
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: July 20, 2019

Subject: NERT – GWETS Operation Monthly Report – June 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 June 2019.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in June 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 1,009 gpm during June 2019. At the end of the month, the GW-11 Pond volume was at 37.2 million gallons (MG), which would allow 17.5 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 1.7 MG from the end of May 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 0.23 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 138 mg/L for the month, with a maximum concentration of 160 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of May 2019 averaged 118 mg/l, with a maximum concentration of 120 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 June.

2. Biological Plant

Treatment of AP-5 water through the FBR Biological plant continued in the month of June beginning with a flow rate of 2.5 gpm and decreasing in flow to 2.0 gpm on June 24, 2019 and decreasing in flow to 0.5 gpm on June 26, 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

- Influent Diversion to GW-11 occurred on June 1, 2019 from 3:50pm to 4:30pm due to maintenance activities on the level control valve for separator 1. Approximately 40,000 gallons of water were diverted to GW-11.
- Influent diversion to GW-11 on June 4, 2019 from 1:34pm to 2:15pm due to maintenance activities at the T-601 tank. Approximately 43,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on June 6, 2019 from 9:00am to 9:46am due to maintenance activities on the effluent pipeline. Approximately 51,000 gallons of effluent were diverted to GW-11.
- Effluent diversion to GW-11 occurred on June 12, 2019 from 10:47am to 11:37am due to maintenance activities on the pig launcher for the effluent pipeline. Approximately 53,000 gallons of effluent were diverted to GW-11.
- Effluent diversion to GW-11 occurred on June 24, 2019 from 11:46am to 12:35pm due to maintenance activities on the effluent pipeline. Approximately 50,000 gallons of effluent were diverted to GW-11.

3. Spills

There were no reportable spills in the month of June.

4. Maintenance

- Major maintenance performed by ETI in the month included:
 - I. Replaced the scald protectors on the safety showers.
 - II. Installed a new mechanical seal on the west turbine pump at Lift Station 3.
 - III. Rebuilt the bed height pumps on FBR 1 and FBR 2.

- IV. Installed the new piping on the pig launcher for the effluent pipeline.
 - V. Replaced the cords on the external A/C units.
 - VI. Replaced the motor on interceptor well I-E.
 - VII. Rebuilt the media return pump for separator 4.
 - VIII. Replaced the gasket on the secondary effluent line at the EQ area.
 - IX. Replaced the gasket on the drain line on the S.GAC vessel.
- Preventative Maintenance completed or being performed by ETI in the month included:
 - I. Completed the North DAF semi-annual cleaning and inspection.
 - II. Cleaned the eyewash stations.
 - III. Flushed the seal water supplies on the recycle pumps.
 - IV. Greased the blower motor for the aeration tank.
 - V. Cleaned and calibrated the turbidity meters.
 - VI. Adjusted the packing on the turbine pumps at Lift Station 1.
 - VII. Flushed the sand filter reject tank and calibrated the flow control valve.
 - VIII. Inspected and cleaned the level control positioners for the separators.
 - IX. Removed and cleaned two combo valves on the pipeline.

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.

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	740 ⁵	7.0	0.0019	0.0016
AWF Total Extraction ¹	463 ⁵	74	0.15	0.15
IWF Total Extraction ¹	59 ⁵	474	6.4	6.8
AP Area Total Extraction ¹	12.3 ⁵	618	0.076	0.074
GWTP Effluent ²	61	535	0.14	ND
GW-11 Influent ¹	0.20	73	0.60	0.020
FBR Influent ^{2 3}	1,009	138	0.024	0.020
T-205 Effluent (AP-5 Wash Water) ^{3 4}	2.1	18,367	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	1,864	0.51	0.42
AWF Total Extraction	12,385	25	24
IWF Total Extraction	10,170	137	146
AP Area Total Extraction	2,735	0.34	0.33
GWTP Effluent	11,861	3.1	ND
GW-11 Influent	5.2	0.043	0.0014
FBR Influent ¹	50,373	8.8	7.1
T-205 Effluent (AP-5 Wash Water) ^{1 2}	14,034	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 6/30/2019

