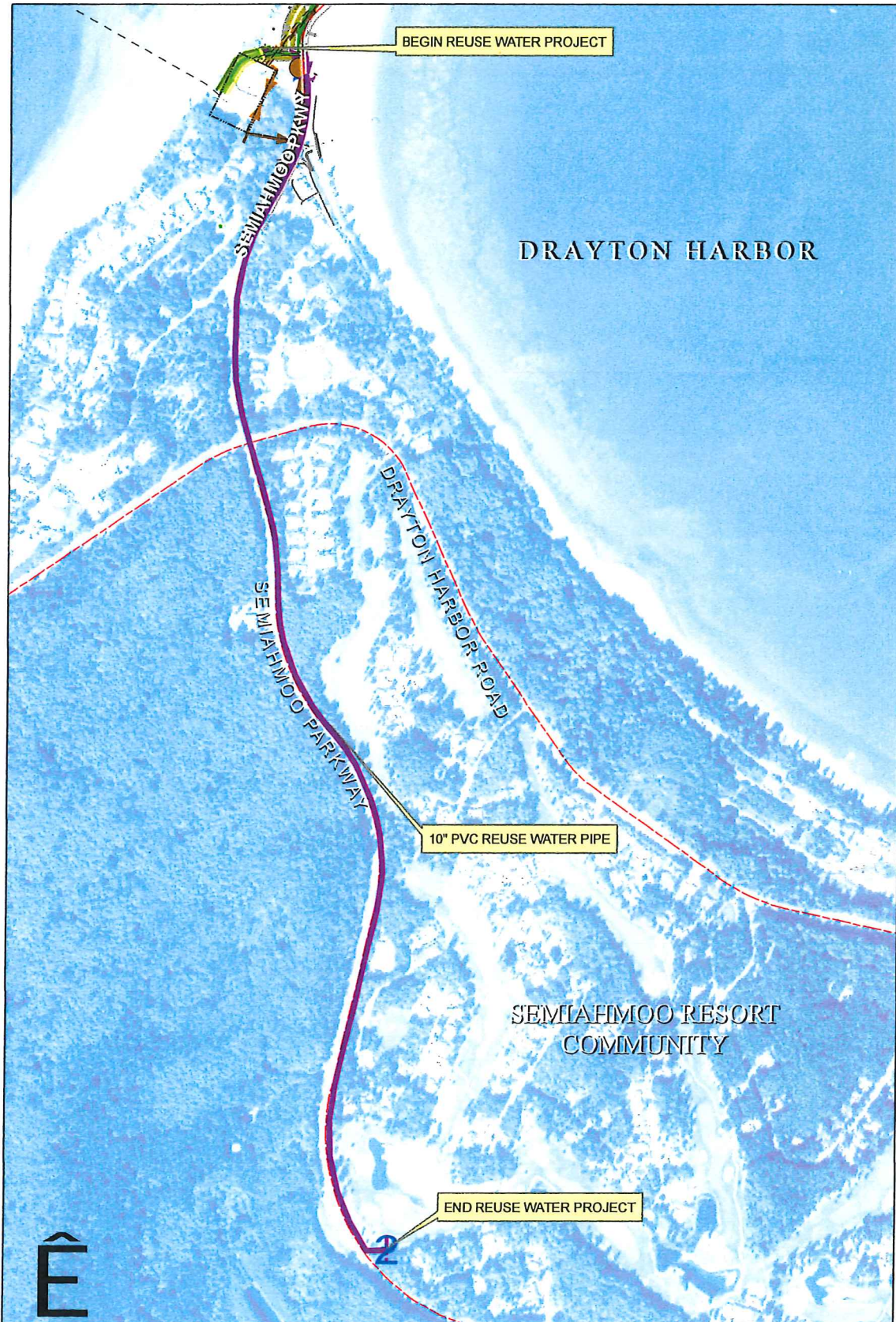


CITY OF BLAINE LPWRF
1/4 MILE RADIUS TOPOGRAPH MAP



Date Checked	Checked By	Job Number	By	Date	Calc. No.	Sheet No.
			DFJ			4.1
Project			Subject			
BLAINE: RECLAIMED WATER			PROCESS DIAGRAM			





1 inch equals 525 feet



CITY OF BLAINE
PUBLIC WORKS DEPARTMENT
1200 YEW AVENUE
BLAINE, WA 98230

CITY OF BLAINE, WA

REUSE WATER PIPE ROUTE

DATE
SEPTEMBER 2007

SCALE
1" equals 525'

JOB NUMBER

SHEET
1

OF
1

GOLF COURSE IRRIGATION
SUPPLY POND

GOLF
COURSE
PUMP-
HOUSE

RECLAIMED
WATER

6"

EXISTING DOUBLE
CHECK VALVE
ASSEMBLY AND
METER

MOTORISED CONTROL
BUTTERFLY VALVE W/
MANUAL PUSH
BUTTON OPEN/CLOSE

12"

8"

SPPOOL

BACKUP WATER
SUPPLY

CONCRETE
SERVICE VAULT

PROPOSED
10" RECLAIMED
WATER PIPE

RECLAIMED
WATER

10"

AIR RELEASE VALVE

IMPROVEMENTS THIS
SIDE NOT INCLUDED
IN RECLAIMED WATER
FORCE MAIN PROJECT

10"

CONNECTION:
NEW PIPE TO
EXISTING VALVE

10"

EXISTING
10" RECLAIMED
WATER PIPE

RECLAIMED
WATER

10"

CONNECTION:
NEW PIPE TO
EXISTING VALVE

10"

DRAIN RELEASE
AT LOW POINT

RECLAIMED
WATER

10"

TO OUTFALL

10"

WETWELL

BUTTERFLY VALVE

• OPEN FOR STANDARD OPERATIONS

• CLOSED FOR RECLAIMED WATER OPERATIONS

WWTP
OUTFALL

10"

WASTEWATER

10"

CITY OF BLAINE
LIGHTHOUSE POINT
WASTEWATER TREATMENT PLANT

LEGEND

- RECLAIMED WATER PIPE (PROPOSED)
- RECLAIMED WATER PIPE (EXISTING)
- ISOLATION VALVE, NORMALLY OPEN
- ISOLATION VALVE, NORMALLY CLOSED
- CHECK VALVE
- COMBINATION AIR RELIEF/
VACUUM RELEASE VALVE

NO.	REVISIONS	BY	DATE
-----	-----------	----	------

Wilson
SURVEY/ENGINEERING

WILSON ENGINEERING, LLC
1015 DOWNS STREET
SUITE 200
DALLAS, TEXAS 75203
(214) 734-8000 FAX (214) 734-8001
www.wilsonengineering.com

DATE	SCALE	DATE	SCALE	DATE	SCALE
2-23-2011	AS SHOWN	2/28/2011	200'-0"=1"		
SHEET	M-1	OF	1	CITY OF BLAINE	RECLAIMED WATER FORCE MAIN - SEMIAHMOO
					PLAN OF INTERIM OPERATIONS

Lighthouse Point Water Reclamation Facility

Plant Narrative

Welcome to the Lighthouse Point Water Reclamation Facility

Owned and operated by The City of Blaine

This is a narrative about who we are and what we do:

Introduction:

Blaine's Lighthouse Point Water Reclamation Facility (LPWRF) is a newer state of the art semi-automated water reclamation facility that uses advanced Membrane Biological Reactors (MBR's) to reliably purify our municipal wastewater to meet stringent Class "A" water reuse standards.

The treatment facility is a model in design architecture that serves as the unobtrusive entrance to Marine Park, with beautiful views, natural lighting, and artistic enhancements including a reclaimed water feature, picnic tables, trails, barbeques, and a pedestrian bridge through the facility.

The LPWRF is Blaine's largest municipal project undertaking to date and began full time operation in July 2010. The LPWRF provides service to the approximately 5500 residents.

The Facility occupies a fairly small footprint, with all operations enclosed within approximately 23,000 square feet. Most of the processes movers are located below ground and in covered basins hidden from public view.

The LPWRF is an Activated Sludge Wastewater Treatment Plant that utilizes MBR's, an advanced ultra-filtration tertiary treatment system with enhanced capabilities, to produce Class 'A' reclaimed water and a superior quality effluent overall. Marine Park and the plant's landscaping are irrigated with reclaimed water produced on site.

Plant Classification:

LPWRF is a Washington State Department of Ecology certified group 3 Wastewater Treatment Plant designed to treat waste from Blaine's separate sanitary wastewater collection system. Storm water is not treated at the facility, with the exception of unintentional seasonal infiltration.

Activated Sludge plants are considered group 3 plants when design flows are greater than 1 Million Gallons per Day, but less than 10 MGD. LPWRF meets these requirements as our permitted monthly design flow had been set to 1.54 MGD. Water Reclamation Plants also require a group 3 certification.

These classifications also include the level of treatment, population equivalent served, receiving water characteristics, and potential health hazards in accordance with a point rating system. This rating also specifies the level of certification operators must have.

Each Wastewater Treatment Facility requires a minimum certification level required for the Direct Responsible Charge (DRC) Operator in overall charge of the entire wastewater treatment facility, at that level or above, as well as the other journey level operators.

Christina (Chrissy) Ness, currently the Lead Operator, is certified as a Group 3 operator and has been in the wastewater field for over 50 years. Frank Arnett, and Matt Luttrell are also group 3 level operators with each having over 25 years experience.

Clark Young is a group 2 operator, but is not sufficiently certified to work without a group 3 operator present.

Influent Properties/Preliminary Treatment:

The average yearly flow rate through the LPWRF is just over 0.5 MGD with the monthly permitted capacity to treat up to 1.54 MGD and a maximum capacity of 3.1 (MGD) for up to 16 hours.

Other influent design criteria include maximum monthly average plant loadings of BOD5 (biological oxygen demand) set at 3060 Pounds per Day (lbs/day) and Total Suspended Solids (TSS) of 3000lbs/day.

The influent at LPWRF is pumped from the influent wet well by centrifugal pumps to our rotating drum screens where preliminary treatment is conducted to remove fine screening debris which is then removed from the waste stream using an auger type conveyance system, then bagged and placed into a dumpster for landfill disposal.

This is the only preliminary treatment performed.

Influent samples are sampled before screening for compliance with our discharge permit, measured and recorded for flow, time, temperature, pH, ammonia nitrogen, BOD5 and TSS. Flow measurements are continuous and recorded daily. BOD and TSS samples are collected twice a week as 24 hour composites for analysis, while pH, temperature and ammonia are collected and analyzed daily as grab samples.

Secondary Treatment:

After fine screening, the influent flows directly into the aeration basin distribution channel. LPWRF uses an activated sludge process and there is no primary treatment conducted.

Secondary treatment starts with the flow entering an anoxic zone before entering the aeration basin.

The anoxic zone utilizes a Modified Ludzak-Ettinger (MLE) process whereby a metered volume of mixed liquor from the aeration basins is recycled back into the anoxic cell through the mixed liquor recycle pump, at an operator adjustable rate (set point).

The anoxic basin contents are also mixed mechanically and the anoxic zone is ideally almost devoid of dissolved oxygen which is monitored daily by the operators.

Optimal Anoxic Basin operating conditions call for dissolved oxygen (DO) concentration of less than 0.5 mg/l above which nitrogen stripping bacteria (denitrifiers). The LPWRF readings are usually below 0.5 Milligrams per Liter (mg/L) and mostly fall between .02-.5mg/l.

As the wastewater flows into the aeration basins, air is introduced from high efficiency turbo blowers, through fine bubble air diffusers located near the bottom of the aeration basin.

DO Set points are maintained by controllers that compare the actual process values to operator set values from continuous DO sensors located at both ends of the aeration basin and then open or close the valves respectively responsible for adding air (oxygen) to maintain operator-preset conditions.

A DO content of 2.0 mg/L is recommended for the aerobic zones. LPWRF samples are collected daily from both basins and the local DO readings are then compared to the lab DO meters and recorded for internal monitoring quality control to maintain the accuracy of the system.

The aerobic zone is also responsible for nitrification that promotes BOD removal. Nitrification decreases alkalinity which is then regained back in the anoxic zone where de-nitrification occurs, thus buffering the pH.

Advanced Treatment:

Tertiary treatment begins after the flow leaves the aeration basin and pumped to the membrane distribution channel inside the Membrane Plant. Flow to the Membrane Plant is regulated by the level controllers in the aeration basins. Rising levels controls the number of membranes required to efficiently operate the filtration process by varying the number of trains needed to process the waste stream flow.

Each train is comprised of three cassettes containing the modules that form the ultra filtration system. These cassettes are located in four separate trains (tanks). Each membrane strand is comprised of hollow fibers that are permeable to water but designed to filter out bacterium and most viruses measuring less than .04 microns.

They provide adequate surface area for ultra filtration and are able to withstand a high solids environment, up to a Mixed Liquor Suspended Solids (MLSS) concentration of 12,000 mg/l.

Currently, the LPWRF maintains an average MLSS concentration between 8,000-10,000 mg/l.

The flows entering the Membrane Plant equate to four times the plant's influent flow, with a flow rate matching the influent flow passing through the membranes as treated permeate, and the remaining three flow equivalents being returned to the beginning of the aeration basin as Return Activated Sludge (RAS).

Samples are collected from the RAS channel, located at the end of the membrane trains, for analysis and compared to our MLSS meter readings for quality control purposes.

The membrane channels use multiple controls for cleaning, maintenance, and operation.

Scour air is provided by a three step air flow-based system that utilizes multiple blower configurations in each step, and, controlled by our System Control and Data Acquisition (SCADA), are automated to vary the blower configurations to regulate the air flow into the trains matching the number of trains in operation.

Our scour air utilizes the “Zenon Leap” system which lowers the air demand needed to “shake” the solids off the membranes as permeate is extracted by vacuum.

Permeate turbidity is a final control element and must be within pre-set limits before the water is released as clarified effluent. The membrane system is operator programmable to maintain the desired concentration of MLSS by diverting MLSS to the membrane thickener basin. This process is called ‘wasting’. The RAS is re-circulated back into the beginning of the aeration basin to maintain the desired microbial population capable of adequately purifying our influent.

Solids Handling:

The excess MLSS are wasted into our solids thickener basin to maintain the required MLSS concentrations throughout the activated sludge process. The thickener basin has its own set of membrane cassettes and its own air source from yet another set of smaller sized centrifugal blowers.

The thickening operation operates pretty much in the same way as our other MBR’s by providing scour air and separate permeate pumps to remove the permeate from the solids, thus increasing the concentration of MLSS in the basin. The difference is the thickener operates as a batch treatment bringing in more MLSS to replace permeate removed from the thickener basin.

This membrane permeate also is monitored by its own turbidity meter and permeate is sent either to the plant effluent or back to the aeration basin, depending on permeate quality.

After the solids in the thickener basin reach an operator programmable concentration, the basin contents are pumped to a Thickened Waste Activated Sludge (TWAS) holding tank.

The TWAS is transported by truck to Tjoelker Enterprises, a local biosolids NPDES permitted beneficial use facility, where they are processed to meet Class 503- B biosolids standards before application to crops grown for animal feed. Last year LPWRF produced 110 dry tons of biosolids, approximately 603 lbs/day.

Effluent Properties:

Disinfected effluent leaves the LPWRF and is pumped through a segmented cathodic protected ductile iron pipe that previously carried raw sewage across the harbor to the old treatment plant. This pipe now connects to the existing outfall where reclaimed water from LPWRF can be diverted, monitored, and then pumped to our reclaimed water customers; the biggest user being the Semiahmoo Golf Course irrigation ponds.

The final effluent receiving water is the Semiahmoo Bay; a part of the Strait of Georgia.

The sampling point of compliance for the outfall total chlorine residual and fecal coliform determination is located at the old wastewater treatment plants outfall, across Drayton Harbor from LPWRF.

The effluent from the LPWRF must meet stringent requirements to be utilized as reclaimed water. Our reclaimed water is currently classified as class "A", the purest water possible from wastewater processing.

We can also discharge non-reclaimed effluent to Semiahmoo Bay.

The LPWRF state discharge permit has set monthly average discharge limitations of both BOD5 and TSS at 30 mg/L, equivalent to 278 lbs/day with a minimum 85% removal rate. The plant is producing a 100% removal rate for BOD and 99-100% TSS, consistently exceeding the required standards.

Disinfection Methods:

Disinfection is accomplished with liquid Sodium Hypochlorite that is metered into the effluent and reclaimed water streams via peristaltic pumps. Adequate chlorine contact time was designed into the piping configurations for compliance before the reclaimed water can be utilized. The disinfecting solution comes to LPWRF by bulk tanker truck and is pumped into our storage tanks by the vendor, so there is minimal exposure to the chemical room.

For reclaimed water the chlorine residual must meet or exceed our permit required daily minimum concentration of 0.5 mg/l and not exceed our maximum residual concentration of 4.0 mg/L. This is monitored from a point of compliance at the plant and at the booster station located at the diversion point at our plant outfall. Total coliform samples are required to be taken daily and the maximum 7 day median is 2.2/100ml and maximum sample of 23/100ml. We have had our analysis result in non-detects since the LPWRF was commissioned.

Reclaimed water turbidity must be continuously monitored and not exceed 0.5 Nephelometric Turbidity Units (NTU's) anytime and can not exceed a monthly average of 0.2 NTU's . A dedicated reclaimed water turbidity meter is programmed to not exceed the 0.5 NTU maximum for reclaimed water by signaling our SCADA to shut down reclaimed water production.

There is also a smaller reclaimed water process located in the LPWRF that furnishes reclaimed water to the public restroom toilets, west Marine Park irrigation and the LPWRF water feature.

Odor Control:

Two large towers house activated carbon beds for odor removal throughout the plant. Four forced air fans draw foul air from enclosed areas throughout the plant and push it through the activated carbon towers. The system is designed to maintain a slightly negative pressure in potential odorous tanks and rooms, eliminating odors and maintaining the required number of air changes per hour. The result is there are no detectable odors from or around the plant as the facility was designed to completely eliminate any such noxious exposures that would inhibit the general public from accessing the surrounding park or the Marine Drive area.

The LPWRF uses a unique redundant emergency electrical fail safe power design.

There is no stand-by generator to automatically supply power in an outage. Instead, the LPWRF electrical power is provided through two independent electrical substations.

The LPWRF is a textbook example of 'state of the art' engineering available to date.

The LPWRF operators are accessible for scheduled tours and are glad to speak with the general public about the unique biological membrane processes that are guaranteeing the cleanest reclaimed water obtainable.

References:

WA-002264-1 Fact Sheet Addendum for *Blaine* WWTP

GE Water & Process Technologies-Handout "Zee Weed Membranes for Municipal Wastewater Treatment" Bulletin1054EN Sep 08;
www.ge.com/water

National Pollutant Discharge Elimination System; Waste Discharge and Reclaimed Water Permit No. WA-002264, 4th Modification Date: October 12, 2011 State Dept of Ecology; Bellingham Field Office, Bellingham WA 98225

Brown and Caldwell-Blaine Operators Training Workshop; Biological Treatment Fundamentals, Henryk Melcer and Rick Kelly

Reclaimed Water Use Area Agreements



**RECLAIMED WATER SERVICE AND USE AREA AGREEMENT
BETWEEN THE CITY OF BLAINE AND GLENEAGLE VILLAS CONDOMINIUM
ASSOCIATION**

This Reclaimed Water Service and Use Agreement is made and entered into this 6th day of June 2013, between the City of Blaine, a Washington municipal corporation (hereinafter referred to as "the City") and Gleneagle Villas Condominium Association, hereinafter referred to as "the User"), together referred to as the "parties".

WHEREAS, Washington State Law encourages the use of reclaimed water "to replace potable water in non-potable applications, to supplement existing surface and groundwater supplies, and to assist in meeting the future water needs of the State"; and

WHEREAS, the City owns and operates the City of Blaine's Lighthouse Point Water Reclamation Facility (hereinafter referred to as "LPWRF"), which generates Class A reclaimed water, as defined in RCW 90.46; and

WHEREAS, the use of reclaimed water in Blaine is regulated by National Pollution Discharge Elimination System (NPDES) Permit #WA-002264-1 issued by the State Department of Ecology on May 10, 2013 and further modified from time to time (hereinafter referred to as the "City Permit"); and

WHEREAS, the City has developed a Reclaimed Water Plan entitled "Requirements for Reclaimed Water Use", dated January, 2010, attached hereto by reference; and

WHEREAS, the City has received from the State Department of Ecology a grant for the construction of pumps and pipes to deliver reclaimed water to the User; and

WHEREAS, the reclaimed water piping plans to deliver reclaimed water to the User have been approved by the Washington State Department of Health and by the Department of Ecology; and

WHEREAS, the City desires to promote and make available reclaimed water and has adopted by City ordinance a reclaimed water program that includes policy guidelines and associated pricing structure in the Unified Fee Schedule for the use of reclaimed water produced by the City ("Reclaimed Water Program"); and

WHEREAS, the User has identified potential beneficial uses of reclaimed water and wishes to secure a commitment from the City to provide reclaimed water service to its properties, as depicted in Exhibit 1 attached hereto; and

WHEREAS, the User agrees that the use of reclaimed water will benefit the environment and help the City meet water conservation goals by reducing withdrawals of groundwater from the Blaine aquifer;

NOW, THEREFORE, in consideration of the recitals and the mutual promises and covenants contained herein, the City agrees to supply reclaimed water and the User agrees to purchase reclaimed water under the following terms and conditions:

TERMS AND CONDITIONS

The City agrees to provide reclaimed water and User agrees to pay the City for the use of said reclaimed water, according to the following terms and conditions:

1. Term

The term of this Agreement is ten (10) years, renewable every five (5) years thereafter, commencing on the effective date of this Agreement, unless terminated earlier as allowed herein.

