



1411 East Mission Avenue
PO Box 3727
Spokane, WA 99220-3727

July 12, 2018

Pat Hallinan
Department of Ecology
Water Quality Program
4601 North Monroe
Spokane, WA 99205-1295

Subject: Revised NPDES Permit No. WA0045217 Kettle Falls Generating Station Renewal Application

Mr. Hallinan,

Avista is submitting this revised application for NPDES renewal that addresses comments received from the Department of Ecology on May 18, 2018. No other changes have been made.

Two (2) EPA Application Forms and their required supporting documents for the renewal of above-referenced permit are attached as follows along with a revised Engineering Report for the facility:

- 1. 3510-1 General Information**
XI Topographic Map
- 2. 3510-2C Wastewater Discharge**
IIA Process Flow Diagram
Sample Results
- 3. Revised Engineering Report**

Form 3510-2F will be submitted separately following additional stormwater sampling.

Additionally, Avista has compiled available water quality data and performed preliminary potential permit limit calculations. This information is provided in two spreadsheets submitted electronically only (excluded from hard copy).

Water Quality Permit Coordinator
July 12, 2018
Page 2

Please call me at (509) 495-4738 with any questions regarding this application. We appreciate your attention to this application and look forward to working with you to obtain the final permit renewal.

Sincerely,



Kevin Booth
Senior Environmental Scientist
(509) 495-4738
kevin.booth@avistacorp.com

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

This form is equivalent to EPA Form 3510-1

FORM 1 GENERAL	 U.S. ENVIRONMENTAL PROTECTION AGENCY/ECOLOGY GENERAL INFORMATION <i>Consolidated Permits Program</i> (Read the "General Instructions" before starting.)	1. Current permit I.D.		T/A	C				
		WA0045217			D				
				14	15				
II. POLLUTANT CHARACTERISTICS									
INSTRUCTIONS: Complete A through J to determine whether you need to submit a NPDES permit application forms to Ecology. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms .									
		MARK "X"		MARK "X"					
		YES	NO	FORM ATTACHED	YES	NO	FORM ATTACHED		
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	B. Does or will this facility (<i>either existing or proposed</i>) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C. Is this facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C) Does this facility operate a cooling water intake structure? (FORM 2C Supplemental)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D. Is this proposal facility (<i>other than those described in A or B above</i>) which will result in a discharge to waters of the U.S.? (FORM 2D)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E. Does or will this facility treat, store, or dispose of hazardous wastes ? (FORM 3)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G. Do you or will you inject at this facility any produced water other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
III. NAME OF FACILITY									
C	Kettle Falls Generating Station								
1									
IV. FACILITY CONTACT									
A. NAME & TITLE (<i>last, first, & title</i>)			B. PHONE (<i>area code & no.</i>)						
2	Wiggins, Gregory, Plant Manager		509	738	1505				
B. EMAIL ADDRESS			C. Does the facility have or can it obtain broadband internet access?						
C	Gregory.Wiggins@avistacorp.com		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
2									
V. FACILITY MAILING ADDRESS									
A. STREET OR P.O. BOX			B. CITY OR TOWN						
C	P.O. Box 609		Kettle Falls						
3									
C. STATE			D. ZIP CODE						
C	WA		99141						
4									
VI. FACILITY LOCATION									
A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			B. COUNTY NAME						
C	1151 Highway 395 North		Stevens						
5									
C. CITY OR TOWN			D. STATE						
C	Kettle Falls		WA						
6									
E. ZIP CODE			F. COUNTY CODE						
C	99141		n/a						
7									
D. LATITUDE/LONGITUDE (NAD 83 DATUM)									
LATITUDE AS DECIMAL DEGREES - N4 48.6196									
LONGITUDE AS DECIMAL DEGREES - W1 118.1116									

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VII. SIC, NAICS CODES (in order of priority) **AND UBI NUMBER** Place additional on an attachment.

SIC FIRST			SIC. SECOND		
C 7	4911	(specify) Electric services	7 7		(specify)

EQUIVALENT NAICS FIRST			EQUIVALENT NAICS SECOND		
C 7	221117	(specify) Biomass electric power generation	7 7		(specify)

UBI NUMBER - 328-000-223

VIII. OPERATOR INFORMATION

A. NAME				B. Is the name listed in Item VIII-A also the owner?	
C 8	Avista Corporation			<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other," specify.)				D. PHONE (area code & no.)			
F = FEDERAL	M = PUBLIC (other than federal or state)	P	(specify)	C A	509	489	0500
S = STATE	O = OTHER (specify)						
P = PRIVATE							

E. STREET OR PO BOX
1411 East Mission Avenue

F. CITY OR TOWN		G. STATE	H. ZIP CODE	IX. INDIAN LAND
C B	Spokane	WA	99202	Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)				D. PSD (Air Emissions from Proposed Sources)				
C 9	T N	I WA0045217		C 9	T P	S X80-11		
B. UIC (Underground Injection of Fluids)				E. OTHER (specify)				(Specify)
C 9	T U	I 		C 9	T 	S 07AQ-E231		AOP
C. RCRA (Hazardous Wastes)				E. OTHER (specify)				(Specify)
C 9	T R	I 		C 9	T 	S 		

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

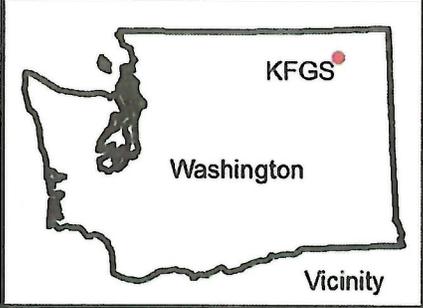
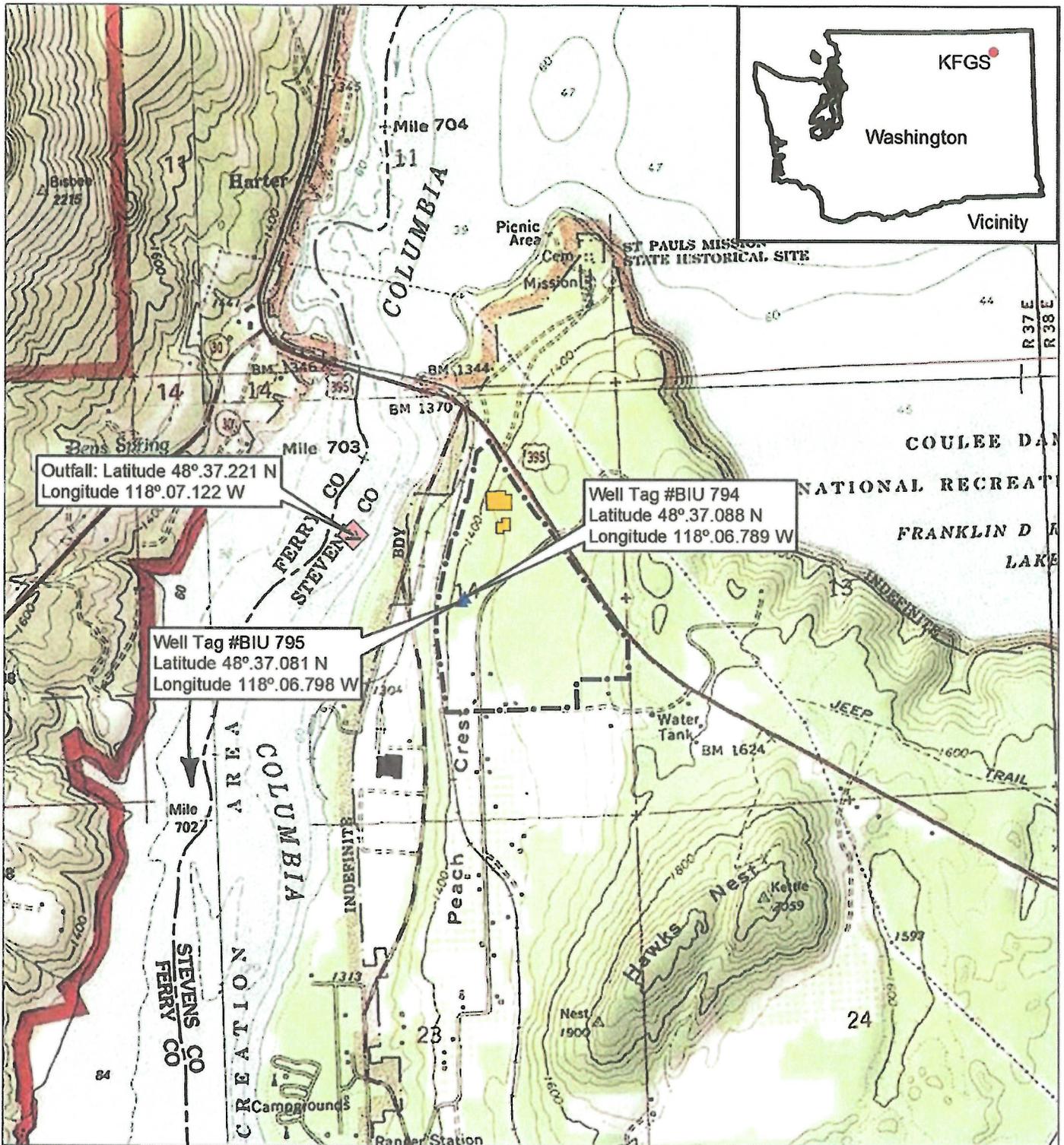
XII. NATURE OF BUSINESS (provide a brief description)

The Kettle Falls Generating Station is a wood-waste fired steam-electrical generating facility.

XIII. CERTIFICATION (see instructions)

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 that, 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.

A. NAME & OFFICIAL TITLE (type or print) Dennis Vermillion, President, Avista Corporation	B. SIGNATURE 	C. DATE SIGNED 7/12/18
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1 inch = 2,000 feet



Kettle Falls Generation Station

Site Location and Surrounding Topography



I. Outfall Location

For this outfall, list the latitude and longitude, (degrees, min.xxxx) and name of the receiving water(s)

Outfall Number (list)	Latitude		Longitude		Receiving Water (name)
	Deg	Min	Deg	Min	
1	48	37.221	118	07.122	Lake Roosevelt, Columbia River

II. Flows, Sources of Pollution, and Treatment Technologies

- A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed description in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.
- B. For each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. Outfall No. (list)	2. Operations Contributing Flow		3. Treatment	
	a. OPERATION (list)	b. AVERAGE FLOW (include units)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1
1	Cooling Tower	133,316 GPD	Sedimentation	1 U
1	Process and Boiler	13,200 GPD	Sedimentation	1 U
1	Reverse Osmosis Reject	192,010 GPD	Sedimentation	1 U

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C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?
 YES (complete the following table) **NO** (go to Section III)

1. OUTFALL NUMBER (list)	2. OPERATION(S) CONTRIBUTING FLOW (list)	3. FREQUENCY		4. FLOW				c. DURATION (in days)
		a. DAYS PER WEEK (specify average)	b. MONTHS PER YEAR (specify average)	a. FLOW RATE (in mgd)		b. TOTAL VOLUME (specify with units)		
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
	<i>Intermittent</i>							
1	Total Operations as listed in II-B 2	5.7 AVE	10 AVE	0.1997	0.2329	0.1997 MGD	0.2329 MGD	298

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?
 YES (complete Item III-B) **NO** (go to Section IV)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?
 YES (complete Item III-C) **NO** (go to Section IV)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS (list outfall numbers)
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	

IV. IMPROVEMENTS

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.
 YES (complete the following table) **NO** (go to Item IV-B)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. No	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.
 MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAM IS ATTACHED

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

YES (identify the test(s) and describe their purpose below)

NO (go to Section VIII)

(This area is intentionally left blank for providing test details.)

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

YES (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)

NO (go to Section IX)

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
Edge Analytical, Inc. - Sampling Analysis	1620 S Walnut St Burlington, WA 98223	((360) 757-1400) () ()	See Lab Sampling Results Attachment
Schwyn Environmental Services, LLC - Sample Collection	4621 S Custer Court Spokane, WA 99223	((509) 448-3187) () () ()	All Pollutants on Lab Sampling Results Attachment
Anatek Labs, Inc. Sampling Analysis	504 E Sprague, Suite D Spokane, WA 99202	(509) 838-3999 () () () () ()	See Lab Sampling Results Attachment

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (type or print)

Dennis Vermillion, President, Avista Utilities

B. PHONE NO. (area code & no.)

(509) 495-4752

C. SIGNATURE

(Handwritten signature of Dennis Vermillion)

D. DATE SIGNED

7/12/18

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER (copy from Item 1 of Form 1)
WA0045217

V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)

1. POLLUTANT	a. MAXIMUM DAILY VALUE			b. MAXIMUM 30 DAY VALUE (if available)			c. LONG TERM AVRG. VALUE (if available)			d. NO. OF ANALYSIS	3. UNITS (specify if blank)		4. INTAKE (optional)	
	(1) CONCENTRATION	(2) MASS	VALUE	(1) CONCENTRATION	(2) MASS	VALUE	(1) CONCENTRATION	(2) MASS	VALUE		a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (BOD)	ND	0.00							1	mg/l	g			
b. Chemical Oxygen Demand (COD)	31.3	59.24							1	mg/l	g			
c. Total Organic Carbon (TOC)	6.53	12.36							1	mg/l	g			
d. Total Suspended Solids (TSS)	5	9.46							1	mg/l	g			
e. Ammonia (as N)	0.05	0.09							1	mg/l	g			
f. Flow	Value	232,900	Value	Value	Value	Value	Value	Value	1	GPD		Value		
g. Temperature (winter)	Value	18.3	Value	Value	Value	Value	17.7	Value	3		°C	Value		
h. Temperature (summer)	Value	26.7	Value	Value	Value	Value	22.2	Value	26		°C	Value		
i. pH	Minimum 6.0	Maximum 9.1	Minimum	Maximum	Minimum	Maximum			54	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitation guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		a. MAXIMUM DAILY VALUE			b. MAXIMUM 30 DAY VALUE (if available)			c. LONG TERM AVRG. VALUE (if available)			d. NO. OF ANALYSIS	4. UNITS (specify if blank)		5. INTAKE (optional)	
	a. BE-LIEVE PRESENT	b. BE-LIEVE ABSENT	(1) CONCENTRATION	(2) MASS	VALUE	(1) CONCENTRATION	(2) MASS	VALUE	(1) CONCENTRATION	(2) MASS	VALUE		a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	b. NO. OF ANALYSES
a. Bromide (24959-67-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.05	0.09								1	mg/l	g		
b. Chlorine Total Residual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.03	0.06								1	mg/l	g		
c. Color	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5	0.00								1	color units			
d. Fecal Coliform	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<1.8									1	100/ml			
e. Fluoride (16984-48-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.13	2.14								1	mg/l	g		
f. Nitrate-Nitrite (as N)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.79	7.17								1	mg/l	g		

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT				4. UNITS (specify if blank)		5. INTAKE (optional)		
	a. BE-LIEVE PRESENT	b. BE-LIEVE DABSENT	a. MAXIMUM DAILY VALUE	b. MAXIMUM 30 DAY VALUE (if available)	c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE	b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (as N)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.65	1.23			1	mg/l	g		
h. Oil and Grease	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.3	2.46			1	mg/l	g		
i. Phosphorus (as P), Total (7723-14-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.45	2.74			1	mg/l	g		
j. Radioactivity											
(1) Alpha, Total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.9				1	pCi/l			
(2) Beta, Total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	9.70				1	pCi/l			
(3) Radium, Total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.74				1	pCi/l			
(4) Radium 226, Total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.33				1	pCi/l			
k. Sulfate (as SO ₄) (14808-79-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	714	1351.4			1	mg/l	g		
l. Sulfide (as S)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND				1				
m. Sulfite (as SO ₃) (14265-45-3)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND				1	mg/l			
n. Surfactants	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND				1	mg/l			
o. Aluminum, Total (7429-90-5)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND				1	ug/l			
p. Barium, Total (7440-39-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	305	0.58			1	ug/l	g		
q. Boron, Total (7440-42-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	260	0.49			1	ug/l	g		
r. Cobalt, Total (7440-48-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.6	0.00			1	ug/l	g		
s. Iron, Total (7439-89-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	130	0.25			1	ug/l	g		
t. Magnesium, Total (7439-95-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	73700	139.49			1	ug/l	g		
u. Molybdenum, Total (7439-98-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20.0	0.04			1	ug/l	g		
v. Manganese, Total (7439-96-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2.00	0.00			1	ug/l	g		
w. Tin, Total (7440-31-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.10	0.01			1	ug/l	g		
x. Titanium, Total (7440-32-6)	<input type="checkbox"/>	<input type="checkbox"/>	13.0	0.02			1	ug/l	g		

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2c for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT		4. UNITS (specify if blank)		5. INTAKE (optional)		b. NO. OF ANALYSES
	a. TESTING REQUIRED	b. BELIEVED PRE-SENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION (2) MASS	d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION (2) MASS		
METALS, CYANIDE, AND TOTAL PHENOLS										
1m. Antimony, Total (7440-36-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.1	0.00		1	ug/l	g	
2M. Arsenic, Total (7440-38-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.7	.02		1	ug/l	g	
3M. Beryllium, Total (7440-41-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l		
4M. Cadmium, Total (7440-43-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l		
5M. Chromium, Total (7440-47-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.1	0.01		1	ug/l	g	
6M. Copper, Total (7440-50-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.6	0.00		1	ug/l	g	
7M. Lead, Total (7439-92-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.1	0.00		1	ug/l	g	
8M. Mercury, Total (7439-97-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.00599	0.000		2	ug/l	g	
9M. Nickel, Total (7440-02-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.7	0.00		1	ug/l	g	
10M. Selenium, Total (7782-49-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.6	0.01		1	ug/l	g	
11M. Silver, Total (7440-22-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l		
12M. Thallium, Total (7440-28-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l		
13M. Zinc, Total (7440-66-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.0	0.02		1	ug/l	g	
14M. Cyanide, Total (57-12-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l		
15M. Phenols, Total	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l		
DIOXIN										
2,3,7,8-Tetrachlorodibenzo-p-dioxin (1784-01-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DESCRIBE RESULTS ND						

