

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.: MO-0103241

Owner: City of Lake Ozark and City of Osage Beach
Address: P.O. Box 370, Lake Ozark, MO 65049

Continuing Authority:
Address: Joint Sewer Board
P.O. Box 370, Lake Ozark, MO 65049

Facility Name: Lake of the Ozarks Regional Wastewater Treatment Plant #1
Facility Address: #3 Anderson Road, Lake Ozark, MO 65049

Legal Description: Sec. 33, T40N, R15W, Miller County
UTM Coordinates: X = 535310, Y = 4226177

Receiving Stream: Tributary to Osage River (C)
First Classified Stream and ID: 100K Extent-Remaining Streams (C) (3960)
USGS Basin & Sub-watershed No.: (10290111-0203)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW

The use or operation of this facility shall be by or under the supervision of a Certified A Operator.
Automatic bar screens and grit removal / oxidation ditches (2) / final clarifiers (3) / UV disinfection / cascade aeration / aerobic sludge digesters (2) / biosolids are land applied
Design population equivalent is 42,860.
Design flow is 3.0 MGD. Actual flow is 1.75 MGD.
Design sludge production is 658.8 dry tons/year.


Permitted Feature INF – Influent Monitoring Location – Headworks

This permit authorizes only wastewater and stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

August 1, 2021
Effective Date


Edward B. Galbraith, Director, Division of Environmental Quality

December 31, 2025
Expiration Date


Chris Wieberg, Director, Water Protection Program

OUTFALL #001	TABLE A-1. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in Table A-1 shall become effective on August 1, 2021 and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: M						
Flow	MGD	*		*	once/day	24 hr. total
Biochemical Oxygen Demand ₅	mg/L		45	30	once/week	composite***
Total Suspended Solids	mg/L		45	30	once/week	composite***
<i>E. coli</i> (Note 1, Page 3)	#/100mL		630	126	once/week	grab
Ammonia as N						
(January)		12.1		3.1		
(February)		10.1		2.7		
(March)		12.1		3.1		
(April)		*		*		
(May)		12.1		2.2		
(June)	mg/L	12.1		1.7	once/week	composite [†]
(July)		12.1		1.5		
(August)		10.1		1.3		
(September)		12.1		1.8		
(October)		12.1		2.5		
(November)		*		*		
(December)		12.1		3.1		
Total Phosphorus	mg/L	*		*	once/month	composite [†]
Total Kjeldahl Nitrogen	mg/L	*		*	once/month	composite [†]
Nitrite + Nitrate	mg/L	*		*	once/month	composite [†]
EFFLUENT PARAMETER(S)	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units**	SU	6.0		9.0	once/week	grab
EFFLUENT PARAMETER(S)			UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand ₅ – Percent Removal (Note 2, Page 3)			%	85	once/month	calculated
Total Suspended Solids – Percent Removal (Note 2, Page 3)			%	85	once/month	calculated
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY ; THE FIRST REPORT IS DUE SEPTEMBER 28, 2021 . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

** pH is measured in pH units and is not to be averaged.

*** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

† A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in Table A-2 shall become effective on August 1, 2021 and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Oil & Grease	mg/L	15		10	once/quarter***	grab
Cadmium, Total Recoverable	µg/L	*		*	once/quarter***	composite**
Selenium, Total Recoverable	µg/L	*		*	once/quarter***	composite**
Total Hardness	mg/L	*		*	once/quarter***	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY ; THE FIRST REPORT IS DUE OCTOBER 28, 2021 .						

* Monitoring requirement only.

** A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

*** See table below for quarterly sampling requirements.

Quarterly Minimum Sampling Requirements			
Quarter	Months	Quarterly Effluent Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 th
Second	April, May, June	Sample at least once during any month of the quarter	July 28 th
Third	July, August, September	Sample at least once during any month of the quarter	October 28 th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 th

Note 1 – Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean.

