

Table B1: Analytical Results for Nutrients in Surface Water			E292898 ANCILLARY DISCHARGE	E305365 SW-1
Laboratory ID	BCAWWQG ⁽²⁾		7011234-01	7011234-02
Sample ID			1-Weir	2-SW1
Date Sampled/Time			2017-01-19	2017-01-19
Physical Tests				
Colour, True (Colour Units)	15 ⁽⁴⁾ units absolute, or 5 units above background (30-day average)		<5	<5
Conductivity (uS/cm)	-		276	337
Hardness (as CaCO ₃)	-		83.6	114
pH	-		7.56	7.56
Total Suspended Solids (mg/L)	25 mg/L above background (24-hr during clear flow)		14	3
Total Dissolved Solids (mg/L)	-		152	189
Turbidity (NTU)	8 NTU above background (24-hr during clear flow)			
	Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters		23.1	4.4
	Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters			
Anions and Nutrients mg/L				
Alkalinity Total (as CaCO ₃)	<10 high sensitivity to acid inputs	10-20 moderate sensitivity to acid inputs	37	52
Acid Sensitivity	>20 low sensitivity to acid inputs		Low	Low
Chloride (Cl)	600 (instant max)		35.3	39
	150 (30-day average)			
Fluoride (F)	1.5 (instant max)		<0.10	<0.10
	1.0 (30-day average)			
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾			
Nitrate (as N)	32.8 (instant maximum) 3.0 (30-day average)		0.195	0.395
Nitrite (as N) ⁽³⁾ Cl <2 mg/L	0.06 (max)	0.02 (30-day average)		
	Cl 2 - <4 mg/L	0.12 (max)	0.04 (30-day average)	
	Cl 4 - <6 mg/L	0.18 (max)	0.06 (30-day average)	
	Cl 6 - <8 mg/L	0.24 (max)	0.08 (30-day average)	
	Cl 8 - <10 mg/L	0.3 (max)	0.1 (30-day average)	
	Cl ≥ 10 mg/L	0.6 (max)	0.2 (30-day average)	<0.010
Sulfate (SO ₄) H 0-30 mg/L	128 (30-day average)			
	H 31 - 75 mg/L			55
	H 76 - 180 mg/L		44.2	
	H 181 - 250 mg/L			
	H > 250 mg/L		TBD	

Notes: Refer to Table Endnotes (attached)