2. Supply and Sale of Reclaimed Water

2.1 Quality. The User understands that the reclaimed water is not potable. The City shall make reasonable efforts to provide Class A Reclaimed Water, as defined in the *Water Reclamation and Reuse Standards* (DOE and DOH 1997). The City makes no other representation concerning the quality of the reclaimed water and makes no express or implied warranties whatsoever other than the following:

2.1.1 The City's Lighthouse Point Water Reclamation Facility uses a membrane bioreactor (MBR) treatment technology to filter wastewater to reclaimed water quality standards and delivery system is designed to stop delivery of reclaimed water to the User should the quality of water not meet Class A standards.

2.2 Delivery. The City will deliver reclaimed water to the User through the conveyance system which connects to the pond identified in exhibit 1, the largest in the pond network, which is currently supplied with potable water. The City has installed and will maintain a reclaimed water meter on the outlet side of the conveyance system on Semiahmoo Parkway, to measure with reasonable accuracy the quantity of reclaimed water supplied to the User for billing purposes.

2.3 Backflow Prevention. The reclaimed water service has been designed to be physically separated from the potable water supply while in operation. If potable water is to be supplied at any time in lieu of reclaimed water, the City shall make reasonable efforts to ensure that the reclaimed water shall be physically separated from the delivery system. The User shall continue to ensure that delivery to the pond is separated by an air gap.

2.4 Quantity and Service. The City produces a limited quantity of Class A reclaimed water at its Lighthouse Point Water Reclamation Facility. The total amount of reclaimed water available is dependent on the number of sewer customers. The total amount of water that is available is a factor of the plant's flow and the amount of reclaimed water being consumed at any given time by the number of sewer customers connected to the system. Therefore the User is limited to the flow rate and volume as determined by the City. Subject to the limits of the storage capacity of the pond network, the City will make reasonable attempts to deliver, through a water

meter, reclaimed water for use in User's pond network. The City will make every attempt to supply enough reclaimed water to keep pond network full, but this Agreement does not guarantee that the User will receive this amount of reclaimed water under all circumstances and at all times.

- 2.5 In the event delivery is prevented or affected by a cause outside of City's control, including, but not limited to, acts of God, shortage of wastewater, malfunction or upset of the City's system, actions of a third party, an order by a governmental regulatory authority or court; or in the event of emergency repairs or other necessary work, or whenever the public health or safety so demands; or any Force Majeure condition or situation; or if the City determines, in good faith, that any aspect of the parties' performance hereunder may be contrary to law; the City may change, reduce or limit the time for or temporarily discontinue the supply of Class A Reclaimed Water to the User. Before so changing, reducing, limiting or discontinuing the supply of Class A Reclaimed Water to the User, the City shall, insofar as practicable, notify the User. The City shall not be responsible for any damage resulting from interruption or change of the Class A Reclaimed Water supply, or for any damages incurred by the User arising out of the use or transportation of the Class A Reclaimed Water.
- 2.6 In the event that the City cannot deliver Class A Reclaimed Water to the Use Location for more than ninety (90) days, then the City may terminate this agreement and shall be under no further obligation to provide Class A Reclaimed Water or a back-up water source under this Agreement. The User will be responsible for paying all potable water charges at City retail potable water rates when reclaimed water is not available.
- 2.7 Water Right. No water right or any contractual right to water is created by this Agreement.
- 2.8 Beneficial Use of Reclaimed Water
- 2.8.1 Use. The User may use the reclaimed water only to keep the pond network full.
- 2.8.2 Use Location. The reclaimed water shall only be used on the property as shown on Exhibit 1. This property is located within Parcel A of the Gleneagle Villa Condominiums in Blaine, WA, further defined within Whatcom County Auditor's File Number 2110200999. Application of reclaimed wastewater on any other property or at any other location than shown on Exhibit 1 shall not be permitted without the written approval of the City.
- 2.8.3 Designated maintenance and operations personnel. The User has designated the following person as being responsible for maintenance and operation of the User's irrigation facilities and prevention of non-permitted uses of the reclaimed water:

Name: Tess Allison, Integra Condominium Association Management, Inc.

Address: PO Box 31936
Bellingham, WA 98228

Phone Number: (360) 656-5091

The User will inform the City in writing of any personnel changes which necessitate a change in the above designee.

- 2.9 Future Repairs and Improvement. Any and all onsite system improvements, including supplies, or repairs to the reclaimed water system on the User's property, shall be borne by the User. This includes piping, signage, etc. The User shall contact the City for the specifications of approved materials (see Section 3.9).

3. User's Obligations and Restrictions on Use of Reclaimed Water

- 3.1 The User shall at all times comply with the use restrictions of reclaimed water contained in RCW 90.46 and the most current edition of the following joint Washington State Department of Ecology and Department of Health publication:
- 3.1.1 The Water Reclamation and Reuse Standards
(<http://www.ecy.wa.gov/programs/wq/reclaim/advisorycommittee/standards.pdf>),
- 3.2 The User shall not allow reclaimed water to be sprayed on people, drinking water fountains, areas of consumption of food or liquids by humans or pets, and/or any other area not designated for application of reclaimed wastewater. Such an occurrence may constitute a health violation under RCW 90.46.250.
- 3.3 The User shall not apply or use reclaimed water for irrigation purposes when the ground is saturated or frozen, as applicable.
- 3.4 The User **shall not** directly release the reclaimed water to any surface waters of the State of Washington or any wetland within the City of Blaine as defined by the City's Critical Areas Ordinance.
- 3.5 The penalty for violation of the terms and conditions of this Agreement or any of the criteria established in the Washington State Department of Ecology/Health, Water Reclamation and Reuse Standards, is immediate termination of service.
- 3.6 Notification and Signage. The User shall notify the residents, and the User's agents who have physical contact with reclaimed water of the use of reclaimed water, that the reclaimed water is not potable and shall not be used for drinking. This notification shall, at a minimum, include the use of appropriate advisory signage posted at sites using reclaimed water. Design and location shall be submitted to the City (see Section 3.8). The User shall be responsible for obtaining, installing, maintaining, and ensuring that signs are properly posted in accordance with the applicable rules pertaining to such signage for the life of the Agreement.
- 3.7 Color-coding of piping, valves, outlets and other appurtenances. These appurtenances (pipes, valves, outlets) of the conveyance system in (see Section 2.2) shall be color-coded purple depicting that such system components are using reclaimed water. The purple color shall be Pantone 522 or other shades of purple acceptable to the City.
- 3.8 The User shall provide to the City Public Works Department a signage and color coding plan for review and approval within 60 days of executing this Agreement. The

approved plan must be implemented prior to delivery of reclaimed water by the City. Maintenance, replacement and any expansion of future signage or reclaimed water facilities/fixtures on the User's property will be the sole responsibility of the User.

- 3.9 The User shall also comply with the following additional general requirement, obligations, conditions and limitations:
- A. Maximum attainable separation between reclaimed water lines and potable water lines shall be practiced. A minimum separation of five (5) feet shall be maintained between reclaimed water lines and potable water lines. Vertical separation from the potable water line shall be above the reclaimed water line, unless otherwise approved.
 - B. All reclaimed water valves and outlets shall be of a type or secured in a manner that permits operation only by authorized personnel.
 - C. No cross-connection with the potable water system, including hose bibs, shall be allowed.
 - D. Standard hose bibs on reclaimed water lines are prohibited. Hoses, if any, shall have a special connection to the reclaimed water system.
 - E. Adequate measures shall be taken to prevent the breeding of vectors of health significance and the creation of odors, slimes, or aesthetically displeasing deposits.
 - F. The User shall not sell, transfer, gift or convey the reclaimed water to any other third person or party.
 - G. The User understands that reclaimed water has restricted uses and agrees to use it only upon its own premises, under its direct control, and in accordance with all applicable laws, regulations and rules existing or adopted during the life of this Agreement.

4. Right of Entry/Inspection

In accordance with RCW 90.46.230, User hereby grants the City and its duly authorized employees, agents, representatives and contractors, reasonable access to User's land as identified in Section 2.8.2 for purposes of making any necessary installation and/or inspection of ground water quality monitoring equipment and any necessary inspection of, including, but not limited to: meter reading; cross-connection control devices; backflow prevention devices and verification of reclaimed water use and use patterns consistent with the obligations and restrictions in Section 3. In the course of making said inspection, City shall interfere as little as possible with User's use and enjoyment of said land.

of the mediator. Each party shall bear their own costs of mediation. If the Court does not appoint a mediator, or if either notifies the other party that mediation will likely not be successful, then there is no obligation to undertake mediation thereafter.

B. Arbitration. In the event the parties are unable to resolve a dispute pursuant to the procedures set forth in Section 6.5.A above, then the dispute shall be submitted to mandatory and binding arbitration. The parties shall agree to an arbitrator. In the event the parties are unable to agree to an arbitrator, within thirty (30) days of such disagreement either party may apply to the Whatcom County Superior Court requesting the court appoint an arbitrator pursuant to Chapter 7.04A RCW. Each party shall bear the cost of preparation and presentation, including attorneys' fees and expert witness fees, of its case before the arbitrator, and each party shall split equally the cost of the arbitrator and the administrative cost of the arbitration. The decision of the arbitrator shall be binding and final on the parties, and may be entered as a judgement in the Whatcom County Superior Court.

- 6.6 Entire Agreement. This Agreement and attached exhibits shall constitute the entire agreement between the parties as of the date of this Agreement with respect to the subject matter covered by this Agreement, and shall supersede all prior agreements related to the specific use of reclaimed water. No promises, covenants, or other obligations shall be implied in this Agreement that are not expressly addressed in this Agreement.
- 6.7 Severability. If any legal authority having the proper jurisdiction deems any portion of this Agreement not to be enforceable, invalid or illegal, all portions of this Agreement not so identified shall remain in full force and effect.
- 6.8 Termination. This Agreement shall remain in effect for the duration identified in Section 1, Term. The City or the User may terminate this Agreement for convenience upon three (3) months' advance written notice. See Section 2.6.
- 6.9 Breach. If either party breaches any of the terms and conditions of this Agreement, or violates any term of the Blaine Municipal Code, the other party shall send written notice of the breach to the breaching party. Examples of breaches include refusal to adhere to conservation protocols, using more reclaimed water than allowed in the Agreement, using reclaimed water for any purpose not mentioned in this Agreement, and the discharging of waste into the reclaimed water system. The breaching party shall have ten (10) days from the date of receipt of said notice to take significant corrective action. If the breach is material and if said action is not taken within ten (10) days, or if said action has been taken previously but has not resulted in an elimination of the breach within a reasonable time as determined by the non-breaching party, the non-breaching party may, in addition to any other remedies provided by law, terminate this Agreement.
- 6.10 Captions. The captions of this Agreement shall have no effect on the interpretation of this Agreement.
- 6.11 Binding Nature. This Agreement touches and concerns the land identified in Exhibit 1 and is intended by the parties to run with the land. The City will record this

Gleneagle Villas
Reclaimed Water User Agreement


Agreement with the Whatcom County Auditor. This Agreement shall be binding on the heirs, successors, lessees, sublessees, and assigns of the parties. This Agreement shall be bound to the real property as identified herein. The User shall not sell, assign or transfer the User's interest in this Agreement, or assign, sell, or transfer the reclaimed water identified hereunder, without the City's approval.

- 6.12 Amendments. Any waiver or modification of the terms of this Agreement must be in writing. This Agreement and any subsequent amendments shall not be effective until executed by both parties.
- 6.13 Waiver. Waiver by any of the parties of any default shall not be deemed to be a waiver of any subsequent default. Waiver by either of the parties of a breach of any provision of this agreement shall not be deemed to be a waiver of any other or subsequent breach and shall not be construed to be a modification of the terms of this agreement.
- 6.14 Severability. If any provision of this agreement or its application to any circumstance is held invalid, the remainder of the agreement or the application to other circumstances shall not be affected.
- 6.15 Counterparts. This Agreement may be executed in two or more counterparts each of which shall be deemed an original, but all of which together shall constitute one and the same Agreement.

IN WITNESS THEREOF, the parties hereto have caused this Agreement to be executed by these offers thereunto duly authorized.

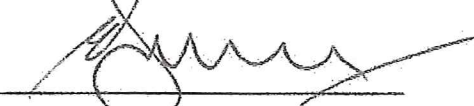
DATED this 6th day of June, 2013

City of Blaine

By: 
Gary R. Tomsic, ^{POW}
City Manager

Date: 6-6-13

**Gleneagle Villas
Condominium Association**

By: 
Scott A Brown
Board president

Date: 6/20/13

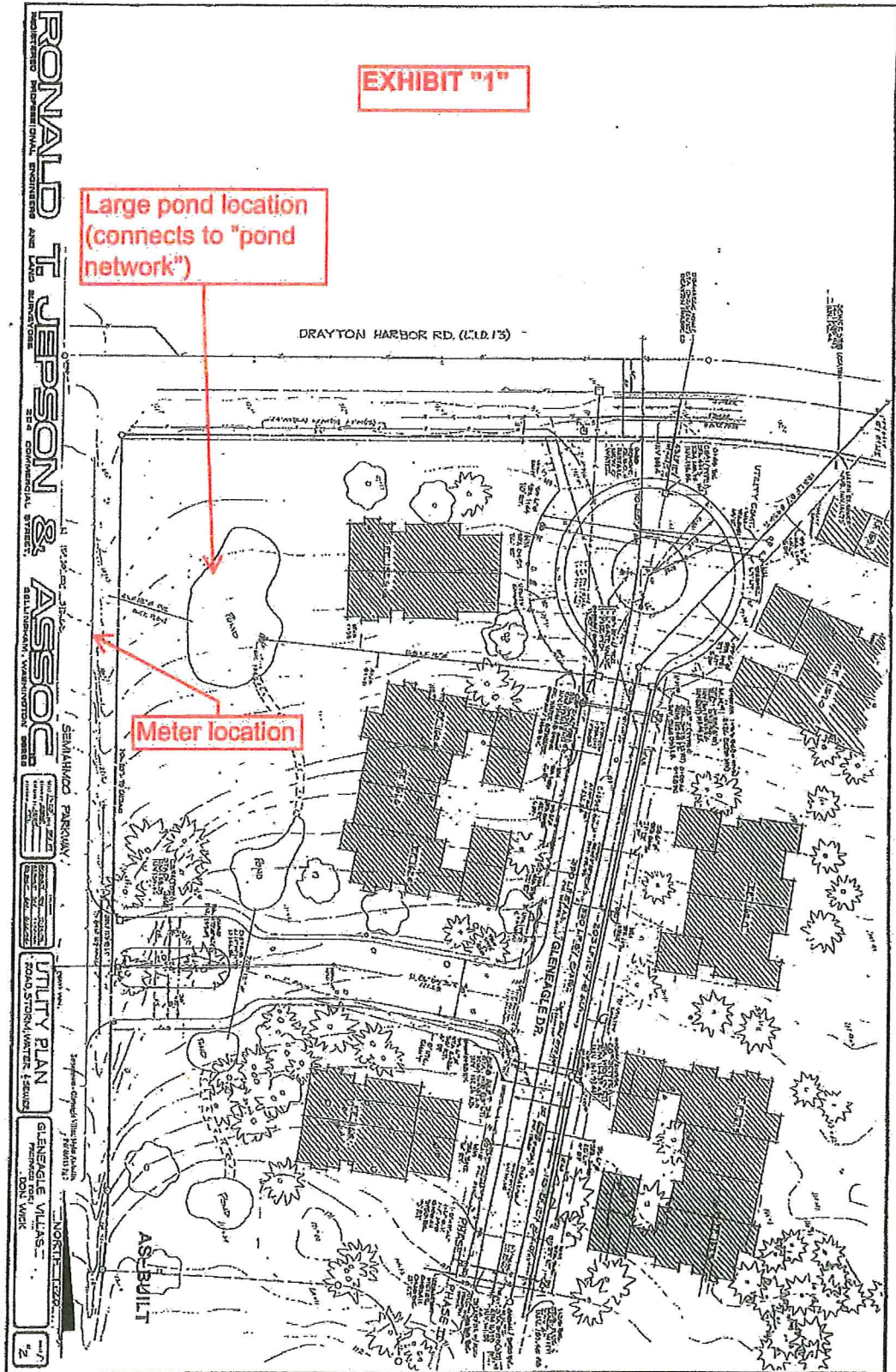
Attested: 
By: 
Sheri Sanchez, City Clerk

Date: 6/6/13

EXHIBIT "1"

Large pond location
(connects to "pond
network")

Meter location





**RECLAIMED WATER SERVICE AND USE AREA AGREEMENT
BETWEEN THE CITY OF BLAINE AND SEMIAHMOO RESORT COMPANY, L.L.C.**

This Reclaimed Water Service and Use Agreement is made and entered into this 30th day of June 2011, between the City of Blaine, a Washington municipal corporation (hereinafter referred to as "the City") and Semiahmoo Resort Company, L.L.C. (hereinafter referred to as "the User"), together referred to as the "parties".

WHEREAS, Washington State Law encourages the use of reclaimed water "to replace potable water in non-potable applications, to supplement existing surface and groundwater supplies, and to assist in meeting the future water needs of the State"; and

WHEREAS, the City owns and operates the City of Blaine's Lighthouse Point Water Reclamation Facility (hereinafter referred to as "LPWRF"), which generates Class A reclaimed water, as defined in RCW 90.46; and

WHEREAS, the use of reclaimed water in Blaine is regulated by National Pollution Discharge Elimination System (NPDES) Permit #WA-002264-1 issued by the State Department of Ecology on November 2, 2007, amended to address reclaimed water on June 25, 2010 and further modified from time to time (hereinafter referred to as the "City Permit"); and

WHEREAS, the City has developed a Reclaimed Water Plan entitled "Requirements for Reclaimed Water Use", dated January, 2010, attached hereto by reference; and

WHEREAS, the City has received from the State Department of Ecology a grant for the construction of pumps and pipes to deliver reclaimed water to the User; and

WHEREAS, the reclaimed water piping plans to deliver reclaimed water to the User have been approved by the Washington State Department of Health and by the Department of Ecology; and

WHEREAS, the City desires to promote and make available reclaimed water and has adopted by City ordinance a reclaimed water program that includes policy guidelines and associated pricing structure in the Unified Fee Schedule for the use of reclaimed water produced by the City ("Reclaimed Water Program"); and

WHEREAS, the User has identified potential beneficial uses of reclaimed water and wishes to secure a commitment from the City to provide reclaimed water service to its properties, including the Semiahmoo Golf Course, as depicted in Exhibit 1 attached hereto; and

WHEREAS, the User agrees that the use of reclaimed water will benefit the environment and help the City meet water conservation goals by reducing withdrawals of groundwater from the Blaine aquifer;

NOW, THEREFORE, in consideration of the recitals and the mutual promises and covenants contained herein, the City agrees to supply reclaimed water and the User agrees to purchase reclaimed water under the following terms and conditions:

TERMS AND CONDITIONS

The City agrees to provide reclaimed water and User agrees to pay the City for the use of said reclaimed water, according to the following terms and conditions:

1. Term

The term of this Agreement is ten (10) years, renewable every five (5) years thereafter, commencing on the effective date of this Agreement, unless terminated earlier as allowed herein.

2. Supply and Sale of Reclaimed Water

2.1 Quality. The User understands that the reclaimed water is not potable. The City shall make reasonable efforts to provide Class A Reclaimed Water, as defined in the *Water Reclamation and Reuse Standards* (DOE and DOH 1997). The City makes no other representation concerning the quality of the reclaimed water and makes no express or implied warranties whatsoever other than the following:

2.1.1 The City's Lighthouse Point Water Reclamation Facility uses a membrane bioreactor (MBR) treatment technology to filter wastewater to reclaimed water quality standards and delivery system is designed to stop delivery of reclaimed water to the User should the quality of water not meet Class A standards.

2.2 Delivery. The City will deliver reclaimed water to the User through the conveyance system which connects to the User's wet well and from there into **pond 12**, the large water feature on the 12th hole of the course, which is currently supplied with potable water (see Exhibit 2). The City has installed and will maintain a reclaimed water meter on the outlet side of the conveyance system, to measure with reasonable accuracy the quantity of reclaimed water supplied to the User for billing purposes.

2.3 Backflow Prevention. The reclaimed water service has been designed to be physically separated from the potable water supply while in operation. If potable water is to be supplied at any time in lieu of reclaimed water, the City shall make reasonable efforts to ensure that the reclaimed water shall be physically separated from the delivery system. The User shall continue to ensure that delivery to the pond is separated by an air gap.

2.4 Quantity and Service. The City produces a limited quantity of Class A reclaimed water at its Lighthouse Point Water Reclamation Facility. The total amount of reclaimed water available is dependent on the number of sewer customers. The total amount of water that is available is a factor of the plant's flow and the amount of reclaimed water being consumed at any given time by the number of sewer customers connected to the system. Therefore the User is limited to the flow rate and volume as specified in this Section. Subject to the limits of the storage capacity of Pond 12, the City will make reasonable attempts to deliver, through a water meter,

200,000 gallons per day of reclaimed water for use in User's irrigation system. The City will make every attempt to supply this amount of reclaimed water or to keep pond 12 full, whichever comes first, but this Agreement does not guarantee that the User will receive this daily amount of reclaimed water under all circumstances and at all times.

