

Joint Venture

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Missoula, MT 59808

June 14, 2017

TO: Scott Hansen

CC: Jamie Dunn, Eric Ealy, Alan Buell, Denis Roznowski, Steve Garbaciak,
Ken Aukerman, Kris Gamble, Scott Inman, Jim Burton, Tom Perry, Pat Carr

FR: Brian Bell, Andrea Martin

RE: Ashland/NSP Lakefront Site: Phase 2 Odor/Emission Control System Status Report

This report provides the performance evaluation of the Odor/Emission Control System (OECS) installed in the sediment processing tent supporting Phase 2 Wet Dredge activities. Data through the following dates are included:

Field Measured Data: June 5, 2017	Laboratory Measured Data: May 31, 2017
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Monitoring the performance of the five modules comprising the OECS was conducted by Foth Infrastructure & Environment/Envirocon Joint Venture (FE JV) personnel. OECS operation was initiated on May 18, 2017. Design and monitoring details and requirements are presented in the *Final (100%) Design for Phase 2 Wet Dredge* (FE JV, 2017).

The primary goal of the OECS performance evaluation is to identify when the granular activated carbon (GAC) in the system adsorption beds should be replaced. Secondly, the evaluation compares OECS emissions to Wisconsin Administrative Code (Wis. Admin. Code) NR 445, Control of Hazardous Air Pollutants. Information provided in the attachments address both goals. This report is structured in the following manner:

Attachment 1 OECS Performance Evaluation:

Data are evaluated as it becomes available. Field data for each module include photoionization detector (PID) measurements of total volatile organic compounds (TVOC), air flow, and other operational parameters. Data are made available daily. Approximately twice per week, SUMMA canister sampling is conducted and analyzed by Test America Laboratory. The analytical results are made available in approximately 5 days. This attachment provides a series of trend graphs documenting module performance of TVOC reduction.

Attachment 2 Wis. Admin. Code NR 445 Comparison:

Emissions of benzene, toluene, ethylbenzene, xylene, and naphthalene are tabulated and compared to NR 445 compliance limits. Benzene is presented graphically because this constituent has the lowest annual compliance limits of the five parameters and therefore is the most sensitive to increasing emissions.

If you have any questions regarding the OECS weekly status report, please contact Steve Garbaciak at (630) 368-3069 or e-mail at steve.garbaciak@foth.com.

References

Foth Infrastructure & Environment/Envirocon Joint Venture, 2017. *Final (100%) Design for Phase 2 Wet Dredge – Ashland/NSP Lakefront Site*. March 2017.

