
To: Nevada Division of Environmental Protection
Nevada Environmental Response Trust

Cc: Nevada Environmental Response Trust Stakeholders

From: Ryan Sullivan, Vice President Service and O&M

Date: August 20, 2019

Subject: NERT – GWETS Operation Monthly Report – July 2019

At the request of the Nevada Environmental Response Trust (Trust), Envirogen Technologies, Inc. (ETI) is providing this summary of the groundwater extraction and treatment system (GWETS) operation and performance during July 2019.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in July 2019. Flow from PC-119, PC-120, PC-121, and PC-133 was routed to the IX system, bypassing all flow meters associated with the FBR plant. The flow rate to the IX system averaged approximately 182 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 1,007 gpm during July 2019. At the end of the month, the GW-11 Pond volume was at 36.8 million gallons (MG), which would allow 17.8 days of available additional storage in the event of an emergency FBR plant shutdown with continued well field pumping. The water volume stored in the GW-11 Pond decreased by 0.4 MG from the end of June 2019. Figure 1 in this report depicts the actual GW-11 pond volumes and additional storage available.

The influent perchlorate concentration to the IX system averaged 0.26 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 102 mg/L for the month, with a maximum concentration of 120 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of June 2019 averaged 138 mg/l, with a maximum concentration of 160 mg/l. Fluctuations in the influent perchlorate concentrations are due to the changes in the AP-5 treatment feed rate and not a result of groundwater changes.

Enhanced Operational Metrics

Tables 1 and 2 provide a summary of the current GWETS operational metrics data for flow rates, perchlorate and chromium concentrations, and mass removal. These tables also include data associated with the AP-5 decant liquids. Figure 2 graphically presents historical perchlorate and chromium mass flux information. Attachment A provides a summary of the NPDES permit analytes with numerical discharge limits.

Operational Issues

All routine plant repairs conducted by ETI were performed in accordance with the NERT Perchlorate Treatment System Operations Manual. The following is a list of operational issues and major repairs and/or equipment replaced during this reporting period.

1. GW-11

There were no operational issues with GW-11 in the month of July.

2. Biological Plant

Treatment of AP-5 water through the FBR Biological plant continued in the month of July beginning with a flow rate of 0.5 gpm and increasing in flow to 1.0 gpm thru the end of July 2019. Changes in flow were made to balance the load from processing AP-5 material with seasonal restrictions in NERT's NPDES permit during the summer months.

There were influent / effluent diversions during the reporting period generally associated with maintenance activities. Below is a description of the events that occurred:

Diversion Events / Well Shutdowns

- Effluent Diversion to GW-11 occurred on July 1, 2019 from 11:03pm to 5:03am due to concerns that the GW-11 pond level was approaching its minimum permitted level. The pond level transducer was cleaned and calibrated. Approximately 383,000 gallons of water were diverted to GW-11.
- Influent diversion to GW-11 on July 8, 2019 from 7:55pm to 8:24pm due to maintenance activities at the sand filter causing the T-621 tank to reach a high level. Maintenance activities were paused until the tank was returned to an appropriate level. Approximately 31,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on July 15, 2019 from 10:17am to 10:49am due to maintenance activities on the effluent pipeline. Approximately 34,000 gallons of water were diverted to GW-11.
- Influent diversion to GW-11 occurred on July 17, 2019 from 9:35pm to 11:39pm due to an I/O communication card failure at the ethanol feed system. The I/O card was replaced and the plant was brought back online. Approximately 125,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on July 18, 2019 from 2:38am to 4:00am as a precautionary measure due to concerns about the effluent quality following the I/O card failure. Approximately 90,000 gallons of effluent were diverted to GW-11.
- Effluent diversion to GW-11 occurred on July 26, 2019 from 10:32pm to 11:57pm as a precautionary measure due to concerns about the effluent quality. Adjustments were made to the process and the effluent was returned to the outfall. Approximately 70,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on July 27, 2019 from 9:50am to 11:05am as a precautionary measure due to concerns about the effluent quality. Adjustments were made to the process and the effluent was returned to the outfall. Approximately 50,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on July 28, 2019 from 8:17am to 3:11pm due to a damaged

level control valve. The level control valve was disassembled, cleaned, repaired, and placed back into service. Approximately 451,000 gallons of water were diverted to GW-11.

3. Spills

There were no reportable spills in the month of July.

4. Maintenance

- Major maintenance performed by ETI in the month included:
 - I. Installed the new DAF polymer system.
 - II. Assembled and installed the new P-602 pump.
 - III. Installed the clamp rings for the caustic bulkhead.
 - IV. Installed a new motor on the pump at the southeast corner sump of GW-11.
 - V. Replaced the motor on PC-150.
 - VI. Removed debris and replaced the I/P controllers on the level control positioners for the separators.
 - VII. Repaired the solenoid on the plate shifter for the filter press.
 - VIII. Replaced the I/O card that controls the ethanol pumps for FBR's 1-4.
 - IX. Rebuilt the bed height pump for FBR 4.

- Preventative Maintenance completed or being performed by ETI in the month included:
 - I. Pulled, cleaned and calibrated the pond level transducer.
 - II. Pulled and inspected the pumps in the GW-11 Pond sumps.
 - III. Maintained the landscape at the outfall.
 - IV. Inspected the separator level control positioners.
 - V. Calibrated the H2S monitors.
 - VI. Cleared debris and inspected the sump pumps.
 - VII. Pulled and cleaned the media on the evaporation coolers.
 - VIII. Rebuilt spare media return pumps.
 - IX. Inspected the MCC Air Conditioning units at the lift stations.