- 2.5 In the event delivery is prevented or affected by a cause outside of City's control, including, but not limited to, acts of God, shortage of wastewater, malfunction or upset of the City's system, actions of a third party, an order by a governmental regulatory authority or court; or in the event of emergency repairs or other necessary work, or whenever the public health or safety so demands; or any Force Majeure condition or situation; or if the City determines, in good faith, that any aspect of the parties' performance hereunder may be contrary to law; the City may change, reduce or limit the time for or temporarily discontinue the supply of Class A Reclaimed Water to the User. Before so changing, reducing, limiting or discontinuing the supply of Class A Reclaimed Water to the User, the City shall, insofar as practicable, notify the User. The City shall not be responsible for any damage resulting from interruption or change of the Class A Reclaimed Water supply, or for any damages incurred by the User arising out of the use or transportation of the Class A Reclaimed Water.
- 2.6 In the event that the City cannot deliver Class A Reclaimed Water to the Use Location, through no fault of the User, for a period exceeding seventy-two (72) continuous hours, then the City will provide a back-up water source only to the extent needed to irrigate the Use Location (not to exceed the quantity specified in Section 2.4) and only up to a maximum of ninety (90) days. If the inability to deliver Class A Reclaimed Water is due to the actions, omissions or willful conduct of the User, its representatives, agents, employees or volunteers, then the obligation stated herein to provide a back-up water source shall not be triggered.
- 2.7 In the event that the City cannot deliver Class A Reclaimed Water to the Use Location for more than ninety (90) days, then the City may terminate this agreement and shall be under no further obligation to provide Class A Reclaimed Water or a back-up water source under this Agreement. If after ninety (90) days reclaimed water is still not available and this agreement is terminated as allowed above, the City will reconnect the existing 6" potable water service downstream of the backflow preventer to allow potable water delivery to the User's irrigation system. The User will be responsible for paying all potable water charges at City retail potable water rates.
- 2.8 Water Right. No water right or any contractual right to water is created by this Agreement.
- 2.9 Beneficial Use of Reclaimed Water
- 2.9.1 Use. The User may use the reclaimed water only for irrigation of lawns and landscaping areas associated with the Semiahmoo Golf Course. Irrigation shall be applied with demands that generally do not exceed the quantity of reclaimed water as established in Section 2.4 of this Agreement.
- 2.9.2 Use Location. The reclaimed water shall only be used on the property as shown on Exhibit 1. This property is Parcel 8 of Semiahmoo Lot Line

Adjustment of Whatcom County Auditor's File Number 2031000016, approximately 162 acres of real property, generally known as the Semiahmoo Golf Course. Application of reclaimed wastewater on any other property or at any other location than shown on Exhibit 1 shall not be permitted without the written approval of the City.

- 2.9.3 Designated maintenance and operations personnel. The User has designated the following person as being responsible for maintenance and operation of the User's irrigation facilities and prevention of non-permitted uses of the reclaimed water:

Name: Vance Much, Director of Turf Management

Address: Semiahmoo Golf Course and Country Club
8720 Semiahmoo Pkwy
Blaine, WA, 98230

Phone Number: (360) 371-0606 Mobile: (360) 661-5709

The User will inform the City in writing of any personnel changes which necessitate a change in the above designee.

- 2.10 Future Repairs and Improvement. Any and all onsite system improvements, including supplies, or repairs to the reclaimed water system on the User's property, shall be borne by the User. This includes piping, sprinkler heads, hoses, signage, etc. The User shall contact the City for the specifications of approved materials (see Section 3.9).

3. User's Obligations and Restrictions on Use of Reclaimed Water

- 3.1 The User shall at all times comply with the use restrictions of reclaimed water contained in RCW 90.46 and the most current edition of the following joint Washington State Department of Ecology and Department of Health publication:
- 3.1.1 *The Water Reclamation and Reuse Standards*
(<http://www.ecy.wa.gov/programs/wq/reclaim/advisorycommittee/standards.pdf>),
- 3.2 The User shall not allow reclaimed water to be sprayed on people, drinking water fountains, areas of consumption of food or liquids by humans or pets, and/or any other area not designated for application of reclaimed wastewater. Such an occurrence may constitute a health violation under RCW 90.46.250.
- 3.3 There shall not apply or use reclaimed water for irrigation purposes when the ground is saturated or frozen.
- 3.4 The User **shall not** directly release the reclaimed water to any surface waters of the State of Washington or any wetland within the City of Blaine as defined by the City's Critical Areas Ordinance.
- 3.5 Use of reclaimed water for irrigation purposes shall be at normal agronomic rates for the types of plants and vegetation being irrigated. Agronomic rate is defined as that amount of water required for plant or vegetation growth without saturation of the

underlying soils. The City has completed and attached a detailed water balance analysis as required by DOH and attached that information as **Exhibit 3**. To prevent over-watering, the User shall actively monitor irrigation controllers to ensure that reclaimed water is not applied during periods of rainfall.

- 3.6 The User must ensure that reclaimed water is not applied faster than the local soil can infiltrate. The User must ensure that the use of reclaimed water for irrigation adheres to *The Water Reclamation and Reuse Standards*. The existing pond irrigation system using potable water make-up has been in operation for 25 years and has been adjusted to ensure that ponding does not occur during irrigation. Should ponding occur in the future under this Agreement, the City reserves the right to require the User to change the irrigation amount or pattern to eliminate the ponding and to temporarily suspend service until this has been corrected.
- 3.7 The penalty for violation of the terms and conditions of this Agreement or any of the criteria established in the Washington State Department of Ecology/Health, Water Reclamation and Reuse Standards, is immediate termination of service.
- 3.8 Notification and Signage. The User shall notify the general public, and the User's employees and agents who have physical contact with reclaimed water of the use of reclaimed water, that the reclaimed water is not potable and shall not be used for drinking. This notification shall, at a minimum, include the use of appropriate advisory signage posted at sites using reclaimed water. Design and location shall be submitted to the City (see **Section 3.10**). The User shall be responsible for obtaining, installing, maintaining, and ensuring that signs are properly posted in accordance with the applicable rules pertaining to such signage for the life of the Agreement. Additional information and notification is encouraged to adequately apprise the public of the use of reclaimed water as an irrigation source. Examples of additional notification include, but are not limited to, notices on golf scorecards, posting on employee break room notice boards, and reminders to homeowners through association flyers, additions to informational kiosks, etc.
- 3.9 Color-coding of piping, valves, outlets and other appurtenances. Because the User is converting an existing non-potable irrigation system, the existing pipes, valves, and appurtenances will be allowed to continue in use. Any future replacements of any of these appurtenances shall be color-coded purple depicting that such irrigation system components are using reclaimed water for irrigation. The purple color shall be Pantone 522 or other shades of purple acceptable to the City. All irrigation heads and valve boxes should be replaced by the User as soon as possible with purple ones to identify them as using reclaimed water. Whenever the User plans on modifying or extending the irrigation system, a plan shall be submitted to the City for review and approval of proper placement and proper signage and/or color coding.
- 3.10 The City agrees to reimburse the User by means of a credit up to \$5000 on reclaimed water delivered toward the initial development and fabrication of advisory and informational signage and color-coding of appurtenances. The User shall provide to the City Public Works Department a signage and color coding plan for review and approval within 60 days of executing this Agreement. The approved plan must be implemented prior to delivery of reclaimed water by the City. Reimbursement credit will be made by the City based on invoices paid by the User for items on the approved plan. Maintenance, replacement and any expansion of

future signage or reclaimed water facilities/fixtures on the User's property will be the sole responsibility of the User.

3.11 The User shall also comply with the following additional general requirement, obligations, conditions and limitations:

- A. Maximum attainable separation between reclaimed water lines and potable water lines shall be practiced. A minimum separation of five (5) feet shall be maintained between reclaimed water lines and potable water lines. Vertical separation from the potable water line shall be above the reclaimed water line, unless otherwise approved.
- B. All reclaimed water valves and outlets shall be of a type or secured in a manner that permits operation only by authorized personnel.
- C. No cross-connection with the potable water system, including hose bibs, shall be allowed.
- D. Standard hose bibs on reclaimed water lines are prohibited. Hoses, if any, shall have a special connection to the reclaimed water system.
- E. Adequate measures shall be taken to prevent the breeding of vectors of health significance and the creation of odors, slimes, or aesthetically displeasing deposits.
- F. The User shall not sell, transfer, gift or convey the reclaimed water to any other third person or party.
- G. The User understands that reclaimed water has restricted uses and agrees to use it only upon its own premises, under its direct control, and in accordance with all applicable laws, regulations and rules existing or adopted during the life of this Agreement.

4. Right of Entry/Inspection

In accordance with RCW 90.46.230, User hereby grants the City and its duly authorized employees, agents, representatives and contractors, reasonable access to User's land as identified in Section 2.9.2 for purposes of making any necessary installation and/or inspection of ground water quality monitoring equipment and any necessary inspection of, including, but not limited to: meter reading; cross-connection control devices; backflow prevention devices and verification of reclaimed water use and use patterns consistent with the obligations and restrictions in Section 3. In the course of making said inspection, City shall interfere as little as possible with User's use and enjoyment of said land.

5. Price of Reclaimed Water

User shall pay the City **80% of the potable water Tier 2 billing rate**, as published in the City's Unified Fee Schedule, on a volume basis (ccf), as measured at the City's reclaimed water meter. The City shall bill on a monthly basis and User shall pay the amount due based upon the metered flow and said rate specified in the Unified Fee Schedule. Billing shall be less the one-time credit given to the User under **Section 3.10** of this agreement. The price charged by the City for the use of the reclaimed water may change as the cost of providing the reclaimed water changes. Any change in rates may occur upon adoption of a rate change by the City Council effective on the date established by the City Council, and shall not require a change in this Agreement. In the event that potable water is temporarily supplied in place of unavailable reclaimed water under the provisions of **Section 2.7**, through no fault of the User, that water will be supplied at no increased cost to the User.

6. Miscellaneous Provisions

- 6.1 **Disclaimer.** The City shall not be liable to the User for any loss or damage of property, vegetation or plants due to reduced or interrupted flow including, but not limited to, damages paid to third parties, incurred by the User arising out of the use or transportation of the reclaimed water which is the subject of this Agreement.
- 6.2 **Indemnification.** To the fullest extent permitted by Laws and Regulations, the User shall defend, indemnify, and hold harmless the City, its officers, employees, agents, representatives and consultants from and against all claims, demands, penalties and causes of action of any kind or character, including the cost of defense thereof, including attorney fees, arising out of or relating to any permit violation, personal injury, death, breach of contract or damage to property arising out of the User's use of the reclaimed water or any suspension of reclaimed water service by the City except to the extent such is caused by the City's sole negligence. This paragraph shall survive termination of this Agreement under **Sections 2.7 and 6.8**.
- 6.3 **Remedies.** The parties agree that each parties sole and exclusive remedy in the event of a breach of any term or condition of this Agreement shall be specific performance, and that neither party shall be entitled to monetary damages of any kind or nature, including without limitation lost profits, monetary damages, and consequential damages, for breach of this Agreement, except for those damages set forth specifically in **Section 6.8** below, and provided further that this limitation shall not act as a bar to the City's the collection of unpaid water fees to the City and interest and late charges, and attorneys fees for the collection of such unpaid charges.
- 6.4 **Applicable Law/Venue.** This Agreement shall be construed and interpreted in accordance with the laws of the State of Washington. The venue of any dispute shall be Whatcom County Superior Court, subject to the provisions of 6.4 below.

6.5 Dispute Resolution.

- A. Mediation. In the event of any dispute arising between the parties relating to or arising from this Agreement, any such dispute shall, at the request of either party, be submitted to mediation. In the event that mediation becomes necessary, the parties shall mutually agree upon a mediator to assist them in resolving their differences. If the parties are unable to agree upon a mediator, then they shall apply to the Whatcom County Superior Court to appoint a mediator within 30 days. The parties shall equally share the costs of the mediator. Each party shall bear their own costs of mediation. If the Court does not appoint a mediator, or if either notifies the other party that mediation will likely not be successful, then there is no obligation to undertake mediation thereafter.
- B. Arbitration. In the event the parties are unable to resolve a dispute pursuant to the procedures set forth in Section 6.4.A above, then the dispute shall be submitted to mandatory and binding arbitration. The parties shall agree to an arbitrator. In the event the parties are unable to agree to an arbitrator, within thirty (30) days of such disagreement either party may apply to the Whatcom County Superior Court requesting the court appoint an arbitrator pursuant to Chapter 7.04A RCW. Each party shall bear the cost of preparation and presentation, including attorneys' fees and expert witness fees, of its case before the arbitrator, and each party shall split equally the cost of the arbitrator and the administrative cost of the arbitration. The decision of the arbitrator shall be binding and final on the parties, and may be entered as a judgement in the Whatcom County Superior Court.

- 6.6 Entire Agreement. This Agreement and attached exhibits shall constitute the entire agreement between the parties as of the date of this Agreement with respect to the subject matter covered by this Agreement, and shall supersede all prior agreements related to the specific use of reclaimed water. No promises, covenants, or other obligations shall be implied in this Agreement that are not expressly addressed in this Agreement.
- 6.7 Severability. If any legal authority having the proper jurisdiction deems any portion of this Agreement not to be enforceable, invalid or illegal, all portions of this Agreement not so identified shall remain in full force and effect.
- 6.8 Termination. This Agreement shall remain in effect for the duration identified in Section 1, Term. The City may terminate this Agreement for convenience upon three (3) months' advance written notice. See Section 2.7. The User may not terminate this Agreement, unless the following first occurs prior to the effective date of the termination, (1) the User has provided the City one (1) year advance written notice, (2) the User has fully reimbursed the City for all expenses, costs and obligation incurred by the City arising from the User's termination of the Agreement, including repayment of any grants obtained for the City's wastewater treatment system that the City is obligated to repay in full or in part, and (3) the City has first obtained any necessary wastewater discharge permit or other permit approvals or modifications necessitated by the anticipated termination of the Agreement by the User.


- 6.9 Breach. If either party breaches any of the terms and conditions of this Agreement, or violates any term of the Blaine Municipal Code, the other party shall send written notice of the breach to the breaching party. Examples of breaches include refusal to adhere to conservation protocols, using more reclaimed water than allowed in the Agreement, using reclaimed water for any purpose not mentioned in this Agreement, and the discharging of waste into the reclaimed water system. The breaching party shall have ten (10) days from the date of receipt of said notice to take significant corrective action. If the breach is material and if said action is not taken within ten (10) days, or if said action has been taken previously but has not resulted in an elimination of the breach within a reasonable time as determined by the non-breaching party, the non-breaching party may, in addition to any other remedies provided by law, terminate this Agreement.
- 6.10 Captions. The captions of this Agreement shall have no effect on the interpretation of this Agreement.
- 6.11 Binding Nature. This Agreement touches and concerns the land identified in Exhibit 1 and is intended by the parties to run with the land. The City will record this Agreement with the Whatcom County Auditor. This Agreement shall be binding on the heirs, successors, lessees, sublessees, and assigns of the parties. This Agreement shall be bound to the real property as identified herein. The User shall not sell, assign or transfer the User's interest in this Agreement, or assign, sell, or transfer the reclaimed water identified hereunder, without the City's approval.
- 6.12 Amendments. Any waiver or modification of the terms of this Agreement must be in writing. This Agreement and any subsequent amendments shall not be effective until executed by both parties.
- 6.13 Waiver. Waiver by any of the parties of any default shall not be deemed to be a waiver of any subsequent default. Waiver by either of the parties of a breach of any provision of this agreement shall not be deemed to be a waiver of any other or subsequent breach and shall not be construed to be a modification of the terms of this agreement.
- 6.14 Severability. If any provision of this agreement or its application to any circumstance is held invalid, the remainder of the agreement or the application to other circumstances shall not be affected.
- 6.15 Counterparts. This Agreement may be executed in two or more counterparts each of which shall be deemed an original, but all of which together shall constitute one and the same Agreement.

IN WITNESS THEREOF, the parties hereto have caused this Agreement to be executed by these offers thereunto duly authorized.

DATED this 28th day of June, 2011

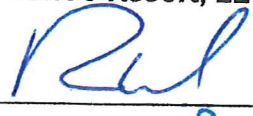
Semiahmoo Golf Course
Reclaimed Water User Agreement

City of Blaine

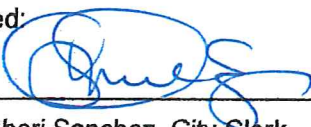
By: 
Gary R. Tomsic,
City Manager

Date: 6-30-11

Semiahmoo Resort, LLC

By: 
~~Bob Hayden~~ Rick Swanson
General Manager

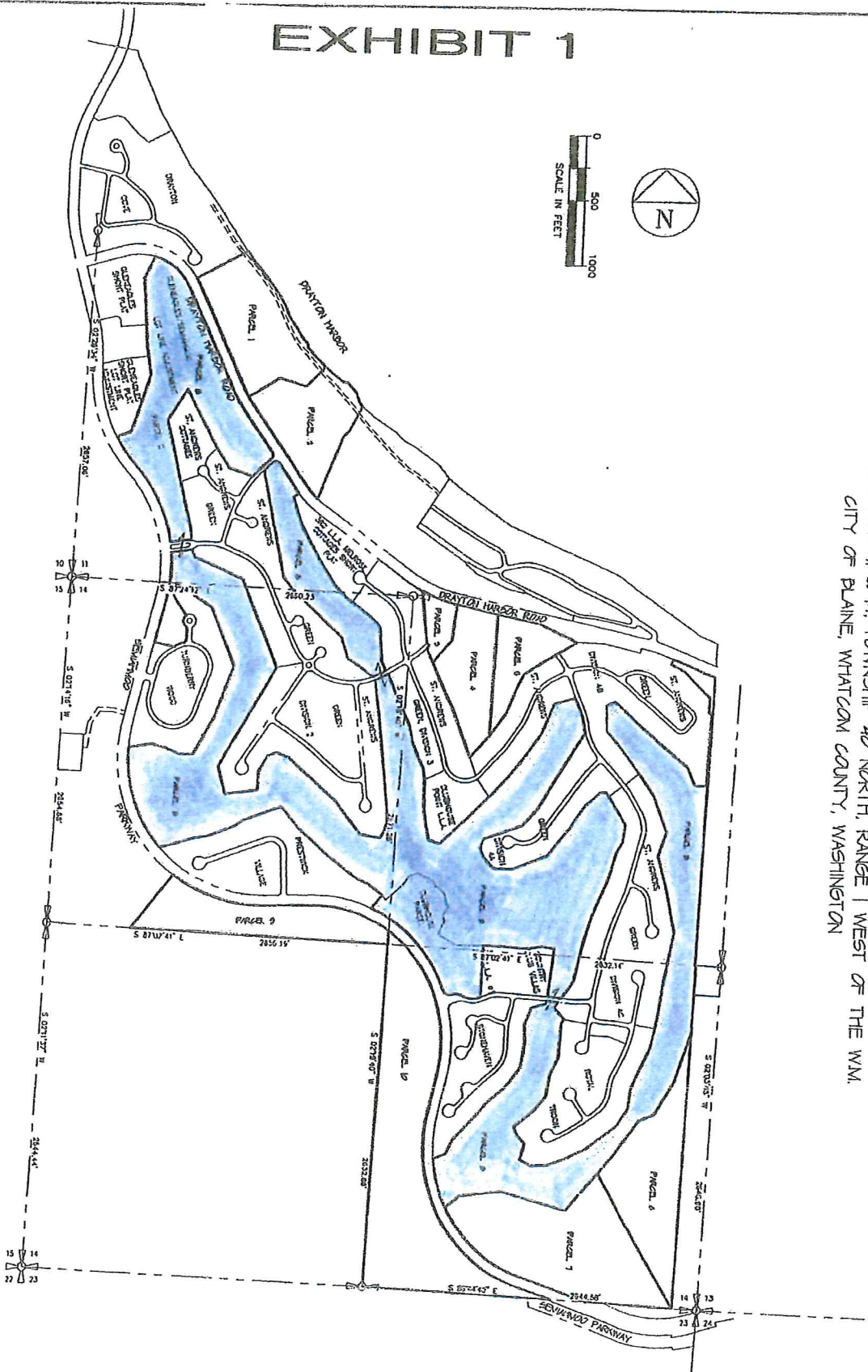
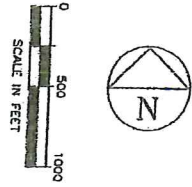
Date: 6/28/11

Attested:
By: 
Sheri Sanchez, City Clerk

Date: 7/1/11

2031000016
SEMAHMOO LOT LINE ADJUSTMENT
 PORTIONS OF SECTIONS 11 & 14, TOWNSHIP 40 NORTH, RANGE 1 WEST OF THE W.M.
 CITY OF PLAIN, WHATCOM COUNTY, WASHINGTON