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT				4. UNITS (specify if blank)			5. INTAKE (optional)				
	a. TESTING REQUIRED	b. BELIEVED PRE-SENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
2V. Acrylonitrile (107-13-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
3V. Benzene (71-43-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
4V. Bis (Chloromethyl) Ether (94-88-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
5V. Bromoform (75-25-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
6V. Carbon Tetrachloride (55-23-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
7V. Chlorobenzene (108-90-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
8V. Chlorodibromomethane (124-48-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
9V. Chloroethane (75-00-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
10V. 2-Chloroethylvinyl Ether (110-75-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
11V. Chloroform (67-66-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.7	0.00					1	ug/l	g			
12V. Dichlorobromomethane (97-74-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
13V. Dichlorobenzene (75-71-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
14V. 1,1-Dichloroethane (78-27-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
15V. 1,2-Dichloroethane (107-08-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
16V. 1,1-Dichloroethylene (7535-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
17V. 1,2-Dichloropropane (78-87-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
18V. 1,3-Dichloropropane (52-75-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
19V. Ethylbenzene (100-41-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
20V. Methyl Bromide (74-83-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				
21V. Methyl Chloride (74-87-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l				

1. POLLUTANT AND GAS NO. (if available)	2. MARK 'X'		3. EFFLUENT				4. UNITS (specify if blank)				5. INTAKE (optional)			
	a. TEST-ING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE	b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS					
GC/MS - VOLATILE COMPOUNDS (continued)														
23.V. Methylene Chloride (75-09-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
23.V. 1,1,2,2-Tetra-Chloroethane (79-34-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
24.V. Tetrachloro-ethylene (127-18-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
25.V. Toluene (108-88-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
26.V. 1,2-Trans-Dichloroethylene (156-50-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
27.V. 1,1,1-Trichloroethane (71-35-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
28.V. 1,1,2-Trichloroethane (79-06-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
29.V. Trichloro-ethene (79-06-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
30.V. 1,1-Dichloro-ethane (78-07-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
31.V. Methyl Chloride (75-01-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
GC/MS FRACTION - ACID COMPOUNDS														
1A. 2-Chlorophenol (85-57-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
2A. 2,4-Dichlorophenol (126-95-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
3A. 2,4-Dimethylphenol (105-67-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
4A. 4,6-Dinitro-O-cresol (534-52-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
5A. 2,4-Dinitro-O-cresol (51-28-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
6A. 2-Nitro-phenol (68-75-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
7A. 4-Nitro-phenol (100-02-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
8A. P-Chloro-M-cresol (68-95-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
9A. Penta-chlorophenol (67-96-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
10A. Phenol (108-95-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			
11A. 2,4,6-Trichlorophenol (88-06-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l			

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT				4. UNITS (specify if blank)		5. INTAKE (optional)		b. NO. OF ANALYSES
	a. TEST-ING. RE-QUIRED	b. BE-LIEVED PRE-SENT	c. BE-LIEVED ABSENT	a. MAXIMUM DAILY VALUE	b. MAXIMUM 30 DAY VALUE (if available)	c. LONG TERM AVRG. VALUE (if available)	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE	b. MASS	
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS												
18. Acemphthene (83-32-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
28. Acenaphthylene (208-96-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
38. Anthracene (124-72-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
48. Benzidine (92-87-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
58. Benzo (a) Anthracene (85-36-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
68. Benzo (a) Pyrene (85-32-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
78. 3,4-Benzo-fluoranthene (205-99-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
88. Benzo (ghi) Perylene (191-24-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
98. Benzo (k) Fluoranthene (207-08-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
108. Bis (2-Chloroethoxy) Methane (111-91-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
118. Bis (2-Chloroethyl) Eth. Ether (111-44-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
128. Bis (2-Chloroisopropyl) Ether (108-60-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
138. Bis (2-Ethylhexyl) Phthalate (117-81-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
14 B. 4-Bromo-phenyl Phenyl Ether (107-55-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
158. Butyl Benzyl Phthalate (85-86-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
168. 2-Chloro-ethyl Eth. Ether (85-89-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
178. 4-Chloro-phenyl Phenyl Ether (7005-72-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
188. Chrysene (218-01-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
198. Dibenzo (a,h) Anthracene (85-70-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
208. 1,2-Dichloro-ethane (107-06-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				
218. 1,3-Dichloro-benzene (644-73-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l				

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1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT		4 if blank		5. INTAKE (optional)		b. NO. OF ANALYSES		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE	b. MAXIMUM 30 DAY VALUE (if available)	c. LONG TERM AVRG. VALUE (if available)	a. CONCENTRATION	b. MASS		a. LONG TERM AVERAGE VALUE	(1) CONCENTRATION
GC/MS - BASE/NEUTRAL COMPOUNDS (continued)											
228. 1,4-Dichlorobenzene (105-46-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
235. 3,3-Dichlorobenzidine (91-94-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
248. Diethyl Phthalate (84-66-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
248. Dimethyl Phthalate (131-11-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
258. Di-N-Butyl Phthalate (84-74-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
278. 2,4-Dinitrotoluene (121-14-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
285. 2,6-Dinitrotoluene (605-20-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
298. Di-N-Octyl Phthalate (117-84-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
308. 1,2-Diphenylhydrazine (as Azobenzene) (106-74-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
315. 8-Methylnaphthalene (206-44-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
325. Fluorene (85-73-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
338. Hexachlorobenzene (108-74-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
348. Heptachlorobutadiene (87-68-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
358. Hexachlorocyclopentadiene (77-47-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
368. Hexachloroethane (67-72-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
378. Indene (1,2,3-cyclo) Pyrene (193-39-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
398. Isophorone (78-59-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
398. Naphthalene (91-20-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
408. Nitrobenzene (98-95-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
418. N,N-Dimethylamine (62-75-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				
428. N,N-Dimethyl-N-Propylamine (621-64-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			ug/l				

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1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			2. EFFLUENT				3. UNITS (specify if blank)		4. INTAKE (optional)	
	a. TESTING REQUIRED	b. BELIEVED PRE-SENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE	b. MAXIMUM 30 DAY VALUE (if available)	c. LONG TERM AVRG. VALUE (if available)	d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE	b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)											
43B. N-Nitrosodiphenylamine (65-30-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
44B. Phthalanthrene (65-01-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
45B. Pyrene (129-00-0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
46B. 1,2,4-Trichlorobenzene (120-82-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
GC/MS FRACTION - PESTICIDES											
1P. Aldrin (309-00-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
2P. α-BHC (319-84-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
3P. β-BHC (319-85-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
4P. γ-BHC (68-89-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
5P. δ-BHC (319-86-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
6P. Chlordane (57-74-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
7P. 1,4-DDT (60-29-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
8P. 4,4'-DDE (72-55-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
9P. 4,4'-DDD (72-54-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
10P. Dieldrin (60-57-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
11P. α-Endo-sulfan (115-29-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
12P. β-Endo-sulfan (115-28-7)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
13P. Endosulfan Sulfate (1031-07-8)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
14P. Endrin (72-20-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
15P. Endrin (742135-4)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			
16P. Heptachlor (75-44-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND			1	ug/l			

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT				4. UNITS (specify if blank)		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE	b. MAXIMUM 30 DAY VALUE (if available)	c. LONG TERM AVERAGE VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE	b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	
GC/MS - PESTICIDES (continued)												
17P. Heptachlor Epoxide (1624-57-3)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
18P. PCB-1242 (59469-21-9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
19P. PCB-1254 (11097-69-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
20P. PCB-1221 (11104-28-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
21P. PCB-1232 (11141-16-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
22P. PCB-1248 (12672-29-6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
23P. PCB-1260 (11096-82-5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
24P. PCB-1016 (12674-11-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								
25P. Toxa-phene (8001-35-2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ND								



Burlington, WA	Corporate Laboratory (a)	1620 S Walnut St	Burlington, WA 98233	800 755 9295 • 360 757 1400
Bellingham, WA	Microbiology (b)	805 Orchard Dr Ste 4	Bellingham, WA 98225	360 715 1212
Portland, OR	Microbiology/Chemistry (c)	9150 SW Pioneer Ct Ste W	Wilsonville, OR 97070	503 682 7802
Corvallis, OR	Microbiology (d)	540 SW Third Street	Corvallis, OR 97333	541 753 4946

September 12, 2017

Page 1 of 2

Pam Kish
Avista Corporation
1411 E Mission Ave
Spokane, WA 99202

RE: 17-17631 - KFGS NPDES Permit Sampling

Dear Pam Kish,

Your project: KFGS NPDES Permit Sampling, was received on Friday July 21, 2017.

The following comments are reported for your project:

The following analytes were analyzed by alternate methods approved for NPDES testing.

Ammonia - EPA 350.1
Fluoride - EPA 300.0
Nitrate and Nitrite Nitrogen - EPA 300.0
Total Kjeldahl Nitrogen - EPA 351.2
Sulfate - EPA 300.0
Total Cyanide - ASTM D7511-09
Available Cyanide - OIA -1677
Total Phenols - EPA 420.4
1,2-Diphenolhydrazine - EPA 625

The following analytes were analyzed by an alternate method approved for NPDES testing but did not meet the permit DL and QL because there was a measureable amount in the samples.

Boron - EPA 200.7
Molybdenum - EPA 200.7
Manganese - EPA 200.7

If you have questions phone us at 800 755-9295.

Respectfully

Patrick Miller, MS
QA Officer



RE: 17-17631 - KFGS NPDES Permit Sampling

Page 2 of 2

Enclosures: Data Report
QC Reports
Chain of Custody



Burlington, WA	Corporate Laboratory (s)	1620 S Walnut St	Burlington, WA 98223	800.753.9295 • 360.757.1400
Bellingham, WA	Microbiology (R)	833 Orchard Dr Ste 4	Bellingham, WA 98225	360.715.1212
Portland, OR	Microbiology/Chemistry (c)	8160 SW Pioneer Ct Ste W	Wilsonville, OR 97170	503.682.7802
Corvallis, OR	Microbiology (R)	548 SW Third Street	Corvallis, OR 97333	541.753.4946

September 12, 2017

Page 1 of 1

Case Narrative

Reference: 17-17631

Lab Sample ID

Sample Information

40079

Discharge H2O - KFGS

Analytical Method
625

Notes

The acid surrogates are significantly below the acceptance limits and indicates a matrix affect for low recoveries likely for the acid fraction. The sample field duplicate was also analyzed in the extraction batch and confirmed the low recoveries due to matrix. The QA samples and other samples analyzed within this batch met QC criteria. co 8/4/17

Created by
CO

625

The acid surrogates are significantly below the acceptance limits and indicates a matrix affect for low recoveries likely for the acid fraction. The sample field duplicate was also analyzed in the extraction batch and confirmed the low recoveries due to matrix. The QA samples and other samples analyzed within this batch met QC criteria. I would encourage to request the laboratory to use this sample location as the matrix spike for the next sampling required. co 8/4/17

CO

Analytical Method
SM2120 B

Notes

Sample was filtered prior to analysis.

Created by
RHF



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Corvallis, OR Microbiology/Chemistry (d)
 540 SW Third Street - Corvallis, OR 97333 - 541 753 4849
Bend, OR Microbiology (e)
 29332 Empire Blvd Ste 4 - Bend, OR 97701 - 541 639 8425

Data Report

Client Name: **Avista Corporation**
 1411 E Mission Ave
 Spokane, WA 99202

Reference Number: **17-17631**
 Project: **KFGS NPDES Permit Sampling**

Report Date: **9/12/17**

Date Received: **7/21/17**

Approved by: **anp,bj,fm,ljh,lrs**

Authorized by:

Patrick Miller
Patrick Miller, MS
 QA Officer

Sample Description: Discharge Dup KFGS (Clean Hg)										Sample Date: 7/19/17 1:45 pm			
Lab Number: 40076 Sample Comment:										Collected By:			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

7439-97-6	MERCURY - clean	5.28	0.40		ng/L	1.0	1631		7/31/17	ETL	ANAT1631_170731	Analyzed by Anatek
-----------	-----------------	------	------	--	------	-----	------	--	---------	-----	-----------------	--------------------

Sample Description: Discharge H2O KFGS (Clean Hg)										Sample Date: 7/19/17 1:45 pm			
Lab Number: 40077 Sample Comment:										Collected By:			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

7439-97-6	MERCURY - clean	5.99	0.40		ng/L	1.0	1631		7/31/17	ETL	ANAT1631_170731	Analyzed by Anatek
-----------	-----------------	------	------	--	------	-----	------	--	---------	-----	-----------------	--------------------

Sample Description: Discharge Blank KFGS (Clean Hg)										Sample Date: 7/19/17 1:45 pm			
Lab Number: 40078 Sample Comment:										Collected By:			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

7439-97-6	MERCURY - clean	0.592	0.40		ng/L	1.0	1631		7/31/17	ETL	ANAT1631_170731	Analyzed by Anatek
-----------	-----------------	-------	------	--	------	-----	------	--	---------	-----	-----------------	--------------------

Sample Description: Discharge H2O KFGS										Sample Date: 7/19/17 12:00 pm			
Lab Number: 40079 Sample Comment:										Collected By:			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

1332-21-4	ASBESTOS	ND	0.098		MFL > 10um	1.0	100.2	a	7/20/17	HM	LAB100_170728	Analyzed by LabCor
E-10140	OIL AND GREASE	1.3 J	2.5	0.9	mg/L	1.0	1654	a	7/27/17	RHF	1654_170727	
18540-29-9	HEXAVALENT CHROMIUM	3.79	0.030	0.0016	ug/L	1.0	218.6	a	8/4/17	LJH	218.6_170804	
16984-48-8	FLUORIDE	1.13	0.1		mg/L	1.0	300.0		9/11/17	ALI	ANFK_170801	Analyzed by Anatek (SM4500F)
14797-55-8	NITRATE-N	3.79	0.100	0.0236	mg/L	1.0	300.0	a	7/21/17	HKL	1170721A	
14797-65-0	NITRITE-N	ND	0.10	0.0203	mg/L	1.0	300.0	a	7/21/17	HKL	1170721A	
14808-79-8	SULFATE	714.0	0.2	0.0497	mg/L	1.0	300.0	a	7/21/17	HKL	1170721A	

Notes

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Data Report

24959-67-9	BROMIDE	0.05	0.005	0.00051	mg/L	1.0	300.1	a	9/6/17	DJ	ANTRK_170908	Analyzed by Edge Analytical
7664-41-7	AMMONIA-N	0.05	0.010	0.0012	mg/L	1.0	350.1	a	7/31/17	LRS	350.1_170731	
E-10264	TOTAL KJELDAHL NITROGEN	0.70	0.20	0.0047	mg/L	1.0	351.2	a	8/15/17	LRS	351.2_170815	
E-10253	PHENOLICS	ND	50	5	ug/L	1.0	420.4		8/16/17	KF	AMT420_170816	Analyzed by AmTest
12587-46-1	GROSS ALPHA	14.9	3		pCi/L	1.0	900.0		9/5/17	APM	ANTRK_170908R	Analyzed by Anatek
12587-47-2	GROSS BETA	9.70	4		pCi/L	1.0	900.0		9/5/17	APM	ANTRK_170908R	Analyzed by Anatek
7440-14-4	RADIUM 226,228 (combined)	1.74	1		pCi/L	1.0	903.1/904.0		9/5/17	APM	ANTRK_170908R	Analyzed by Anatek
15262-20-1	RADIUM 228	0.413	1		pCi/L	1.0	904.0		9/5/17	APM	ANTRK_170908R	Analyzed by Anatek
57-12-5	CYANIDE, TOTAL	ND	0.010	0.002	mg/L	1.0	D7511-09	a	8/31/17	ANP	D7511_170803	
57-12-5	CYANIDE, TOTAL	ND	10	2	ug/L	1.0	D7511-09	a	8/31/17	ANP	D7511_170803	
E-10162	TOTAL SUSPENDED SOLIDS	5	4		mg/L	1.0	I-3765-05	a	7/24/17	HKL	TSS_170724	
57-12-5	CYANIDE, AVAILABLE	ND	0.1		mg/L	1.0	CIA-1677	a	7/27/17	ANP	1677_170727	
E-11712	COLOR	5	5		Color Units	1.0	SM2120 B	a	8/31/17	KAE	ANATEK_170721	pH: 7.06
E-14506	ALKALINITY	442.8	10		mg CaCO3/L	10.0	SM2320 B	a	7/23/17	SRS	ALK_170723	
NA	SALINITY	1.133	0		PSS	1.0	SM2520 B	a	8/15/17	LRS	SALINITY_170816	
E-10173	TOTAL DISSOLVED SOLIDS (TDS)	1672	10		mg/L	1.0	SM2540 C	a	7/24/17	HKL	TDS_170724	
E-11949	SETTLABLE SOLIDS BY VOLUMN	ND	1		ml/L	1.0	SM2540F	a	7/24/17	LRS	SET_170721	
7782-50-5	FREE CHLORINE RESIDUAL	0.03	0.05		mg/L	1.0	SM4500 Cl G		8/16/17	MS	FLD_170816	Analyzed in Field
57-12-5	CYANIDE (WAD)	0.005	0.005	0.0034	mg/L	1.0	SM4500 CN I	a	7/28/17	LRS	WAD_170726	
E-14539	DISSOLVED OXYGEN	5.92			mg/L	1.0	SM4500 O G	a	7/21/17	MS	FLD_DO_170804	Performed in Field
14265-44-2	ORTHO-PHOSPHATE	0.75	0.01	0.0011	mg/L	1.0	SM4500-P F	a	7/21/17	LRS	OPHOS_170721	
18496-25-8	HYDROGEN SULFIDE	ND	0.05	0.044	mg/L	1.0	SM4500-S2 F	a	7/28/17	RHF	H2S_170726	
14265-45-3	SULFITE	ND	2	0.7	mg/L	1.0	SM4500-SO3 B	a	7/29/17	RHF	SO3_170725	
E-10106	5-Day BOD Test	ND	2.0		mg/L	1.0	SM5210 B	a	8/31/17	KAE	ANATEK_170831	Analyzed by Anatek
E-10106	5-Day Soluble BOD	ND	2.0		mg/L	1.0	SM5210 B	a	8/31/17	KAE	ANATEK_170831	Analyzed by Anatek
E-10117	CHEMICAL OXYGEN DEMAND	31.3	8	4	mg/L	1.0	SM5220 D	a	8/11/17	KAE	ANTRK_COD170801	Analyzed by Anatek
E-10195	TOTAL ORGANIC CARBON	6.53	0.15	0.05	mg/L	1.0	SM5310 B	a	7/27/17	ANP	TOC_170727	
NA	SURFACTANTS	ND	0.05		mg/L	1.0	SM5540 C		8/11/17	KMC	ANTRK_170901	
7429-90-5	ALUMINUM	ND	10	4	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
7440-42-8	BORON	260	50	7	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
E-11778	HARDNESS as Calcium Carbonate	950200	3300	10.	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
7439-89-6	IRON	130	50	1.2	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
7439-95-4	MAGNESIUM	73700	500	1.	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
7439-96-5	MANGANESE	2	1	0.2	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
7439-98-7	MOLYBDENUM	20	10	5.	ug/L	1.0	200.7/3010A	a	7/25/17	ANP	200.7_170725B	
7440-36-0	ANTIMONY	2.1	1	0.00691	ug/L	1.0	200.8/3010A	a	7/28/17	DJ	200.8_170728B2	
7440-38-2	ARSENIC	8.7	0.5	0.02177	ug/L	1.0	200.8/3010A	a	7/28/17	DJ	200.8_170728B2	
7440-39-3	BARIUM	305	1	0.01489	ug/L	1.0	200.8/3010A	a	7/28/17	DJ	200.8_170728B2	