Table B2: Analytical Results for Total and Dissolved Metals in Surface Water		E292898 ANCILLARY DISCHARGE
Laboratory ID		7011234-01
Sample ID	BCAWWQG ⁽²⁾	1-Weir
Date Sampled/Time		2017-01-19
Physical Tests		
Hardness (as CaCO ₃) (mg/L)	-	83.6
pH	-	7.56
Total Metals (mg/L)		
Aluminum (Al)-Total	-	0.9
Antimony (Sb)-Total	0.009	0.0002
Arsenic (As)-Total	0.005	<0.0005
Barium (Ba)-Total	1.0	0.009
Beryllium (Be)-Total	0.00013	<0.0001
Boron (B)-Total	1.2	0.014
Cadmium (Cd)-Total	-	<0.00001
Calcium (Ca)-Total	-	27.2
Chromium (Cr)-Total Chromium	-	0.0016
Chromium (Cr(III))	0.0089	0.0016
Chromium (Cr(VI))	0.001	<0.001
Cobalt (Co)-Total	0.004 (30-d average)	0.00043
	Hardness-Dependent ⁽⁷⁾	0.0026
Copper (Cu)-Total	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.0099
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.0033
Iron (Fe)-Total	1	0.93
	Hardness-Dependent ⁽⁷⁾	0.0005
Lead (Pb)-Total	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.0650
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.0058
Magnesium (Mg)-Total	-	5.08
	Hardness-Dependent ⁽⁷⁾	0.034
Manganese (Mn)-Total	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	1.5
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	1.0
Mercury (Hg)-Total	0.00002	<0.00002
Molybdenum (Mo)-Total	≤1 (instant max) 2 (30-d average)	0.0005
Nickel (Ni)-Total	0.025 (Hardness-Dependent BCAWQG to protect AW H<60mg/L) Calculated Hardness-Dependent BCAWQG to protect AW 60≤H≤180 mg/L CaCO ₃	0.0017
		0.083
Potassium (K)-Total	-	0.88
Selenium (Se)-Total	0.002	<0.0005
	Hardness-Dependent ⁽⁷⁾	0.0001
Silver (Ag)-Total	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.0001
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.00005
Sodium (Na)-Total	-	17.2
Thallium (Tl)-Total	0.0008 (30-day average, site-specific objective for lower Columbia River)	<0.00002
Uranium (U)-Total	0.0085	0.00016
	Hardness-Dependent ⁽⁷⁾	<0.004
Zinc (Zn)-Total	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.033
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.008
Dissolved Metals (mg/L)		
Aluminum (Al)-Dissolved	0.05 (30-day average where median pH > 6.5) 0.1 (maximum where instantaneous pH > 6.5) *** indicates pH-dependent maximum where instant pH ≤ 6.5 Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max) Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d Mean)	0.005
Antimony (Sb)-Dissolved	-	0.0002
Arsenic (As)-Dissolved	-	<0.0005
Barium (Ba)-Dissolved	-	<0.005
Boron (B)-Dissolved	-	0.013
	Hardness-Dependent ⁽⁷⁾	<0.00001
Cadmium (Cd)-Dissolved	Calculated Hardness-Dependent BCAWQG to protect AW (short-term max) e[1.03 * ln(Hss) - 5.274] ug/L H<455mg/L Calculated Hardness-Dependent BCAWQG to protect AW (long-term max) e[0.736 * ln(Hss) - 4.943] ug/L H<285mg/L	0.00049
		0.00019
Calcium (Ca)-Dissolved	up to 4, highly sensitive to acid inputs 4 to 8, moderately sensitive over 8 low sensitivity	25.2 Low
Chromium (Cr)-Dissolved ⁽⁸⁾	-	<0.0005
Copper (Cu)-Dissolved	-	0.0007
Iron (Fe)-Dissolved	0.35	<0.010
Lead (Pb)-Dissolved	-	<0.0001
Magnesium (Mg)-Dissolved	-	5.04
Manganese (Mn)-Dissolved	-	0.0217
Mercury (Hg)-Dissolved	-	<0.00002
Molybdenum	-	0.0005
Potassium (K)-Dissolved	-	0.77
Selenium (Se)-Dissolved	-	<0.0005
Sodium (Na)-Dissolved	-	16.9
Uranium (U)-Dissolved	-	0.00013
Zinc (Zn)-Dissolved	-	<0.004

Notes: Refer to Table Endnotes (attached)

Table B5: Analytical Results for Total and Dissolved Metals in Surface Water using Background Hardness

