
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: June 20, 2021

Subject: NERT – GWETS Operation Monthly Report – May 2021

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 May 2021.

Summary of GWETS Operation

Envirogen Technologies, Inc. (ETI) mechanically operated the GWETS and ion exchange (IX) system normally in May 2021. 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 194 gallons per minute (gpm). The flow rate to the FBR plant averaged approximately 1,031 gpm during May 2021. At the end of the month, the GW-11 Pond volume was at 35.6 million gallons (MG), which would allow 18.6 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 increased from the end of April 2021. 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 0.15 mg/L for the month. The influent perchlorate concentration to the FBR plant averaged 58 mg/L for the month, with a maximum concentration of 61 mg/L. In comparison, the influent perchlorate concentration to the FBRs for the month of April 2021 averaged 55 mg/L, with a maximum concentration of 59 mg/L.

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. 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 May.

2. Biological Plant

There were influent / effluent diversions during the reporting period generally associated with GW-11 pond level maintenance as well as extraction well short-term shutdown events. Below is a description of the events that occurred:

Diversion Events / Well Shutdowns

- Effluent diversion to GW-11 occurred on May 2, 2021 from 11:18pm to May 3, 2021 at 4:15am due to low GW-11 pond level. Approximately 320,000 gallons of water were diverted to GW-11.
- Effluent diversion to GW-11 occurred on May 4, 2021 from 9:42pm to May 5, 2021 at 4:00am due to low GW-11 pond level. Approximately 377,000 gallons of water were diverted to GW-11.
- Influent diversion to GW-11 occurred on May 5, 2021 from 4:03pm to May 5, 2021 7:10pm and May 5, 2021 11:00pm to May 6, 2021 4:00am due to communication signaling errors at the EQ area. Troubleshooting was conducted and the plant was brought back online.
- Influent diversion to GW-11 occurred on May 9, 2021 from 10:03am to May 9, 2021 3:39pm due to communication signaling errors at the EQ area. Troubleshooting was conducted, communication cards were replaced, and the plant was brought back online.
- Influent diversion to GW-11 occurred on May 10, 2021 from 7:43am to 12:33pm due to communication signaling errors at the EQ area. Troubleshooting was conducted, communication power supplies were replaced, and the plant was brought back online.
- Extraction Well Shutdown of I-G (IWF) occurred on May 14, 2021 from 10:30pm to May 16, 2021 6:30am, due to a malfunction at the power box. Maintenance was conducted, the main electrical connections in the power box were replaced, and the well was brought back online.
- Effluent diversion to GW-11 occurred on May 17, 2021 from 11:57am to 3:30pm as a precautionary measure due to high effluent turbidity results. Adjustments were made, low turbidity was restored, and the effluent was returned to the outfall. Approximately 219,000 gallons of water were diverted to GW-11.
- Well Field Shutdown of the IWF (Eastern leg) occurred on May 18, 2021 from 4:00am to 6:22am and from 1:07pm to 4:00pm due to a communication switch malfunction. The communication error was resolved and the well field was brought back online.
- Well Field Shutdown of the IWF occurred on May 19, 2021 from 12:05pm to 1:00pm due to maintenance activities on the electrical system. The main electrical breaker was replaced and the well field was brought back online.
- Extraction Well Shutdown of I-K (IWF) occurred on May 31, 2021 from 3:33am to 9:40am, due to a malfunction at the pump. Maintenance was conducted, the pump was replaced, and the well was brought back online.

3. Spills

There were no reportable spills in the month of May.

4. Maintenance

- Major maintenance performed by ETI in the reporting month included:
 - I. Replaced the 2hp motor and the pump on ART-2A.
 - II. Located a buried combo valve on the effluent pipeline under the old haul road northeast of the WC-East Pond. Isolated the valve and replaced with a new combo valve.
 - III. Replaced the pigtail and 0.5hp motor on IWF extraction well I-G.
 - IV. Reset the radio communications on the IWF eastern leg well field.
 - V. Replaced the breaker on the IWF east wellfield main panel.
 - VI. Replaced the 0.5hp motor and pigtail on AP Area extraction well E2-2.
 - VII. Repaired the main electrical connections supplying the power box for IWF extraction well I-G.
 - VIII. Replaced the motor saver for IWF extraction well I-V.
 - IX. Replaced the digital output cards, analog input cards, and communication card to address a loss of communication between the control room and EQ area. The power supply and Profibus connectors were also replaced and the connections on the signal repeater were re-terminated.
 - X. Replaced bearing on the pump end of P-102A. The pump and motor were pulled and the seal was replaced.
 - XI. Replaced the pump on media return #1.
 - XII. Repaired a hole in the South DAF vessel.
 - XIII. Replaced the North DAF sludge pump.
 - XIV. Changed out the 30 hp motor and the electrical connections on P-602.
 - XV. Replaced the 3-inch press pump.
- Preventative Maintenance completed by ETI in the reporting month included:
 - I. Cleaned out the head of the DAF polymer chemical feed pump.
 - II. Set up a tote for the GWTP polymer system.
 - III. Cleaned out the dust from the MCC's at Lift Station 3.
 - IV. Cleaned the air filters on the external Air Conditioners at the lift stations.
 - V. Flushed the sump pump west of the D-1 bldg.
 - VI. Tightened pipe brackets on the bed height pumps.
 - VII. Changed the oil on the lift station turbine pumps.