GWETS Upgrades and Facility Projects

Unit 4 Water Treatment – ETI received approval from the Trust for a Work Authorization for providing the design and engineering scope associated with expanding the treatment system for Unit 4 groundwater treatment. This work is currently in progress and most of the deliverables associated with the design project were submitted to the Trust via email on July 31, 2019. Proposals will be submitted to the Trust in August for performing the treatment plant modifications and for O&M of the expanded system.

Documents regarding expansion of the treatment system to support TIMET's UIC permit modification were submitted to the Trust in May.

Equipment Availability Tracking

ETI operators continue to update the equipment tracking form on a weekly basis or whenever there is a

change in the status of key equipment. During regular site visits, Tetra Tech field personnel verify the entries on the form, including both the operating status and confirmation of the inventory of required shelf spares. The equipment tracking form is included as Attachment B.

GWETS Staffing

ETI continues with 24-hour staffing of the GWETS at the direction of the Trust and continues to follow the security procedures in the Standard Operating Procedures (SOP).

Tables

Operational Metrics

Nevada Environmental Response Trust Groundwater Extraction and Treatment System Monthly Stakeholder Metrics				
Location ID	Average Flow Rate (gpm)	Perchlorate (mg/L) ^{6 7}	Chromium (TR) (mg/L) ^{6 7}	Chromium(VI) (mg/L) ^{6 7}
SWF Total Extraction ¹	741 ⁵	7.5	0.0019	0.0015
AWF Total Extraction ¹	463 ⁵	69	0.15	0.14
IWF Total Extraction ¹	59 ⁵	494	6.4	6.3
AP Area Total Extraction ¹	12.8 ⁵	580	0.074	0.074
GWTP Effluent ²	61	533	0.27	ND
GW-11 Influent ¹	0.45	57	0.09	0.037
FBR Influent ^{2 3}	1,007	102	0.026	0.022
T-205 Effluent (AP-5 Wash Water) ^{3 4}	1.3	17,606	NA	NA

Notes:

TR = Total Recoverable; NA = Not Analyzed; ND = Not detectable above laboratory method detection limit (Chromium (VI) = 0.25 ug/L).

- 1: Perchlorate and chromium TR sampled monthly, values reported from TestAmerica.
- 2: Perchlorate, chromium TR, and chromium (VI) sampled weekly, values reported from TestAmerica.
- 3: AP-5 Wash Water perchlorate data is also included in the GW-11 Effluent/ FBR Influent totals.
- 4: Flow weighted average concentration based on mass flow meter readings.
- 5: Sum of daily average flow for individual wells.
- 6: All concentrations reported are monthly flow weighted averages.
- 7: ND analytical values are treated as zero values in the flow weighted average calculations.

Nevada Environmental Response Trust Groundwater Extraction and Treatment System Monthly Stakeholder Metrics			
Location ID	Perchlorate (lbs/month) ³	Chromium (TR) (lbs/month) ³	Chromium (VI) (lbs/month) ³
SWF Total Extraction	2,076	0.53	0.42
AWF Total Extraction	11,992	26	25
IWF Total Extraction	10,843	141	139
AP Area Total Extraction	2,771	0.35	0.35
GWTP Effluent	12,189	6.1	ND
GW-11 Influent	9.6	0.015	0.0062
FBR Influent ¹	38,291	9.9	8.4
T-205 Effluent (AP-5 Wash Water) ^{1 2}	8,298	NA	NA

Notes:

TR = Total Recoverable; NA = Not Analyzed.

1: AP-5 Wash Water perchlorate data is also included in the GW-11 Effluent/ FBR Influent totals.

2: AP-5 Wash Water concentrations and mass flux are estimates based on mass flow meter readings.

3: Total mass extracted is calculated from flow weighted average concentration and average flow (see Table 1).