Note 2 – Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula:

$$[(\text{Average Influent} - \text{Average Effluent}) / \text{Average Influent}] \times 100\% = \text{Percent Removal}$$
Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample, composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

OUTFALL #001	TABLE A-3. WHOLE EFFLUENT TOXICITY FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
	EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS
			DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY
Limit Set: WA						
	Acute Whole Effluent Toxicity (Note 3)	TU _a	*			once/year
ACUTE WET TEST MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY ; THE FIRST REPORT IS DUE JANUARY 28, 2022 .						
Limit Set: WC						
	Chronic Whole Effluent Toxicity (Note 4)	TU _c	*			once/permit cycle
CHRONIC WET TEST REPORTS SHALL BE SUBMITTED ONCE PER PERMIT CYCLE ; THE FIRST REPORT IS DUE JANUARY 28, 2025 .						

* Monitoring requirement only.

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

Note 3 – The Acute WET test shall be conducted during the years 2022, 2023, and 2025. See Special Condition #14 for additional requirements.

Note 4 – The Chronic WET test shall be conducted once per permit cycle during the year 2024. An Acute WET test is not required during the year of the Chronic test. See Special Condition #15 for additional requirements.

PERMITTED FEATURE INF	TABLE B-1. INFLUENT MONITORING REQUIREMENTS					
	PARAMETER(S)	UNITS	MONITORING REQUIREMENTS			
			DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY
Limit Set: IM						
	Biochemical Oxygen Demands (Note 5, Page 6)	mg/L			*	once/month
	Total Suspended Solids (Note 5, Page 6)	mg/L			*	once/month
	Ammonia as N	mg/L	*		*	once/month
	Total Phosphorus	mg/L	*		*	once/month
	Total Kjeldahl Nitrogen	mg/L	*		*	once/month
	Nitrite + Nitrate	mg/L	*		*	once/month
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY ; THE FIRST REPORT IS DUE SEPTEMBER 28, 2021 .						

* Monitoring requirement only.

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

† A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

Note 5 – Samples are to be collected prior to any treatment process. Calculate Percent Removal by using the following formula: $[(\text{Average Influent} - \text{Average Effluent}) / \text{Average Influent}] \times 100\% = \text{Percent Removal}$. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Influent samples are to be collected as a 24-hour composite sample, composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. **Electronic Discharge Monitoring Report (eDMR) Submission System.** Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
 - (a) **eDMR Registration Requirements.** The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at <https://dnr.mo.gov/mogem>. Information about the eDMR system can be found at <https://dnr.mo.gov/env/wpp/edmr.htm>. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
 - (b) **Electronic Submissions.** To access the eDMR system, use the following link in your web browser: <https://apps5.mo.gov/mogems/welcome.action>. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
 - (c) **Waivers from Electronic Reporting.** The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: <http://dnr.mo.gov/forms/780-2692-f.pdf>. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.
2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
 - (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.
3. All outfalls must be clearly marked in the field.
4. Report as no-discharge when a discharge does not occur during the report period.
5. **Reporting of Non-Detects:**
 - (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
 - (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
 - (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).

D. SPECIAL CONDITIONS (continued)

- (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
 - (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
 - (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.
6. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
7. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the monitoring frequencies listed in 10 CSR 20-9. To request a modification of the operational control testing requirements listed in 10 CSR 20-9, the permittee shall submit a permit modification application and fee to the Department requesting a deviation from the operational control monitoring requirements. Upon approval of the request, the Department will modify the permit.
8. The permittee is under the authority of the Lake Ozark & Osage Beach Joint Sewer Board, which does not maintain or fund the collection system for each of the satellite cities presently connected to this facility. The Lake Ozark & Osage Beach Joint Sewer Board consists of officials from the satellite cities connected to this facility, which are the Cities of Lake Ozark and Osage Beach. The satellite cities fund and maintain their own collection systems. It is recommended that the satellite cities develop and implement a program for maintenance and repair of the collection system. The recommended guidance is the US EPA's Guide For Evaluating Capacity, Management, Operation, And Maintenance (CMOM) Programs At Sanitary Sewer Collection Systems (Document number EPA 305-B-05-002) or the Departments' CMOM Model located at <http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc>. For additional information regarding the Departments' CMOM Model, see the CMOM Plan Model Guidance document at <http://dnr.mo.gov/pubs/pub2574.htm>.
- For the term of this operating permit, the Cities of Lake Ozark and Osage Beach shall each submit an annual I&I report to the Joint Sewer Board representative(s) for review and reporting via the Electronic Discharge Monitoring Report system, by January 28th for the previous calendar year. The reports should contain the following information:
- (a) A summary of the efforts to locate and eliminate specific sources of excessive infiltration and inflow into the collection system serving the facility for the previous year.
 - (b) A summary of the general maintenance and repairs to the collection system serving the facility for the previous year.
 - (c) A summary of any planned maintenance and repairs to the collection system serving the facility for the upcoming calendar year. This list shall include locations (GPS, 911 address, manhole number, etc.) and actions to be taken.
9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Central Field Operations Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: <https://dnr.mo.gov/mogem/> or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.
10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.
11. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.
12. An all-weather access road to the treatment facility shall be maintained.
13. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