GWETS Upgrades and Facility Projects

Unit 4 Chromium Water Treatment Plant – Envirogen participated in a meeting with the Trust in April 2021 to discuss moving this project forward. Envirogen received notification at the end of May that the Trust will be repurposing one of the AP tanks to support the Unit 4 Source Area In-situ Bioremediation Treatability Study. Groundwater extracted as part of this treatability study will be conveyed to this tank via tanker truck where it will be stored and subsequently routed to the treatment plants for processing. Envirogen will take over responsibility for operating this tank for the duration of treatability study. Envirogen will work with the Trust in the coming months to establish a scope of work.

GWETS Extension – The signed Work Authorization for engineering and fabrication of the GWETS Extension was returned to the Trust on January 28, 2020. As a result of comments received from Clark County that prohibit the use of shipping containers as structures, Envirogen submitted a Work Authorization to the Trust for: re-designing the pump system containers to independent skids; modifying the electrical control panels; and providing 3-sided canopies to house sun sensitive equipment. The Work Authorization was signed by Envirogen and the Trust in March 2021. Envirogen received comments from the Trust regarding the GWETS O&M Work Authorization (Contract Amendment 8) and provided a response in March 2021. The Authorization has not been completed, Envirogen is waiting to receive the final version of the Contract Amendment.

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) ^{4 5}	Chromium (TR) (mg/L) ^{4 5}	Chromium(VI) (mg/L) ^{4 5}
SWF Total Extraction ¹	749 ³	6.0	0.00032	0.0012
AWF Total Extraction ¹	460 ³	69	0.13	0.13
IWF Total Extraction ¹	60 ³	451	6.8	6.3
AP Area Total Extraction ¹	8.5 ³	645	0.15	0.16
GWTP Effluent ²	72	482	0.36	ND
GW-11 Influent ¹	0.24	68	0.10	0.0087
FBR Influent ²	1,031	58	0.016	0.019

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 Eurofins TestAmerica.
- 2: Perchlorate, chromium TR, and chromium (VI) sampled weekly, values reported from Eurofins TestAmerica.
- 3: Sum of daily average flow for individual wells.
- 4: All concentrations reported are monthly flow weighted averages.
- 5: 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) ¹	Chromium (TR) (lbs/month) ¹	Chromium (VI) (lbs/month) ¹
SWF Total Extraction	1,666	0.088	0.34
AWF Total Extraction	11,766	22	23
IWF Total Extraction	10,074	152	141
AP Area Total Extraction	2,041	0.48	0.51
GWTP Effluent	12,999	9.7	ND
GW-11 Influent	6.1	0.0086	0.00078
FBR Influent ¹	22,299	6.3	7.3

Notes:

TR = Total Recoverable; NA = Not Analyzed.