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Reference Number: 17-17631
 Report Date: 9/12/17

Data Report

7440-41-7	BERYLLIUM	ND	0.3	0.00676	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-43-9	CADMIUM	ND	1	0.01127	ug/L	1.0	200.B/3010A	a	8/5/17	KVP	ANIK_170905
7440-47-3	CHROMIUM	5.1	1	0.02026	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-48-4	COBALT	0.6	1	0.00405	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-50-8	COPPER	2.6	2	0.02764	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7439-92-1	LEAD	0.1	0.5	0.00666	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-02-0	NICKEL	0.7	0.5	0.01618	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7782-49-2	SELENIUM	3.6	1	0.0266	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-22-4	SILVER	ND	0.2	0.01175	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-28-0	THALLIUM	ND	0.1	0.00706	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-28-0	THALLIUM	ND	0.001	7.06E-06	mg/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-31-5	TIN	7.1	1	0.5	ug/L	1.0	200.B/3010A	a	8/7/17	BJ	200.B_170907A2
7440-32-6	TITANIUM	13	1	0.05	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7440-86-6	ZINC	13	2.5	0.55193	ug/L	1.0	200.B/3010A	a	7/28/17	BJ	200.B_17072002
7723-14-0	TOTAL PHOSPHORUS	1.45	0.100	0.0026	mg/L	10.0	SM4500 P F/SM4500 P B(5)	a	7/28/17	LRS	IPHOS_170725

Notes:

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 DF = Dilution Factor



Reference Number: 17-17631
Report Date: 9/12/17

Page 4 of 4

Data Report

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WSDOE Lab C567

**Revised -
 9/12/2017**

DATA REPORT

Page 1 of 1

Client Name: Avista Corporation
 1411 E Mission Ave
 Spokane, WA 99202

Reference Number: 17-17631
Project: KFGS NPDES Permit Sampl

Lab Number: 40079
Field ID: Discharge H2O
Sample Description: KFGS
Matrix: Water
Sample Date: 7/19/17
Extraction Date:
Extraction Method: 3510C

Report Date: 8/18/17
Date Analyzed: 8/3/17
Analyst: SMT
Analytical Method: 1613
Batch: PACE1613_170803
Approved By: fm,pdm

Authorized by:

Patrick Miller
 Patrick Miller, MS
 QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
41903-57-5	Base/Neutral Extractables 2,3,7,8-TCDD(DIOXIN)	ND		pg/l	5	5	1.24	1.00		Analyzed by PACE_MN

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.
 ND - indicates the compound was not detected above the PQL or MDL.
 Lab QL = Laboratory Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
 Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.
 D.F. = Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.
 Form c500 rpt



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WSDOE Lab C567

**Revised -
 9/12/2017**

DATA REPORT

Page 1 of 1

Client Name: Avista Corporation
 1411 E Mission Ave
 Spokane, WA 99202

Reference Number: 17-17631
Project: KFGS NPDES Permit Sampl

Lab Number: 40079
Field ID: Discharge H2O
Sample Description: KFGS
Matrix: Water
Sample Date: 7/19/17
Extraction Date: 7/26/17
Extraction Method: 3510C

Report Date: 8/18/17
Date Analyzed: 7/27/17
Analyst: CO
Analytical Method: 608
Batch: 608_170726
Approved By: fm.pdm

Authorized by:

[Signature]
 Patrick Miller, MS
 QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
PCBs										
12674-11-2	AROCOLOR 1016	ND		ug/L	0.1	0.5	0.1	1.00	a	
11104-26-2	AROCOLOR 1221	ND		ug/L	0.5	0.5	0.2	1.00	a	
11141-16-5	AROCOLOR 1232	ND		ug/L	0.5	0.5	0.2	1.00	a	
53469-21-9	AROCOLOR 1242	ND		ug/L	0.1	0.5	0.1	1.00	a	
12672-29-6	AROCOLOR 1248	ND		ug/L	0.5	0.5	0.2	1.00	a	
11097-69-1	AROCOLOR 1254	ND		ug/L	0.1	0.5	0.1	1.00	a	
11096-62-5	AROCOLOR 1260	ND		ug/L	0.1	0.5	0.1	1.00	a	
Organochlorine Pesticides										
309-00-2	ALDRIN	ND		ug/L	0.05	0.05	0.013	1.00	a	
319-84-6	BHC, ALPHA -	ND		ug/L	0.05	0.05	0.021	1.00	a	
319-85-7	BHC, BETA -	ND		ug/L	0.05	0.05	0.009	1.00	a	
50-89-9	LINDANE (BHC - GAMMA)	ND		ug/L	0.05	0.05	0.015	1.00	a	
319-86-8	BHC, DELTA -	ND		ug/L	0.05	0.05	0.013	1.00	a	
57-74-9	CHLORDANE	ND		ug/L	0.05	0.05	0.018	1.00	a	
50-29-3	4,4' - DDT	ND		ug/L	0.05	0.05	0.011	1.00	a	
72-55-9	4,4' - DDE	ND		ug/L	0.05	0.05	0.025	1.00	a	
72-54-8	4,4' - DDD	ND		ug/L	0.05	0.05	0.011	1.00	a	
60-57-1	DIELDRIN	ND		ug/L	0.05	0.05	0.017	1.00	a	
959-98-8	ENDOSULFAN I	ND		ug/L	0.05	0.05	0.022	1.00	a	
33213-85-9	ENDOSULFAN II	ND		ug/L	0.05	0.05	0.023	1.00	a	
1031-07-9	ENDOSULFAN SULFATE	ND		ug/L	0.05	0.05	0.017	1.00	a	
7421-93-4	ENDRIN ALDEHYDE	ND		ug/L	0.05	0.05	0.015	1.00	a	
76-44-8	HEPTACHLOR	ND		ug/L	0.05	0.05	0.024	1.00	a	
1074-57-3	HEPTACHLOR EPOXIDE "B"	ND		ug/L	0.05	0.05	0.014	1.00	a	
8001-35-2	TOXAPHENE	ND		ug/L	0.5	0.5	0.4	1.00	a	

Notes:

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 Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.
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WSDOE Lab C567

**Revised -
 9/12/2017**

DATA REPORT

Page 1 of 2

Client Name: Avista Corporation
 1411 E Mission Ave
 Spokane, WA 99202

Reference Number: 17-17631
Project: KFGS NPDES Permit Sampl

Lab Number: 40079
Field ID: Discharge H2O
Sample Description: KFGS
Matrix: Water
Sample Date: 7/19/17
Extraction Date: 7/21/17
Extraction Method: 5030B

Report Date: 8/18/17
Date Analyzed: 7/21/17
Analyst: HY
Analytical Method: 624
Batch: 624_170721
Approved By: fm,pdm

Authorized by:

Patrick Miller
 Patrick Miller, MS
 QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
Volatiles										
120-82-1	1,2,4 - TRICHLORO BENZENE	ND		ug/L	0.5	0.5	0.06	100	a	
107-02-8	ACROLEIN	ND		ug/L	4.0	10	1.05	100	a	
107-13-1	ACRYLONITRILE	ND		ug/L	1.0	2.0	0.97	100	a	
71-43-2	BENZENE	ND		ug/L	0.5	2.0	0.13	100	a	
75-25-2	BROMOFORM	ND		ug/L	0.5	2.0	0.12	100	a	
56-23-5	CARBON TETRACHLORIDE	ND		ug/L	0.5	2.0	0.23	100	a	
108-90-7	CHLORO BENZENE	ND		ug/L	0.5	2.0	0.08	100	a	
75-00-3	CHLOROETHANE	ND		ug/L	0.5	2.0	0.29	100	a	
110-75-8	2 - CHLOROETHYL VINYL ETHER	ND		ug/L	0.5	2.0	0.97	100	a	
67-65-3	CHLOROFORM	0.7		ug/L	0.5	2.0	0.06	100	a	
124-48-1	CHLORODIBROMOMETHANE	ND		ug/L	0.5	2.0	0.12	100	a	
95-50-1	O - DICHLORO BENZENE	ND		ug/L	0.5	7.6	0.04	100	a	
541-73-1	M - DICHLORO BENZENE	ND		ug/L	0.5	7.6	0.06	100	a	
106-46-7	P - DICHLORO BENZENE	ND		ug/L	0.5	17.6	0.08	100	a	
75-27-4	DICHLOROBROMOMETHANE	ND		ug/L	0.5	2.0	0.07	100	a	
75-34-3	1,1 - DICHLOROETHANE	ND		ug/L	0.5	2.0	0.12	100	a	
107-09-2	1,2 - DICHLOROETHANE	ND		ug/L	0.5	2.0	0.08	100	a	
75-35-4	1,1 - DICHLOROETHYLENE	ND		ug/L	0.5	2.0	0.21	100	a	
78-07-5	1,2 - DICHLOROPROPANE	ND		ug/L	0.5	2.0	0.09	100	a	
10061-01-5	CIS - 1,3 - DICHLOROPROPENE	ND		ug/L	0.5	2.0	0.08	100	a	
10061-02-6	TRANS- 1,3 - DICHLOROPROPENE	ND		ug/L	0.5	2.0	0.08	100	a	
542-75-6	1,3-DICHLOROPROPYLENE, TOTAL	ND		ug/L	0.5	0.5		100	a	
100-41-4	ETHYLBENZENE	ND		ug/L	0.5	2.0	0.11	100	a	
75-09-2	METHYLENE CHLORIDE	ND		ug/L	0.5	10.0	0.06	100	a	
79-34-5	1,1,2,2 - TETRACHLOROETHANE	ND		ug/L	0.5	2.0	0.13	100	a	
127-18-4	TETRACHLOROETHYLENE	ND		ug/L	0.5	2.0	0.21	100	a	

Notes:

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 Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.
 D.F. - Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.
 Form: c608.q4t



Reference Number: 17-17631
Lab Number: 40079
Report Date: 8/18/17

Page 2 of 2

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
108-88-3	TOLUENE	ND		ug/L	0.5	2.0	0.12	1.00	a	
156-60-5	1,2 - TRANS - DICHLOROETHYLENE	ND		ug/L	0.5	2.0	0.17	1.00	a	
71-55-6	1,1,1 - TRICHLOROETHANE	ND		ug/L	0.5	2.0	0.31	1.00	a	
79-00-5	1,1,2 - TRICHLOROETHANE	ND		ug/L	0.5	2.0	0.15	1.00	a	
79-01-6	TRICHLOROETHYLENE	ND		ug/L	0.5	2.0	0.15	1.00	a	
75-01-4	VINYL CHLORIDE	ND		ug/L	0.5	2.0	0.18	1.00	a	

Notes:

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Lab QL = Laboratory Quantitation Limit (is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions)

Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement

D.F. - Dilution Factor.



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Bend, OR Microbiology (e)
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541 639 8425

WSDOE Lab C567

Revised -
9/12/2017

DATA REPORT

Page 1 of 2

Client Name: Avista Corporation
1411 E Mission Ave
Spokane, WA 99202

Reference Number: 17-17631
Project: KFGS NPDES Permit Sampl

Lab Number: 40079
Field ID: Discharge H2O
Sample Description: KFGS
Matrix: Water
Sample Date: 7/19/17
Extraction Date: 7/25/17
Extraction Method: 3510C

Report Date: 8/18/17
Date Analyzed: 7/26/17
Analyst: CO
Analytical Method: 625
Batch: 625_170725
Approved By: fm.pdm

Authorized by:

Patrick Miller
Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
Base/Neutral Extractables										
83-32-9	ACENAPHTHENE	ND		ug/L	0.4	0.4	0.04	1.00	a	
208-96-8	ACENAPHTHYLENE	ND		ug/L	0.4	0.6	0.07	1.00	a	
120-12-7	ANTHRACENE	ND		ug/L	0.4	0.6	0.05	1.00	a	
92-87-5	BENZIDINE	ND		ug/L	10	24	9.	1.00	a	
85-68-7	BENZYL BUTYL PHTHALATE	ND		ug/L	0.4	0.6	0.03	1.00	a	
56-55-3	BENZ[AI]ANTHRACENE	ND		ug/L	0.4	0.6	0.05	1.00	a	
205-99-2	3,4 - BENZOFLUORANTHENE (BENZO[E])	ND		ug/L	0.4	1.6	0.08	1.00	a	unresolved w/ Benzo(J)Fluoranthene
207-08-9	BENZO[K]FLUORANTHENE	ND		ug/L	0.4	1.6	0.08	1.00	a	
50-32-8	BENZO[AI]PYRENE	ND		ug/L	0.4	1	0.05	1.00	a	
191-24-2	BENZO[G,H,I]PERYLENE	ND		ug/L	0.4	1	0.05	1.00	a	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	ND		ug/L	0.4	21.2	0.06	1.00	a	
111-44-4	BIS(2-CHLOROETHYL)ETHER	ND		ug/L	0.4	1	0.06	1.00	a	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	ND		ug/L	0.4	0.6	0.06	1.00	a	
117-81-7	Bis(2-ETHYLHEXYL)PHTHALATE	ND		ug/L	0.4	0.5	0.1	1.00	a	
101-55-3	4-BROMOPHENYL PHENYL ETHER	ND		ug/L	0.4	0.4	0.04	1.00	a	
91-58-7	2-CHLORONAPHTHALENE	ND		ug/L	0.4	0.6	0.05	1.00	a	
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ND		ug/L	0.4	0.5	0.04	1.00	a	
218-01-9	CHRYSENE	ND		ug/L	0.4	0.6	0.06	1.00	a	
53-70-3	DIBENZO[A,H]ANTHRACENE	ND		ug/L	0.4	1.6	0.05	1.00	a	
91-94-1	3,3-DICHLOROBENZIDINE	ND		ug/L	0.4	1	0.2	1.00	a	
84-68-2	DIETHYL PHTHALATE	ND		ug/L	0.4	7.6	0.06	1.00	a	
131-11-3	DIMETHYL PHTHALATE	ND		ug/L	0.4	6.4	0.05	1.00	a	
84-74-2	DI-N-BUTYL PHTHALATE	ND		ug/L	0.4	1	0.07	1.00	a	
121-14-2	2,4-DINITROTOLUENE	ND		ug/L	0.4	0.4	0.07	1.00	a	
608-20-2	2,6-DINITROTOLUENE	ND		ug/L	0.4	0.4	0.09	1.00	a	

Notes:

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Reference Number: 17-17631
 Lab Number: 40079
 Report Date: 8/18/17

