

ASPEN REGIONAL WATERWORKS SYSTEM - 2017 ANNUAL OPERATIONS REPORT

Environmental Protection and Enhancement Act Approval No 254323-00-00 (Expiry June 1, 2019)

Approval Holder: Aspen Regional Water Services Commission

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For Deliveries

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Operations Staff	Position	Certificate No.
Jamie Giberson	Commission Manager	3490
Darrell Nelson	Operations Technician	0214
Evelyn Mellott	Operations Technician	2903
Les Hatherley	Operations Technician	n/a

RAW WATER - Entering WTP

MEMBRANE FILTER EFFLUENT (Train A)

Month	Volume Total m ³	Turbidity (NTU) Grab Sample			Fluoride (Mg/L) Weekly Grab Sample			Turbidity (NTU) (AIT 2A)			Cumulative Min/Day between 0.1 & 0.3 NTU			Particle Count ≥ 2µm (AIT 55A)			Cumulative Min/Day between 20 & 50 particles/ml			Membrane Direct Integrity Test (kPA) Pass ≤ 2.2 kPA		
		Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
January	57868	7.44	8.09	7.72	0.200	0.340	0.270	0.014	0.080	0.021	0.00	0.00	0.00	0.380	14.880	4.425	0.00	0.00	0.00	0.45	1.35	0.86
February	56418	1.67	7.93	2.34	0.200	0.220	0.220	0.014	0.060	0.018	0.00	0.00	0.00	0.290	8.500	2.660	0.00	0.00	0.00	0.69	1.57	1.15
March	69497	0.81	2.85	1.67	0.180	0.250	0.220	0.014	0.270	0.030	0.00	8.52	0.39	0.100	12.680	4.910	0.00	0.00	0.00	0.67	1.35	1.12
April	59211	1.51	35.10	6.44	0.240	0.290	0.270	0.015	0.050	0.019	0.00	0.00	0.00	0.000	14.800	1.710	0.00	14.80	1.71	0.45	1.12	0.78
May	64963	7.27	27.40	15.16	0.040	0.270	0.150	0.016	0.060	0.020	0.00	0.00	0.00	3.090	40.150	17.550	0.00	13.80	1.57	0.45	0.90	0.66
June	63782	2.90	8.61	5.32	0.120	0.180	0.150	0.018	0.079	0.027	0.00	0.00	0.00	4.120	49.350	24.360	0.00	7.50	1.79	0.22	0.90	0.67
July	64121	2.21	36.20	9.54	0.160	0.190	0.180	0.018	0.035	0.025	0.00	0.00	0.00	2.500	32.870	9.010	0.00	3.00	0.10	0.22	0.90	0.52
August	59576	1.87	8.14	4.05	0.170	0.180	0.170	0.025	0.050	0.020	0.00	0.00	0.00	0.380	16.660	4.160	0.00	0.00	0.00	0.22	0.67	0.53
September	59316	1.39	8.28	4.01	0.100	0.260	0.170	0.018	0.027	0.020	0.00	0.00	0.00	0.100	5.800	1.170	0.00	0.00	0.00	0.22	0.90	0.47
October	59458	1.48	12.30	4.49	0.070	0.270	0.200	0.016	0.024	0.017	0.00	0.00	0.00	0.190	16.900	2.830	0.00	0.00	0.00	0.22	0.67	0.43
November	55309	2.14	10.10	4.08	0.210	0.340	0.260	0.015	0.018	0.016	0.00	0.00	0.00	0.249	17.381	7.192	0.00	0.00	0.00	0.00	0.45	0.35
December	58747	1.86	5.98	2.95	0.160	0.340	0.220	0.014	0.020	0.016	0.00	0.00	0.00	0.290	32.678	8.695	0.00	0.86	0.03	0.00	0.67	0.36
TOTAL	728266	32.55	170.98	67.77	1.850	3.130	2.480	0.197	0.773	0.249	0.00	8.52	0.39	11.689	262.649	88.672	0.00	39.96	5.20	3.81	11.45	7.90
Average	60689	2.71	14.25	5.65	0.154	0.261	0.207	0.016	0.064	0.021	0.00	0.71	0.03	0.974	21.887	7.389	0.00	3.33	0.43	0.32	0.95	0.66

CONTRAVENTIONS: Summary attached

OUT SOURCED COMPREHENSIVE TESTING: Summary attached.

Milestones:

April 3	Entry Level Operator hired.
April 14	Transmission line leak repaired.
May 8	Raw water supply line leak repaired.
June	PALL Membrane fully recovered from approximately 50% clogging.
November 4	Second raw water supply line leak repaired.