D. SPECIAL CONDITIONS (continued)

14. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:
- (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour, static, non-renewal toxicity tests with the following species:
 - i. The fathead minnow, *Pimephales promelas* (Acute Toxicity EPA Test Method 2000.0).
 - ii. The daphnid, *Ceriodaphnia dubia* (Acute Toxicity EPA Test Method 2002.0).
 - (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
 - (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
 - (d) The laboratory shall not chemically dechlorinate the sample.
 - (e) The Allowable Effluent Concentration (AEC) is 100%; the dilution series is: 6.25%, 12.5%, 25%, 50%, and 100%.
 - (f) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
 - (g) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of acute toxic units ($TU_a = 100/LC_{50}$) reported according to the test methods manual chapter on report preparation and test review. The Lethal Concentration 50 Percent (LC_{50}) is the effluent concentration that would cause death in 50 percent of the test organisms at a specific time.
15. Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows:
- (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 7-day, static renewal toxicity tests with the following species:
 - i. The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
 - ii. The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).
 - (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
 - (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
 - (d) The laboratory shall not chemically dechlorinate the sample.
 - (e) The Allowable Effluent Concentration (AEC) is 100%, the dilution series is: 100%, 50%, 25%, 12.5%, and 6.25%.
 - (f) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
 - (g) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of chronic toxic units ($TU_c = 100/IC_{25}$) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration (IC_{25}) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.
16. Expanded Effluent Testing
Permittee must sample and analyze for the pollutants listed in Form B2 – Application for Operating Permit for Facilities That Receive Primarily Domestic Waste And Have A Design Flow More Than 100,000 Gallons Per Day (MO-780-1805 dated 02-19), Part D – Expanded Effluent Testing Data, #18. The permittee shall provide this data with the permit renewal application. A minimum of three samples taken within four and one-half years prior to the date of the permit application must be provided. Samples must be representative of the seasonal variation in the discharge from each outfall. Approved and sufficiently sensitive testing methods listed in 40 CFR 136.3 must be utilized. A method is “sufficiently sensitive” when; 1) The method minimum level is at or below the level of the applicable water quality criterion for the measured pollutant or pollutant parameter; or 2) the method minimum level is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or 3) the method has the lowest minimum level of the analytical methods approved under 40 CFR part 136. These methods are also required for parameters listed as monitoring only, as the data collected may be used to determine if numeric limitations need to be established.