Figures

Operational Metrics

Figure 1 - GW-11 Pond Volume Through 7/31/2019

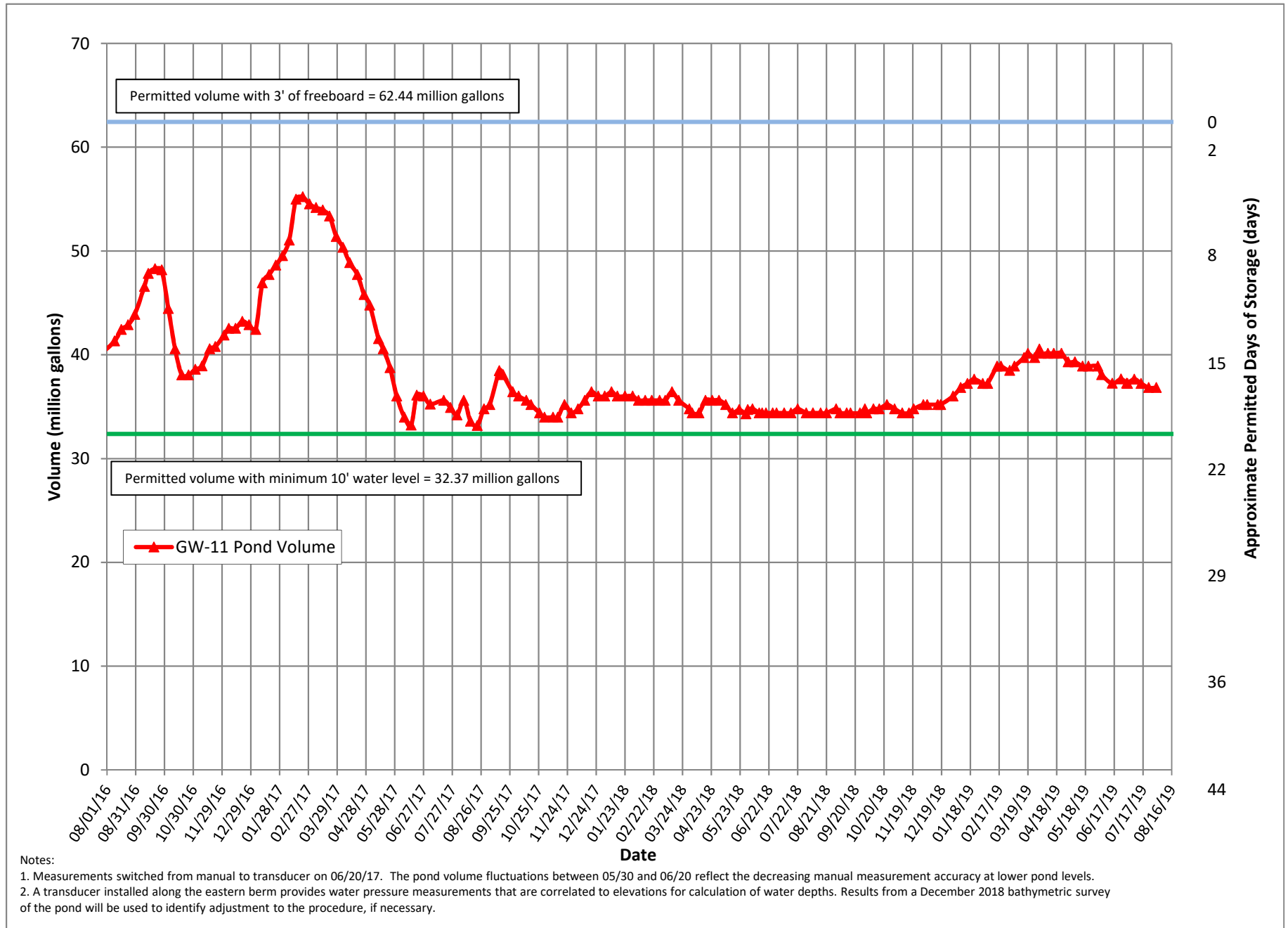
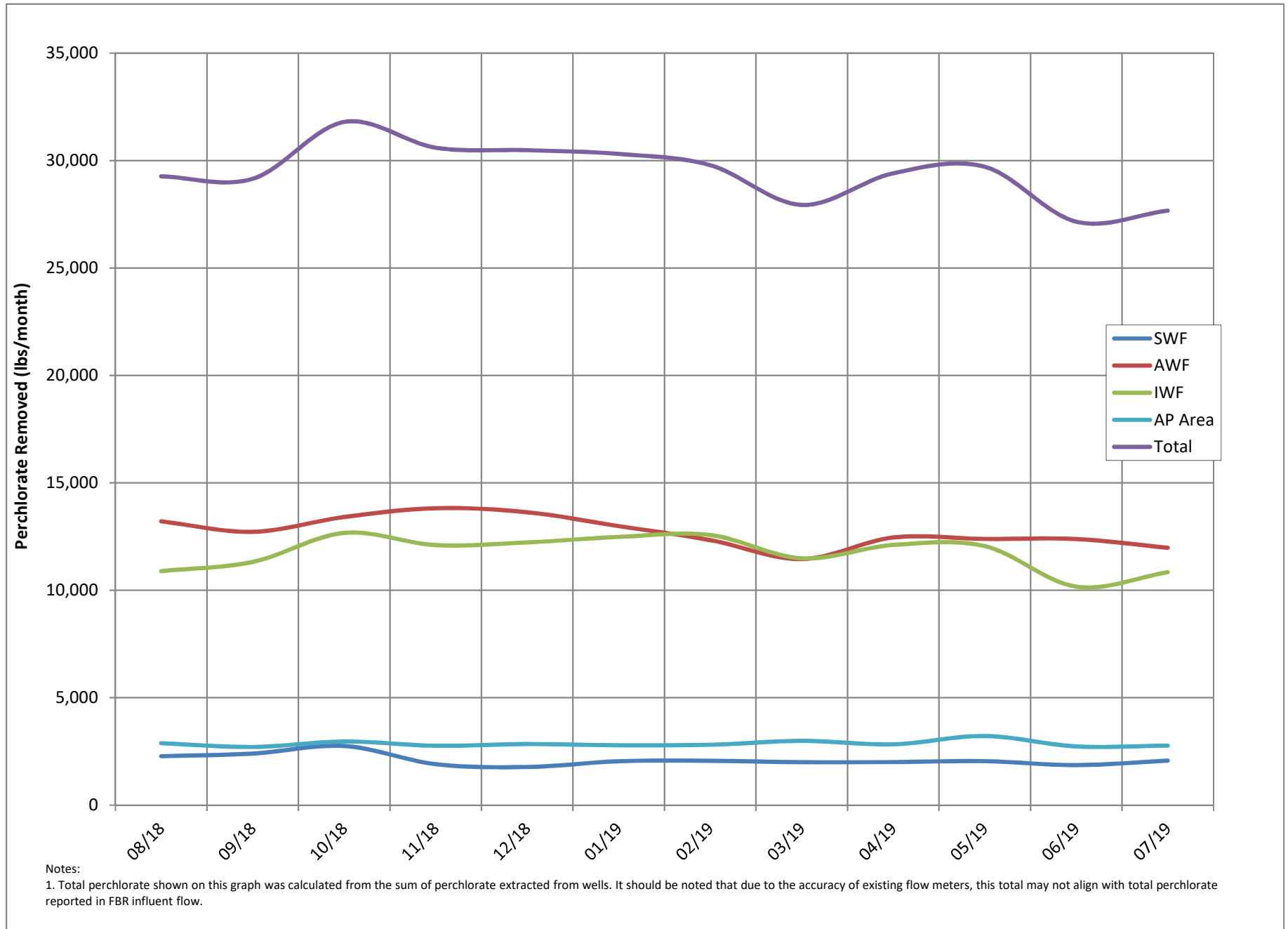