Page 2 of 2

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
117-84-0	DI-N-OCTYL PHTHALATE	ND		ug/L	0.4	0.6	0.02	100	a	
122-66-7	1,2-DIPHENYLHYDRAZINE (as Azobenze	ND		ug/L	0.4	20	0.06	100	a	as Azobenze
206-44-0	FLUORANTHENE	ND		ug/L	0.4	0.6	0.05	100	a	
86-73-7	FLUORENE	ND		ug/L	0.4	0.6	0.05	100	a	
118-74-1	HEXACHLOROBENZENE	ND		ug/L	0.4	0.6	0.06	100	a	
87-68-3	HEXACHLOROBUTADIENE	ND		ug/L	0.4	1	0.09	100	a	
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND		ug/L	0.4	1	0.2	100	a	
67-72-1	HEXACHLOROETHANE	ND		ug/L	0.4	1	0.09	100	a	
193-39-5	INDENO[1,2,3-C]DIPYRENE	ND		ug/L	0.4	1	0.09	100	a	
78-59-1	ISOPHORONE	ND		ug/L	0.4	1	0.07	100	a	
91-20-3	NAPHTHALENE	ND		ug/L	0.4	0.6	0.06	100	a	
98-95-3	NITROBENZENE	ND		ug/L	0.4	1	0.05	100	a	
62-75-9	N-NITROSODIMETHYLAMINE	ND		ug/L	0.4	4	0.3	100	a	
621-64-7	N-NITROSODI-N-PROPYLAMINE	ND		ug/L	0.4	1	0.1	100	a	
86-30-6	N-NITROSODIPHENYLAMINE	ND		ug/L	0.4	1	0.05	100	a	as Diphenylamine
85-01-8	PHENANTHRENE	ND		ug/L	0.4	0.6	0.06	100	a	
129-00-0	PYRENE	ND		ug/L	0.4	0.6	0.05	100	a	
120-82-1	1,2,4-TRICHLOROBENZENE	ND		ug/L	0.4	0.6	0.05	100	a	
Acid Extractables										
95-57-8	2-CHOROPHENOL	ND		ug/L	1	2	0.1	100	a	
120-83-2	2,4-DICHLOROPHENOL	ND		ug/L	1	1	0.2	100	a	
105-67-9	2,4-DIMETHYLPHENOL	ND		ug/L	1	1	0.4	100	a	
534-52-1	4,6-DINITRO-O-CRESOL	ND		ug/L	1	2	0.3	100	a	
88-75-5	2-NITROPHENOL	ND		ug/L	1	1	0.2	100	a	
100-02-7	4-NITROPHENOL	ND		ug/L	1	1	0.3	100	a	
59-50-7	P-CHLORO-M-CRESOL	ND		ug/L	1	2	0.2	100	a	
87-88-5	PENTACHLOROPHENOL	ND		ug/L	1	1	0.2	100	a	
108-95-2	PHENOL	ND		ug/L	1	4	0.1	100	a	
88-06-2	2,4,6-TRICHLOROPHENOL	ND		ug/L	1	4	0.1	100	a	
Ecology Priority Toxic Chemicals										
205-82-3	BENZO(J)FLUORANTHENE	ND		ug/L	1	1	0.4	100	a	unresolved w/ Benzo(B)Fluoranthene
189-55-9	BENZO(R,S,T)PENTAPHENE	ND		ug/L	1	1	0.3	100	a	
220-36-8	DIBENZO(A,H)ACRIDINE	ND		ug/L	1	10	0.4	100	a	
192-65-4	DIBENZO(A,E)PYRENE	ND		ug/L	1	10	0.5	100	a	
189-64-0	DIBENZO(A,H)PYRENE	ND		ug/L	1	10	0.3	100	a	
56-49-5	3-METHYL CHOLANTHRENE	ND		ug/L	1	8	0.4	100	a	
198-55-0	PERYLENE	ND		ug/L	1	7.6	0.6	100	a	

Notes:

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Burlington, WA Corporate Laboratory (a)
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Bend, OR Microbiology (e)
 20322 Empire Blvd Ste 4 - Bend, OR 97701 - 541.539.8425

Revised - 9/12/2017

Page 1 of 1

Hydrocarbon Data Report

Client Name: **Avista Corporation**
 1411 E Mission Ave
 Spokane, WA 99202

Reference Number: **17-17631**
 Project: **KFGS NPDES Permit Sampl**
 Report Date: **8/18/17**
 Date Received: **7/21/17**
 Approved By: **hy,pdm**
 Authorized by:

Patrick Miller
 Patrick Miller, MS
 QA Officer

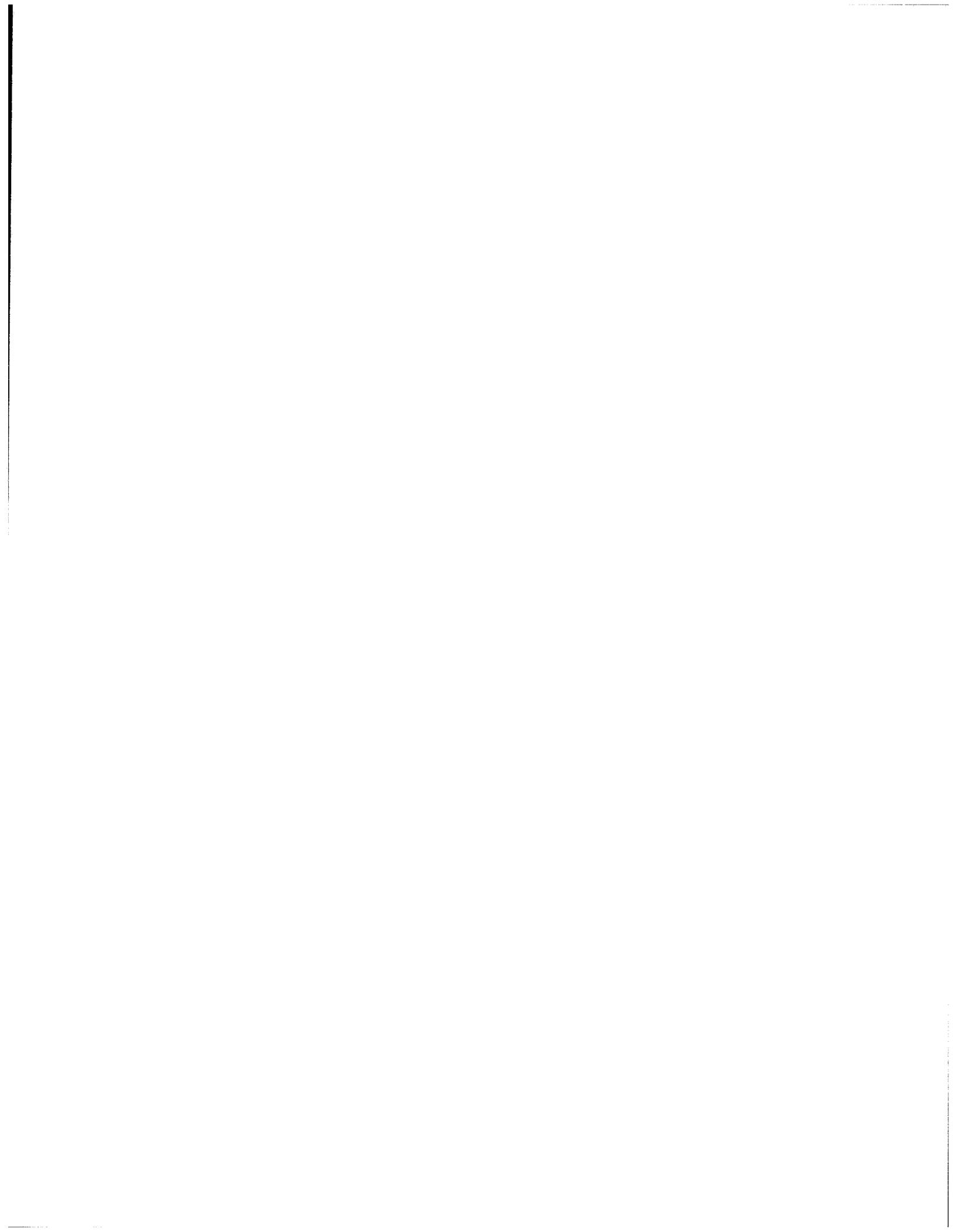
Sample Description: Discharge H2O - KFGS	Sample Date: 7/19/17 12:00
Lab Number: 40079	Collected By:
Date Analyzed: 7/24/17	Analyzed By: WCY

Parameter	Result	Flag	DF	Cleanup Level	PQL	MDL	Units	Method	Lab	Batch	Comment
NWTPH-Dx											
DIESEL (C12 - C24)	ND		1	0.5	0.1	0.07	mg/L	NWTPH-Dx/35 10C	a	DXW_170724	
HEAVIER OILS (>C24)	ND		1	0.5	0.1		mg/L	NWTPH Dx/35 10C	a	DXW_170724	

Notation:

ND - A result of "ND" indicates that the compound was not detected above the Lab's Method Reporting Limit - MRL.
 PQL - Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
 D.F. - Dilution Factor
 Cleanup Level - The regulatory limit for Method A Cleanup Levels (MCLA, Chapter 173-340 WAC) contaminants in the specified matrix. Amended Feb 12, 2001
 The Cleanup level for Gasoline Range Organics (GRO) is 100 mg/Kg for gas mixtures without benzene and when the total ethylbenzene, toluene and xylenes are less than 1% of the gasoline concentration. The Cleanup level for GRO is 30 mg/Kg for all other mixtures.

If you have any questions concerning this report contact us at the above phone number.





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 540 SW Third Street - Corvallis, OR 97333 - 541 753 4946
Bend, OR Microbiology (e)
 20332 Emporia Blvd Ste 4 - Bend, OR 97701 - 541 639 8425

Revised - 9/12/2017

Page 1 of 1

Hydrocarbon Data Report

Client Name: **Avista Corporation**
 1411 E Mission Ave
 Spokane, WA 99202

Reference Number: **17-17631**
 Project: **KFGS NPDES Permit Sampl**
 Report Date: **8/18/17**
 Date Received: **7/21/17**
 Approved By: **hy,pdm**
 Authorized by:

Patrick Miller
Patrick Miller, MS
 QA Officer

Sample Description: **Discharge H2O - KFGS**
 Lab Number: **40079**
 Date Analyzed: **7/25/17**

Sample Date: **7/19/17 12:00**
 Collected By:
 Analyzed By: **HY**

Parameter	Result	Flag	DF	Cleanup			Units	Method	Lab	Batch	Comment
				Level	PQL	MDL					
NWTPH-Gx											
BENZENE	ND		1	0.005	0.0004	0.00014	mg/L	8260C/5030B	a	GXW_170725	
TOLUENE	ND		1	1.00	0.0004	7.00E-05	mg/L	8260C/5030B	a	GXW_170725	
ETHYLBENZENE	ND		1	0.70	0.0004	9.00E-05	mg/L	8260C/5030B	a	GXW_170725	
TOTAL XYLENES	ND		1	1.00	0.0008		mg/L	8260C/5030B	a	GXW_170725	
GASOLINE (C8 - C12)	ND		1	1	0.10		mg/L	8260C/5030B	a	GXW_170725	

Notation:

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 PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
 D.F. = Dilution Factor
 Cleanup Level - The regulatory limit for Method A Cleanup Levels (MCA, Chapter 173-340 WAC) contaminants in the specified matrix. Amended Feb 12, 2001
 The Cleanup level for Gasoline Range Organics (GRO) is 100 mg/Kg for gas mixtures without benzene and when the total ethylbenzene, toluene and xylenes are less than 1% of the gasoline concentration. The Cleanup level for GRO is 30 mg/Kg for all other mixtures.

If you have any questions concerning this report contact us at the above phone number.
 Form: cHC10.rpt

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: AVISTA CORPORATION
Address: 1411 EAST MISSION
SPOKANE, WA 99202
Attn: PAM KISH

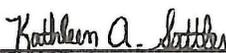
Batch #: 170830004
Project Name: 2018 KFGS, NPDES
SAMPLING

Analytical Results Report

Sample Number	170830004-001	Sampling Date	8/30/2017	Date/Time Received	8/30/2017 9:00 AM
Client Sample ID	KFGS DISCHARGE	Sampling Time	5:50 AM	Extraction Date	
Matrix	Water	Sample Location			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
BOD	<2	mg/L	2	8/31/2017 11:00:00 AM	KAE	SM5210B	K5
SBOD	<2	mg/L	2	8/31/2017 11:00:00 AM	KAE	SM5210C	K5
Bromide	0.05	mg/L	0.05	9/6/2017	SUB	EPA 300.1	
Cadmium	ND	mg/L	0.001	9/5/2017 3:14:00 PM	KNP	EPA 200.8	
COD	31.3	mg/L	5	9/1/2017 4:30:00 PM	KAE	EPA 410.4	
Color	5 @ pH7.06	Color Units	5	8/31/2017 12:35:00 PM	KAE	SM 2120B	
Fluoride	1.13	mg/L	0.1	9/1/2017	SUB	SM4500F	
Gross Alpha	14.9 ± 2.98	pCi/L	3	9/6/2017 7:06:14 PM	APM	EPA 900.0	
Gross Beta	9.70 ± 1.73	pCi/L	4	9/6/2017 7:06:14 PM	APM	EPA 900.0	
Radium 228	0.413 ± 0.317	pCi/L	1	9/5/2017	GPB	EPA 904.0	
Hexachlorobutadiene	ND	ug/L	0.5	9/1/2017	HSW	EPA 625	
MBAS	ND	mg/L 342.4MW LAS	0.05	9/1/2017	KMC	SM5540C	
Titanium	0.00469	mg/L	0.001	9/5/2017 3:14:00 PM	KNP	EPA 200.8	
Total Alpha Radium	1.74 ± 0.247	pCi/L		9/2/2017 10:51:00 AM	APM	EPA 903.0	

Authorized Signature



Kathleen A. Sattler, Lab Manager

K5 Glucose/glutamic acid BOD was above method acceptance criteria
MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

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The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA ID00013, AZ 0701, FL(NELAP): E87893, ID: ID00013, MT CERT0028, NM ID00013, NV ID00013, OR: ID200001-002, WA C595
Certifications held by Anatek Labs WA: EPA-WA00169, ID WA00169, WA C585, MT Cert0095, FL(NELAP): E871099

Thursday, September 07, 2017

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Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

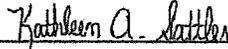
Client: AVISTA CORPORATION **Batch #:** 170830004
Address: 1411 EAST MISSION **Project Name:** 2018 KFGS, NPDES
SPOKANE, WA 99202 **SAMPLING**
Attn: PAM KISH

Analytical Results Report - Radiochemistry

Sample Number	170830004-001	Sampling Date	8/30/2017	Date/Time Received	8/30/2017 9:00 AM
Client Sample ID	KFGS DISCHARGE	Sampling Time	5:50 AM	Prep Date	
Matrix	Water	Sample Location			
Comments					

Parameter	Activity +/- Uncertainty Units	MDA	Analysis Date	Analyst	Method	Qualifier
Radium 226	0.566 ± 0.0980 pCi/L	0.2	9/15/2017	APM	EPA 903.0	

Authorized Signature



Kathy Sattler, Lab Manager

MDA Minimum Detectable Activity
MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

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FINAL

Kettle Falls Generating Station
Engineering Report

Avista Corporation

April 12, 2018

Revised July 2, 2018



Table of Contents

Section 1 General Information	1-1
1.1 Description of Existing Facility & Proposed Modifications	1-1
1.2 Ownership.....	1-1
Section 2 Water Usage	2-1
2.1 Plant Water Supply.....	2-1
2.2 Non-Contact Cooling Water.....	2-1
2.3 Process Water.....	2-2
2.3.1 RO System.....	2-2
2.3.2 Polishing Process.....	2-3
2.3.3 Ash Handling Systems.....	2-4
2.3.3.1 Fly Ash.....	2-4
2.3.3.2 Bottom Ash.....	2-4
2.3.4 Steam Cycle.....	2-5
2.4 Domestic Water	2-5
Section 3 Wastewater Collection, Treatment and Disposal	3-1
3.1 Process Wastewater Treatment	3-1
3.1.1 Settling Basins	3-1
3.1.2 Retention Basin.....	3-1
3.1.3 Mixing Tank	3-2
3.2 Effluent Disposal	3-2
3.3 Treatment Alternatives Considered	3-2
3.4 Domestic Wastewater Treatment.....	3-2
3.5 Non-Point Source Contamination	3-3
3.6 Oil and Grease Removal	3-3
3.7 Bulk Material Storage and Containment.....	3-3
3.8 Chemical Cleaning Wastewater	3-4
3.9 Sludge Disposal.....	3-4
Section 4 Compliance with Regulatory Requirements	4-1
4.1 Effluent Limitations	4-1
4.2 Water Quality Criteria.....	4-1
4.3 Water Quality Management.....	4-1
4.4 Environmental Impact Assessment	4-1
Section 5 Final Design and Construction Schedule	5-1
5.1 Full-Scale RO System Schedule	5-1

List of Figures

Figure 1-1 General Site Layout.....	1-2
Figure 2-1 Process Flow Diagram.....	2-8
Figure 3-1 Outfall Location.....	3-7

List of Tables

Table 2-1 Peachcrest Groundwater Well Water Quality Data	2-5
Table 2-2 Expected Water Quality of RO Reject	2-7
Table 3-1 AVISTA Effluent Discharge Water Quality Data.....	3-5
Table 4-1 Freshwater Aquatic Life Uses and Associated Criteria.....	4-1
Table 4-2 Recreational Uses and Associated Criteria.....	4-1
Table 5-1 Selected Milestones for the Design and Construction of the RO System.....	5-1

Appendices

Appendix A	Water Treatment Safety Data Sheets
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Section 1

General Information

This Engineering Report is a revision of the Engineering Report prepared by Morrison-Knudsen Company, Inc. December 1981. CDM Smith, Inc. (CDM Smith) has been tasked by Avista Corporation (Avista) to update the existing 1981 Engineering Report in support of an upcoming NPDES permit application. This Engineering Report contains the water use, treatment and discharge information required by Chapter 173-240-130 of the Washington Administrative Code.