D. SPECIAL CONDITIONS (continued)

17. Stormwater Pollution Prevention Plan (SWPPP): SWPPP must be implemented upon permit issuance. Through implementation of the SWPPP, the permittee shall minimize the release of pollutants in stormwater from the facility to the waters of the state. The SWPPP shall be developed in consultation with the concepts and methods described in the following document: Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in June 2015.
- (a) The SWPPP must identify any stormwater outfall from the facility and Best Management Practices (BMPs) used to prevent or reduce the discharge of contaminants in stormwater. The stormwater outfalls shall either be marked in the field or clearly marked on a map and maintained with the SWPPP.
 - (b) The SWPPP must include a schedule and procedures for a once per month routine site inspection.
 - (1) The monthly routine inspection shall be documented in a brief written report, which shall include:
 - i. The person(s) conducting the inspection.
 - ii. The inspection date and time.
 - iii. Weather information for the day of the inspection.
 - iv. Precipitation information for the entire period since the last inspection.
 - v. Description of the discharges observed, including visual quality of the discharges (sheen, turbid, etc.).
 - vi. Condition of BMPs
 - vii. If BMPs were replaced or repaired.
 - viii. Observations and evaluations of BMP effectiveness.
 - (2) Any deficiency observed during the routine inspection must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report.
 - (3) The routine inspection reports must be kept onsite with the SWPPP and maintained for a period of five (5) years.
 - (4) The routine inspection reports shall be made available to Department personnel upon request.
 - (c) The SWPPP must include a schedule and procedures for a once per year comprehensive site inspection.
 - (1) The annual comprehensive inspection shall be documented in a written report, which shall include:
 - i. The person(s) conducting the inspection.
 - ii. The inspection date and time.
 - iii. Findings from the areas of your facility that were examined;
 - iv. All observations relating to the implementation of your control measures including:
 - 1. Previously unidentified discharges from the site,
 - 2. Previously unidentified pollutants in existing discharges,
 - 3. Evidence of, or the potential for, pollutants entering the drainage system;
 - 4. Evidence of pollutants discharging to receiving waters at all facility outfall(s), and the condition of and around the outfall, and
 - 5. Additional control measures needed to address any conditions requiring corrective action identified during the inspection.
 - v. Any required revisions to the SWPPP resulting from the inspection;
 - vi. Any incidence of noncompliance observed or a certification stating that the facility is in compliance with Special Condition D.17.
 - (2) Any deficiency observed during the comprehensive inspection must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report.
 - (3) The comprehensive inspection reports must be kept onsite with the SWPPP and maintained for a period of five (5) years.
 - (4) The comprehensive inspection reports shall be made available to Department personnel upon request.
 - (d) The SWPPP must be kept on-site and should not be sent to the Department unless specifically requested.
 - (e) The SWPPP must be reviewed and updated at a minimum once per permit cycle, as site conditions or control measures change.
18. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP.
- (a) Permittee shall adhere to the following minimum Best Management Practices (BMPs):
 - (1) Minimize the exposure of industrial material storage areas, loading and unloading areas, dumpsters and other disposal areas, maintenance activities, and fueling operations to rain, snow, snowmelt, and runoff, by locating industrial materials and activities inside or protecting them with storm resistant coverings, if warranted and practicable.
 - (2) Provide good housekeeping practices on the site to prevent potential pollution sources from coming into contact with stormwater and provide collection facilities and arrange for proper disposal of waste products, including sludge.
 - (3) Implement a maintenance program to ensure that the structural control measures and industrial equipment is kept in good operating condition and to prevent or minimize leaks and other releases of pollutants.
 - (4) Prevent or minimize the spillage or leaks of fluids, oil, grease, fuel, etc. from equipment and vehicle maintenance, equipment and vehicle cleaning, or activities.

D. SPECIAL CONDITIONS (continued)

- (5) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed.
- (6) Provide stormwater runoff controls to divert, infiltrate, reuse, contain, or otherwise minimize pollutants in the stormwater discharge.
- (7) Enclose or cover storage piles of salt or piles containing salt, used for deicing or other commercial or industrial purposes.
- (8) Provide training to all employees who; work in areas where industrial materials or activities are exposed to stormwater, are responsible for stormwater inspections, are members of the Pollution Prevention Team. Training must cover the specific control measures and monitoring, inspection, planning, reporting and documentation requirements of this permit. Training is recommended annually for any applicable staff and whenever a new employee is hired who meets the description above.
- (9) Eliminate and prevent unauthorized non-stormwater discharges at the facility.
- (10) Minimize generation of dust and off-site tracking of raw, final, or waste materials by implementing appropriate control measures.

E. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: <https://ahc.mo.gov>

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0103241
LAKE OF THE OZARKS REGIONAL WWTP #1

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)(A)2.], a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

Part I – Facility Information

Application Date: 01/27/20
Expiration Date: 12/31/20

Facility Type and Description: POTW

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
#001	4.65	Secondary	Domestic

Comments:

Changes in this permit for Outfall #001 include the revision of final effluent limits for Ammonia; increased sampling for Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate from quarterly to monthly; and the removal of Total Recoverable Copper. Changes in this permit for Permitted Feature #001 include the addition of monthly Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia as N. See Part II of the Fact Sheet for further information regarding the addition, revision, and removal of effluent parameters.

During the drafting of this permit, the permittee requested modified composite sampling for influent and effluent Ammonia, Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and metals due to staffing and sampling schedule limitations. The sampling type for BOD₅ and TSS remains a 24-hour composite.

