

Appendix A – CCD Daily Operating Parameters

Appendix A - CCD Daily Operating Parameters

Date	Runtime	Runtime total (Sec)	Runtime corrected (Hrs)	Runtime Corrected (Days)	Differential Pressure (psi)	Permeate Flow Rate (gpm)	CCD Cycle Length (min)	PFD Cycle Length (min)	Temp. (°C)	Feed Flow Rate (gpm)	Inlet Pressure (psi)	Membrane Feed Pressure (psi)	Electrical Conductivity Feed μS/cm	Feed pH	Electrical Conductivity Concentrate μS/cm
2/29/16	21875	21875			9	8.7	7.6	1.7	23.2	8.7	30	179	4736	6.7	14807
3/1/16	74085	74085			9	8.7	7.7	1.65	22.7	8.7	30	181	4664.5	6.6	15044.5
3/2/16	154737	154737	0	0	9	7.8	13.6	1.7	22.7	7.8	30	200	4499.5	6.6	19994
3/3/16	240455	240455	24	1.0	9	7.8	13.6	1.7	23	7.8	30	198	4400	6.5	18663
3/4/16	290226	290226	38	1.6	9	7.8	13.5	1.7	23.2	7.8	30	193	4213	6.7	18617
3/7/16	305234	305234	42	1.7	8	7.8	13.5	1.7	22.2	7.8	30	191	3947.5	6.4	19863
3/8/16	328046	328046	48	2.0	9	7.8	13.5	1.7	23	7.8	30	188	3830.5	6.8	15483
3/10/16	340012	340012	51	2.1	3	5.7	0.9	1.7	23.5	5.7	30		4130	6.3	573
3/15/16	368033	368033	59	2.5	9	7.8	13.6	1.7	23.7	7.8	30	197	4060	6.5	16477
3/16/16	436378	436378	78	3.3	9	7.8	13.6	1.7	23.5	7.8	30	200	4104.5	6.6	16253.5
3/17/16	522063	522063	102	4.3	9	7.8	13.6	1.7	23.6	7.8	30	194	4130.5	6.7	17658
3/18/16	607326	607326	126	5.2	9	7.9	13.4	1.8	23.7	7.9	30		4130	6.8	8584
3/19/16	690175	690175	149	6.2	9	8	12.9	1.8	23.5	8	30		4141.5	6.7	6986
3/20/16	773023	773023	172	7.2	9	8	12.9	1.8	23.2	8	30		4113	7	6892
3/21/16	859971	859971	196	8.2	9	8	13.3	1.8	23.7	8	30		4011.5	6.6	6752
3/22/16	944084	944084	219	9.1	9	7.8	13.5	1.7	23.2	7.8	30		4140	6.4	16030
3/23/16	1027873	1027873	243	10.1	9	7.8	13.6	1.65	23	7.8	30	205	4360.5	6.3	15922.5
3/24/16	1114758	1114758	267	11.1	9	7.8	13.2	1.6	23	7.8	30	207	4428	6.3	16570.5
3/25/16	1198890	1198890	290	12.1	9	7.8	13.6	1.6	23	7.8	30	213	4440	6.6	19456
3/26/16	1280053	1280053	313	13.0	9	7.8	13.6	1.6	23.7	7.8	30	209	4431.5	6.9	18395
3/27/16	1328975	1328975	326	13.6	8	7.8	13.2	1.6	23.2	7.8	30	213	4517.5	7.1	16609.5
3/28/16	1341889	1341889	330	13.7	8	7.75	12.55	1.6	23.5	7.75	30	198.5	4645.5	7.2	21998
3/29/16	1370202	1370202	338	14.1	9	7.8	13.1	1.6	23.2	7.8	30	209	4541.5	6.4	23044
3/30/16	1424366	1424366	353	14.7	8	7.8	13.1	1.6	23	7.8	31	209	4337.5	6.5	15955
4/5/16	1480175	1480175	368	15.3	9	7.8	13.1	1.6	24.4	7.8	30	213	4683	6.1	16705
4/6/16	1543409	1543409	386	16.1	9	7.8	13.2	1.6	24.2	7.8	30	213	4690	6.3	18601.5
4/7/16	1621596	1621596	407	17.0	9	7.8	13.2	1.6	24.2	7.8	30	208	4506.5	6.3	16544.5
4/8/16	1705528	1705528	431	17.9	9	7.8	13.6	1.6	24.2	7.8	30	207	4427	5.8	15830
4/9/16	1788257	1788257	454	18.9	9	7.8	13.2	1.6	24	7.8	30	210	4482.5	6	15862.5
4/10/16	1873230	1873230	477	19.9	9	7.8	13.2	1.6	23.7	7.8	30	213	4485	6.1	15516
4/11/16	1923967	1923967	491	20.5	8	7.8	13.2	1.6	23.2	7.8	30	214	4515	6	17503
4/22/16	1958607	1958607	501	20.9	9	7.8	13.1	1.6	24.9	7.8	30	189	3839	5.7	20042
4/23/16	2025741	2025741	520	21.7	9	7.8	13.1	1.6	24.7	7.8	30	190	3914	5.9	15426
4/24/16	2110857	2110857	543	22.6	9	7.8	13.15	1.6	24.7	7.8	30	197	4076	6.3	15807

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Date	Electrical Conductivity Permeate $\mu\text{S/cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S/cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
2/29/16	121	170	24	10.4	1651	2315	2159	4736	80	
3/1/16	116	172	24	10.4	1655	2335.5	2154	4664.5	80	
3/2/16	187.5	191	23	9.3	1634	2462.5	2072	4499.5	80	0.102966181
3/3/16	180	189	23	9.3	1632	2445.5	2073	4400	80	0.102586591
3/4/16	178	184	23	9.3	1628	2414	2075.5	4213	80	0.102145625
3/7/16	129.5	183	23	9.3	1635.5	2401	2075	3974	80	0.10103432
3/8/16	163	178	23	9.3	1626.5	2374	2105	3830.5	80	0.100750549
3/10/16	61	89	0.7	6.8	1602	1482	3500	4130	80	
3/15/16	191	188	23	9.3	1629	2436	2198	4060	80	0.09426227
3/16/16	191	191	23	9.3	1633.5	2458.5	2195	4104.5	80	0.093628916
3/17/16	186	185	23	9.3	1632	2423.5	2193.5	4130.5	80	0.097947911
3/18/16	119	101	23	9.4	1632	1704	2177	4130	80	
3/19/16	114	101	23	9.6	1633	1692	2175	4141.5	80	
3/20/16	106	101	23	9.6	1634	1697	2174	4113	80	
3/21/16	99	100	23	9.6	1633	1681.5	2173	4011.5	80	
3/22/16	180	188	23	9.3	1634	2445	2189	4140	80	
3/23/16	198	196	23	9.3	1632	2499	2189.5	4360.5	80	0.094134124
3/24/16	194	199.5	23	9.3	1631.5	2517.5	2191	4428	80	0.093876262
3/25/16	189	204	23	9.3	1631	2550	2193	4440	80	0.088460952
3/26/16	189.5	200	23	9.3	1629	2527.5	2191	4431.5	80	0.090863337
3/27/16	186	204	23	9.3	1631	2554	2191	4517.5	80	0.090278993
3/28/16	164.5	190	23	9.25	1629.5	2455	2192.5	4645.5	80	0.099671077
3/29/16	208.5	200	23	9.3	1632	2527	2190	4541.5	80	0.093982358
3/30/16	183	200	23	9.3	1633	2524.5	2189	4337.5	80	0.08978558
4/5/16	206	204	23	9.3	1629	2548	2190	4683	80	0.089529586
4/6/16	191	205	23	9.3	1629.5	2558	2188	4690	80	0.090321918
4/7/16	201	200	23	9.3	1627	2523	2187	4506.5	80	0.092400024
4/8/16	200	198	23	9.3	1626	2513	2187	4427	80	0.091564467
4/9/16	196.5	201	23	9.3	1626	2534	2186	4482.5	80	0.089999685
4/10/16	199	204	23	9.3	1627	2554	2188	4485	80	0.088438061
4/11/16	201	205	23	9.3	1632	2562	2190	4515	80	0.089055766
4/22/16	166	180	23	9.3	1626	2381	2187	3971	80	0.095234365
4/23/16	153	181	23	9.3	1629	2394	2185	3914	80	0.095295299
4/24/16	149.5	188	23	9.3	1630	2440	2185	4100	80	0.093371418

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Date	Comments
2/29/16	
3/1/16	
3/2/16	choosing to start plots at 3/2/16
3/3/16	
3/4/16	
3/7/16	
3/8/16	
3/10/16	System likely off this day
3/15/16	
3/16/16	
3/17/16	
3/18/16	Avista black box was negatively affecting operation of CCD pilot
3/19/16	
3/20/16	
3/21/16	
3/22/16	
3/23/16	
3/24/16	
3/25/16	
3/26/16	
3/27/16	
3/28/16	
3/29/16	
3/30/16	
4/5/16	
4/6/16	
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4/11/16	
4/22/16	
4/23/16	
4/24/16	

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Date	Runtime	Runtime total (Sec)	Runtime corrected (Hrs)	Runtime Corrected (Days)	Differential Pressure (psi)	Permeate Flow Rate (gpm)	CCD Cycle Length (min)	PFD Cycle Length (min)	Temp. (°C)	Feed Flow Rate (gpm)	Inlet Pressure (psi)	Membrane Feed Pressure (psi)	Electrical Conductivity Feed µS/cm	Feed pH	Electrical Conductivity Concentrate µS/cm
4/25/16	2197193	2197193	567	23.6	9	7.8	13.2	1.6	24.4	7.8	30	198	4151	6.3	15765
4/26/16	2282985	2282985	591	24.6	9	7.8	13.1	1.6	24.4	7.8	30	201	4273	6.3	16046
4/27/16	2351293	2351293	610	25.4	9	7.8	13.1	1.6	24.2	7.8	30	199	4235	6.4	14856
4/28/16	2399239	2399239	623	26.0	9	7.8	13.1	1.6	24.7	7.8	30	196	4161	6.4	15346
4/29/16	2448752	2448752	637	26.6	9	7.8	13.1	1.6	24.7	7.8	30	199	4276	6.4	14906
4/30/16	2520948	2520948	657	27.4	9	7.8	13.1	1.6	24.7	7.8	30	203	4327	6.6	15322
5/1/16	2604388	2604388	680	28.4	9	7.8	13.2	1.6	24.4	7.8	30	206	4441	6.7	15855
5/2/16	2688207	2688207	704	29.3	9	7.8	13.2	1.6	25.2	7.8	30	211	4573	6.7	17041
5/3/16	2775507	2775507	728	30.3	9	7.8	13.1	1.6	25.2	7.8	30	211	4700.5	6.7	18562.5
5/4/16	2859757	2859757	751	31.3	9	7.8	13.1	1.6	25.2	7.8	30	210	4662	6.6	17318
5/5/16	2944519	2944519	775	32.3	9	7.8	13.1	1.6	25.2	7.8	30	207	4489.5	6.6	15843.5
5/6/16	3028397	3028397	798	33.3	9	7.8	13.1	1.6	24.7	7.8	30	205	4365	6.4	15691
5/7/16	3112486	3112486	822	34.2	8	7.8	13.1	1.6	24.7	7.8	30	206	4259.5	6.2	15477
5/8/16	3197055	3197055	845	35.2	9	7.8	13.1	1.6	24.9	7.8	30	207	4308.5	6.6	15672.5
5/9/16	3282146	3282146	869	36.2	9	7.8	13.1	1.6	24.9	7.8	30	207	4241	6.6	14847
5/10/16	3366767	3366767	892	37.2	9	7.8	13.1	1.6	25.2	7.8	30	204	4274.5	6.55	14866
5/11/16	3450007	3450007	915	38.1	8	7.8	13.1	1.6	25.2	7.8	28	201	4149	6.3	14912
5/12/16	3534445	3534445	939	39.1	9	7.8	13.1	1.6	25.4	7.8	30	197	4040	6.3	15103
5/13/16	3620345	3620345	963	40.1	9	7.8	13.1	1.6	25.4	7.8	30	197	4062	6.3	15104.5
5/14/16	3704336	3704336	986	41.1	8	7.8	13.1	1.6	25.4	7.8	28	197	4016	6.5	15297
5/15/16	3790009	3790009	1010	42.1	8	7.8	13.1	1.6	25.2	7.8	30	196	3967	6.5	15248
5/16/16	3876704	3876704	1034	43.1	9	7.8	13.1	1.6	25.2	7.8	30	195	3913	6.7	15149
5/17/16	3963091	3963091	1058	44.1	9	7.8	13.1	1.6	25.2	7.8	30	199	3931	6.5	15913
5/18/16	4045975	4045975	1081	45.0	9	7.8	13.1	1.6	25.7	7.8	30	195	3890	6.15	15924
5/19/16	4128647	4128647	1104	46.0	9	7.8	13.1	1.6	25.7	7.8	30	193	3802	6.2	14835
5/20/16	4214591	4214591	1128	47.0	9	7.8	13.1	1.6	25.4	7.8	30	195	3834	6.3	14944.5
5/21/16	4301445	4301445	1152	48.0	9	7.8	13.1	1.6	25.2	7.8	30	195	3792.5	6.4	14322
5/22/16	4385725	4385725	1175	49.0	9	7.8	13.1	1.6	25.2	7.8	30	197	3791	6.5	14678
5/23/16	29838	4456858	1195	49.8	9	7.8	13.1	1.6	25.2	7.8	30	182	3883	6.4	13562
5/24/16	105496	4532516	1216	50.7	8	7.8	13.5	1.7	25.2	7.8	30	182	3838	6.5	12019
5/25/16	187453	4614473	1239	51.6	8	7.8	13.6	1.7	25.2	7.8	30	186	3905	6.7	12620
5/26/16	255927	4682947	1258	52.4	8	7.8	13.5	1.7	25.4	7.8	30	187	3847	6.7	12469
5/27/16	329444	4756464	1278	53.3	8	7.8	13.5	1.7	25.4	7.8	30	188	3868	6.5	12561
5/28/16	413335	4840355	1302	54.2	8	7.8	13.5	1.7	25.4	7.8	30	193	4006.5	6.7	12740

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Date	Electrical Conductivity Permeate $\mu\text{S}/\text{cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S}/\text{cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
4/25/16	141	189	23	9.3	1630	2452	2185	4151	80	0.092881279
4/26/16	151	193	23	9.3	1631	2470	2185	4273	80	0.093398745
4/27/16	156	191	23	9.3	1632	2458	2184	4235	80	0.093965635
4/28/16	168	188	23	9.3	1633	2435	2186	4161	80	0.094664286
4/29/16	176	189	23	9.3	1629	2454	2184	4276	80	0.093700523
4/30/16	172	194	23	9.3	1629	2487	2183	4327	80	0.091335029
5/1/16	168	197	23	9.3	1629	2505	2186	4441	80	0.09073405
5/2/16	168	202	23	9.3	1629	2538	2185	4573	80	0.088623601
5/3/16	175	202	23	9.3	1630	2540	2184	4700.5	80	0.088817234
5/4/16	189	201	23	9.3	1633	2532	2184	4662	80	0.089623868
5/5/16	182.5	199	23	9.3	1635	2509.5	2185	4489.5	80	0.089747314
5/6/16	181	196	23	9.3	1635	2493	2186	4365	80	0.09034874
5/7/16	156.5	198	23	9.3	1632	2507.5	2186	4259.5	80	0.08763162
5/8/16	158	199	23	9.3	1630	2517	2185	4308.5	80	0.087176682
5/9/16	157	197	23	9.3	1629	2508	2185	4241	80	0.086711417
5/10/16	163.5	195	23	9.3	1628	2490	2184	4274.5	80	0.087023075
5/11/16	174	191	23	9.3	1633	2461	2184	4149	80	0.088744518
5/12/16	173	188	23	9.3	1627	2442	2184	4040	80	0.088643805
5/13/16	172	188	23	9.3	1629	2442	2184	4066	80	0.088590362
5/14/16	163	188	23	9.3	1627	2443	2183	4016	80	0.088905179
5/15/16	154	188	23	9.3	1629	2442	2184	3967	80	0.087537938
5/16/16	141	187	23	9.3	1607	2432	2183	3913	80	0.088021631
5/17/16	152	189	23	9.3	1624	2438	2183	3931	80	0.086456344
5/18/16	163.5	186	23	9.3	1625	2425	2184.5	3894.5	80	0.087586611
5/19/16	151	184	23	9.3	1626	2414	2185	3802	80	0.087019572
5/20/16	146	186	23	9.3	1628	2426	2183.5	3846.5	80	0.086539365
5/21/16	145	186	23	9.3	1631	2425.5	2186	3792.5	80	0.086649958
5/22/16	142	188	23	9.3	1634	2439	2186	3791	80	0.086010367
5/23/16	154	174	23	9.3	1618	2332	2187	3887	80	0.100631728
5/24/16	241	174	23	9.3	1615	2330	2186	3838	80	0.099085773
5/25/16	245	177	23	9.3	1617	2359	2186	3905	80	0.097102063
5/26/16	242	178	23	9.3	1618	2368	2188	3873	80	0.094621607
5/27/16	235	182	23	9.3	1618	2378	2186	3868	80	0.092300394
5/28/16	227	185	23	9.3	1617	2414	2185	4006.5	80	0.090920584

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Date	Comments
4/25/16	
4/26/16	
4/27/16	
4/28/16	
4/29/16	
4/30/16	
5/1/16	
5/2/16	
5/3/16	
5/4/16	
5/5/16	
5/6/16	
5/7/16	
5/8/16	
5/9/16	
5/10/16	
5/11/16	
5/12/16	
5/13/16	pulled out negative values of s. flux for daily avg
5/14/16	
5/15/16	
5/16/16	
5/17/16	
5/18/16	
5/19/16	
5/20/16	
5/21/16	
5/22/16	
5/23/16	CIP No heat
5/24/16	
5/25/16	
5/26/16	
5/27/16	
5/28/16	

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5/29/16	483588	4910608	1321	55.0	8	7.8	13.6	1.7	25.7	7.8	30	198	4185	7	13574.5
5/30/16	556985	4984005	1341	55.9	9	7.8	13.6	1.7	25.4	7.8	30	202	4250	7	13978
5/31/16	632386	5059406	1362	56.8	9	7.8	13.6	1.7	25.9	7.8	30	200	4153.5	7.1	13360.5
6/1/16	708306	5135326	1383	57.6	8	7.7	13.5	1.7	25.9	7.8	30	201	4108	7	12761
6/2/16	794122	5221142	1407	58.6	9	7.8	13.5	1.7	26.4	7.8	30	193	3887	7.2	12333
6/3/16	867872	5294892	1428	59.5	9	7.8	13.5	1.7	26.9	7.8	30	191	3950	6.9	12130
6/4/16	942116	5369136	1448	60.4	8	7.8	13.5	1.7	26.7	7.8	24.5	200	3965.5	7.5	11860
6/5/16	1028675	5455695	1472	61.4	9	7.8	13.6	1.7	26.4	7.8	34.5	206.5	4037	7.7	13191
6/6/16	1091971	5518991	1490	62.1	9	7.8	13.5	1.7	26.7	7.8	30	202	4149	6.7	13288
6/7/16	1156093	5583113	1508	62.8	8	7.8	13.5	1.7	26.4	7.8	34	198	4055	6.8	11150
6/8/16	1232058	5659078	1529	63.7	9	7.8	13.6	1.7	26.4	7.8	30	199	4044.5	6.6	11556.5
6/9/16	1294482	5721502	1546	64.4	9	7.8	13.5	1.7	26.7	7.8	30	197	3968	6.7	10525
6/10/16	1322327	5749347	1554	64.8	4	6	12.9	1.2	24.4	6	35		3714	6.4	1993
6/10/16	1340796	5767816	1559	65.0	8	7.8	13.6	1.7	26.9	7.8	30	191	4088	6.8	17586
6/11/16	1401665	5828685	1576	65.7	8.5	7.8	13.5	1.7	26.4	7.8	30	193	3994.5	6.8	11988
6/12/16	1488151	5915171	1600	66.7	8	7.8	13.5	1.7	26.4	7.8	30	191	3874	6.9	11840
6/13/16	1574395	6001415	1624	67.7	9	7.8	13.5	1.7	26.4	7.8	30	193.5	3904.5	7	11519.5
6/14/16	1660169	6087189	1648	68.7	9	7.8	13.5	1.7	26.7	7.8	30	196	4022	6.6	12546
6/15/16	1746994	6174014	1672	69.7	8.5	7.8	13.6	1.7	26.7	7.8	30	199	4153	6.4	13117
6/16/16	1833727	6260747	1696	70.7	8	7.8	13.5	1.7	26.7	7.8	30	197	4101	6.1	11965
6/17/16	1909587	6336607	1717	71.5	9	7.8	13.5	1.7	26.9	7.8	30	197	4081	6.1	11652
6/18/16	1985307	6412327	1738	72.4	9	7.8	13.5	1.7	26.9	7.8	30	195	3984	6.2	10725
6/19/16	2072201	6499221	1762	73.4	9	7.8	13.5	1.7	27.4	7.8	30	192	3955	6.5	13079
6/20/16	2158397	6585417	1786	74.4	9	7.8	13.5	1.7	27.6	7.8	30	193	3942	6.9	11843
6/21/16	2244510	6671530	1810	75.4	9	7.8	13.5	1.7	27.4	7.8	30	200.5	4188.5	7.05	11580
6/22/16	2330743	6757763	1834	76.4	9	7.8	13.5	1.7	27.6	7.8	30	204	4279	6.8	16452
6/23/16	2417450	6844470	1858	77.4	9	7.8	13.5	1.7	27.6	7.8	30	201	4239	6.8	12225
6/24/16	2503854	6930874	1882	78.4	9	7.9	13.5	1.6	27.4	7.9	30	202	4272	6.8	11378
6/25/16	2590367	7017387	1906	79.4	9	7.8	13.5	1.6	27.4	7.8	30.5	205	8.5	6.8	11995.5
6/26/16	2671809	7098829	1929	80.4	9	7.8	13.5	1.6	27.6	7.8	26	207	4260	6.9	11658
6/27/16	2741872	7168892	1948	81.2	9	7.9	13.1	1.6	28.4	7.9	23	205	4349	7	11760
6/28/16	2817370	7244390	1969	82.1	9	7.9	13.5	1.6	28.1	7.9	37	210	4.5	6.8	11633.5
6/29/16	2902531	7329551	1993	83.0	9	7.7	13.5	1.6	27.9	7.7	32	205	5	6.7	11587
6/30/16	2988422	7415442	2017	84.0	9	7.8	13.5	1.7	27.9	7.8	30	203.5	26	6.7	11680