Attachment 1
OECS Performance Evaluation



Joint Venture

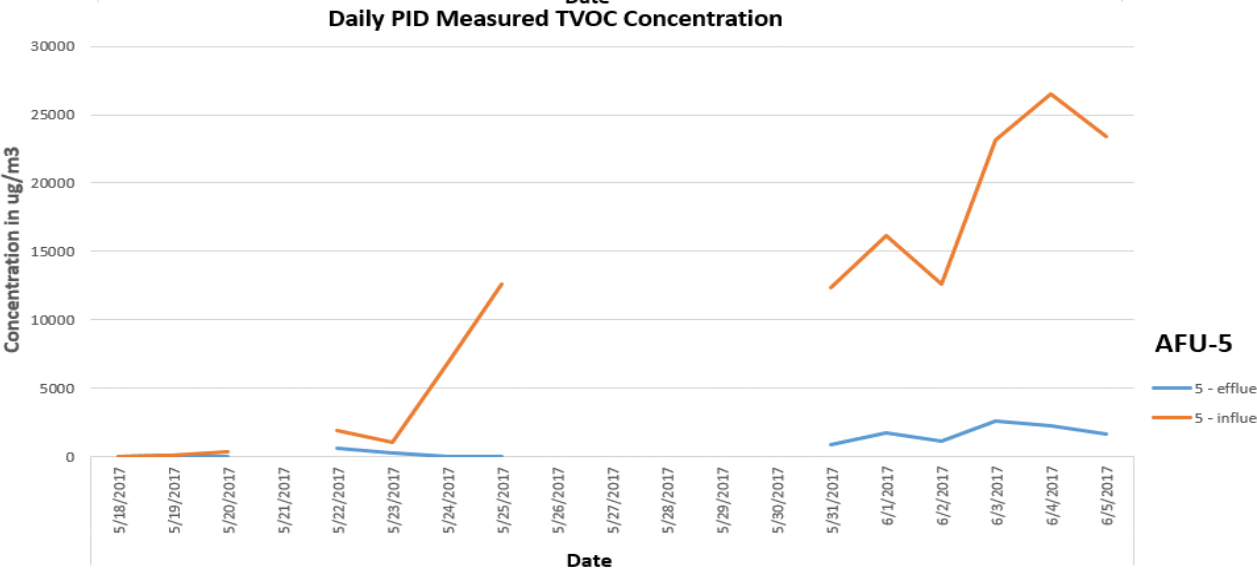
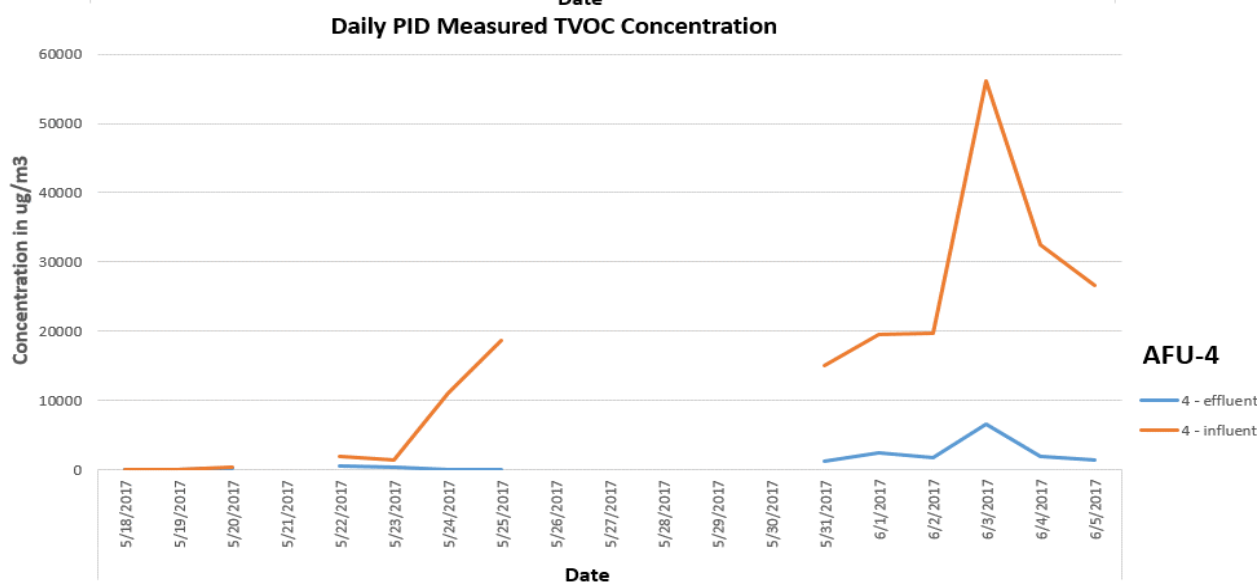
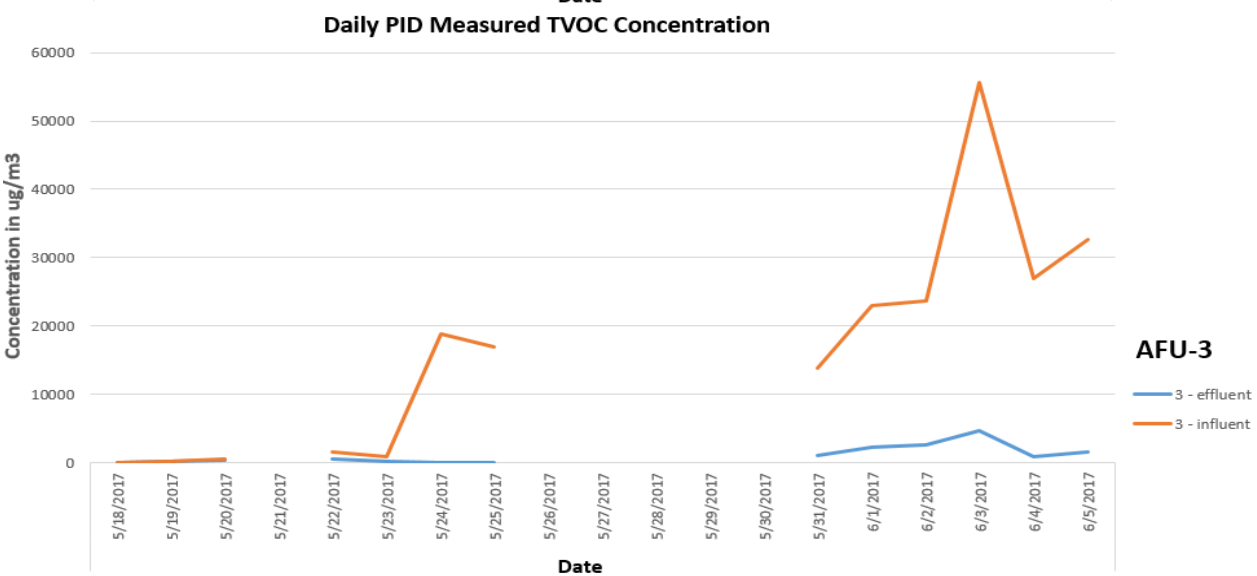
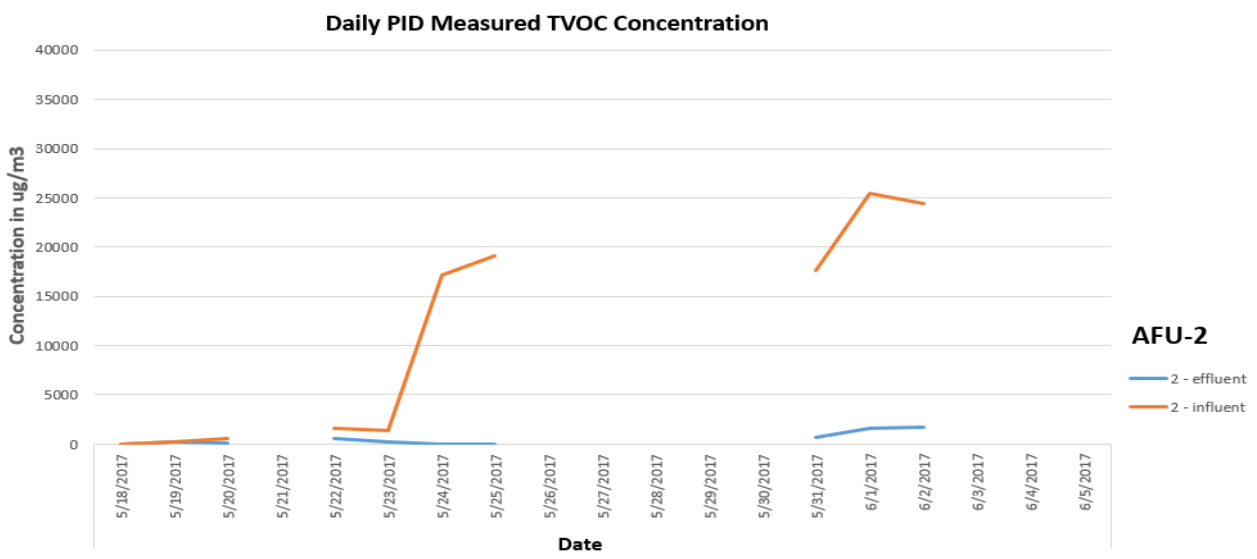
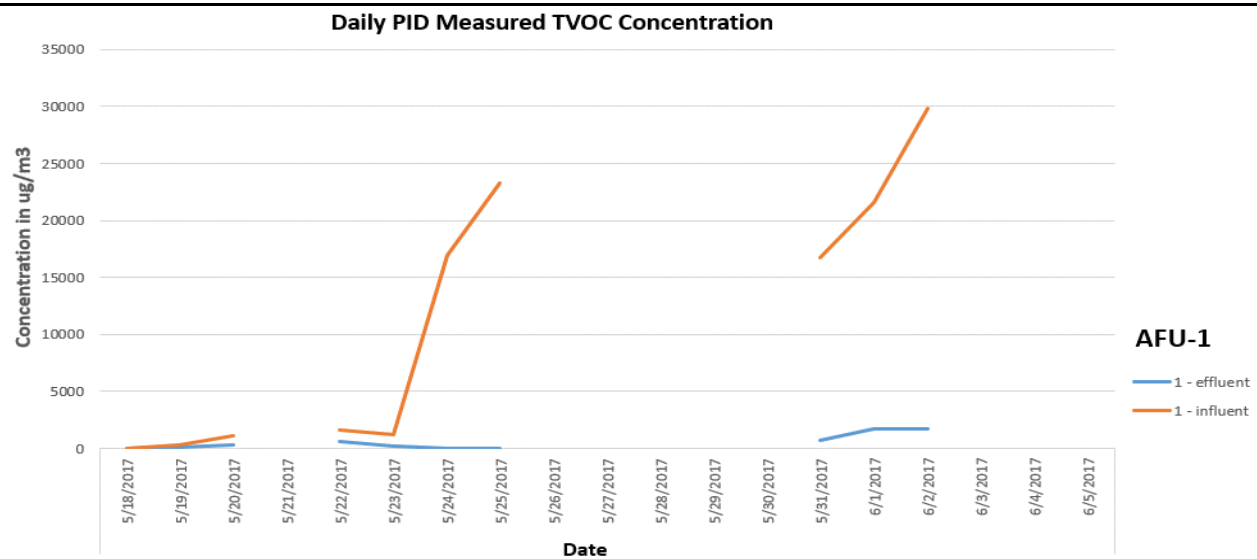
Odor/Emission Control System Log

