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**To:** Nevada Division of Environmental Protection  
Nevada Environmental Response Trust

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**Cc:** Nevada Environmental Response Trust Stakeholders

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

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**Date:** November 20, 2017

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**Subject:** NERT – GWETS Operation Monthly Report – October 2017

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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 October 2017.

### Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in October 2017. 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 239 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 1,060 gpm during October 2017. At the end of the month, the GW-11 Pond volume was at 34.0 million gallons (MG), which would allow 19.8 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 approximately 2.4 MG from the end of September 2017. The average flow rate for October from the GW-11 pond was approximately 8 gpm. 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 0.79 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 180 mg/L for the month, with a maximum concentration of 270 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of September 2017 averaged 114 mg/l, with a maximum concentration of 140 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 October.

### 2. Biological Plant

Treatment of AP-5 water through the FBR Biological plant continued in the month of October starting at a flow rate of 1.5 gpm. Flow rate increased incrementally through October with a flow rate on Oct. 31<sup>st</sup> of 6.5 gpm. ETI maintains plans on gradually increasing the AP-5 feed rate as allowed by permit.

There was one Influent diversion into GW-11 for the month of October and one event that prevented the operation of the extraction wells. Two unplanned events caused the FBR plant to be taken out of feeding mode while keeping the extraction wells operational. Below is a description of the events that occurred:

#### Diversion Event

- Influent Diversion to GW-11 on October 24<sup>th</sup> at 9:44am to 3:28pm due to maintenance activities on the plant compressed air system. Effluent flow was returned to the outfall at 5:40pm.

#### Unplanned Event

- The extraction wells were prevented from operating on Oct 12<sup>th</sup> at 1:54am to 3:40am due to a power outage that affected all three lift stations. Power was restored at 2:43am. All lift station flows were reestablished at 3:40am.
- The FBR plant was placed into Shutdown mode due to a break in the compressed airlines on Oct. 5<sup>th</sup>, from 12:50pm to 1:30pm. The airline break was repaired and the FBR plant was put back into Feeding mode.
- The FBR plant was placed into Recycle mode due to a PLC error on Oct. 16<sup>th</sup> at 11:02am. The PLC error was repaired and the plant was placed back to feeding mode at 11:16am.

### 3. Spills

There were no spills in the month of October.

### 4. Maintenance

- Major maintenance performed by ETI in the month included:
  - I. A new compressed air regulator was installed on the S.DAF pressure tank as well as a flow control valve.

- II. All of the bed height pumps were rebuilt and put back online.
  - III. A gasket was replaced on the discharge piping for FBR4.
  - IV. A new valve positioner was installed on FBR 1 and 4.
  - V. The ORP line was relocated and a new probe was installed on the GWTP Degassifier tank.
  - VI. Tubing, regulator and fittings were all replaced on the GWTP filter press.
  - VII. The plant was put into shutdown to install isolation valves around the plant to perform future airline repairs.
  - VIII. Installation of the new airlines on FBR-A was initiated.
  - IX. The Phosphoric acid pumps for FBR's A, 1, and 2 were replaced and spares were ordered.
  - X. A new mechanical seal was installed on the west turbine pump at LS3.
  - XI. Repaired a damaged portion on the sludge roll away bin.
  - XII. Installed a new "air end" as well as a new fuse for the middle lead on the motor for the west air compressor.
  - XIII. The ART-9 pump was pulled to replace the electrical connection to the motor.
- Preventative Maintenance completed or being performed by ETI in the month included:
    - I. Both DAF vessels were taken offline to make necessary repairs, pressure washed and inspected for cracks or breaks.
    - II. The sump pumps and pits on the FBR pad were inspected and cleaned out.
    - III. ORP and pH probes were standardized.
    - IV. The influent pumps were greased and inspected for wear.
    - V. The air compressors were serviced to ensure smooth operation.
    - VI. The packing was replaced on both turbine pumps at LS1.

### **GWETS Upgrades and Facility Projects**

The following is a summary of the initiatives in-progress during the reporting period at the direction of the Trust:

1. **Ammonia Pretreatment** - The Trust is currently evaluating options to reduce ammonia concentrations in the AP decant.