TOWN OF ATHABASCA WATER LICENCE USAGE: 158,619 m³

ASPEN REGIONAL WATER SERVICES COMMISSION WATER LICENCE (248 506-00-00) USAGE: 584,335 m³

TOTAL: 742,954 m³

MEMBRANE FILTER EFFLUENT (Train B)

PRIMARY DISINFECTION

Month	Turbidity (NTU) AIT 2B			Cumulative Min/Day between 0.1 & 0.3 NTU			Particle Count ≥ 2µm AIT 55B			Cumulative Min/Day between 20 & 50 particles/ml			Membrane Direct Integrity Test (kPA) Pass ≤ 2.2 kPA			Free Chlorine mg/L AIT 1327			CT Required From Table		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
January	0.014	0.180	0.032	2.32	3.35	0.18	0.038	13.880	4.625	0.00	0.00	0.00	0.90	2.02	1.450	2.000	3.170	2.270	143.00	188.00	167.00
February	0.016	0.180	0.026	0.00	3.75	0.13	0.290	11.770	4.220	0.00	0.00	0.00	1.12	1.80	1.490	1.800	2.950	2.410	143	191	180
March	0.015	0.220	0.030	0.00	3.73	0.12	0.380	18.370	5.340	0.00	0.00	0.00	0.67	1.57	0.980	1.460	2.760	2.250	149	188	178
April	0.017	0.090	0.023	0.00	0.00	0.00	0.840	23.380	7.830	0.00	0.80	0.00	0.22	1.12	0.730	1.340	2.470	2.090	114	184	147
May	0.014	0.095	0.020	0.00	0.00	0.00	1.780	29.820	12.070	0.00	9.90	0.81	0.45	0.90	0.700	0.930	2.530	2.020	51	129	113
June	0.013	0.170	0.033	0.00	0.00	0.00	1.990	43.930	12.530	0.00	14.60	1.33	0.45	0.90	0.750	1.250	3.100	2.060	48	67	58
July	0.013	0.061	0.021	0.00	0.00	0.00	1.280	28.670	7.000	0.00	0.30	0.01	0.22	0.67	0.470	1.460	2.730	2.160	36	66	45
August	0.012	0.040	0.017	0.00	0.00	0.00	0.160	12.380	3.040	0.00	0.00	0.00	0.22	0.67	0.370	1.580	2.520	2.040	37	78	49
September	0.012	0.018	0.014	0.00	0.00	0.00	0.190	6.570	1.620	0.00	0.00	0.00	0.00	0.67	0.370	1.710	2.690	2.380	60	97	78
October	0.013	0.017	0.014	0.00	0.00	0.00	0.190	10.170	2.520	0.00	0.00	0.00	0.22	0.45	0.320	0.960	2.460	2.060	81	196	119
November	0.012	0.021	0.013	0.00	0.00	0.00	1.190	17.958	6.408	0.00	0.00	0.00	0.22	0.45	0.270	1.740	2.420	2.120	119	218	177
December	0.012	0.027	0.014	0.00	0.00	0.00	0.190	17.160	5.940	0.00	0.00	0.00	0.22	0.67	0.380	1.920	2.590	2.220	173	218	180
TOTAL	0.163	1.119	0.257	2.32	10.83	0.43	8.518	234.058	73.143	0.00	25.60	2.15	4.91	11.89	8.280	18.150	32.390	26.080	1154	1820	1491
Average	0.014	0.093	0.021	0.19	0.90	0.04	0.710	19.505	6.095	0.00	2.13	0.18	0.41	0.99	0.690	1.513	2.699	2.173	96.17	151.67	124.25

Month	CT Lowest Actual Calculated			CT Performance Ratio Giardia Cysts			CT Performance Ratio Virus Reduction			Volume m ³ Cell A			Volume m ³ Cell B			Flow Entering Clearwell Flow Entering Clearwell L/min			pH Max Value AIT 1344		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
January	636.00	1316.00	995.00	4.45	7.85	5.98	106.00	219.00	166.00	1260	1264	1261	884	1365	1104	2340	3450	2679	7.36	7.69	7.50
February	768.00	1401.00	1032.00	4.35	7.45	5.75	128.00	234.00	172.00	1260	1298	1264	720	1236	1019	2388	3315	2714	7.48	7.78	7.57
March	412.00	1115.00	830.00	2.50	6.21	5.00	69.00	188.00	138.00	1247	1281	1264	657	1031	867	2707	5060	3244	7.39	7.91	7.64
April	485.00	916.00	698.00	2.95	6.91	4.85	87.00	222.00	147.00	1260	1264	1261	605	1333	1102	2982	4818	3476	7.70	7.99	7.83
May	294.12	950.20	687.38	6.00	14.52	2.72	73.00	370.00	189.00	1222	1266	1262	463	1345	1021	2902	4493	3421	7.42	7.98	7.64
June	286.27	1104.72	644.97	5.02	22.55	11.31	143.13	552.36	322.48	1262	1279	1266	383	1280	914	1801	6184	3837	7.35	7.98	7.55
July	407.58	1044.91	601.07	9.97	25.49	13.46	324.13	1044.91	554.74	1263	1268	1264	664	1386	1016	3013	5234	4193	7.21	7.80	7.50
August	295.70	779.45	598.65	6.57	18.34	12.56	293.73	732.12	489.19	1263	1266	1264	654	1360	1095	2786	6786	4027	7.25	8.19	7.58
September	483.96	808.76	681.30	5.53	12.37	9.08	176.92	404.38	295.17	1261	1266	1263	746	1349	1119	3446	6117	4089	7.78	8.07	7.89
October	251.91	853.37	653.90	2.48	8.29	6.00	83.97	262.46	177.78	1260	1265	1262	647	1392	1099	2671	5753	3711	7.60	8.20	7.88
November	453.84	903.79	666.84	2.56	5.12	3.81	75.64	158.67	114.54	1260	1264	1261	647	1307	1034	2963	5226	3693	7.72	8.33	7.85
December	665.49	906.04	665.49	2.68	4.92	4.00	77.21	151.01	110.91	1260	1264	1261	599	1394	1066	3088	5307	3917	7.62	8.04	7.62
TOTAL	5439.87	12099.24	8754.60	55.06	140.02	84.52	1637.73	4538.91	2876.81	15078	15245	15153	7669	15778	12456	33087	61743	43001	89.88	95.96	92.05
Average	453.32	1008.27	729.55	4.59	11.67	7.04	136.48	378.24	239.73	1257	1270	1263	639.08	1314.83	1038.00	2757	5145	3583	7.49	8.00	7.67