E305365 SW-1

Laboratory ID	BCAWWQG ⁽²⁾	7011234-02
Sample ID		2-SW1
Date Sampled/Time		2017-01-19
Physical Tests		
Background Hardness (as CaCO ₃) (mg/L)		20
Hardness (as CaCO ₃) (mg/L)	-	114
pH	-	7.56
Total Metals (mg/L)		
Aluminum (Al)-Total	-	0.107
Antimony (Sb)-Total	0.009	0.0002
Arsenic (As)-Total	0.005	<0.0005
Barium (Ba)-Total	1.0	0.007
Beryllium (Be)-Total	0.00013	<0.0001
Boron (B)-Total	1.2	0.013
Cadmium (Cd)-Total	-	<0.00001
Calcium (Ca)-Total	-	37.2
Chromium (Cr)-Total Chromium	-	<0.0005
Chromium (Cr(III))	0.0089	<0.0010
Chromium (Cr(VI))	0.001	<0.001
Cobalt (Co)-Total	0.004	0.00011
Copper (Cu)-Total	Hardness-Dependent ⁽⁷⁾	0.0012
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.0039
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.0020
Iron (Fe)-Total	1	0.11
Lead (Pb)-Total	Hardness-Dependent ⁽⁷⁾	0.0001
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.0105
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.0037
Magnesium (Mg)-Total	-	5.76
Manganese (Mn)-Total	Hardness-Dependent ⁽⁷⁾	0.0067
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.8
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.7
Mercury (Hg)-Total	0.00002	<0.00002
Molybdenum (Mo)-Total	≤1 (instant max) 2 (30-d average)	0.0006
Nickel (Ni)-Total	0.025 (Hardness-Dependent BCAWQG to protect AW H<60mg/L) Calculated Hardness-Dependent BCAWQG to protect AW 60≤H<180 mg/L CaCO ₃	0.0006 0.025
Potassium (K)-Total	-	0.81
Selenium (Se)-Total	0.002	<0.0005
Silver (Ag)-Total	Hardness-Dependent ⁽⁷⁾	0.00008
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.0001
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.00005
Sodium (Na)-Total	-	16.6
Thallium (Tl)-Total	0.0008 (30-day average, site-specific objective for lower Columbia River)	<0.00002
Uranium (U)-Total	0.0085	0.00028
Zinc (Zn)-Total	Hardness-Dependent ⁽⁷⁾	<0.004
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	0.033
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d average)	0.008
Dissolved Metals (mg/L)		
Aluminum (Al)-Dissolved	0.05 (30-day average where median pH > 6.5) 0.1 (maximum where instantaneous pH > 6.5) *** indicates pH-dependent maximum where instant pH ≤ 6.5	<0.005
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (instant max)	-
	Hardness-Dependent BCAWQG to protect AW ⁽⁷⁾ (30-d Mean)	-
Antimony (Sb)-Dissolved	-	0.0002
Arsenic (As)-Dissolved	-	<0.0005
Barium (Ba)-Dissolved	-	0.007
Boron (B)-Dissolved	-	0.012
Cadmium (Cd)-Dissolved	Hardness-Dependent ⁽⁷⁾	<0.00001
	Calculated Hardness-Dependent BCAWQG to protect AW (short-term max) e[1.03 * ln(Hss) - 5.274] ug/L H<455mg/L	0.00011
	Calculated Hardness-Dependent BCAWQG to protect AW (long-term max) e[0.736 * ln(Hss) - 4.943] ug/L H<285mg/L	0.00006
Calcium (Ca)-Dissolved	up to 4, highly sensitive to acid inputs 4 to 8, moderately sensitive over 8 low sensitivity	35.5 Low
Chromium (Cr)-Dissolved ⁽⁸⁾	-	<0.0005
Copper (Cu)-Dissolved	-	0.0008
Iron (Fe)-Dissolved	0.35	<0.010
Lead (Pb)-Dissolved	-	<0.0001
Magnesium (Mg)-Dissolved	-	6.05
Manganese (Mn)-Dissolved	-	0.0046
Mercury (Hg)-Dissolved	-	<0.00002
Molybdenum	-	0.0007
Potassium (K)-Dissolved	-	0.82
Selenium (Se)-Dissolved	-	<0.0005
Sodium (Na)-Dissolved	-	16.7
Uranium (U)-Dissolved	-	0.00026
Zinc (Zn)-Dissolved	-	<0.004

Notes: Refer to Table Endnotes (attached)

Table B3: Analytical Results for Volatile Organic Compounds (VOCs) in Surface Water

Table B3: Analytical Results for Volatile Organic Compounds (VOCs) in Surface Water		E292898 ANCILLARY DISCHARGE	E305365 SW-1
Laboratory ID	BCAWWQG ⁽²⁾	7011234-01	7011234-02
Sample ID		1-Weir	2-SW1
Date Sampled/Time		2017-01-19	2017-01-19
Volatile Organic Compounds (ug/L)			
Benzene	40	<0.5	<0.5
Bromodichloromethane	-	<1.0	<1.0
Bromoform	-	<1.0	<1.0
Carbon Tetrachloride	13.3	<0.5	<0.5
Chlorobenzene	1.3	<1.0	<1.0
Chloroethane	-	<2.0	<2.0
Chloroform	1.8	<1.0	<1.0
Chloromethane	-	<2.0	<2.0
Dibromochloromethane	-	<1.0	<1.0
1,2-Dichlorobenzene	0.7	<0.5	<0.5
1,3-Dichlorobenzene	150	<1.0	<1.0
1,4-Dichlorobenzene	26	<1.0	<1.0
1,1-Dichloroethane	-	<1.0	<1.0
1,2-Dichloroethane	100	<1.0	<1.0
1,1-Dichloroethene	-	<1.0	<1.0
cis-1,2-Dichloroethene	-	<1.0	<1.0
trans-1,2-Dichloroethene	-	<1.0	<1.0
Methylene chloride	98.1	<3.0	<3.0
1,2-Dichloropropane	-	<1.0	<1.0
cis-1,3-Dichloropropene	-	<1.0	<1.0
trans-1,3-Dichloropropene	-	<1.0	<1.0
1,3-Dichloropropene (cis & trans)	-	-	-
Ethylbenzene	200	<1.0	<1.0
Methyl t-butyl ether (MTBE)	3400	<1.0	<1.0
Styrene	72	<1.0	<1.0
1,1,1,2-Tetrachloroethane	-	<1.0	<1.0
1,1,2,2-Tetrachloroethane	-	<0.5	<0.5
Tetrachloroethene	110	<1.0	<1.0
Toluene	0.5	<1.0	<1.0
1,1,1-Trichloroethane	-	<1.0	<1.0
1,1,2-Trichloroethane	-	<1.0	<1.0
Trichloroethene	21	<1.0	<1.0
Trichlorofluoromethane	-	<1.0	<1.0
Vinyl Chloride	-	<1.0	<1.0
Xylenes	30	<2.0	<2.0