EXHIBIT 1

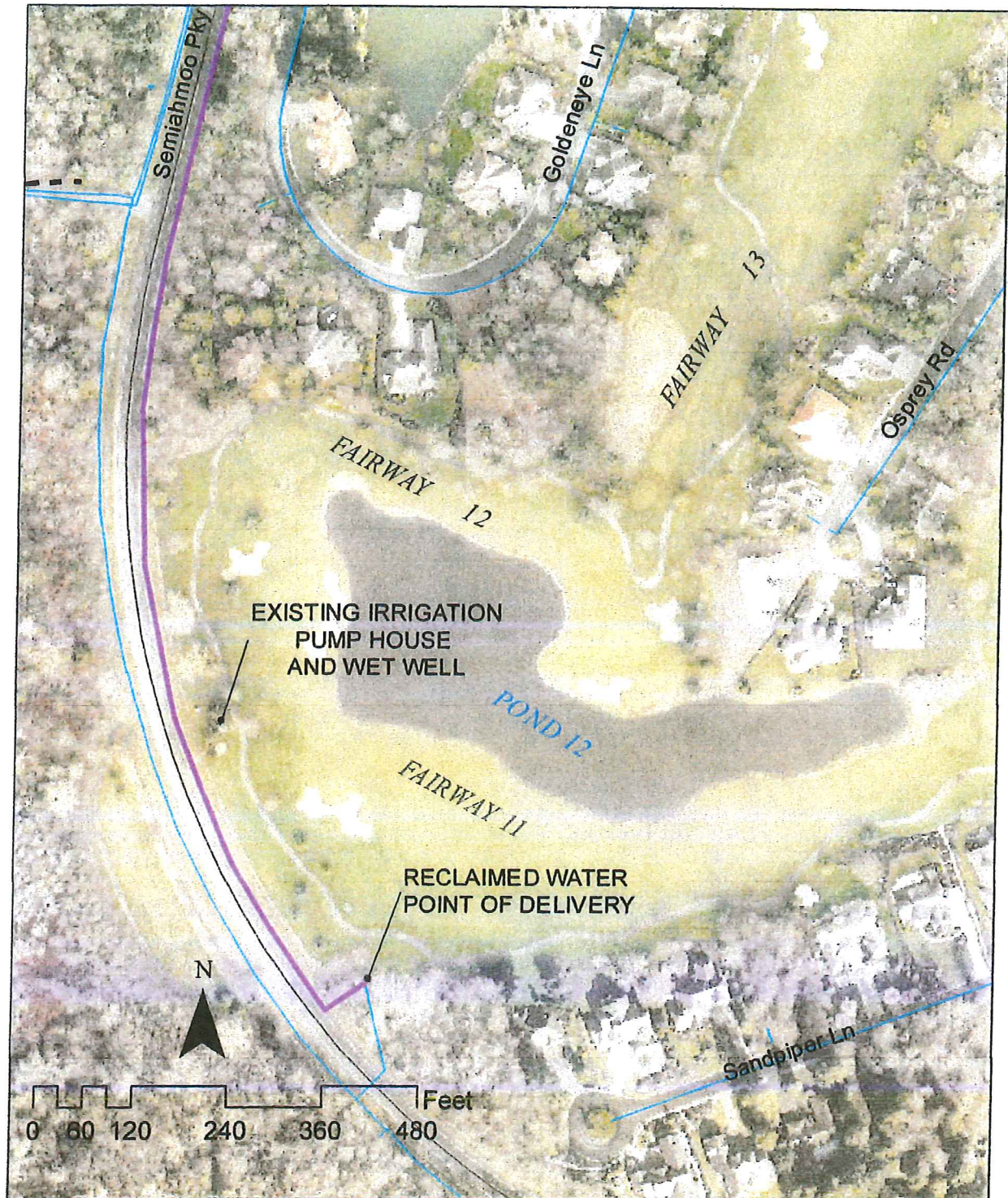


**DAVID EVANS
 AND ASSOCIATES INC.**
 170 Grand Avenue, Suite D
 Bellingham, Washington 98225
 Phone: 360.867.7181

SEMAHMOO LOT LINE ADJUSTMENT

Scale: 1" = 500'	Drawn By: SLC	Date: 08/27/03	Job No.: RLX0100
Checked By: CPBW			Sheet: 5 of 9

EXHIBIT 2



MAP SHOWING SEMIAHMOO GOLF COURSE
RECLAIMED WATER POINT OF DELIVERY





EXHIBIT 3

IRRIGATION WATER BALANCE

Worksheet Legend
Data Input Required
Calculated Value
Design Requirement
Irrigation Season

Utility Name:	City of Blaine Public Works Department
Project Name:	Reclaimed Water Permit Application - LPWRF to Semiahmoo Golf Course
Project Location:	Blaine
County:	Whatcom
Date Source - Crop Consumptive Use	Washington Irrigation Guide, USDA - National Engineering Manual, Appendix A
Crop:	Assumed Pasture/Turf (most similar to planted crop)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Temp °F:	31	28	31	30	31	30	31	31	30	31	30	31	365
Total Precipitation, Inches:	36.2	40.3	43.0	47.8	55.7	58.7	61.7	61.5	56.9	49.6	42.6	38.2	NA
Effective Precipitation, Inches:	5.35	4.34	3.60	2.83	2.20	1.81	1.25	1.58	2.20	3.93	5.82	6.02	40.73
Monthly Crop Irrigation Requirement (CIR), Inches:	0.06	0.57	1.38	1.71	1.57	1.30	0.93	1.14	1.48	1.26	0.28	0.00	11.69

Historical Potable Water Augmentation (Pond 12)

2005	0	3195	4800	3445	0	ccf
2006	1187	3770	5465	9645	1140	ccf
2007	2000	1670	3625	4900	0	ccf
2008	0	1470	7690	1420	1295	ccf
2009	0	9215	7145	4550	710	ccf
2010	0	5	6815	5310	0	ccf
Averages	531.2	3220.8	5940.0	4378.3	524.2	ccf
Averages	1.22	7.38	13.64	10.05	1.20	AF
Averages	397,340	2,409,347	4,443,423	3,275,216	392,103	gallons

Pond 12 Irrigated Areas (Acres)	
Greens	1.4
Tees	1.1
Fairways	14.0
Rough	45.0

Conversion Factors
1 AF = 325,851 gallons
1 AF = 435.6 ccf (100 cf)
1 CF = 7.48 gallons

Total Irrigated Area:	61.5 Acres
Monthly Crop Irrigation Requirement (CIR), Acre-feet:	
Irrigation Method	Fixed sprinkler system
Irrigation Efficiency	75.0%
Total Monthly Irrigation (Net) Requirement, acre-feet	
Pond 12 Monthly Irrigation Requirement (Net)	0.00

IRRIGATION REQUIREMENTS (In Acre-Feet)											
0.00	0.00	0.00	0.00	9.28	20.04	28.24	20.71	10.20	0.00	0.00	88.46

0.00	0.00	0.00	0.00	12.37	26.72	37.65	27.61	13.60	0.00	0.00	0.00	117.94
0.00	0.00	0.00	0.00	148.42	320.62	451.82	331.26	163.16	0.00	0.00	0.00	1415.32

Assume no leaching requirement

Maximum Irrigation Demand (gallons):

2,015,117	4,353,050	6,134,417	4,497,830	2,215,515
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19,215,977

Daily Reclaimed Water - Per Agreement:	200,000	gallons
Monthly Reclaimed Water - Per Agreement:	6,200,000	gallons

EXHIBIT 2



MAP SHOWING SEMIAHMOO GOLF COURSE
RECLAIMED WATER POINT OF DELIVERY



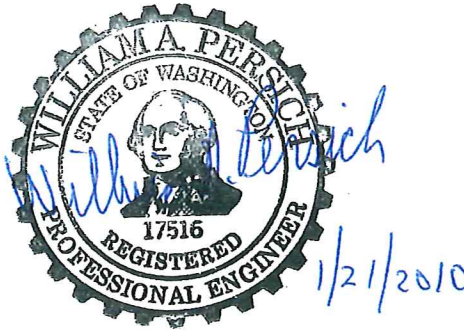
Reclaimed Water Engineering Report

701 Pike Street, Suite 1200
Seattle, Washington 98101
Tel: 206-624-0100
Fax: 206-749-2200

Prepared for: City of Blaine
Project Title: City of Blaine Reclaimed Water Program Review
Project No: 137110

Technical Memorandum/Engineering Report

Subject: Requirements for Reclaimed Water Use
Date: January 21, 2010
To: Steve Banham, City of Blaine Public Works Director
From: Bill Persich
Copy to: David Wingate, Rick Kelly
Prepared by: David Wingate
Reviewed by: Bill Persich and Rick Kelly

**Limitations:**

This document was prepared solely for City of Blaine in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Blaine and Brown and Caldwell dated February 24, 2009. This document is governed by the specific scope of work authorized by City of Blaine; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Blaine and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

1. INTRODUCTION

The Lighthouse Point Treatment Plant (Plant) is a membrane bioreactor plant that is currently designed to discharge membrane permeate into Semiahmoo Bay. Because the discharge will be of such high quality, the City has indicated several potential uses for the effluent from the Plant. This technical memorandum (TM) will focus on the required piping and equipment needed at the Plant for these potential reclaimed water uses.

2. DESIGN REQUIREMENTS

This section will describe the Plant's reclaimed water characteristics, requirements, potential uses of reclaimed water, and Plant flow and pressure limitations.

2.1 Reclaimed Water Characteristics

The Plant effluent is a membrane permeate and is expected to contain low levels of solids, BOD, and pathogens. Below, in Table 1, are the characteristics of the LOTT WWTP effluent, an MBR plant similar to the Lighthouse Point Treatment Plant.

Table 1: Effluent Characteristics of the LOTT WWTP	
BOD 5-DAY, mg/L	2.8
TSS, mg/L	2.0
pH, S.U.	7.0
Total Nitrogen, mg/L	5.7
Total Coliform, #/100 ml 7DMED	0.0

The total nitrogen for the Lighthouse Point Treatment Plant is expected to be higher than the LOTT WWTP. The LOTT WWTP is required to meet low total nitrogen limits. The Lighthouse Point Treatment Plant is expected to have a total nitrogen concentration of 10 mg/L.

2.2 Reclaimed Water Requirements

The requirements for reclaimed water in the state of Washington are regulated by the Department of Health (DOH) in conjunction with the Department of Ecology (DOE). These regulations are far-reaching, covering most potential applications of reclaimed water.

For the purpose of this TM, design requirements from the DOE *Criteria for Sewage Works Design 2006* were used. The applicable design requirements used in this TM can be found in Section E1-4.5.1: Chlorine Disinfection of this DOE document.

Criteria for Sewage Works Design sets two requirements for reclaimed water disinfection using chlorine:

- The state requires a minimum contact time (CT) of 30 minutes, based on a minimum free available chlorine residual of 1.0 mg/L at the end of the 30-minute contact time.

- A minimum residual chlorine concentration of 0.5 mg/L must be maintained at all locations within the distribution system.

This TM does not discuss requirements for spacing of piping needed to tie into existing systems.

2.3 Potential Uses of Reclaimed Water

The City has identified several potential end users for Plant reclaimed water, as shown in Table 2.

User	Instantaneous Peak Flow (gpm)	Instantaneous Peak Flow (MGD)
Semiahmoo Golf Course	300 ¹	0.43
Marine Drive Park irrigation	60 ^{2,6}	0.08
Peace Arch Park irrigation	50 ^{3,6}	0.07
Lighthouse Point irrigation	60 ⁴	0.08
Plant restrooms	53 ⁵	0.07
Plant hydrant	100 ⁷	0.14
Plant utility stations	90 ⁸	0.13
Industrial park	100 ⁹	0.14

1. Required flow will match existing City water flow metered solely for irrigation to ponds.
2. Average monthly flow calculated using USDA irrigation requirements for pasture in Blaine.
3. Average monthly flow based on meter readings provided by the City.
4. Required flow based on conversations with irrigation design engineer.
5. Required flow based on all toilets and urinals flushing simultaneously four times per minute.
6. Required flow is the peak hour flow derived by multiplying monthly average flow by a peaking factor of 3.
7. Flow based on the assumption that the hydrant will only be used to fill municipal equipment and will not be used in emergency situations.
8. The Plant has 16 low-pressure utility stations at 25 gpm each and 6 high-pressure utility stations at 40 gpm each. Equipment at the Plant has been sized assuming two low-pressure utility stations and one high-pressure utility station in operation.
9. Assumed flow. No data were provided to Brown and Caldwell on the expected water demand of the industrial park.

2.3.1 Semiahmoo Golf Course

The golf course is located across Drayton Harbor from the Plant. The golf course currently uses City water for irrigation of the 125-acre site. City water is pumped into two ornamental irrigation ponds where it is drawn down as required for irrigation. Currently the golf course staff very carefully manage their irrigation water consumption to ensure against overwatering the turf and to prevent irrigation water from passing beyond the root zone. Golf course staff control the use of irrigation water to match the agronomic uptake rates to minimize expenditures for water purchase and re-pumping and to ensure healthy and attractive turf. They monitor and adjust their water applications on a daily basis and have been successfully using wetting agents and soil aeration methods to reduce water consumption and ensure that water is quickly transferred to the root zone. Additionally, overwatering turf at golf courses tend to create soft ground easily damaged by golfers and golf carts, and also causes expensive applied nutrients to be unnecessarily flushed from the turf root zone before they can be taken up by the plants. Due to the frequency of tournament play at the golf course, staff tend to deliberately under-water the turf to stress the grass resulting in faster ball speeds on the greens. They closely measure ball speeds on the greens using a Stimpmeter to determine how much water to

use for irrigation. This use of reclaimed water would also follow these strict irrigation guidelines practiced by the golf course staff.

2.3.2 Marine Drive Park

Marine Drive Park is a community park that shares the Plant's eastern border. The 7-acre park currently uses City water to meet its irrigation requirements. In order for the irrigation systems to function properly, each sprinkler head must be provided with a pressure of 30 pounds per square inch (psi).

2.3.3 Peace Arch Park

Peace Arch Park is an international park jointly managed by the U.S. and Canada. The park is located roughly 0.5 mile northeast of the Plant. Irrigation needs are currently met using City water and require a minimum pressure of 30 psi to function. The City has indicated that connecting Peace Arch Park to reclaimed water would not occur during construction of the treatment plant and that this potential reclaimed water use may occur at a later date. A connection point for Peace Arch Park is addressed in this TM and the water requirements are included in the calculations.

The required flow for irrigation, as noted above, is based on historical data. When the historical data are compared to USDA estimates, the USDA requirements are roughly 8.5 times larger. If the USDA number were used in design calculations, the required pipe would be excessively large. Usage volumes estimated in this TM are based on historical City water records.

2.3.4 Lighthouse Point Irrigation

The Plant irrigation system is designed to provide reclaimed water to the 1-acre site. The irrigation system requires a minimum pressure of 30 psi at each sprinkler head.

2.3.5 Plant Restrooms

The Plant has two sets of restroom facilities: a public restroom open to those enjoying the park, which contains six toilets and two urinals, and a private facility within the Plant which contains one toilet. The discharge from the restrooms will return to the Plant headworks. This configuration will create a closed system where the flow is recirculated within the Plant. Therefore, reclaimed water demand for the restrooms will not contribute to total reclaimed water demand.

2.3.6 Plant Hydrant

The City has indicated a need for a reclaimed water hydrant to fill municipal equipment including street-sweeping trucks and water trucks. The new hydrant will be located next to an existing City water hydrant located in the southeast corner of the site. If the required pressure of 30 psi for irrigation is developed at the discharge of the hydrant, the design flow of 100 gpm will be exceeded. When municipal vehicles are filled, a flow meter and manually adjusted valve will be required to prevent excessive flows.

2.3.7 Plant Utility Stations

The City has requested that the Plant utility stations be connected to reclaimed water. The Plant operates two types of utility stations; one operates at a pressure of 35 psi and the other operates at a pressure of 70 psi. The pressure is increased by the utility water pump. Like the Plant restrooms, the discharge of the Plant utility stations will return to the Plant headworks.

2.3.8 Industrial Park

The City has indicated that the nearby industrial park is a potential user of reclaimed water. The City has indicated that connecting the industrial park to reclaimed water would not occur during construction of the treatment plant and that this reclaimed water use may occur at a later date. A connection point for the industrial park is addressed in this TM and the water requirements are included in the calculations.

As of the writing of this TM, Brown and Caldwell did not have information relating to the type, size, or water demand of the industrial park. Consequently, the 100-gpm flow used for peak instantaneous design flow is assumed.

2.4 Plant Flow and Pressure Limitations

Due to the projected influent flows to the Plant, not all of the proposed reclaimed water use sites will be able to receive the estimated reclaimed water flow at once. Table 3 shows projected Plant influent flows during startup.

Table 3: Projected Plant Startup Flows	
	Plant Flow (mgd)
Maximum month	1.11
Minimum month	0.49
Average month	0.62
Peak hour	2.70
Minimum day	0.3–0.4

During startup, projected influent flows will not meet expected demand of all potential end users. See Figure 1 below for a comparison of projected influent flows and reclaimed water demand.

The irrigation systems at the parks and the Plant require a minimum pressure of 30 psi. A design pressure of 50 psi will be used to take into account head losses that occur during pumping and conveyance. Typical methods for maintaining constant pressure at variable flows, hydropneumatic or elevated storage tanks, are not feasible due to the Plant design. The compact nature of the Plant prevents the installation of a properly sized hydropneumatic tank or an elevated storage tank. Two alternative methods for boosting pressure were examined.

3.1.1 Pumping Alternative 1: Use Existing Effluent Pumps

In order to achieve the required pressure for irrigation, a back-pressure regulating valve (PRV) could be placed on the discharge end of the Plant effluent pipe. The PRV induces a large head loss across the element causing the effluent pump to discharge at a higher pressure. The PRV would be set at the required design pressure, 50 psi.

3.1.2 Pumping Alternative 2: New Reclaimed Water Pump

In order to achieve the required pressure for irrigation, a new pump could be installed in the northwest corner of the lower floor of the Plant. The pump would draw off the effluent wet well from an existing capped pipe penetration. The pump would be a 25- to 30-hp end-suction centrifugal pump similar to those manufactured by Goulds or Bell and Gosset and would be connected to a variable frequency drive (VFD) to allow for variable flow.

Due to the need for constant pressure with variable flows, a recirculation loop with a throttling valve and a pressure sensor would be required for the pump. Piping would be routed from the discharge of the pump directly back to the suction piping of the pump. The VFD would operate over its nominal flow range in response to system demands. Whenever the system demands are lower than the acceptable operating range of the pump while operating via the VFD, an automatically adjusted throttling valve would open to recirculate an appropriate amount of water around the pump to ensure that the pump operates efficiently and within its operating parameters.

3.1.3 Discussion

Brown and Caldwell recommends the installation of a new pump in the northwest corner of the Plant as indicated in Alternative 2.

Large pressure drops across a single PRV for Alternative 1 will result in rapid deterioration of this valve. While 10 to 15 psi can safely be dropped through a single element, excessive pressure drops will cause increased cavitation and failure. Wear on this PRV could occur fast enough to require replacement after several months of use.

3.2 Additional Chlorination

As previously noted, the DOE requires a concentration of 1 mg/L of chlorine at a contact time of 30 minutes and a residual of 0.5 mg/L at the end user. In order to achieve the required 1 mg/L at a contact time of 30 minutes, the dosage must be higher than 1 mg/L due to chlorine demand. In addition, the dosage must also be high enough to provide a concentration of 0.5 mg/L at the end user.

In the current design, chlorine is added to the effluent wet well by a hypochlorite solution via two metering pumps, one duty, one standby. The current system is designed to achieve a concentration of 1 mg/L in the

effluent wet well. The expectation is that there will be sufficient chlorine demand to result in a zero chlorine residual when the effluent reaches Semiahmoo Bay.

Additional chlorine must be added to the reclaimed water system in order to ensure proper chlorination. Because the potential users are spread throughout the City of Blaine, total chlorine requirements are difficult to predict. The required dosage at the Plant to provide an effluent concentration of 0.5 mg/L to Peace Arch Park or the industrial park would result in concentrations above 0.5 mg/L at users closer to the Plant with shorter travel times.

It is estimated that a total applied chlorine dose of 2.0 mg/L in the reclaimed water will be required to meet the state regulatory requirements at all users. An additional reclaimed water applied dosage of 1.0 mg/L will be required as the effluent is already at a concentration of 1.0 mg/L. To achieve this level, one new hypochlorite pump, the reclaimed water disinfection pump, will need to be installed at the Plant to meet the additional chlorine demand. The new pump will connect to the existing hypochlorite storage tanks. The flow of the reclaimed water disinfection pump will be paced off the reclaimed water disinfection flow meter as seen on Figure P-2 at the end of this TM. This will result in an additional maximum demand of approximately 6.3 lb/day of chlorine.

Due to the difficulty in accurately predicting chlorine demand, field adjustments will be required such that regulatory requirements are met while minimizing total hypochlorite usage. If not all identified users are connected to the reclaimed water system, the required chlorine dose and total chlorine usage will change.

3.3 Pipe Routing

Brown and Caldwell reviewed several pipe routing options for the reclaimed water system that would provide the proper CT while minimizing conflicts with existing piping, minimizing required pipe penetrations, and providing a relatively simple installation.

Routing piping in the basement of the Plant will be extremely difficult due to the compact nature of the Plant. The current design has left room for a 10-inch-diameter reclaimed water pipe. This reclaimed water pipe is not sufficiently sized to allow for the required contact time for reclaimed water users at the Plant. Consequently, a large-diameter pipe will need to be routed outside the Plant to ensure adequate contact time. See Figures P-2 and C-2 for a process diagram and pipe layout respectively at the end of this TM.