TRANSMISSION Chlorine Residual (mg/L)

Month	Temperature °C Lowest AIT 1327B			Leaving WTP AIT 1518			Cornwall AIT 4112			Colinton In AIT 2701			Colinton Out AIT 2727			Boyle AIT 0612			Grassland In AIT 101		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
January	2.67	4.65	3.41	1.92	2.60	2.27	1.96	2.68	2.34	0.94	2.17	1.82	1.15	1.86	1.45	1.06	1.69	1.43	0.85	1.49	1.20
February	2.35	2.89	2.79	1.92	2.48	2.25	1.87	2.54	2.36	1.41	2.09	1.89	1.17	1.46	1.35	1.41	1.74	1.61	1.22	1.59	1.42
March	2.75	2.92	2.85	1.00	2.34	2.03	1.02	2.41	2.12	1.41	2.12	1.88	1.15	1.50	1.32	1.34	1.78	1.61	0.93	1.19	1.07
April	2.94	5.46	4.33	1.60	2.39	2.10	1.66	2.52	2.21	1.11	2.07	1.87	1.18	1.64	1.44	1.10	1.76	1.59	0.41	1.30	1.06
May	5.46	17.32	7.67	1.74	2.52	2.02	1.77	2.43	2.06	1.18	1.92	1.64	1.21	1.64	1.39	1.31	1.67	1.47	0.90	1.30	1.12
June	13.36	19.66	18.63	1.75	2.39	1.99	1.72	2.30	2.02	1.10	1.59	1.42	1.02	1.38	1.18	1.10	1.47	1.28	0.92	1.40	1.17
July	18.94	22.09	20.90	1.56	2.29	2.02	1.66	2.32	2.04	1.24	1.70	1.47	0.29	1.24	0.98	1.14	1.52	1.31	0.52	1.45	1.24
August	19.18	22.00	20.68	1.71	2.33	2.09	1.49	2.40	2.13	1.48	1.68	1.59	0.33	1.62	1.11	1.03	2.19	1.46	1.20	1.59	1.45
September	11.86	19.42	15.61	1.65	2.43	2.12	1.68	2.43	2.13	1.44	2.56	1.69	0.75	1.78	1.29	1.30	2.04	1.45	1.28	1.69	1.41
October	5.73	13.62	8.36	1.62	2.30	2.05	1.68	2.42	2.13	1.23	1.79	1.62	0.65	1.55	1.16	1.28	1.55	1.41	1.18	1.50	1.37
November	2.03	5.33	2.76	2.00	2.39	2.27	1.96	2.45	2.32	1.57	2.06	1.88	0.31	1.75	1.31	1.23	1.64	1.52	1.20	1.55	1.38
December	1.69	2.54	2.08	2.09	2.46	2.22	2.07	2.50	2.26	1.95	1.74	2.09	0.64	1.92	1.55	1.43	1.74	1.61	1.35	1.65	1.50
TOTAL	88.96	137.90	110.07	20.56	28.92	25.43	20.54	29.40	26.12	16.06	23.49	20.86	9.85	19.34	15.53	14.73	20.79	17.75	11.96	17.70	15.39
Average	7.41	11.49	9.17	1.71	2.41	2.12	1.71	2.45	2.18	1.34	1.96	1.74	0.82	1.61	1.29	1.23	1.73	1.48	1.00	1.48	1.28