Figure 2 - Historical Perchlorate Mass Removed From Environment



Attachment A

NPDES Tracking Sheet (Prepared by Ramboll)

Treated Effluent at Outfall 001																				
Continuous		Daily Samples, composited weekly		Weekly Grab Samples										Weekly, collected separately			Quarterly			
Flow Rate		Perchlorate		pH		Hexavalent Chromium	Total Chromium	Manganese	Total Iron	Total Inorganic Nitrogen (TIN)	Total Suspended Solids (TSS)		Total Ammonia as N		Total Phosphorus as P		BOD ₅ (inhibited)			Total Dissolved Solids (TDS)
30-Day Avg. (MGD)	Daily Maximum (MGD)	30-Day Avg. (µg/L)	30-Day Avg. (lbs/day)	Daily Min. (S.U.)	Daily Max. (S.U.)	Daily Max. (µg/L)	Daily Max. (µg/L)	Daily Max. (µg/L)	Daily Max. (µg/L)	Daily Max. (mg/L)	Daily Average (mg/L)	30-Day Avg. (lbs/day)	30-Day Avg. (lbs/day)	30-Day Avg. (lbs/day)	30-Day Avg. (mg/L)	Daily Max. (mg/L)	30-Day Avg. (lbs/day)	30-Day Avg. (mg/L)	Daily Max. (mg/L)	Daily Max. (mg/L)
2.52	2.88	18	0.38	6.5	9.0	10	100	5,000	10,000	20	135	2,839	20*	10*	25	40	525			8,000

January 2019	1.80	1.87	0.5	0.0075	6.77	7.33	ND (<0.25)	31	250	330	15	7	110	170	1.5			1.8	2.7	27	
February 2019	1.79	1.87	4.7	0.070	6.58	6.91	ND (<0.25)	16	220	390	14	10	150	190	1.6			0.9	1.2	13	4,500
March 2019	1.67	1.86	0.5	0.0069	6.57	6.82	ND (<0.25)	14	290	160	19	7	100	120	2.1			0.7	2.2	11	
April 2019	1.73	1.85	0.5	0.0072	6.50	6.88	ND (<0.25)	11	310	410	1.2	9	130	5	1.6			0.5	1.4	7	
May 2019	1.78	1.83	0.5	0.0074	6.50	7.05	ND (<0.25)	5.9	340	130	1.5	6	90	10	2.0			0.7	1.4	10	4,300
June 2019	1.73	1.83	0.5	0.0072	6.63	6.65	3.5	2.8	360	150	2.5	4.9	70	18	2.2			0.7	1.9	9	
July 2019 (month to date)	1.72	1.81	5.2	0.08	6.59	7.00	ND (<0.25)	4.0	360	77	2.9	3.8	50	8	2.4			0.37	0.83	6	NA