### **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

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*Operational Metrics*

Nevada Environmental Response Trust   Groundwater Extraction and Treatment System   Monthly Stakeholder Metrics				
Location ID	Average Flow Rate (gpm)	Perchlorate (mg/L) <sup>5 6</sup>	Chromium (TR) (mg/L) <sup>5 6</sup>	Chromium(VI) (mg/L) <sup>5 6</sup>
SWF Total Extraction <sup>2</sup>	797 <sup>1</sup>	7.9	0.00026	0.00061
AWF Total Extraction <sup>2</sup>	462 <sup>1</sup>	82	0.18	0.17
IWF Total Extraction <sup>2</sup>	62 <sup>1</sup>	614	7.8	7.8
AP Area Total Extraction <sup>3</sup>	12 <sup>1</sup>	769	NA	0.031
GWTP Effluent <sup>4</sup>	67	661	0.27	ND
GW-11 Influent <sup>2</sup>	7.7	40	0.16	0.064
FBR Influent <sup>4 7</sup>	1,060	180	0.041	0.025
T-205 Effluent (AP-5 Wash Water) <sup>7 8</sup>	4.1	34,766	NA	NA

## Notes:

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

1: Sum of daily average flow for individual wells.

2: Perchlorate and chromium TR sampled monthly, values reported from TestAmerica.

3: Perchlorate, chromium TR and chromium (VI) sampled twice weekly, values reported from TestAmerica.

4: Perchlorate, chromium TR and chromium (VI) sampled weekly, values reported from TestAmerica.

5: All concentrations reported are monthly flow weighted averages.

6: ND analytical values are treated as zero values in the flow weighted average calculations.

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

8: Flow weighted average concentration based on mass flow meter readings.

Nevada Environmental Response Trust   Groundwater Extraction and Treatment System   Monthly Stakeholder Metrics			
Location ID	Perchlorate (lbs/month) <sup>1</sup>	Chromium (TR) (lbs/month) <sup>1</sup>	Chromium (VI) (lbs/month) <sup>1</sup>
SWF Total Extraction	2,338	0.08	0.18
AWF Total Extraction	14,073	31	30
IWF Total Extraction	14,148	180	179
AP Area Total Extraction	3,360	NA	0.14
GWTP Effluent	16,492	6.6	0.00
GW-11 Influent	115	0.46	0.18
FBR Influent <sup>2</sup>	71,180	16	9.8
T-205 Effluent (AP-5 Wash Water) <sup>2 3</sup>	52,780	NA	NA

## Notes:

TR = Total Recoverable; NA = Not Analyzed.