1.1 Description of Existing Facility & Proposed Modifications

The Kettle Falls Generating Station is located approximately 3-miles northwest of Kettle Falls, Washington, adjacent to Franklin D. Roosevelt Lake in Stevens County. The generating unit consists of a wood-fired steam generator and a steam turbine driven electric generator with net generating capacity of approximately 46 megawatt electrical. The wastewater treatment facilities are an integral part of the plant operation. There are no proposed changes to the existing wastewater treatment facilities at the plant site and no provisions for any future committed plans. This revision reflects a proposed change in the treatment of process water. The relative location of major plant components is shown in Figure 1-1.

1.2 Ownership

The wastewater treatment facilities are owned, operated and maintained by the Avista Corporation.



<p>KETTLE FALLS GENERATING STATION AVISTA CORPORATION</p>	<p>GENERAL SITE LAYOUT</p>	<p>FIGURE 1-1</p>
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**Figure 1-1
General Site Layout**

Section 2

Water Usage

The overall plant process flow diagram is presented in Figure 2-1. Daily average flow rates for typical case conditions are included in the text below for major flow paths. All process related flow rates are calculated daily averages at 100% load factor. The values presented herein should be multiplied by 0.75 (i.e. the projected plant availability factor) to obtain annual averages for process related flows.

2.1 Plant Water Supply

Process water and non-contact cooling water is supplied by the Peachcrest groundwater wells at the Kettle Falls Generating Station. Peachcrest wells 1, 2, and 3 were installed in 2010, 2011, and 2017, respectively. Each taps into the same highly productive sand and gravel aquifer with screens ranging from 270 to 300 below ground surface. A summary of the chemical characteristics of this water source is presented in Table 2-1. The data in Table 2-1 was compiled from the analysis of water sampled collected by Avista from the Peachcrest wells.

Domestic water for the Kettle Falls Generating Station is supplied by the Kettle Falls Municipal Water System from wells in the Kettle Falls area.

2.2 Non-Contact Cooling Water

The use of non-contact cooling water at the Kettle Falls Generating Station is limited to the circulating water system. This system utilizes a conventional mechanical draft cooling tower for condenser water cooling. Since the circulating water is cooled in the cooling tower largely by evaporation, the solids dissolved in the circulating water become concentrated. The average number of circulating water system cycles of concentration is 3.5, but is expected to increase once the full-scale reverse osmosis (RO) system is installed as it will supply approximately 80% of the water to the cooling tower with the remaining makeup water coming directly from the Peachcrest wells. Cooling tower blowdown is used to maintain acceptable circulating water quality by removing both dissolved and suspended solids. The amount of blowdown is affected by makeup water quality, the evaporation rate and selected circulating water quality characteristics. The primary water quality parameter that governs the blowdown rate is calcium hardness. Cooling tower blowdown is used to limit hardness to 600-1000 mg/l as CaCO₃.

The circulating water is conditioned with a scale inhibitor to limit the formation of mineral scale, sulfuric acid to control alkalinity, and chlorine to minimize biofouling. The use of corrosion inhibitors is not included in the design of the circulating water system. Typically, the concentration of scale inhibitor is maintained between 40 and 60 mg/l depending upon the formulation of the commercial product used. The scale inhibitor is currently 3D TRASAR™ 3DT487 by Nalco, which provides both corrosion and scale inhibitors designed for use in open recirculating water systems. The safety data sheet (SDS) for 3D TRASAR™ 3DT487 is provided in Appendix A. The feed rate of scale inhibitor is estimated to average 18 pounds per day. This feed rate is anticipated to reduce by 70-80% once the full-scale RO system is installed.

Sulfuric acid is fed to the circulating water to neutralize a portion of the alkalinity present in the makeup to this system and to lower the pH of the entire circulating water inventory. The alkalinity of the circulating water will be maintained at 100 to 200 mg/l as CaCO₃. Based on operation at 3.5 cycles of concentration and an average unit load factor of 100%, acid feed averages 500 pounds per day of 93% sulfuric acid. The cycles of concentration are anticipated to increase and the acid feed rate is anticipated to decrease by 80-90% once the full-scale RO system is installed.

Intermittent shock chlorination of the circulating water system is utilized to prevent biofouling. The amount of chlorine used is not significantly affected by the cooling tower cycles of concentration. The frequency of chlorination and the rate of application varies seasonally with warmer weather requiring more frequent chlorination periods and higher application rates. Typically, shock chlorination is performed once every four hours for a 10-minute duration. Total chlorination per day requires approximately 10-15 pounds of chlorine.

Average evaporation from the cooling tower is estimated to be 562,464 gallons per day (gpd). Average drift (spray loss) is estimated to be 2,300 gpd. Blowdown from the circulating water system is anticipated to be discharged to the retention basin at a daily average flow rate of 133,316 gpd and to feed the ash handling system at a daily average flow rate of 5,000 gpd. The expected daily makeup requirement for the circulating water system is 703,080 gpd. The blowdown is not sampled separately prior to combining with other wastewater.

2.3 Process Water

Process water is supplied to various plant systems including the RO system, EDI system, ash handling system, the steam cycle and miscellaneous equipment.

2.3.1 RO System

The full-scale RO system is being designed by Newterra, Ltd. (Newterra) and will provide high quality water to the cooling tower and to the EDI system that will ultimately supply the steam cycle.

Pressurized well water will be directed through the cartridge filters which acts as a safeguard to remove any residual suspended solids in solution.

The filtered water from the cartridge filters will feed the RO high pressure pumps which will pressurize the feed water and send it through the 1st pass RO units. The piping and valves are arranged to allow either of the high pressure pumps to feed either RO skid for maintenance service operation.

RO uses semi-permeable membranes with very small pores, smaller than 0.001 μm . Water is able to diffuse across the membrane much more readily than dissolved solutes (salts). High feed water pressure is used to counteract the natural osmotic pressure enabling the passage of water from the side of high concentration (feed) of the membrane to the side of low concentration (permeate). A percentage of the water fed to the RO is discarded, as it will contain the salts rejected by the RO membrane. This RO reject will be discharged to the settling basin at a maximum anticipated daily average flow rate of 192,010 gpd.

The RO system is equipped with three chemical dosing systems; antiscalant, biocide and caustic which will be dosed as required upstream of the cartridge filters. The antiscalant to reduce the fouling potential of the water, the biocide to protect against biological growth in the RO membranes to reduce the cleaning frequency and maintain permeate water quality. Caustic will be dosed to reduce the CO₂ level in the RO permeate which improves EDI performance. Under normal operation (RO→RO→EDI) only antiscalant and biocide are dosed ahead of the 1st pass RO units. The biocide planned to be used is PermaClean™ PC-56 by Nalco, which is an effective non-oxidizing, non-ionic biocide for sanitizing RO systems. The antiscalant planned to be used is PermaTreat™ PC-191T by Nalco. PermaTreat™ PC-191T is an effective scale inhibitor specifically designed for use in RO systems. SDSs for both products are included in Appendix A.

Two (2) RO units are included, each designed to produce 200 gallons per minute (gpm) of clean permeate with a recovery of 75%. The permeate from the two RO units is directed to the 12,000 gallon 1st pass RO permeate storage tank. From there separate transfer pumps send permeate to the 2nd pass RO unit and to the cooling tower. The permeate to the cooling tower will be blended with up to 100 gpm of raw water to produce a total of up to 500 gpm make up to the cooling towers. The blending will be controlled by a proportional valve and flow monitoring. The maximum daily average flow rate from the RO system to the cooling tower is anticipated to be 559,080 gpd.

A 2nd pass RO pretreats 1st pass treated water to supply to the EDI and ultimately the boiler system. A dedicated pump sends permeate from the 12,000 USG tank to the 2nd pass RO unit. The permeate is directed through a cartridge filter which acts as a safeguard to remove any residual suspended solids in solution. Filter performance is monitored by differential pressure sensors. In normal operation these filters receive first pass RO permeate which is virtually particle free. If the facility is only operated in normal mode these filters will probably never require maintenance. The filters are included in the design to protect the second pass RO if the plant ever needs to produce boiler makeup water with the first pass RO systems both out of service. The design allows for an operating mode where the second pass RO receives direct feed of well water and in this configuration the filters will receive well water particulate loading and will require exchange of the disposable filters based on increase in differential pressure caused by accumulation of solids.

As with the 1st pass RO units, the 2nd pass RO unit is equipped with all three chemical dosing systems as well. During normal operation (RO→RO→EDI) only caustic is dosed ahead of the 2nd pass RO unit. This is done to reduce CO₂ in the RO permeate and optimize EDI performance. The 2nd pass RO will further treat the permeate making the water suitable to be fed to the EDI units increasing the quality of the final product water.

The 2nd pass RO is mainly designed to treat permeate from the 1st pass RO units, however in service mode it can directly treat well water (in this case, the 2nd pass RO unit acts as a 1st pass RO). During this situation all three chemical dosing systems (antiscalant, biocide, and caustic) are dosed ahead of the 2nd pass RO unit.

One (1) 2nd pass RO unit is included designed to produce 36 gpm of clean permeate with a recovery of 75%. The permeate from the 2nd pass RO unit is sent directly to the EDI units. The reject in normal operation is sent to the 1st pass RO permeate storage tank to reduce discharge

from the system. During service mode operation when the 2nd pass RO is acting as the 1st pass RO, the concentrate will be sent directly to the settling basin.

Under service mode 2, the process can be configured so that 1st pass RO permeate bypasses the 2nd pass RO unit and is sent directly to the EDI units. In this case, all three chemicals (antiscalant, biocide, and caustic) will be dosed ahead of the 1st pass RO units. This configuration will also require some manual valve arrangement and selecting the appropriate control scheme

2.3.2 Polishing Process

The electrodeionization (EDI) process is used as a polishing step to remove traces of dissolved solids in the water so that the product water is very high purity water prior to feeding the boiler system. The EDI system consists of multiple channels through which water is directed.

The majority of the water is directed through channels that are filled with ion exchange resin. The resin is compressed between two membranes. An electrical potential or voltage is applied across the channel. This creates an electric field which applies force on charged ions (dissolved solids) in the water. The electric field forces positively charged ions in one direction while negatively charged ions are moved in the opposite direction. The membranes on one side are permeable only to negative ions while only positive ions are able to pass through the opposite membrane. In this way ions are removed from the resin filled chamber and collected in wastewater chambers. The resin in effect increases the conductivity within the channel between the two membranes. This facilitates the lateral movement of ions away from the center of the channel and through the membranes on either side of the channel.

A small portion of feed water feeding the EDI system is directed through the waste collection channels to convey the waste out of the system where it is blended to produce an electrically neutral waste stream. The EDI reject will be sent back to the 1st pass RO permeate storage tank to minimize the discharge from the overall system. Treated water from the EDI system is directed to a 2,100-gallon break tank and from there it is pumped via transfer pumps to the two existing Condensate Storage Tanks (CSTs).

Two (2) EDI units are included each designed to produce 15 gpm of clean permeate with a recovery of 90%. The EDI is designed to treat two pass RO permeate however in service mode it can treat one-pass RO permeate (from either the 1st pass RO units or 2nd pass RO unit) for a short period of time. The system is designed to run both EDI units all the time. If for some reason one of the EDI units is out of service, the system will be able to operate with only one EDI unit. The additional flow from the 2nd pass RO system will be directed to the 1st pass RO permeate storage tank. The EDI will only be operated as needed to replenish the CSTs and make up for boiler losses and blowdown estimated at 14,100 gpd.

2.3.3 Ash Handling Systems

The fly ash and bottom ash handling systems utilize process water during normal operation. Based on a load factor of 100%, approximately 110 tons of total ash are collected daily. Fly ash production averages 75 tons per day while bottom ash averages 35 tons per day.

2.3.3.1 Fly Ash

Fly ash is removed from the flue gas by an electrostatic precipitator. The fly ash handling system utilizes 4,300 gpd of water for dust suppression and to aid in compaction of the ash. The fly ash is transported by truck to the Kettle Falls Generating Station Limited Purpose Landfill for disposal. There is no wastewater discharge from the fly ash handling system.

2.3.3.2 Bottom Ash

Bottom ash from the combustion process consists of sand, gravel and other inert materials. Bottom ash collected in the bottom ash hopper is removed mechanically and transported by truck along with the fly ash to the Kettle Falls Generating Station Limited Purpose Landfill for disposal. An insignificant amount of water is entrained in the discarded bottom ash. This system utilizes process water to cool the bottom ash and bottom ash handling equipment and to provide furnace seal water between the furnace and the bottom ash hopper.

The bottom ash handling system requires an average of 1,000 gpd of water. There is no wastewater discharge from the bottom ash handling system.

2.3.4 Steam Cycle

The steam cycle utilizes a subcritical drum type steam generator and is, in essence, a closed system. However, some losses occur particularly from sampling, soot-blowing, leakage and boiler blowdown. An average of 14,100 gpd of high purity makeup water from EDI water storage is introduced to the condenser hotwell to compensate for cycle losses. An estimated 2,000 gallons per day is recovered in the plant drains, 2,600 gpd is sampled and directed to the building sump, with the remainder lost through soot blowing and cycle losses. This high purity wastewater is directed to the settling basins via the building sump.

Chemicals used to condition the condensate and feedwater include hydrazine and ammonia. Hydrazine serves as an oxygen scavenger by reacting with oxygen to form water and nitrogen gas, thus eliminating traces of dissolved oxygen which are not removed by mechanical de aeration. A dilute hydrazine solution of approximately 35 mg/l is fed in proportion to the condensate flow rate with a bias from the hydrazine residual. Hydrazine residual is controlled in the range of 0.005 to 0.020 mg/l.

Ammonia is fed to the condensate to increase the pH in the cycle to a level that will minimize corrosion. Ammonia feed is automatically controlled in proportion to the specific conductance of the condensate. The ammonia residual is maintained at approximately 0.8 to 1.2 mg/l, corresponding to a pH of 9.3 to 9.5.

Hydrazine rapidly decomposes into ammonia and nitrogen gas at boiler water temperatures. Since ammonia and nitrogen are relatively insoluble in water at this temperature, the concentration of these chemicals in boiler blowdown is insignificant.

The boiler blowdown is not sampled prior to combining with other wastewater.

2.4 Domestic Water

Kettle Falls Municipal Water is used in all sanitary facilities at the plant site. Approximately 1,200 gpd is used for domestic and sanitary purposes and routed to the sanitary waste collection system.

Table 2-1 Peachcrest Groundwater Well Water Quality Data

Parameter	Concentration	Units
3-Methyl Cholanthrene	ND	ug/L
5-day BOD Test	ND	mg/L
5-day Soluble BOD	ND	mg/L
Acid Extractables ¹	ND	ug/L
Alkalinity	243.3	mg CaCO ₃ /L
Aluminum	ND	ug/L
Ammonia-N	ND	mg/L
Antimony	0.2	ug/L
Arsenic	2	ug/L
Asbestos	ND	MFL>10um
Barium	76	ug/L
Base/Neutral Extractables ²	ND	ug/L
Base/Neutral Extractables - 2,3,7,8 TCDD (Dioxin)	ND	pg/L
Benzo (J) Fluoranthene	ND	ug/L
Benzo (R,S,T) Pentaphene	ND	ug/L
Beryllium	ND	ug/L
Boron	70	ug/L
Cadmium	ND	ug/L
Chemical Oxygen Demand	ND	mg/L
Chromium	0.6	ug /L
Cobalt	0.16	ug/L
Color	ND N1	CU
Copper	1.1	ug/L
Cyanide (WAD)	ND	mg/L
Cyanide, Available	ND	mg/L
Cyanide, Total	ND	mg/L
Dibenzo (A,H) Acridine	ND	ug/L
Dibenzo (A, J) Acridine	ND	ug/L
Dibenzo (A,E) Pyrene	ND	ug/L
Dibenzo (A, H) Pyrene	ND	ug/L
Dissolved Oxygen	8.68	mg/L
Hydrogen Sulfide	ND	mg/L
Hardness (CaCO ₃)	212200	ug/L
Hexavalent Chromium	1.29	ug/L
Hydrocarbons	ND	mg/L
Iron	ND	ug/L
Lead	0.05	ug/L
Magnesium	16300	ug/L
Manganese	ND	ug/L
Mercury	0.695	ng/L
Molybdenum	ND	ug/L
Nickel	ND	ug/L
Nitrate-N	0.86	mg/L
Nitrite-N	ND	mg/L

Parameter	Concentration	Units
Oil and Grease	ND	mg/L
Ortho-phosphate	0.03	mg/L
Organochlorine Pesticides ³	ND	ug/L
PCBs ⁴	ND	ug/L
Perylene	ND	ug/L
Phenolics	ND	ug/L
Salinity	0.292	PSS
Selenium	0.8	ug/L
Settleable Solids by Volume	ND	mL/L
Silver	ND	ug/L
Sulfate	27.7	mg/L
Sulfite	ND	mg/L
Total Dissolved Solids	320	mg/L
Thallium	ND	ug/L
Tin	3.7	ug/L
Titanium	3	ug/L
Total Kjeldahl Nitrogen	0.24	mg/L
Total Organic Carbon	0.58	mg/L
Total Phosphorus	0.022	mg/L
Total Suspended Solids	ND	mg/L
Volatiles ⁵	ND	ug/L
Zinc	4.5	ug/L

¹A total of 11 Acid Extractable compounds were tested and analyzed resulting in all non-detect values.

²A total of 43 Base/Neutral Extractable compounds were tested and analyzed resulting in all non-detect values.

³A total of 18 Organochlorine Pesticide compounds were tested and analyzed resulting in all non-detect values.

⁴A total of 7 Aroclor PCB compounds were tested and analyzed resulting in all non-detect values.

⁵A total of 34 Volatile compounds were tested and analyzed resulting in all non-detect values.