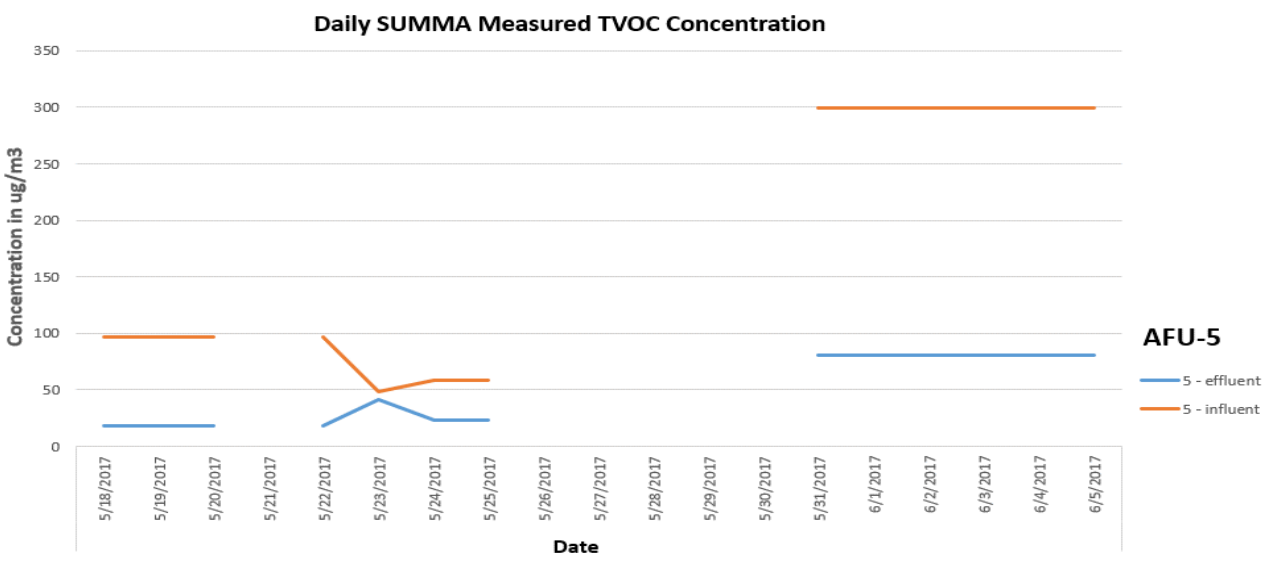
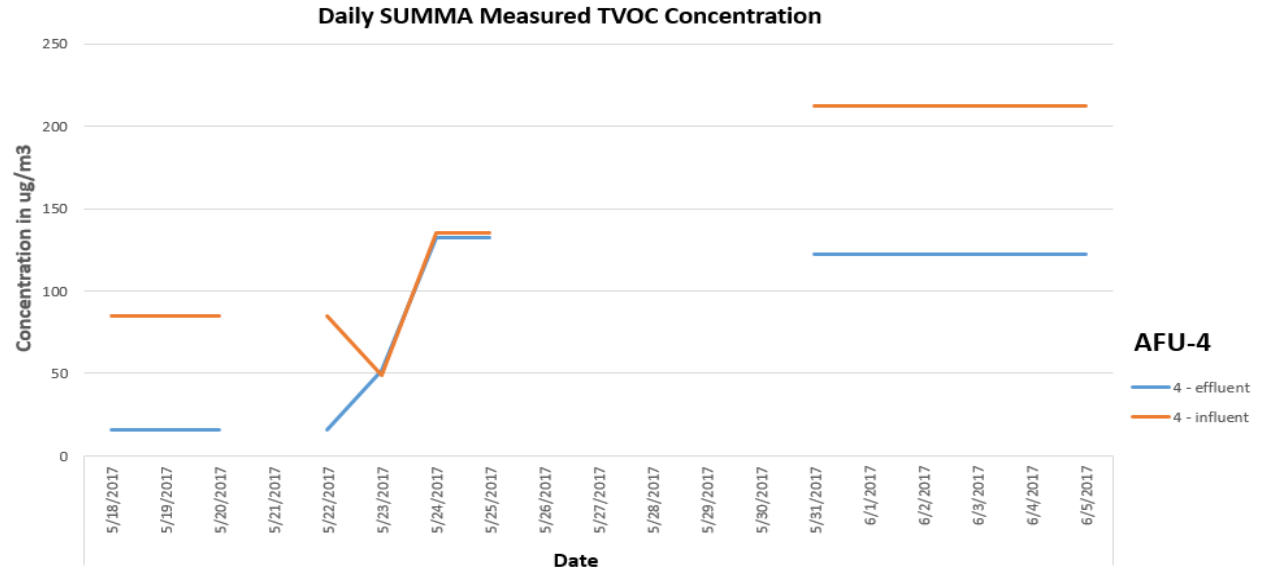
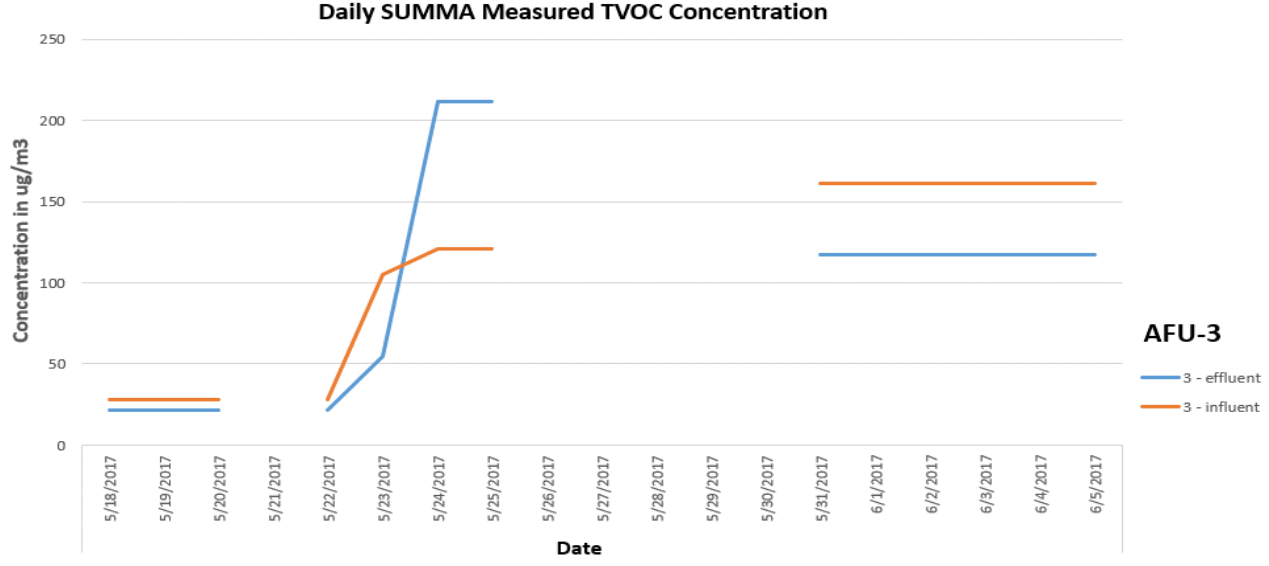
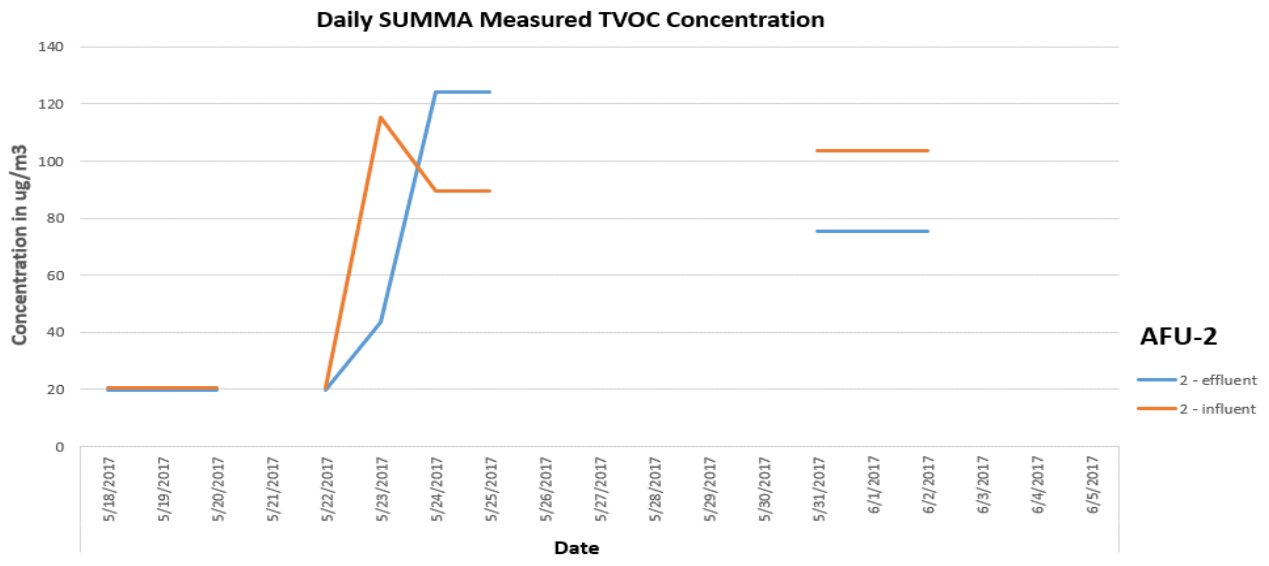
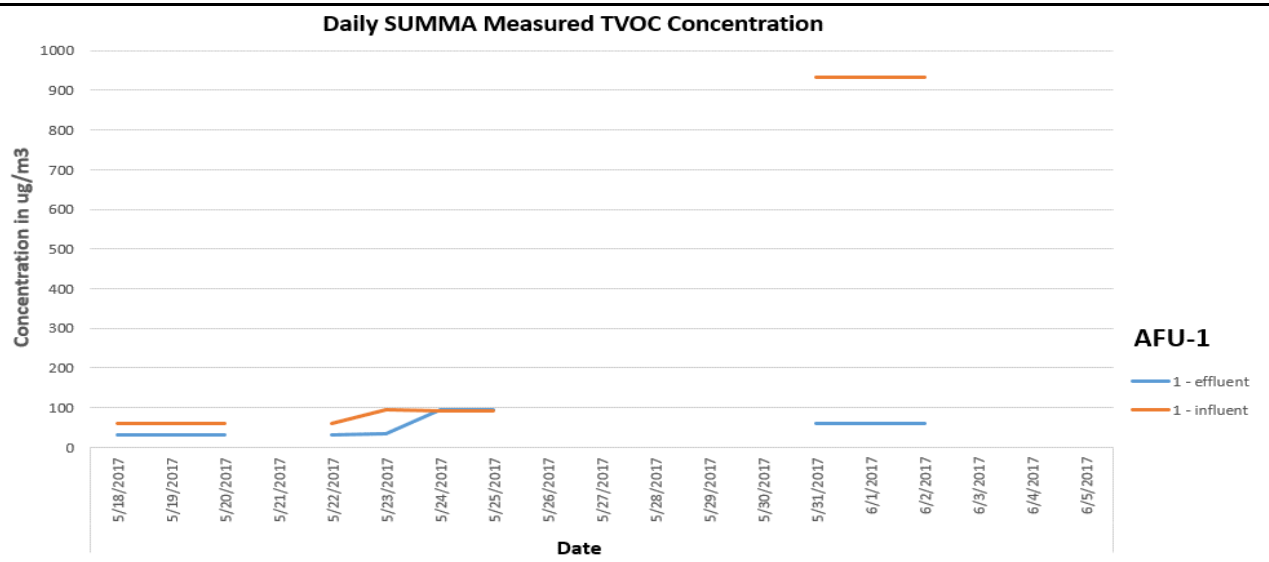
Client's Name: NSPW	Site Location: Ashland/NSP Lakefront Site	Project No. 17X001
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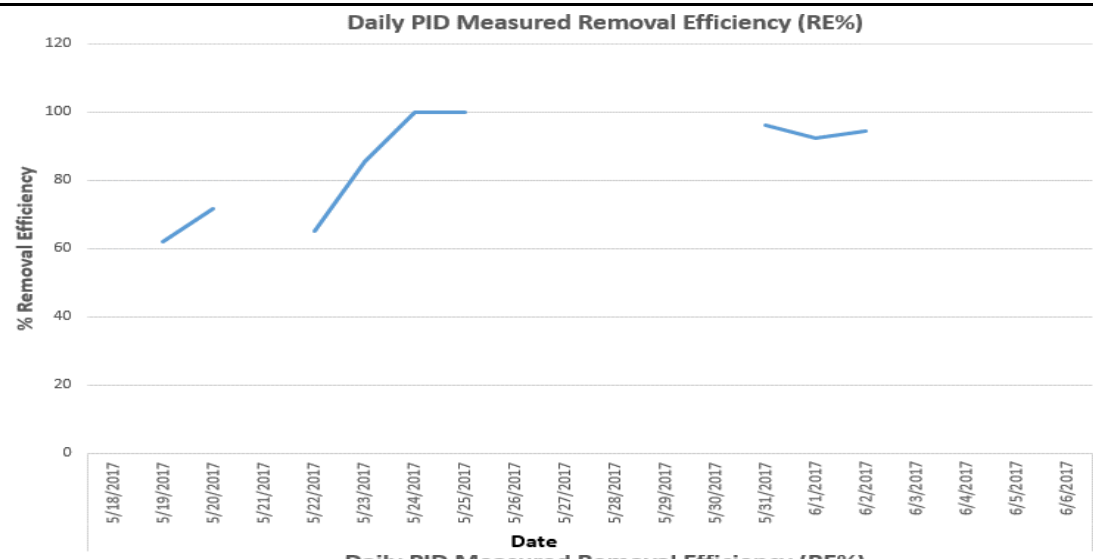
Report #	Through Date	Performance Evaluation Results/ Action Taken	NR 445 Compliance ¹	Prepared By
1	6-5-2017	<p>The Odor Emissions Control System (OECS) operations started on 5/18/17, and consist of five Air Filters Inc. modules (AFU-1 to AFU-5). The fans for the units are turned down for the night-time hours. The AFUs were turned off for the extended holiday break from the night-time hours of 5/25/17 to re-start during the morning hours of 5/31/17.</p> <p>On 5/24/17, the photoionization detector (PID) monitoring instrument was changed out from MiniRAE 3000 to ppbRAE 3000. This allows the total VOC (TVOC) detection level to be lowered from 100 ppb (v/v) to 1 ppb (v/v). As a result, the PID data are more useful from 5/24/17 onwards. Excessive airborne lime dust conditions were experienced within the sediment processing tent as part of early stabilization operations of dredged materials during ramp up of processing operations. The excessive lime loading was captured on the AFU pre-filters which caused extra maintenance of the AFUs. The AFU modules/fans experienced backpressure increases due to the lime dust capture. Maintenance included removing the pre-filters and cleaning the lime fines from the filters. The carbon filter components of the AFUs were not compromised during this time period as no breakthrough of lime dust past the pre-filters was observed.</p> <p>The PID readings and SUMMA samples were taken and analyzed according to the <i>Monitoring Plan</i>. The PID values are much higher than the TVOC values reported by the TO-15 PF analysis, by one or two orders of magnitude for influent concentrations. Additional data will be evaluated to better identify a correlation.</p> <p>In general, after the ppbRAE 3000 PID instrument was used, the removal efficiencies for total VOCs, as measured by PID, are in the 90% to 100% range. Regarding the SUMMA canister TO-15 analysis (for sampling dates up to 5/31/17), TVOC removal efficiencies varied as measured by the TO-15 PF analysis due to a number of likely mitigating factors resulting from actual operations in the field. The effluent TVOC concentrations were quite low in comparison to site perimeter alert and action levels and NR 445 requirements. The SUMMA canister TO-15 analysis also presents some anomalous data where effluent concentrations exceed influent concentrations for some organic constituents. This may indicate actual conditions, however, it is not uncommon to see this type of anomaly when sampling extremely low concentrations.</p>	In	Brian Bell