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

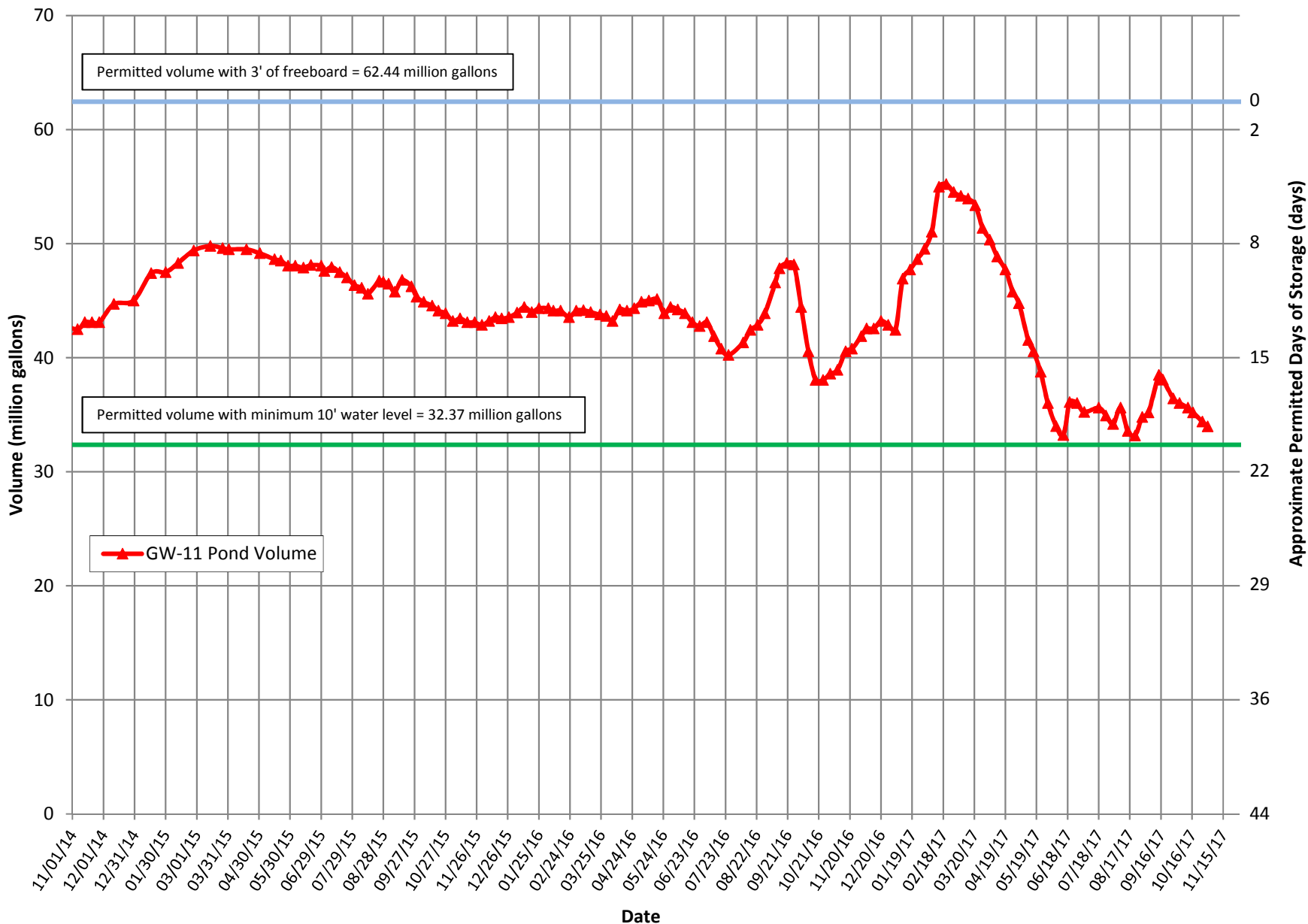
2: AP-5 Wash Water perchlorate data is also included in the GW-11 Effluent/ FBR Influent totals.