ENTERING END
TRANSMISSION TRANSMISSION

Month	Grassland Distribution AIT 102			Grassland to Wandering River AIT 101			Wandering River In AIT 101			Wandering River Dist. AIT 102			TTHM	THAA	TTHM	THAA
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	(mg/L)	(mg/L)	(mg/L)	(mg/L)
January	0.85	1.21	1.02	0.99	1.43	1.27	0.86	1.38	1.02	0.83	1.05	0.96				
February	0.95	1.26	1.13	1.01	1.61	1.42	0.97	1.33	1.18	0.93	1.22	1.11	0.0400	0.0456	0.0460	0.0497
March	0.90	1.43	1.24	1.15	1.65	1.43	0.95	1.21	1.09	0.92	1.15	1.06				
April	1.02	1.54	1.36	1.21	1.57	1.43	0.92	1.21	1.09	0.91	1.12	1.01				
May	1.18	1.47	1.35	0.86	1.53	1.25	0.82	1.19	1.08	0.87	1.10	1.04	0.1300	0.0689	0.0690	0.0518
June	0.97	1.34	1.14	0.91	1.35	1.15	0.75	1.09	0.88	0.69	1.00	0.83				
July	1.14	1.42	1.29	0.73	1.38	1.23	0.79	1.11	1.03	0.69	0.97	0.88				
August	1.14	1.52	1.38	1.12	1.58	1.40	0.64	1.27	1.06	0.78	1.07	0.90	0.0998	0.0760	0.0985	0.1030
September	1.21	1.56	1.38	1.06	1.63	1.36	1.09	1.36	1.21	0.98	1.09	1.03				
October	1.19	1.41	1.30	1.22	1.45	1.34	0.95	1.17	1.04	0.83	1.00	0.90				
November	0.10	1.43	1.25	0.63	1.53	1.18	0.84	1.09	0.97	0.68	0.91	0.79	0.0590	0.0890	0.0420	0.1040
December	1.16	1.50	1.36	1.18	1.59	1.46	0.92	1.15	1.03	0.78	1.00	0.86				
TOTAL	11.81	17.09	15.20	12.07	18.30	15.92	10.50	14.56	12.68	9.89	12.68	11.37	0.3288	0.2795	0.2555	0.3085
Average	0.98	1.42	1.27	1.01	1.53	1.33	0.88	1.21	1.06	0.82	1.06	0.95	0.0822	0.0699	0.0639	0.0771

CHEMICAL DOSAGE (mg/L)

Month	Alum Al ₂ (SO ₄) ₃ 14 H ₂ O 48.5%			Diallyl Dimethyl/Ammonium Chloride Polymer 100% CT I CL 2410			Sulfuric Acid H ₂ SO ₄ 93%			Sodium Hydroxide Solution 50% NA OH			Chlorine Cl ₂ Gas 100%			Crystal Grade Potassium Permanganate KMnO ₄			Powder Activated Carbon		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
January	9.74	13.99	10.57	-	-	-	-	-	-	-	-	-	4.53	7.10	5.43	-	-	-	0.00	0.00	0.00
February	9.29	11.98	10.16	-	-	-	-	-	-	-	-	-	4.35	6.02	5.02	-	-	-	0.00	0.00	0.00
March	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	2.79	6.74	4.43	-	-	-	0.00	0.00	0.00
April	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	3.36	7.79	4.72	-	-	-	11.00	13.78	12.73
May	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	4.48	9.84	6.95	-	-	-	6.40	12.24	9.74
June	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	4.83	9.00	6.53	-	-	-	6.40	19.39	11.86
July	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	4.13	7.00	5.07	-	-	-	8.95	24.91	16.37
August	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	1.37	8.97	5.43	-	-	-	18.88	13.70	27.82
September	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	1.35	4.74	3.80	-	-	-	12.10	24.01	16.03
October	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	3.48	4.45	4.02	-	-	-	9.19	19.79	15.08
November	3.00	6.54	4.42	-	-	-	-	-	-	-	-	-	2.88	5.24	4.11	-	-	-	0.00	12.65	8.71
December	2.45	4.13	3.72	-	-	-	-	-	-	-	-	-	3.80	5.07	4.31	-	-	-	0.00	0.00	0.00
TOTAL	24.48	36.64	28.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.35	81.96	59.82	0.00	0.00	0.00	72.92	140.47	118.34
Average	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.45	6.83	4.99	0.00	0.00	0.00	0.00	0.00	0.00

Grassland Reservoir

Month	CTI 4900			Aqua Ammonia NH ₄ OH 29%			H ₂ Si F Fluorosilicic Acid 23% - 27%			Sodium Hypochlorite NaOH 12%			Aqua Ammonia		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
January	60.80	73.79	67.34	0.49	2.66	1.03	-	-	-	-	-	-	-	-	-
February	32.86	61.52	51.81	0.66	1.31	1.08	-	-	-	-	-	-	-	-	-
March	29.25	56.57	44.97	0.64	1.31	0.96	-	-	-	-	-	-	-	-	-
April	26.38	41.80	32.26	0.53	1.14	0.80	-	-	-	-	-	-	-	-	-
May	29.47	47.95	40.54	0.35	1.13	0.81	-	-	-	-	-	-	-	-	-
June	33.65	50.81	46.76	0.59	1.13	0.83	-	-	-	-	-	-	-	-	-
July	40.13	57.31	46.81	0.74	1.14	0.91	-	-	-	-	-	-	-	-	-
August	35.27	57.31	49.04	0.57	1.25	0.91	-	-	-	-	-	-	-	-	-
September	46.66	60.43	50.13	0.51	1.31	0.85	-	-	-	-	-	-	-	-	-
October	43.81	54.08	49.67	0.61	1.76	0.92	-	-	-	-	-	-	-	-	-
November	41.33	56.61	48.17	0.58	1.08	0.83	-	-	-	-	-	-	-	-	-
December	41.02	57.31	45.47	0.72	1.16	0.92	-	-	-	-	-	-	-	-	-
TOTAL	460.63	675.49	572.97	6.99	16.38	10.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average	38.39	56.29	47.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Aspen Regional Water Services Commission
Water Use Reporting - Adhoc Report
Licence Number: 248506-00-00