Notes:

1. In – facility emissions are in compliance with Wisconsin Administrative Code NR 445.
Out – facility emissions are not in compliance with Wisconsin Administrative Code NR 445. See comments under “Performance Evaluation Results/Action Taken” column.
Reference(s):
Foth Infrastructure & Environment/Envirocon Joint Venture, 2017. *Monitoring Plan for Phase 2 Wet Dredge Pilot Study* – Ashland/NSP Lakefront Site. March 2017.

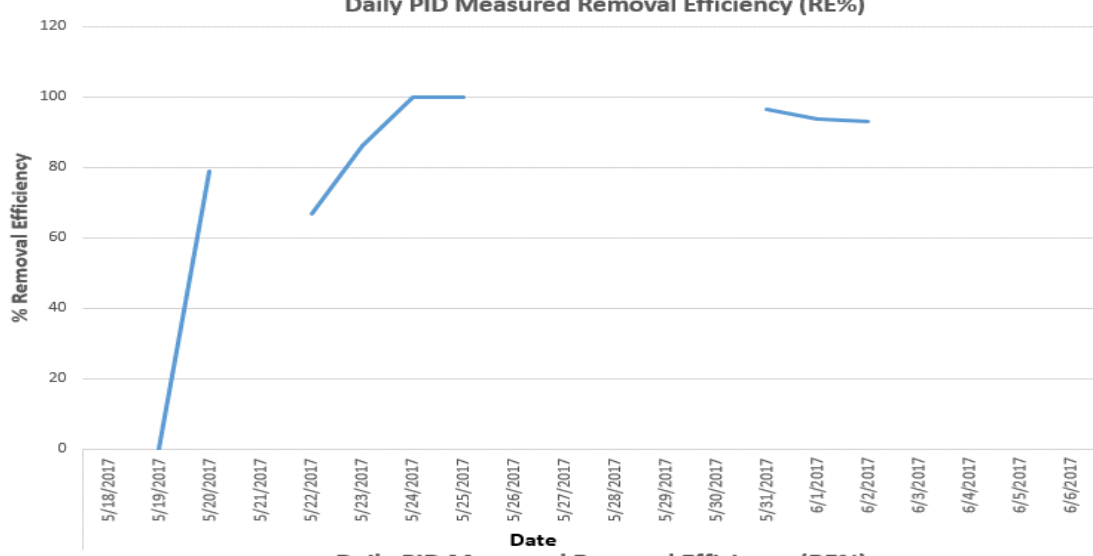






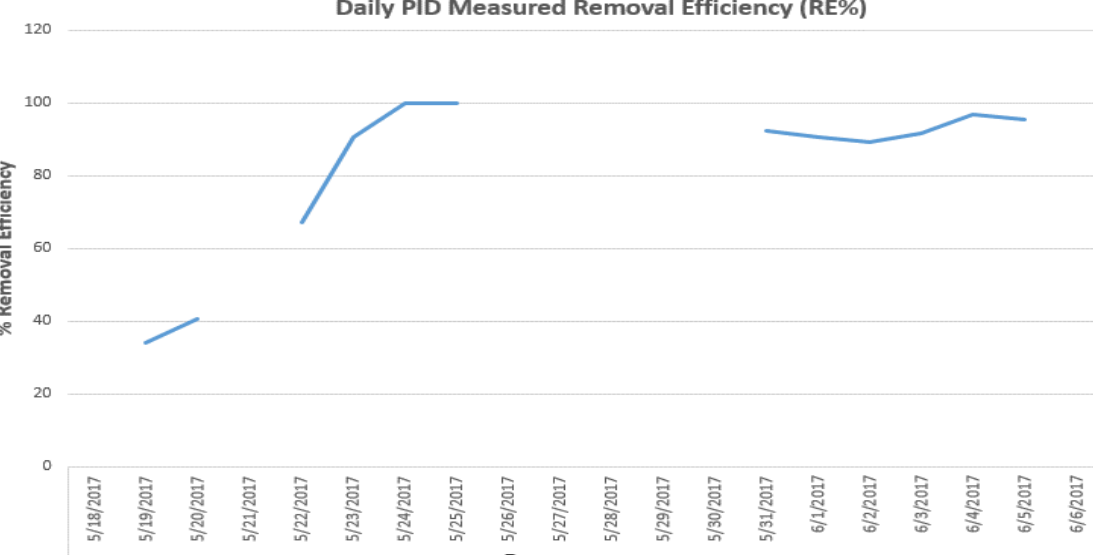
AFU-1

1



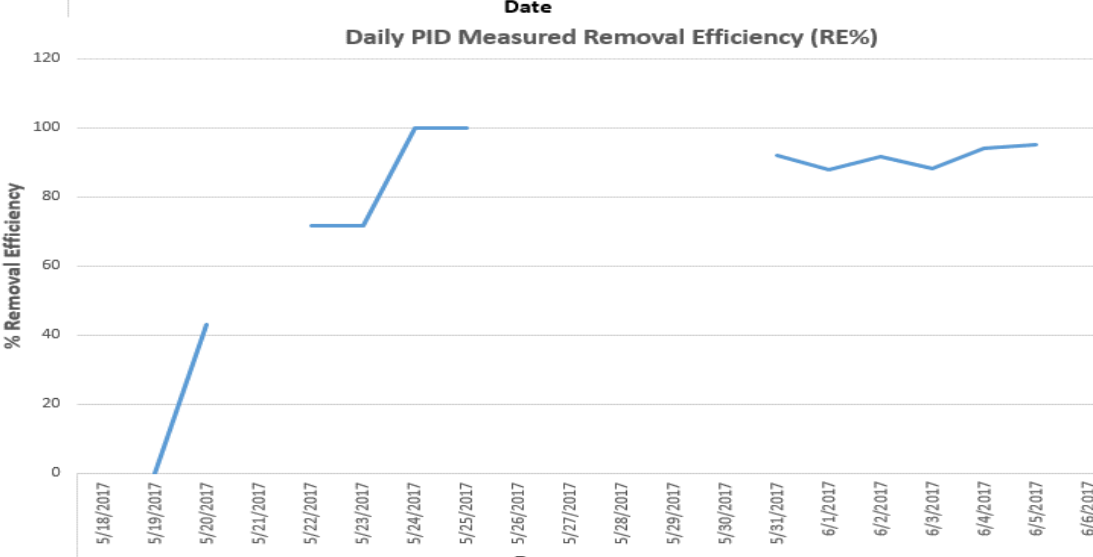
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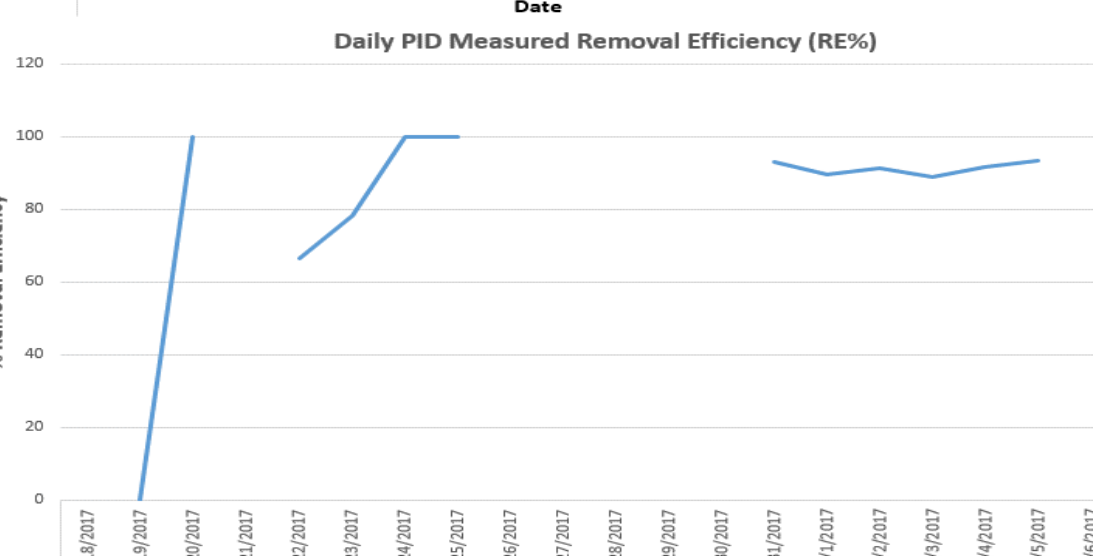
AFU-3