Part II – Effluent Limitations and Monitoring Requirements

OUTFALL #001 – MAIN FACILITY OUTFALL

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

OUTFALL #001 - RECEIVING STREAM INFORMATION

RECEIVING STREAM(S) TABLE:

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
100K Extent-Remaining Streams	C	3960	AQL, HHP, IRR, LWW, SCR, WBC-B	10290111-0203	Direct Discharge
Osage River	P	1031	AQL, HHP, IRR, LWW, SCR, WBC-A		0.42

*As per 10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses found in the receiving streams table, above:

10 CSR 20-7.031(1)(C)1.:

AQL = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: **WWH** = Warm Water Habitat; **CDF** = Cold-water fishery (Current narrative use is cold-water habitat.); **CLF** = Cool-water fishery (Current narrative use is cool-water habitat); **EAH** = Ephemeral Aquatic Habitat; **MAH** = Modified Aquatic Habitat; **LAH** = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)

10 CSR 20-7.031(1)(C)2.: Recreation in and on the water

WBC = Whole Body Contact recreation where the entire body is capable of being submerged;

WBC-A = Whole body contact recreation that supports swimming uses and has public access;

WBC-B = Whole body contact recreation that supports swimming;

SCR = Secondary Contact Recreation (like fishing, wading, and boating).

10 CSR 20-7.031(1)(C)3. to 7.:

HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish;

IRR = Irrigation for use on crops utilized for human or livestock consumption;

LWW = Livestock and wildlife watering (Current narrative use is defined as **LWP** = Livestock and Wildlife Protection);

DWS = Drinking Water Supply;

IND = Industrial water supply

10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)

WSA = Storm- and flood-water storage and attenuation; **WHP** = Habitat for resident and migratory wildlife species;

WRC = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; **WHC** = Hydrologic cycle maintenance.

10 CSR 20-7.031(6): **GRW** = Groundwater

RECEIVING STREAM(S) LOW-FLOW VALUES:

RECEIVING STREAM	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
100K Extent-Remaining Streams	0	0	0

MIXING CONSIDERATIONS TABLE:

MIXING ZONE (CFS) [10 CSR 20-7.031(5)(A)4.B.(I)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(5)(A)4.B.(I)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
0	0	0	0	0	N/A

Receiving Water Body's Water Quality

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

- ✓ This facility does not discharge to a 303(d) listed stream or to a stream with an EPA approved TMDL.
- ✓ The Department has not conducted a stream survey for this waterbody. When a stream survey is conducted, more information may be available about the receiving stream.

CHANGES TO EFFLUENT LIMITATIONS TABLE:

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type **
Ammonia as N (January) (February) (March) (April) (May) (June) (July) (August) (September) (October) (November) (December)	mg/L	2, 3	12.1 10.1 12.1 * 12.1 12.1 12.1 10.1 12.1 12.1 * 12.1		3.1 2.7 3.1 * 2.2 1.7 1.5 1.3 1.8 2.5 * 3.1	Apr – Sep: 6.0/1.2 Oct - Mar: 11.5/2.7	1/week	monthly	MC
Total Phosphorus	mg/L	1	*		*	*/*	1/month	monthly	MC
Total Kjeldahl Nitrogen	mg/L	1	*		*	*/*	1/month	monthly	MC
Nitrite + Nitrate	mg/L	1	*		*	*/*	1/month	monthly	MC
Selenium, Total Recoverable	µg/L	2, 3	*		*	9.1/3.1	1/quarter	quarterly	MC
Total Hardness	mg/L	1, 3	*		*	*/*	1/quarter	quarterly	G

* - Monitoring requirement only.