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

# Figures

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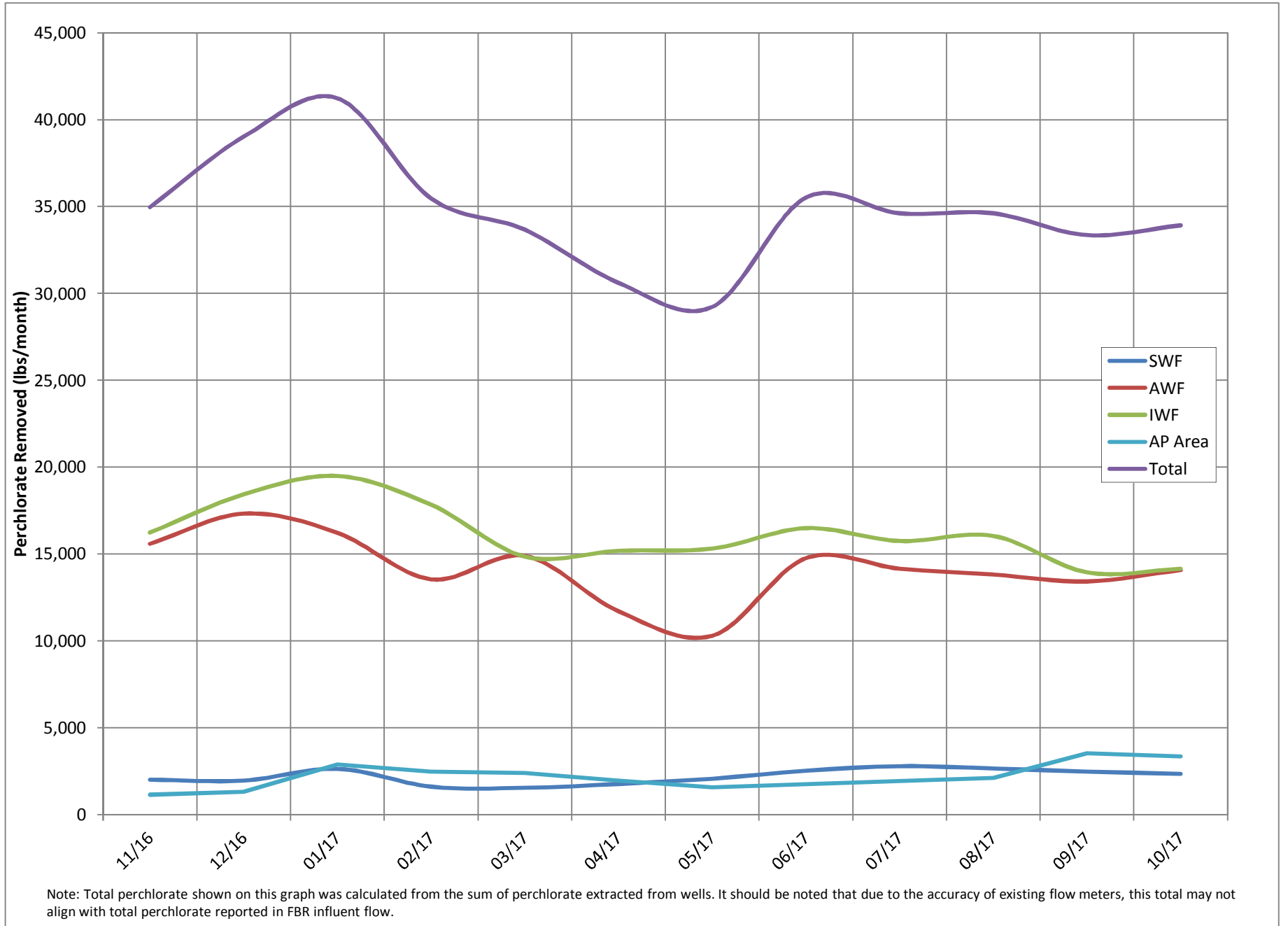
*Operational Metrics*



Note: Measurements switched from manual to transducer on 06/20/17. The pond volume fluctuations between 05/30 and 06/20 reflect the decreasing manual measurement accuracy at lower pond levels.



Figure 2 - Historical Perchlorate Mass Removed From Environment



# Attachment A

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*NPDES Tracking Sheet (Prepared by ENVIRON)*