Daily Grab Sample Dates	Composite Sample Date	µg/L	lbs/day	Sample Date	S.U.	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	Sample Date	mg/L	lbs/day	Sample Date	mg/L	
12/30 - 1/5	1/5/2019	ND (<1.0)	0.5	0.0074	1/2/2019	7.33	ND (<0.25)	31	200	170	11	15	231	--	11	185 ⁺⁺	--	0.20	3.1	1/2/2019	2.7	42
1/6 - 1/12	1/12/2019	ND (<1.0)	0.5	0.0074	1/7/2019	7.21	ND (<0.25)	7.2	250	99	15	4.4	63	--	15	117 ⁺⁺	--	0.13	1.9	1/9/2019	1.5	22
1/13 - 1/19	1/19/2019	ND (<1.0)	0.5	0.0075	1/14/2019	6.77	ND (<0.25)	3.7	150	330	14	4.4	67	--	13	197	--	0.061	0.93	1/16/2019	2.6	40
1/20 - 1/26	1/26/2019	ND (<1.0)	0.5	0.0077	1/21/2019	7.26	ND (<0.25)	7.6	190	170	12	5.4	84	--	11	172	ND (<0.025)	0.013	0.20	1/23/2019	1.5	23
1/27 - 2/2	2/2/2019	ND (<1.0)	0.5	0.0074	1/28/2019	6.98	ND (<0.25)	4.0	200	170	9.5	6.1	95	--	9.5	148	--	0.10	1.6	1/30/2019	0.78	11
2/3 - 2/9	2/9/2019	ND (<1.0)	0.5	0.0071	2/4/2019	6.58	ND (<0.25)	8.6	200	390	14	12	176	--	14	205	--	0.12	1.8	2/6/2019	1.2	16
2/10 - 2/16	2/16/2019	9.1	9.1	0.14	2/11/2019	6.88	ND (<0.25)	6.3	180	100	13	4.8	72	--	13	194	--	0.11	1.6	2/13/2019	1.1	16
2/17 - 2/23	2/23/2019	8.6	8.6	0.13	2/18/2019	6.91	ND (<0.25)	5.3	210	82	13	9.3	139	--	12	179	--	0.094	1.4	2/20/2019	0.75	11
2/24 - 3/2	3/2/2019	ND (<1.0)	0.5	0.0075	2/25/2019	6.74	ND (<0.25)	16	220	170	11	13	202	--	11	171	--	0.11	1.7	2/27/2019	0.55	8.3
3/3 - 3/9	3/9/2019	ND (<1.0)	0.5	0.0068	3/4/2019	6.64	ND (<0.25)	14	220	160	15	15	199	--	15	199	--	0.11	1.5	3/6/2019	ND (<0.50)	0.25
3/10 - 3/16	3/16/2019	ND (<1.0)	0.5	0.0068	3/11/2019	6.57	ND (<0.25)	3.5	250	72	19	4.8	65	--	19	257	--	0.16	2.2	3/13/2019	ND (<0.50)	0.25
3/17 - 3/23	3/23/2019	ND (<1.0)	0.5	0.0073	3/18/2019	6.82	ND (<0.25)	3.4	290	81	13	4.9	67	--	13	178 ⁺⁺	--	0.24	3.3	3/20/2019	2.2	33
3/24 - 3/30	3/30/2019	ND (<1.0)	0.5	0.0068	3/25/2019	6.69	ND (<0.25)	5.0	280	78	0.97	5.1	71	--	0.97	14 ⁺⁺	--	0.12	1.7	3/27/2019	ND (<0.50)	0.25
3/30 - 4/6	4/6/2019	ND (<1.0)	0.5	0.0070	4/1/2019	6.64	ND (<0.25)	ND (<2.5)	250	ND (<50)	ND (<0.50)	3.3	46	--	0.13	1.8 ⁺⁺	--	0.081	1.1	4/3/2019	ND (<0.50)	0.25
4/7 - 4/13	4/13/2019	ND (<1.0)	0.5	0.0075	4/8/2019	6.50	ND (<0.25)	3.8	300	92	ND (<0.50)	9.6	136	ND (<0.10)	0.05	1.2 ⁺⁺	--	0.13	1.8	4/10/2019	ND (<0.50)	0.25
4/14 - 4/20	4/20/2019	ND (<1.0)	0.5	0.0071	4/15/2019	6.60	ND (<0.25)	3.2	300	72	ND (<0.50)	4.3	65	--	0.21	2.9 ⁺⁺	--	0.075	1.1	4/17/2019	ND (<0.50)	0.25
4/21 - 4/27	4/27/2019	ND (<1.0)	0.5	0.0074	4/22/2019	6.88	ND (<0.25)	11	310	410	0.60	23	335	--	0.60	8.7 ⁺⁺	--	0.13	1.9	4/24/2019	1.4	21
4/28 - 5/4	5/4/2019	ND (<1.0)	0.5	0.0073	4/29/2019	6.50	ND (<0.25)	ND (<2.5)	310	130	1.2	5.1	76	--	0.63	9.4	--	0.14	2.1	5/1/2019	ND (<0.50)	0.25
5/5 - 5/11	5/11/2019	ND (<1.0)	0.5	0.0074	5/6/2019	6.50	ND (<0.25)	2.5	310	58	1.2	3.5	51	--	0.64	9.4 ⁺⁺	--	0.14	2.1	5/8/2019	0.63	9.0
5/12 - 5/18	5/18/2019	ND (<1.0)	0.5	0.0074	5/13/2019	6.78	ND (<0.25)	5.9	340	130	0.57	13	193	--	0.57	8.4 ⁺⁺	--	0.22	3.3	5/15/2019	ND (<0.50)	0.25
5/19 - 5/25	5/25/2019	ND (<1.0)	0.5	0.0074	5/20/2019	6.57	ND (<0.25)	2.7	290	70	ND (<0.50)	3.4	51	--	0.47	7.1 ⁺⁺	--	0.10	1.5	5/22/2019	1.4	21
5/26 - 6/1	6/1/2019	ND (<1.0)	0.5	0.0073	5/28/2019	7.05	ND (<0.25)	4.4	250	99	1.5	4.6	67	--	0.79	11 ⁺⁺	--	0.078	1.1	5/29/2019	0.88	13
6/2 - 6/8	6/8/2019	ND (<1.0)	0.5	0.0076	6/3/2019	6.63	ND (<0.25)	ND (<2.5)	340	58	0.82	3.5	53	--	0.82	12	--	0.14	2.1	6/5/2019	ND (<0.50)	0.25
6/9 - 6/15	6/15/2019	ND (<1.0)	0.5	0.0072	6/10/2019	6.63	3.5	2.8	360	73	1.6	7.5	105	--	1.0	14 ⁺⁺	--	0.16	2.2	6/12/2019	ND (<0.50)	0.25
6/16 - 6/22	6/22/2019	ND (<1.0)	0.5	0.0070	6/17/2019	6.65	ND (<0.25)	ND (<2.5)	310	150	2.5	5.7	81	--	2.5	35 ⁺⁺	--	0.18	2.5	6/19/2019	1.9	27
6/23 - 6/29	6/29/2019	ND (<1.0)	0.5	0.0071	6/24/2019	6.65	ND (<0.25)	ND (<2.5)	330	59	1.8	2.9	38	--	1.8	24 ⁺⁺	--	0.15	2.0	6/26/2019	ND (<0.50)	0.25
6/30 - 7/6	7/6/2019	5.7	5.7	0.080	7/1/2019	7.00	ND (<0.25)	ND (<2.5)	340	ND (<50)	ND (<0.50)	3.6	51	ND (<0.10)	0.05	0.7	--	0.13	1.8	7/3/2019	ND (<0.50)	0.25
7/7 - 7/13	7/13/2019	11	11	0.16	7/8/2019	6.59	ND (<0.25)	ND (<2.5)	310	ND (<50)	2.9	1.7	25	--	1.4	21	--	0.13	1.9	7/10/2019	0.83	12
7/14 - 7/20	7/20/2019	3.5	3.5	0.051	7/15/2019	6.77	ND (<0.25)	2.6	280	77	0.83	6.7	97	--	0.26	3.8	--	0.25	3.6	7/17/2019	ND (<0.50)	0.25
7/21 - 7/27	7/27/2019	ND (<1.0)	0.5	0.0070	7/22/2019	6.62	ND (<0.25)	4.0	330	ND (<50)	ND (<0.50)	4.4	63	--	0.11	1.6	--	0.19	2.7	7/24/2019	ND (<0.50)	0.25
7/28 - 8/3	8/3/2019	NA	NA	NA	7/29/2019	6.77	ND (<0.25)	ND (<2.5)	360	72	ND (<0.50)	2.4	35	--	0.16	2.3	--	0.12	1.8	7/31/2019	ND (<0.50)	0.25
					8/5/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: All analytical responsibilities are performed by TestAmerica Laboratories, Inc. (TestAmerica) in Irvine, California, unless otherwise indicated.