3



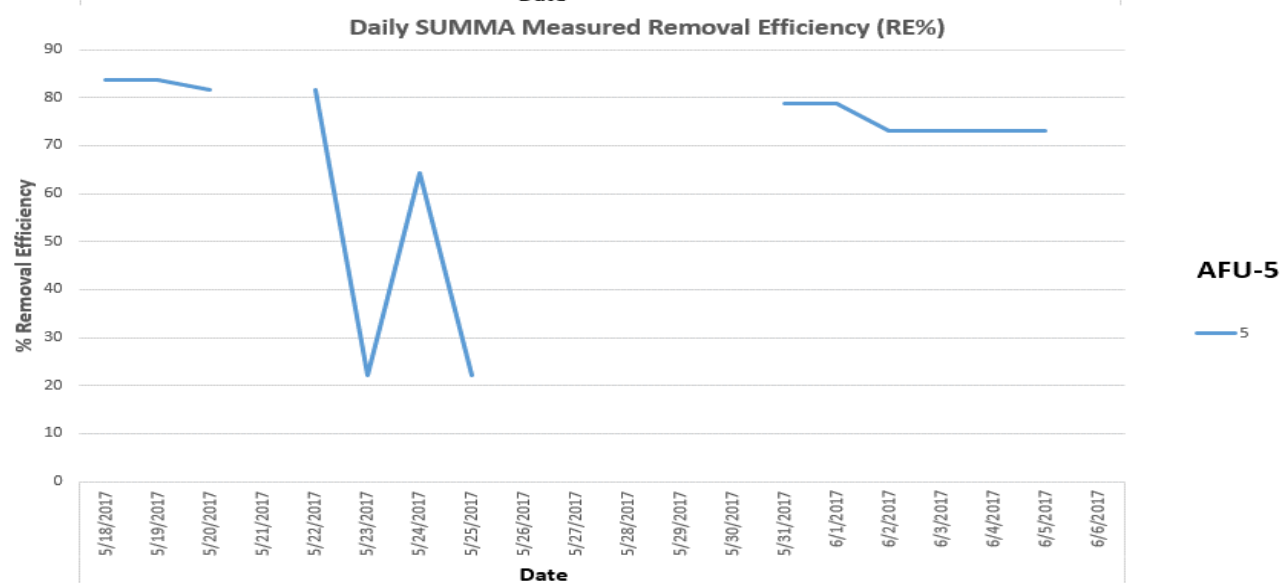
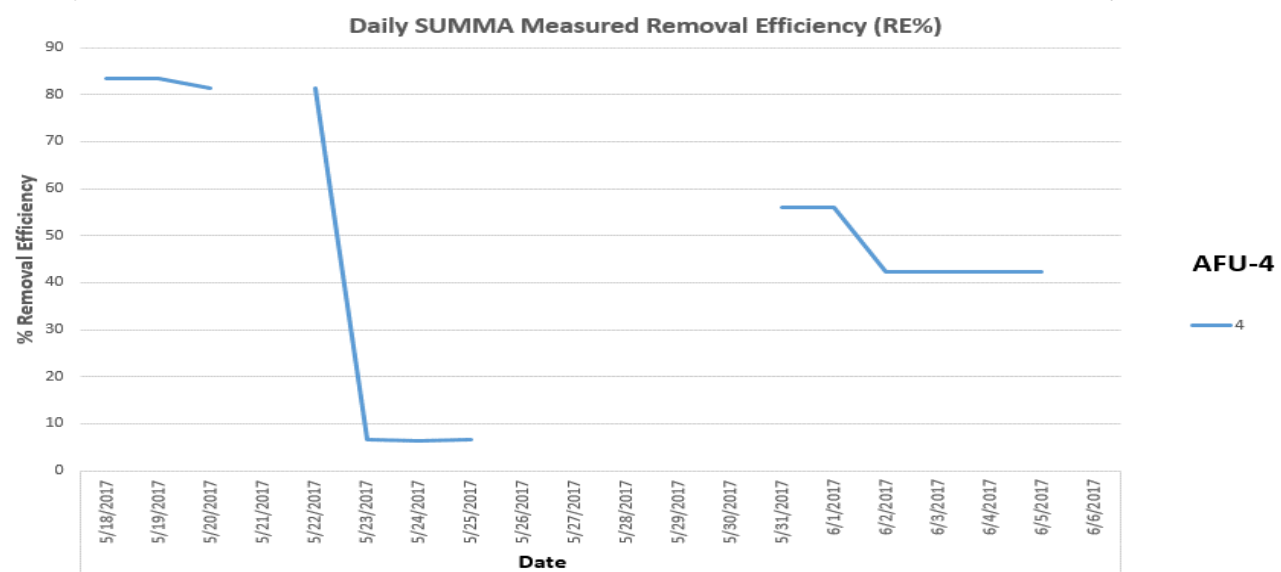
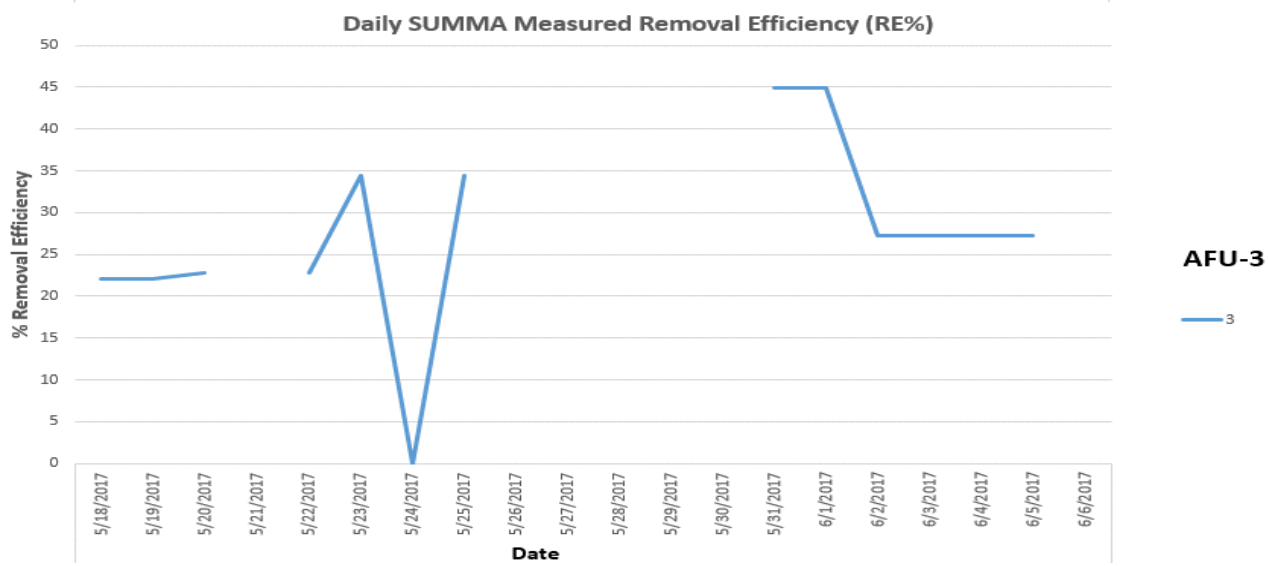
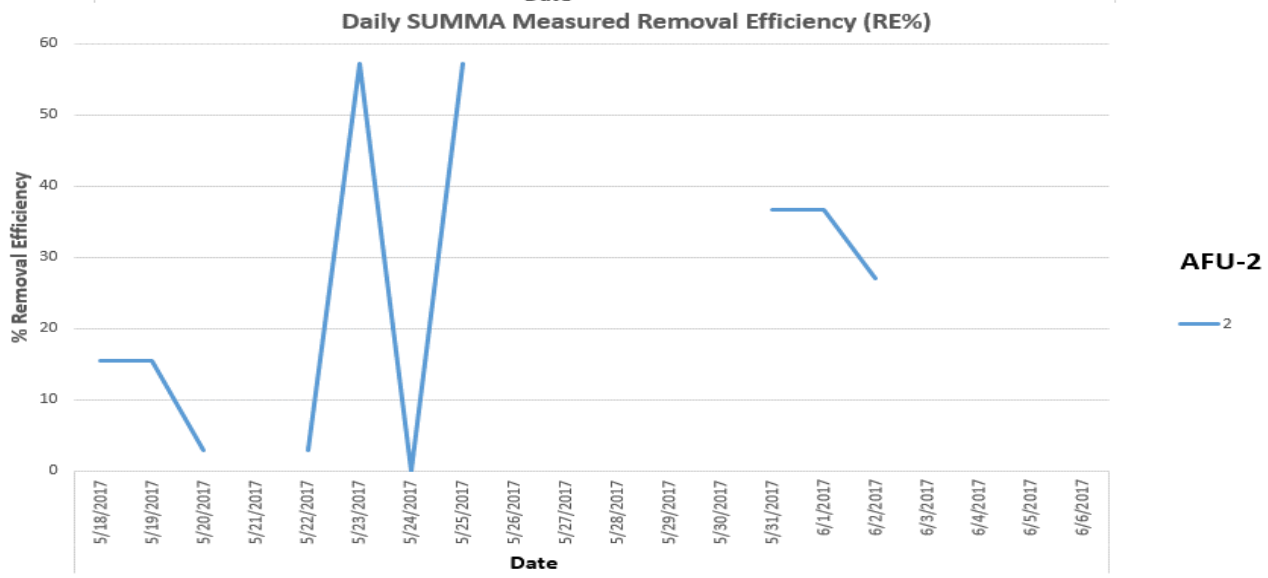
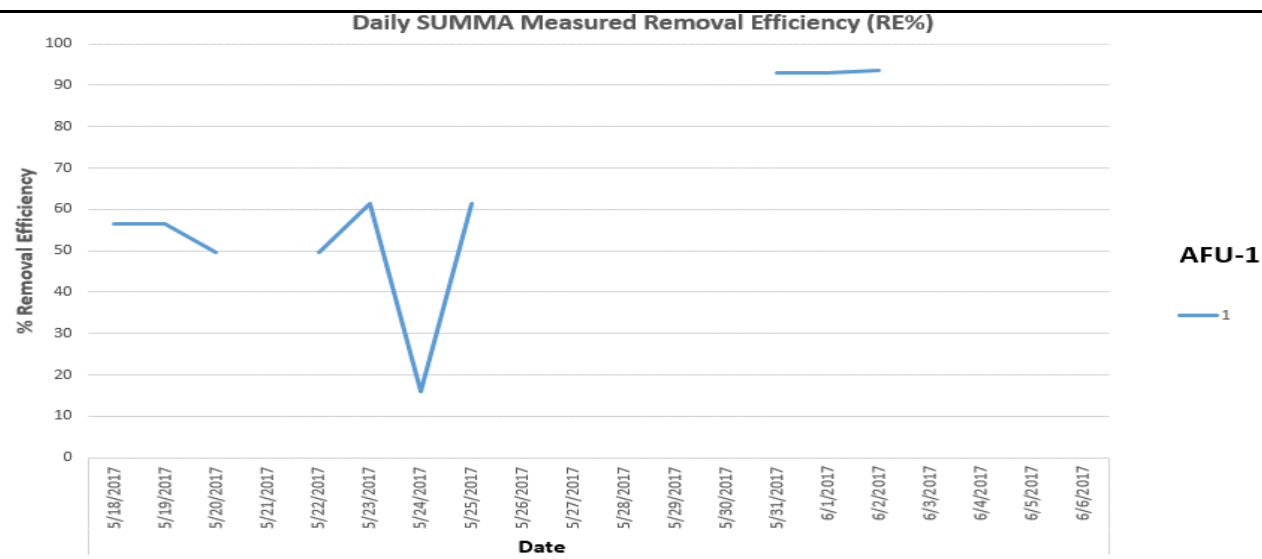
AFU-4

4



AFU-5

5



Attachment 2

Wis. Admin. Code NR 445 Comparison



Client: NSPW Project ID.: 17X001
 Project: Ashland/NSP Lakefront Site - Odor / Emissions Control System for Phase 2
 Prepared by: AKM Date: 6/10/2017
 Checked by: SMB2 Date: 6/10/2017

NR 445.07 Table A Emission Thresholds, Standards, and Control Requirements for All Sources of Hazardous Air Contaminants