Table 2-2 Expected Water Quality of RO Reject

Parameter	Concentration	Units
Ammonia and Ammonium	0.77	mg/L
Potassium	11.56	mg/L
Sodium	87.69	mg/L
Magnesium	99.84	mg/L
Calcium	335.49	mg/L
Strontium	2.16	mg/L
Barium	0.41	mg/L
Carbonate	8.46	mg/L
Bicarbonate	1301.32	mg/L
Nitrate	0.79	mg/L
Chlorine	151.90	mg/L
Fluorine	0.00	mg/L
Sulfate	155.95	mg/L
Silicon Dioxide	79.96	mg/L
Boron	0.20	mg/L
Carbon Dioxide	25.13	mg/L
TDS	2237.44	mg/L
pH	7.86	

Section 3

Wastewater Collection, Treatment and Disposal

The wastewater collection and treatment systems provide a method of treatment for all plant wastewaters. The treated wastewaters are discharged to Franklin D. Roosevelt Lake (Columbia River), surface drainage ditches or recycled within the facility.

3.1 Process Wastewater Treatment

Process wastewater is received from the RO reject, the ash handling system, the steam cycle and miscellaneous floor and equipment drains. A common wastewater treatment system is used to treat all process wastes. Depending on the suspended solids concentration of the wastewater, each process waste stream is routed to either the retention basin or one of the settling basins. Circulating water system blowdown is also routed to the retention basin. Since this blowdown is combined with the process wastewater, the blowdown is considered as a process waste in the following discussion.

Major components of the process wastewater treatment system include two settling basins, a retention basin and a mixing tank for recirculation. This wastewater treatment system is presented in Figure 2-1. The wastewater treatment systems have been operational for over 30 years and no changes are proposed at this time.

3.1.1 Settling Basins

The two rectangular settling basins with concrete sides and bottoms receive boiler blowdown, miscellaneous plant drains, RO reject, precipitation, and mixing tank sludge. Daily average settling basin influent flow rate is anticipated to be 208,510 gpd.

Each settling basin is sized to contain one year's solids production from the influent sources. This volume is estimated to be approximately 5,000 cubic feet per year. Following commercial operation, the settled solids will be excavated from the basin annually and trucked to the Stevens County landfill for final disposal.

Depending upon the volume of accumulated solids in the basins, approximately 12 to 48 hours retention time will be provided in the settling basins. This allows the majority of suspended solids to settle out and provides some mixing and cooling of the influent streams. Suspended solids concentrations in the settling basin effluent are expected to average from 50 mg/l to 150 mg/l. The settling basins overflow to the retention basin at an anticipated average flow rate of 208,410 gpd, accounting for 100 gpd evaporation.

3.1.2 Retention Basin

The retention basin with concrete sides and bottom receives settling basin overflow, cooling tower blowdown, and precipitation. Daily average retention basin influent flow rate is anticipated to be 342,326 gpd.

The retention basin provides up to 48 hours retention time for the combined wastewater streams. This allows mixing and cooling of the wastewater. The retention period is expected to reduce the chlorine residual in the cooling tower blowdown to less than 0.1 mg/l free available chlorine. The effluent suspended solids concentration from the retention basin is expected to average less than 30 mg/l. Retention basin effluent will be pumped to the mixing tank for final settling and recirculation as needed to meet effluent limits at an anticipated average flow rate of 342,126 gpd, accounting for approximately 200 gpd evaporation.

3.1.3 Mixing Tank

The mixing tank consists of a circular steel tank with a concrete bottom that is approximately 25 feet in diameter. This unit provides additional settling of solids and recirculation to the retention pond as needed to meet effluent limitations. The mixing tank can be bypassed when the unit is out of service or the retention basin effluent does not require further treatment. This mixing tank was referred to as a clarifier in the previous engineering report.

Suspended solids concentration in the mixing tank effluent is expected to average 30 mg/l or less. Daily average and daily maximum effluent temperatures are expected to be less than 90°F. The mixing tank is anticipated to overflow to Franklin D. Roosevelt Lake at an average flow rate of approximately 339,126 gpd. Table 3-1 presents the expected chemical characteristics of the final plant effluent. These are based on current effluent sampling results as chemical characteristics are anticipated to be similar to, or better than, current effluent once the full-scale RO system is installed.

3.2 Effluent Disposal

Effluent from the solids contact unit is discharged to Franklin D. Roosevelt Lake through a simple outfall. The location of the outfall is shown in Figure 3-1. The design of the effluent disposal system was based on mixing calculations, applicable receiving water quality standards (Chapter 173-201-045 of the Washington Administrative Code), and the delineation of mixing zone boundaries as presented in the Washington Department of Ecology "Effluent Dilution Zone Guidelines" (Chapter 25). No changes are proposed to the outfall at this time.

The existing outfall consists of an 8-inch pipe with 0.125-inch mesh screening at the discharge point. The entire length of the effluent line from the water treatment plant to the outfall is buried. The outfall is located in Franklin D. Roosevelt Lake at an elevation of approximately 1170 feet (mean sea level, MSL), which is 38 feet below the normal low water surface elevation of 1208 ft. The discharge point is approximately 125 feet from the shoreline at the normal low water level.

3.3 Treatment Alternatives Considered

Treatment alternatives were considered during initial design of the existing wastewater treatment systems. No changes to the existing wastewater treatment systems are proposed at this time.

3.4 Domestic Wastewater Treatment

Sanitary waste is collected by the sanitary waste collection system and treated by a septic tank and sanitary drain field. This system design conforms to the Northeast Tri-County Health District

On-Site Sewage Regulation (Regulation No. 04-1978). Based on a wastewater generation rate of 40 gallons/person/day, the total plant sanitary wastewater generation for an average of 30 plant employees is 1,200 gallons/day. Since the On-Site Sewage Regulation requires a septic tank designed to accommodate 150 percent of the daily waste rate, the plant septic tank is sized at 1,800 gallons.

This regulation also requires that the associated drain field have a maximum loading rate of 1.2 gallons/ft²/day. Based on the daily waste rate of 1,200 gallons/day, the plant sanitary drain field design incorporates 1,000 square feet of drain field trench. The pipe material selected for the drain field is 4-inch diameter slotted PVC pipe.

3.5 Non-Point Source Contamination

Three types of non-point source contamination are expected from the Kettle Falls Generating Plant: (1) leachate from the fuel storage pile, (2) stormwater runoff, and (3) hydrocarbons and oily wastes from paved areas. All fuel storage pile leachate is collected in a holding pond and applied by spray to the incoming fuel. This method of treatment and disposal prevents the discharge of fuel pile leachate to surface waters of the State.

All stormwater runoff from the plant site is collected by the stormwater collection system. The majority of this runoff is transported to normal drainage channels. Appropriate measures are implemented to minimize soil erosion and the transport of sediments from the plant in stormwater runoff. The collection and treatment of runoff from paved areas within the plant site is discussed in Section 3.6.

3.6 Oil and Grease Removal

All runoff water from paved areas is collected and passed through an oil separation system. The separators are designed to handle a portion of the peak flow rate of the design storm. The majority of the oil and grease washed off of these paved surfaces appears well before the runoff peak and should be removed by the oil separators. After passing through the oil separators, the storm water from paved areas is routed through normal drainage channels along with runoff from the rest of the plant.

Floor drains from the machine shop area, located in the maintenance and administration building, pass through an oil separator for the removal of oil and grease. Collected oils and greases are stored in a tank adjacent to the separator. Disposal of these wastes is contracted to a vendor specializing in the recovery of oil and grease.

3.7 Bulk Material Storage and Containment

Containment dikes or berms are constructed around major sources of oil contaminated wastes such as large storage tanks and transformers. Bulk chemical storage on the site includes 93% sulfuric acid and 50% sodium hydroxide. Note that sodium hydroxide is maintained onsite if needed to adjust wastewater pH; however, it is not needed as part of typical operations. Separate containment dikes, sized to contain the maximum spill, are constructed around each bulk chemical tank.

3.8 Chemical Cleaning Wastewater

Chemical cleaning of the boiler and preboiler systems includes both acid and alkaline preoperational cleaning solutions and system flush water. If operational acid and alkaline cleaning of the boiler were required, that would generate chemical cleaning wastewater. Chemical cleaning will be performed by a qualified subcontractor. Chemical cleaning wastewater will be removed from the site by the subcontractor and will not, therefore, be discharged to Franklin D. Roosevelt Lake.

3.9 Sludge Disposal

Suspended solids from influent wastewater sources and recovered solids sludge from the mixing tank accumulate in the two settling basins. As noted in Section 3.1.1, the settled solids will be excavated and trucked to the Stevens County landfill for final disposal. Alternative sludge management techniques that were considered include onsite disposal and incineration.

Due to the limited availability of suitable onsite sludge disposal areas, the onsite disposal option was discarded. Incineration of the sludge also proved unsatisfactory from an economic standpoint. The relatively minor volume reduction expected from incineration and the associated high operating and maintenance costs made this option unfeasible. Offsite disposal of the sludge in a landfill provides the most suitable cost-effective method of final sludge disposal for the Kettle Falls Generating Station.

Table 3-1 AVISTA Effluent Discharge Water Quality Data

Parameter	Concentration	Units
3-Methyl Cholanthrene	ND	ug/L
5-day BOD Test	ND	mg/L
5-day Soluble BOD	ND	mg/L
Acid Extractables ¹	ND	ug/L
Alkalinity	442.8	mg CaCO ₃ /L
Aluminum	ND	ug/L
Ammonia-N	0.05	mg/L
Antimony	2.1	ug/L
Arsenic	8.7	ug/L
Asbestos	ND	MFL>10um
Barium	305	ug/L
Base/Neutral Extractables ²	ND	ug/L
Base/Neutral Extractables - 2,3,7,8 TCDD (Dioxin)	ND	pg/L
Benzo (J) Fluoranthene	ND	ug/L
Benzo (R,S,T) Pentaphene	ND	ug/L
Beryllium	ND	ug/L
Boron	260	ug/L
Bromide	0.05	mg/L
Cadmium	ND	ug/L
Chemical Oxygen Demand	31.3	mg/L
Chromium	5.1	ug/L
Cobalt	0.6	ug/L
Color	5	CU
Copper	0.6	ug/L
Cyanide (WAD)	0.005	mg/L
Cyanide, Available	ND	mg/L
Cyanide, Total	ND	mg/L
Cyanide, Total	ND	ug/L
Dibenzo (A,H) Acridine	ND	ug/L
Dibenzo (A,E) Pyrene	ND	ug/L
Dibenzo (A, H) Pyrene	ND	ug/L
Dissolved Oxygen	5.92	mg/L
Ecology Priority Toxic Chemicals	ND	ug/L
Fluoride	1.13	mg/L
Free Chlorine Residual	0.03	mg/L
Gross Alpha	14.9	pCi/L
Gross Beta	9.7	pCi/L
Hydrogen Sulfide	ND	mg/L
Hardness (CaCO ₃)	950200	ug/L
Hexavalent Chromium	3.79	ug/L
Hydrocarbons	ND	mg/L
Iron	130	ug/L
Lead	0.1	ug/L
Magnesium	73700	ug/L
Manganese	2	ug/L
Mercury	5.28	ng/L
Mercury	5.99	ng/L
Molybdenum	20	ug/L
Nickel	0.7	ug/L
Nitrate-N	3.79	mg/L

Parameter	Concentration	Units
Nitrite-N	ND	mg/L
Oil and Grease	1.3	mg/L
Ortho-phosphate	0.75	mg/L
Organochlorine Pesticides ³	ND	ug/L
PCBs ⁴	ND	ug/L
Perylene	ND	ug/L
pH	6.0 to 9.0	
Phenolics	ND	ug/L
Radium 226,228 (combined)	1.74	pCi/L
Radium 228	0.413	pCi/L
Salinity	1.133	PSS
Selenium	3.6	ug/L
Settleable Solids by Volume	ND	mL/L
Silver	ND	ug/L
Sulfate	714	mg/L
Sulfite	ND	mg/L
Surfactants	ND	mg/L
Total Dissolved Solids	1672	mg/L
Thallium	ND	ug/L
Thallium	ND	mg/L
Tin	7.1	ug/L
Titanium	13	ug/L
Total Kjeldahl Nitrogen	0.7	mg/L
Total Organic Carbon	6.53	mg/L
Total Phosphorus	1.45	mg/L
Total Suspended Solids	5	mg/L
Volatiles ⁵	ND	ug/L
Volatiles - Chloroform	0.7	ug/L
Zinc	13	ug/L

¹A total of 10 Acid Extractable compounds were tested and analyzed resulting in all non-detect values.

²A total of 43 Base/Neutral Extractable compounds were tested and analyzed resulting in all non-detect values.

³A total of 17 Organochlorine Pesticide compounds were tested and analyzed resulting in all non-detect values.

⁴A total of seven Aroclor PCB compounds were tested and analyzed resulting in all non-detect values.

⁵A total of 31 Volatile compounds were tested and analyzed resulting in all non-detect values.

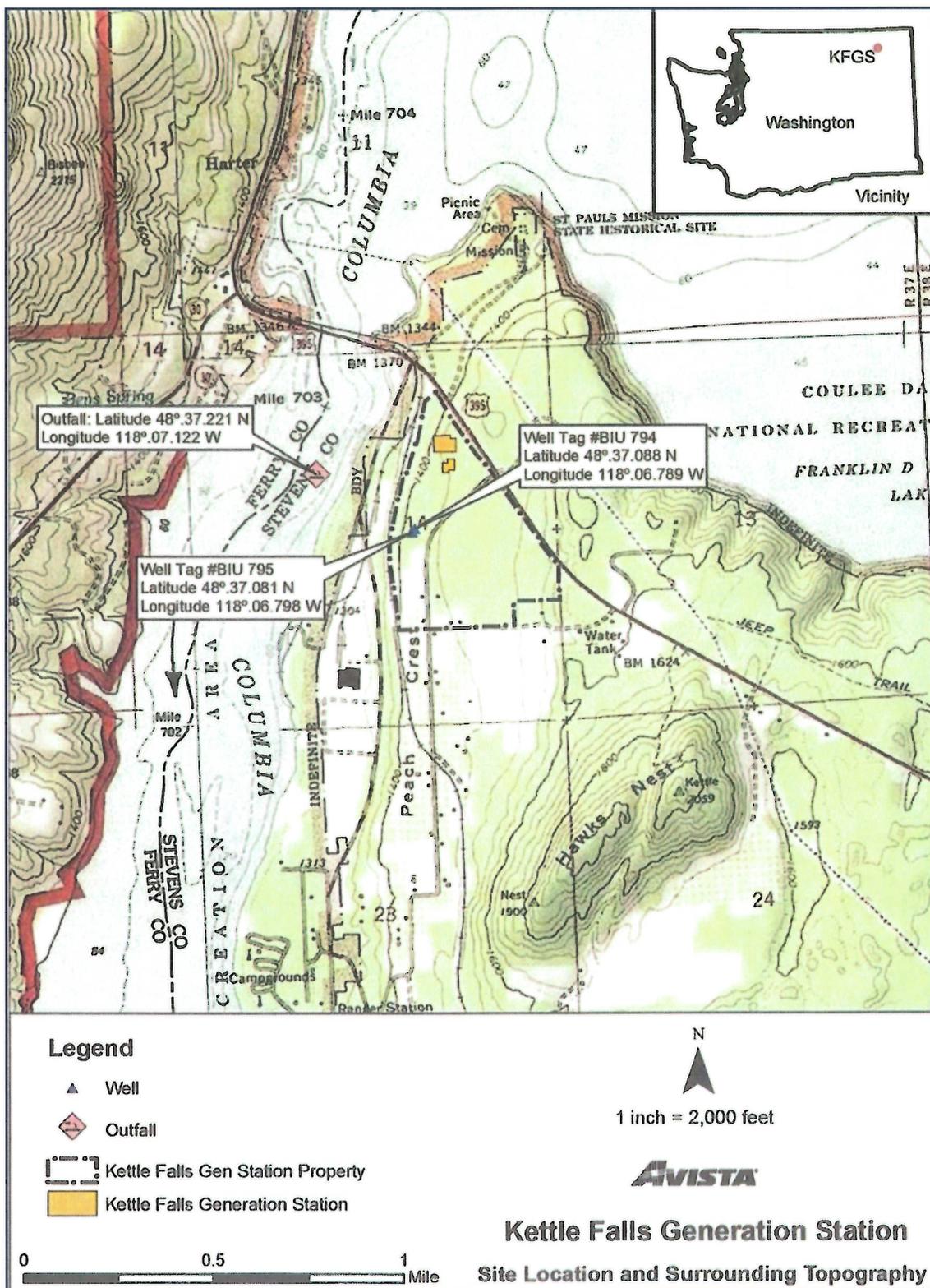


Figure 3-1
Outfall Location

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Section 4

Compliance with Regulatory Requirements

4.1 Effluent Limitations

The Washington Department of Ecology has adopted the Environmental Protection Agency Effluent Guidelines and Standards for Steam Electric Power Generating (40 CFR 423) as a guideline in establishing specific effluent limitations for the Kettle Falls Generating Station previously. 40 CFR 423.10 dictates that the guidelines apply to fossil-fuel, fuel derived from fossil-fuel and nuclear steam electric plants and does not include biomass steam electric plants like Kettle Falls Generating Station.

4.2 Water Quality Criteria

The Washington Department of Ecology has assigned use designations for fresh waters of the state, including the Columbia River, in Washington Administrative Code (WAC) 173-201A-602 (also referred to as Table 602). Roosevelt Lake, the receiving water for discharge from Kettle Falls Generating Station, is located in the Columbia River reach from Grand Coulee Dam to the Canadian border. The uses and associated criteria for this reach are summarized below.