1: 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 05/31/2021

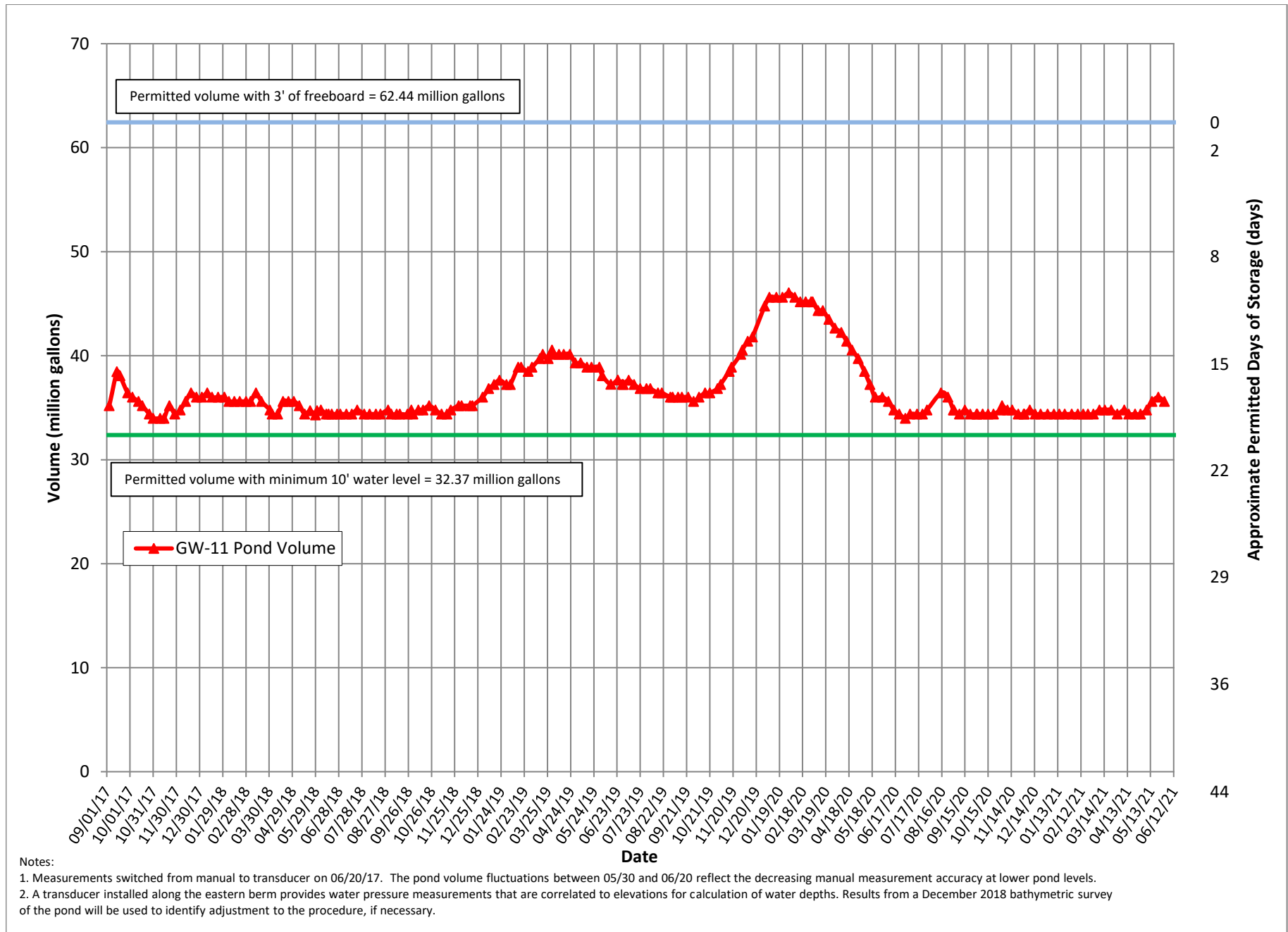
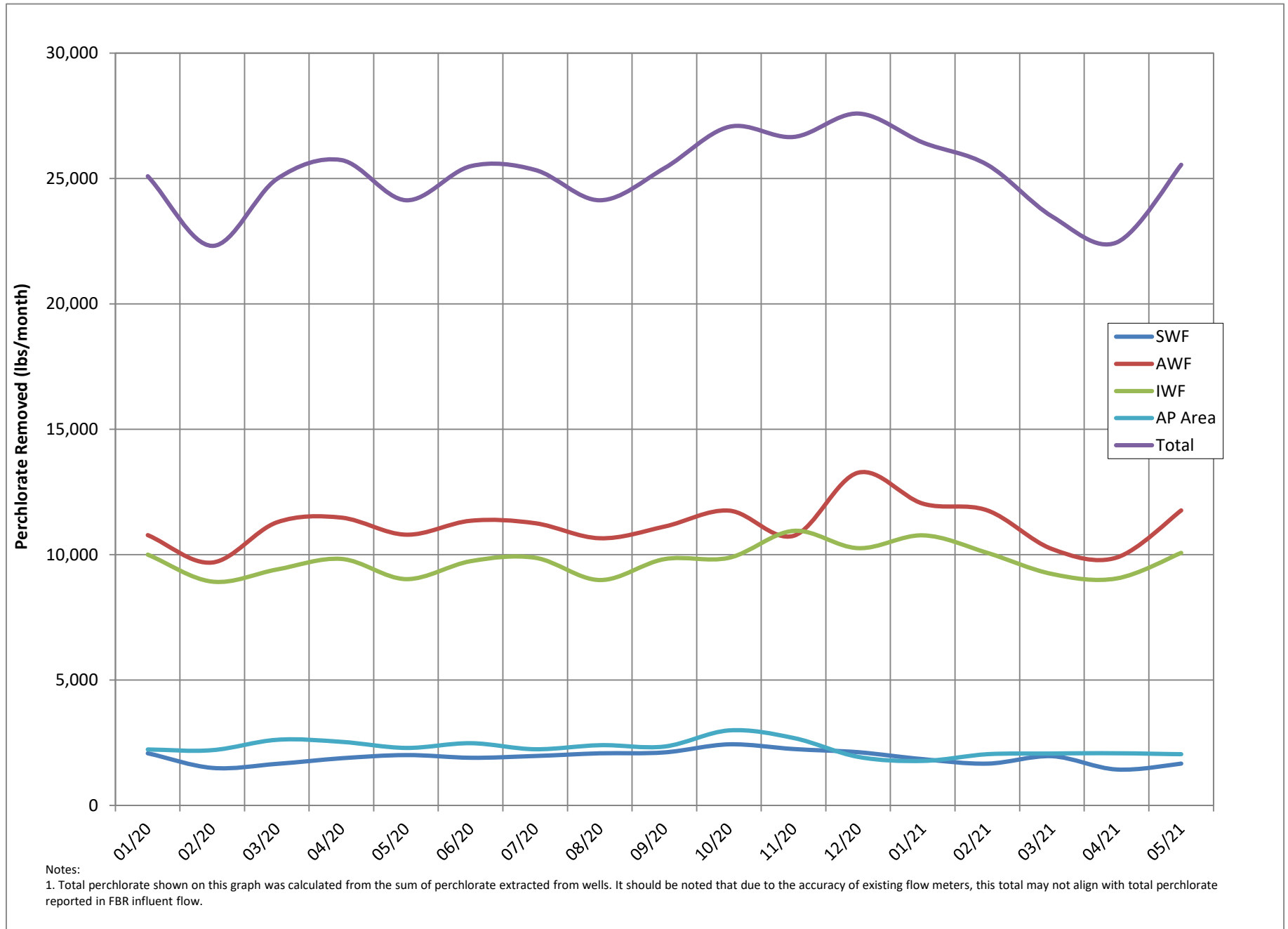