Appendix A - CCD Daily Operating Parameters

Date	Electrical Conductivity Permeate $\mu\text{S/cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S/cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
5/29/16	226	189.5	23	9.3	1625.5	2455	2182	4185	80	0.089897818
5/30/16	232	194	23	9.3	1617	2473	2183	4250	80	0.088358738
5/31/16	209	191	23	9.3	1616.5	2459.5	2184	4153.5	80	0.087882487
6/1/16	222	192	23	9.2	1610	2462	2184	4108	80	0.084852682
6/2/16	209	183	23	9.3	1609	2418	2184	3887	80	0.086645086
6/3/16	213	183	23	9.3	1609	2400	2186	3951	80	0.088273373
6/4/16	207	191	23	9.3	1629	2474	2184.5	3965.5	80	0.082439883
6/5/16	226	199	23	9.3	1633.5	2504.5	2184	4037	80	0.079185258
6/6/16	232	194	23	9.3	1612	2467	2187	4149	80	0.083505479
6/7/16	215	192	23	9.3	1560	2461	2186	4055	80	0.08615152
6/8/16	231	189	23	9.3	1611.5	2452.5	2185	4045	80	0.084898137
6/9/16	216	189	23	9.3	1612	2438	2186	3975	80	0.084532796
6/10/16	61	104	0.1	7.2	1629	1597	3500	3714	80	
6/10/16	237	182	23	9.3	1618	2396	2186	4088	80	0.091315781
6/11/16	210	184	23	9.3	1618	2408.5	2184.5	3994.5	80	0.08963306
6/12/16	194	182	23	9.3	1618	2396	2184	3874	80	0.088270425
6/13/16	181	185	23	9.3	1619	2412.5	2184	3904.5	80	0.087220418
6/14/16	206.5	189	23	9.3	1618.5	2439	2185	4022	80	0.087305132
6/15/16	208	190	23	9.3	1615	2453.5	2184	4153	80	0.086654914
6/16/16	216	188	23	9.3	1612	2432.5	2185	4101	80	0.087599056
6/17/16	214	188	23	9.3	1614	2435	2186	4083	80	0.086132756
6/18/16	184	187	23	9.3	1618	2431	2186	4002	80	0.086176395
6/19/16	188	183	23	9.3	1611	2414	2186	3965	80	0.086971507
6/20/16	164	183.5	23	9.3	1612	2408.5	2185	3984.5	80	0.086425303
6/21/16	189	191.5	23	9.3	1609	2459	2184	4188.5	80	0.083505348
6/22/16	210	193	23	9.3	1588	2467	2184	4279	80	0.084088625
6/23/16	213	193	23	9.3	1613	2458	2184	4239	80	0.084221882
6/24/16	213	193	23	9.4	1605	2467	2184	4272	80	0.084834934
6/25/16	212	195.5	23	9.3	1598	2490	2185	4100	80	0.080882984
6/26/16	194	199	23	9.3	1646	2526	2185	4260	80	0.079839781
6/27/16	223	196	23	9.4	1633	2508	2188	4349	80	0.079806253
6/28/16	240	201	23	9.4	1572	2519.5	2186	4100	80	0.076428759
6/29/16	260	197	23	9.2	1641	2515	2187	4100	80	0.076564494
6/30/16	257	196	23	9.3	1605.5	2483.5	2186	4100	80	0.079942135

Appendix A - CCD Daily Operating Parameters

Date	Comments
5/29/16	
5/30/16	
5/31/16	
6/1/16	
6/2/16	
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6/21/16	
6/22/16	
6/23/16	
6/24/16	
6/25/16	
6/26/16	
6/27/16	
6/28/16	System was off this day
6/29/16	
6/30/16	

Appendix A - CCD Daily Operating Parameters

Date	Runtime	Runtime total (Sec)	Runtime corrected (Hrs)	Runtime Corrected (Days)	Differential Pressure (psi)	Permeate Flow Rate (gpm)	CCD Cycle Length (min)	PFD Cycle Length (min)	Temp. (°C)	Feed Flow Rate (gpm)	Inlet Pressure (psi)	Membrane Feed Pressure (psi)	Electrical Conductivity Feed μS/cm	Feed pH	Electrical Conductivity Concentrate μS/cm
7/1/16	3051089	7478109	2034	84.8	7.5	7.7	13.6	1.7	27.6	7.7	36	207.5	5	6.7	11165.5
7/8/16	3072942	7499962	2040	85.0	6	5.5	1	1.7	28.6	15.8	16		3832	6.6	5928
7/10/16	3090279	7517299	2045	85.2	9	7.9	13.4	1.7	28.9	7.9	30	159	3947.5	6.65	18564
7/11/16	3150652	7577672	2062	85.9	9	7.9	13.4	1.7	28.1	7.9	30	157	4039	6.8	18252
7/12/16	3237434	7664454	2086	86.9	9	7.9	13.5	1.7	28.1	7.9	30	158	3449.5	6.8	18353.5
7/13/16	3321212	7748232	2109	87.9	9	7.8	13.5	1.7	28.1	7.8	30	183	3	6.8	19820
7/14/16	3404387	7831407	2132	88.9	9	7.8	13.6	1.7	28.1	7.8	30	191	4	6.8	15164
7/15/16	3488427	7915447	2156	89.8	9	7.8	13.6	1.7	28.1	7.8	30	193	4051.5	6.7	15811.5
7/16/16	3574408	8001428	2180	90.8	9	7.8	13.6	1.7	28.4	7.8	30	196	4227	6.7	18510
7/17/16	3661090	8088110	2204	91.8	9	7.8	13.6	1.7	28.4	7.8	30	196	4153	6.7	17534
7/18/16	3721731	8148751	2221	92.5	9	7.8	13.6	1.7	27.9	7.8	30	198	4124.5	6.8	18264
7/26/16	19408	8186603	2231	93.0	9	7.8	13.1	1.6	29.8	7.8	30	214	5000	5	27544
7/27/16	53728	8220923	2241	93.4	9	7.8	13.1	1.6	28.9	7.8	30	226.5	5000	6.05	20802.5
7/28/16	94627	8261822	2252	93.8	9	7.75	13.1	1.6	29.7	7.75	30	224	5000	6.25	499
7/29/16	162845	8330040	2271	94.6	9	7.8	13.1	1.6	29.1	7.8	30	225	5000	6.1	598
7/30/16	248785	8415980	2295	95.6	9	7.8	13.1	1.6	29.3	7.8	30	228	5000	6	471
7/31/16	335287	8502482	2319	96.6	9	7.7	13.1	1.6	29.3	7.7	30	228	5000	6.1	385
8/1/16	422186	8589381	2343	97.6	9	7.7	13.1	1.6	29.3	7.7	30	231	5000	6.2	422
8/2/16	507678	8674873	2367	98.6	9	7.8	13.1	1.6	29.3	7.8	30	231	5000	6	246
8/3/16	593023	8760218	2390	99.6	9	7.8	13.1	1.6	29.3	7.8	30	231	5000	6	339
8/4/16	679589	8846784	2414	100.6	9	7.8	13.1	1.6	29.3	7.8	25	221	4970	6.4	24574
8/5/16	753115	8920310	2435	101.5	9	7.8	13.1	1.6	29.3	7.8	25	219	4962	6.3	1519
8/6/16	826331	8993526	2455	102.3	9	7.8	13.1	1.6	29.3	7.8	25	225	4833	6.2	382
8/7/16	912845	9080040	2479	103.3	9	7.8	13.1	1.6	29.1	7.8	25	226	4796	6.4	234
8/8/16	976449	9143644	2497	104.0	8	7.8	13.1	1.6	29.1	7.8	24	226.5	4784	6.6	282
8/8/16	1020235	9187430	2509	104.5	8.5	7.8	13.1	1.6	29.6	7.8	20	216.5	4888	6.3	24691
8/9/16	1076188	9243383	2525	105.2	8	7.8	13.1	1.6	28.9	7.8	20	218	4818.5	6.1	19365
8/10/16	1151184	9318379	2545	106.1	9	7.8	13.2	1.6	29.1	7.8	20	221	3520	6.1	1226
8/11/16	1227815	9395010	2567	106.9	9	7.8	13.2	1.6	29.3	7.8	20	217	3792	6.15	628.5
8/12/16	1304235	9471430	2588	107.8	9	7.8	13.2	1.6	29.3	7.8	20	218	3333	6.4	588
8/13/16	1377383	9544578	2608	108.7	9	7.8	13.6	1.6	29.6	7.8	20	218	3526	6.6	595
8/14/16	1423771	9590966	2621	109.2	9	7.8	13.6	1.6	30.1	7.8	20	216	4590.5	6.55	369.5
8/15/16	1451574	9618769	2629	109.5	9	7.8	13.6	1.6	30.7	7.8	20	215	4770	6.6	510
8/16/16	1480652	9647847	2637	109.9	9	7.8	13.2	1.6	30.1	7.8	20	228	5084.5	6.5	605.5

Appendix A - CCD Daily Operating Parameters

Date	Electrical Conductivity Permeate $\mu\text{S/cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S/cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
7/1/16	252	199	23	9.2	1483.5	2488.5	2186	4100	80	0.076942044
7/8/16	73	57	12.5	6.6	1500	1500	3500	3836	80	
7/10/16	218.5	151	23	9.4	1617	2153.5	2123.5	4100	80	0.131754291
7/11/16	190	149	23	9.4	1616	2136	2120	4095	80	0.136758761
7/12/16	193	149	23	9.4	1612	2143.5	2117	4100	80	0.136659614
7/13/16	234	175	23	9.3	1612	2340	2117	4100	80	0.094323298
7/14/16	231.5	183	23	9.3	1612	2402	2119	4100	80	0.088776984
7/15/16	247	184	23	9.3	1612	2413.5	2119	4100	80	0.087612553
7/16/16	233	187	23	9.3	1610	2434	2119	4227	80	0.086054769
7/17/16	249	186	23	9.3	1611	2429	2118	4153	80	0.085591007
7/18/16	218	189	23	9.3	1613	2446	2119.5	4124.5	80	0.084640718
7/26/16	542	204	23	9.3	1612	2560	2124	5000	80	0.082750416
7/27/16	355	218	23	9.3	1611.5	2650.5	2117	5500	80	0.082648027
7/28/16	383.5	215	23	9.25	1611	2626	2121	5500	80	0.083427611
7/29/16	361.5	217	23	9.3	1611	2639	2117	5500	80	0.083064205
7/30/16	361	219	23	9.3	1610	2657	2115	5500	80	0.080771204
7/31/16	344	219	23	9.2	1609	2655	2115	5500	80	0.080925548
8/1/16	326	222	23	9.2	1611	2674	2115	5500	80	0.078182209
8/2/16	341	222	23	9.3	1614	2673	2116	5500	80	0.078573189
8/3/16	336	222	23	9.3	1618	2668	2116	5500	80	0.079238871
8/4/16	325	213	23	9.3	1491	2623	2115	5500	80	0.087442567
8/5/16	338	211	23	9.3	1490	2629	2116	5500	80	0.088400657
8/6/16	333	216	23	9.3	1489	2668	2115	5500	80	0.083066738
8/7/16	306	217	23	9.3	1464	2666	2115	5500	80	0.084137872
8/8/16	267	218	23	9.3	1487.5	2672	2115	5500	80	0.081887773
8/8/16	287	208	23	9.3	1354	2644	2115	5500	80	0.091669812
8/9/16	314	210	23	9.3	1356	2653	2115	5500	80	0.090751785
8/10/16	275	212	23	9.3	1357	2671	2115	5500	80	0.088092265
8/11/16	285	208.5	23	9.3	1357	2650	2115	5500	80	0.090705967
8/12/16	278	210	23	9.3	1357	2657	2115	5500	80	0.089660403
8/13/16	276	210	23	9.3	1355	2655	2115	5500	80	0.089169565
8/14/16	271.5	207	23	9.3	1352.5	2637.5	2117	5500	80	0.090357012
8/15/16	273.5	205.5	23	9.3	1354	2628	2120	5500	80	0.090812483
8/16/16	304	219	23	9.3	1354	2716	2119	5500	80	0.080796158

Appendix A - CCD Daily Operating Parameters

Date	Comments
7/1/16	
7/8/16	negative value
7/10/16	
7/11/16	
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7/14/16	
7/15/16	96% run started, all EC feed data not valid, using 5500 for conduc
7/16/16	
7/17/16	
7/18/16	
7/26/16	CIP off site
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7/31/16	
8/1/16	
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8/14/16	
8/15/16	
8/16/16	

Appendix A - CCD Daily Operating Parameters

Date	Runtime	Runtime total (Sec)	Runtime corrected (Hrs)	Runtime Corrected (Days)	Differential Pressure (psi)	Permeate Flow Rate (gpm)	CCD Cycle Length (min)	PFD Cycle Length (min)	Temp. (°C)	Feed Flow Rate (gpm)	Inlet Pressure (psi)	Membrane Feed Pressure (psi)	Electrical Conductivity Feed μS/cm	Feed pH	Electrical Conductivity Concentrate μS/cm
8/17/16	1527282	9694477	2650	110.4	9	7.8	13.2	1.6	30.1	7.8	20	227	5140	6.2	607
8/18/16	1599348	9766543	2670	111.2	9	7.8	13.2	1.6	29.3	7.8	20	232	5270	6.4	595
8/19/16	1685610	9852805	2694	112.2	9	7.8	13.2	1.6	29.3	7.8	20	233	5297	6.4	592
8/20/16	1772505	9939700	2718	113.3	9	7.8	13.2	1.6	29.3	7.8	20	237	5435	6.4	595
8/21/16	1858929	10026124	2742	114.3	9	7.8	13.2	1.6	29.3	7.8	20	237	5415	6.5	369.5
8/22/16	1945082	10112277	2766	115.2	9	7.8	13.2	1.6	29.3	7.8	20	236	5292	6.5	598
8/23/16	2031146	10198341	2790	116.2	8	7.8	13.2	1.6	29.3	7.8	20	234	5212	6.4	592
8/24/16	2106225	10273420	2811	117.1	8	7.8	13.2	1.6	29.3	7.8	20	230	5070	6.1	582
8/25/16	2180543	10347738	2831	118.0	8	7.8	13.2	1.6	29.3	7.8	20	231	5109	6.1	588
8/26/16	2267210	10434405	2855	119.0	8	7.8	13.2	1.6	29.1	7.8	20	229	4980.5	6.05	592
8/27/16	2353905	10521100	2880	120.0	8	7.8	13.2	1.6	29.1	7.8	20	228	4879	5.9	588
8/28/16	2440219	10607414	2904	121.0	8	7.8	13.2	1.6	29.3	7.8	20	229	4898	6.1	373
8/29/16	2526333	10693528	2927	122.0	8	7.8	13.2	1.6	29.6	7.8	20	225.5	4807.5	6.3	370
8/30/16	2602175	10769370	2949	122.9	8	7.8	13.6	1.6	29.8	7.8	20	224	4845	6.1	364
8/31/16	2667839	10835034	2967	123.6	9	7.8	13.6	1.6	29.8	7.8	20	218	3793	5.8	463.5
9/1/16	2744171	10911366	2988	124.5	9	7.8	13.6	1.6	29.3	7.8	20	223	3957	6	336
9/2/16	2830392	10997587	3012	125.5	8	7.8	13.6	1.6	29.3	7.8	20	226	4213	6.5	287
9/3/16	2886223	11053418	3027	126.1	8	7.8	13.7	1.6	29.1	7.8	20.5	225.5	4381	6.5	593.5
9/4/16	2914190	11081385	3035	126.5	9	7.7	13.6	1.6	29.1	7.7	20	219	3409	6.4	397
9/5/16	2954540	11121735	3046	126.9	9	7.8	13.1	1.6	29.1	7.8	20	222.5	3615	6.5	303.5
9/6/16	3020447	11187642	3065	127.7	8	7.8	13.6	1.6	29.1	7.8	20	221	3675	6.7	259
9/7/16	3088625	11255820	3084	128.5	8	7.8	13.6	1.6	28.9	7.8	20	218	3501	6.65	383.5
9/8/16	3144477	11311672	3099	129.1	8	7.8	13.6	1.6	29.1	7.8	20	217	3408	6.4	391
9/9/16	3215827	11383022	3119	130.0	8	7.8	13.6	1.6	29.1	7.8	20	215	2634	6.2	305
9/10/16	3303263	11470458	3143	131.0	8	7.8	13.6	1.6	29.1	7.8	20	219	2632.5	6.2	209.5
9/11/16	3388474	11555669	3167	132.0	8	7.8	13.6	1.6	29.1	7.8	20	218	3604	6.4	345
9/12/16	3475109	11642304	3191	133.0	8	7.8	13.6	1.6	29.1	7.8	20	219	1972	6.6	176
9/13/16	3559202	11726397	3214	133.9	8	7.8	13.6	1.6	28.6	7.8	20	222	1934	6.5	225
9/14/16	3638626	11805821	3236	134.9	8	7.8	13.6	1.6	28.4	7.8	20	219	3059	6.2	259
9/15/16	3721476	11888671	3259	135.8	8	7.8	13.6	1.6	28.4	7.8	20	220	3521	6.3	169
9/16/16	3794032	11961227	3280	136.6	8	7.8	13.6	1.6	27.9	7.8	20	221	2976.5	6.4	291.5
9/18/16	3849351	12016546	3295	137.3	9	7.8	13.7	1.6	29.3	7.8	20	233	4557	5.25	228
9/19/16	3919028	12086223	3314	138.1	8	7.8	13.2	1.6	29.1	7.8	20	235	3934	6.3	111
9/20/16	4005512	12172707	3338	139.1	8	7.8	13.6	1.6	29.1	7.8	20	232	4862	6.5	142

Appendix A - CCD Daily Operating Parameters

Date	Electrical Conductivity Permeate $\mu\text{S}/\text{cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S}/\text{cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
8/17/16	340.5	218	23	9.3	1354	2709	2120	5500	80	0.080184125
8/18/16	309.5	224	23	9.3	1355	2748.5	2116	5500	80	0.077266821
8/19/16	308	224	23	9.3	1355	2751	2115	5500	80	0.077001339
8/20/16	313	229	23	9.3	1354	2777	2114	5500	80	0.074160004
8/21/16	300.5	229	23	9.3	1354	2778	2114	5500	80	0.074183702
8/22/16	283	227	23	9.3	1354.5	2770	2114	5500	80	0.074878313
8/23/16	294.5	226	23	9.3	1356	2759	2114	5500	80	0.076515045
8/24/16	310	222	23	9.3	1357	2732	2115	5500	80	0.079608603
8/25/16	300	223	23	9.3	1357	2741	2115	5500	80	0.078361092
8/26/16	272	221	23	9.3	1357	2727.5	2115	5500	80	0.080278445
8/27/16	247.5	220	23	9.3	1358	2721	2116	5500	80	0.081011233
8/28/16	228	221	23	9.3	1357	2728	2115	5500	80	0.080058669
8/29/16	238	218	23	9.3	1357	2704	2115	5500	80	0.083034318
8/30/16	257	215	23	9.3	1356	2695	2116	5500	80	0.082659195
8/31/16	257	210	23	9.3	1356	2650.5	2118.5	5500	80	0.088748942
9/1/16	235	215	23	9.3	1357	2688	2117	5500	80	0.084562932
9/2/16	254.5	218	23	9.3	1356	2702	2117	5500	80	0.082842612
9/3/16	259.5	218	23	9.3	1357.5	2708	2116	5500	80	0.083944649
9/4/16	267.5	211	23	9.2	1357	2670	2123	5500	80	0.088903626
9/5/16	284.5	213.5	23	9.3	1357.5	2685	2123	5500	80	0.08676534
9/6/16	243.5	212.5	23	9.3	1357	2672.5	2121	5500	80	0.08821542
9/7/16	208	211	23	9.3	1359	2664	2121	5500	80	0.090455334
9/8/16	304	209	23	9.3	1358	2653	2124	5500	80	0.090296579
9/9/16	293	207	23	9.3	1358	2639	2122	5500	80	0.092305057
9/10/16	165	210.5	23	9.3	1358	2660	2120.5	5500	80	0.089326792
9/11/16	282	210	23	9.3	1357	2650	2120	5500	80	0.090296579
9/12/16	333	210	23	9.3	1358	2659	2119	5500	80	0.089357939
9/13/16	304	213	23	9.3	1360	2678	2120	5500	80	0.087640241
9/14/16	298	211	23	9.3	1358	2657	2121	5500	80	0.090656397
9/15/16	289.5	211	23	9.3	1360	2668	2121	5500	80	0.089951126
9/16/16	263	213	23	9.3	1360	2678	2121	5500	80	0.090620442
9/18/16	319	225	23	9.3	1354.5	2750.5	2125	5500	80	0.076481384
9/19/16	272	227	23	9.3	1354	2761.5	2119	5500	80	0.076260743
9/20/16	379	224	23	9.3	1357	2747	2118	5500	80	0.078361092