** - MC = Modified composite

Basis for Limitations Codes:

- | | | |
|--|-----------------------------------|---|
| 1. State or Federal Regulation/Law | 5. Antidegradation Policy | 9. WET Test Policy |
| 2. Water Quality Standard (includes RPA) | 6. Water Quality Model | 10. Multiple Discharger Variance |
| 3. Water Quality Based Effluent Limits | 7. Best Professional Judgment | 11. Nutrient Criteria Implementation Plan |
| 4. Antidegradation Review | 8. TMDL or Permit in lieu of TMDL | |

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD₅).** Operating permit retains 45 mg/L as a Weekly Average and 30 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(8) for discharges to All Other Waters.
- **Total Suspended Solids (TSS).** Operating permit retains 45 mg/L as a Weekly Average and 30 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(8) for discharges to All Other Waters.
- **Escherichia coli (E. coli).** Monthly average of 126 per 100 mL as a geometric mean and Weekly Average of 630 per 100 mL as a geometric mean during the recreational season (April 1 – October 31), for discharges within two miles upstream of segments or

lakes with Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.015(9)(B). An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d). The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 6, 10, and 5 (#/100mL). Geometric Mean = 5th root of (1)(4)(6)(10)(5) = 5th root of 1,200 = 4.1 #/100mL.

- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L. No mixing considerations allowed; therefore, WLA = appropriate criterion.

The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation:

$$C_e = \frac{(Q_e + Q_s)C - (Q_s \times C_s)}{(Q_e)}$$

Where C = downstream concentration C_e = effluent concentration
Cs = upstream concentration Q_e = effluent flow
Q_s = upstream flow

In the event that mixing considerations derive an AML less stringent than the MDL, the AML and MDL will be equal and based on the MDL.

Month	Temp (°C)*	pH (SU)*	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
January	8.1	7.8	3.1	12.1
February	9.3	7.9	2.7	10.1
March	13.0	7.8	3.1	12.1
April	16.7	7.8	2.7	12.1
May	20.0	7.8	2.2	12.1
June	24.0	7.8	1.7	12.1
July	26.6	7.8	1.5	12.1
August	26.5	7.9	1.3	10.1
September	23.5	7.8	1.8	12.1
October	18.0	7.8	2.5	12.1
November	14.0	7.8	3.1	12.1
December	10.0	7.8	3.1	12.1

* Ecoregion data (Ozark Highlands)

January

Chronic WLA:

$$C_e = ((4.65 + 0.0)3.1 - (0.0 * 0.01))/4.65 = 3.1 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1** mg/L

Acute WLA = MDL = **12.1** mg/L

March

Chronic WLA:

$$C_e = ((4.65 + 0.0)3.1 - (0.0 * 0.01))/4.65 = 3.1 \text{ mg/L}$$

February

Chronic WLA:

$$C_e = ((4.65 + 0.0)2.7 - (0.0 * 0.01))/4.65 = 2.7 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)10.1 - (0.0 * 0.01))/4.65 = 10.1 \text{ mg/L}$$

Chronic WLA = AML = **2.7** mg/L

Acute WLA = MDL = **10.1** mg/L

April

Monitoring only for April. The reasonable potential analysis determined that Ammonia in this facility's discharge is unlikely

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1 mg/L**

Acute WLA = MDL = **12.1 mg/L**

May

Chronic WLA:

$$C_e = ((4.65 + 0.0)2.2 - (0.0 * 0.01))/4.65 = 2.2 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **2.2 mg/L**

Acute WLA = MDL = **12.1 mg/L**

July

Chronic WLA:

$$C_e = ((4.65 + 0.0)1.5 - (0.0 * 0.01))/4.65 = 1.5 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **1.5 mg/L**

Acute WLA = MDL = **12.1 mg/L**

September

Chronic WLA:

$$C_e = ((4.65 + 0.0)1.8 - (0.0 * 0.01))/4.65 = 1.8 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **1.8 mg/L**

Acute WLA = MDL = **12.1 mg/L**

November

Monitoring only for November. The reasonable potential analysis determined that Ammonia in this facility's discharge is unlikely to exceed water quality standards for Ammonia in the month of November.

to exceed water quality standards for Ammonia in the month of April.

June

Chronic WLA:

$$C_e = ((4.65 + 0.0)1.7 - (0.0 * 0.01))/4.65 = 1.7 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **1.7 mg/L**

Acute WLA = MDL = **12.1 mg/L**

August

Chronic WLA:

$$C_e = ((4.65 + 0.0)1.3 - (0.0 * 0.01))/4.65 = 1.3 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)10.1 - (0.0 * 0.01))/4.65 = 10.1 \text{ mg/L}$$

Chronic WLA = AML = **1.3 mg/L**

Acute WLA = MDL = **10.1 mg/L**

October

Chronic WLA:

$$C_e = ((4.65 + 0.0)2.5 - (0.0 * 0.01))/4.65 = 2.5 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **2.5 mg/L**