** Additional samples were collected and analyzed for ammonia during this week and results were included in the 30-day average loading calculation.

NA = Not Available To Date

ND = Not Detected above laboratory reporting limit; concentration in adjacent cell to right is one-half the reporting limit (per Permit condition)

J = Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

-- = Analyte detected; see column adjacent to right

* Total phosphorus discharge limitation of 10 lbs/day applies between March 1 and October 31; Ammonia discharge limitation of 20 lbs/day applies between April 1 and September 30; no limits apply the rest of the year.

Last Updated: August 9, 2019

Attachment B

Equipment Tracking Form

Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
Main Plant Equipment						
1 Seep Wells and Lift Station 1						
1.01		Seep Well Field, 9 wells	Running			
1.02		Lift Station 1 Lift Pump A	Running			
1.03		Lift Station 1 Lift Pump B	Standby			
1.04		Area in and around Lift Station 1	Running		3	Changed out the pump on the IX feed system. Pulled the faulty VFD for the IX feed pump.
2 Athens Road Wells and Lift Station 3						
2.01		Athens Road Well Field, 9 wells	Running		2	Replaced the .5 hp motor on PC-150.
2.02		Lift Station 3 Lift Pump A	Standby			
2.03		Lift Station 3 Lift Pump B	Running			
2.04		Area in and around Lift Station 3	Running			
3 Lift Station 2 and Transmission Pipelines						
3.01		Influent Pipeline	In operation			
3.02		Effluent Pipeline	Running		3	Isolated the combo valve and repaired the float. Put the combo valve back online.
3.03		Lift Station 2 Lift Pump A	Running			
3.04		Lift Station 2 Lift Pump B	Standby			
3.05		Area in and around Lift Station 2	Running			
4 Interceptor Wells and Cr Treatment Plant						
4.01		IWF Well Field, 30 wells	Running		2	Replaced the motor on I-W
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running		4	Replaced the mixer on the polymer feed system
4.04		Clarifier	In operation			
4.05		Filter Press	Running			
4.06		GWTP Effluent Tank	In operation			
4.07		Interceptor Booster Pump A	Running			
4.08		Interceptor Booster Pump B	Standby			
4.09		Area In And Around GWTP	Running			
5 Equalization Area and GW-11 Pond						
5.01	PID10A	Pond GW-11	In operation		2	Replaced the motor on the SE pumping corner
5.02	PID10A	Pond Water Pump - P101A	Running			
5.03	PID10A	Pond Water Pump - P101B	Standby			
5.04	PID10A	Equalization Tanks	In operation			

Status Codes

Running - Unit is in operation
 Standby - Spare or duplicate, not currently in operation
 Maintenance - Out of service for maintenance
 Off - Not currently needed for use, but can be placed in service

Criticality Codes

1= Critical - Cannot continue with operation until repairs made
 2= Important - Can still operate safely and in compliance with permits, but risks are increased
 3= Moderate - Work needs to be performed, but plant can still operate with redundancy that is in place
 4= Low - Minor repairs that in no way alter the performance of the plant

Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
5.05	PID10A	Area in and Around EQ	In operation			
5.06	PID10A	Raw Water Feed Pump - P102A				
5.07	PID10A	Raw Water Feed Pump - P102B				
5.08	PID10A	F-101 Filters	Running			
5.09	PID10B	Carbon Absorber - LGAC 201A	Running			
5.10	PID10B	Carbon Absorber - LGAC 201B	Running			
5.11	PID10B	Carbon Absorber - LGAC 201C	Running			
6		First Stage FBRs A, 1 & 2				
6.01	PID14	FBR A			3	Rebuilt the bed height control pump
6.02	PID14	Separator Tank - 1401				
6.03	PID14	Media Return Pump - P 1401				
6.04	PID14	P1401A				
6.05	PID01A	P1401B				
6.06	PID01A	FBR 1	Running			
6.07	PID02A	FBR 2	Running			
6.08	PID01A	First Stage Separator Tank - T2011	Running		2	Cleared debris and replaced the I/P on the level control positioner
6.09	PID01A	Media Return Pump - P2011	Running			
6.10	PID01A	First Stage FBR Pump - P1011	Standby			
6.11	PID01A	First Stage FBR Pump - P1012				
6.12	PID01A	First Stage FRB Pump - P101A	Running			
6.13	PID07A	FBR A pH Feed Pump - P71A	Off			
6.14	PID07A	FBR 1 pH Feed Pump - P711	Off			
6.15	PID07A	FBR 2 pH Feed Pump - P712	Off			
6.16	PID07A	FBR A Nutrient (Urea) Feed Pump - P72A	Off			
6.17	PID07A	FBR 1 Nutrient (Urea) Feed Pump - P721	Off			
6.18	PID07A	FBR 2 Nutrient (Urea) Feed Pump - P722	Off			
6.19	PID15	FBR A Nutrient (Phos Acid) Feed Pump - P1520A	Running			
6.20	PID15	FBR 1 Nutrient (Phos Acid) Feed Pump - P1521	Running			
6.21	PID15	FBR 2 Nutrient (Phos Acid) Feed Pump - P1522	Running			
6.22	PID07B	FBR A Electron Donor Assembly Pump - P73A	Running			
6.23	PID07B	FBR 1 Electron Donor Assembly Pump - P731	Running			
6.24	PID07B	FBR 2 Electron Donor Assembly Pump - P732	Running			
7		First Stage FBRs 3 & 4				
7.01	PID01B	FBR 3	Running		2	Cleared debris and replaced the I/P controllers on the feed valve positioner

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
7.02	PID01B	FBR 4	Running		2	Cleared debris and replaced the I/P controllers on the feed valve positioner
7.03	PID02B	First Stage Separator Tank - T2012	Running			
7.04	PID01B	Media Return Pump - P2012	Running			
7.05	PID01B	First Stage FBR Pump - P1013	Running			
7.06	PID01B	First Stage FRB Pump - P1014	Running			
7.07	PID01B	First Stage FBR Pump - P102A	Running			
7.08	PID07A	FBR 3 pH Feed Pump - P713	Running			
7.09	PID07A	FBR 4 pH Feed Pump - P714	Running			
7.10	PID07A	FBR 3 Nutrient (Urea) Feed Pump - P723				
7.11	PID07A	FBR 4 Nutrient (Urea) Feed Pump - P 724	Off			
7.12	PID15	FBR 3 Nutrient (Phos Acid) Feed Pump - P1523	Running			
7.13	PID15	FBR 4 Nutrient (Phos Acid) Feed Pump - P1524	Running			
7.14	PID07B	FBR 3 Electron Donor Assembly Pump - P733	Running			
7.15	PID07B	FBR 4 Electron Donor Assembly Pump - P734	Running			
8		Second Stage FBRs 5 & 6				
8.01	PID03A	FBR 5	Running			
8.02	PID03A	FBR 6	Running			
8.03	PID03C	Second Stage Separator Tank - T3011	Running		2	Cleared debris and replaced the I/P on the level control positioner
8.04	PID03A	Media Return Pump - P3011	Running		3	The pump was rebuilt due to failed trunnions
8.05	PID03A	Second Stage FBR Pump - P3015	Running			
8.06	PID03A	Second Stage FBR Pump - P3016	Standby			
8.07	PID03A	Second Stage FBR Pump - P301A	Running			
8.08	PID07A	FBR 5 pH Feed Pump - P715	Off			
8.09	PID07A	FBR 6 pH Feed Pump - P716	Off			
8.1	PID07A	FBR 5 Nutrient (Urea) Feed Pump - P725	Off			
8.11	PID07A	FBR 6 Nutrient (Urea) Feed Pump - P726	Off			
8.12	PID07B	FBR 5 Electron Donor Assembly Pump - P735	Running			
8.13	PID07B	FBR 6 Electron Donor Assembly Pump - P736	Running			
9		Second Stage FBRs 7 & 8				
9.01	PID03B	FBR 7	Running			
9.02	PID03B	FBR 8	Running			
9.03	PID03D	Second Stage Separator Tank - T3012	Running			
9.04	PID03B	Media Return Pump - P3012	Running			
9.05	PID03B	Second Stage FBR Pump - P3017	Running			
9.06	PID03B	Second Stage FBR Pump - P3018	Running			