Appendix A - CCD Daily Operating Parameters

Date	Comments
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Appendix A - CCD Daily Operating Parameters

Date	Runtime	Runtime total (Sec)	Runtime corrected (Hrs)	Runtime Corrected (Days)	Differential Pressure (psi)	Permeate Flow Rate (gpm)	CCD Cycle Length (min)	PFD Cycle Length (min)	Temp. (°C)	Feed Flow Rate (gpm)	Inlet Pressure (psi)	Membrane Feed Pressure (psi)	Electrical Conductivity Feed μS/cm	Feed pH	Electrical Conductivity Concentrate μS/cm
9/21/16	4091337	12258532	3362	140.1	8	7.8	13.6	1.6	29.3	7.8	20	229	3879.5	6.1	97.5
9/22/16	4177830	12345025	3386	141.1	8	7.7	13.2	1.6	28.9	7.7	20	239	2752	6.1	120
9/23/16	4263912	12431107	3410	142.1	8	7.8	13.7	1.6	28.6	7.8	20	236	4765	6.1	99
9/24/16	4350275	12517470	3434	143.1	8.5	7.8	13.2	1.6	28.4	7.8	20	244	1528	6	177.5
9/25/16	4436858	12604053	3458	144.1	8	7.8	13.2	1.6	28.5	7.8	20	249	686	6.3	265
9/26/16	4522334	12689529	3482	145.1	9	7.8	13.2	1.6	29.1	7.8	17	240	1165	6.5	625
9/27/16	4608485	12775680	3506	146.1	9	7.8	13.2	1.6	29.1	7.8	17	238	5125.5	6.5	2047
9/28/16	4694805	12862000	3530	147.1	9	7.8	13.2	1.6	28.9	7.8	17	239	5157	6.4	585
9/29/16	4765288	12932483	3549	147.9	8	7.8	13.7	1.6	28.6	7.8	17	240	89	6.5	582
9/30/16	4822341	12989536	3565	148.6	9	7.8	13.2	1.6	29.3	7.8	17	240	24	6.4	299
10/1/16	4893659	13060854	3585	149.4	8	7.8	13.2	1.6	28.6	7.8	17	242	127	6.5	573
10/2/16	4979439	13146634	3609	150.4	8	7.8	13.2	1.6	28.4	7.8	17	241	7.5	6.6	462
10/3/16	19966	13210263	3627	151.1	8	7.8	13.2	1.6	27.9	7.8	17	243	8	6.7	585
10/4/16	72347	13262644	3641	151.7	8	7.8	19.2	1.7	28.1	7.8	17	265	5235	5.5	13473
10/5/16	141515	13331812	3660	152.5	8	7.8	19.2	1.7	27.9	7.8	17	270	5192	5.7	746
10/6/16	228791	13419088	3685	153.5	8	7.8	19.2	1.7	27.9	7.8	17	268	5002	5.65	337.5
10/7/16	314279	13504576	3708	154.5	8	7.8	19.2	1.7	27.9	7.8	17	271	4762	5.9	280
10/8/16	400331	13590628	3732	155.5	8	7.8	19.2	1.7	27.6	7.8	17	274.5	5234.5	6.1	174
10/9/16	486608	13676905	3756	156.5	8	7.8	19.2	1.7	27.9	7.8	17	275	5170	6.2	373
10/10/16	572662	13762959	3780	157.5	8	7.8	19.2	1.7	27.9	7.8	17	274	5092	6.3	414.5
10/11/16	657420	13847717	3804	158.5	8	7.8	19.2	1.6	27.9	7.8	17	281	5207	6.4	339
10/12/16	739089	13929386	3826	159.4	8	7.8	19.2	1.7	27.6	7.8	17	275	5086	6.1	311
10/13/16	823964	14014261	3850	160.4	8	7.8	19.2	1.7	27.6	7.8	17	275	4950	6.1	243
10/14/16	910679	14100976	3874	161.4	8	7.8	19.2	1.7	27.6	7.8	17	274	4963	6.2	323
10/15/16	996743	14187040	3898	162.4	8	7.8	19.2	1.7	27.6	7.8	17	277	5117.5	6.2	285
10/16/16	1083417	14273714	3922	163.4	8	7.8	19.2	1.6	27.9	7.8	17	286	5142.5	6.5	303.5
10/17/16	1154210	14344507	3942	164.2	8	7.8	19.3	1.6	27.9	7.8	17	293	5414.5	6.5	599.5
10/18/16	1225966	14416263	3962	165.1	8	7.8	19.3	1.6	27.6	7.8	17	289	5474.5	6.5	291.5
10/19/16	1312280	14502577	3986	166.1	8	7.8	19.3	1.6	27.4	7.8	17	288	5179	6.4	305
10/20/16	1398493	14588790	4009	167.1	8	7.8	19.2	1.7	27.4	7.8	17	286	5024.5	6.25	429.5
10/21/16	1465869	14656166	4028	167.8	8	7.8	19.3	1.6	27.1	7.8	17	296	8	6.3	582
10/22/16	1515288	14705585	4042	168.4	8	7.8	19.3	1.6	27.75	7.8	17	302	4	3.2	359
10/23/16	1583198	14773495	4061	169.2	8	7.8	19.3	1.6	27.1	7.8	17	310.5	8	3.4	188
10/24/16	1660960	14851257	4082	170.1	8	7.8	19.3	1.6	27.1	7.8	17	310	1124	6.2	194

Appendix A - CCD Daily Operating Parameters

Date	Electrical Conductivity Permeate $\mu\text{S}/\text{cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S}/\text{cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
9/21/16	333.5	221	23	9.3	1358	2729.5	2119	5500	80	0.079968486
9/22/16	300	230	23	9.2	1358	2790	2118	5500	80	0.073884224
9/23/16	302.5	227	23	9.3	1356	2767	2121	5500	80	0.076886355
9/24/16	262.5	235	23	9.3	1357.5	2816.5	2120	5500	80	0.071373466
9/25/16	275	241	23	9.3	1352.5	2852	2119	5500	80	0.067754506
9/26/16	293.5	231	23	9.3	1270	2807.5	2119	5500	80	0.072857985
9/27/16	322	229	23	9.3	1269	2799	2119	5500	80	0.074105452
9/28/16	284.5	230	23	9.3	1270	2808	2123	5500	80	0.074109894
9/29/16	277	231	23	9.3	1271	2814	2120	5500	80	0.073868843
9/30/16	0	230	23	9.3	1269	2808	2123	5500	80	0.072885109
10/1/16	272.5	233	23	9.3	1270	2829	2120	5500	80	0.07267473
10/2/16	283	233	23	9.3	1271	2823	2120	5500	80	0.072742914
10/3/16	0	235	23	9.3	1273	2834	2122	5500	80	0.072772969
10/4/16	513	257	23	9.3	1270	2970	2117	5500	85	0.086410368
10/5/16	488	262	23	9.3	1270	2996	2113	5500	85	0.083026035
10/6/16	473	260	23	9.3	1270	2985	2113	5500	85	0.083460319
10/7/16	465	263	23	9.3	1270	3006	2113	5500	85	0.082594529
10/8/16	466	267	23	9.3	1269	3027	2113	5500	85	0.079346714
10/9/16	434	267	23	9.3	1271	3026	2118	5500	85	0.079736393
10/10/16	420	266	23	9.3	1270	3024	2115	5500	85	0.080035857
10/11/16	437	273	23	9.3	1270	3062	2114	5500	85	0.075201163
10/12/16	450.5	267	23	9.3	1270.5	3029	2115	5500	85	0.079595836
10/13/16	428	268	23	9.3	1271	3033	2115	5500	85	0.079493755
10/14/16	420	266	23	9.3	1270	3024	2115	5500	85	0.080333381
10/15/16	418	269	23	9.3	1270	3038.5	2116	5500	85	0.078094854
10/16/16	396	278	23	9.3	1270	3090	2116	5500	85	0.071311034
10/17/16	435	285	23	9.3	1270	3131.5	2118.5	5500	85	0.06791301
10/18/16	397	281	23	9.3	1270	3109.5	2118	5500	85	0.070003705
10/19/16	399	280	23	9.3	1270	3100	2120	5500	85	0.070259807
10/20/16	412	279	23	9.3	1269	3095.5	2122	5500	85	0.071805939
10/21/16	413	287	23	9.3	1271	3146	2122	5500	85	0.067333771
10/22/16	464	293.5	23	9.3	1267	3176	2125	5500	85	0.0630854
10/23/16	395	303	23	9.3	1269	3227	2121	5500	85	0.060715953
10/24/16	385.5	302.5	23	9.3	1269	3224	2120	5500	85	0.060508372

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Appendix A - CCD Daily Operating Parameters

Date	Runtime	Runtime total (Sec)	Runtime corrected (Hrs)	Runtime Corrected (Days)	Differential Pressure (psi)	Permeate Flow Rate (gpm)	CCD Cycle Length (min)	PFD Cycle Length (min)	Temp. (°C)	Feed Flow Rate (gpm)	Inlet Pressure (psi)	Membrane Feed Pressure (psi)	Electrical Conductivity Feed μS/cm	Feed pH	Electrical Conductivity Concentrate μS/cm
10/25/16	1705253	14895550	4095	170.6	7	7.8	19.3	1.6	27.1	7.8	17	305	5068	3.1	598
10/26/16	1743489	14933786	4105	171.1	8	7.8	19.25	1.6	27.6	7.8	17	292.5	5147.5	2.8	23912.5
10/27/16	1805539	14995836	4123	171.8	8	7.8	19.3	1.6	27.1	7.8	17	293	5183	2.6	593.5
10/28/16	1866020	15056317	4139	172.5	8	7.8	19.3	1.6	27.1	7.8	17	291	5086.5	2.8	592
10/29/16	1945020	15135317	4161	173.4	8	7.8	22.9	1.5	27.6	7.8	17	284	4860	3.2	2305
10/30/16	2030423	15220720	4185	174.4	8	7.9	22.9	1.5	27.4	7.9	17	295.5	4965.5	3.1	456
10/31/16	2116904	15307201	4209	175.4	8	7.8	23	1.5	27.1	7.8	17	302	4961	3	77
11/1/16	2203578	15393875	4233	176.4	8	7.85	23	1.5	26.9	7.85	17	310.5	197	2.8	142
11/2/16	2289246	15479543	4257	177.4	8	7.9	23	1.5	26.7	7.9	17	317	235	3.1	194
11/3/16	2375929	15566226	4281	178.4	7	7.8	23	1.5	26.7	7.8	17	322	14	3.1	176
11/4/16	2462698	15652995	4305	179.4	7	7.8	23	1.5	26.7	7.8	17	321	7	2.8	145
11/5/16	2549432	15739729	4329	180.4	7	7.9	23	1.5	26.7	7.9	18	329	7	3.5	10475
11/6/16	2639354	15829651	4354	181.4	7	7.9	23	1.5	26.4	7.9	20	336	7	3.5	10475
11/7/16	2726769	15917066	4378	182.4	7	7.9	23	1.5	26.4	7.9	22	344	7	3.5	10475
11/8/16	2812182	16002479	4402	183.4	8	7.9	23	1.5	26.7	7.9	23	349	1501	3.5	10475
11/9/16	2893815	16084112	4425	184.4	8	7.5	22.3	1.4	26.7	7.5	28	357	14	3.5	10475
11/10/16	2952653	16142950	4441	185.0	7	7.2	22.3	1.4	26.2	7.2	30	363	4709	3.5	10475
11/11/16	2986701	16176998	4451	185.4	7	7.25	22.3	1.4	26.7	7.25	30	359	7	3.5	10475
11/12/16	3046101	16236398	4467	186.1	6.5	7.05	22.6	1.4	26.4	7.05	34	364	5.5	3.5	10475
11/13/16	3130944	16321241	4491	187.1	10	6.6	22.9	1.4	26.4	6.6	38	365	6	3.5	10475
11/14/16	3195099	16385396	4509	187.9	7	6.3	23.6	1.4	25.9	6.3	41	374	7	3.5	10475

Appendix A - CCD Daily Operating Parameters

Date	Electrical Conductivity Permeate $\mu\text{S/cm}$	Concentrate Pressure (psi)	Concentrate Flow Rate (gpm)	Membrane Flux (gfd)	Pump 1 Speed (rpm)	Pump 2 Speed (rpm)	Pump 3 Speed (rpm)	Corrected Electrical Conductivity Feed ($\mu\text{S/cm}$)	Recovery Setpoint (%)	Specific Flux at 25°C (gfd/psi)
10/25/16	417	296	23	9.3	1270	3195	2126	5500	85	0.062769685
10/26/16	401	284	23	9.3	1268	3126.5	2126	5500	85	0.068725359
10/27/16	415	285	23	9.3	1269	3131.5	2122.5	5500	85	0.069129688
10/28/16	401	283	23	9.3	1271	3117	2125	5500	85	0.069842377
10/29/16	577	276	23	9.3	1269	3083	2119	5500	85	0.073710436
10/30/16	527	287	23	9.4	1270	3142.5	2115.5	5500	85	0.067750516
10/31/16	489	294	23	9.3	1270	3185	2114	5500	85	0.064724101
11/1/16	508	303	23	9.35	1270	3227.5	2114	5500	85	0.061261892
11/2/16	487	310	23	9.4	1272	3269	2114	5500	85	0.059380236
11/3/16	485	314	23	9.3	1271	3290	2114	5500	85	0.057487009
11/4/16	461	314	23	9.3	1271	3283	2114	5500	85	0.057911159
11/5/16	468	322	23	9.4	1307	3323	2114	5500	85	0.055263029
11/6/16	442	328	23	9.4	1351	3349	2113	5500	85	0.053687656
11/7/16	412	337	23	9.4	1403	3376	2113	5500	85	0.050516664
11/8/16	435	342	23	9.4	1467	3411	2113	5500	85	0.048777796
11/9/16	481	350	23	9	1495	3500	2112	5500	85	0.044907475
11/10/16	463	352	23	8.6	1562	3500	2109	5500	85	0.042952067
11/11/16	542	352	23	8.65	1622	3500	2114.5	5500	85	0.042840396
11/12/16	486.5	357.5	23	8.45	1688	3500	2112	5500	85	0.040806998
11/13/16	542	361	23	7.9	1861.5	3500	2105	5500	85	0.037605767
11/14/16	579.5	366	23	7.5	1934	3500	2102	5500	85	0.035735383

Appendix A - CCD Daily Operating Parameters

Date	Comments
10/25/16	
10/26/16	
10/27/16	
10/28/16	CIP no heat
10/29/16	
10/30/16	
10/31/16	
11/1/16	
11/2/16	
11/3/16	
11/4/16	
11/5/16	
11/6/16	
11/7/16	
11/8/16	
11/9/16	
11/10/16	
11/11/16	
11/12/16	
11/13/16	
11/14/16	

Appendix B – cRRO Daily Operating Parameters

Appendix B - cRRO Daily Operating Parameters

Date	Time	RRO Feed Flow (gpm)	RRO Feed pH	Pre-Feed Pump Pressure PI-401 (psi)	Feed Pressure (psi)	Conc. Pressure PI407 (psi)	Feed Pump P401 (Amps)	Conc. Flow, FIT-403 (gpm)	Permeate Flow, FIT-401 (gpm)	Interstage Flow, FIT-402 (gpm)	Pre-Boost Pressure, PI-405 (psi)	Post-Boost Pressure, PI-406 (psi)	Interstage Booster Pump P402 (Amps)
1/10/17	10:40	14.1		46	135	160	48.9	3.49	10.7	8.8	127	170	32.1
1/10/17	15:00	14.4	6.79	46	135	160	50.06	3.62	10.7	6.9	130	170	32.41
1/11/17	8:30	14.2	6.47	45	135	160	48.88	3.59	10.7	7	127	170	32.54
1/11/17	14:40	14.3	6.5	45	138	160	49.1	3.6	10.7	6.8	126	170	32.4
1/12/17	9:11	14.3	6.6	50	140	160	49	3.6	10.8	6.9	130	170	32.5
1/12/17	15:30	14.3	6.4	46	140	160	49.2	3.6	10.6	6.7	130	170	32.3
1/13/17	8:45	14.3	6.76	50	140	160	49.8	3.6	10.7	6.9	130	170	32.6
1/13/17	15:29	14.3	6.47	47	135	155	47.9	3.5	10.6	6.8	125	165	32.1
1/14/17	8:32	14.4	6.51	50	138	160	48.5	3.6	10.7	6.9	130	175	32.1
1/14/17	15:25	14.3	6.77	45	140	155	44.1	3.6	10.7	6.9	125	170	32.4
1/15/17	8:25	14.4	6.49	50	140	165	50.8	3.6	10.7	6.6	135	175	32.4
1/15/17	15:26	14.3	6.8	48	140	165	49.6	3.6	10.7	6.7	130	180	32.2
1/16/17	8:30	14.5	6.9	49	145	165	51.0	3.6	10.9	6.9	130	179	32.4
1/16/17	15:28	14.3	6.88	46	140	165	50.36	3.6	10.8	6.8	130	175	32.35
1/17/17	8:05	14.4	6.7	49	146	160	50.3	3.7	10.8	6.9	132	175	32.3
1/17/17	15:20	14.4	6.71	46	140	160	49.5	3.6	10.6	6.9	130	165	32.4
1/18/17	8:21	14.4	6.6	50	140	165	49.7	3.6	10.8	6.9	133	180	32.4
1/18/17	15:30	14.3	6.6	50	140	165	49.4	3.6	10.8	6.7	130	175	32.3
1/19/17	8:45	14.2	6.4	50	145	162	49.9	3.6	10.7	6.9	130	180	32.1
1/19/17	15:30	14.4	6.5	48	140	160	48.7	3.6	10.7	6.8	130	175	32.3
1/20/17	8:30	14.4	6.6	51	140	165	49.16	3.6	10.7	6.8	130	175	32.4
1/20/17	16:30	14.4	6.6	52	145	160	49.5	3.7	10.7	6.8	125	175	32.5
1/21/17	8:39	14.4	6.54	54	140	160	48.59	3.7	10.8	6.9	130	170	32.6
1/21/17	15:13	14.4	6.6	54	145	160	48.85	3.7	10.7	6.8	135	175	32.31
1/22/17	8:21	14.5	6.86	55	150	170	50.47	3.7	10.6	7	140	180	32.43
1/22/17	15:24	14.4	6.74	55	155	170	50.04	3.8	10.7	6.8	140	180	32.33
1/23/17	8:30	14.6	6.97	55	150	170	50.85	3.81	10.75	6.94	140	180	32.3
1/23/17	15:30	14.5	6.38	54	150	170	49.92	3.81	10.6	6.9	135	180	32.34
1/24/17	8:15	14.6	6.46	55	152	172	51.16	3.83	10.61	6.85	140	185	32.46
1/24/17	15:30	14.5	6.51	55	150	175	50.08	3.83	10.76	6.82	138	182	32.31
1/25/17	8:30	14.6	6.49	57	150	180	51.37	3.89	10.7	6.8	140	190	32.33
1/26/17	16:00	14.5	6.5	52	150	175	51.1	3.8	10.8	6.8	140	185	32.3
1/27/17	9:15	14.5	6.45	55	150	180	51.18	3.9	10.6	6.5	140	190	32.41
1/26/17	15:25	14.6	6.46	55	152	180	50.9	3.8	10.6	6.8	143	190	32.3
1/27/17	8:20	14.6	6.2	56	155	180	51	3.9	10.7	6.8	140	195	32.4
1/27/17	14:00	14.5	6.2	55	145	175	51.06	3.8	10.7	6.8	140	190	32.36
1/28/17	8:29	14.5	6.56	52	155	180	52.4	3.9	10.8	6.7	145	195	32.34