Acute WLA = MDL = **12.1 mg/L**

December

Chronic WLA:

$$C_e = ((4.65 + 0.0)3.1 - (0.0 * 0.01))/4.65 = 3.1 \text{ mg/L}$$

Acute WLA:

$$C_e = ((4.65 + 0.0)12.1 - (0.0 * 0.01))/4.65 = 12.1 \text{ mg/L}$$

Chronic WLA = AML = **3.1 mg/L**

Acute WLA = MDL = **12.1 mg/L**

- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **Total Phosphorus and Total Nitrogen (Speciated).** Effluent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate are required per 10 CSR 20-7.015(9)(D)8.
- **pH.** 6.0-9.0 SU. The permit writer has made a reasonable potential determination based on effluent data submitted to the department that the discharge will not cause or contribute to the excursion of the water quality standard for pH instream. Therefore, effluent limitations as required by 10 CSR 20-7.015 are substituted for the pH water quality criteria of 6.5-9.0 SU.
- **Biochemical Oxygen Demand (BOD₅) Percent Removal.** In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD₅ and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 85% removal efficiency for BOD₅.

- **Total Suspended Solids (TSS) Percent Removal.** In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD₅ and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 85% removal efficiency for TSS.
- **Cadmium, Total Recoverable.** Monitoring only. Results from Discharge Monitoring Reports included data that was not sufficiently sensitive. As a result, the permit writer was unable to conduct a reasonable potential determination to determine if the discharge has the reasonable potential to cause or contribute to an excursion of the water quality standard. Quarterly monitoring will allow sufficient data to conduct a reasonable potential analysis and to calculate appropriate effluent limits if applicable.
- **Selenium, Total Recoverable.** Monitoring only requirements have been included in this permit. An RPA was conducted based on the current WQS and determined that there is no reasonable potential to violate the water quality standard for Selenium, please see **Appendix – RPA Results**. This determination will be reassessed at the time of renewal.

Whole Effluent Toxicity

- **Acute Whole Effluent Toxicity.** Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards. Where no mixing is allowed, the acute criterion must be met at the end of the pipe. However, when using an LC50 as the test endpoint, the acute toxicity test has an upper sensitivity level of 100% effluent, or 1.0 TUa. If less than 50% of the test organisms die at 100% effluent, the true LC50 value for the effluent cannot be measured, effectively acting as a detection limit. Therefore, when the allowable effluent concentration is 100% a limit of 1.0 TUa will apply. If more than 50% of the organisms survive at 100% effluent, the permittee should report TUa <1.
 - ✓ Acute Allowable Effluent Concentrations (AECs) for facilities that discharge to Class C waterbodies are 100%, 50%, 25%, 12.5%, & 6.25%.
- **Chronic Whole Effluent Toxicity.** Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards. The permit writer has determined that this facility has reasonable potential to cause toxicity in the receiving stream. The permit writer has determined that this facility has reasonable potential to cause toxicity in the receiving stream. A chronic toxic unit limit of 1.6 applies.
 - Chronic Allowable Effluent Concentrations (AECs) for facilities that discharge to Class C waterbodies are 100%, 50%, 25%, 12.5%, & 6.25%.

Sampling Frequency Justification: The Department has determined that previously established sampling and reporting frequency is sufficient to characterize the facility's effluent and be protective of water quality, with the exception of nutrients which were increased to monthly, and Oil & Grease and Selenium, which were decreased to quarterly. Weekly sampling is required for *E. coli*, per 10 CSR 20-7.015(9)(D)7.A.

WET Test Sampling Frequency Justification. WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.

Acute Whole Effluent Toxicity

- ✓ **No less than ONCE/YEAR:**
 - Facility is designated as a Major facility or has a design flow ≥ 1.0 MGD.
 - Facility has Water Quality-based effluent limitations for toxic substances (other than NH₃).

Chronic Whole Effluent Toxicity

- ✓ **No less than ONCE/PERMIT CYCLE:**
 - POTW facilities with a design flow of greater than 1.0 million gallons per day, but less than 10 million gallons per day, shall conduct and submit to the Department a chronic WET test no less than once per five years.

