

Table B1: Analytical Results for Nutrients in Surface Water			E292898 ANCILLARY DISCHARGE	E305365 SW-1
Laboratory ID	BCAWWQG ⁽²⁾		6111669-01	6111669-02
Sample ID			1	2
Date Sampled/Time			22-Nov-16	22-Nov-16
Physical Tests				
Colour, True (Colour Units)	15 ⁽⁴⁾ units absolute, or 5 units above background (30-day average)		<5	<5
Conductivity (uS/cm)	-		553	709
Hardness (as CaCO ₃)	-		166	252
pH	-		7.66	7.62
Total Suspended Solids (mg/L)	25 mg/L above background (24-hr during clear flow)		35	6
Total Dissolved Solids (mg/L)	-		320	436
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		61.5	9.15
	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 moderate sensitivity to acid inputs >20 low sensitivity to acid inputs		49	90
Acid Sensitivity			Low	Low
Chloride (Cl)	600 (instant max) 150 (30-day average)		80.8	83.7
Fluoride (F)	1.5 (instant max) 1.0 (30-day average)		<0.10	<0.10
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾		1.54	1.71
Nitrate (as N)	32.8 (instant maximum) 3.0 (30-day average)		0.252	0.568
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	<0.010
Sulfate (SO ₄) H 0-30 mg/L	128 (30-day average)			
H 31 - 75 mg/L	218 (30-day average)			126
H 76 - 180 mg/L	309 (30-day average)		79.3	
H 181 - 250 mg/L	429 (30-day average)			
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	E305365 SW-1
Laboratory ID		6111669-01	6111669-02
Sample ID	BCAWWQG ⁽²⁾	1	2
Date Sampled/Time		22-Nov-16	22-Nov-16
Physical Tests			
Background Hardness (as CaCO ₃) (mg/L)	-	30	30
Hardness (as CaCO ₃) (mg/L)	-	166	252
pH	-	7.66	7.62
Total Metals (mg/L)			
Aluminum (Al)-Total	-	3.2	0.355
Antimony (Sb)-Total	0.009	0.0004	0.0004
Arsenic (As)-Total	0.005	0.0008	<0.0005
Barium (Ba)-Total	1.0	0.031	0.023
Beryllium (Be)-Total	0.00013	<0.0001	<0.0001
Boron (B)-Total	1.2	0.031	0.036
Cadmium (Cd)-Total	-	0.00002	<0.00001
Calcium (Ca)-Total	-	56	89.3
Chromium (Cr)-Total Chromium	-	0.0066	0.0014
Chromium (Cr(III))	0.0089	0.007	<0.001
Chromium (Cr(VI))	0.001	<0.001	0.001
Cobalt (Co)-Total	0.004	0.00157	0.00064
Copper (Cu)-Total	Hardness-Dependent ⁽⁷⁾	0.0069	0.0023
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (instant max)	0.0176	0.0048
Iron (Fe)-Total	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (30-d average)	0.0066	0.0020
	1	3.23	0.41
Lead (Pb)-Total	Hardness-Dependent ⁽⁷⁾	0.0016	0.0003
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (instant max)	0.1556	0.0176
Magnesium (Mg)-Total	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (30-d average)	0.0094	0.0040
	-	12	14.5
Manganese (Mn)-Total	Hardness-Dependent ⁽⁷⁾	0.0656	0.0543
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (instant max)	2.4	0.9
Mercury (Hg)-Total	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (30-d average)	1.3	0.7
	0.00002	<0.00002	<0.00002
Molybdenum (Mo)-Total	≤1 (instant max)	0.0009	0.0017
	2 (30-d average)	0.0048	0.0014
Nickel (Ni)-Total	0.025 (Hardness-Dependent BCAWWQG to protect AW H<60mg/L)	0.140	0.025
	Calculated Hardness-Dependent BCAWWQG to protect AW 60≤H≤180 mg/L CaCO ₃	-	-