Appendix B - cRRO Daily Operating Parameters

Date	S2 Perm Pressure, PI-404 (psi)	S1 Perm Pressure, PI-403 (psi)	Feed Cond, AE-401 (uS/cm)	Feed Temp (°C)	Conc. Cond. AE-404 (mS/cm)	Conc. Temp. (°C)	S1 Perm Cond. AE-402 (uS/cm)	S1 Perm Temp. (°C)	S2 Perm Cond. AE-403 (uS/cm)	S2 Perm Temp. (°C)	Power (kWh)
1/10/17	0	2	5880	23.4	18.98	22.4	66.13	21.4	101.6	22.7	391.9
1/10/17	0	2	5985	23.3	19.09	22.2	65.13	20.3	95.15	20.9	402.2
1/11/17	0	1.5	5848	23	19.24	21.9	66.27	19.6	102	19.1	429.7
1/11/17	1	2	5850	23	19.2	21.7	62.7	19.6	101.4	19	441.6
1/12/17	1	2	5830	22.6	19.4	21.4	66	19.1	99.8	18.3	477.8
1/12/17	1	2	5918	22.3	19.5	20.8	66.6	18.3	99.7	17.6	489.8
1/13/17	1	2	5816	22.1	19.4	21	65.38	18.1	101.5	17.6	523.3
1/13/17	1	2	5493	22.7	18.8	21.5	60.7	19.4	81.3	19	535.8
1/14/17	1	3	5559	21.7	19	20.6	60.8	18	95.8	17	567.7
1/14/17	0.5	2	5666	22.9	19.2	22.2	60.8	21.4	106.8	21.6	580.8
1/15/17	1	3	5930	21.5	20	20.2	64.5	17.6	116.1	16.9	614.5
1/15/17	0.5	2	5993	22.3	20.1	21.2	64.7	19.6	103.9	19.6	628.2
1/16/17	1	3	6065	22.1	20.3	21.1	67.6	18.8	112.4	18.4	662.4
1/16/17	0	2	6096	23.3	20.4	22.5	66.1	21.4	100.3	22.2	675.7
1/17/17	1	1.5	6124	21.3	20.5	20	67.7	16.5	112.14	15.3	705.1
1/17/17	1	2	6082	23	20.4	22.2	67.5	20.9	84.8	21.1	718.9
1/18/17	2	4	6162	21.4	20.7	20.2	74.2	17.1	109.6	16	743.2
1/18/17	1	3	6138	22.8	20.5	21.8	71.7	20.1	100	20.2	755.4
1/19/17	1	2	6162	21.4	20.6	19.6	73.5	17.6	117.89	17.1	779.3
1/19/17	1	3	6075	22.6	20.4	21.5	71.7	19.4	94.8	19.9	788.5
1/20/17	1	2	5856	21.1	19.7	19.5	67.78	17	135.3	16.5	811.5
1/20/17	1	2	5822	21	19.3	19.7	60.1	17.3	86.6	16.9	822
1/21/17	1	2	5573	20.4	18.6	19.2	55.7	17.2	81.9	16.7	844.9
1/21/17	0.5	2	5686	21	18.8	20.2	52.8	19.1	70.1	18.8	857
1/22/17	1	3	6180	20.5	20.1	19.4	61.4	17.1	89.8	16.3	886.1
1/22/17	1	3	6334	20.8	20.4	19.6	64.3	17.9	92.7	17.6	900.3
1/23/17	1	3	6284	20.6	20.13	19.4	67.45	16.8	82.9	16.1	935
1/23/17	1	2	6107	20.4	19.63	19.3	62.12	16.8	81.39	16.1	948.6
1/24/17	1	2	6235	19.7	19.76	18.6	63.9	15.6	85.8	14.6	982.7
1/24/17	1	2	6243	20.5	19.7	19.4	65.5	17.3	83.6	16.8	998.1
1/25/17	1	2	6452	19.6	20.2	18.3	69.1	16	80.1	14.8	26.9
1/26/17	1	3	6449	21	20.2	20.2	71.9	18.3	80.9	20.7	41.6
1/27/17	1	2	6629	20.4	20.6	19.3	77.3	17.6	112.2	16.6	69.9
1/26/17	1	3	6591	21.2	20.5	20.5	76.4	19.2	106.2	20.6	82.4
1/27/17	1	2	6534	20.1	20.3	19	78	16.6	93.8	16	110.4
1/27/17	0.5	1	6392	21.5	20	20.7	74.2	19.6	109.5	20.9	121.9
1/28/17	1	2	6467	19.5	20.1	18.1	76	14.7	93.7	13.5	152

Appendix B - cRRO Daily Operating Parameters

Date	Time	RRO Feed Flow (gpm)	RRO Feed pH	Pre-Feed Pump Pressure PI-401 (psi)	Feed Pressure (psi)	Conc. Pressure PI407 (psi)	Feed Pump P401 (Amps)	Conc. Flow, FIT-403 (gpm)	Permeate Flow, FIT-401 (gpm)	Interstage Flow, FIT-402 (gpm)	Pre-Boost Pressure, PI-405 (psi)	Post-Boost Pressure, PI-406 (psi)	Interstage Booster Pump P402 (Amps)
1/28/17	15:25	14.4	6.48	48	150	175	50.9	3.8	10.6	6.8	135	185	32.24
1/29/17	8:22	14.6	6.61	50	150	180	51.19	3.9	10.6	6.8	140	195	32.19
1/29/17	15:21	14.6	6.42	47	145	175	51.97	3.8	10.6	6.9	135	190	32.54
1/30/17	8:45	14.5	6.46	51	150	180	52	3.92	10.8	6.5	140	190	32.34
1/30/17	15:45	14.6	6.46	47	145	180	51.8	3.8	10.6	6.8	135	190	32.3
1/31/17	9:10	14.6	6.49	50	150	185	52.34	3.97	10.7	6.9	140	190	32.46
2/1/17	8:30	14.7	6.3	51	155	195	52.4	4	10.8	6.8	145	205	32.4
2/2/17	16:15	14.4	6.61	81	135	175	39.7	3.4	10.6	6.8	125	185	32.5
2/3/17	8:31	14.1	6.47	83	140	180	39.4	3.5	10.9	6.8	130	190	32.76
2/3/17	16:05	14.3	6.58	80	135	180	40.69	3.5	10.8	6.8	125	185	32.43
2/4/17	8:28	14.1	6.56	82	140	180	40.06	3.5	10.7	6.9	130	196	32.41
2/4/17	15:21	14.1	6.43	80	140	180	40.3	3.5	10.8	6.8	130	190	32.41
2/5/17	8:26	14.2	6.69	82	140	185	40.71	3.5	10.6	6.9	130	195	32.78
2/5/17	15:14	14.1	6.52	81	140	185	39.51	3.5	10.7	6.9	130	195	32.31
2/6/17	8:23	14.2	6.7	80	135	190	40.8	3.5	10.6	6.8	130	200	32.3
2/6/17	15:20	14.3	6.55	81	140	190	40.4	3.5	10.8	6.8	130	200	32.4
2/7/17	8:25	14.3		81	140	190	41.13	3.56	10.8	6.82	130	200	32.34
2/8/17	7:14	14.2	6.45	80	130	190	40	3.5	10.6	6.8	125	200	32.3
2/8/17	15:25	14.4	6.61	78	135	190	40.3	3.5	10.6	6.8	130	195	32.4
2/9/17	9:50	14.2	6.5	79	130	190	40	3.5	10.7	6.8	125	200	32.3
2/9/17	15:34	14.2	6.6	77	135	190	39.6	3.5	10.6	6.8	125	200	32.3
2/10/17	8:37	14.4	6.46	80	132	195	39.63	3.5	10.7	6.8	125	205	32.21
2/10/17	15:14	14.2	6.57	64	130	190	44.25	3.5	10.5	6.8	125	200	32.28
2/11/17	8:23	14.3	6.54	65	135	195	44.73	3.6	10.7	6.7	125	210	32.13
2/11/17	15:24	14.4	6.52	76	135	205	40.97	3.5	10.8	6.7	125	210	32.39
2/12/17	8:34	shut down											
2/12/17	15:30	shut down											
2/13/17		shut down											
2/14/17	AM	shut down											
2/14/17	15:20	14.2	6.68	78	130	185	39.7	3.5	10.6	6.8	120	200	32.3
2/15/17	8:15	14.3	6.3	82	135	200	40	3.6	10.6	6.8	130	200	32.4
2/16/17	9:00	14.4	6.44	80	135	185	40.48	3.8	10.6	6.8	125	195	32.39
2/16/17	16:00	14.4	6.47	80	130	180	40.68	3.79	10.6	6.6	125	190	32.38
2/17/17	8:20	14.7	6.5	81	142	182	41.3	3.6	10.7	6.9	130	210	32.2
2/17/17	15:28	14.3	6.4	82	135	200	34.69	3.6	10.6	6.8	130	210	32.38
2/18/17		Shut down											
2/19/17	AM	Shut down	WRF Secondary issues										

Appendix B - cRRO Daily Operating Parameters

Date	S2 Perm Pressure, PI-404 (psi)	S1 Perm Pressure, PI-403 (psi)	Feed Cond, AE-401 (uS/cm)	Feed Temp (°C)	Conc. Cond. AE-404 (mS/cm)	Conc. Temp. (°C)	S1 Perm Cond. AE-402 (uS/cm)	S1 Perm Temp. (°C)	S2 Perm Cond. AE-403 (uS/cm)	S2 Perm Temp. (°C)	Power (kWh)
1/28/17	0	0.5	6332	22.7	19.8	22.4	75.1	22.5	112.1	24.2	165.9
1/29/17	1	2	6378	20.1	19.8	18.8	72.3	15.6	105.4	14.5	192
1/29/17	0	1	6330	23.3	19.8	23	74.5	23.1	93.6	24.6	202.9
1/30/17	1	2	6404	20.9	19.86	19.8	68.3	17.9	80.1	17	230.3
1/30/17	0	1	6414	23.2	20	22.8	71	22.6	91.1	25.6	241.5
1/31/17	1	1	6582	21.4	20.4	20.4	74.1	19.4	93.7	18.3	269.1
2/1/17	1	2	6829	20.4	20.8	19.3	78.8	16.2	89.5	14.9	306.8
2/2/17	1	3	6729	22.3	22.9	21.3	106.1	20.1	185.1	20.4	333.8
2/3/17	1	2	6704	21.4	22.4	20.3	108.9	18	188.4	17.5	351.6
2/3/17	1	2	6669	22.4	22.2	21.5	106.8	20.1	172.3	20.2	360.3
2/4/17	1	2	6722	22	22	20.9	105.8	18.8	162.4	18.5	378.8
2/4/17	0.5	1	6710	22.9	21.9	22.2	104.4	20.9	154	22.1	386.8
2/5/17	1	2	6615	21.8	21.6	20.6	94.5	18.2	169.4	17.9	406.6
2/5/17	1	2	6642	22.2	21.6	21.2	95.9	19.2	133.1	19	414.4
2/6/17	1	3	6547	22.1	21.1	21	95.9	18.8	156.1	18.3	434.8
2/6/17	1	3	6576	21.9	21.2	20.6	94.7	18.8	110.3	18.5	443.1
2/7/17	1	2	6468	21.9	20.8	20.6	101.6	18.7	131.2	18.4	464.2
2/8/17	1	3	6338	22	20.4	20.9	116.7	18.4	130.1	18.4	491.9
2/8/17	1	1	6257	23.7	20.4	23.2	97.9	22.4	130	24	501.9
2/9/17	1	2	6132	23.7	20.1	22.6	100.2	21.8	132.2	21.8	524.3
2/9/17	0	1	6201	24.3	20.1	23.9	101.3	23.2	126.5	26.2	531.1
2/10/17	0.5	1	6225	22.5	20.3	21.6	104.7	19.5	118.6	19.6	552.1
2/10/17	0	1	6155	23.7	20	23.1	99.2	21.8	162.7	22.8	556.9
2/11/17	1	2	6107	22.5	19.9	21.4	97.1	19.3	127.6	18.8	580.3
2/11/17	1	2	6187	23	22.1	22.2	99.5	20	143.6	22.1	588.4
2/12/17											
2/12/17											
2/13/17											
2/14/17											
2/14/17	0	0	5943	23.7	19.6	23.2	94.7	22.3	146	24.3	599.1
2/15/17	1	2	6090	21.6	19.9	20.3	100	17.7	161	16.9	619
2/16/17	0	1	5761	23.3	18.4	22.2	90.4	22.2	111.9	21.6	645.7
2/16/17	1	1	5884	23.7	18.6	23	93.3	22.4	136.2	24.2	652.7
2/17/17	1	1	6069	22.2	19.2	21	104.4	19	172	18.7	671.6
2/17/17	0.5	1	6181	22.4	19.8	21.3	99.7	19.6	108	19.3	680.1
2/18/17											
2/19/17											

Appendix B - cRRO Daily Operating Parameters

Date	Time	RRO Feed Flow (gpm)	RRO Feed pH	Pre-Feed Pump Pressure PI-401 (psi)	Feed Pressure (psi)	Conc. Pressure PI407 (psi)	Feed Pump P401 (Amps)	Conc. Flow, FIT-403 (gpm)	Permeate Flow, FIT-401 (gpm)	Interstage Flow, FIT-402 (gpm)	Pre-Boost Pressure, PI-405 (psi)	Post-Boost Pressure, PI-406 (psi)	Interstage Booster Pump P402 (Amps)
2/19/17	15:31	14.4	6.64	86	135	195	40.31	3.7	10.6	6.8	130	205	32.44
2/20/17	8:25	14.6	6.57	84	140	200	39.77	3.7	10.6	6.8	125	210	32.24
2/20/17	15:23	14.4	6.49	80	130	200	40.68	3.6	10.5	6.7	125	210	32.38
2/21/17	8:45	14.4	6.6	82	140	205	40	3.6	10.6	6.7	130	215	31.8
2/21/17	15:20	14.4	6.78	81	135	205	40	3.6	10.6	6.7	125	210	31.9
2/22/17	8:00	Shut down	WRF Secondary issues										
2/22/17	15:00	Shut down	WRF Secondary issues										
2/23/17	8:00	Shut down	WRF Secondary issues										
2/23/17	15:30	14.4	6.5	82	135	165	40.2	3.6	10.7	6.8	125	175	32.4
2/24/17	9:06	14.4	6.58	85	135	165	39.56	3.6	10.8	6.9	125	180	32.71
2/24/17	15:24	14.2	6.5	84	135	170	40.07	3.6	10.7	6.7	125	180	32.76
2/25/17	8:36	14.4	6.58	86	140	180	40.95	3.7	10.6	6.6	130	190	32.48
2/25/17	15:24	14.3	6.53	84	140	180	40.22	3.7	10.6	6.8	130	190	32.24
2/26/17	8:28	14.4	6.61	85	140	190	41.29	3.8	10.7	6.7	130	205	32.29
2/26/17	15:32	14.3	6.61	85	135	205	39.52	3.6	10.7	6.7	130	215	32.29
2/28/17	15:30	14.2	6.82	86	125	195	36.6	3.5	10.7	6.8	120	205	32.4
3/1/17	8:15	14.2	6.85	89	140	210	40.23	3.6	10.7	6.7	130	220	31.3
3/2/17	8:45	14	6.5	88	148	215	42.1	3.44	10.6	6.8	135	224	27.9
3/2/17	14:45	14.2	6.89	86	145	210	42	3.4	10.6	6.2	135	220	29.5
3/3/17	14:21	14.3	6.52	85	130	170	40.6	3.5	10.5	6.8	125	180	32.39
3/3/17	15:00	14.1		86	135	174	39	3.53	10.6	6.7	124	184	
3/3/17	17:40	14.1		86	140	181	40	3.57	10.8	6.9	130	190	32
3/4/17	8:29	14.2	6.52	86	150	200	42.92	3.6	10.6	6.8	135	210	32.26
3/4/17	15:28	14.3	6.6	85	145	210	43.65	3.5	10.6	6.6	135	220	31.35
3/5/17	8:25	14.2	6	86	150	220	45.04	3.6	10.7	6.3	140	225	30.38
3/5/17	15:21	14.2	6.57	86	150	220	45.32	3.6	10.7	6.3	145	230	30.13
3/6/17	7:15	14.3	6.72	88	150	220	45.72	3.64	10.6	6.5	145	230	29.81
3/7/17	9:05	14.2	6.43	85	150	215	45.5	3.5	10.7	6.3	140	225	30
3/7/17	15:50	14.3	6.47	83	145	215	44.4	3.5	10.7	6.3	135	222	30
3/8/17	8:35	14.1	6.3	86	150	220	45.75	3.44	10.67	6.11	145	235	28.99
3/9/17	7:35	14.3	6.55	88	150	220	44.79	3.5	10.6	6.7	140	230	29.48
3/9/17	16:30	15.1	6.6	49	115	85	47.2	4.6	10.72	7.3	115	100	32.5
3/10/17	8:15	15.4	6.45	55	140	100	50.5	4.8	10.6	6.9	128	115	32.5
3/10/17	15:33	15.4	6.54	54	135	100	50.62	4.7	10.6	6.7	125	110	32.5
3/11/17	8:23	15.4	6.42	5.5	140	100	50.75	4.8	10.6	6.6	125	115	32.5
3/11/17	15:32	15.3	6.53	53	135	100	50.65	4.7	10.7	6.7	125	115	32.58
3/12/17	8:23	15.5	6.4	55	135	100	51.04	4.8	10.6	6.8	130	120	32.5

Appendix B - cRRO Daily Operating Parameters

Date	S2 Perm Pressure, PI-404 (psi)	S1 Perm Pressure, PI-403 (psi)	Feed Cond, AE-401 (uS/cm)	Feed Temp (°C)	Conc. Cond. AE-404 (mS/cm)	Conc. Temp. (°C)	S1 Perm Cond. AE-402 (uS/cm)	S1 Perm Temp. (°C)	S2 Perm Cond. AE-403 (uS/cm)	S2 Perm Temp. (°C)	Power (kWh)
2/19/17	1	2	5767	21.4	18.4	20.4	87.9	18.2	127.7	17.9	707
2/20/17	1	2	5782	21.5	18.3	20.4	87.8	18.2	87.1	17.6	727.9
2/20/17	0	0.5	5916	23.1	18.9	22.7	96.8	21.5	97.5	22.6	737.1
2/21/17	1	3	6003	22	19.2	21.2	87	19.1	84.1	18.8	760.2
2/21/17	0	1	6005	23.8	19.2	23.5	88.8	22.6	84.9	25.1	769.1
2/22/17											
2/22/17											
2/23/17											
2/23/17	1	2	6410	22.2	20.3	21.2	112.2	19.2	167	20.9	824.3
2/24/17	1	2	6466	21.1	20.6	18.9	122.6	16.5	243.8	14.9	826.6
2/24/17	0.5	1	6430	22.6	20.5	21.9	118.7	20.3	180.7	22.5	831.2
2/25/17	1	2	6472	21	20.3	19.6	113.1	16.7	152.6	15.9	849
2/25/17	1	2	6487	22.4	20.2	21.5	113.7	19.9	129.8	20.5	856.6
2/26/17	1	2	6426	21.6	19.8	20.3	106.8	17.8	130.7	17	875.7
2/26/17	1	2	6534	21.9	20.8	20.8	108.5	18.8	114.3	18.7	884.8
2/28/17	1	3	5059	20.8	16.4	20	70.8	18.4	76.1	19	912.4
3/1/17	1	2	5815	19.8	18.5	18.8	90.7	16.1	122.1	15.6	932.3
3/2/17	1	1	6493	20.5	21.1	19.7	120.14	17.3	134.15	17.1	942.3
3/2/17	0	1	6447	23	21.2	22.6	117.7	22.4	127	23	951
3/3/17	0	0.5	6444	23.6	20.9	20.8	150.8	23.6	204.1	24.6	966.4
3/3/17	0	0	6570	23.3	21.3	22.7	151	22.7	253	24.3	968
3/3/17	0	0	6740	22.2	21.75	21.3	121	19.9	183	20	975
3/4/17	1	2	6633	21	20.9	19.8	117.7	17.3	207.4	17.2	992.4
3/4/17	0.5	2	6697	22.1	21.4	21.4	116	20.1	165.3	20.3	1.3
3/5/17	1	2	6666	21.5	21.3	20.5	116.5	18	134.9	17.4	23.4
3/5/17	1	2	6727	21.5	21.3	20.4	115.6	18.3	129.5	18.1	33
3/6/17	1	1	6700	20.3	21.1	19	115	15.2	122	14	54.5
3/7/17	1	3	6585	21.6	21	20.5	122.1	18.4	144.5	18.1	59.6
3/7/17	0	2	6561	23.4	21	23.2	120.3	22.3	117.8	24.4	68.8
3/8/17	1	3	6551	22.4	21.5	21.7	122.9	19.6	126.6	20.1	91.6
3/9/17	1	1	6496	21.7	21	20.8	119	18	143	17.1	99.1
3/9/17	0	0	5200	24.2	14	23.6	114.9	23.9	175.1	25.5	111.3
3/10/17	0	0	5115	22.5	14	21.6	119.2	20.3	168.6	20.4	128.7
3/10/17	0	0.5	5038	24.6	13.9	23.7	113.7	24.3	144.1	26.2	136.3
3/11/17	0.5	2	5115	22.3	13.9	21.3	114.9	19.8	150.2	19.3	154.2
3/11/17	0	0.5	5063	24.5	14	23.7	114.1	24.1	137.1	25.7	161.9
3/12/17	1	2	5042	21.9	13.8	20.6	111.8	17.9	150.3	16.6	178.4