Treated Effluent at Outfall 001														Weekly, collected separately			Quarterly	
Continuous		Daily Samples, composited weekly		Weekly Grab Samples								BOD <sub>5</sub> (inhibited)			Total Dissolved Solids (TDS)			
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		30-Day Avg. (mg/L)	Daily Max. (mg/L)	30-Day Avg. (lbs/day)	Daily Max. (mg/L)	
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 Max. (mg/L)	Daily Average (mg/L)	30-Day Avg. (lbs/day)	30-Day Avg. (lbs/day)	30-Day Avg. (mg/L)	30-Day Avg. (lbs/day)	8,000	
2.52	2.88	18	0.38	6.5	9.0	10	100	5,000	10,000	20	20	135	2,839	20*	10*	25	40	525
January 2017	1.38	1.42	1.3	0.014	6.75	7.13	0.13	30	510	9,600	0.60	32	370	4.8	1.1	2.4	4.3	28
February 2017	1.50	1.80	9	0.09	6.72	7.16	0.13	36	530	4,200	0.59	21	280	4.0	1.1	5.7	8.4	68
March 2017	1.76	1.86	0.5	0.0073	6.65	6.80	0.13	9.5	540	4,700	1.6	23	340	8	1.2	2.8	5.4	41
April 2017	1.82	1.93	0.5	0.0076	6.70	6.88	0.13	20	570	4,000	1.3	22	330	3.0	3.6	2.8	4.1	42
May 2017	1.84	1.91	0.5	0.0077	6.68	7.00	0.13	10	580	3,300	2.0	20	310	3.2	2.4	1.7	2.8	26
June 2017	1.62	1.94	0.5	0.0066	6.81	7.10	0.13	21	620	2,200	1.9	18	240	2.2	0.68	1.2	2.3	16
July 2017	1.75	2.14	10	0.14	6.58	7.16	0.13	7.2	620	2,100	1.1	12	170	16	0.8	1.5	2.0	23
August 2017	1.72	1.97	0.5	0.0073	6.64	7.15	0.13	14	620	5,200	1.2	34	500	9	4	1.4	2.1	22
September 2017	1.92	2.01	1.3	0.021	6.50	6.86	0.13	6.6	600	3,500	2.1	19	310	3.4	1.3	2.3	3.6	36
October 2017	1.92	2.02	0.5	0.0080	6.57	6.90	0.13	8.5	680	3,700	11	11	180	96	1.2	2.0	2.7	32
November 2017 (month to date)	1.84	1.93	0.5	0.0078	6.55	6.81	0.29	6.0	830	4,900	14	11.3	170	160	1.61	3.4	3.8	52