A 55-foot-long, 8-inch-diameter pipe will tap off the effluent wet well from an existing penetration and run to the new reclaimed water pump. The pump discharge piping will penetrate through the sheet pile wall in the northwest corner of the Plant, then transition into a 280-foot-long, 36-inch-diameter pipe. The 36-inch-diameter pipe will travel along the north edge of the Plant and transition to a 10-inch diameter pipe along the east wall of the plant. The 10-inch diameter pipe will be routed to the existing fire hydrant and will provide service to a new reclaimed water hydrant located adjacent to the existing fire hydrant.

Following the new reclaimed water hydrant, two pipes will split from the 36-inch-diameter pipe. A 4-inch-diameter pipe will be routed to Marine Drive Park. A butterfly valve and blind flange would be installed after the connection to Marine Drive Park for the future connection to Peace Arch Park. A 2-inch-diameter pipe will connect to the Plant's existing irrigation system. A 4-inch diameter spool piece with butterfly valve and blind flange would be installed for a future connection to the industrial park.

Connections to irrigation systems currently on City water require a means to prevent contamination by cross-connection whenever reclaimed water sources are used. A spool piece assembly allowing only one type of water source at a time is a typical means to prevent contamination. The spool piece assembly can be seen on the figure M-2 at the end of this TM.

A 4-inch-diameter pipe will branch off of the 36-inch-diameter pipe roughly 20 feet from the southeast corner of the Plant and penetrate into the basement through the existing wall thimble. The 4-inch-diameter pipe will be routed through the area set aside for reclaimed water piping in the original design plans and travel to the existing air gap tank on the utility water system. The utility water system provides water to the Plant utility stations and the Plant toilets and urinals. During startup, the utility water system is provided with City water by the process water system. An air gap tank is already in place to prevent contamination by cross-connection.

The new reclaimed water system will be connected to the process water system for use during periods of low demand. The process water system currently provides Plant effluent water to the screens, thickened waste activated sludge storage tanks, aeration basins, and membrane thickener basins. A 4-inch-diameter pipe will be routed from a blind flange on the process water compression tank to discharge piping of the reclaimed water pump.

During periods of low demand such as when only the toilets are in use or when there is drop in pressure caused by leaks, the process water system will maintain pressure in the reclaimed water system. The use of the process water system will prevent the reclaimed water pump from turning on too frequently and prevent unnecessary wear. When demand increases for reclaimed water, such as for irrigation or filling a municipal vehicle, the process water system will not be able to maintain adequate pressure in the reclaimed water system. This drop in pressure will cause the reclaimed water pump to turn on to maintain pressure.

4. RECLAIMED WATER USE FOR SEMIAHMOO GOLF COURSE

Design documents for the Plant by Brown and Caldwell provide a basic design for pumping reclaimed water to the Semiahmoo Golf Course. The current design is for a 10-inch-diameter pipe to travel from the Plant discharge pipe at the old treatment plant site along Semiahmoo Parkway to the existing golf course irrigation ponds.

A new pump station will be required to move the reclaimed water through nearly 9,000 feet of piping and approximately 200 feet of elevation gain. The new pump station will be located on the grounds of the former treatment plant and will be built aboveground to limit excavation. See Figures P-1, C-1, and M-1 at the end of this TM for a process diagram and civil and mechanical drawings.

The new pump station will contain two major pieces of equipment, the irrigation reclaimed water pump and chemical pot feeder. The new irrigation pump will be a 25-hp, corrosion resistant, end-suction centrifugal water pump similar to those manufactured by Goulds or Bell and Gosset. The new irrigation pump will be variable speed and would be manually operated. Two smaller variable speed pumps may be used if a single larger pump is unable to meet the range of flows. Staff at the golf course will coordinate with the staff of the treatment plant when reclaimed water is required for irrigation. The pump station will also include a chemical pot feeder which will be discussed later in the TM.

A control valve will be required to create enough pressure to feed the new irrigation reclaimed water pump during low flows. The control valve will be installed on the Plant discharge pipe downstream of the 10-inch-diameter reclaimed water pipe tee. A pressure indicating transmitter would be installed upstream of the control valve and would be used to modulate the control valve to create the required back pressure. A back pressure of 10 feet will be suitable to ensure a large enough net positive suction head available (NPSHA) for this new pump. During period when the capacity of the pump exceeds the effluent flow from the treatment plant, the pump will turn down to maintain a suitable NPSHA.

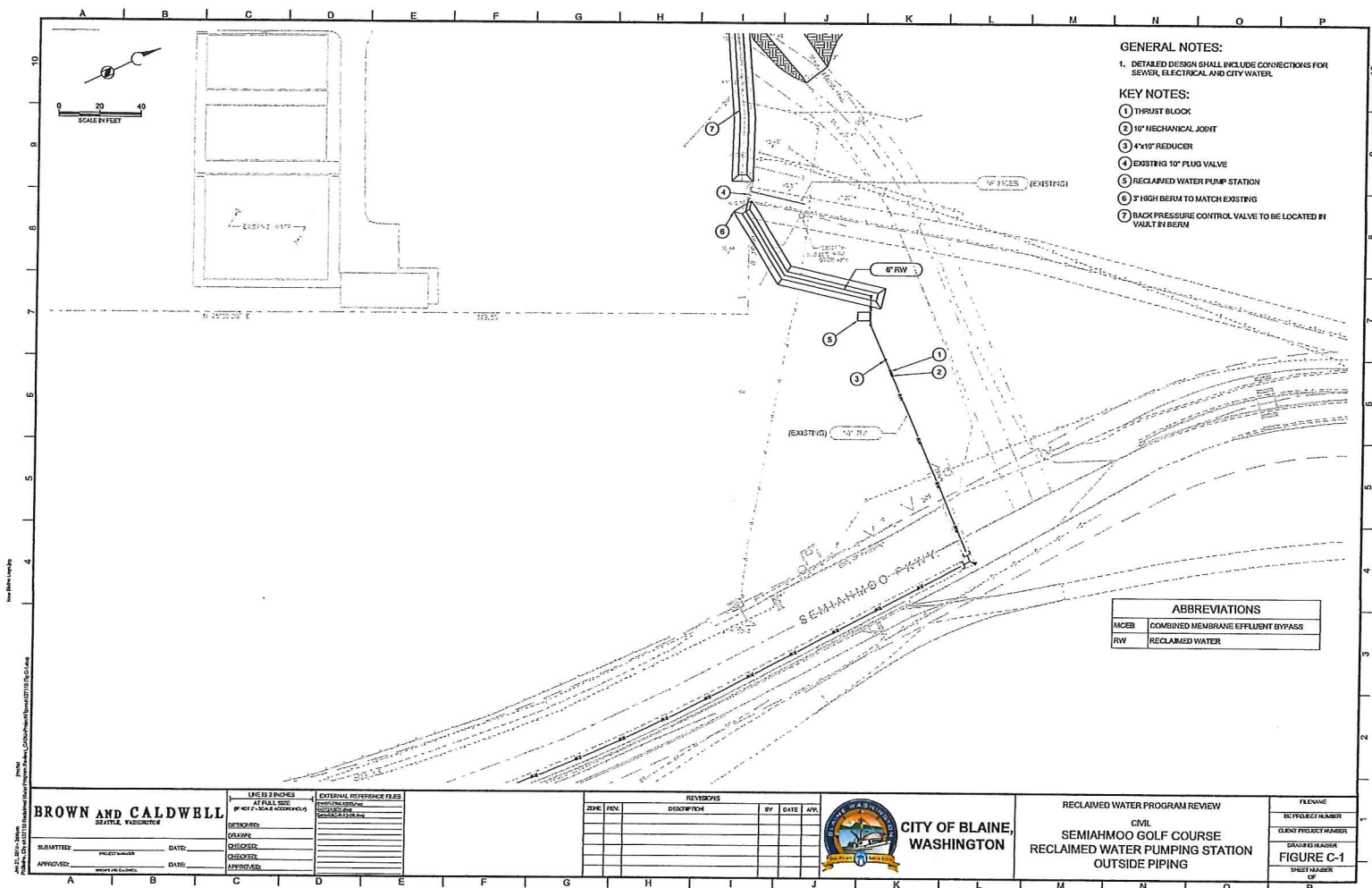
An emergency bypass around the back pressure control valve will be required to prevent failure should the control valve fail closed. If the back pressure control valve failed closed when the irrigation reclaimed water

pump is off, the pressure in the effluent pipe may exceed the pressure rating of the pipe. A weighted check valve would be installed in the bypass for ease of operation and set to a pressure of 15 psi. If pressure exceeds 15 psi, the check valve will open allowing effluent to discharge at the outfall.

An additional chlorination system at this reclaimed water pump station was initially investigated, but a waiver to eliminate the installation of a permanent chlorination system at this pump station is sought from DOH and DOE due to the high quality of membrane filtered reclaimed water. The possibility of seeking a waiver was discussed with Craig Reilly of DOH during a teleconference on December 8, 2009. There are several reasons to seek a waiver for a permanent chlorination system at this pump station as follows:

- The addition of chlorine may not substantially improve irrigation water quality compared to the City potable water currently used for irrigation. Irrigation water is currently transferred and stored in two open ornamental ponds at the golf course with no barriers in place to prevent contamination from wildlife, airborne debris, or runoff. Water stored in these ponds is re-pumped by the golf course for subsequent irrigation. If additional chlorine is added to the reclaimed water, it will quickly degrade upon entering the irrigation ponds, and not provide a lasting benefit to the water actually transferred from the ponds to the irrigation sprinkler heads.
- The proposed site for the pump station is dictated by system hydraulics. This site is a remote site, located in an exceptionally sensitive cultural area. As a result of these environmental and cultural constraints, any permanent facility must be kept small and inconspicuous. Additionally, excavation is prohibited and all structures must be constructed at grade and partially buried in berms. If DOE waives the requirement for additional chlorination, the foot print of the pump station would drastically shrink, because chemical feed systems (e.g. tablet feeder), chemical storage facilities, water supply piping, floor drains, eyewash and emergency shower facilities (including hot water heaters and alarm systems now required by NFPA codes), could be omitted. The required small pump station could be effectively hidden in a berm or under a simulated rock enclosure.
- The MBR effluent originating from the plant will be dosed with chlorine as it leaves the plant to ensure adequate control of microorganisms in the effluent. The range of travel time from the WWTP to the Semiahmoo golf course reclaimed water pump station will typically range from 126 minutes at plant maximum winter month flow conditions to 500 minutes at plant minimum day flow conditions (approximately 1.9 miles of 16-inch diameter pipe). The present strategy is to add just enough chlorine to control the effluent concentration of the permitted effluent indicator organisms (fecal coliforms), but to ensure that the residual chlorine concentration in the effluent at the point of discharge to Puget Sound (located very close to the Semiahmoo Golf Course reclaimed water pump station) does not exceed concentrations harmful to marine organisms, nor be too low as to not provide a public health protection for the harvesting of local shellfish. As a result, the residual chlorine concentration at the point of reclaimed water extraction for the golf course may be near zero or it may have a slight positive value depending on the concentration needed to protect marine organisms and prevent contamination (especially viral contamination) of local shellfish.

A possible concern of not providing additional chlorination is the possible growth of microorganisms in the reclaimed water pipeline. While the risk is low, there have been isolated documented cases of growth in reclaimed water pipe from MBR plants. An option to prevent microbial growth in the pipeline is to dose the pipeline with hypochlorite on a periodic basis. A pot feeder is proposed to be installed on the suction of the irrigation reclaimed water pump and a hypochlorite solution from the plant would be added periodically as needed by City staff. Dosing would typically be done at the beginning and at the end of the irrigation season.



- GENERAL NOTES:**
1. DETAILED DESIGN SHALL INCLUDE CONNECTIONS FOR SEWER, ELECTRICAL AND CITY WATER.
- KEY NOTES:**
① THRUST BLOCK
② 10" MECHANICAL JOINT
③ 4"x10" REDUCER
④ EXISTING 10" PLUG VALVE
⑤ RECLAIMED WATER PUMP STATION
⑥ 2' HIGH BERM TO MATCH EXISTING
⑦ BACK PRESSURE CONTROL VALVE TO BE LOCATED IN VAULT BY BERM

ABBREVIATIONS	
MCEB	COMBINED MEMBRANE EFFLUENT BYPASS
RW	RECLAIMED WATER

BROWN AND CALDWELL
SEATTLE, WASHINGTON

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APPROVED:	DESIGNER:	DATE:

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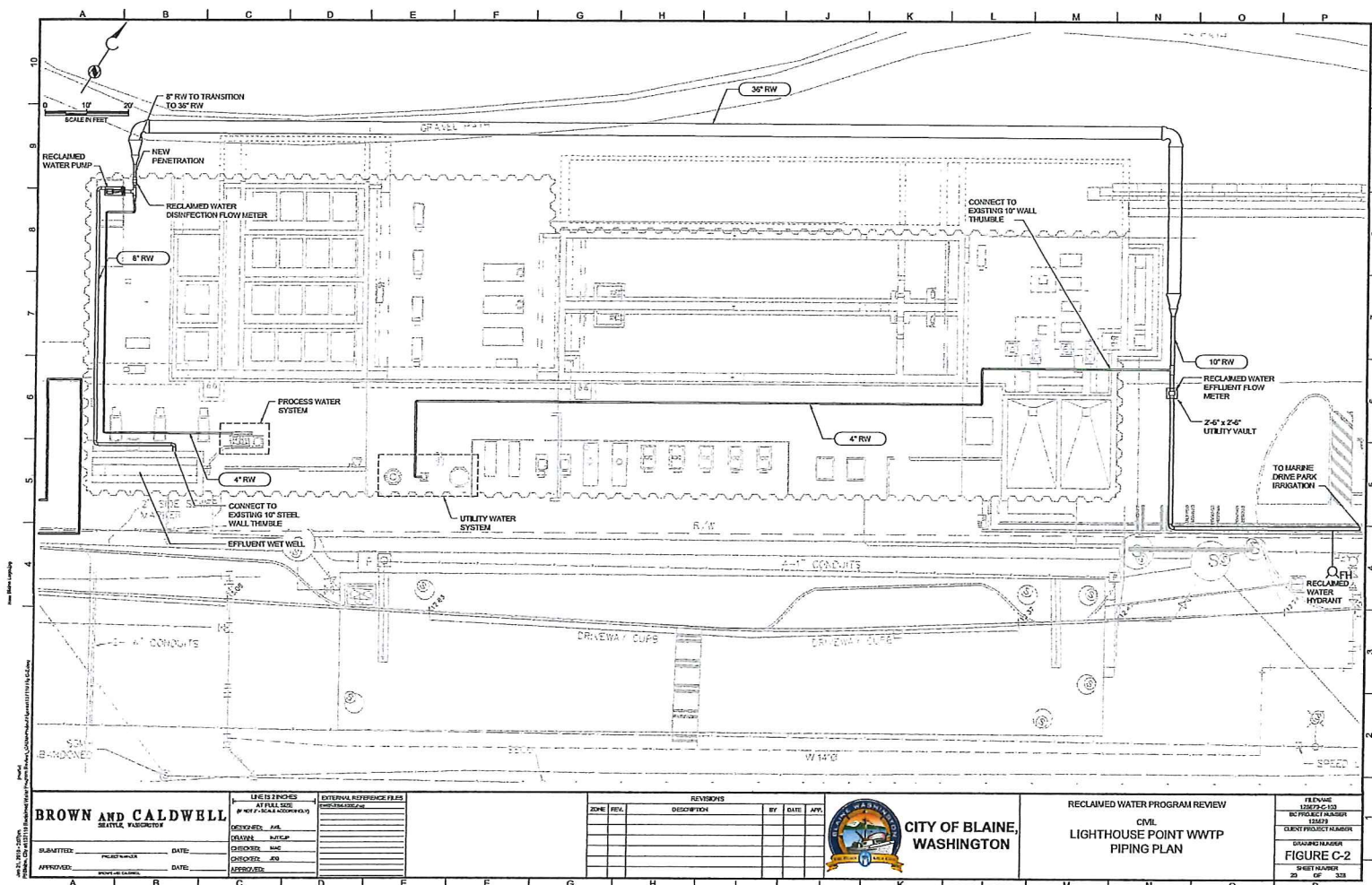
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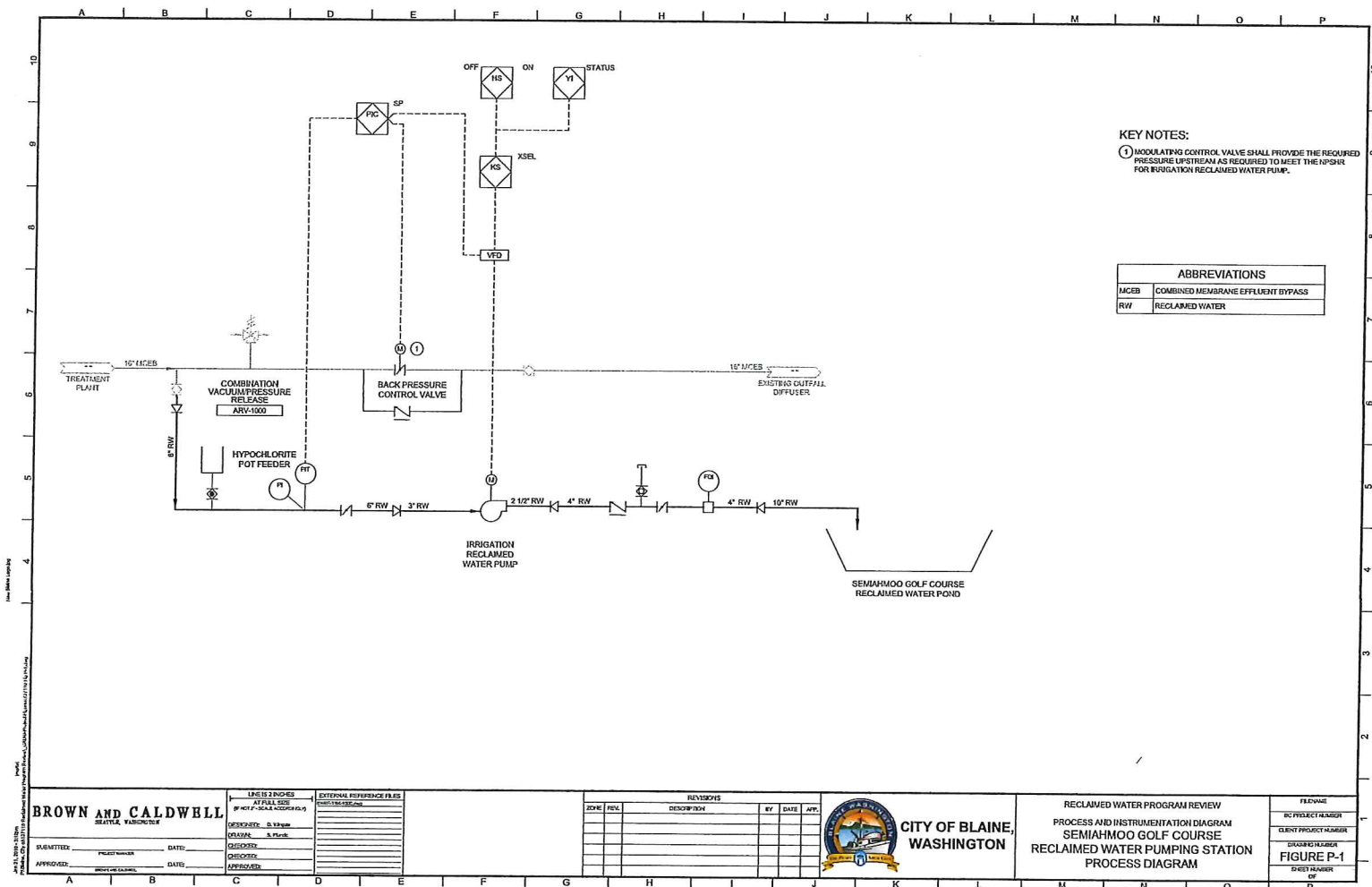