Licence to Divert Water, Province of Alberta Water Act - Monitoring and Reporting Requirements

- 4.0 a total volume of water diverted each month
- 4.0 b daily peak rate of diversion
- 4.0 c total volume of effluent water returned to the Athabasca River and any other location
- 4.0 d amount of water supplied to each regional water user

2017 Month	4.0 a		4.0 b	4.0 c	4.0 d - Supplied to Regional Water User					
	Volume Diverted m ³	* Town of Athabasca Licence m ³	Peak Rate l/s	Effluent Returned m ³	Town of Athabasca m ³	Colinton m ³	Village of Boyle m ³	Grassland m ³	Wandering River m ³	ARWSC Private Connections m ³
January	83,111	0	39	0	31,815	2,245	9,205	2,839	5,530	210
February	63,106	0	36	0	31,206	2,070	9,987	3,079	5,204	312
March	66,593	0	34	0	33,990	2,505	15,977	3,712	5,136	128
April	30,870	0	50	0	31,203	2,405	11,330	3,279	2,765	177
May	22,133	48,588	52	0	35,167	2,992	12,335	2,853	2,909	203
June	8,747	43,928	50	0	34,889	3,401	9,507	4,074	2,878	299
July	57,382	0	44	0	35,137	3,263	10,390	4,205	2,476	282
August	64,126	0	43	0	40,340	3,034	9,671	3,862	2,496	287
September	0	66,103	38	0	34,047	2,875	8,872	4,161	2,708	180
October	54,040	0	39	0	35,504	2,680	8,914	3,970	2,422	146
November	63,403	0	40	0	33,500	2,695	8,129	2,264	2,205	142
December	70,824	0	40	0	36,266	2,178	8,586	4,063	2,511	196
Totals	584,335	158,619	505	0	413,064	32,343	122,903	42,361	39,240	2,562

ARWSC private service connections - corrections made for August and September

* May 15 to Jun 15 and Sep 1 to Oct 1 Town of Athabasca water licence is used to divert water from the Athabasca River.

*Data transferred from Aspen Regional Water Services Commission Daily Operational Log Sheets.

*Data for ARWSC Private Connections is transferred from Aspen Regional Water Services Commission monthly billing reports

2017 Contravention Summary

Facility: ARWSC Water Treatment Plant

Approval No: 254323

	Date Discovered	Date Reported	Date of Letter	Reference No.	Description
1	Apr 20 17	Apr 20 17	Apr 25 17	323 332	Coagulant Delivery Failure
2	Sep 7 17	Sep 7 17	Sep 8 17	329 369	Pall Membrane Enhanced Flux Maintenance (EFM) Discharge Prior to Neutralization
3	Sep 25 17	Sep 25 17	Sep 27 17	330 067	Chlorine System Scale Failure

Jan	May	Sep 2
Feb	Jun	Oct
Mar	Jul	Nov
Apr 1	Aug	Dec
TOTALS:		3

Aspen Regional Water Services Commission
Provincial Laboratory Lab Results
2017

Satisfactory Laboratory Results per Month

Jan	9	Apr	10	Jul	9	Oct	9	
Feb	6	May	8	Aug	9	Nov	8	
Mar	6	Jun	6	Sep	6	Dec	6	
							<i>Totals:</i>	92