Daily Grab Sample Dates	Composite Sample Date	µg/L	lbs/day	Sample Date	S.U.	µg/L	µg/L	mg/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			
1/1 - 1/7	1/7/2017	ND (<2.5)	1.3	0.014	1/3/2017	6.76	ND (<0.25)	8.0	280	3,100	ND (<0.50)	26	300	--	0.35	4.0	--	0.046	0.53	1/4/2017	2.2	25		
1/8 - 1/14	1/14/2017	ND (<2.5)	1.3	0.015	1/11/2017	7.03	ND (<0.25)	30	410	9,600	0.60	62	728	--	0.60	7.0	--	0.13	1.5	1/11/2017	ND (<0.50)	0.25	2.9	
1/15 - 1/21	1/21/2017	ND (<2.5)	1.3	0.015	1/16/2017	7.13	ND (<0.25)	17	510	3,400	ND (<0.50)	27	313	--	0.23	2.7	--	0.078	0.91	1/18/2017	4.3	50		
1/22 - 1/28	1/28/2017	ND (<2.5)	1.3	0.014	1/24/2017	6.89	ND (<0.25)	29	480	3,100	ND (<0.50)	22	247	--	0.37	4.2	--	0.079	0.89	1/25/2017	2.9	33		
1/29 - 2/4	2/4/2017	ND (<2.5)	1.3	0.014	1/30/2017	6.75	ND (<0.25)	16	390	3,100	0.52	23	263	--	0.52	5.9	--	0.13	1.5	2/1/2017	3.9	45		
2/5 - 2/11	2/11/2017	34*	34	0.32	2/6/2017	7.00	ND (<0.25)	21	460	4,200	ND (<0.50)	25	234	ND (<0.10)	0.050	0.47	--	0.13	1.2	2/10/2017	8.4	79		
2/12 - 2/18	2/18/2017	ND (<1.0)	0.5	0.0068	2/15/2017	7.16	ND (<0.25)	36	330	340	ND (<0.50)	19	24	260	329	--	0.12	1.6	--	0.11	1.5	2/15/2017	5.2	71
2/19 - 2/25	2/25/2017	ND (<1.0)	0.5	0.0072	2/21/2017	6.73	ND (<0.25)	10	480	3,900	0.59	19	273	--	0.59	8.5	--	0.059	0.85	2/22/2017	5.4	78		
2/26 - 3/4	3/4/2017	ND (<1.0)	0.5	0.0074	2/27/2017	6.72	ND (<0.25)	8.9	530	3,400	ND (<0.50)	19	282	--	0.36	5.3	--	0.046	0.68	3/1/2017	2.7	40		
2/5 - 3/11	3/11/2017	ND (<1.0)	0.5	0.0074	3/6/2017	6.78	ND (<0.25)	7.9	490	1,800	1.6	17	253	--	1.0	15	--	0.11	1.6	3/8/2017	2.3	34		
3/12 - 3/18	3/18/2017	ND (<1.0)	0.5	0.0074	3/13/2017	6.75	ND (<0.25)	6.7	540	2,300	1.2	21	309	--	0.50	7.4	--	0.058	0.85	3/15/2017	1.9	28		
3/19 - 3/25	3/25/2017	ND (<1.0)	0.5	0.0074	3/20/2017	6.65	ND (<0.25)	9.5	490	4,700	ND (<0.50)	27	398	--	0.32	4.7	--	0.073	1.08	3/22/2017	1.8	27		
3/26 - 4/1	3/31/2017	ND (<1.0)	0.5	0.0071	3/27/2017	6.80	ND (<0.25)	7.1	540	2,900	1.2	27	384	--	0.26	3.7	--	0.10	1.4	3/29/2017	5.4	77		
4/2 - 4/8	4/8/2017	ND (<1.0)	0.5	0.0074	4/3/2017	6.72	ND (<0.25)	17	570	3,500	0.87	20	296	ND (<0.10)	0.05	0.74	--	0.066	0.98	4/5/2017	2.3	34		
4/9 - 4/15	4/15/2017	ND (<1.0)	0.5	0.0074	4/10/2017	6.70	ND (<0.25)	12	570	3,900	1.2	24	354	--	0.16	2.4	--	0.16	2.4	4/12/2017	1.9	28		
4/16 - 4/22	4/22/2017	ND (<1.0)	0.5	0.0078	4/17/2017	6.88	ND (<0.25)	20	530	4,000	ND (<0.50)	23	358	--	0.25	3.9	--	0.62	9.6	4/19/2017	4.1	64		
4/23 - 4/29	4/29/2017	ND (<1.0)	0.5	0.0078	4/24/2017	6.82	ND (<0.25)	11	520	2,900	1.3	21	330	--	0.31	4.9	--	0.084	1.3	4/26/2017	2.7	42		
4/30 - 5/6	5/6/2017	ND (<1.0)	0.5	0.0078	5/1/2017	6.76	ND (<0.25)	7.6	490	1,800	ND (<0.50)	19	296	--	0.11	1.7	--	0.55	8.6	5/3/2017	1.2	19		
5/7 - 5/13	5/13/2017	ND (<1.0)	0.5	0.0078	5/8/2017	6.68	ND (<0.25)	8.5	450	3,000	0.64	19	296	--	0.17	2.6	--	0.033	0.51	5/10/2017	1.5	23		
5/14 - 5/20	5/20/2017	ND (<1.0)	0.5	0.0077	5/15/2017	6.69	ND (<0.25)	9.0	540	3,300	1.0	16	234	--	0.31	4.5	--	0.081	1.18	5/17/2017	0.94	14		
5/21 - 5/27	5/27/2017	ND (<1.0)	0.5	0.0073	5/22/2017	6.93	ND (<0.25)	6.1	580	2,400	ND (<0.50)	18	278	--	0.15	2.3	--	0.074	1.14	5/24/2017	2.8	43		
5/28 - 6/3	6/3/2017	ND (<1.0)	0.5	0.0079	5/29/2017	7.00	ND (<0.25)	10	500	2,700	2.0	28	444	--	0.29	4.6	--	0.046	0.73	5/31/2017	2.0	32		
6/4 - 6/10	6/10/2017	ND (<1.0)	0.5	0.0075	6/5/2017	6.81	ND (<0.25)	5.8	540	2,200	ND (<0.50)	20	299	--	0.15	2.2	--	0.048	0.72	6/7/2017	0.68	10.2		
6/11 - 6/17	6/17/2017	ND (<1.0)	0.5	0.0063	6/12/2017	6.93	ND (<0.25)	21	560	2,200	1.9	31	389	--	0.26	3.3	--	0.056	0.70	6/14/2017	0.97	12.2		
6/18 - 6/24	6/24/2017	ND (<1.0)	0.5	0.0062	6/19/2017	6.89	ND (<0.25)	6.3	620	770	ND (<0.50)	9.0	112	--	0.22	2.7	--	0.059	0.74	6/21/2017	0.85	10.6		
6/25 - 7/1	7/1/2017	ND (<1.0)	0.5	0.0066	6/26/2017	7.10	ND (<0.25)	7.9	560	1,400	0.88	12	157	ND (<0.10)	0.05	0.68	--	0.044	0.58	6/30/2017	2.3	30		
7/2 - 7/8	7/8/2017	16**	16	0.21	7/3/2017	7.16	ND (<0.25)	2.6	520	680	1.6	9.3	125	ND (<0.10)	0.05	0.67	--	0.042	0.56	7/5/2017	2.0	25		
7/9 - 7/15	7/15/2017	15**	15	0.22	7/10/2017	6.77	ND (<0.25)	7.2	590	2,100	ND (<0.50)	21	293	--	0.20	2.8**	--	0.099	1.4	7/12/2017	1.2	18		
7/16 - 7/22	7/22/2017	8.8**	8.8	0.13	7/17/2017	6.80	ND (<0.25)	4.1	530	1,100	ND (<0.50)	11	165	--	0.13	2.0**	--	0.043	0.65	7/19/2017	1.2	21		
7/23 - 7/29	7/29/2017	ND (<1.0)	0.5	0.0077	7/24/2017	6.80	ND (<0.25)	2.9	540	710	1.5	3.2	49	--	0.59	9.0**	--	0.050	0.76	7/26/2017	1.7	27		
7/30 - 8/5	8/5/2017	ND (<1.0)	0.5	0.0066	7/31/2017	6.58	ND (<0.25)	2.6	620	670	8.1	16	238	--	7.0	104**	--	0.042	0.62	8/2/2017	1.6	24		
8/6 - 8/12	8/12/2017	ND (<1.0)	0.5	0.0074	8/7/2017	6.84	ND (<0.25)	ND (<2.5)	410	580	1.2	2.8	41	--	0.13	1.9**	--	0.032	0.47	8/9/2017	1.3	20		
8/13 - 8/19	8/19/2017	ND (<1.0)	0.5	0.0076	8/14/2017	6.64	ND (<0.25)	13	470	4,300	ND (<0.50)	52	800	--	0.12	1.8**	--	0.76	12	8/16/2017	1.8	27		
8/20 - 8/26	8/26/2017	ND (<1.0)	0.5	0.0067	8/21/2017	7.05	ND (<0.25)	14	580	5,200	0.90	62	876	ND (<0.10)	0.05	0.70**	--	0.18	2.5	8/23/2017	ND (<0.50)	0.25	2.2	
8/27 - 9/2	9/2/2017	ND (<1.0)	0.5	0.0081	8/28/2017	7.15	ND (<0.25)	7.7	620	2,300	1.2	18	276	ND (<0.10)	0.05	0.77**	--	0.18	2.8	8/30/2017	2.1	35		
9/3 - 9/9	9/9/2017	ND (<1.0)	0.5	0.0081	9/5/2017	6.65	ND (<0.25)	6.6	580	3,500	ND (<0.50)	42	657	--	0.23	3.5	--	0.14	2.2	9/6/2017	0.75	12		