Notes: Refer to Table Endnotes (attached)

Table B4: Analytical Results for Hydrocarbons, PAHs, and Glycols in Surface Water

		E292898 ANCILLARY DISCHARGE	E305365 SW-1
Laboratory ID	BCAWWQG ⁽²⁾	7011234-01	7011234-02
Sample ID		1-Weir	2-SW1
Date Sampled/ Time		2017-01-19	2017-01-19
Hydrocarbons ug/L			
LEPH	-	<250	<250
HEPH	-	<250	<250
ug/l			
Acenaphthene	6	<0.05	<0.05
Acenaphthylene	-	<0.20	<0.20
Acridine	3	<0.05	<0.05
Anthracene	4	<0.01	<0.01
Benz(a)anthracene	0.1	<0.01	<0.01
Benzo(a)pyrene	0.01	<0.01	<0.01
Benzo(b)fluoranthene	-	<0.05	<0.05
Benzo(g,h,i)perylene	-	<0.05	<0.05
Benzo(k)fluoranthene	-	<0.05	<0.05
Chrysene	-	<0.05	<0.05
Dibenz(a,h)anthracene	-	<0.05	<0.05
Fluoranthene	4	<0.03	<0.03
Fluorene	12	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	-	<0.05	<0.05
Naphthalene	1	<0.20	<0.20
Phenanthrene	0.3	<0.10	<0.10
Pyrene	0.02	<0.02	<0.02
Quinoline	3.4	<0.05	<0.05
Glycols mg/l			
Diethylene Glycol	-	<5	<5
Ethylene Glycol	192 ⁽⁶⁾	<5	<5
1,2-Propylene Glycol	500 ⁽⁶⁾	<5	<5

Notes: Refer to Table Endnotes (attached)

Analytical Table Footnotes: Analytical Results for Surface Water

- All concentrations in mg/L, except pH or as indicated.
- "<" less than the laboratory detection limit indicated.
- "-" means not analyzed or no standard or guideline applies.
- * RPDs are not normally calculated where one or more concentrations are less than five times MDL.
- (2) A Compendium of Approved and Working Water Quality Guidelines for BC (updated January 2010). Applicable water uses include Drinking Water (for toxicity, not odour/taste), and Freshwater Aquatic Life.
- (3) Nitrite BCAWWQG Guideline is Chloride dependent. Nitrite AW Standard is dissolved Chloride-dependent. The most conservative standard has been applied.
- (4) Guideline of 15 mg/L Pt for Drinking Water. Once background levels are established, colour should also not exceed 5 mg/L above background, to protect for Aquatic Life. This is considered a clearwater system (background less than 20 mg/L Pt.)
- (6) Working Water Quality Guidelines for Glycols
- (7) Standard is calculated based on the hardness dependent BCAWWQG formula, and has been calculated and shown for each individual result
- (8) Standards exist for Trivalent (III) and Hexavalent (VI) Chromium. As chromium results were not speciated, the most stringent standard has been applied.
- (9) Standard applies to all sites irrespective of water use.
- (10) pH-dependent maximum where instant pH < 6.5
- ** No hardness value was reported for the WTP Outlet sample from March 10, 2014. The Hardness value from the previous sampling event (3 March 14) has been used for calculating hardness-dependent guidelines.

<u>BOLD, UNDERLINE</u>	Laboratory Detection Limit exceeds one or more applicable Standard
BOLD, BLUE SHADING	Concentration greater than BCAWWQG Guideline
BOLD, BEIGE SHADING	Concentration greater than BCAWWQG Chronic Guideline
RED FONT	Concentration less than laboratory detection limit (Formula 0.5MRL utilized for statistical analysis)