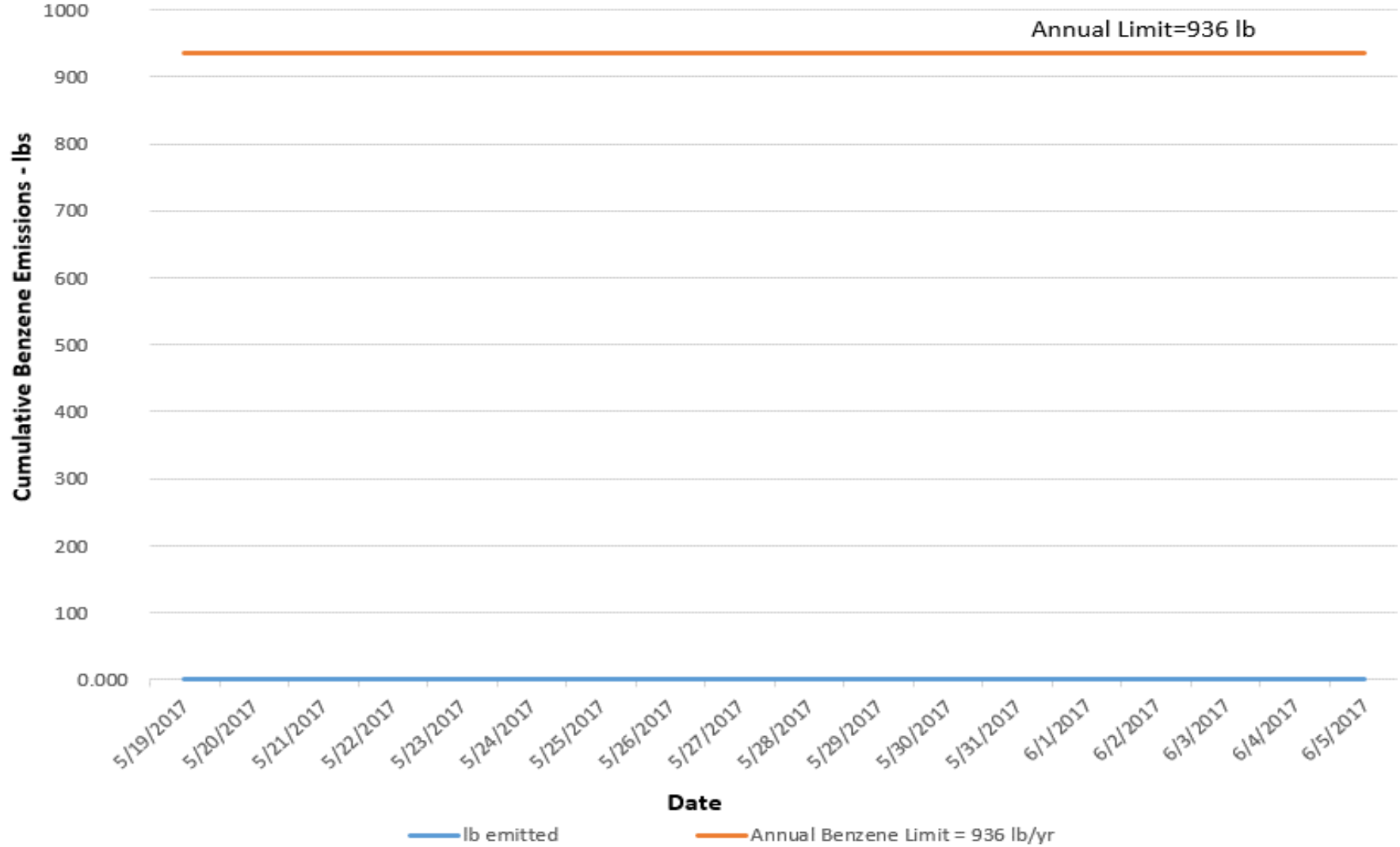
Notes:

Parameter	Allowable emission rate
	30 foot stacks
Benzene	936 lb/yr
Ethylbenzene	90.6 lb/hr - 24 hr avg
	730,000 lb/yr
Naphthalene	10.9 lb/hr - 24 hr avg
Toluene	39.3 lb/hr - 24 hr avg
	292,000 lb/yr
Xylene	90.6 lb/hr - 24 hr avg

1. Values appearing in red highlight are those that exceed the applicable limit.
2. Emission rates (24 hr avg) and annual emissions include 5 modules. Emission rate is 0 when system is offline.
3. Annual emissions are the cumulative emissions since start of operations.
4. Annual emissions = $\sum MFR_{eff1-5} \times hrs$ at that MFR
5. Operations are anticipated to span 4 months, therefore the cumulative sum of emissions will be annual emissions.

	Emissions rate in lb/hr (24 hr avg) ²				Annual Emissions in lb/yr ^{2,3}		
	Ethylbenzene	Naphthalene	Toluene	Xylene	Benzene	Ethylbenzene	Toluene
Limit-->	90.6	10.9	39.3	90.6	936	730,000	292,000
5/18/2017	5.01E-05	0.00E+00	1.80E-04	1.41E-04	2.68E-03	1.20E-03	4.31E-03
5/19/2017	5.22E-05	0.00E+00	1.87E-04	1.46E-04	5.46E-03	2.46E-03	8.80E-03
5/20/2017	5.46E-05	0.00E+00	1.70E-04	1.26E-04	8.07E-03	3.77E-03	1.29E-02
5/21/2017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.07E-03	3.77E-03	1.29E-02
5/22/2017	5.46E-05	0.00E+00	1.88E-04	1.46E-04	1.09E-02	5.08E-03	1.74E-02
5/23/2017	4.05E-04	1.94E-03	3.06E-04	6.23E-04	1.35E-02	1.48E-02	2.47E-02
5/24/2017	3.15E-03	1.18E-02	5.63E-03	3.92E-03	1.85E-02	9.04E-02	1.60E-01
5/25/2017	1.63E-03	5.94E-03	3.09E-03	2.04E-03	2.10E-02	1.30E-01	2.34E-01
5/26/2017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-02	1.30E-01	2.34E-01
5/27/2017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-02	1.30E-01	2.34E-01
5/28/2017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-02	1.30E-01	2.34E-01
5/29/2017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-02	1.30E-01	2.34E-01
5/30/2017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-02	1.30E-01	2.34E-01
5/31/2017	1.11E-03	7.41E-03	2.95E-04	1.46E-03	2.43E-02	1.56E-01	2.41E-01
6/1/2017	1.03E-03	6.87E-03	2.71E-04	1.35E-03	2.73E-02	1.81E-01	2.48E-01
6/2/2017	8.94E-04	5.93E-03	2.40E-04	1.17E-03	2.99E-02	2.03E-01	2.53E-01
6/3/2017	4.64E-04	2.37E-03	1.08E-04	5.85E-04	3.11E-02	2.14E-01	2.56E-01
6/4/2017	1.59E-02	1.03E-01	3.70E-03	2.03E-02	7.42E-02	5.96E-01	3.45E-01
6/5/2017	1.04E-02	6.87E-02	2.77E-03	1.36E-02	1.05E-01	8.45E-01	4.11E-01

Cumulative Benzene Emissions - lbs



NORTHERN STATES POWER COMPANY		
Figure A2-1 NR 445 Benzene Evaluation		
Ashland/NSP Lakefront Site		
Odor/Emissions Control System Performance thru 6/5/17		
Date: June 2017		Revision Date:
Drawn by: AKM	Checked by: B.Bell	Project ID: 17X001