# Attachment B

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*Equipment Tracking Form*

Sub-System	P&ID	Description	Status <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
<b>Main Plant Equipment</b>						
<b>1 Seep Wells and Lift Station 1</b>						
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			
<b>2 Athens Road Wells and Lift Station 3</b>						
2.01		Athens Road Well Field, 9 wells	Running			
2.02		Lift Station 3 Lift Pump A	Standby		2	A new mechanical seal was installed on the turbine shaft.
2.03		Lift Station 3 Lift Pump B	Running			
2.04		Area in and around Lift Station 3	Running			
<b>3 Lift Station 2 and Transmission Pipelines</b>						
3.01		Influent Pipeline	In operation			
3.02		Effluent Pipeline	Running			
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		1	A power loss at the NV Energy substation caused a power outage at all of the LS.
<b>4 Interceptor Wells and Cr Treatment Plant</b>						
4.01		IWF Well Field, 30 wells	Running		3	Pulled and inspected I-Z for depth of the pump and the transducer.
4.02		Ferrous Sulfate Feed System	Running			
4.03		Polymer Feed System	Running		3	A new pump head was installed.
4.04		Clarifier	In operation			
4.05		Filter Press	Running		2	New fittings were installed on the piping feeding the press. New bracing was also installed. A new airline regulator was also installed.
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			
<b>5 Equalization Area and GW-11 Pond</b>						
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			