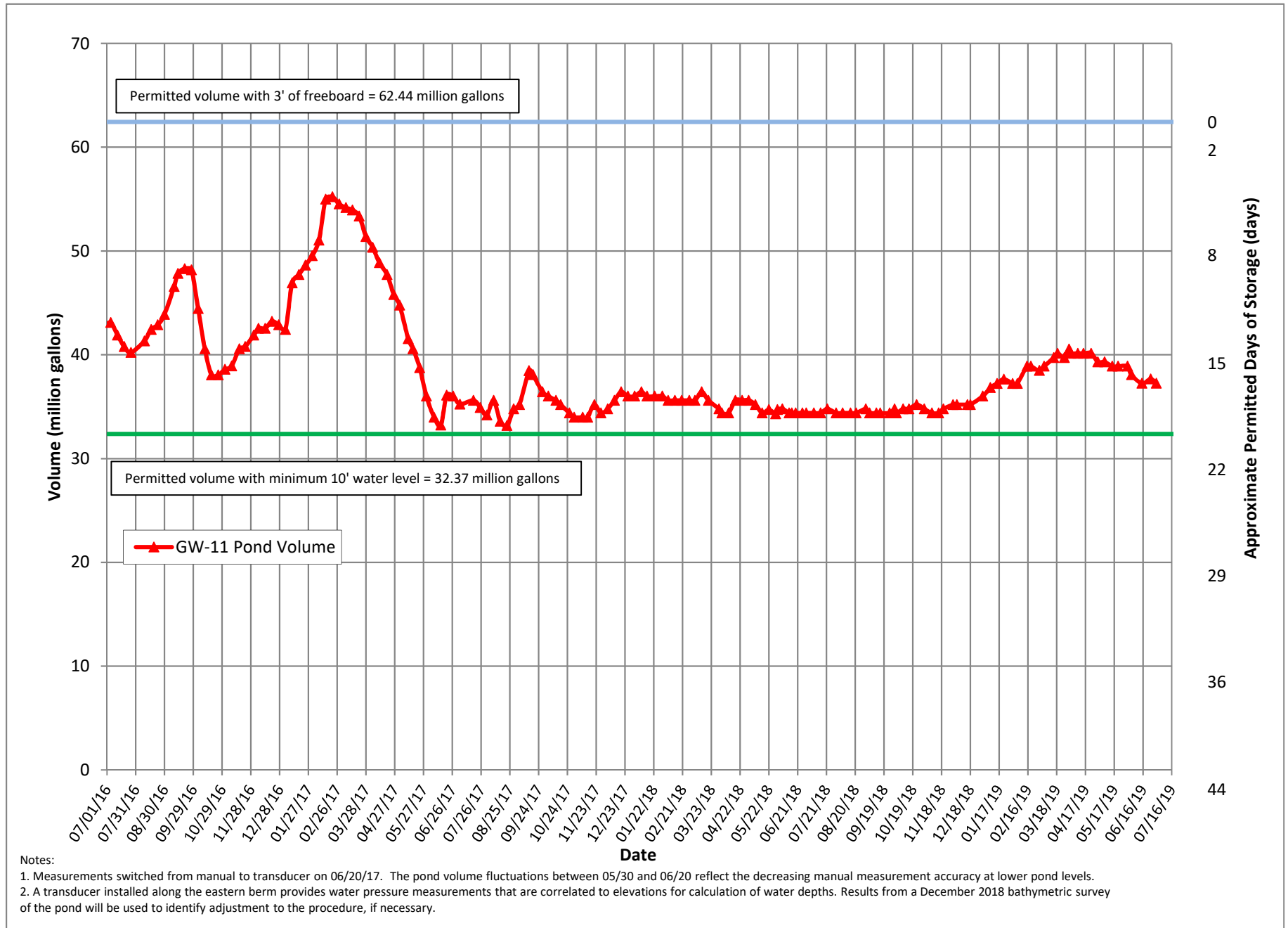
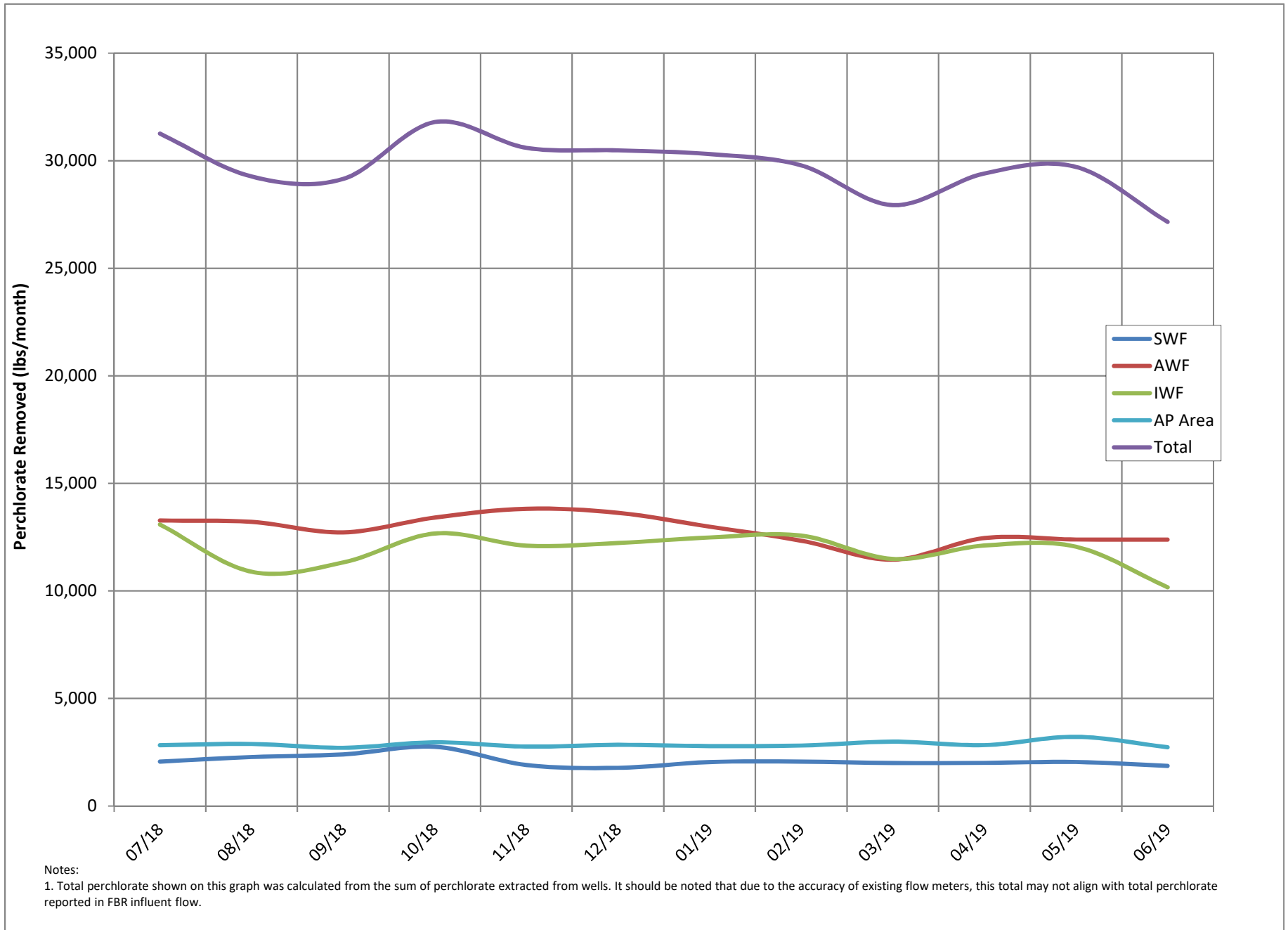