Appendix B - cRRO Daily Operating Parameters

Date	Time	RRO Feed Flow (gpm)	RRO Feed pH	Pre-Feed Pump Pressure PI-401 (psi)	Feed Pressure (psi)	Conc. Pressure PI407 (psi)	Feed Pump P401 (Amps)	Conc. Flow, FIT-403 (gpm)	Permeate Flow, FIT-401 (gpm)	Interstage Flow, FIT-402 (gpm)	Pre-Boost Pressure, PI-405 (psi)	Post-Boost Pressure, PI-406 (psi)	Interstage Booster Pump P402 (Amps)
3/12/17	15:19	15.3	6.52	53	130	100	49.31	4.7	10.6	6.8	120	110	32.5
3/13/17	8:20	15.4	6.43	55	140	100	50.76	4.78	10.6	6.7	125	120	32.5
3/13/17	15:28	15.4	6.55	54	130	95	49.33	4.7	10.6	6.8	120	110	32.5
3/14/17	9:15	15.5	6.26	56	135	100	49.8	4.78	10.7	6.8	115	125	32.5
3/14/17	15:50	15.3	6.47	53	130	100	49.7	4.7	10.8	6.9	120	110	32.5
3/15/17	8:15	15.3	6.15	56	135	100	49.9	4.7	10.6	6.8	125	115	32.5
3/15/17	15:45	15.5	6.4	55	130	100	48.21	4.7	10.6	6.7	120	115	32.58
3/16/17	8:20	15.5	6.43	56	137	110	50.8	4.8	10.7	6.8	115	130	32.5
3/16/17	3:30	15.4	6.7	55	130	104	50	4.6	10.7	6.6	125	120	32.5
3/17/17	7:50	15.4	6.4	56	135	105	50	4.7	10.8	6.9	115	125	32.5
3/17/17	15:30	15.1	6.63	55	130	100	48.66	4.6	10.7	6.8	125	115	32.5
3/18/17	8:31	15.5	5.98	56	140	105	50.77	4.7	10.6	6.8	130	120	32.5
3/18/17	15:31	15.4	6.68	55	135	105	50.28	4.7	10.5	6.7	125	115	32.58
3/19/17	8:26	15.3	6.38	58	135	110	50.35	4.6	10.6	6.7	125	120	32.5
3/19/17	15:30	15.2	6.59	56	135	110	48.87	4.6	10.7	6.7	125	120	32.57
3/20/17	8:27	15.3	6.53	57	135	105	49.65	4.7	10.7	6.8	130	115	32.5
3/21/17	15:30	15.2	6.73	56	135	110	50.3	4.4	10.6	6.8	125	130	32.5
3/22/17	8:22	15.1	6.5	56	135	115	50	4.4	10.6	6.8	125	125	32.5
3/22/17	15:30	15.4	6.64	58	135	110	50.15	4.7	10.6	6.8	125	125	32.68
3/22/17	15:48	15.4	6.64	58	135	110	50.15	4.7	10.6	6.8	125	125	32.68
3/23/17	9:40	15.3	6.46	58	137	105	50.8	4.68	10.6	6.8	130	120	32.5
3/23/17	15:48	15.3	6.5	57	135	103	49.2	4.7	10.6	6.9	130	120	32.5
3/24/17	8:50	15.5	6.2	59	140	105	49.29	4.6	10.5	6.8	130	120	32.5
3/24/17	15:30	15.4	6.66	57	140	105	49.68	4.6	10.7	6.7	125	120	32.5
3/25/17	8:24	15.3	6.49	58	140	105	48.79	4.7	10.7	6.7	125	120	32.5
3/25/17	15:28	15.4	6.7	58	135	105	49.72	4.6	10.7	6.7	130	120	32.5
3/26/17	8:31	15.3	6.61	60	135	110	49.58	4.6	10.7	6.8	130	120	32.5
3/26/17	15:22	15.4	6.71	58	135	105	51.02	4.7	10.6	6.7	125	120	32.5
3/27/17	9:45	15.4	6.71	59	135	105	49.81	4.6	10.7	6.8	125	120	32.5
3/27/17	15:26	15.4	6.73	56	135	115	49.76	4.6	10.7	6.8	130	120	32.5
3/28/17	9:50	15.1	6.93	58	135	105	50.22	4.6	10.7	6.8	130	120	32.5
3/28/17	15:50	15.4	6.8	57	135	105	50.3	4.7	10.6	6.9	125	125	32.5
3/29/17	9:30	15	6.8	56	135	112	48.8	4.5	10.6	6.8	125	125	32.5
3/29/17	15:15	15.1	6.8	56	130	115	48.3	4.5	10.8	6.7	125	125	32.5
3/30/17	8:00	15.3	6.9	58	138	115	50.6	4.6	10.5	6.7	125	130	32.5
3/30/17	15:00	15.3	6.8	57	140	120	50	4.6	10.7	6.7	126	126	32.5
4/1/17	14:25	15.1	6.9	55	140	135	52.8	4.7	10.8	6.8	130	150	32.5

Appendix B - cRRO Daily Operating Parameters

Date	S2 Perm Pressure, PI-404 (psi)	S1 Perm Pressure, PI-403 (psi)	Feed Cond, AE-401 (uS/cm)	Feed Temp (°C)	Conc. Cond. AE-404 (mS/cm)	Conc. Temp. (°C)	S1 Perm Cond. AE-402 (uS/cm)	S1 Perm Temp. (°C)	S2 Perm Cond. AE-403 (uS/cm)	S2 Perm Temp. (°C)	Power (kWh)
3/12/17	0	0	4875	25.4	13.6	24.5	109.9	26	147.8	27.8	185.7
3/13/17	1	1	4900	22.2	13.5	20.9	105	18.4	144	17	203.1
3/13/17	0	0.5	4762	25.3	13.3	24.4	97.6	25.4	145.7	26.8	210.2
3/14/17	1	2	4856	23	13.3	22.1	105	21.2	132	21.6	228.5
3/14/17	0	0	4762	25.8	13.3	24.9	101.2	26.2	142.5	28	235.1
3/15/17	1	4	4875	22.9	13.4	21.7	112.9	19.7	126	18.7	251.8
3/15/17	0	0	4788	25.4	13.4	24.4	102.2	24.8	145.3	25.9	259.6
3/16/17	1	2	4907	22.6	13.5	21.3	114	18.8	178	17.6	276.4
3/16/17	0	0	4829	25.5	13.6	24.5	105.85	25.1	147.9	26.7	283.2
3/17/17	1	2	4864	22.3	13.6	21	110	18.1	137	16.6	299.8
3/17/17	0	0.5	4701	25.1	13.3	24.1	97.8	24.6	123.2	26.4	307.3
3/18/17	0.5	1	4712	23	13.2	21.8	83.4	19.5	95.3	18.6	324.7
3/18/17	0	0.5	4692	25.6	13.3	24.6	81.6	25.4	102.3	27.5	332.1
3/19/17	1	2	4709	22.6	13.4	21.3	84.4	18.7	120.4	17.5	348.2
3/19/17	0	1	4726	24.7	13.5	23.5	84.1	23.1	96.3	24	355.3
3/20/17	0.5	2	4642	23.2	13	21.9	78.8	19.9	163.4	19	372.4
3/21/17	0	1	4787	24.3	13.8	23.3	81.5	22.7	124.8	22.7	386.2
3/22/17	0	1	4689	23.3	13.5	21.8	91.4	20.1	136.8	19.1	403.9
3/22/17	0	0	4727	24.5	13.38	23.2	86.5	22.5	116.5	22.9	410.9
3/22/17	0	0	4727	24.5	13.38	23.2	86.5	22.5	116.5	22.9	410.9
3/23/17	1	1	4652	23.3	13.1	21.8	91.2	19.9	198.5	19	429.3
3/23/17	0	0	4690	24.4	13.3	22.4	85.1	22.4	191.6	23.3	435.7
3/24/17	0	1	4593	22.6	12.9	21.3	88	20.4	110.6	19.1	453
3/24/17	0	1	4586	24.4	13	23.2	81.9	22.6	118	24.1	459
3/25/17	0.5	2	4588	22.7	12.9	21.3	84.6	19.1	128.6	17.7	477
3/25/17	0	1	4511	24	12	22.8	80.5	22	116.5	22.3	484
3/26/17	0.5	2	4536	23.1	12.7	22	77.8	19.8	115.9	19	501.3
3/26/17	0.5	1	4580	24.5	12.9	23.3	77	22.8	110.2	24.1	508.5
3/27/17	0	0	4387	23.8	12.4	22.6	67.6	21.3	84.7	21.1	527.3
3/27/17	0	1	4540	24.3	12.7	23.1	71.6	22.3	160.58	23.3	532.9
3/28/17	0	1	4318	24.3	12.3	22.8	70.8	21.1	94.9	22	551.6
3/28/17	1	1	4467	24.9	12.7	23.8	77.3	23.7	100.7	24.3	557.8
3/29/17	1	2	4286	24	12.5	22.5	77.2	21.5	88.8	22.8	575.5
3/29/17	0	0	4418	25.6	12.78	24.7	75.3	25.1	106.7	27.2	581
3/30/17	1	2	4469	22.7	12.6	21.4	81.8	18.6	107	17.9	598.8
3/30/17	1	1	4515	24.2	12.8	23.1	78.1	22.3	113.8	22.7	606
4/1/17	0	0	4669	24.8	16	23.7	101.6	23.6	158.4	25.4	645

Appendix B - cRRO Daily Operating Parameters

Date	Time	RRO Feed Flow (gpm)	RRO Feed pH	Pre-Feed Pump Pressure PI-401 (psi)	Feed Pressure (psi)	Conc. Pressure PI407 (psi)	Feed Pump P401 (Amps)	Conc. Flow, FIT-403 (gpm)	Permeate Flow, FIT-401 (gpm)	Interstage Flow, FIT-402 (gpm)	Pre-Boost Pressure, PI-405 (psi)	Post-Boost Pressure, PI-406 (psi)	Interstage Booster Pump P402 (Amps)
4/3/17	14:20	14.8	7.1	55	140	130	49.4	4.3	10.8	7	120	155	32.5

Appendix B - cRRO Daily Operating Parameters

Date	S2 Perm Pressure, PI-404 (psi)	S1 Perm Pressure, PI-403 (psi)	Feed Cond, AE-401 (uS/cm)	Feed Temp (°C)	Conc. Cond. AE-404 (mS/cm)	Conc. Temp. (°C)	S1 Perm Cond. AE-402 (uS/cm)	S1 Perm Temp. (°C)	S2 Perm Cond. AE-403 (uS/cm)	S2 Perm Temp. (°C)	Power (kWh)
4/3/17	0	0	4548	24.1	13.2	23.1	78.9	22.4	115.1	21.9	665.8

Appendix C – CCD Feed Water Quality Data

Appendix C - CCD Feed Water Quality

Parameter	Units	Method	MRL	MDL	Average	STDEV	3/8/16	3/15/16	3/24/16	4/7/16
Aluminum Total ICAP/MS*	µg/L	EPA 200.8	20	0.78	80.6	20.06	63 ⁶	70 ⁶	66	61
Barium Total ICAP/MS*	µg/L	EPA 200.8	2	0.17	226.7	42.15	160	190	220	270
Calcium Total ICAP*	mg/L	EPA 200.7	1	0.12	246.7	32.46	200	210	240	260
Iron Total ICAP*	mg/L	EPA 200.7	0.02	0.0026	0.19	0.06	0.18	0.18	0.18	0.15
Magnesium Total ICAP*	mg/L	EPA 200.7	0.1	0.003	86.6	14.51	75	84	97	100
Potassium Total ICAP*	mg/L	EPA 200.7	1	0.13	71.1	9.41	58	62	64	66
Silica*	mg/L	EPA 200.7	0.43	0.1	37.9	7.11	35	35	31	20
Sodium Total ICAP*	mg/L	EPA 200.7	1	0.11	600.0	84.40	490	500	580	580
Strontium ICAP*	mg/L	EPA 200.7/UCMR 200.8	0.01	0.002	2.7	0.56	2	2.2	2.7	3.4
Total Organic Carbon*	mg/L	SM5310C/E415.3	0.3	0.042	31.6	6.79	14	33	34	27
Dissolved UV abs. at 254 nm*	cm ⁻¹	SM 5910	0.009	0.002	0.57	0.08	0.53	0.55	0.5	0.52
UV Transmittance (by calc from UVA)*	%	<i>calc</i>			27.1	4.8	29.5	28.2	31.6	30.2
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	SM2340B	3	3	970.0	137.73	810	870	1000	1100
Chloride*	mg/L	EPA 300.0	1	0.025	757.8	132.57	670	690	740	680
Sulfate*	mg/L	EPA 300.0	0.5	0.06	1051.5	188.29	860	930	1000	1100
Total Dissolved Solids (TDS)*	mg/L	E160.1/SM2540C	10	4.2	3132.1	472.23	2500	2700	2900	3200
Alkalinity as CaCO3**	mg/L	SM2320B	2		130.2	57.11	66	190	111	90
Ammonia**	mg-N/L	EPA 350.1	0.2		2.8	0.58	3.74	2.6	2.13	2.14
Nitrate**	mg-N/L	EPA 353.2	0.2		47.9	10.79	35.1	33.5	53.3	53.4
Ortho Phosphate**	mg-P/L	EPA 365.1	0.01		0.23	0.12	0.161	0.107	0.132	0.168
* Performed by Eurofins Eaton Analytical										
** Performed by Ray Stoyer WRF lab										
¹ Analysis did not meet one or more of the QC criteria										
² Sample required dillution due to matrix										
⁶ Too many dillutions. Sample removed from statistics										

Appendix C - CCD Feed Water Quality

Parameter	Units	4/28/16	5/5/16	5/12/16	5/19/16	5/26/16	6/2/16	6/9/16	6/16/16	6/23/16	6/30/16
Aluminum Total ICAP/MS*	µg/L	61	80	64	65	48	65	73	75	86	82
Barium Total ICAP/MS*	µg/L	220	280	190	170	190	210	180	190	210	240
Calcium Total ICAP*	mg/L	220	260	230	200	200	210	210	230	230	240
Iron Total ICAP*	mg/L	0.16	0.14	0.13	0.15	0.16	0.19	0.2	0.17	0.14	0.11
Magnesium Total ICAP*	mg/L	71	94	74	67	68	72	66	71	79	85
Potassium Total ICAP*	mg/L	62	66	64	62	61	62	62	65	63	66
Silica*	mg/L	30	38	33	32	31	32	32	34	35	37
Sodium Total ICAP*	mg/L	480	570	540	500	490	500	530	530	560	580
Strontium ICAP*	mg/L	2.2	3.1	2.1	2	2.2	2.2	2	2.2	2.6	2.8
Total Organic Carbon*	mg/L	31	28	26	25	26	25	24	25	30	30
Dissolved UV abs. at 254 nm*	cm ⁻¹	0.53	0.51	0.49	0.47	0.49	0.48	0.49	0.5	0.53	0.52
UV Transmittance (by calc from UVA)*	%	29.5	30.9	32.4	33.9	32.4	33.1	32.4	31.6	29.5	30.2
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	840	1000	880	780	780	820	800	870	900	950
Chloride*	mg/L	670	700	660	600	650	650	690	700	720	730
Sulfate*	mg/L	970	1200	920	830	810	760	860	970	920	920
Total Dissolved Solids (TDS)*	mg/L	2700	3100	2800	2500	2500	2600	2600	2800	2900	3000
Alkalinity as CaCO3**	mg/L	120	162	112	84	158	322	122	88	234	
Ammonia**	mg-N/L	2.19	2.4	2.18	2.12	2.68	2.73	2.7	2.56	2.56	
Nitrate**	mg-N/L	45	37.9	44.0	37.4	46.3	29.1	34.2	40.4	31.5	
Ortho Phosphate**	mg-P/L	0.228	0.313		0.174	0.15	0.093	0.141	0.0968	0.127	
* Performed by Eurofins Eaton Analytical											
** Performed by Ray Stoyer WRF lab											
¹ Analysis did not meet one or more of the QC criteria											
² Sample required dilution due to matrix											
⁶ Too many dilutions. Sample removed from statistics											

Appendix C - CCD Feed Water Quality

Parameter	Units	7/14/16	7/28/16	8/4/16	8/11/16	8/18/16	8/25/16	9/1/16	9/8/16	9/15/16	9/22/16	9/29/16
Aluminum Total ICAP/MS*	µg/L	66	99	86	130	120		87	87	92	99	88 ²
Barium Total ICAP/MS*	µg/L	190	300	310	190	260		210	220	210	260	300
Calcium Total ICAP*	mg/L	230	300	280	240	290		250	250	260	270	310
Iron Total ICAP*	mg/L	0.2	0.2	0.22	0.4	0.3		0.23	0.24	0.15	0.12	0.22
Magnesium Total ICAP*	mg/L	76	120	99	86	100		87	84	90	89	120
Potassium Total ICAP*	mg/L	65	85	82	80	85		76	80	78	76	84
Silica*	mg/L	35	46	42	37	44		42	43	45	43	52
Sodium Total ICAP*	mg/L	570	710	720	640	750		630	660	640	690	690
Strontium ICAP*	mg/L	2.4	3.5	3	2.8	3.3		2.6	2.5	2.9	3.1	4.2
Total Organic Carbon*	mg/L	28	37	35	32	36		33	35	33	43	38
Dissolved UV abs. at 254 nm*	cm ⁻¹	0.5	0.66	0.65	0.6	0.67		0.63	0.62	0.62	0.72	0.7
UV Transmittance (by calc from UVA)*	%	31.6	21.9	22.4	25.1	21.4		21.4	24.0	24.0	19.1	20.0
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	890	1200	1100	950	1100		980	970	1000	1000.0	1300
Chloride*	mg/L	770	940	920	780	1000		800	890	820	910	391
Sulfate*	mg/L	840	1400	1200	1100	1300		1100	1000	1100	1200	1500
Total Dissolved Solids (TDS)*	mg/L	2800	3900	3700	3300	3800		3400	3200	3200	3500	4100
Alkalinity as CaCO3**	mg/L						80	62	106	114	96	132
Ammonia**	mg-N/L						3.84	3	3.42	2.47	3.22	3.68
Nitrate**	mg-N/L						60.1	55.4	49.8	58.4	56.4	61.8
Ortho Phosphate**	mg-P/L						0.186	0.244	0.234	0.318	0.288	0.183
* Performed by Eurofins Eaton Analytical												
** Performed by Ray Stoyer WRF lab												
¹ Analysis did not meet one or more of the QC criteria												
² Sample required dilution due to matrix												
⁶ Too many dilutions. Sample removed from statistics												

Appendix C - CCD Feed Water Quality

Parameter	Units	9/30/16	10/6/16	10/13/16	10/20/16	10/27/16
Aluminum Total ICAP/MS*	µg/L		88 ²	80 ¹		65 ¹
Barium Total ICAP/MS*	µg/L		240	240		270
Calcium Total ICAP*	mg/L		270	270		300
Iron Total ICAP*	mg/L		0.24	0.26		0.225
Magnesium Total ICAP*	mg/L		92	94		98
Potassium Total ICAP*	mg/L		80	81		85
Silica*	mg/L		46	45		48
Sodium Total ICAP*	mg/L		680	670		720
Strontium ICAP*	mg/L		2.9	3.1		3.5
Total Organic Carbon*	mg/L		44	42		40
Dissolved UV abs. at 254 nm*	cm ⁻¹		0.66	0.64		0.66
UV Transmittance (by calc from UVA)*	%		21.9	22.9		21.9
Total Hardness as CaCO3 by ICP (calc.)*	mg/L		1000	1100		1200
Chloride*	mg/L		890	870		930
Sulfate*	mg/L		1200	1200		1200
Total Dissolved Solids (TDS)*	mg/L		3700	3000	3600	3700
Alkalinity as CaCO3**	mg/L	176	120	122	122	136
Ammonia**	mg-N/L	3.05	3.16	2.75	1.99	3.81
Nitrate**	mg-N/L	49.4	56.3	59.1	62	60.6
Ortho Phosphate**	mg-P/L	0.292	0.208	0.508	0.534	0.336
* Performed by Eurofins Eaton Analytical						
** Performed by Ray Stoyer WRF lab						
¹ Analysis did not meet one or more of the QC criteria						
² Sample required dilution due to matrix						
⁶ Too many dilutions. Sample removed from statistics						

Appendix D – CCD Permeate Water Quality Data

Appendix D - CCD Permeate Water Quality

Parameter	Units	Method	MRL	MDL	Average	STDEV	3/8/16	3/15/16	3/24/16	4/7/16
Aluminum Total ICAP/MS*	µg/L	EPA 200.8	20	0.78	2.9	2.61	1.3	5.9	5.5	2.4
Barium Total ICAP/MS*	µg/L	EPA 200.8	2	0.17	0.4	0.22	0.18	ND	0.22	0.38
Calcium Total ICAP*	mg/L	EPA 200.7	1	0.12	0.2	0.12	0.2	ND	ND	0.16
Iron Total ICAP*	mg/L	EPA 200.7	0.02	0.0026	0.0	N/A	ND	ND	ND	ND
Magnesium Total ICAP*	mg/L	EPA 200.7	0.1	0.003	0.0	0.03	0.067	0.045	0.022	0.037
Potassium Total ICAP*	mg/L	EPA 200.7	1	0.13	3.5	1.30	2	1.9	2.3	2.4
Silica*	mg/L	EPA 200.7	0.43	0.1	0.9	0.43	0.5	0.43	0.34	0.23
Sodium Total ICAP*	mg/L	EPA 200.7	1	0.11	31.2	11.36	20	18	24	23
Strontium ICAP*	mg/L	EPA 200.7/UCMR 200.8	0.01	0.002	0.0	0.0014	0.0027	0.0021	ND	0.0019
Total Organic Carbon*	mg/L	SM5310C/E415.3	0.3	0.042	0.4	0.20	0.4	0.13	0.51	0.11
Dissolved UV abs. at 254 nm*	cm ⁻¹	SM 5910	0.009	0.002	0.014	0.00	0.011	0.01	0.01	0.014
UV Transmittance (by calc from UVA)*	%	<i>calc</i>			96.9	0.8	97.5	97.7	97.7	96.8
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	SM2340B	3	3			ND	ND	ND	ND
Chloride*	mg/L	EPA 300.0	1	0.025	23.8	9.81	16	15	15	16
Sulfate*	mg/L	EPA 300.0	0.5	0.06	0.7	0.41	1.1	0.76	0.64	0.93
Total Dissolved Solids (TDS)*	mg/L	E160.1/SM2540C	10	4.2	108.5	36.46	80	58	76	86
Alkalinity as CaCO3**	mg/L	SM2320B	2		10.3	1.55	9	8	6	10
Ammonia**	mg-N/L	EPA 350.1	0.2		0.65	0.16	0.531	0.51	0.486	0.508
Nitrate**	mg-N/L	EPA 353.2	0.2		8.5	3.42	4.85	4.65	6.5	7.54
Ortho Phosphate**	mg-P/L	EPA 365.1	0.01		0.0	0.00	ND	ND	ND	ND
Total Kjeldahl nitrogen (TKN)**	mg-N/L	EPA 351.2	0.5							
Biochemical Oxygen Demand (BOD)**	mg-BOD/L	SM 5210	2.0							
Total Chlorine**	mg/L									
Dissolved Oxygen (DO)**	mg/L									
pH**										
* Performed by Eurofins Eaton Analytical										
** Performed by Ray Stoyer WRF lab										