Figure 2 - Historical Perchlorate Mass Removed From Environment



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	Replaced the 2hp motor and the pump on ART-2A.
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		1	Found the combo valve on the old haul road. Isolated the valve and replaced with a new combo valve and put it 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 pigtail and .5hp motor on I-G. Reset the radio communications on the east well field. Replaced the breaker on the east wellfield main panel. Replaced the .5hp motor and pigtail on E2-2. Repaired the main electrical connections supplying the power box for I-Replaced the motor saver for I-V.
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			

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Criticality Codes

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
5.05	PID10A	Area in and Around EQ	In operation		1	The communication between the control room and Eq is losing connection. Digital output cards and analog input cards have been replaced. The communication card has been replaced. The power supply has been replaced. The Profibus connectors have been replaced. The connections on the signal repeater have been re-terminated.
5.06	PID10A	Raw Water Feed Pump - P102A			1	The bearing failed on the pump end. The pump and motor were pulled and the seal was replaced. The pump and motor were reinstalled.
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				
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 pump was replaced.
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			

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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
6.24	PID07B	FBR 2 Electron Donor Assembly Pump - P732	Running			
7		First Stage FBRs 3 & 4				
7.01	PID01B	FBR 3	Running		3	The differential pressure flow meter was flushed and recalibrated.
7.02	PID01B	FBR 4	Running		3	The positioner on the valve was calibrated.
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 - P724	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 belt was replaced on the pump.
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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Sub-System	P&ID	Description	Status ¹	Checked	Criticality ²	Notes
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		3	Replaced the belts on the pump.
10.14	PID05	DAF Vessel - D551	Running		2	Took the vessel offline for a short time to patch a hole on the wall near the weir box.
10.15	PID05	DAF Pressure Pump - P551	Running			
10.16	PID05	DAF Float Pump - P552	Running		3	Replaced the pump with a rebuilt pump.
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			2	Changed out the 30 hp motor and the electrical connections.
12		Sand Filter System				
12.01	PID17	Sand Filter			4	Installed new splash guards on the airlifts.
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		4	Installed a new valve at the sample port.
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		3	Replaced the press pump with a rebuilt pump.
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		2	The pump has been replaced with new connections.
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	In operation			
24	PID07B	Polymer Systems - DAF	In operation		3	The pump head fitting were replaced. The pump head and line were cleaned out.
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		4	New labeling has been put on the wiring for the digital output card.
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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