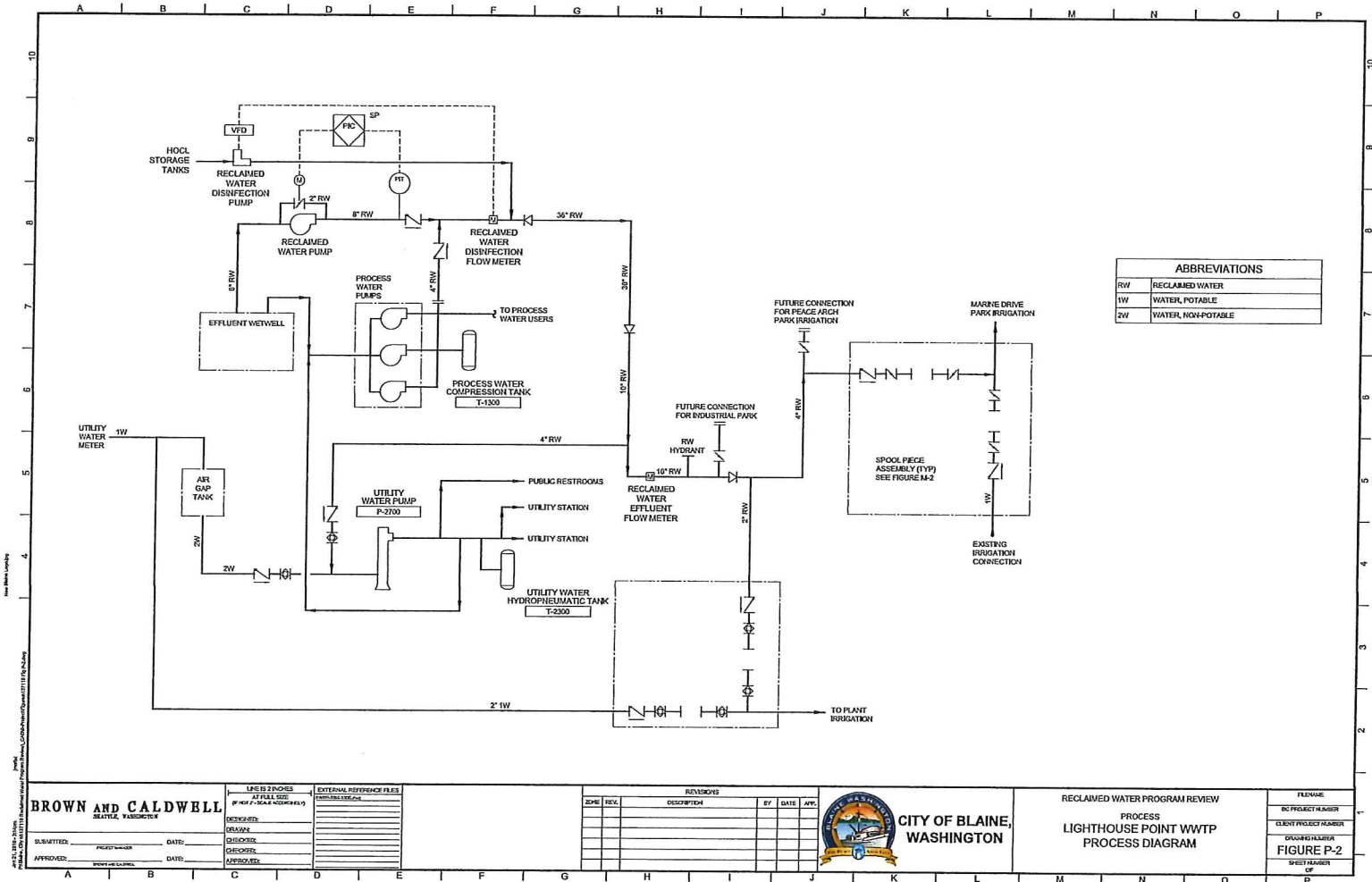
**CITY OF BLAINE,
WASHINGTON**

RECLAIMED WATER PROGRAM REVIEW
CIVIL
SEMAHMOO GOLF COURSE
RECLAIMED WATER PUMPING STATION
OUTSIDE PIPING

FILENAME:
PROJECT NUMBER:
DESIGN NUMBER:
SHEET NUMBER OF







ABBREVIATIONS	
RW	RECLAIMED WATER
1W	WATER, POTABLE
2W	WATER, NON-POTABLE

BROWN AND CALDWELL
SEATTLE, WASHINGTON

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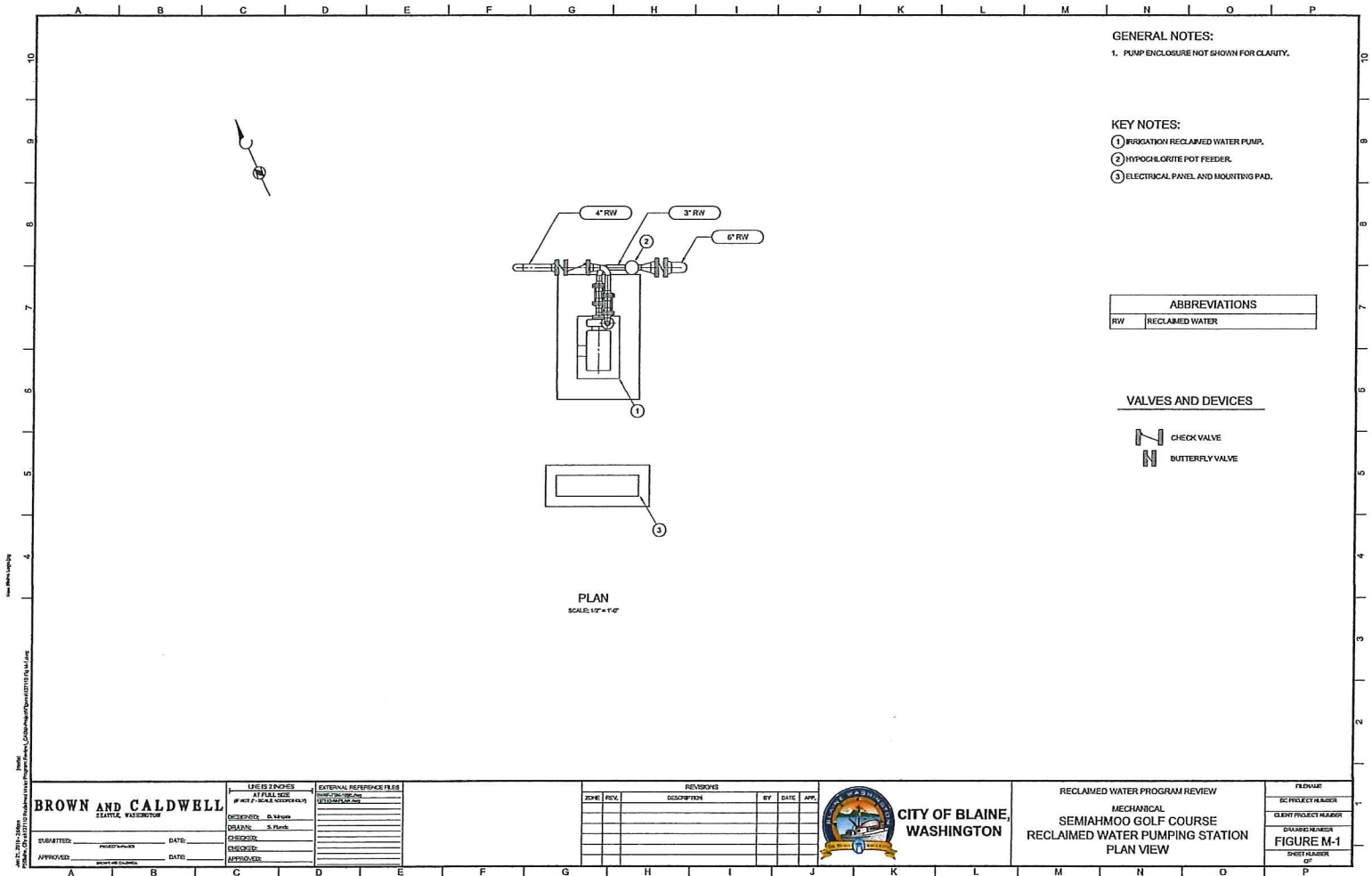
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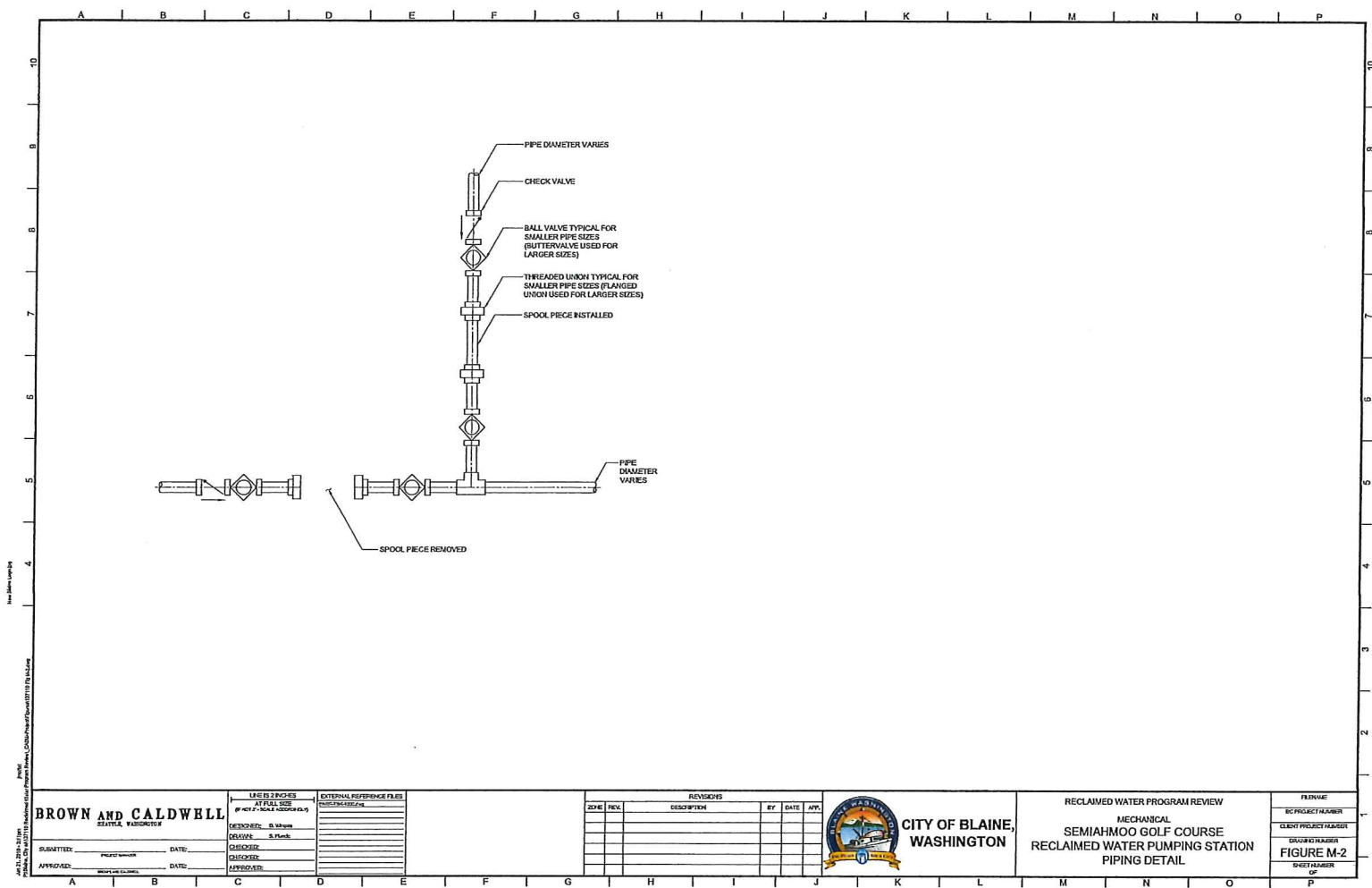


CITY OF BLAINE, WASHINGTON

RECLAIMED WATER PROGRAM REVIEW
PROCESS
LIGHTHOUSE POINT WWTP
PROCESS DIAGRAM

FILENAME
PROJECT NUMBER
CLIENT PROJECT NUMBER
DRAWING NUMBER
FIGURE P-2
SHEET NUMBER OF





BROWN AND CALDWELL
SEATTLE, WASHINGTON

SUBMITTED: _____ DATE: _____
APPROVED: _____ DATE: _____

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CHECKED BY: _____
DRAWN BY: _____

EXTERNAL REFERENCE FILES
PROJECT LOCATION

REVISIONS				
NO.	REV.	DESCRIPTION	BY	DATE



**CITY OF BLAINE,
WASHINGTON**

RECLAIMED WATER PROGRAM REVIEW
MECHANICAL
SEMAHAMMOO GOLF COURSE
RECLAIMED WATER PUMPING STATION
PIPING DETAIL

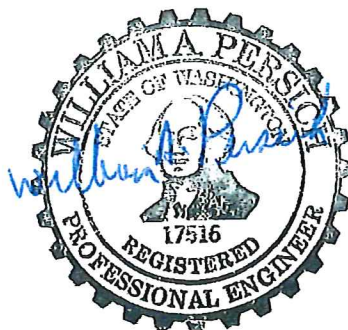
FIGURE M-2
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OF

701 Pike Street, Suite 1200
Seattle, Washington 98101
Tel: 206-624-0100
Fax: 206-749-2200

Prepared for: City of Blaine
Project Title: City of Blaine Reclaimed Water Program Review
Project No: 137110

Technical Memorandum/Engineering Report-Revision 1

Subject: Requirements for Reclaimed Water Use
Date: July 31, 2013
To: Ravyn Whitewolf, City of Blaine Public Works Director
From: Bill Persich
Copy to: David Wingate, Rick Kelly
Prepared by: David Wingate
Reviewed by: Bill Persich and Rick Kelly



July 31, 2013

Limitations:

This document was prepared solely for City of Blaine in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Blaine and Brown and Caldwell dated February 24, 2009. This document is governed by the specific scope of work authorized by City of Blaine; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Blaine and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

1. INTRODUCTION

The Lighthouse Point Treatment Plant (Plant) is a membrane bioreactor plant that is currently designed to discharge membrane permeate into Semiahmoo Bay. Because the discharge will be of such high quality, the City has indicated several potential uses for the effluent from the Plant. This technical memorandum (TM) will focus on the required piping and equipment needed at the Plant for these potential reclaimed water uses.

2. DESIGN REQUIREMENTS

This section will describe the Plant's reclaimed water characteristics, requirements, potential uses of reclaimed water, and Plant flow and pressure limitations.

2.1 Reclaimed Water Characteristics

The Plant effluent is a membrane permeate and is expected to contain low levels of solids, BOD, and pathogens. Below, in Table 1, are the characteristics of the LOTT WWTP effluent, an MBR plant similar to the Lighthouse Point Treatment Plant.

Table 1: Effluent Characteristics of the LOTT WWTP	
BOD 5-DAY, mg/L	2.8
TSS, mg/L	2.0
pH, S.U.	7.0
Total Nitrogen, mg/L	5.7
Total Coliform, #/100 ml 7DMED	0.0

The total nitrogen for the Lighthouse Point Treatment Plant is expected to be higher than the LOTT WWTP. The LOTT WWTP is required to meet low total nitrogen limits. The Lighthouse Point Treatment Plant is expected to have a total nitrogen concentration of 10 mg/L.

2.2 Reclaimed Water Requirements

The requirements for reclaimed water in the state of Washington are regulated by the Department of Health (DOH) in conjunction with the Department of Ecology (DOE). These regulations are far-reaching, covering most potential applications of reclaimed water.

For the purpose of this TM, design requirements from the DOE *Criteria for Sewage Works Design 2006* were used. The applicable design requirements used in this TM can be found in Section E1-4.5.1: Chlorine Disinfection of this DOE document.

Criteria for Sewage Works Design sets two requirements for reclaimed water disinfection using chlorine:

- The state requires a minimum contact time (CT) of 30 minutes, based on a minimum free available chlorine residual of 1.0 mg/L at the end of the 30-minute contact time.

- A minimum residual chlorine concentration of 0.5 mg/L must be maintained at all locations within the distribution system.

This TM does not discuss requirements for spacing of piping needed to tie into existing systems.

2.3 Potential Uses of Reclaimed Water

Reclaimed water users will be required to enter into a contractual agreement with the City for the delivery of reclaimed water which will stipulate conditions to include allowable uses, quantity and service, delivery, obligations of the User and the City, etc. Users will be classified into Primary Users and Secondary Users.

Primary Users: Primary users are given a commitment for a minimum quantity to be delivered as specified in the contract between the customer and the City. If the City cannot meet this commitment, there are provisions for the City to provide a back up interim water source. It is the City's responsibility to ensure that the system is not over-obligated with primary user contracts based on the available reclaimed water production of the LPWRF.

Secondary Users: Secondary users can be served with reclaimed water where there is a reasonable level of system capacity to provide reclaimed water for an allowable use but the on-demand availability of the source cannot be guaranteed. This may be a viable option for those customers where an interruption of service is not critical to their needs.

The City has identified several potential primary end users for Plant reclaimed water, as shown in Table 2 (Note: some of these could be classified as secondary users as well). *The preceding text in this section is provided by the City of Blaine.*

User	Instantaneous Peak Flow (gpm)	Instantaneous Peak Flow (MGD)
Semlahmoo Golf Course	300 ¹	0.43
Marine Drive Park irrigation	60 ^{2,6}	0.08
Peace Arch Park irrigation	50 ^{3,6}	0.07
Lighthouse Point irrigation	60 ⁴	0.08
Plant restrooms	53 ⁵	0.07
Plant hydrant	100 ⁷	0.14
Plant utility stations	90 ⁸	0.13
Industrial park	100 ⁹	0.14

1. Required flow will match existing City water flow metered solely for irrigation to ponds.
2. Average monthly flow calculated using USDA irrigation requirements for pasture in Blaine.
3. Average monthly flow based on meter readings provided by the City.
4. Required flow based on conversations with irrigation design engineer.
5. Required flow based on all toilets and urinals flushing simultaneously four times per minute.
6. Required flow is the peak hour flow derived by multiplying monthly average flow by a peaking factor of 3.
7. Flow based on the assumption that the hydrant will only be used to fill municipal equipment and will not be used in emergency situations.
8. The Plant has 16 low-pressure utility stations at 25 gpm each and 6 high-pressure utility stations at 40 gpm each. Equipment at the Plant has been sized assuming two low-pressure utility stations and one high-pressure utility station in operation.
9. Assumed flow. No data were provided to Brown and Caldwell on the expected water demand of the industrial park.

2.3.1 Semiahmoo Golf Course

The golf course is located across Drayton Harbor from the Plant. The golf course currently uses City water for irrigation of the 125-acre site. City water is pumped into two ornamental irrigation ponds where it is drawn down as required for irrigation. Currently the golf course staff very carefully manage their irrigation water consumption to ensure against overwatering the turf and to prevent irrigation water from passing beyond the root zone. Golf course staff control the use of irrigation water to match the agronomic uptake rates to minimize expenditures for water purchase and re-pumping and to ensure healthy and attractive turf. They monitor and adjust their water applications on a daily basis and have been successfully using wetting agents and soil aeration methods to reduce water consumption and ensure that water is quickly transferred to the root zone. Additionally, overwatering turf at golf courses tend to create soft ground easily damaged by golfers and golf carts, and also causes expensive applied nutrients to be unnecessarily flushed from the turf root zone before they can be taken up by the plants. Due to the frequency of tournament play at the golf course, staff tend to deliberately under-water the turf to stress the grass resulting in faster ball speeds on the greens. They closely measure ball speeds on the greens using a Stimpmeter to determine how much water to use for irrigation. This use of reclaimed water would also follow these strict irrigation guidelines practiced by the golf course staff.

2.3.2 Marine Drive Park

Marine Drive Park is a community park that shares the Plant's eastern border. The 7-acre park currently uses City water to meet its irrigation requirements. In order for the irrigation systems to function properly, each sprinkler head must be provided with a pressure of 30 pounds per square inch (psi).

2.3.3 Peace Arch Park

Peace Arch Park is an international park jointly managed by the U.S. and Canada. The park is located roughly 0.5 mile northeast of the Plant. Irrigation needs are currently met using City water and require a minimum pressure of 30 psi to function. The City has indicated that connecting Peace Arch Park to reclaimed water would not occur during construction of the treatment plant and that this potential reclaimed water use may occur at a later date. A connection point for Peace Arch Park is addressed in this TM and the water requirements are included in the calculations.

The required flow for irrigation, as noted above, is based on historical data. When the historical data are compared to USDA estimates, the USDA requirements are roughly 8.5 times larger. If the USDA number were used in design calculations, the required pipe would be excessively large. Usage volumes estimated in this TM are based on historical City water records.

2.3.4 Lighthouse Point Irrigation

The Plant irrigation system is designed to provide reclaimed water to the 1-acre site. The irrigation system requires a minimum pressure of 30 psi at each sprinkler head.

2.3.5 Plant Restrooms

The Plant has two sets of restroom facilities: a public restroom open to those enjoying the park, which contains six toilets and two urinals, and a private facility within the Plant which contains one toilet. The discharge from the restrooms will return to the Plant headworks. This configuration will create a closed

system where the flow is recirculated within the Plant. Therefore, reclaimed water demand for the restrooms will not contribute to total reclaimed water demand.

2.3.6 Plant Hydrant

The City has indicated a need for a reclaimed water hydrant to fill municipal equipment including street-sweeping trucks and water trucks. The new hydrant will be located next to an existing City water hydrant located in the southeast corner of the site. If the required pressure of 30 psi for irrigation is developed at the discharge of the hydrant, the design flow of 100 gpm will be exceeded. When municipal vehicles are filled, a flow meter and manually adjusted valve will be required to prevent excessive flows.

2.3.7 Plant Utility Stations

The City has requested that the Plant utility stations be connected to reclaimed water. The Plant operates two types of utility stations; one operates at a pressure of 35 psi and the other operates at a pressure of 70 psi. The pressure is increased by the utility water pump. Like the Plant restrooms, the discharge of the Plant utility stations will return to the Plant headworks.

2.3.8 Industrial Park

The City has indicated that the nearby industrial park is a potential user of reclaimed water. The City has indicated that connecting the industrial park to reclaimed water would not occur during construction of the treatment plant and that this reclaimed water use may occur at a later date. A connection point for the industrial park is addressed in this TM and the water requirements are included in the calculations.

As of the writing of this TM, Brown and Caldwell did not have information relating to the type, size, or water demand of the industrial park. Consequently, the 100-gpm flow used for peak instantaneous design flow is assumed.

2.4 Plant Flow and Pressure Limitations

Due to the projected influent flows to the Plant, not all of the proposed reclaimed water use sites will be able to receive the estimated reclaimed water flow at once. Table 3 shows projected Plant influent flows during startup.