Table 4-1 Freshwater Aquatic Life Uses and Associated Criteria

Core Summer Salmonid Habitat	
Temperature Criteria ^a – Highest 1-DAD MAX	20°C
Dissolved Oxygen Criteria	9.5 mg/L
Turbidity Criteria	<ul style="list-style-type: none"> • 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
Total Dissolved Gas Criteria	Total dissolved gas must not exceed 110 percent of saturation at any point of sample collection.
pH Criteria	The pH must measure within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units.

^a Specified in Table 602 of Chapter 173-201A

Table 4-2 Recreational Uses and Associated Criteria

Recreational Use	Criteria
Extraordinary Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 50 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 100 colonies/100 mL

Water supply uses: domestic, agricultural, industrial, and stock watering.

Miscellaneous freshwater uses: wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

The standards specific aquatic life toxics criteria in WAC 173-201A-240 while the National Toxics Rule at 40 CFR Part 131.45 includes numeric human health-based criteria for Washington State.

The Kettle Falls Generating Station wastewater treatment systems and associated outfall structure are designed to maintain the integrity of the receiving water and compliance with the applicable water quality criteria.

4.3 Water Quality Management

The wastewater treatment systems existing at the Kettle Falls Generating Station do not conflict with the goals and objectives of the Washington Continuing Planning Process as implemented under the provisions of Section 301 (e) of the Federal Water Pollution Control Act (PL 92-500, as amended). No local water quality management plans under Section 208 of the Act have been developed and implemented in the Kettle Falls Generating Station area.

4.4 Environmental Impact Assessment

An Environmental Impact Statement for the Kettle Falls Generating Station was prepared by Stevens County in 1979 and 1980 pursuant to the Washington State Environmental Policy Act of 1971 (Chapter 43.21C, Washington Revised Code) and State Environmental Policy Act Guidelines (Chapter 197-10 of the Washington Administrative Code). This impact statement was prepared to accompany the Environmental Coordination Procedures Act process (Chapter 90.62 of the WRC) since project approval was deemed to be a major action significantly affecting the quality of the environment.

The National Environmental Policy Act of 1969 (43 U.S.C. 4341) requires an environmental impact statement for major federal actions significantly affecting the quality of the human environment. However, the Bureau of Reclamation, as lead federal agency in the approval of the Kettle Falls Generating Station, determined that execution of a water service contract to supply water from Franklin D. Roosevelt Lake was not a major Federal action requiring the preparation of an Environmental Impact Statement. A "Finding of No Significant Impact" was published by the Water and Power Resources Service in October 1980.

With respect to NPDES permits, Clean Water Act Section 511 establishes that only EPA-issued permits to new sources are subject to NEPA's environmental review procedures under state law prior to permit issuance. This revised report supports an application for renewal of an existing NPDES permit, therefore NEPA review is not required.

The State Environmental Protection Act (SEPA) (Revised Code of Washington [RCW] Chapter 43.21C) requires an environmental impact statement on proposals for legislation and other major actions having a probable significant adverse environmental impact. However, issuance, reissuance or modification of a wastewater discharge permit that contains conditions no less stringent than federal effluent limitations and state rules are not subject to SEPA (RCW 43.21C.0383). This revised report supports an application for renewal of an existing NPDES permit, therefore SEPA review is not required.

Section 5

Final Design and Construction Schedule

5.1 Full-Scale RO System Schedule

A general project schedule with selected milestones for the design and construction of the full-scale process water RO system at Kettle Falls Generating Station is shown in Table 5-1. The final system design and construction will be completed during 2018.

Table 5-1 Selected Milestones for the Design and Construction of the RO System

Milestone	Target Completion Date
Procurement of Design/Build Services	11/8/2017
Substantial Completion	8/20/2018
Acceptance Testing	10/23/2018
Final Completion	11/19/2018

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Appendix A

SAFETY DATA SHEET

3D TRASAR™ 3DT487

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 3D TRASAR™ 3DT487

Other means of identification : Not applicable.

Recommended use : COOLING WATER TREATMENT

Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.

Company : Nalco Company
1601 W. Diehl Road
Naperville, Illinois 60563-1198
USA
TEL: (630)305-1000

Emergency telephone number : (800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 03/23/2018

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Corrosive to metals : Category 1

GHS Label element

Hazard pictograms :



Signal Word : Warning

Hazard Statements : May be corrosive to metals.

Precautionary Statements : **Prevention:**
Keep only in original container.
Response:
Absorb spillage to prevent material damage.
Storage:
Store in corrosive resistant stainless steel container with a resistant inner liner.

Other hazards : Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Concentration: (%)
Phosphoric Acid	7664-38-2	5 - 10

Section: 4. FIRST AID MEASURES

SAFETY DATA SHEET

3D TRASAR™ 3DT487

- In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.
- In case of skin contact : Wash off with soap and plenty of water. Get medical attention if symptoms occur.
- If swallowed : Rinse mouth. Get medical attention if symptoms occur.
- If inhaled : Get medical attention if symptoms occur.
- Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
- Notes to physician : Treat symptomatically.
- Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : None known.
- Specific hazards during firefighting : Not flammable or combustible.
- Hazardous combustion products : Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
- Special protective equipment for firefighters : Use personal protective equipment.
- Specific extinguishing methods : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Do not allow contact with soil, surface or ground water.
- Methods and materials for containment and cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

SAFETY DATA SHEET

3D TRASAR™ 3DT487

Section: 7. HANDLING AND STORAGE

- Advice on safe handling : Wash hands thoroughly after handling. Use only with adequate ventilation. Do not mix with bleach or other chlorinated products – will cause chlorine gas.
- Conditions for safe storage : Keep away from strong bases. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
- Suitable material : Keep in properly labelled containers.
- Unsuitable material : not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Phosphoric Acid	7664-38-2	TWA	1 mg/m ³	ACGIH
		STEL	3 mg/m ³	ACGIH
		TWA	1 mg/m ³	NIOSH REL
		STEL	3 mg/m ³	NIOSH REL
		TWA	1 mg/m ³	OSHA Z1

- Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

- Eye protection : Safety glasses
- Hand protection : Wear protective gloves.
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Skin protection : Wear suitable protective clothing.
- Respiratory protection : No personal respiratory protective equipment normally required.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : liquid
- Colour : yellow
- Odour : None
- Flash point : 102.8 °C, Method: ASTM D 92, Does not sustain combustion.
- pH : 1.3 - 2.0

SAFETY DATA SHEET

3D TRASAR™ 3DT487

Odour Threshold	: no data available
Melting point/freezing point	: Melting point/freezing point: -7.4 °C
Initial boiling point and boiling range	: 97.8 °C
Evaporation rate	: no data available
Flammability (solid, gas)	: no data available
Upper explosion limit	: no data available
Lower explosion limit	: no data available
Vapour pressure	: no data available
Relative vapour density	: no data available
Relative density	: 1.223, (15.6 °C),
Density	: no data available
Water solubility	: Complete
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: no data available
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: 16.5 mPa.s (23 °C)
Viscosity, kinematic	: no data available
Molecular weight	: no data available
VOC	: no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Conditions to avoid	: None known.
Incompatible materials	: Strong bases
Hazardous decomposition products	: Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	: Inhalation, Eye contact, Skin contact
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SAFETY DATA SHEET

3D TRASAR™ 3DT487

Potential Health Effects

Eyes : Health injuries are not known or expected under normal use.
Skin : Health injuries are not known or expected under normal use.
Ingestion : Health injuries are not known or expected under normal use.
Inhalation : Health injuries are not known or expected under normal use.
Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : No symptoms known or expected.
Skin contact : No symptoms known or expected.
Ingestion : No symptoms known or expected.
Inhalation : No symptoms known or expected.

Toxicity

Product

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Acute inhalation toxicity : Acute toxicity estimate: > 10 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Skin corrosion/irritation : Species: rabbit
Result: 0.0
GLP: yes
Test substance: Product
Serious eye damage/eye irritation : Species: rabbit
Exposure time: 72 hrs
Result: 0.0
Method: Draize Test
GLP: yes
Test substance: Product
Respiratory or skin sensitization : no data available
Carcinogenicity : no data available
Reproductive effects : no data available
Germ cell mutagenicity : no data available
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available

SAFETY DATA SHEET

3D TRASAR™ 3DT487

Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : LC50 Fathead Minnow: 7,175 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Fathead Minnow: 3,600 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Rainbow Trout: > 10,000 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Rainbow Trout: 6,000 mg/l
Exposure time: 96 hrs
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates : EC50 Ceriodaphnia dubia: 1,103 mg/l
Exposure time: 48 hrs
Test substance: Product

LC50 Ceriodaphnia dubia: 1,350 mg/l
Exposure time: 48 hrs
Test substance: Product

NOEC Ceriodaphnia dubia: 313 mg/l
Exposure time: 48 hrs
Test substance: Product
Test Type: Immobilization

NOEC Ceriodaphnia dubia: 625 mg/l
Exposure time: 48 hrs
Test substance: Product

Components

Toxicity to algae : Phosphoric Acid
EC50 Desmodesmus subspicatus (green algae): > 100 mg/l
Exposure time: 72 h

Persistence and degradability

Total Organic Carbon (TOC) : 120,000 mg/l

Chemical Oxygen Demand (COD): 300,000 mg/l

SAFETY DATA SHEET

3D TRASAR™ 3DT487

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
5 d	400 mg/l	

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

- Disposal methods : Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
- Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : PHOSPHORIC ACID SOLUTION
Technical name(s) :
UN/ID No. : UN 1805
Transport hazard class(es) : 8
Packing group : III
Reportable Quantity (per package) : 54,007 lbs
RQ Component : Phosphoric Acid

Air transport (IATA)

Proper shipping name : PHOSPHORIC ACID SOLUTION
Technical name(s) :
UN/ID No. : UN 1805
Transport hazard class(es) : 8
Packing group : III
Reportable Quantity (per package) : 54,007 lbs
RQ Component : Phosphoric Acid

Sea transport (IMDG/IMO)

SAFETY DATA SHEET

3D TRASAR™ 3DT487

Proper shipping name : PHOSPHORIC ACID SOLUTION
Technical name(s) :
UN/ID No. : UN 1805
Transport hazard class(es) : 8
Packing group : III

Section: 15. REGULATORY INFORMATION

TSCA list : Not relevant

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Phosphoric Acid	7664-38-2	5000	54007

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : The following components are subject to reporting levels established by SARA Title III, Section 302:
Hydrogen Peroxide 7722-84-1

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

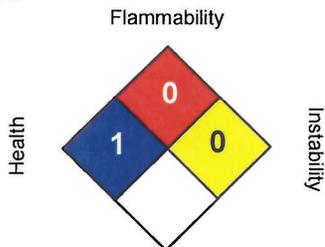
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3D TRASAR™ 3DT487

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

Section: 16. OTHER INFORMATION

NFPA:



Special hazard.

HMIS III:

HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date : 03/23/2018
Version Number : 1.9
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.

SAFETY DATA SHEET

NALCO® 8735

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : NALCO® 8735

Other means of identification : Not applicable.

Recommended use : pH STABILIZER

Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.

Company : Nalco Company
1601 W. Diehl Road
Naperville, Illinois 60563-1198
USA
TEL: (630)305-1000

Emergency telephone number : (800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 03/09/2017

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion : Category 1A
Serious eye damage : Category 1

GHS Label element

Hazard pictograms :



Signal Word : Danger

Hazard Statements : Causes severe skin burns and eye damage.

Precautionary Statements : **Prevention:**
Keep only in original container. Wash skin thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.
Storage:
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

SAFETY DATA SHEET

NALCO® 8735

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Concentration: (%)
Sodium Hydroxide	1310-73-2	30 - 60
Potassium Hydroxide	1310-58-3	10 - 30

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention if symptoms occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : None known.

Specific hazards during firefighting : Not flammable or combustible.

Hazardous combustion products : metal oxides

Special protective equipment for firefighters : Use personal protective equipment.

Specific extinguishing methods : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not

SAFETY DATA SHEET

NALCO® 8735

breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Do not allow contact with soil, surface or ground water.
- Methods and materials for containment and cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

- Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation.
- Conditions for safe storage : Do not store near acids. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
- Suitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Stainless Steel 304, Stainless Steel 316L, Hastelloy C-276, Buna-N, Nylon, Polyethylene, Polypropylene, PVC, HDPE (high density polyethylene), Plexiglass, PTFE, Perfluoroelastomer, Chlorosulfonated polyethylene rubber
- Unsuitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Aluminum, Mild steel, Natural rubber, Brass, Copper, Ethylene propylene, Neoprene, Polyurethane, Fluoroelastomer

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Sodium Hydroxide	1310-73-2	Ceiling	2 mg/m ³	ACGIH
		Ceiling	2 mg/m ³	NIOSH REL
		TWA	2 mg/m ³	OSHA Z1
Potassium Hydroxide	1310-58-3	Ceiling	2 mg/m ³	ACGIH
		Ceiling	2 mg/m ³	NIOSH REL

- Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

SAFETY DATA SHEET

NALCO® 8735

Personal protective equipment

- Eye protection : Safety goggles
Face-shield
- Hand protection : Wear protective gloves.
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Skin protection : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing
- Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Liquid
- Colour : colourless
- Odour : odourless
- Flash point : does not flash
- pH : 14, 5 %, Method: ASTM E 70
- Odour Threshold : no data available
- Melting point/freezing point : FREEZING POINT: -23 °C, ASTM D-1177
- Initial boiling point and boiling range : 145 °C, Method: ASTM D 86
- Evaporation rate : no data available
- Flammability (solid, gas) : no data available
- Upper explosion limit : no data available
- Lower explosion limit : no data available
- Vapour pressure : 0.5 mm Hg, (37.7 °C),
- Relative vapour density : no data available
- Relative density : 1.50 - 1.53, (15.6 °C), ASTM D-1298
- Density : 1.50 - 1.53 g/cm³ , 12.5 - 12.7 lb/gal
- Water solubility : completely soluble
- Solubility in other solvents : no data available
- Partition coefficient: n-octanol/water : no data available
- Auto-ignition temperature : no data available

SAFETY DATA SHEET

NALCO® 8735

Thermal decomposition temperature : no data available
Viscosity, dynamic : no data available
Viscosity, kinematic : no data available
Molecular weight : no data available
VOC : no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions : No dangerous reaction known under conditions of normal use.
Conditions to avoid : None known.
Incompatible materials : Strong acids
Hazardous decomposition products : metal oxides

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes : Causes serious eye damage.
Skin : Causes severe skin burns.
Ingestion : Causes digestive tract burns.
Inhalation : May cause nose, throat, and lung irritation.
Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : Redness, Pain, Corrosion
Skin contact : Redness, Pain, Corrosion
Ingestion : Corrosion, Abdominal pain
Inhalation : Respiratory irritation, Cough

Toxicity

Product

SAFETY DATA SHEET

NALCO® 8735

Acute oral toxicity	: rat: 205 mg/kg
Acute inhalation toxicity	: no data available
Acute dermal toxicity	: rabbit: 1,260 mg/kg
Skin corrosion/irritation	: no data available
Serious eye damage/eye irritation	: no data available
Respiratory or skin sensitization	: no data available
Carcinogenicity	: no data available
Reproductive effects	: no data available
Germ cell mutagenicity	: no data available
Teratogenicity	: no data available
STOT - single exposure	: no data available
STOT - repeated exposure	: no data available
Aspiration toxicity	: no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : Harmful to aquatic life.

Product

Toxicity to fish	: LC50 Pimephales promelas (fathead minnow): 102 mg/l Exposure time: 96 hrs Test substance: Similar Product
	: LC50 Gambusia affinis (Mosquito fish): 125 mg/l Exposure time: 96 hrs Test substance: Active Substance
Toxicity to daphnia and other aquatic invertebrates	: LC50 Daphnia magna (Water flea): 180 mg/l Exposure time: 48 hrs Test substance: Similar Product
	: LC50 Daphnia magna (Water flea): 156 mg/l Exposure time: 48 hrs Test substance: Active Substance

Persistence and degradability

The product does not contain any organic substances.

Chemical Oxygen Demand (COD): 140 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
5 d	0 mg/l	Product

SAFETY DATA SHEET

NALCO® 8735

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	:	<5%
Water	:	30 - 50%
Soil	:	50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: : D002

Disposal methods : The product should not be allowed to enter drains, water courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

The presence of an RQ component (Reportable Quantity for U.S. DOT) in this product causes it to be regulated with an additional description of RQ for road, or as Environmentally hazardous for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

Land transport (DOT)

Proper shipping name : CAUSTIC ALKALI LIQUID, N.O.S.

SAFETY DATA SHEET

NALCO® 8735

Technical name(s) : SODIUM HYDROXIDE, POTASSIUM HYDROXIDE
UN/ID No. : UN 1719
Transport hazard class(es) : 8
Packing group : II
Reportable Quantity (per package) : 2,999 lbs
RQ Component : SODIUM HYDROXIDE

Air transport (IATA)

Proper shipping name : CAUSTIC ALKALI LIQUID, N.O.S.
Technical name(s) : SODIUM HYDROXIDE, POTASSIUM HYDROXIDE
UN/ID No. : UN 1719
Transport hazard class(es) : 8
Packing group : II
Reportable Quantity (per package) : 2,999 lbs
RQ Component : SODIUM HYDROXIDE

Sea transport (IMDG/IMO)

Proper shipping name : CAUSTIC ALKALI LIQUID, N.O.S.
Technical name(s) : SODIUM HYDROXIDE, POTASSIUM HYDROXIDE
UN/ID No. : UN 1719
Transport hazard class(es) : 8
Packing group : II

Section: 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium Hydroxide	1310-73-2	1000	2999

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SAFETY DATA SHEET

NALCO® 8735

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Taiwan Chemical Substance Inventory

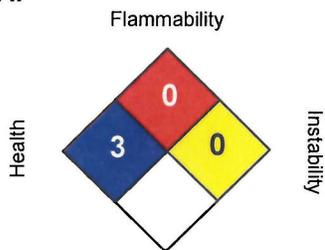
All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

SAFETY DATA SHEET

NALCO® 8735

NFPA:



Special hazard.