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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		3	Installed plugs on the flow meter tubing which are no longer in use.
<b>6</b>		<b>First Stage FBRs A, 1 &amp; 2</b>				
6.01	PID14	FBR A			3	Began installing new airlines for the FBR skid
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		3	The media return pump was rebuilt
6.10	PID01A	First Stage FBR Pump - P1011	Standby			
6.11	PID01A	First Stage FBR Pump - P1012	Running			
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		2	A new pump was installed to replace the pump with a damaged pump
6.20	PID15	FBR 1 Nutrient (Phos Acid) Feed Pump - P1521	Running		2	A new pump was installed to replace the pump with a damaged pump
6.21	PID15	FBR 2 Nutrient (Phos Acid) Feed Pump - P1522	Running		2	A new pump was installed to replace the pump with a damaged pump
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			
<b>7</b>		<b>First Stage FBRs 3 &amp; 4</b>				

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7.01	PID01B	FBR 3	Running			
7.02	PID01B	FBR 4	Running		2	A new gasket was installed on the 12" line
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			
<b>8</b>		<b>Second Stage FBRs 5 &amp; 6</b>				
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			
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			
<b>9</b>		<b>Second Stage FBRs 7 &amp; 8</b>				
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			

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Sub-System	P&ID	Description	Status <sup>1</sup>	Checked	Criticality <sup>2</sup>	Notes
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			
<b>10</b>		<b>Aeration and DAF System</b>				
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		3	A new regulator was installed.
10.11	PID05	DAF Vessel - D501	Running		2	The unit was taken offline to inspect and pressure wash the vessel and make all repairs needed.
10.12	PID05	DAF Pressure Pump - P501	Running		3	A new flow valve was installed.
10.13	PID05	DAF Float Pump - P502	Running		3	The pump was rebuilt.
10.14	PID05	DAF Vessel - D551	Running		2	The unit was taken offline to inspect and pressure wash the vessel and make all repairs needed.
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			
<b>11</b>		<b>Pumping System (Old Effluent)</b>				
11.01	PID06	Effluent Tank 601	In operation			
11.02	PID06	Effluent Pump - P601	Running			
11.03	PID06	Effluent Pump - P602	Standby			
<b>12</b>		<b>Sand Filter System</b>				
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			
<b>13</b>		<b>Effluent Tank and Pumping</b>				

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13.01	PID10C	UV Effluent Tank	Running			
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			
<b>14</b>		<b>Solids Collection and Pressing System</b>				
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			
		<b>Chemical Systems</b>				
<b>15</b>		<b>Electron Donor System</b>				
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			
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	Ferric Chloride System	In operation			
24	PID07B	Polymer Systems - DAF	In operation			
25	PID09	Polymer System - Solids Dewatering (2 tanks, 2 centrifugal pumps, mixer, volumetric feeder)	In operation			
		<b>Utility Systems</b>				
<b>26</b>		<b>Compressed Air System</b>				

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26.01	PID08	West Compressor	Running		2	A fuse was replaced on one of the leads. No other faults were found.
26.02	PID08	East Compressor	Running			
26.03	PID08	O2 Compressor	Running			
26.04	PID08	Compressed Air Receiver Tank	In operation		1	The plant was taken offline to replace an airline fitting and to install new valves around the plant.
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			
<b>Miscellaneous Systems</b>						
33		Operations Office/Network	In operation			
34		Laboratory Analyzers	In operation			
35		Security Systems	In operation			
<b>Shelf Spares</b>						
		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			New pumps have been ordered to replace the ones used during the month.
		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			Spares are on the shelf.

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