Potassium (K)-Total	-	2.13	1.99
Selenium (Se)-Total	0.002	<0.0005	<0.0005
Silver (Ag)-Total	Hardness-Dependent ⁽⁷⁾	<0.00005	<0.00005
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (instant max)	0.003	0.0001
Sodium (Na)-Total	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (30-d average)	0.0015	0.00005
	-	42.8	40.9
Thallium (Tl)-Total	0.0008 (30-day average, site-specific objective for lower Columbia River)	<0.00002	<0.00002
Uranium (U)-Total	0.0085	0.00058	0.0012
Zinc (Zn)-Total	Hardness-Dependent ⁽⁷⁾	0.006	<0.004
	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (instant max)	0.090	0.033
Zinc (Zn)-Total	Hardness-Dependent BCAWWQG to protect AW ⁽⁷⁾ (30-d average)	0.065	0.008
	-	-	-
Dissolved Metals (mg/L)			
Aluminum (Al)-Dissolved	0.05 (30-day average where median pH > 6.5)	<0.005	<0.005
	0.1 (maximum where instantaneous pH > 6.5)	-	-
*** indicates pH-dependent maximum where instant pH < 6.5			
Antimony (Sb)-Dissolved	-	0.0003	0.0003
Arsenic (As)-Dissolved	-	<0.0005	<0.0005
Barium (Ba)-Dissolved	-	0.01	0.019
Boron (B)-Dissolved	-	0.025	0.031
Cadmium (Cd)-Dissolved	Hardness-Dependent ⁽⁷⁾	<0.00001	<0.00001
	Calculated Hardness-Dependent BCAWWQG to protect AW (short-term max) e[1.03 * ln(Hss) - 5.274] ug/L H<455mg/L	0.00099	0.00017
Cadmium (Cd)-Dissolved	Calculated Hardness-Dependent BCAWWQG to protect AW (long-term max) e[0.736 * ln(Hss) - 4.943] ug/L H<285mg/L	0.00031	0.00009
	-	-	-
Calcium (Ca)-Dissolved	up to 4, highly sensitive to acid inputs	49.6	78.5
	4 to 8, moderately sensitive over 8 low sensitivity	Low	Low
Chromium (Cr)-Dissolved ⁽⁸⁾	-	0.0009	0.0009
Copper (Cu)-Dissolved	-	0.0008	0.0013
Iron (Fe)-Dissolved	0.35	<0.010	<0.010
Lead (Pb)-Dissolved	-	<0.0001	<0.0001
Magnesium (Mg)-Dissolved	-	10.3	13.7
Manganese (Mn)-Dissolved	-	0.0121	0.0025
Mercury (Hg)-Dissolved	-	<0.00002	<0.00002
Molybdenum	-	0.0008	0.0015
Potassium (K)-Dissolved	-	1.68	1.91
Selenium (Se)-Dissolved	-	<0.0005	<0.0005
Sodium (Na)-Dissolved	-	39.6	38.4
Uranium (U)-Dissolved	-	0.00045	0.00103
Zinc (Zn)-Dissolved	-	<0.004	<0.004

Notes: Refer to Table Endnotes (attached)

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

		E292898 ANCILLARY DISCHARGE	E305365 SW-1
Laboratory ID		6111669-01	6111669-02
Sample ID	BCAWWQG⁽²⁾	1	2
Date Sampled/Time		22-Nov-16	22-Nov-16
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	<1.0	<1.0
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	-	<1.0	<1.0
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	-	<2.0	<2.0
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⁾	6111669-01	6111669-02
Sample ID		1	2
Date Sampled/ Time		22-Nov-16	22-Nov-16
Hydrocarbons ug/L			
LEPH	-	<250	<250
HEPH	-	<250	<250
ug/l			
Acenaphthene	6	<0.05	<0.05
Acenaphthylene	-	<0.20	<0.20
Acridine	3	<0.10	<0.10
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-dependend guidelines.

BOLD, UNDERLINE

Laboratory Detection Limit exceeds one or more applicable Standard

BOLD, BLUE SHADING

Concentration greater than BCAWWQG Guideline