Appendix D - CCD Permeate Water Quality

Parameter	4/28/16	5/5/16	5/11/16	5/12/16	5/19/16	5/20/16	5/25/16	5/26/16	6/2/16	6/8/16
Aluminum Total ICAP/MS*	ND	5.5		ND	0.89			8.4	3.4	
Barium Total ICAP/MS*	ND	ND		ND	ND			1.0	0.39	
Calcium Total ICAP*	ND	ND		ND	ND			0.33	0.15	
Iron Total ICAP*	ND	ND		ND	ND			ND	0.0028	
Magnesium Total ICAP*	0.020	0.016		0.011	0.011			0.1	0.027	
Potassium Total ICAP*	2.4	2		2.1	2			2.1	3.4	
Silica*	0.43	0.48		0.45	0.36			0.47	0.77	
Sodium Total ICAP*	20	18		19	18			19	25	
Strontium ICAP*	0.00087	0.00081		0.00045	0.0026			0.0059	0.0011	
Total Organic Carbon*	0.24	0.34		0.28	0.29			0.43	1.1	
Dissolved UV abs. at 254 nm*	0.025	0.01		0.014	0.012			0.009	0.015	
UV Transmittance (by calc from UVA)*	94.4	97.7		96.8	97.3			97.9	96.6	
Total Hardness as CaCO3 by ICP (calc.)*	ND	ND		ND	ND			ND	ND	
Chloride*	15	15		13	11			13	20	
Sulfate*	0.76	0.70		0.46	0.56			0.60	0.53	
Total Dissolved Solids (TDS)*	80	82		74	62			78	90	
Alkalinity as CaCO3**	10	12		10	10			8	12	
Ammonia**	0.49	0.486		0.5	0.468			0.414	0.771	
Nitrate**	6.36	5.84		5.48	4.47			6.18	5.7	
Ortho Phosphate**	ND	ND		ND	ND			ND	ND	
Total Kjeldahl nitrogen (TKN)**						ND		ND	ND	
Biochemical Oxygen Demand (BOD)**			ND				ND			ND
Total Chlorine**										
Dissolved Oxygen (DO)**										
pH**										
* Performed by Eurofins Eaton Analytical										
** Performed by Ray Stoyer WRF lab										

Appendix D - CCD Permeate Water Quality

Parameter	6/9/16	6/16/16	6/22/16	6/23/16	6/30/16	7/14/16	7/28/16	8/4/16	8/11/16	8/18/16
Aluminum Total ICAP/MS*	ND	ND		ND	ND	ND	1.6	0.9	ND	1.2
Barium Total ICAP/MS*	ND	ND		ND	ND	ND	0.40	0.39	ND	0.18
Calcium Total ICAP*	ND	ND		ND	ND	D	0.33	0.14	0.18	0.14
Iron Total ICAP*	ND	ND		ND	ND	ND	ND	ND	ND	ND
Magnesium Total ICAP*	0.018	ND		0.015	0.018	0.014	0.1	0.036	0.034	0.034
Potassium Total ICAP*	2.9	3.1		2.8	3.3	2.8	4.9	4.4	3.1	3.8
Silica*	0.7	0.73		0.82	0.89	0.83	1.5	1.1	0.62	1
Sodium Total ICAP*	25	27		27	32	27	45	40	26	36
Strontium ICAP*	0.00074	0.00075		0.001	0.00095	0.0008	0.0043	0.0016	0.002	0.0016
Total Organic Carbon*	0.2	0.24		0.42	0.33	0.39	0.38	0.32	0.43	0.64
Dissolved UV abs. at 254 nm*	0.01	0.008		0.017	0.012	0.016	0.018	0.018	0.01	0.013
UV Transmittance (by calc from UVA)*	97.7	98.2		96.2	97.3	96.4	95.9	95.9	97.7	97.1
Total Hardness as CaCO3 by ICP (calc.)*	ND	ND		ND	ND	ND	ND	ND	ND	ND
Chloride*	20	20		22	23	23	38	32	19	30
Sulfate*	0.49	0.50		0.45	0.39	0.41	2.00	1.00	0.56	0.92
Total Dissolved Solids (TDS)*	62	100		92	100	94	140	150	100	120
Alkalinity as CaCO3**	9	12		12						
Ammonia**	0.6	0.67		0.762						
Nitrate**	6.28	7.2		5.6						
Ortho Phosphate**	ND	ND		ND						
Total Kjeldahl nitrogen (TKN)**	ND									
Biochemical Oxygen Demand (BOD)**			ND							
Total Chlorine**										
Dissolved Oxygen (DO)**										
pH**										
* Performed by Eurofins Eaton Analytical										
** Performed by Ray Stoyer WRF lab										

Appendix D - CCD Permeate Water Quality

Parameter	8/24/16	8/25/16	9/1/16	9/8/16
Aluminum Total ICAP/MS*			1.4	0.92
Barium Total ICAP/MS*			ND	0.28
Calcium Total ICAP*			ND	ND
Iron Total ICAP*			ND	ND
Magnesium Total ICAP*			0.017	0.023
Potassium Total ICAP*			3.4	3.4
Silica*			0.87	0.98
Sodium Total ICAP*			29	32
Strontium ICAP*			0.001	0.0011
Total Organic Carbon*			0.3	0.44
Dissolved UV abs. at 254 nm*			0.016	0.011
UV Transmittance (by calc from UVA)*			96.4	97.5
Total Hardness as CaCO3 by ICP (calc.)*			ND	ND
Chloride*			19	22
Sulfate*			0.54	0.62
Total Dissolved Solids (TDS)*			100	100
Alkalinity as CaCO3**		12	10	12
Ammonia**		0.678	0.894	0.724
Nitrate**		10.5	7.55	8.34
Ortho Phosphate**		0.0155	ND	0.0109
Total Kjeldahl nitrogen (TKN)**				
Biochemical Oxygen Demand (BOD)**	ND			
Total Chlorine**	2.8			
Dissolved Oxygen (DO)**				
pH**	5.51			
* Performed by Eurofins Eaton Analytical				
** Performed by Ray Stoyer WRF lab				

Appendix D - CCD Permeate Water Quality

Parameter	9/9/16	9/15/16	9/21/16	9/22/16	9/29/16	9/30/16	10/5/16	10/6/16	10/13/16	10/19/16
Aluminum Total ICAP/MS*		1.1		ND	1.5			1.7	0.8	
Barium Total ICAP/MS*		ND		0.26	ND			0.23	ND	
Calcium Total ICAP*		ND		ND	ND			0.2	0.14	
Iron Total ICAP*		ND		ND	ND			ND	ND	
Magnesium Total ICAP*		0.0067		0.022	0.025			0.043	0.026	
Potassium Total ICAP*		3.4		3.1	3.9			6	4.7	
Silica*		0.88		0.81	1			1.6	1.2	
Sodium Total ICAP*		30		29	32			54	42	
Strontium ICAP*		0.001		0.0011	0.0014			0.0022	0.0021	
Total Organic Carbon*		0.33		0.3	0.31			0.4	0.3	
Dissolved UV abs. at 254 nm*		0.014		0.011	0.016			0.018	0.012	
UV Transmittance (by calc from UVA)*		96.8		97.5	96.4			95.9	97.3	
Total Hardness as CaCO3 by ICP (calc.)*		ND		ND	ND			ND	ND	
Chloride*		21		21	23			41	33	
Sulfate*		0.65		0.59	0.65			1.00	0.66	
Total Dissolved Solids (TDS)*		100		110	120			180	180	
Alkalinity as CaCO3**		10		10	12	12		11	10	
Ammonia**		0.538		0.643	0.686	0.657		0.882	0.884	
Nitrate**		8.94		7.64	9.96	7.2		13.8	14.6	
Ortho Phosphate**		ND		ND	ND	ND		ND	ND	
Total Kjeldahl nitrogen (TKN)**				ND				ND	ND	
Biochemical Oxygen Demand (BOD)**	ND		ND				ND			ND
Total Chlorine**	2.7		2.7				2.6			2.6
Dissolved Oxygen (DO)**	6.94		5.88				7.1			5.63
pH**	5.51		5.49				5.61			5.54
* Performed by Eurofins Eaton Analytical										
** Performed by Ray Stoyer WRF lab										

Appendix D - CCD Permeate Water Quality

Parameter	10/20/16	10/27/16	11/2/16	11/3/16	11/10/16
Aluminum Total ICAP/MS*	ND	ND		ND	8.4
Barium Total ICAP/MS*	ND	ND		0.23	0.60
Calcium Total ICAP*	0.15	0.14		0.23	0.58
Iron Total ICAP*	ND	ND		ND	ND
Magnesium Total ICAP*	0.026	0.026		0.041	0.17
Potassium Total ICAP*	5.7	4.8		6.2	5.8
Silica*	1.4	1.2		1.9	1.7
Sodium Total ICAP*	46	43		57	52
Strontium ICAP*	0.0015	0.0014		0.0021	0.0058
Total Organic Carbon*	0.34	0.49		0.85	0.7
Dissolved UV abs. at 254 nm*	0.012	0.01		0.02	0.014
UV Transmittance (by calc from UVA)*	97.3	97.7		95.5	96.8
Total Hardness as CaCO3 by ICP (calc.)*	ND	ND		ND	ND
Chloride*	34	31		49	43
Sulfate*	0.54	0.46		0.81	2.2
Total Dissolved Solids (TDS)*	160	140		170	170
Alkalinity as CaCO3**	10	10		10	12
Ammonia**	0.554	0.986		0.687	0.794
Nitrate**	13	14		16	12.1
Ortho Phosphate**	0.0131	ND		0.0122	0.0124
Total Kjeldahl nitrogen (TKN)**	ND			ND	
Biochemical Oxygen Demand (BOD)**			ND		
Total Chlorine**			2.5		
Dissolved Oxygen (DO)**			6.46		
pH**			5.58		
* Performed by Eurofins Eaton Analytical					
** Performed by Ray Stoyer WRF lab					

Appendix E – CCD Brine Water Quality Data

Appendix E - CCD Brine Water Quality

Parameter	Units	Method	MRL	MDL	Average	STDEV	3/8/16	3/15/16	3/24/16	4/7/16	4/28/16	5/5/16
Aluminum dissolved ICAP/MS*	µg/L	EPA 200.8	20	0.78	350.0	72.11	30 ¹				36 ¹	
Aluminum Total ICAP/MS*	µg/L	EPA 200.8	20	0.78	430.0	121.04	300 ¹			350	380	
Barium dissolved ICAP/MS*	µg/L	EPA 200.8	2	0.17	1184.0	693.74	83 ¹				120	
Barium Total ICAP/MS*	µg/L	EPA 200.8	2	0.17	1489.0	452.02	740			1500	1400	
Calcium Dissolved ICAP*	mg/L	EPA 200.7	1	0.12	1361.7	494.39	870				1200	
Calcium Total ICAP*	mg/L	EPA 200.7	1	0.12	1268.0	215.03	880			1400	1400	
Iron Dissolved ICAP*	mg/L	EPA 200.7	0.02	0.0026	0.88	0.40	0.74				0.92	
Iron Total ICAP*	mg/L	EPA 200.7	0.02	0.0026	1.23	0.55	0.78			0.9	0.98	
Magnesium Dissolved ICAP*	mg/L	EPA 200.7	0.1	0.003	478.3	161.30	330				420	
Magnesium Total ICAP*	mg/L	EPA 200.7	0.1	0.003	542.0	166.25	330			540	440	
Potassium Dissolved ICAP*	mg/L	EPA 200.7	1	0.13	370.0	125.22	260				360	
Potassium Total ICAP*	mg/L	EPA 200.7	1	0.13	418.0	141.09	250			340	370	
Dissolved Silica*	mg/L	EPA 200.7	0.5	0.1	210.0	54.77						
Silica*	mg/L	EPA 200.7	0.43	0.1	209.0	82.79	140			90	150	
Sodium Dissolved ICAP*	mg/L	EPA 200.7	1	0.11	3166.7	1150.07	2100				2800	
Sodium Total ICAP*	mg/L	EPA 200.7	1	0.11	3570.0	1288.45	2100			2900	2900	
Strontium ICAP*	mg/L	EPA 200.7/UCMR 200.8	0.01	0.002	16.3	4.98	8.8			18	14	
Strontium Dissolved ICAP*	mg/L	EPA 200.7/UCMR 200.8	0.01	0.002	15.2	5.91	8.6					
Total Organic Carbon*	mg/L	SM5310C/E415.3	0.3	0.042	202.0	58.08	140			150	150	
Dissolved Organic Carbon*	mg/L	SM5310C	0.3	0.042	205.0	49.33	150					
Dissolved UV abs. at 254 nm*	cm ⁻¹	SM 5910	0.009	0.002	3.8	1.03	2.4			3.02	2.7	
UV Transmittance (by calc from UVA)*	%	<i>calc</i>			0.1	0.13	0.4			0.1	0.2	
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	SM2340B	3	3	5590.0	1458.65	3500			5700	5300	
Chloride*	mg/L	EPA 300.0	1	0.025	4550.0	1356.67	2800			3600	3600	
Sulfate*	mg/L	EPA 300.0	0.5	0.06	6570.0	1976.56	3700			6100	5600	
Total Dissolved Solids (TDS)*	mg/L	E160.1/SM2540C	10	4.2	21133.3	5343.44	12000			17000	13000	
Alkalinity as CaCO3**	mg/L	SM2320B	2		911.1	506.76	930	1088	590	450	680	900
Ammonia**	mg-N/L	EPA 350.1	0.2		12.8	3.71	17.6	12.2	7.72	8.88	8.95	9.53
Nitrate**	mg-N/L	EPA 353.2	0.2		265.3	81.08	195	166	263	273	230	197
Ortho Phosphate**	mg-P/L	EPA 365.1	0.01		1.28	0.89	0.804	0.582	0.666	0.875	1.2	1.7
* Performed by Eurofins Eaton Analytical												
** Performed by Ray Stoyer WRF lab												
¹ Analysis did not meet one or more of the QC criteria												
² Sample required dillution due to matrix												
³ Target analyte detected in blank at, or above, method acceptance criteria												

Appendix E - CCD Brine Water Quality

Parameter	5/12/16	5/19/16	5/26/16	6/2/16	6/9/16	6/16/16	6/23/16	6/30/16
Aluminum dissolved ICAP/MS*								370
Aluminum Total ICAP/MS*			270					310
Barium dissolved ICAP/MS*								1100
Barium Total ICAP/MS*			1000					950
Calcium Dissolved ICAP*								1100
Calcium Total ICAP*			1000					1100
Iron Dissolved ICAP*								0.5
Iron Total ICAP*			0.81					0.51
Magnesium Dissolved ICAP*								360
Magnesium Total ICAP*			350					400
Potassium Dissolved ICAP*								260
Potassium Total ICAP*			300					300
Dissolved Silica*								170
Silica*			160					150
Sodium Dissolved ICAP*								2400
Sodium Total ICAP*			2400					2700
Strontium ICAP*			12					11
Strontium Dissolved ICAP*								
Total Organic Carbon*			160					180
Dissolved Organic Carbon*								170 ³
Dissolved UV abs. at 254 nm*			2.9					3.8
UV Transmittance (by calc from UVA)*			0.1					0.0
Total Hardness as CaCO3 by ICP (calc.)*			3900					4400
Chloride*			3600					3400
Sulfate*			4600					4300
Total Dissolved Solids (TDS)*			14000					17000
Alkalinity as CaCO3**	640	500	500	1980	940	570	1340	
Ammonia**	9.13	9.74	9.54	9.96	13.2	11	10.9	
Nitrate**	272	202	222	154	172	220	154	
Ortho Phosphate**		0.932	0.686	0.542	0.764	0.615	0.716	
* Performed by Eurofins Eaton Analytical								
** Performed by Ray Stoyer WRF lab								
¹ Analysis did not meet one or more of the Q								
² Sample required dillution due to matrix								
³ Target analyte detected in blank at, or above								

Appendix E - CCD Brine Water Quality

Parameter	8/25/16	9/1/16	9/29/16	9/30/16	10/4/16	10/6/16	10/11/16	10/13/16	10/18/16	10/20/16	10/27/16	11/3/16
Aluminum dissolved ICAP/MS*	410		120 ²								270	
Aluminum Total ICAP/MS*	670		500							500	460	
Barium dissolved ICAP/MS*	1100		1700								1900	
Barium Total ICAP/MS*	1900		1800							2000	1900	
Calcium Dissolved ICAP*	1100		1700								2200	
Calcium Total ICAP*	1300		1600							1300	1300	
Iron Dissolved ICAP*	0.98		0.547								1.6	
Iron Total ICAP*	1.2		1.2							2	1.9	
Magnesium Dissolved ICAP*	400		640								720	
Magnesium Total ICAP*	500		620							720	730	
Potassium Dissolved ICAP*	310		450								580	
Potassium Total ICAP*	370		420							610	580	
Dissolved Silica*	180		200								290	
Silica*	210		270							280	320	
Sodium Dissolved ICAP*	2700		3800								5200	
Sodium Total ICAP*	3200		3500							4900	5500	
Strontium ICAP*	20		21							16	25	
Strontium Dissolved ICAP*			20								17	
Total Organic Carbon*	200		200							270	270	
Dissolved Organic Carbon*	200		200								270	
Dissolved UV abs. at 254 nm*	3.8		3.7							5	4.8	
UV Transmittance (by calc from UVA)*	0.0		0.0							0.0	0.0	
Total Hardness as CaCO3 by ICP (calc.)*	5300		6500							6200	8400	
Chloride*	5300		4400							6100	6300	
Sulfate*	7600		7500							9200	8400	
Total Dissolved Solids (TDS)*	20000		21000		27000	24000	26000	26000	27000	22000	26000	
Alkalinity as CaCO3**	418	340	720	800		840		920		900	930	2460
Ammonia**	16.8	14.4	16.9	13.1		17.9		16		11.5	21.8	15.9
Nitrate**	298	295	306	229		332		371		398	412	350
Ortho Phosphate**	0.975	1.16	1.1	1.26		1.4		3.54		3.93	2.26	1.29
* Performed by Eurofins Eaton Analytical												
** Performed by Ray Stoyer WRF lab												
¹ Analysis did not meet one or more of the QCL												
² Sample required dillution due to matrix												
³ Target analyte detected in blank at, or above												

Appendix E - CCD Brine Water Quality

Parameter	11/10/16
Aluminum dissolved ICAP/MS*	
Aluminum Total ICAP/MS*	430
Barium dissolved ICAP/MS*	
Barium Total ICAP/MS*	1700
Calcium Dissolved ICAP*	
Calcium Total ICAP*	1400
Iron Dissolved ICAP*	
Iron Total ICAP*	2
Magnesium Dissolved ICAP*	
Magnesium Total ICAP*	790
Potassium Dissolved ICAP*	
Potassium Total ICAP*	640
Dissolved Silica*	
Silica*	320
Sodium Dissolved ICAP*	
Sodium Total ICAP*	5600
Strontium ICAP*	17
Strontium Dissolved ICAP*	
Total Organic Carbon*	300
Dissolved Organic Carbon*	
Dissolved UV abs. at 254 nm*	5.4
UV Transmittance (by calc from UVA)*	0.0
Total Hardness as CaCO ₃ by ICP (calc.)*	6700
Chloride*	6400
Sulfate*	8700
Total Dissolved Solids (TDS)*	25000
Alkalinity as CaCO ₃ **	1520
Ammonia**	12.8
Nitrate**	390
Ortho Phosphate**	1.14
* Performed by Eurofins Eaton Analytical	
** Performed by Ray Stoyer WRF lab	
¹ Analysis did not meet one or more of the QCL	
² Sample required dillution due to matrix	
³ Target analyte detected in blank at, or above	