Table 3: Projected Plant Startup Flows	
	Plant Flow (mgd)
Maximum month	1.11
Minimum month	0.49
Average month	0.62
Peak hour	2.70
Minimum day	0.3–0.4

During startup, projected influent flows will not meet expected demand of all potential end users. See Figure 1 below for a comparison of projected influent flows and reclaimed water demand.

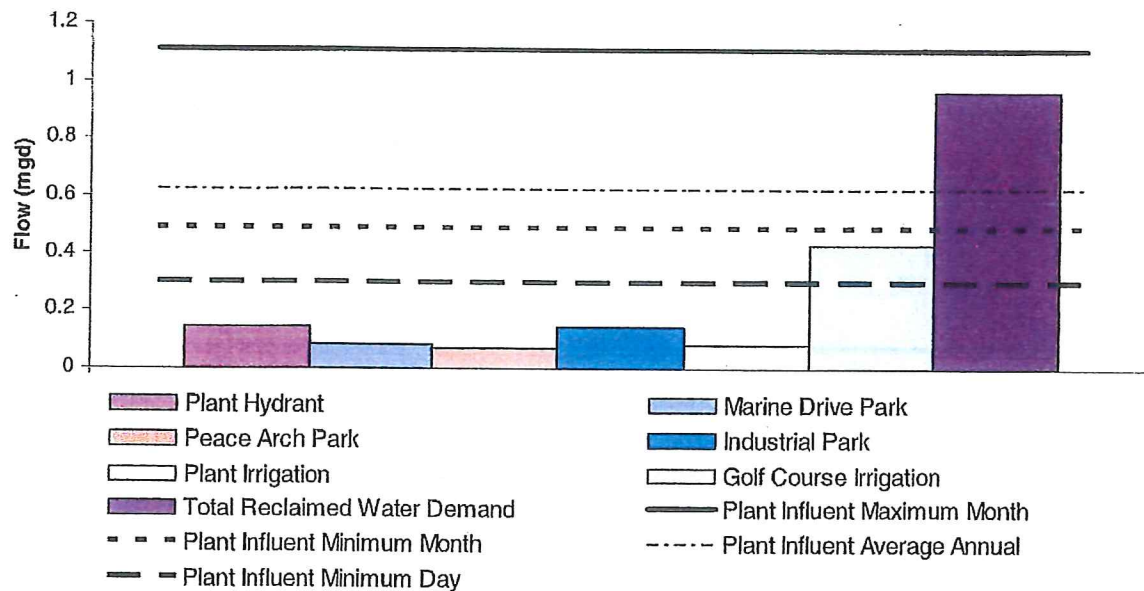


Figure 1: Expected reclaimed water demand versus plant influent flows

Minimum month and minimum day flows will occur during the summer, when irrigation will be required, resulting in insufficient water to meet all potential uses. During these periods, irrigation to the golf course will receive priority. All other potential users will not be able to use reclaimed water during periods of low flow when reclaimed water is conveyed to the Semiahmoo Golf Course. Flow to the Plant restrooms and utility stations will not be affected during periods of low flow as flow to these two users is recirculated within the Plant.

During the winter months when irrigation is not required at the golf course or the three parks, additional flow could be diverted to the industrial park as needed.

The Plant effluent pumps are able to provide a wide range of pressures. During low-flow periods at low tide, discharge pressure will be at 3 to 4 psi. During high-flow periods at high tide, the effluent pumps will produce 90 psi. During periods of low flow, pressure will need to be increased in the Plant effluent lines to meet the flow and pressure demands of potential reclaimed water users.

3. RECLAIMED WATER USE EAST OF PLANT

Because all potential reclaimed water users except the Semiahmoo Golf Course are to the east of or within the Plant, Brown and Caldwell investigated the requirements for a single system able to meet the demand of all these eastern and internal Plant use users (described as eastern users for this TM).

3.1 Pressure Boosting Alternatives

Because the discharge pressure of the effluent pumps will be insufficient to meet the requirements of the irrigation systems at the various eastern users consistently, several mechanical means to increase pressure were reviewed.

The irrigation systems at the parks and the Plant require a minimum pressure of 30 psi. A design pressure of 50 psi will be used to take into account head losses that occur during pumping and conveyance. Typical methods for maintaining constant pressure at variable flows, hydropneumatic or elevated storage tanks, are not feasible due to the Plant design. The compact nature of the Plant prevents the installation of a properly sized hydropneumatic tank or an elevated storage tank. Two alternative methods for boosting pressure were examined.

3.1.1 Pumping Alternative 1: Use Existing Effluent Pumps

In order to achieve the required pressure for irrigation, a back-pressure regulating valve (PRV) could be placed on the discharge end of the Plant effluent pipe. The PRV induces a large head loss across the element causing the effluent pump to discharge at a higher pressure. The PRV would be set at the required design pressure, 50 psi.

3.1.2 Pumping Alternative 2: New Reclaimed Water Pump

In order to achieve the required pressure for irrigation, a new pump could be installed in the northwest corner of the lower floor of the Plant. The pump would draw off the effluent wet well from an existing capped pipe penetration. The pump would be a 25- to 30-hp end-suction centrifugal pump similar to those manufactured by Goulds or Bell and Gosset and would be connected to a variable frequency drive (VFD) to allow for variable flow.

Due to the need for constant pressure with variable flows, a recirculation loop with a throttling valve and a pressure sensor would be required for the pump. Piping would be routed from the discharge of the pump directly back to the suction piping of the pump. The VFD would operate over its nominal flow range in response to system demands. Whenever the system demands are lower than the acceptable operating range of the pump while operating via the VFD, an automatically adjusted throttling valve would open to recirculate an appropriate amount of water around the pump to ensure that the pump operates efficiently and within its operating parameters.

3.1.3 Discussion

Brown and Caldwell recommends the installation of a new pump in the northwest corner of the Plant as indicated in Alternative 2.

Large pressure drops across a single PRV for Alternative 1 will result in rapid deterioration of this valve. While 10 to 15 psi can safely be dropped through a single element, excessive pressure drops will cause increased cavitation and failure. Wear on this PRV could occur fast enough to require replacement after several months of use.

3.2 Additional Chlorination

As previously noted, the DOE requires a concentration of 1 mg/L of chlorine at a contact time of 30 minutes and a residual of 0.5 mg/L at the end user. In order to achieve the required 1 mg/L at a contact time of 30 minutes, the dosage must be higher than 1 mg/L due to chlorine demand. In addition, the dosage must also be high enough to provide a concentration of 0.5 mg/L at the end user.

In the current design, chlorine is added to the effluent wet well by a hypochlorite solution via two metering pumps, one duty, one standby. The current system is designed to achieve a concentration of 1 mg/L in the

effluent wet well. The expectation is that there will be sufficient chlorine demand to result in a zero chlorine residual when the effluent reaches Semiahmoo Bay.

Additional chlorine must be added to the reclaimed water system in order to ensure proper chlorination. Because the potential users are spread throughout the City of Blaine, total chlorine requirements are difficult to predict. The required dosage at the Plant to provide an effluent concentration of 0.5 mg/L to Peace Arch Park or the industrial park would result in concentrations above 0.5 mg/L at users closer to the Plant with shorter travel times.

It is estimated that a total applied chlorine dose of 2.0 mg/L in the reclaimed water will be required to meet the state regulatory requirements at all users. An additional reclaimed water applied dosage of 1.0 mg/L will be required as the effluent is already at a concentration of 1.0 mg/L. To achieve this level, one new hypochlorite pump, the reclaimed water disinfection pump, will need to be installed at the Plant to meet the additional chlorine demand. The new pump will connect to the existing hypochlorite storage tanks. The flow of the reclaimed water disinfection pump will be paced off the reclaimed water disinfection flow meter as seen on Figure P-2 at the end of this TM. This will result in an additional maximum demand of approximately 6.3 lb/day of chlorine.

Due to the difficulty in accurately predicting chlorine demand, field adjustments will be required such that regulatory requirements are met while minimizing total hypochlorite usage. If not all identified users are connected to the reclaimed water system, the required chlorine dose and total chlorine usage will change.

3.3 Pipe Routing

Brown and Caldwell reviewed several pipe routing options for the reclaimed water system that would provide the proper CT while minimizing conflicts with existing piping, minimizing required pipe penetrations, and providing a relatively simple installation.

Routing piping in the basement of the Plant will be extremely difficult due to the compact nature of the Plant. The current design has left room for a 10-inch-diameter reclaimed water pipe. This reclaimed water pipe is not sufficiently sized to allow for the required contact time for reclaimed water users at the Plant. Consequently, a large-diameter pipe will need to be routed outside the Plant to ensure adequate contact time. See Figures P-2 and C-2 for a process diagram and pipe layout respectively at the end of this TM.

A 55-foot-long, 8-inch-diameter pipe will tap off the effluent wet well from an existing penetration and run to the new reclaimed water pump. The pump discharge piping will penetrate through the sheet pile wall in the northwest corner of the Plant, then transition into a 280-foot-long, 36-inch-diameter pipe. The 36-inch-diameter pipe will travel along the north edge of the Plant and transition to a 10-inch diameter pipe along the east wall of the plant. The 10-inch diameter pipe will be routed to the existing fire hydrant and will provide service to a new reclaimed water hydrant located adjacent to the existing fire hydrant.

Following the new reclaimed water hydrant, two pipes will split from the 36-inch-diameter pipe. A 4-inch-diameter pipe will be routed to Marine Drive Park. A butterfly valve and blind flange would be installed after the connection to Marine Drive Park for the future connection to Peace Arch Park. A 2-inch-diameter pipe will connect to the Plant's existing irrigation system. A 4-inch diameter spool piece with butterfly valve and blind flange would be installed for a future connection to the industrial park.

Connections to irrigation systems currently on City water require a means to prevent contamination by cross-connection whenever reclaimed water sources are used. A spool piece assembly allowing only one type of water source at a time is a typical means to prevent contamination. The spool piece assembly can be seen on the figure M-2 at the end of this TM.

A 4-inch-diameter pipe will branch off of the 36-inch-diameter pipe roughly 20 feet from the southeast corner of the Plant and penetrate into the basement through the existing wall thimble. The 4-inch-diameter pipe will be routed through the area set aside for reclaimed water piping in the original design plans and travel to the existing air gap tank on the utility water system. The utility water system provides water to the Plant utility stations and the Plant toilets and urinals. During startup, the utility water system is provided with City water by the process water system. An air gap tank is already in place to prevent contamination by cross-connection.

The new reclaimed water system will be connected to the process water system for use during periods of low demand. The process water system currently provides Plant effluent water to the screens, thickened waste activated sludge storage tanks, aeration basins, and membrane thickener basins. A 4-inch-diameter pipe will be routed from a blind flange on the process water compression tank to discharge piping of the reclaimed water pump.

During periods of low demand such as when only the toilets are in use or when there is drop in pressure caused by leaks, the process water system will maintain pressure in the reclaimed water system. The use of the process water system will prevent the reclaimed water pump from turning on too frequently and prevent unnecessary wear. When demand increases for reclaimed water, such as for irrigation or filling a municipal vehicle, the process water system will not be able to maintain adequate pressure in the reclaimed water system. This drop in pressure will cause the reclaimed water pump to turn on to maintain pressure.

4. RECLAIMED WATER USE FOR SEMIAHMOO GOLF COURSE

Design documents for the Plant by Brown and Caldwell provide a basic design for pumping reclaimed water to the Semiahmoo Golf Course. The current design is for a 10-inch-diameter pipe to travel from the Plant discharge pipe at the old treatment plant site along Semiahmoo Parkway to the existing golf course irrigation ponds.

A new pump station will be required to move the reclaimed water through nearly 9,000 feet of piping and approximately 200 feet of elevation gain. The new pump station will be located on the grounds of the former treatment plant and will be built aboveground to limit excavation. See Figures P-1, C-1, and M-1 at the end of this TM for a process diagram and civil and mechanical drawings.

The new pump station will contain two major pieces of equipment, the irrigation reclaimed water pump and chemical pot feeder. The new irrigation pump will be a 25-hp, corrosion resistant, end-suction centrifugal water pump similar to those manufactured by Goulds or Bell and Gosset. The new irrigation pump will be variable speed and would be manually operated. Two smaller variable speed pumps may be used if a single larger pump is unable to meet the range of flows. Staff at the golf course will coordinate with the staff of the treatment plant when reclaimed water is required for irrigation. The pump station will also include a chemical pot feeder which will be discussed later in the TM.

A control valve will be required to create enough pressure to feed the new irrigation reclaimed water pump during low flows. The control valve will be installed on the Plant discharge pipe downstream of the 10-inch-diameter reclaimed water pipe tee. A pressure indicating transmitter would be installed upstream of the control valve and would be used to modulate the control valve to create the required back pressure. A back pressure of 10 feet will be suitable to ensure a large enough net positive suction head available (NPSHA) for this new pump. During period when the capacity of the pump exceeds the effluent flow from the treatment plant, the pump will turn down to maintain a suitable NPSHA.

An emergency bypass around the back pressure control valve will be required to prevent failure should the control valve fail closed. If the back pressure control valve failed closed when the irrigation reclaimed water

pump is off, the pressure in the effluent pipe may exceed the pressure rating of the pipe. A weighted check valve would be installed in the bypass for ease of operation and set to a pressure of 15 psi. If pressure exceeds 15 psi, the check valve will open allowing effluent to discharge at the outfall.

An additional chlorination system at this reclaimed water pump station was initially investigated, but a waiver to eliminate the installation of a permanent chlorination system at this pump station is sought from DOH and DOE due to the high quality of membrane filtered reclaimed water. The possibility of seeking a waiver was discussed with Craig Reilly of DOH during a teleconference on December 8, 2009. There are several reasons to seek a waiver for a permanent chlorination system at this pump station as follows:

- The addition of chlorine may not substantially improve irrigation water quality compared to the City potable water currently used for irrigation. Irrigation water is currently transferred and stored in two open ornamental ponds at the golf course with no barriers in place to prevent contamination from wildlife, airborne debris, or runoff. Water stored in these ponds is re-pumped by the golf course for subsequent irrigation. If additional chlorine is added to the reclaimed water, it will quickly degrade upon entering the irrigation ponds, and not provide a lasting benefit to the water actually transferred from the ponds to the irrigation sprinkler heads.
- The proposed site for the pump station is dictated by system hydraulics. This site is a remote site, located in an exceptionally sensitive cultural area. As a result of these environmental and cultural constraints, any permanent facility must be kept small and inconspicuous. Additionally, excavation is prohibited and all structures must be constructed at grade and partially buried in berms. If DOE waives the requirement for additional chlorination, the foot print of the pump station would drastically shrink, because chemical feed systems (e.g. tablet feeder), chemical storage facilities, water supply piping, floor drains, eyewash and emergency shower facilities (including hot water heaters and alarm systems now required by NFPA codes), could be omitted. The required small pump station could be effectively hidden in a berm or under a simulated rock enclosure.
- The MBR effluent originating from the plant will be dosed with chlorine as it leaves the plant to ensure adequate control of microorganisms in the effluent. The range of travel time from the WWTP to the Semiahmoo golf course reclaimed water pump station will typically range from 126 minutes at plant maximum winter month flow conditions to 500 minutes at plant minimum day flow conditions (approximately 1.9 miles of 16-inch diameter pipe). The present strategy is to add just enough chlorine to control the effluent concentration of the permitted effluent indicator organisms (fecal coliforms), but to ensure that the residual chlorine concentration in the effluent at the point of discharge to Puget Sound (located very close to the Semiahmoo Golf Course reclaimed water pump station) does not exceed concentrations harmful to marine organisms, nor be too low as to not provide a public health protection for the harvesting of local shellfish. As a result, the residual chlorine concentration at the point of reclaimed water extraction for the golf course may be near zero or it may have a slight positive value depending on the concentration needed to protect marine organisms and prevent contamination (especially viral contamination) of local shellfish.

A possible concern of not providing additional chlorination is the possible growth of microorganisms in the reclaimed water pipeline. While the risk is low, there have been isolated documented cases of growth in reclaimed water pipe from MBR plants. An option to prevent microbial growth in the pipeline is to dose the pipeline with hypochlorite on a periodic basis. A pot feeder is proposed to be installed on the suction of the irrigation reclaimed water pump and a hypochlorite solution from the plant would be added periodically as needed by City staff. Dosing would typically be done at the beginning and at the end of the irrigation season.

Reclaimed Water Monitoring Reports, 2017



Permit Number: WA0022641

Permittee: Lighthouse Point Water Reclamation Facility

Facility County: Whatcom

Receiving Waterbody:

Monitoring Period: 09/01/2017 - 09/30/2017

Outfall: 002

Version: 1

Week	Monitoring Point	Total #CDS Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residual) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total Coliforms MP/100ml 1/Day Grab	pH Standard Units 1/Day Grab	Ammonia Total Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Nitrate Total Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Nitrogen (calculated) Total (TKN + NO3 + NO2) Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Temperature Measured Degrees C 1/Day Grab	Flow Million Gallons/Day Continuous Measurement	Turbidity (NTU) Measured NTU Continuous Measurement	Dissolved Oxygen Milligrams/L (mg/L) 1/Day Grab
		002	002	002	002	002	002	002	002	PS11	PS11	PS11
1-F	9/1/17			B 1	6.9				21	.172	.073	8.3
1-Sa	9/2/17			B 1	6.9				21	.314	.112	8.4
2-Su	9/3/17			B 1	6.8				22	.366	.087	8.3
2-M	9/4/17			B 1	6.9				22	.379	.118	8.4
2-T	9/5/17	0	1	B 1	7.1				23	.239	.108	8.2
2-W	9/6/17			B 1	7				22	.320	.105	8.1
2-Th	9/7/17			B 1	7.1				22	.196	.103	8.1
2-F	9/8/17			B 1	7.1				22	C	C	C
2-Sa	9/9/17			B 1	7.1				21	C	C	C
3-Su	9/10/17			B 1	7.1				20	C	C	C
3-M	9/11/17	0	0	B 1	7	.782	8.95	10.6	22	C	C	C
3-T	9/12/17			B 1	7.1				22	C	C	C
3-W	9/13/17			B 1	7.2				21	C	C	C
3-Th	9/14/17			B 1	7.3				21	C	C	C
3-F	9/15/17			B 1	7.2				21	C	C	C
3-Sa	9/16/17			B 1	7.1				20	C	C	C
4-Su	9/17/17			B 1	7.1				20	C	C	C
4-M	9/18/17			B 1	7				21	C	C	C
4-T	9/19/17	0	1	B 1	7.2				21	C	C	C
4-W	9/20/17			B 1	7.2				21	C	C	C
4-Th	9/21/17			B 1	7.3				21	C	C	C
4-F	9/22/17			B 1	7.1				21	C	C	C
4-Sa	9/23/17			B 1	7.1				21	C	C	C
5-Su	9/24/17			B 1	7.1				21	C	C	C
5-M	9/25/17	0	1	B 1	6.9				21	C	C	C
5-T	9/26/17			B 1	7.2				21	C	C	C
5-W	9/27/17			B 1	6.9				21	.201	.26	8.6
5-Th	9/28/17			B 1	7.1				21	.373	.135	8.5
5-F	9/29/17			B 1	7				21	C	C	C
5-Sa	9/30/17			B 1	7.1				21	C	C	C
Minimum					6.8							8.1
					>= 6.0 (RO)							>= 0 (RO)
Average		0	0.75			0.782	8.95	10.6	21.2	.2844	.122	8.322
		<= 30 (RO)	<= 30 (RO)			Report Only	Report Only	Report Only	Report Only	<= 0.72	<= 0.2	Report Only
Weekly Average		0	1									
		<= 45 (RO)	<= 45 (RO)									
Maximum				B 1	7.3	0.782	8.95	10.6		0.379	0.26	
				<= 23	<= 9.0 (RO)	Report Only	Report Only	Report Only		Report Only	<= 0.5	
Daily Maximum									23			
									Report Only			
7 Day Median				B 1								
				<= 2.2								

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit



Permit Number: WA0022641

Permittee: Lighthouse Point Water Reclamation Facility

Facility County: Whatcom

Receiving Waterbody:

Monitoring Period: 08/01/2017 - 08/31/2017

Outfall: 002

Version: 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residual) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total Coliforms W/100ml 1/Day Grab	pH Standard Units 1/Day Grab	Ammonia Total Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Nitrate Total Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Nitrogen (calculation) Total (TKN + NO3 + NO2) Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Temperature Measured Degrees C 1/Day Grab	Flow Million Gallons/Day Continuous Measurement	Turbidity (NTU) Measured NTU Continuous Measurement	Dissolved Oxygen Milligrams/L (mg/L) 1/Day Grab
		002	002	002	002	002	002	002	002	PS11	PS11	PS11
1-T	8/1/17			B 1	6.9				21	.139	.143	8.2
1-W	8/2/17			B 1	6.8				22	.190	.126	8
1-Th	8/3/17			B 1	6.9				21	.293	.126	8.2
1-F	8/4/17			B 1	6.9				22	.366	.123	7.9
1-Sa	8/5/17			B 1	6.9				22	.167	.13	8.1
2-Su	8/6/17			B 1	7				22	.125	.143	8
2-M	8/7/17	0	1	B 1	6.8				22	.146	.137	8.2
2-T	8/8/17			B 1	6.8	0.01	19.2	20.75	21	C	C	C
2-W	8/9/17			B 1	6.7				22	C	C	C
2-Th	8/10/17			B 1	6.9				22	C	C	C
2-F	8/11/17			B 1	6.9				22	C	C	C
2-Sa	8/12/17			B 1	6.9				21	C	C	C
3-Su	8/13/17			B 1	7				21	C	C	C
3-M	8/14/17	0	1	B 1	6.9				21	.311	.147	8.5
3-T	8/15/17			B 1	7				21	C	C	C
3-W	8/16/17			B 1	7				22	.050	.055	8.5
3-Th	8/17/17			B 1	7				21	.103	.077	8.6
3-F	8/18/17			B 1	7.2				21	C	C	C
3-Sa	8/19/17			B 1	7				21	.111	.188	8.6
4-Su	8/20/17			B 1	7				21	C	C	C
4-M	8/21/17	0	0	B 1	6.9				21	.067	.075	8.5
4-T	8/22/17			B 1	7				21	.310	.122	8.6
4-W	8/23/17			B 1	6.9				21	.327	.098	8.7
4-Th	8/24/17			B 1	6.9				22	.1	.098	8.4
4-F	8/25/17			B 1	7				22	C	C	C
4-Sa	8/26/17			B 1	7				20	.057	.11	8.2
5-Su	8/27/17			B 1	7				21	.296	.125	8.2
5-M	8/28/17	0	0	B 1	6.8				22	.298	.093	8
5-T	8/29/17			B 1	6.8				22	C	C	C
5-W	8/30/17			B 1	6.8				22	C	C	C
5-Th	8/31/17			B 1	6.8				22	.186	.125	8.3
Minimum					6.7							7.9
					>= 6.0 (RO)							>= 0 (RO)
Average		0	0.5			.01	19.2	20.75	21.4333	0.192	0.118	8.3
		<= 30 (RO)	<= 30 (RO)			Report Only	Report Only	Report Only	Report Only	<= 0.72	<= 0.2	Report Only
Weekly Average		0	1									
		<= 45 (RO)	<= 45 (RO)									
Maximum				B 1	7.2	.01	19.2	20.75		0.366	0.188	
				<= 23	<= 9.0 (RO)	Report Only	Report Only	Report Only		Report Only	<= 0.5	
Daily Maximum									22			
									Report Only			
7 Day Median				B 1								
				<= 2.2								

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit



Permit Number: WA0022641

Permittee: Lighthouse Point Water Reclamation Facility

Facility County: Whatcom

Receiving Waterbody:

Monitoring Period: 07/01/2017 - 07/31/2017

Outfall: 002

Version: 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total Coliforms MP100/ml 1/Day Grab	Standard Units 1/Day Grab	Ammonia Total Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Nitrate Total Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Nitrogen (calculation) Total (TKN + NO3 + NO2) Milligrams/L (mg/L) Monthly Composite sample (24 hour)	Temperature Measured Degrees C 1/Day Grab	Flow Million Gallons/Day Continuous Measurement	Turbidity (NTU) Measured NTU Continuous Measurement	Dissolved Oxygen Milligrams/L (mg/L) 1/Day Grab
002	002	002	002	002	002	002	002	002	002	PS11	PS11	PS11
1-Sa	7/1/17			B 1	6.9				20	C	C	C
2-Su	7/2/17			B 1	7				20	C	C	C
2-M	7/3/17			B 1	6.9				20	C	C	C
2-T	7/4/17	0	0	B 1	6.9				20	C	C	C
2-W	7/5/17			B 1	7	0.87	7.9	10.2	21	.262	.123	8.4
2-Th	7/6/17			B 1	6.8				21	.081	.082	8.4
2-F	7/7/17			B 1	6.8				21	.355	.085	8.2
2-Sa	7/8/17			B 1	7				21	.081	.1	8.3
3-Su	7/9/17			B 1	6.9				21	.302	.08	8.2
3-M	7/10/17			B 1	6.9				21	.264	.088	8
3-T	7/11/17	1	1	B 1	7.1				21	.125	.13	8.2
3-W	7/12/17			B 1	7.1				21	.276	.098	7.9
3-Th	7/13/17			B 1	7.2				21	.107	.103	8.2
3-F	7/14/17			B 1	7				21	.235	.105	8.1
3-Sa	7/15/17			B 1	7.1				21	.324	.096	8.1
4-Su	7/16/17			B 1	7.1				21	.231	.082	8.4
4-M	7/17/17			B 1	7				21	.327	.08	8.5
4-T	7/18/17	0	0	B 1	6.8				21	.363	.085	8.4
4-W	7/19/17			B 1	6.7				21	.210	.09	8.5
4-Th	7/20/17			B 1	6.8				21	C	C	C
4-F	7/21/17			B 1	6.8				21	.182	.093	8.3
4-Sa	7/22/17			B 1	6.8				21	.239	.10	8.4
5-Su	7/23/17			B 1	6.8				21	.309	.093	8.4
5-M	7/24/17	0	0	B 1	6.9				21	.348	.107	8.1
5-T	7/25/17			B 1	6.9				21	.155	.128	8.1
5-W	7/26/17			B 1	6.7				21	.085	.145	8.9
5-Th	7/27/17			B 1	6.8				21	.134	.148	8.4
5-F	7/28/17			B 1	6.9				21	.115	.137	8.3
5-Sa	7/29/17			B 1	6.9				21	.111	.17	8.2
6-Su	7/30/17			B 1	6.8				21	.155	.137	8.4
6-M	7/31/17	0	0	B 1	6.9				21	.158	.103	8.2
Minimum					6.7							7.9
					>= 6.0 (RO)							>= 0 (RO)
Average		0.2	0.2			0.87	7.9	10.2	20.871	.213	0.107	8.28
		<= 30 (RO)	<= 30 (RO)			Report Only	Report Only	Report Only	Report Only	<= 0.72	<= 0.2	Report Only
Weekly Average		1	1									
		<= 45 (RO)	<= 45 (RO)									
Maximum				1	7.2	0.87	7.9	10.2		0.363	0.17	
				<= 23	<= 9.0 (RO)	Report Only	Report Only	Report Only		Report Only	<= 0.5	
Daily Maximum									21			
									Report Only			
7 Day Median				J 1								
				<= 2.2								

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit



Permit Number: WA0022641

Permittee: Lighthouse Point Water Reclamation Facility

Facility County: Whatcom

Receiving Waterbody:

Monitoring Period: 06/01/2017 - 06/30/2017

Outfall: 002

Version: 1

Week	Monitoring Point	Total BOD5 Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Solids (Residual) Total suspended (TSS) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Total Coliforms R/100ml 1/Day Grab	pH Standard Units 1/Day Grab	Ammonia Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Nitrate Total Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Nitrogen (calculation) Total (TKN + NO3 + NO2) Milligrams/L (mg/L) Weekly Composite sample (24 hour)	Temperature Measured Degrees C 1/Day Grab	Flow Million Gallons/Day Continuous Measurement	Turbidity (NTU) Measured NTU Continuous Measurement	Dissolved Oxygen Milligrams/L (mg/L) 1/Day Grab
		002	002	002	002	002	002	002	002	PS11	PS11	PS11
1-Th	6/1/17			B 1	7.2				18	C	C	C
1-F	6/2/17			B 1	7				18	C	C	C
1-Sa	6/3/17			B 1	7.1				18	C	C	C
2-Su	6/4/17			B 1	7	.05	21	22	18	C	C	C
2-M	6/5/17			B 1	6.9				18	C	C	C
2-T	6/6/17	0	0	B 1	6.9				19	C	C	C
2-W	6/7/17			B 1	7				19	.109	.19	9.1
2-Th	6/8/17			B 1	6.9				19	.078	.11	8.9
2-F	6/9/17			B 1	6.9				19	C	C	C
2-Sa	6/10/17			B 1	7.1				19	C	C	C
3-Su	6/11/17			B 1	7				19	C	C	C
3-M	6/12/17			B 1	6.9				19	C	C	C
3-T	6/13/17	0	1	B 1	6.7				19	C	C	C
3-W	6/14/17			B 1	6.9				19	.210	.18	9.2
3-Th	6/15/17			B 1	6.6				19	.270	.163	8.6
3-F	6/16/17			B 1	6.7				19	.159	.15	8.7
3-Sa	6/17/17			B 1	6.7				19	C	C	C
4-Su	6/18/17			J 1	6.8				19	C	C	C
4-M	6/19/17			B 1	6.8				19	C	C	C
4-T	6/20/17			B 1	6.6				19	C	C	C
4-W	6/21/17	0	0	B 1	6.8				20	C	C	C
4-Th	6/22/17			B 1	6.8				20	C	C	C
4-F	6/23/17			B 1	7				20	C	C	C
4-Sa	6/24/17			B 1	7				20	.153	.081	8.6
5-Su	6/25/17			B 1	6.9				20	.104	.082	8.6
5-M	6/26/17			B 1	7				20	.306	.11	9
5-T	6/27/17	0	0	B 1	6.8				20	.410	.093	8.5
5-W	6/28/17			B 1	6.8				20	.380	.098	8.6
5-Th	6/29/17			B 1	7				20	.129	.097	8.6
5-F	6/30/17			B 1	6.9				20	C	C	C
Minimum					6.6							8.5
					>= 6.0 (RO)							>= 0 (RO)
Average		0	0.25			0.05	21	22	19.1667	.2098	.123	8.764
		<= 30 (RO)	<= 30 (RO)			Report Only	Report Only	Report Only	Report Only	<= 0.72	<= 0.2	Report Only
Weekly Average		0	1									
		<= 45 (RO)	<= 45 (RO)									
Maximum				1	7.2	0.05	21	22		0.41	0.19	
				<= 23	<= 9.0 (RO)	Report Only	Report Only	Report Only		Report Only	<= 0.5	
Daily Maximum									20			
									Report Only			
7 Day Median				B 1								
				<= 2.2								

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit

City of Blaine Reclaimed Water Ordinance

ORDINANCE NO. 11-2788

**AN ORDINANCE OF THE CITY OF BLAINE, WASHINGTON,
CREATING A RECLAIMED WATER COMMODITY, PROVIDING THAT
SUCH COMMODITY SHALL BE CONSIDERED TO BE A PART OF THE CITY
WASTEWATER UTILITY FUND.**

WHEREAS, the City Council of the City of Blaine, Washington (the "City") owns, maintains and operates the Lighthouse Point Water Reclamation Facility (LPWRF) which produces Class "A" Reclaimed Water as defined in RCW 90.46, and

WHEREAS, Washington State Law encourages the use of reclaimed water "to replace potable water in non-potable applications, to supplement existing surface and groundwater supplies, and to assist in meeting the future water needs of the State"; and

WHEREAS, the City has developed a Reclaimed Water Plan entitled "Requirements for Reclaimed Water Use", dated January, 2010, which has been reviewed and approved by the State Departments of Health and Ecology; and

WHEREAS, the Lighthouse Point Water Reclamation Facility would otherwise simply discharge the reclaimed water into Semiahmoo Bay each year, and

WHEREAS, in order to conserve water in areas of the City where such reclaimed water can be made available and substituted for the use of potable water for certain beneficial uses including irrigation, and

WHEREAS, as part of the Wastewater Utility, it is necessary and beneficial to create a Reclaimed Water Commodity under the Wastewater Utility Fund,

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BLAINE, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. There is hereby established a new Chapter 13.09 in the Blaine Municipal Code, to read as follows:

**Chapter 13.09
Reclaimed Water**

Sections:

- 13.09.010 Policy
- 13.09.020 Definitions
- 13.09.030 Reclaimed Water Plan
- 13.09.040 Use of Reclaimed Water
- 13.09.050 User Agreements
- 13.09.060 Reclaimed Water Charges

13.09.010 Policy and Purpose

It is the policy of the City of Blaine to produce high quality effluent from its wastewater treatment process which can meet state reclaimed water standards contained in RCW 90.46 and be used for beneficial purposes where financially and technically feasible. The city is dependent on groundwater sources and limited water rights for potable water which is vital to public health, safety, and welfare. Developing and using reclaimed water for non-potable beneficial uses can defer the need to acquire additional potable water rights and water infrastructure. This chapter establishes a Reclaimed Water Commodity as part of the Wastewater Utility Fund and provides a basis for the use of and assessment of fees for reclaimed water that encourage reclaimed water use in place of potable water.

13.09.020 Definitions.

The following words when used herein shall have the following meanings unless the context clearly indicates otherwise:

- A. "Agronomic rate" means the amount of water required to sustain and promote plant and vegetation growth without saturation of the underlying soils.
- B. "Agricultural purposes" means and includes the growing of field and nursery crops, row crops, trees, and vines and the feeding of fowl and livestock.
- C. "Beneficial use" means the use of reclaimed water which has been transported from the point of production to the point of use without an intervening discharge to waters of the state, for a beneficial purpose.
- D. "Irrigation" means application of water to non-consumptive vegetation and landscaping at normal agronomic rates.
- E. "Industrial process water" means water used by any industrial facility with process water requirements which include, but are not limited to, rinsing, washing, cooling and circulation, or construction process.
- F. "Potable water" means groundwater that is used or intended to be used as, and is suitable for, a source of a water supply for domestic purposes and has been classified as a source of drinking water by the Department of Health.
- G. "Reclaimed water" means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur and is no longer considered wastewater. As used herein, reclaimed water shall be classified as Class A reclaimed water as defined in Chapter 90.46 RCW and the Water Reclamation and Reuse Standards.
- H. "Reclaimed water distribution systems" means a piping system intended for the delivery of reclaimed water separate from and in addition to the potable water distribution system.

- I. "Reclaimed water user agreement" means a binding agreement between the City of Blaine and the owner of a use area outlining the conditions for use of reclaimed water to ensure that construction, operation, maintenance and monitoring meets all requirements of the Washington Departments of Ecology and Health and the city.
- J. "Reuse" means the use of reclaimed water in compliance with Washington Departments of Ecology and Health regulations for a beneficial use.
- K. "Service connection" means that portion of the reclaimed water supply system connecting the reclaimed water distribution main including the tap into the main, the water meter and appurtenances and the service line from the main to the meter and from the meter to the user's property line. "Service connection" includes connections for fire protection as well as for irrigation, commercial and industrial uses.
- L. "Service use area" means any facility, building, or area approved for use of reclaimed water as evidenced by an executed user agreement.
- M. "Water reclamation and reuse standards" means the most current version of the standards developed by the Washington State Departments of Ecology and Health.

13.09.030 City of Blaine Reclaimed Water Plan

The City of Blaine has prepared and adopted a Reclaimed Water Plan which has been approved by the Washington State Department of Ecology and the Washington State Department of Health consistent with the Blaine General Sewer Plan. Reclaimed water requirements and restrictions are defined in RCW 90.46 and the current Water Reclamation and Reuse Standards, published by Washington State Department of Ecology & Department of Health.

13.09.040 Use of Reclaimed Water

- A. **Irrigation.** Reuse water may be used for irrigation purposes and shall be at normal agronomic rates for the types of plants and vegetation being irrigated. There shall be no application of reclaimed water for irrigation purposes when the ground is saturated or frozen or when the City has temporarily suspended the use of reclaimed water. Reclaimed water shall not be allowed to be sprayed on people, or on areas where humans or pets consume food or liquids, and/or any other area not designated for application of reclaimed wastewater.
- B. **Other Beneficial Uses.** The city has identified other uses for reclaimed water including restrooms and utility stations at the Lighthouse Point Water Reclamation Facility. A reclaimed water hydrant has also been located adjacent to the facility to be used for flushing the wastewater equalization basin, and filling the City street sweeper and other tank trucks or other equipment used to distribute reclaimed water. Tank trucks used to transport reclaimed water shall be clearly identified with advisory signs and shall not be used to transport potable water that is used for drinking or other potable purposes. Tank trucks used to transport reclaimed water shall be inspected and approved for such use by the city prior to transporting reclaimed water. The city also anticipates the potential for future use of reclaimed water as industrial process water in the vicinity of the Wharf

District. Specific conditions and limitations on those industrial uses shall be established by separate user agreements as described in Section C which follows.

C. **User Agreements.** User agreements are contracts between the City and a specific User which specify the terms and conditions under which beneficial use of reclaimed water may be:

1. **Requested Service.** Staff shall review requests for reclaimed water service for consistency with the approved reclaimed water plan and evaluate the expected demand and available production capacity and make a determination whether the subject property can be served with reclaimed water. Based upon such determination, a user agreement may then be prepared.
2. **User Agreement Conditions.** The user agreement shall specify the service use area, operation, maintenance and monitoring requirements for the applicant's planned use, based on the rules and regulations adopted pursuant to this chapter and shall require compliance with the Washington State Departments of Ecology and Health requirements (see Chapter 90.46 RCW), and requirements of the Water Reclamation and Reuse Standards.
3. **Connection – General Requirements.** When an agreement has been accepted for the installation of reclaimed water service, the city shall cause the premises described in the agreement to be connected with the reclaimed water system by a service pipe extending from the reclaimed water main to the property line and a shutoff valve and reclaimed water meter placed within the right-of-way. Every separate user and premises shall have its own separate meter. All connections to the city's reclaimed water distribution system shall conform to the standard specifications and regulations of the city.
4. **Water Meters.** All service connections to the city reclaimed water system shall be metered. Reclaimed water meters shall be sized to provide adequate flow of reclaimed water to the customer. Minimum water meter sizes shall ordinarily be determined from the maximum flow requirements for the user as determined by an engineering study. All water meters shall be American Water Works Association (AWWA) approved.

D. **Identification of Pipe and Appurtenances.** All reclaimed water pipelines, valves, outlets, and other appurtenances, including all irrigation systems pipelines, valve and control boxes shall be color-coded purple (Pantone 622 or other shades of purple acceptable to the city). Signs for notification of reclaimed water connections shall read "Reclaimed Water – Do Not Drink" or other similar City approved language. All identification shall comply with State regulations contained in the current State Water Reclamation and Reuse Standards.

E. **Cross-Connection Control.** There shall be no cross-connections between the reclaimed water and potable water systems. Where both reclaimed water and potable water are

supplied to a reclaimed water use area, a “reduced pressure principle backflow” prevention device, or an approved “air gap separation” shall be installed at the potable water service connection to the reuse area. The cost of such device and the installation thereof shall be borne by the owner of the premises affected. The installation and periodic testing shall conform to the provisions of WAC 248-54-500. An independent testing laboratory shall submit a test report indicating the backflow prevention device has been tested and is in conformance with this section. Annual testing and reporting shall be required.

- F. **Ownership of Mains and Service Connections.** The ownership of all mains, service connections and appurtenances (up to and including the water meter and meter box) shall be vested fully in the city, and the person responsible for the construction shall relinquish by deed of conveyance all interest in the ownership of such upon acceptance by the city and ensure that all are constructed within rights-of-way or utility easements. The city shall operate, control and maintain all approved and accepted components of the city reclaimed water distribution system in the public streets or utility rights-of-way up to and including the meter, but shall not be responsible beyond the meter. The owner of the property served shall be responsible for maintenance of all pipe and fittings from the meter to his premises. No alteration shall be made to any connection nor shall any connection be made to the city’s reclaimed water distribution system without the approval of the city. All connections or alterations shall be made by the city’s Public Works Department or by a contractor supervised by the city.
- G. **Conversion of Existing Potable Water System.** The city may authorize a potable water user to convert their irrigation and/or other non-potable uses of water to the use of reclaimed water for potable water conservation purposes. Requirements for identification of pipe and appurtenances and responsibility for all other costs associated with the required connection shall be identified in the user agreement.
- H. **Dwelling Unit.** Reclaimed water shall not enter a dwelling unit or a building containing a dwelling unit except as specifically provided in the Water Reclamation and Reuse Standards.

13.09.060 Reclaimed Water Charges

- A. **Reclaimed Water Rate.** The rate charged for reclaimed water shall be a volume rate as established in the Unified Fee Schedule.
- B. **Reclaimed Water Service and Meter Charge.** To help encourage use of reclaimed water in lieu of potable water and to advance the use of reclaimed water, the only charge for connection shall be a service and meter charge, based on the meter size, identified in the Unified Fee Schedule. Special circumstances may be taken into consideration to allow for a different charge. Such special circumstances shall be identified in the user agreement and shall be approved by the city council.

13.09.070 Inspection of Premises.

Authorized employees of the Public Works Department, properly identified, shall have free access at reasonable hours of the day, to all premises served by the city's reuse system for the purpose of ascertaining conformity to this chapter, the User Agreement, Water Reclamation and Reuse Standards, and the city's NPDES permit.

PASSED BY THE CITY COUNCIL OF THE CITY OF BLAINE, WASHINGTON, on the 11th day of April, 2011, and signed by the Mayor on the same day.

Bonnie Onyon, Mayor

ATTEST/AUTHENTICATE:

Sheri Sanchez, City Clerk

CERTIFICATION

I, the undersigned, City Clerk of the City of Blaine, Washington (the "City"), hereby certify as follows:

1. The attached copy of Ordinance No. 11-2788 (the "Ordinance") is a full, true and correct copy of an ordinance duly passed at the March 28, 2011 regular meeting of the City Council of Blaine held at the regular meeting place, as that ordinance appears in the minutes of the City; and the Ordinance will be in full force and effect five days after the publication of its summary in the City's official newspaper; and

2. A quorum of the members of the City Council was present throughout the meeting and a majority of those members present voted in the proper manner for the passage of the Ordinance.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of _____, 2011.

CITY OF BLAINE, WASHINGTON

City Clerk