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9.07	PID03B	Second Stage FBR Pump - P302A	Running			
9.08	PID07A	FBR 7 pH Feed Pump - P717	Off			
9.09	PID07A	FBR 8 pH Feed Pump - P718	Off			
9.10	PID07A	FBR 7 Nutrient (Urea) Feed Pump - P727	Off			
9.11	PID07A	FBR 8 Nutrient (Urea) Feed Pump - P728	Off			
9.12	PID07B	FBR 7 Electron Donor Assembly Pump - P737	Running			
9.13	PID07B	FBR 8 Electron Donor Assembly Pump - P738	Running			
10		Aeration and DAF System				
10.01	PID04	Aeration Tank	In operation			
10.02	PID04	Aeration Blower - B401	Running			
10.03	PID04	Bio filter	In operation			
10.04	PID04	Nutrient Solution	Running			
10.05	PID04	Bio filter Sump				
10.06	PID04	Nutrient Pump - P401	Running			
10.07	PID04	Bio filter Sump Pump - P402A	Standby			
10.09	PID04	Bio filter Blower	Running			
10.10	PID05	DAF Pressure Tanks	In operation			
10.11	PID05	DAF Vessel - D501	Running			
10.12	PID05	DAF Pressure Pump - P501	Running			
10.13	PID05	DAF Float Pump - P502	Running			
10.14	PID05	DAF Vessel - D551	Running			
10.15	PID05	DAF Pressure Pump - P551	Running			
10.16	PID05	DAF Float Pump - P552	Running			
10.17	PID05	Screw Conveyer Drive	Standby			
10.18	PID05	Skimmer Drive	Running			
11		Pumping System (Old Effluent)				
11.01	PID06	Effluent Tank 601	In operation			
11.02	PID06	Effluent Pump - P601	Running			
11.03	PID06	Effluent Pump - P602	Standby		2	Rebuilt and re-installed the new pump
12		Sand Filter System				
12.01	PID17	Sand Filter				
12.02	PID17	Filter Reject Tank	In operation			
12.03	PID17	Filter Reject Pump - P1701A	Standby			
12.04	PID17	Filter Reject Pump - P1701B	Running			
13		Effluent Tank and Pumping				
13.01	PID10C	UV Effluent Tank	Running			

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13.02	PID10C	Effluent Booster Pump - P1302A	Running			
13.03	PID10C	Effluent Booster Pump - P1302B	Standby			
13.04	PID10C	Area Around Effluent and North D-1	Running		4	Replaced the belts on the vent blowers
14		Solids Collection and Pressing System				
14.01	PID16	Sludge Storage Tank	In operation			
14.02	PID16	Solids Storage Effluent Pump - P1601	Running			
14.03	PID16	Solids Cond. Tank	In operation			
14.04	PID09	Sludge Mixer	Running			
14.05	PID09	Filter Press Pump - P901	Running			
14.06	PID09	Filter Press Pump - P902				
14.07	PID09	West Press	Standby			
14.08	PID09	East Press	Running			
14.09	PID09	Filtrate Tank	In operation			
14.10	PID09	Filtrate Tank Effluent (recycle) Pump - P903	Running			
		Chemical Systems				
15		Electron Donor System				
15.01	PID07B	Electron Donor Tank	In operation		1	The I/O card had to be replaced that controlled the ethanol pumps for FBRs 1-4
15.02	PID07B	Booster Pump P739A	Running			
15.03	PID07B	Booster Pump P739B	Standby			
17	PID07C	Micro Nutrient System	In operation			
18	PID07C	Hydrogen Peroxide System	In operation			
19	PID07C	De-Foam System	In operation			
20	PID15	Nutrient (Phosphoric Acid) System (Tank only - pumps included in FBRs)	In operation			
21	PID07A	Nutrient (Urea) System (Tank only - pumps included in FBRs)	In operation			
22	PID07A	pH System (Tank and effluent pH feed pump only - other pumps included in FBRs)	In operation			
23	PID07C	Aluminum Chlorohydrate	In operation			
24	PID07B	Polymer Systems - DAF	In operation		3	The new polymer system was installed and brought online
25	PID09	Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation		3	Re-configured the ACH addition for conditioning
		Utility Systems				
26		Compressed Air System				
26.01	PID08	West Compressor	Running		2	West compressor is offline due to a failed oil separator

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26.02	PID08	East Compressor	Running			
26.03	PID08	O2 Compressor	Running			
26.04	PID08	Compressed Air Receiver Tank	In operation			
26.05	PID08	Air Dryer	Running			
26.06	PID08	Oil Removal Filter	In operation			
26.07	PID08	Particulate Filter	In operation			
27	PID16	Oxygen System	In operation			
28		GWETS Plant Controls/ Siemens Controls	In operation			
29		Well Control System/ Allen Bradley Controls	In operation			
30		MCC FBR Pad	In operation			
31		MCC in D-1	In operation			
32		MCC in EQ area	In operation			
Miscellaneous Systems						
33		Operations Office/Network	In operation			
34		Laboratory Analyzers	In operation			
35		Security Systems	In operation			
Shelf Spares						
		Media Return Pump Rebuild Kit	In stock			
		pH Feed Pump	In stock			
		Nutrient Feed Pump	In stock			
		Electron Donor Feed Pump	In stock			
		Phosphoric Acid Feed Pump	In stock			
		Interceptor Well Pumps (4 each)	In stock			
		Seep Well Pump (1 each, same as Athens so total of 2)	In stock			
		Athens Road Well Pump (1 each, same as Seep so total of 2)	In stock			

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