Appendix F – cRRO Feed Water Quality Data

Appendix F - cRRO Feed Water Quality

Parameter	Units	MRL	MDL	Average	STDEV	1/12/17	1/19/17	1/26/17	2/3/17	2/9/17	2/16/17
Aluminum Total ICAP/MS*	µg/L	20	0.78	110.6	170.51	651	56	52 ²	63 ¹	74 ¹	50
Barium Total ICAP/MS*	µg/L	2	0.17	245.8	64.87	260	280	240	320	320	240
Calcium Total ICAP*	mg/L	1	0.12	299.2	62.01	260	320	360	380	340	270
Iron Total ICAP*	mg/L	0.02	0.0026	0.1	0.03	0.2	0.19	0.14	0.13	0.16	0.14
Magnesium Total ICAP*	mg/L	0.1	0.003	123.3	31.04	97	130	160	160	140	100
Potassium Total ICAP*	mg/L	1	0.13	65.8	7.22	69	73	60	74	74	67
Silica*	mg/L	0.43	0.1	73.6	22.02	58	60	100	82	75	58
Sodium Total ICAP*	mg/L	1	0.11	715.0	96.53	640 ³	750	850	780	780	700
Strontium ICAP*	mg/L	0.01	0.002	2.9	1.00	3	3.3	4.8	4.1	3.3	2.5
Total Organic Carbon*	mg/L	0.3	0.042	39.3	6.53	43	38	41	41	48	35
Dissolved Organic Carbon*	mg/L	0.3	0.02	37.0	N/A		37				
Dissolved UV abs. at 254 nm*	cm ⁻¹	0.009	0.002	0.7	0.16	0.65	0.68	0.97	0.68	0.66	0.65
UV Transmittance (by calc from UVA)*	%			21.7	6.64	22.4	20.9	10.7	20.9	21.9	22.4
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	3	3	1253.3	288.99	1000	1300	1600	1600	1400	1100
Chloride*	mg/L	1	0.025	936.7	82.28	900	990	980	1000	1000	980
Sulfate*	mg/L	0.5	0.06	1216.7	307.85	1200	1400	1500	1600	1300	1100
Total Dissolved Solids (TDS)*	mg/L	10	4.2	3700.0	670.14	3600	3800	4400	4400	4000	3600
Alkalinity as CaCO3**	mg/L	2		197.4	45.37			166	180	168	176
Ammonia**	mg-N/L	0.2		2.1	0.33			2.14	2.27	2.3	2.45
Nitrate**	mg-N/L	0.2		54.1	7.20			61	62.7	58.1	50.9
Ortho Phosphate**	mg-P/L	0.01		1.3	3.41			11	0.218	0.22	0.116
* Performed by Eurofins Eaton											
** Performed by Ray Stoyer WRF lab											
¹ Analysis did not meet one or more of the QC criteria											
² Sample required dillution due to matrix											
³ Target analyte detected in blank at, or above, method acceptance criteria											

Appendix F - cRRO Feed Water Quality

Parameter	2/24/17	3/2/17	3/9/17	3/16/17	3/23/17	3/30/17
Aluminum Total ICAP/MS*	64	87	62	59	50	59 ¹
Barium Total ICAP/MS*	330	230	260	190	160	120
Calcium Total ICAP*	330	350	340	220	220	200
Iron Total ICAP*	0.11	0.1	0.11	0.099	0.11	0.14
Magnesium Total ICAP*	140	150	150	91	84	78
Potassium Total ICAP*	69	52	69	55	62	66
Silica*	79	120	93	56	50	52
Sodium Total ICAP*	720	800	810	600	580	570
Strontium ICAP*	3.5	2.9	2.9	1.8	1.5	1.5
Total Organic Carbon*	39	52	40	30	35	30
Dissolved Organic Carbon*						
Dissolved UV abs. at 254 nm*	0.69	1	0.69	0.5	0.52	0.54
UV Transmittance (by calc from UVA)*	20.4	10.0	20.4	31.6	30.2	28.8
Total Hardness as CaCO ₃ by ICP (calc.)*	1400	1500	1500	920	900	820
Chloride*	980	1000	980	840	820	770
Sulfate*	1400	1500	1300	850	830	620
Total Dissolved Solids (TDS)*	4300	4200	4000	2900	2800	2400
Alkalinity as CaCO ₃ **	202	286	242	210	124	220
Ammonia**	1.72	2.1	1.88	2.48	2.09	1.45
Nitrate**	59	53.2	60.6	42.2	47.3	46.1
Ortho Phosphate**	0.194	0.193	0.284	0.259	0.179	0.285
* Performed by Eurofins Eaton						
** Performed by Ray Stoyer WRF lab						
¹ Analysis did not meet one or more of the QC criteria						
² Sample required dillution due to matrix						
³ Target analyte detected in blank at, or above, method detection limit						

Appendix G – cRRO Permeate Water Quality Data

Appendix G - cRRO Permeate Water Quality

Parameter	Units	MRL	MDL	Average	STDEV	1/12/17	1/19/17	1/25/17	1/26/17	2/3/17	2/8/17
Aluminum Total ICAP/MS*	µg/L	20	0.78	1.4	0.65	0.82	1.3		ND	ND	
Barium Total ICAP/MS*	µg/L	2	0.17	0.4	0.08	ND	ND		ND	ND	
Calcium Total ICAP*	mg/L	1	0.12	0.1	0.02	ND	ND		ND	ND	
Iron Total ICAP*	mg/L	0.02	0.0026	N/A	N/A	ND	ND		ND	ND	
Magnesium Total ICAP*	mg/L	0.1	0.003	0.0	0.01	0.021	0.31		0.016	0.024	
Potassium Total ICAP*	mg/L	1	0.13	1.9	0.42	1.5	1.4		1.3	2.2	
Silica*	mg/L	0.43	0.1	1.1	0.49	0.42	0.38		0.81	1	
Sodium Total ICAP*	mg/L	1	0.11	23.1	4.16	16	16		20	25	
Strontium ICAP*	mg/L	0.01	0.002	0.0	0.00	0.00072	ND		0.00077	0.001	
Total Organic Carbon*	mg/L	0.3	0.042	0.3	0.10	0.23	0.22		0.21	0.25	
Dissolved Organic Carbon*	mg/L	0.3	0.02	0.4	N/A		0.36 ⁴				
Dissolved UV abs. at 254 nm*	cm ⁻¹	0.009	0.002	0.0	0.00	0.01	0.01		0.01	0.013	
UV Transmittance (by calc from UVA)*	%			97.1	0.88	97.7	97.7		97.7	97.1	
Total Hardness as CaCO3 by ICP (calc.)*	mg/L	3	3	N/A	N/A	ND	ND		ND	ND	
Chloride*	mg/L	1	0.025	16.8	4.76	10	9.9		11	18	
Sulfate*	mg/L	0.5	0.06	0.5	0.14	0.49	0.42		0.35	0.69	
Total Dissolved Solids (TDS)*	mg/L	10	4.2	83.6	18.48	54	53		71	92	
Alkalinity as CaCO3**	mg/L	2		8.4	1.01				8	8	
Ammonia**	mg-N/L	0.2		0.5	0.05				0.465	0.398	
Nitrate**	mg-N/L	0.2		6.3	0.96				4.77	7.08	
Ortho Phosphate**	mg-P/L	0.01		0.0	0.07				0.0242	ND	
Total Kjeldahl nitrogen (TKN)**	mg-N/L	0.5		N/A	N/A				ND		
Biochemical Oxygen Demand (BOD)**	mg-BOD/L	2.0		N/A	N/A			ND			ND
Total Chlorine**	mg/L							3.1			1.4
Dissolved Oxygen (DO)**	mg/L							7.28			6.52
pH								5.32			5.26
* Performed by Eurofins Eaton											
** Performed by Ray Stoyer WRF lab											
⁴ Sample analyzed after more than 48 hours											

Appendix G - cRRO Permeate Water Quality

Parameter	2/9/17	2/16/17	2/22/17	2/24/17	3/2/17	3/8/17	3/9/17	3/16/17	3/23/17
Aluminum Total ICAP/MS*	ND	ND		ND	2.1		ND	ND	ND
Barium Total ICAP/MS*	ND	ND		0.42	0.31		ND	ND	ND
Calcium Total ICAP*	ND	ND		0.14	0.12		0.13	0.16	ND
Iron Total ICAP*	ND	ND		ND	ND		ND	ND	ND
Magnesium Total ICAP*	0.016	0.014		0.035	0.030		0.036	0.041	0.022
Potassium Total ICAP*	2.1	2		2.3	1.6		2.2	2.5	2.3
Silica*	0.95	0.8		1.3	1.9		1.5	1.7	1.1
Sodium Total ICAP*	24	22		26	26		27	28	24
Strontium ICAP*	0.00087	0.00062		0.0014	0.0009		0.001	0.0013	0.00072
Total Organic Carbon*	0.2	0.26		0.26	0.55		0.23	0.19	0.3
Dissolved Organic Carbon*									
Dissolved UV abs. at 254 nm*	0.014	0.018		0.022	0.013		0.01	0.011	0.01
UV Transmittance (by calc from UVA)*	96.8	95.9		95.1	97.1		97.7	97.5	97.7
Total Hardness as CaCO3 by ICP (calc.)*	ND	ND		ND	ND		ND	ND	ND
Chloride*	17	16		21	21		20	24	17
Sulfate*	0.37	0.32		0.71	0.43		0.55	0.41	0.32
Total Dissolved Solids (TDS)*	86	80		100	100		94	110	80
Alkalinity as CaCO3**	8	7		10	10		9	8	8
Ammonia**	0.4	0.569		0.522	0.498		0.476	0.504	0.487
Nitrate**	6.14	5.61		8.04	6.54		6.91	5.75	5.92
Ortho Phosphate**	0.163	ND		0.0109	ND		ND	0.0117	0.0182
Total Kjeldahl nitrogen (TKN)**	ND			ND			ND		
Biochemical Oxygen Demand (BOD)**			ND			ND			ND
Total Chlorine**			2.8			2.7			2.7
Dissolved Oxygen (DO)**			5.62			5.5			5.44
pH			5.38			6.55			5.49
* Performed by Eurofins Eaton									
** Performed by Ray Stoyer WRF lab									
⁴ Sample analyzed after more than 48 hours									

Appendix H – cRRO Brine Water Quality Data

Appendix H - cRRO Brine Water Quality

Parameter	Units	MRL	MDL	Average	STDEV	1/19/17	1/26/17
Aluminum dissolved ICAP/MS*	µg/L	20	0.78	132.5	49.92	200	
Aluminum Total ICAP/MS*	µg/L	20	0.78	242.5	55.00	230	
Barium dissolved ICAP/MS*	µg/L	2	0.17	915.0	306.97	1000	
Barium Total ICAP/MS*	µg/L	2	0.17	1092.5	438.43	1100	
Calcium Dissolved ICAP*	mg/L	1	0.12	1107.5	256.04	1200	
Calcium Total ICAP*	mg/L	1	0.12	1117.5	302.03	1200	
Iron Dissolved ICAP*	mg/L	0.02	0.0026	0.4	0.20	0.71	
Iron Total ICAP*	mg/L	0.02	0.0026	0.5	0.13	0.7	
Magnesium Dissolved ICAP*	mg/L	0.1	0.003	460.0	123.56	490	
Magnesium Total ICAP*	mg/L	0.1	0.003	485.0	157.80	500	
Potassium Dissolved ICAP*	mg/L	1	0.13	240.0	32.66	280	
Potassium Total ICAP*	mg/L	1	0.13	252.5	41.93	280	
Dissolved Silica*	mg/L	0.5	0.1	207.5	37.75	220	
Silica*	mg/L	0.43	0.1	227.5	88.08	180	
Sodium Dissolved ICAP*	mg/L	1	0.11	2525.0	427.20	2800	
Sodium Total ICAP*	mg/L	1	0.11	2675.0	607.59	2800	
Strontium ICAP*	mg/L	0.01	0.002	10.9	4.28	13	
Strontium Dissolved ICAP*	mg/L	0.01	0.002	9.4	6.58		
Total Organic Carbon*	mg/L	0.3	0.042	232.5	185.18	130	
Dissolved Organic Carbon*	mg/L	0.3	0.042	121.3	24.19	130	
Dissolved UV abs. at 254 nm*	cm ⁻¹	0.009	0.002	2.5	0.54	2.8	
UV Transmittance (by calc from UVA)*	%			0.6	0.91	0.2	
Total Hardness as CaCO ₃ by ICP (calc.)*	mg/L	3	3	4850.0	1279.32	5000	
Chloride*	mg/L	1	0.025	3175.0	478.71	3400	
Sulfate*	mg/L	0.5	0.06	4425.0	1289.38	5100	
Total Dissolved Solids (TDS)*	mg/L	10	4.2	13275.0	2938.68	14000	
Alkalinity as CaCO ₃ **	mg/L	2		680.8	187.41		640
Ammonia**	mg-N/L	0.2		6.3	0.82		6.28
Nitrate**	mg-N/L	0.2		282.8	188.11		218
Ortho Phosphate**	mg-P/L	0.01		8.7	17.48		40
* Performed by Eurofins Eaton							
** Performed by Ray Stoyer WRF lab							
¹ Analysis did not meet one or more of the QC criteria							
² Sample required dillution due to matrix							

Appendix H - cRRO Brine Water Quality

Parameter	2/3/17	2/9/17	2/24/17	3/9/17	3/23/17
Aluminum dissolved ICAP/MS*			90 ²	140	100
Aluminum Total ICAP/MS*			280 ²	290 ²	170 ¹
Barium dissolved ICAP/MS*			1100	1100	460
Barium Total ICAP/MS*			1400	1400	470
Calcium Dissolved ICAP*			1200	1300	730
Calcium Total ICAP*			1300	1300	670
Iron Dissolved ICAP*			0.3 ²	0.3	0.36 ¹
Iron Total ICAP*			0.48	0.52	0.38 ²
Magnesium Dissolved ICAP*			510	560	280
Magnesium Total ICAP*			560	620	260
Potassium Dissolved ICAP*			240	240	200
Potassium Total ICAP*			270	270	190
Dissolved Silica*			200	250	160
Silica*			230	350	150
Sodium Dissolved ICAP*			2600	2800	1900
Sodium Total ICAP*			2900	3200	1800
Strontium ICAP*			14	12	4.6
Strontium Dissolved ICAP*			14		4.7
Total Organic Carbon*			150 ¹	140	510
Dissolved Organic Carbon*				140	94
Dissolved UV abs. at 254 nm*			2.8	2.7	1.7
UV Transmittance (by calc from UVA)*			0.2	0.2	2.0
Total Hardness as CaCO ₃ by ICP (calc.)*			5600	5800	3000
Chloride*			3200	3600	2500
Sulfate*			5200	4900	2500
Total Dissolved Solids (TDS)*			16000	14000	9100
Alkalinity as CaCO ₃ **	720	680		944	420
Ammonia**	7.36	6.84		5.49	5.53
Nitrate**	226	213		614	143
Ortho Phosphate**	1.44	0.701		1.13	0.459
* Performed by Eurofins Eaton					
** Performed by Ray Stoyer WRF lab					
¹ Analysis did not meet one or more of the QC c					
² Sample required dillution due to matrix					

Appendix I – CCD Permeate Special Sampling Water Quality Data

Appendix I - CCD Permeate Special Sampling Water Quality Data (May 2016)

Category	Method	Units	Parameter	Sampling technique		Composite	24h Composite / Grab for Zinc and Bis-2-Ethylhexyl thalate	24h Composite	24h Composite	24h Composite / Grab for MTBE and Grease and Oil	Composite	Grab?	Average for Summary Table	
				Sampling Group	Annual Sample Analysis									Monthly Sample Analysis
				EnviroMatrix Analytical Log #	16E0673	16E0669	16E0670	16E0671	16E0672	16E0866	16E0865			
				MRL	MDL	5/19/16	5/19/16	5/19/16	5/19/16	5/19/16	5/26/16	5/26/16		
Total Metals by EPA 6000/7000	EPA 6010	mg/L	Calcium	0.5	0.1		1.72							
			Potassium	1	1		1.92							
			Magnesium	0.5	0.1		0.1							
			Sodium	0.5	0.04		17.3							
	EPA 7470	mg/L	Mercury	0.0001	0.00008	ND								
Total Metals by EPA 200	EPA 200.7	mg/L	Silver	0.1	0.01	ND								
			Aluminum	0.2	0.1	ND		ND						
			Arsenic	0.01	0.004	ND								
			Barium	0.01	0.004	ND								
			Beryllium	0.01	0.0002	ND								
			Cadmium	0.01	0.001	ND								
			Chromium	0.05	0.002	ND								
			Copper	0.05	0.009	ND								
			Nickel	0.05	0.004	ND								
			Lead	0.05	0.008	ND								
			Antimony	0.1	0.1	ND								
			Selenium	0.01	0.005	ND								
			Thallium	0.05	0.02	ND								
			Zinc	0.05	0.004	0.004		0.028						
Iron	0.1	0.05			0.093									
Manganese	0.03	0.03					ND							
Boron	0.5	0.1						0.68						
Conventional Chemistry Parameters by Standard/EPA Methods	SM2320B	mg-CaCO ₃ /L	Bicarbonate Alkalinity	5	5		10							
	SM4500 Cl C	mg/L	Chloride	0.05	0.05		20							
	SM2120 B	Color Units	Color	1	1		ND							
	SM2510 B	umhos/cm	Specific Conductance (EC)	1	1		117							
	SM4500 F C	mg/L	Fluoride	0.1	0.031				0.33					
	EPA 200.7	mg-CaCO ₃ /L	Hardness (Total)	10	10				ND					
	SM5540 C	mg/L	Methylene Blue Active Substances (MBAS)	0.5	0.1				ND					
	SM4500 SO4 E	mg/L	Sulfate as SO4	5	1				2.5					
EPA 1664 A	mg/L	Oil & Grease	5	1.56				ND						
SM5310B	mg/L	TOC	0.3	0.15				ND						
			Aldrin	0.1	0.07	ND								
			alpha-BHC	0.05	0.04	ND								
			beta-BHC	0.05	0.05	ND								
			gamma-BHC (Lindane)	0.05	0.05	ND								
			delta-BHC	0.05	0.05	ND								

Appendix I - CCD Permeate Special Sampling Water Quality Data (May 2016)

Category	Method	Units	Parameter	Sampling technique		Composite	24h Composite / Grab for Zinc and Bis-2-Ethylhexyl thalate	24h Composite	24h Composite	24h Composite / Grab for MTBE and Grease and Oil	Composite	Grab?	Average for Summary Table	
				Sampling Group		Annual Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Quarterly Sample Analysis	Annual Sample Analysis	Monthly Sample Analysis		
				EnviroMatrix Analytical Log #		16E0673	16E0669	16E0670	16E0671	16E0672	16E0866	16E0865		
				MRL	MDL	5/19/16	5/19/16	5/19/16	5/19/16	5/19/16	5/26/16	5/26/16		
Organochlorine Pesticides and PCBs by EPA 608	EPA 608	µg/L	alpha-Chlordane	0.1	0.04	ND								
			gamma-Chlordane	0.1	0.04	ND								
			Chlordane (Total)	0.1	0.04	ND								
			4,4'-DDD	0.1	0.04	ND								
			4,4'-DDE	0.1	0.04	ND								
			4,4'-DDT	0.1	0.08	ND								
			Dieldrin	0.1	0.04	ND								
			Endosulfan I	0.05	0.04	ND								
			Endosulfan II	0.1	0.05	ND								
			Endosulfan sulfate	0.1	0.06	ND								
			Endrin	0.1	0.05	ND								
			Endrin aldehyde	0.1	0.04	ND								
			Heptachlor	0.05	0.04	ND								
			Heptachlor epoxide	0.05	0.05	ND								
			Methoxychlor	0.5	0.13	ND								
			Toxaphene	1	1	ND								
			Arochlor-1016	0.5	0.34	ND								
			Arochlor-1221	0.5	0.34	ND								
			Arochlor-1232	0.5	0.34	ND								
Arochlor-1242	0.5	0.34	ND											
Arochlor-1248	0.5	0.34	ND											
Arochlor-1254	0.5	0.34	ND											
Arochlor-1260	0.5	0.34	ND											
			Arcleoin	100	2.8	ND								
			Acrylonitrile	10	0.66	ND								
			Benzene	1	0.24	ND								
			Bromodichloromethane	1	0.17	8.96							13	10.98
			Bromoform	1	0.17	0.40							0.48	0.44
			Bromomethane	2	0.67	ND								
			Carbon tetrachloride	2	0.26	ND								
			Chlorobenzene	1	0.21	ND								
			Chlorodibromomethane	1	0.23	3.12							5.1	4.11
			Chloroethane	2	0.88	ND								
			2-Chloroethylvinyl ether	2	0.36	ND								
			Chloroform	1	0.28	12.7							15.2	13.95
			Chloromethane	2	0.76	ND								
1,2-Dibromoethane (EDB)	1	0.26	ND											
1,2-Dichlorobenzene	1	0.09	ND											

Appendix I - CCD Permeate Special Sampling Water Quality Data (May 2016)