Aspen Regional Water Services Commission
Provincial Laboratory Lab Results
2017

#/Mon	ID #	Collection Date	Collection Site	Collected By:	Total Coliforms	E. Coli	Comments
1 Jan	844505	Jan 3 17	ARWTP Cell C	dn	absent	absent	
2 Jan	844509	Jan 3 17	Colinton Res Lab Sink	dn	absent	absent	
3 Jan	844510	Jan 9 17	ARWTP Cell C	em	absent	absent	
4 Jan	844511	Jan 10 17	Boyle Fill Header	em	absent	absent	
5 Jan	844512	Jan 16 17	ARWTP Cell C	dn	absent	absent	
6 Jan	844513	Jan 16 17	Meter Vault Header	dn	absent	absent	
7 Jan	844515	Jan 23 17	Grassland Reservoir	em	absent	absent	
8 Jan	844516	Jan 23 17	ARWTP Cell C	em	absent	absent	
9 Jan	844517	Jan 30 17	ARWTP Cell C	dn	absent	absent	
1 Feb	844518	Feb 6 17	Wandering River Res	em	absent	absent	
2 Feb	844519	Feb 14 17	Wandering River Res	em	absent	absent	
3 Feb	844520	Feb 14 17	ARWTP Cell C	em	absent	absent	
4 Feb	844521	Feb 21 17	Grassland Reservoir	em	absent	absent	
5 Feb	844523	Feb 21 17	ARWTP Cell C	em	absent	absent	
6 Feb	844522	Feb 28 17	ARWTP Cell C	em	absent	absent	
1 Mar	844524	Mar 6 17	Boyle Fill Header	em	absent	absent	
2 Mar	844525	Mar 6 17	ARWTP Cell C	em	absent	absent	
3 Mar	844527	Mar 13 17	ARWTP Cell C	dn	absent	absent	
Mar	844528	Mar 13 17	Meter Vault Header	dn			Not tested
4 Mar	844529	Mar 20 17	Colinton Res	em	absent	absent	
5 Mar	844530	Mar 27 17	ARWTP Cell C	dn	absent	absent	
6 Mar	844531	Mar 27 17	Meter Vault Header	dn	absent	absent	
1 Apr	844532	Apr 4 17	Grassland Distribution	em	absent	absent	
2 Apr	844533	Apr 4 17	ARWTP Cell C	em	absent	absent	
3 Apr	844534	Apr 10 17	Colinton Res Lab Sink	dn	absent	absent	
4 Apr	844535	Apr 10 17	ARWTP Cell C	dn	absent	absent	
5 Apr	715253	Apr 18 17	ARWTP Cell C	em	absent	absent	
6 Apr	715255	Apr 18 17	Colinton Res Lab Sink	em	absent	absent	
7 Apr	715256	Apr 19 17	Boyle Fill Header	em	absent	absent	
8 Apr	715257	Apr 24 17	ARWTP Cell C	dn	absent	absent	
9 Apr	715258	Apr 24 17	Meter Vault Header	dn	absent	absent	
10 Apr	715259	Apr 25 17	Grassland Distribution	em	absent	absent	
1 May	715260	May 2 17	ARWTP Cell C	dn	absent	absent	
2 May	715261	May 8 17	ARWTP Cell C	dn	absent	absent	
3 May	715262	May 8 17	Meter Vault Header	dn	absent	absent	

Aspen Regional Water Services Commission
Provincial Laboratory Lab Results
2017

#/Mon	ID #	Collection Date	Collection Site	Collected By:	Total Coliforms	E. Coli	Comments
4 May	715263	May 15 17	Grassland Distribution	em	absent	absent	
5 May	715264	May 15 17	Boyle Fill Header	em	absent	absent	
6 May	715265	May 23 17	ARWTP Cell C	dn	absent	absent	
7 May	665669	May 29 17	Grassland Distribution	em	absent	absent	
8 May	766255	May 29 17	Wandering River Dist.	em	absent	absent	
1 Jun	611725	Jun 5 17	Boyle Reservoir	dn	absent	absent	
2 Jun	665667	Jun 12 17	Wandering River Dist.	em	absent	absent	
3 Jun	665668	Jun 12 17	Grassland Distribution	em	absent	absent	
4 Jun	665666	Jun 19 17	ARWTP Cell C	dn	absent	absent	
5 Jun	766281	Jun 26 17	ARWTP Cell C	em	absent	absent	
6 Jun	766282	Jun 26 17	Colinton Lab Sink	em	absent	absent	
1 Jul	936446	Jul 4 17	Colinton Lab Sink	ed	absent	absent	
2 Jul	766288	Jul 4 17	ARWTP Cell C	ed	absent	absent	
3 Jul	936447	Jul 11 17	ARWTP Cell C	lh	absent	absent	
4 Jul	936448	Jul 11 17	Meter Vault Header	lh	absent	absent	
5 Jul	936449	Jul 18 17	ARWTP Cell C	em	absent	absent	
6 Jul	936450	Jul 18 17	WR Header	em	absent	absent	
7 Jul	936451	Jul 24 17	ARWTP Cell C	lh	absent	absent	
8 Jul	936452	Jul 25 17	Boyle Header	lh	absent	absent	
9 Jul	936453	Jul 31 17	ARWTP Cell C	dn	absent	absent	
1 Aug	912632	Aug 1 17	WR Header	em	absent	absent	
2 Aug	912633	Aug 8 17	Grassland Header	em	absent	absent	
3 Aug	936454	Aug 8 17	ARWTP Cell C	em	absent	absent	
4 Aug	936455	Aug 14 17	ARWTP Cell C	dn	absent	absent	
5 Aug	936456	Aug 14 17	Meter Vault Header	dn	absent	absent	
6 Aug	1066017	Aug 21 17	Boyle Header	lh	absent	absent	
7 Aug	1066018	Aug 21 17	ARWTP Cell C	em	absent	absent	
8 Aug	936457	Aug 28 17	ARWTP Cell C	lh	absent	absent	
9 Aug	936458	Aug 28 17	Colinton Res Lab Sink	lh	absent	absent	
1 Sep	1041888	Sep 5 17	Grassland Reservoir	em	absent	absent	
2 Sep	1041895	Sep 5 17	ARWTP Cell C	lh	absent	absent	
3 Sep	1041881	Sep 11 17	ARWTP Cell C	dn	absent	absent	
4 Sep	1041883	Sep 18 17	ARWTP Cell C	em	absent	absent	
5 Sep	1041884	Sep 18 17	Colinton Res Lab Sink	em	absent	absent	
6 Sep	1041885	Sep 25 17	ARWTP Cell C	dn	absent	absent	