Figure 2 - Historical Perchlorate Mass Removed From Environment



Attachment A

NPDES Tracking Sheet (Prepared by Ramboll)

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			
2 Athens Road Wells and Lift Station 3						
2.01		Athens Road Well Field, 9 wells	Running			
2.02		Lift Station 3 Lift Pump A	Standby		3	Replace the mechanical seal
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		2	Pulled and cleaned two combo valve
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	Replace the motor on I-E
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running			
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			
5.02	PID10A	Pond Water Pump - P101A	Running			
5.03	PID10A	Pond Water Pump - P101B	Standby			
5.04	PID10A	Equalization Tanks	In operation			
5.05	PID10A	Area in and Around EQ	In operation		3	Replaced the gasket on the EFF line. Rebuilt the "Y" on the pig launcher. New bracing was installed on the pig launcher.
5.06	PID10A	Raw Water Feed Pump - P102A				
5.07	PID10A	Raw Water Feed Pump - P102B				

Status Codes

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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
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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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		4	Tightened the flange on the fill line
6		First Stage FBRs A, 1 & 2				
6.01	PID14	FBR A				
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			
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			
7.02	PID01B	FBR 4	Running			
7.03	PID02B	First Stage Separator Tank - T2012	Running		2	The level control valve stuck in the closed position. The valve cover was removed and the unit was cleaned. The valve went back to normal operation.
7.04	PID01B	Media Return Pump - P2012	Running			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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			
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			
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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		1	The system was taken offline to perform semi-annual maintenance. This included replacing the recycle pump motor, repaired the flights, pressure wash and inspect the vessel, replace the packing gland and shaft on the auger.
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	The pump drifted forward damaging the impeller. A new shaft and impeller are ordered.
12		Sand Filter System				
12.01	PID17	Sand Filter				
12.02	PID17	Filter Reject Tank	In operation		4	The tank is now controlled in auto. The level control valve and sensor are all in good working order.
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			
13.02	PID10C	Effluent Booster Pump - P1302A	Running			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
13.03	PID10C	Effluent Booster Pump - P1302B	Standby			
13.04	PID10C	Area Around Effluent and North D-1	Running			
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			
15.02	PID07B	Booster Pump P739A	Running			
15.03	PID07B	Booster Pump P739B	Standby			
17	PID07C	Micro Nutrient System	In operation		3	The head was replaced on the pump.
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 system is being relocated to a new location to better feed into the system.
25	PID09	Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation			
		Utility Systems				
26		Compressed Air System				
26.01	PID08	West Compressor	Running			
26.02	PID08	East Compressor	Running			
26.03	PID08	O2 Compressor	Running			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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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