HMIS III:

HEALTH	3
FLAMMABILITY	0
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date : 03/09/2017
Version Number : 1.2
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : PERMACLEAN® PC-56

Other means of identification : Not applicable

Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.

Company : Nalco Company
1601 W. Diehl Road
Naperville, Illinois 60563-1198
USA
TEL: (630)305-1000

Emergency telephone number : (800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 02/15/2018

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Inhalation) : Category 4
Skin corrosion : Category 1A
Serious eye damage : Category 1
Skin sensitization : Category 1

GHS Label element

Hazard pictograms :



Signal Word : Danger

Hazard Statements : Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Harmful if inhaled.

Precautionary Statements : **Prevention:**
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. If skin irritation or rash occurs: Get medical advice/ attention. Wash contaminated clothing before

SAFETY DATA SHEET

PERMACLEAN® PC-56

reuse.

Storage:

Store locked up.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Chemical Name	CAS-No.	Concentration: (%)
Magnesium Nitrate	10377-60-3	1 - 5
5-Chloro-2-Methyl-4-Isothiazolin-3-one	26172-55-4	1.1
2-Methyl-4-Isothiazolin-3-one	2682-20-4	0.4

Section: 4. FIRST AID MEASURES

- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
- In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention.
- Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
- Notes to physician : Treat symptomatically.
- Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : None known.
- Specific hazards during firefighting : Not flammable or combustible.
- Hazardous combustion : Carbon oxides nitrogen oxides (NOx) Hydrogen chloride metal oxides

SAFETY DATA SHEET

PERMACLEAN® PC-56

products

Special protective equipment for firefighters : Use personal protective equipment.

Specific extinguishing methods : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. DEACTIVATION SOLUTION - prepare a fresh solution of 5% sodium bicarbonate and 5% sodium hypochlorite in water (i.e. add 50 grams of sodium bicarbonate per 1 liter of household bleach, seal container then shake well for 1 minute) away from the immediate area of spill. Prepare 10 times the estimated volume of the residual spill. The materials and equipment for preparing solutions should be kept available for use in areas where spills may occur.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation.

Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material : The following compatibility data is suggested based on similar product data and/or industry experience: HDPE (high density polyethylene), PTFE, Perfluoroelastomer, Polyvinylidene difluoride, Polypropylene, CPVC (rigid), Plexiglass

Unsuitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Carbon steel, Stainless Steel 304, Stainless Steel 316L, Nitrile, Brass, Nylon, Neoprene, EPDM, Fluoroelastomer, Plasite 7122

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

SAFETY DATA SHEET

PERMACLEAN® PC-56

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles
Face-shield

Hand protection : Wear the following personal protective equipment:
butyl-rubber
Nitrile rubber
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Respiratory protection : No personal respiratory protective equipment normally required.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid

Colour : colourless

Odour : pungent

Flash point : Not applicable

pH : 2 - 5, (100 %), (25 °C)

Odour Threshold : no data available

Melting point/freezing point : -4 °C, ASTM D-1177

Initial boiling point and boiling range : 100 °C, Method: ASTM D 86

Evaporation rate : no data available

Flammability (solid, gas) : no data available

Upper explosion limit : no data available

Lower explosion limit : no data available

Vapour pressure : similar to water

Relative vapour density : no data available

Relative density : 1.026, (25 °C),

Density : 8.5 lb/gal

Water solubility : completely soluble

SAFETY DATA SHEET

PERMACLEAN® PC-56

Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	3 mPa.s (25 °C)
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	0 %, EPA Method 24

Section: 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.
Hazardous decomposition products	:	In case of fire, hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NO _x) metal oxides Hydrogen chloride

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Causes serious eye damage.
Skin	:	Causes severe skin burns. May cause allergic skin reaction.
Ingestion	:	Causes digestive tract burns.
Inhalation	:	Harmful if inhaled. May cause nose, throat, and lung irritation.
Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	Redness, Pain, Corrosion
Skin contact	:	Redness, Pain, Irritation, Corrosion, Allergic reactions

SAFETY DATA SHEET

PERMACLEAN® PC-56

Ingestion : Corrosion, Abdominal pain

Toxicity

Product

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Acute inhalation toxicity : LC50: 13.7 mg/l
Test atmosphere: vapour
Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Skin corrosion/irritation : no data available
Serious eye damage/eye irritation : no data available
Respiratory or skin sensitization : no data available
Carcinogenicity : no data available
Reproductive effects : no data available
Germ cell mutagenicity : no data available
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available
Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : Very toxic to aquatic life.

Product

Toxicity to fish : LC50 Cyprinodon variegatus (sheepshead minnow): 32.000 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Pimephales promelas (fathead minnow): 8 mg/l
Exposure time: 144 hrs
Test substance: Product (estimated)

LC50 Lepomis macrochirus (Bluegill sunfish): 18.67 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Rainbow Trout: 12.67 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 Inland Silverside: 16.62 mg/l

SAFETY DATA SHEET

PERMACLEAN® PC-56

Exposure time: 96 hrs
Test substance: Product

LC50 *Cyprinodon variegatus* (sheepshead minnow): 0.3 mg/l
Exposure time: 96 hrs
Test substance: Active Substance

NOEC *Cyprinodon variegatus* (sheepshead minnow): 18.000 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Inland Silverside: 12.5 mg/l
Exposure time: 96 hrs
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates : LC50 Mysid Shrimp (*Mysidopsis bahia*): 18.000 mg/l
Exposure time: 96 hrs
Test substance: Product

LC50 *Ceriodaphnia dubia*: 13 mg/l
Exposure time: 48 hrs
Test substance: Product

LC50 *Daphnia magna* (Water flea): 8.7 - 12 mg/l
Exposure time: 48 hrs
Test substance: Product (estimated)

LC50 Blue Mussel: 865 mg/l
Exposure time: 48 hrs
Test substance: Product (estimated)

LC50 American Oyster: 1,730 mg/l
Exposure time: 48 hrs
Test substance: Product (estimated)

NOEC Mysid Shrimp (*Mysidopsis bahia*): < 10 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC *Ceriodaphnia dubia*: 10 mg/l
Exposure time: 48 hrs
Test substance: Product (estimated)

Toxicity to algae : EC50 Marine Algae (*Skeletonema costatum*): 0.003 mg/l
Exposure time: 72 h
Test substance: Active Substance

EC50 Green Algae (*Pseudokirchneriella subcapitata*, previously *Selenastrum capricornutum*): 0.018 mg/l
Exposure time: 72 h
Test substance: Active Substance

Persistence and degradability

SAFETY DATA SHEET

PERMACLEAN® PC-56

Total Organic Carbon (TOC) : 7,850 mg/l

Chemical Oxygen Demand (COD): 20,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
	20 mg/l	

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	: <5%
Water	: 30 - 50%
Soil	: 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Disposal methods : The product should not be allowed to enter drains, water courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

SAFETY DATA SHEET

PERMACLEAN® PC-56

Proper shipping name : CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical name(s) : 5-Chloro-2-Methyl-4-Isothiazolin-3-one
UN/ID No. : UN 3265
Transport hazard class(es) : 8
Packing group : II

Air transport (IATA)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical name(s) : 5-Chloro-2-Methyl-4-Isothiazolin-3-one
UN/ID No. : UN 3265
Transport hazard class(es) : 8
Packing group : II

Sea transport (IMDG/IMO)

Proper shipping name : CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical name(s) : 5-Chloro-2-Methyl-4-Isothiazolin-3-one
UN/ID No. : UN 3265
Transport hazard class(es) : 8
Packing group : II

*Marine pollutant : 5-Chloro-2-Methyl-4-Isothiazolin-3-one

* Note: This product is regulated as a Marine Pollutant when shipped by Rail or Highway (in bulk quantities), and when shipped by water in all quantities.

Section: 15. REGULATORY INFORMATION

EPA Reg. No. : 1706-183

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SAFETY DATA SHEET

PERMACLEAN® PC-56

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

This product is exempted under TSCA and regulated under FIFRA. The inerts are on the Inventory List.

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

Canadian Domestic Substances List (DSL)

Substances regulated under the Pest Control Products Act are exempt from CEPA New Substance Notification requirements.

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

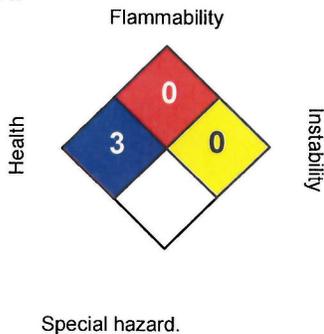
All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Taiwan Chemical Substance Inventory

All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	3*
FLAMMABILITY	0
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

SAFETY DATA SHEET

PERMACLEAN® PC-56

Revision Date : 02/15/2018
Version Number : 1.3
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.

SAFETY DATA SHEET

PERMATREAT™ PC-191T

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : PERMATREAT™ PC-191T

Other means of identification : Not applicable.

Recommended use : REVERSE OSMOSIS ANTISCALANT

Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.

Company : Nalco Company
1601 W. Diehl Road
Naperville, Illinois 60563-1198
USA
TEL: (630)305-1000

Emergency telephone number : (800) 424-9300 (24 Hours) CHEMTREC

Issuing date : 03/19/2018

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Precautionary Statements : **Prevention:**
Wash hands thoroughly after handling.
Response:
Get medical advice/ attention if you feel unwell.
Storage:
Store in accordance with local regulations.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

No hazardous ingredients

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.

In case of skin contact : Wash off with soap and plenty of water. Get medical attention if symptoms occur.

If swallowed : Rinse mouth. Get medical attention if symptoms occur.

If inhaled : Get medical attention if symptoms occur.

SAFETY DATA SHEET

PERMATREAT™ PC-191T

- Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
- Notes to physician : Treat symptomatically.
- Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : None known.
- Specific hazards during firefighting : Not flammable or combustible.
- Hazardous combustion products : Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
- Special protective equipment for firefighters : Use personal protective equipment.
- Specific extinguishing methods : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Section: 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : No special environmental precautions required.
- Methods and materials for containment and cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

- Advice on safe handling : For personal protection see section 8. Wash hands after handling.
- Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

SAFETY DATA SHEET

PERMATREAT™ PC-191T

- Suitable material : The following compatibility data is suggested based on similar product data and/or industry experience: HDPE (high density polyethylene), Stainless Steel 304, Polyethylene (rigid), Polypropylene (rigid), CPVC (rigid), 100% phenolic resin liner, Epoxy phenolic resin, coated steel
- Unsuitable material : The following compatibility data is suggested based on similar product data and/or industry experience: Brass, Buna-N, EPDM, Neoprene, Polyurethane, Fluoroelastomer, Chlorosulfonated polyethylene rubber, Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Personal protective equipment

- Eye protection : Safety glasses
- Hand protection : Wear protective gloves.
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Skin protection : Wear suitable protective clothing.
- Respiratory protection : No personal respiratory protective equipment normally required.
- Hygiene measures : Wash hands before breaks and immediately after handling the product.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Liquid
- Colour : clear amber - yellow green
- Odour : Ammoniacal
- Flash point : > 93.3 °C
- pH : 10.0 - 11.5,(1 %), (25 °C)
- Odour Threshold : no data available
- Melting point/freezing point : no data available
- Initial boiling point and boiling range : no data available
- Evaporation rate : no data available
- Flammability (solid, gas) : no data available
- Upper explosion limit : no data available
- Lower explosion limit : no data available

SAFETY DATA SHEET

PERMATREAT™ PC-191T

Vapour pressure	: no data available
Relative vapour density	: no data available
Relative density	: 1.335 - 1.362, (15.6 °C),
Density	: 1.127 g/cm ³ , 11.3 lb/gal
Water solubility	: completely soluble
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: Pow: 3.5, log Pow: 0.544
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: no data available
Viscosity, kinematic	: no data available
Molecular weight	: no data available
VOC	: 0 %, Calculation method

Section: 10. STABILITY AND REACTIVITY

Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: No dangerous reaction known under conditions of normal use.
Conditions to avoid	: Freezing temperatures.
Incompatible materials	: None known.
Hazardous decomposition products	: In case of fire, hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NO _x) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	: Health injuries are not known or expected under normal use.
Skin	: Health injuries are not known or expected under normal use.
Ingestion	: Health injuries are not known or expected under normal use.
Inhalation	: Health injuries are not known or expected under normal use.

SAFETY DATA SHEET

PERMATREAT™ PC-191T

Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : No symptoms known or expected.

Skin contact : No symptoms known or expected.

Ingestion : No symptoms known or expected.

Inhalation : No symptoms known or expected.

Toxicity

Product

Acute oral toxicity : LD50 rat: > 17,800 mg/kg
Test substance: Similar Product

Acute inhalation toxicity : no data available

Acute dermal toxicity : LD50 rabbit: > 15,800 mg/kg
Test substance: Similar Product

Skin corrosion/irritation : Species: Rabbit
Exposure time: 24 hrs
Result: 0.3
Method: Draize Test
Test substance: Similar Product

Serious eye damage/eye irritation : Species: rabbit
Exposure time: 24 hrs
Result: 3.7
Method: Draize Test
Test substance: Similar Product

Respiratory or skin sensitization : no data available

Carcinogenicity : no data available

Reproductive effects : no data available

Germ cell mutagenicity : no data available

Teratogenicity : no data available

STOT - single exposure : no data available

STOT - repeated exposure : no data available

Aspiration toxicity : no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : LC50 Oncorhynchus mykiss (rainbow trout): > 330 mg/l

SAFETY DATA SHEET

PERMATREAT™ PC-191T

Exposure time: 96 hrs
Test substance: Similar Product

LC50 *Cyprinodon variegatus* (sheepshead minnow): 8,132 mg/l
Exposure time: 96 hrs
Test substance: Similar Product

LC50 *Lepomis macrochirus* (Bluegill sunfish): > 330 mg/l
Exposure time: 96 hrs
Test substance: Similar Product

LC50 *Ictalurus punctatus* (channel catfish): 1,212 mg/l
Exposure time: 96 hrs
Test substance: Similar Product

LC50 *Oncorhynchus mykiss* (rainbow trout): 4,530 mg/l
Exposure time: 96 hrs
Test substance: Product
Test Type: Static

NOEC *Oncorhynchus mykiss* (rainbow trout): 3,600 mg/l
Exposure time: 96 hrs
Test substance: Product
Test Type: Static

LC50 Inland Silverside: > 10,000 mg/l
Exposure time: 96 h
Test substance: Product

NOEC Inland Silverside: 10,000 mg/l
Exposure time: 96 h
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates : LC50 Grass Shrimp: 4,575 mg/l
Exposure time: 96 hrs
Test substance: Similar Product

LC50 *Daphnia magna* (Water flea): 1,673 mg/l
Exposure time: 48 hrs
Test substance: Product
Test Type: Static

EC50 *Daphnia magna* (Water flea): 297 mg/l
Exposure time: 48 hrs
Test substance: Similar Product

NOEC *Daphnia magna* (Water flea): 1,296 mg/l
Exposure time: 48 hrs
Test substance: Product
Test Type: Static

LC50 Mysid Shrimp (*Mysidopsis bahia*): 8,263 mg/l
Exposure time: 96 h
Test substance: Product

SAFETY DATA SHEET

PERMATREAT™ PC-191T

NOEC Mysid Shrimp (*Mysidopsis bahia*): 6,000 mg/l
Exposure time: 96 h
Test substance: Product

Toxicity to algae : LC50 Green Algae (*Pseudokirchneriella subcapitata*,
previously *Selenastrum capricornutum*): 20 mg/l
Exposure time: 96 hrs
Test substance: Similar Product

Toxicity to fish (Chronic toxicity) : LOEC: 47.6 mg/l
Exposure time: 60 Days
Species: *Oncorhynchus mykiss* (rainbow trout)
Test substance: Similar Product

NOEC: 23 mg/l
Exposure time: 60 Days
Species: *Oncorhynchus mykiss* (rainbow trout)
Test substance: Similar Product

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : LOEC: 50 mg/l
Exposure time: 28 Days
Species: *Daphnia magna*
Test substance: Similar Product
Test Type: 3 Brood

NOEC: 25 mg/l
Exposure time: 28 Days
Species: *Daphnia magna*
Test substance: Similar Product
Test Type: 3 Brood

Toxicity to terrestrial organisms : LC50 Bobwhite Quail: > 2,510 mg/kg
Exposure time: 14 Days
Test substance: Similar Product

LC50 Mallard Duck: > 2,510 mg/kg
Exposure time: 14 Days
Test substance: Similar Product

Persistence and degradability

Total Organic Carbon (TOC) : 65,000 mg/l

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

SAFETY DATA SHEET

PERMATREAT™ PC-191T

Air : <5%
Water : 30 - 50%
Soil : 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

Disposal methods : Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Air transport (IATA)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

TSCA list : Not relevant

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SAFETY DATA SHEET

PERMATREAT™ PC-191T

- SARA 311/312 Hazards** : No SARA Hazards
- SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
- SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Australia. Industrial Chemical (Notification and Assessment) Act

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Taiwan Chemical Substance Inventory

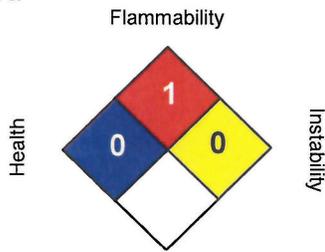
All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

SAFETY DATA SHEET

PERMATREAT™ PC-191T

NFPA:



HMIS III:

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date : 03/19/2018
Version Number : 1.2
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. For additional copies of an SDS visit www.nalco.com and request access.