Aspen Regional Water Services Commission
Provincial Laboratory Lab Results
2017

#/Mon	ID #	Collection Date	Collection Site	Collected By:	Total Coliforms	E. Coli	Comments
1 Oct	1041886	Oct 2 17	Colinton Res Lab Sink	lh	absent	absent	
2 Oct	1041887	Oct 2 17	ARWTP Cell C	lh	absent	absent	
3 Oct	1041889	Oct 10 17	ARWTP Cell C	dn	absent	absent	
Oct	912634	Oct 11 17	Grassland Reservoir	em	n/a	n/a	Not tested
4 Oct	1041890	Oct 16 17	Grassland Reservoir	em	absent	absent	
5 Oct	1041891	Oct 16 17	ARWTP Cell C	em	absent	absent	
6 Oct	1041892	Oct 23 17	Meter Vault Header	lh	absent	absent	
7 Oct	1041893	Oct 23 17	ARWTP Cell C	lh	absent	absent	
8 Oct	912601	Oct 30 17	ARWTP Cell C	lh	absent	absent	
9 Oct	1041894	Oct 30 17	Wandering River	em	absent	absent	
1 Nov	912602	Nov 6 17	ARWTP Cell C	dn	absent	absent	
2 Nov	912603	Nov 6 17	Colinton Reservoir Lab Sin	dn	absent	absent	
3 Nov	912604	Nov 14 17	WR Header	em	absent	absent	
4 Nov	912605	Nov 14 17	ARWTP Cell C	em	absent	absent	
5 Nov	912606	Nov 20 17	Meter Vault Header	lh	absent	absent	
6 Nov	912607	Nov 20 17	ARWTP Cell C	lh	absent	absent	
7 Nov	912608	Nov 27 17	Colinton Res Lab Sink	em	absent	absent	
8 Nov	912609	Nov 27 17	ARWTP Cell C	em	absent	absent	
1 Dec	912610	Dec 5 17	ARWTP Cell C	em	absent	absent	
2 Dec	912611	Dec 5 17	Boyle Header	em	absent	absent	
3 Dec	912612	Dec 11 17	ARWTP Cell C	em	absent	absent	
4 Dec	912613	Dec 11 17	Boyle Header	em	absent	absent	
5 Dec	912614	Dec 19 17	Grassland Reservoir	em	absent	absent	
6 Dec	912615	Dec 19 17	ARWTP Cell C	em	absent	absent	

Table of Physical Organic, Inorganic, & Pesticides Test Results

Tested by:

Test Completed Date:

Exova	Caro/*Exova
06-Feb-17	Aug 1 2017

Physical Parameters (Primary & Secondary)

Substance	Aesthetic Ob.	MAC	Units	WTP	WTP
Colour	AO:≤ 15	None	TCU	<5	<5
pH	6.5-8.5	None		7.81	6.66
Total Dissolved Solids	AO:≤ 500	None	mg/l	262	138
Turbidity	≤0.1	None	NTU	0.4	<0.10
UV Absorbance	None	None	au	0.07	0.052
Total Hardness	None	None	CaCo3/l	200	113
Alkalinity	None	None	CaCo3/l	169	97.9
(TOC)	None	None	mg/l	4.7	3.86

Inorganic Chemicals (Primary) Temp AO: ≤15° C

Substance	Aesthetic Ob.	MAC	WTP	WTP
Antimony Sb	none	0.006 mg/l	<0.0002	<0.00010
Arsenic As	ALARA	0.01 mg/l	0.0003	0.00065
Barium Ba	none	1 mg/l	0.095	0.0553
Boron Ba	none	5 mg/l	0.022	0.018
Bromate BrO ₃	none	0.01 mg/l	<0.003	<0.010
Cadmium Cd	none	0.005 mg/l	0.00002	0.00001
Chlorine-Free Chlorine)	none	3 mg/l	2.4	1.12
Chromium Cr	none	0.05 mg/l	<0.0005	0.0005
Cyanide CN	none	0.2 mg/l	<0.002	<0.002
Fluoride F	none	1.5 mg/l	0.1	<0.10
Lead Pb	none	0.01 mg/l	<0.0001	,0.0001
Mercury Hg	none	0.001 mg/l	<0.0001	*<0.000005
Nitrate NO ₃	none	45/10 mg/l	0.2	<0.05
Nitrite NO ₂	none	3.2/1 mg/l	<0.005	<0.05
Selenium Se	none	0.01 mg/l	0.0002	<0.00050
Uranium U	none	0.02 mg/l	<0.0005	<0.000025

Inorganic and Organic Chemicals (Secondary)