Category	Method	Units	Parameter	Sampling technique		Composite	24h Composite / Grab for Zinc and Bis-2-Ethylhexyl thalate	24h Composite	24h Composite	24h Composite / Grab for MTBE and Grease and Oil	Composite	Grab?	Average for Summary Table	
				Sampling Group		Annual Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Quarterly Sample Analysis	Annual Sample Analysis	Monthly Sample Analysis		
				EnviroMatrix Analytical Log #		16E0673	16E0669	16E0670	16E0671	16E0672	16E0866	16E0865		
				MRL	MDL	5/19/16	5/19/16	5/19/16	5/19/16	5/19/16	5/26/16	5/26/16		
Purgeables by EPA Method 624	EPA 624	µg/L	1,3-Dichlorobenzene	1	0.15	ND								
			1,4-Dichlorobenzene	1	0.14	ND								
			1,1-Dichloroethane	1	0.31	ND								
			1,2-Dichloroethane	1	0.21	ND								
			1,1-Dichloroethane	1	0.31	ND								
			trans-1,2-Dichloroethene	1	0.19	ND								
			1,2-Dichloropropane	1	0.21	ND								
			cis-1,3-Dichloropropene	1	0.22	ND								
			trans-1,3-Dichloropropene	1	0.17	ND								
			Ethyl benzene	1	0.18	ND								
			Methylene chloride	5	0.35	ND								
			1,1,2,2-Tetrachloroethane	2	0.21	ND								
			Tetrachloroethene	1	0.66	ND								
			Toluene	1	0.21	ND								
			1,1,1-Trichloroethene	2	0.41	ND								
			1,1,2-Trichloroethene	1	0.22	ND								
			Trichloroethane	1	0.12	ND								
			Trichlorofluoromethane	2	0.36	ND								
Vinyl chloride	2	0.43	ND											
Methyl tert-butyl ether (MTBE)	1	0.47						ND						
Total Trihalomethanes (TTHMs)	1	0.17									33.8			
			Acenaphthene	2	0.52	ND	ND							
			Acenaphthylene	2	0.87	ND	ND							
			Anthracene	2	0.63	ND	ND							
			Benzidine	50	0.18	ND	ND							
			Benzo (a) anthracene	2	0.65	ND	ND							
			Benzo (b) fluoranthene	2	1.8	ND	ND							
			Benzo (k) fluoranthene	2	1.39	ND	ND							
			Benzo (g,h,i) perylene	2	1.09	ND	ND							
			Benzo (a) pyrene	2	0.65	ND	ND							
			Bis(2-chloroethoxy)methane	2	0.49	ND	ND							
			Bis(2-chloroethyl)ether	2	0.66	ND	ND							
			Bis(2-chloroisopropyl)ether	2	0.66	ND	ND							
Bis(2-ethylhexyl)phthalate	2	1.79	ND	ND										

Category	Method	Units	Parameter	Sampling technique		Composite	24h Composite / Grab for Zinc and Bis-2-Ethylhexyl thalate	24h Composite	24h Composite	24h Composite / Grab for MTBE and Grease and Oil	Composite	Grab?	Average for Summary Table	
				Sampling Group		Annual Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Quarterly Sample Analysis	Annual Sample Analysis	Monthly Sample Analysis		
				EnviroMatrix Analytical Log #		16E0673	16E0669	16E0670	16E0671	16E0672	16E0866	16E0865		
				MRL	MDL	5/19/16	5/19/16	5/19/16	5/19/16	5/19/16	5/26/16	5/26/16		
Acid and Base/Neutral Extractables by EPA 625	EPA 625	µg/L	4-Bromophenyl phenyl ether	2	1.05	ND	ND							
			Butyl benzyl phthalate	2	0.91	ND	ND							
			4-Chloroaniline	10	2.86	ND	ND							
			4-Chloro-3-methylphenol	2	1.21	ND	ND							
			2-Chloronaphthalene	2	0.97	ND	ND							
			2-Chlorophenol	2	0.73	ND	ND							
			4-Chlorophenyl phenyl ether	2	0.44	ND	ND							
			Chrysene	2	0.5	ND	ND							
			Dibenz (a,h) anthracene	2	0.95	ND	ND							
			Dibenzofuran	2	0.89	ND	ND							
			Di-n-butylphthalate	2	0.52	1.30	ND							
			1,2-Dichlorobenzene	2	0.62	ND	ND							
			1,3-Dichlorobenzene	2	0.4	ND	ND							
			1,4-Dichlorobenzene	2	0.66	ND	ND							
			3,3'-Dichlorobenzidine	5	2.52	ND	ND							
			2,4-Dichlorophenol	2	0.75	ND	ND							
			Dimethyl phthalate	2	0.91	ND	ND							
			2,4-Dimethylphenol	2	1.64	ND	ND							
			Diethyl phthalate	2	0.66	ND	ND							
			4,6-Dinitro-2-methylphenol	2	0.78	ND	ND							
			2,4-Dinitrophenol	2	0.97	ND	ND							
			2,4-Dinitrotoluene	2	0.66	ND	ND							
			2,6-Dinitrotoluene	2	0.67	ND	ND							
			Di-n-octyl-phthalate	2	0.77	ND	ND							
			1,2-Diphenylhydrazine	2	0.79	ND	ND							
			Fluoranthene	2	0.6	ND	ND							
			Fluorene	2	0.55	ND	ND							
			Hexachlorobenzene	2	0.73	ND	ND							
			Hexachlorobutadiene	2	0.77	ND	ND							
			Hexachlorocyclopentadiene	2	1.17	ND	ND							
Hexachloroethane	2	0.47	ND	ND										
Indeno (1,2,3-cd)pyrene	2	0.99	ND	ND										
Isophorone	2	0.57	ND	ND										
2-Methylnaphthalene	2	1.18	ND	ND										
2-Methylphenol	2	1.5	ND	ND										

Appendix I - CCD Permeate Special Sampling Water Quality Data (May 2016)

Category	Method	Units	Parameter	Sampling technique		Composite	24h Composite / Grab for Zinc and Bis-2-Ethylhexyl thalate	24h Composite	24h Composite	24h Composite / Grab for MTBE and Grease and Oil	Composite	Grab?	Average for Summary Table	
				Sampling Group		Annual Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Quarterly Sample Analysis	Annual Sample Analysis	Monthly Sample Analysis		
				EnviroMatrix Analytical Log #		16E0673	16E0669	16E0670	16E0671	16E0672	16E0866	16E0865		
				MRL	MDL	5/19/16	5/19/16	5/19/16	5/19/16	5/19/16	5/26/16	5/26/16		
			4-Methylphenol	2	1.6	ND	ND							
			Naphthalene	2	0.36	ND	ND							
			2-Nitroaniline	5	2.26	ND	ND							
			3-Nitroanilini	5	2.84	ND	ND							
			4-Nitroaniline	5	1.89	ND	ND							
			Nitrobenzene	2	0.61	ND	ND							
			2-Nitrophenol	2	0.81	ND	ND							
			4-Nitrophenol	2	1.04	ND	ND							
			N-Nitrosodimethylamine (NDMA)	2	0.85	ND	ND							
			N-Nitrosodiphenylamine	2	0.96	ND	ND							
			N-Nitrosodi-n-propylamine	2	1.07	ND	ND							
			Pentachlorophenol	2	1.07	ND	ND							
			Phenanthrene	2	0.46	ND	ND							
			Phenol	2	1.08	ND	ND							
			Pyrene	2	1.15	ND	ND							
			Pyridine	2	1.46	ND	ND							
1,2,4-Trichlorobenzene	2	0.53	ND	ND										
2,4,5-Trichlorophenol	2	1.07	ND	ND										
2,4,6-Trichlorophenol	2	1.19	ND	ND										
Polynuclear Aromatic Compounds by EPA Method 8270C	EPA 8270C	µg/L	Acenaphthene	2	0.77	ND					ND			
			Acenaphthylene	2	0.87	ND						ND		
			Anthracene	2	0.63	ND						ND		
			Benzo (a) pyrene	2	0.55	ND						ND		
			Benzo (b) fluoranthene	2	1.8	ND						ND		
			Benzo (k) fluoranthene	2	1.39	ND						ND		
			Benzo (g,h,i) perylene	2	1.09	ND						ND		
			Benzo (a) pyrene	2	0.65	ND						ND		
			Chrysene	2	0.5	ND						ND		
			Dibenz (a,h) anthracene	2	0.95	ND						ND		
			Fluoranthene	2	0.6	ND						ND		
			Fluorene	2	0.55	ND						ND		
			Indeno (1,2,3-cd)pyrene	2	0.99	ND						ND		
			Phenanthrene	2	0.46	ND						ND		
Pyrene	2	1.15	ND						ND					
Transmission Electron			Asbestos Conc (>10 µm)	0.18	0.18	ND								

Appendix I - CCD Permeate Special Sampling Water Quality Data (May 2016)

Category	Method	Units	Parameter	Sampling technique		Composite	24h Composite / Grab for Zinc and Bis-2-Ethylhexyl thalate	24h Composite	24h Composite	24h Composite / Grab for MTBE and Grease and Oil	Composite	Grab?	Average for Summary Table
				Sampling Group		Annual Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Monthly Sample Analysis	Quarterly Sample Analysis	Annual Sample Analysis	Monthly Sample Analysis	
				EnviroMatrix Analytical Log #		16E0673	16E0669	16E0670	16E0671	16E0672	16E0866	16E0865	
				MRL	MDL	5/19/16	5/19/16	5/19/16	5/19/16	5/19/16	5/26/16	5/26/16	
Microscopy (TEM) for Asbestos	TEM	µm/L	Asbestos Conc (Total)	0.18	0.18	ND							
Miscellaneous Physical/Conventional Chemistry Parameters	Suarez-1981	Ratio	adj-Sodium Adsorption Ratio	0.1	0.1		1.00						
	Calculation	%	% Sodium of Irrigation Water	0.5	0.5		84						

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
Haloacetic Acids	SM 6251B	µg/L	Bromochloroacetic acid	0.053	1	ND	-
			Dibromoacetic acid	0.054	1	ND	-
			Dichloroacetic acid	0.1	1	ND	-
			Monobromoacetic acid	0.055	1	ND	-
			Monochloroacetic acid	0.41	2	ND	-
			Total Haloacetic Acids (HAA5)	2	2	ND	-
			Trichloroacetic acid	0.1	1	ND	-
Trihalomethanes	EPA 551.1	µg/L	Bromodichloromethane	0.057	0.5	21	-
			Bromoform	0.045	0.5	0.46	-
			Chloroform	0.054	0.5	40	-
			Dibromochloromethane	0.027	0.5	5.6	-
			Total Trihalomethanes		0.5	67	-
EPA Method 556	EPA 556	µg/L	Acetaldehyde	0.19	1	5.9	-
			Formaldehyde	0.81	5	27	-
			2,4-DDD	0.044	0.1	ND	ND
			2,4-DDE	0.019	0.1	ND	ND
			2,4-DDT	0.014	0.1	ND	ND
			2,4-Dinitrotoluene	0.013	0.1	ND	ND
			2,6-Dinitrotoluene	0.036	0.1	ND	ND
			4,4-DDD	0.015	0.1	ND	ND
			4,4-DDE	0.018	0.1	ND	ND
			4,4-DDT	0.031	0.1	ND	ND
			Acenaphthene	0.016	0.1	ND	ND
			Acenaphthylene	0.014	0.1	ND	ND
			Acetochlor	0.009	0.1	ND	ND
			Alachlor	0.022	0.05	ND	ND
			Aldrin	0.042	0.05	ND	ND
			Alpha-BHC	0.018	0.1	ND	ND
			alpha-Chlordane ND	0.029	0.05	ND	ND
			Anthracene	0.019	0.02	ND	ND
			Atrazine	0.048	0.05	ND	ND
			Benz(a)Anthracene	0.011	0.05	ND	ND

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
Semivolatiles by GCMS	EPA 525.2	µg/L	Benzo(a)pyrene	0.011	0.02	ND	ND
			Benzo(b)Fluoranthene	0.011	0.02	ND	ND
			Benzo(g,h,i)Perylene	0.012	0.05	ND	ND
			Benzo(k)Fluoranthene	0.017	0.02	ND	ND
			Beta-BHC	0.02	0.1	ND	ND
			Bromacil	0.029	0.2	ND	ND
			Butachlor	0.033	0.05	ND	ND
			Butylbenzylphthalate	0.063	0.5	ND	ND
			Caffeine by method 525mod	0.02	0.05	ND	0.065
			Chlorobenzilate	0.019	0.1	ND	ND
			Chloroneb	0.016	0.1	ND	ND
			Chlorothalonil(Draconil,Bravo)	0.016	0.1	ND	ND
			Chlorpyrifos (Dursban)	0.019	0.05	ND	ND
			Chrysene	0.014	0.02	ND	ND
			Delta-BHC	0.033	0.1	ND	ND
			Di-(2-Ethylhexyl)adipate	0.063	0.6	ND	ND
			Di(2-Ethylhexyl)phthalate	0.15	0.6	ND	ND
			Diazinon (Qualitative)	0.025	0.1	ND	ND
			Dibenz(a,h)Anthracene	0.033	0.05	ND	ND
			Dichlorvos (DDVP)	0.022	0.05	ND	ND
			Dieldrin	0.017	0.2	ND	ND
			Diethylphthalate	0.051	0.5	ND	ND
			Dimethoate	0.033	0.1	ND	ND
			Dimethylphthalate	0.039	0.5	ND	ND
			Di-n-Butylphthalate	0.074	1	ND	ND
			Di-N-octylphthalate	0.027	0.1	ND	ND
			Endosulfan I (Alpha)	0.058	0.1	ND	ND
			Endosulfan II (Beta)	0.052	0.1	ND	ND
Endosulfan Sulfate	0.04	0.1	ND	ND			
Endrin	0.038	0.2	ND	ND			
Endrin Aldehyde	0.084	0.1	ND	ND			
EPTC	0.013	0.1	ND	ND			

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
			Fluoranthene	0.01	0.1	ND	ND
			Fluorene	0.014	0.05	ND	ND
			gamma-Chlordane	0.021	0.05	ND	ND
			Heptachlor	0.013	0.03	ND	ND
			Heptachlor Epoxide (isomer B)	0.023	0.05	ND	ND
			Hexachlorobenzene	0.041	0.05	ND	ND
			Hexachlorocyclopentadiene	0.038	0.05	ND	ND
			Indeno(1,2,3,c,d)Pyrene	0.027	0.05	ND	ND
			Isophorone	0.02	0.5	ND	ND
			Lindane	0.022	0.04	ND	ND
			Malathion	0.025	0.1	ND	ND
			Methoxychlor	0.032	0.1	ND	ND
			Metolachlor	0.016	0.05	ND	ND
			Metribuzin	0.016	0.05	ND	ND
			Molinate	0.015	0.1	ND	ND
			Naphthalene	0.014	0.3	ND	ND
			Parathion	0.037	0.1	ND	ND
			Pendimethalin	0.047	0.1	ND	ND
			Pentachlorophenol	0.32	1	ND	ND
			Permethrin (mixed isomers)	0.037	0.1	ND	ND
			Phenanthrene	0.008	0.04	ND	ND
			Propachlor	0.02	0.05	ND	ND
			Pyrene	0.008	0.05	ND	ND
			Simazine	0.028	0.05	ND	ND
			Terbacil	0.069	0.1	ND	ND
			Terbutylazine	0.023	0.1	ND	ND
			Thiobencarb (ELAP)	0.017	0.2	ND	ND
			trans-Nonachlor	0.026	0.05	ND	ND
			Trifluralin	0.044	0.1	ND	ND
1,4-Dioxane	EPA 522	µg/L	1,4-Dioxane	0.085	1	0.32	0.26
Nitrosamines by GCMS	EPA 521	ng/L	N-Nitroso-dimethylamine (NDMA)	0.96	2	17	22

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
Bromate by UV/VIS 317	EPA 317	µg/L	Bromate by UV/VIS	0.2	1	ND	-
Disinfection ByProducts by 300.0	EPA 300.0	µg/L	Chlorate by IC	1.3	10	98	-
			1,7-Dimethylxanthine	3.4	10	ND	ND
			Acetaminophen	3.0	5	ND	ND
			Albuterol	2.4	5	ND	ND
			Amoxicillin (semi-quantitative)	6.4	20	ND	ND
			Androstenedione	1.7	5	ND	ND
			Atenolol	3.9	5	10	54
			Atrazine	2.3	5	ND	ND
			Azithromycin	10	20	ND	ND
			Bezafibrate	3.5	5	ND	ND
			Bromacil	3.2	5	ND	ND
			Caffeine	4.3	5	ND	ND
			Carbadox	4.2	5	ND	ND
			Carbamazepine	1.2	5	ND	ND
			Carisoprodol	1.2	5	ND	ND
			Chloridazon	1.6	5	ND	ND
			Chlorotoluron	0.89	5	ND	ND
			Cimetidine	2.7	5	ND	ND
			Cotinine	4.8	10	8.2	ND
			Cyanazine	1.7	5	2.9	3.4
			DACT	3.9	5	ND	ND
			DEA	1.5	5	ND	ND
			DEET	1.1	10	2.6	ND
			Dehydronifedipine	1.4	5	ND	ND
			DIA	2.4	5	ND	ND
			Diazepam	1.1	5	ND	ND
			Dilantin	13	20	ND	ND
			Diltiazem	3.0	5	ND	ND

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
Endocrine Disruptors Positive Mode	LC/MS-MS SPE	ng/L	Diuron	1.8	5	ND	ND
			Erythromycin	4.0	10	ND	ND
			Flumequine	7.1	10	ND	ND
			Fluoxetine	10	10	ND	ND
			Isoproturon	12	100	ND	ND
			Ketoprofen	2.6	5	ND	ND
			Ketorolac	2.1	5	ND	ND
			Lidocaine	1.1	5	ND	ND
			Lincomycin	1.7	10	ND	ND
			Linuron	2.8	5	ND	ND
			Lopressor	5.1	20	19	ND
			Meclofenamic Acid	4.7	5	ND	ND
			Meprobamate	2.0	5	ND	ND
			Metazachlor	1.3	5	ND	ND
			Metolachlor		5	ND	ND
			Nifedipine	12	20	ND	ND
			Norethisterone	2.3	5	ND	ND
			OUST (Sulfameturon,methyl)	2.5	5	ND	ND
			Oxolinic acid	2.5	10	ND	ND
			Pentoxifylline	1.5	5	ND	ND
			Phenazone	5.0	5	ND	ND
			Primidone	4.8	5	ND	ND
			Progesterone	2.9	5	ND	ND
			Propazine	1.8	5	ND	ND
			Quinoline	2.5	5	ND	3.6
			Simazine	1.2	5	ND	ND
			Sulfachloropyridazine	2.1	5	ND	ND
Sulfadiazine	3.9	5	ND	ND			
Sulfadimethoxine	1.6	5	ND	ND			
Sulfamerazine	4.6	5	ND	ND			
Sulfamethazine	1.5	5	ND	ND			
Sulfamethizole	3.2	5	ND	ND			

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
			Sulfamethoxazole	2.8	5	ND	ND
			Sulfathiazole	2.4	5	ND	ND
			TCEP	3.2	10	ND	4.4
			TCPP	20	100	ND	ND
			TDCPP	20	100	ND	ND
			Testosterone	2.5	5	ND	ND
			Theobromine	3.2	10	ND	ND
			Theophylline	4.8	20	ND	ND
			Thiabendazole	2.4	5	ND	ND
			Trimethoprim	1.8	5	ND	ND
Endocrine Disruptors Negative Mode	LC/MS-MS SPE	ng/L	2,4-D	5.0	5	ND	ND
			4-nonylphenol (semi-quantitative)	50	100	ND	ND
			4-tert-Octylphenol	6.9	50	ND	ND
			Acesulfame-K	20	20	ND	ND
			Bendroflumethiazide	4.4	5	ND	ND
			BPA	7.2	10	ND	ND
			Butalbital	2.9	5	ND	ND
			Butylparaben	3.3	5	ND	ND
			Chloramphenicol	3.1	10	ND	ND
			Clofibric Acid	5.0	5	ND	ND
			Diclofenac	3.3	5	ND	ND
			Estradiol	4.4	5	ND	ND
			Estriol	4.0	5	ND	ND
			Estrone	3.9	5	ND	ND
			Ethinyl Estradiol - 17 alpha	3.3	5	ND	ND
			Ethylparaben	11	20	13	ND
			Gemfibrozil	2.5	5	ND	ND
			Ibuprofen	8.6	10	ND	ND
			Iohexal	7.7	10	14	20
			Iopromide	1.6	5	ND	ND
Isobutylparaben	4.2	5	ND	ND			
Methylparaben	11	20	11	ND			

Appendix I - CCD Permeate Special Water Quality Data (Sep 2016)

Category	Method	Units	Parameter	MDL	MRL	9/26/16	9/29/16
			Naproxen	8.5	10	ND	ND
			Propylparaben	2.9	5	6.3	ND
			Salicylic Acid		100	ND	ND
			Sucralose	42	100	92	120
			Triclocarban		5	38	5.3
			Triclosan	6.3	10	ND	36
			Warfarin	4.1	5	ND	ND
Perfluorinated Alkyl Acids	EPA 537	µg/L	Perfluorooctanesulfonic acid	0.00020	0.0025	ND	-
			Perfluorooctanoic acid	0.00023	0.0025	ND	-
Perchlorate by EPA 331.0	EPA 331.0	µg/L	Perchlorate	0.086	2	ND	-

Appendix J – CCD Pilot System Process Flow Diagram

Appendix K – cRRO Pilot System Process Flow Diagram

Appendix L – cRRO Model Projections at 95% and 92.5% Overall Recovery

Appendix M – CCD Tail Element Membrane Autopsy

Appendix N – cRRO Tail Element Membrane Autopsy