Substance	Aesthetic Ob.	MAC	WTP	WTP
Aluminum Al	OG: <0.1	none mg/l	0.03	0.037
Ammonia NH ₄	none	none mg/l	0.271	0.351
Calcium Ca	none	none mg/l	60.4	37.6
Chloride Cl	AO:≤ 250	none mg/l	13.8	9.17
Copper Cu	AO:≤ 1.0	none mg/l	<0.001	0.00097
Iron Fe	AO:≤ 0.3	none mg/l	<0.05	<0.010
Magnesium Mg	none	none mg/l	15.1	9.43
Manganese Mn	AO:≤ 0.05	none mg/l	<0.005	0.00285
Silver Ag	none	none mg/l	<0.00001	0.00005
Sodium Na	AO:≤ 200	none mg/l	18.9	5.72
Sulfate SO ₄	AO:≤ 500	none mg/l	55.7	22.6
Sulphide	AO:≤ 0.05	none mg/l	<0.002	<0.050
Xylenes (total)	AO:≤ 0.3	none mg/l	<0.001	<2.0
Zinc Zn	AO:≤ 5.0	none mg/l	0.002	<0.0040

Organic Chemicals and Pesticides (Primary)

<i>Substance</i>	<i>Aesthetic Ob.</i>	<i>MAC</i>	<i>WTP</i>	<i>WTP</i>
Atrazine & metabolites	none	0.005 mg/l	No Detection	No Detection
Benzene	none	0.005 mg/l	No Detection	No Detection
Benzo(a)pyrene	none	0.00001 mg/l	No Detection	No Detection
Bromoxynil	none	0.005 mg/l	No Detection	No Detection
Carbon Tetrachloride	none	0.002 mg/l	No Detection	No Detection
Chlorpyrifos	none	0.09 mg/l	No Detection	No Detection
Cyanazine	none	n/a mg/l	No Detection	No Detection
(as Microcystin - LR)	none	0.0015 mg/l	No Detection	*No Detection
Diazinon	none	0.02 mg/l	No Detection	No Detection
Dicamba	none	0.12 mg/l	No Detection	No Detection
1,2-Dichlorobenzene	AO:≤ 0.003	0.2 mg/l	No Detection	No Detection
1,4-Dichlorobenzene	AO:≤ 0.001	0.005 mg/l	No Detection	No Detection
1,2-Dichlorethane	none	0.005 mg/l	No Detection	No Detection
(Methaline chloride)	none	0.05 mg/l	No Detection	No Detection
2,4-Dichloropenol	AO:≤ 0.0003	0.9 mg/l	No Detection	No Detection
2,4-D			No Detection	No Detection
Diclofop-methyl	none	0.009 mg/l	No Detection	No Detection
Diuron	none	0.15 mg/l	No Detection	No Detection
Dimethoate	none	0.02 mg/l	No Detection	No Detection
Ethylbenzene	AO≤0.0024	mg/l	No Detection	No Detection
Glyphosate		0.28 mg/l	No Detection	No Detection
Malathion		0.19 mg/l	No Detection	No Detection
Methoxychlor		n/a mg/l	No Detection	No Detection
Metolachlor		0.05 mg/l	No Detection	No Detection
Metribuzin		0.08 mg/l	No Detection	No Detection
(Chlorobenzine)	AO:≤ 0.03	0.08 mg/l	No Detection	No Detection
(NTA)		0.4 mg/l	No Detection	No Detection
Pentachlorophenol	AO:≤ 0.03	0.06 mg/l	No Detection	No Detection
Picloram		0.19 mg/l	No Detection	No Detection
Simazine		0.01 mg/l	No Detection	No Detection
Terbufos		0.001 mg/l	No Detection	No Detection
Tetrachloroethylene		0.03 mg/l	No Detection	No Detection
2,3,4,6-Tetrachlorophenol	AO:≤ 0.001	0.1 mg/l	No Detection	No Detection
Toluene	AO:≤ 0.024	mg/l	No Detection	No Detection
Trichloroethylene		0.005 mg/l	No Detection	No Detection
2,4,6-Trichlorophenol	AO:≤ 0.002	0.005 mg/l	No Detection	No Detection
Trifluralin		0.45 mg/l	No Detection	No Detection
Vinyl Chloride		0.002 mg/l	No Detection	No Detection

Legend:

ns (not sampled) = ARWSC did not provide samples for testing

nr (not reported) = ARWSC provided samples for testing, not reported by Lab

THM Testing

<i>Tested by:</i>	Exova	Exova	Caro	Exova
<i>Test Completed Date:</i>	<i>Feb 06 17</i>	<i>May 09 17</i>	<i>Aug 1 2017</i>	<i>Nov 29 17</i>

Substance	MAC	WTP	W. River	WTP	W. River	WTP	W. River	WTP	W. River
THM	0.1 mg/l	0.04	0.046	0.13	0.069	0.0998	0.0985	0.059	0.042

MAC based on four sample averaging period

Average	WTP	W.River
	0.0822	0.0639

HAA Testing

<i>Tested by:</i>	Exova	Exova	Caro	Exova
<i>Test Completed Date:</i>	<i>Feb 06 17</i>	<i>May 09 17</i>	<i>August 1 2017</i>	<i>Nov 29 17</i>

Substance	MAC	WTP	W. River	WTP	W. River	WTP	W. River	WTP	W. River
HAA	0.08 mg/l	0.0456	0.0497	0.0689	0.0518	0.076	0.103	0.089	0.104

MAC based on four sample averaging period

Average	WTP	W.River
	0.0699	0.0771