Sampling Type Justification: As per 10 CSR 20-7.015, samples collected for mechanical plants shall be a 24 hour composite sample. Grab samples, however, must be collected for pH, *E. coli*, and Oil & Grease in accordance with recommended analytical methods. For further information on sampling and testing methods please review 10 CSR 20-7.015(9)(D) 2.

PERMITTED FEATURE INF – INFLUENT MONITORING

The monitoring requirements established in the below Monitoring Requirements Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including the monitoring requirements listed in this table.

CHANGES TO INFLUENT MONITORING:

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
BOD ₅	mg/L	1			*	***	1/month	monthly	C
TSS	mg/L	1			*	***	1/month	monthly	C
Ammonia as N	mg/L	1	*		*	***	1/month	monthly	MC
Total Phosphorus	mg/L	1	*		*	***	1/month	monthly	MC
Total Kjeldahl Nitrogen	mg/L	1	*		*	***	1/month	monthly	MC
Nitrite + Nitrate	mg/L	1	*		*	***	1/month	monthly	MC

* - Monitoring requirement only.

*** - Parameter not previously established in previous state operating permit.

**** - C = Composite

MC = Modified composite

Basis for Limitations Codes:

- | | | |
|--|-----------------------------------|---|
| 1. State or Federal Regulation/Law | 5. Antidegradation Policy | 9. WET Test Policy |
| 2. Water Quality Standard (includes RPA) | 6. Water Quality Model | 10. Multiple Discharger Variance |
| 3. Water Quality Based Effluent Limits | 7. Best Professional Judgment | 11. Nutrient Criteria Implementation Plan |
| 4. Antidegradation Review | 8. TMDL or Permit in lieu of TMDL | |

Influent Parameters

- **Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS)**. An influent sample is required to determine the removal efficiency. In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD₅ and TSS for Publicly Owned Treatment Works (POTWs)/municipals.
- **Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia**. Influent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia required per 10 CSR 20-7.015(9)(D)8.

Sampling Frequency Justification: The sampling and reporting frequencies for Total Phosphorus and Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia parameters were established to match the required sampling frequency of these parameters in the effluent, per [10 CSR 20-7.015(9)(D)8.]. The sampling and reporting frequencies for influent BOD₅ and TSS have been established to match the required sampling frequency of these parameters in the effluent.

Sampling Type Justification: Sample types for influent parameters were established to match the required sampling type of these parameters in the effluent. Samples should be analyzed as soon as possible after collection and/or properly preserved according to method requirements.

OUTFALL #001 – GENERAL CRITERIA CONSIDERATIONS:

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into the permit for those pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states that pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. In order to comply with this regulation, the permit writer will complete reasonable potential determinations on whether the discharge will violate any of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion (the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)). It should also be noted that Section 644.076.1, RSMo as well as Section D – Administrative Requirements of Standard Conditions Part I of this permit states that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule or regulation promulgated by the commission.

- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses. The discharge from this facility is made up of treated domestic wastewater. Based upon review of the Report of Compliance Inspection for the inspection conducted on August 29, 2017 no

evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, this facility utilizes secondary treatment technology and is currently in compliance with the secondary treatment technology based effluent limits established in this permit and there has been no indication to the Department that the stream has had issues maintaining beneficial uses as a result of this discharge. Based on the information reviewed during the drafting of this permit, these final effluent limitations appear to have protected against the excursion of this criterion in the past. Therefore, the discharge does not have the reasonable potential to cause or contribute to an excursion of this criterion.

- (B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.
- (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life. This permit contains final effluent limitations which are protective of both acute and chronic toxicity for various pollutants that are either expected to be discharged by domestic wastewater facilities or that were disclosed by this facility on the application for permit coverage. Based on the information reviewed during the drafting of this permit, it has been determined if the facility meets final effluent limitations established in this permit, there is no reasonable potential for the discharge to cause an excursion of this criterion.
- (E) Waters shall provide for the attainment and maintenance of water quality standards downstream including waters of another state. Please see (D) above as justification is the same.
- (F) There shall be no significant human health hazard from incidental contact with the water. Please see (D) above as justification is the same.
- (G) There shall be no acute toxicity to livestock or wildlife watering. Please see (D) above as justification is the same.
- (H) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community. Please see (A) above as justification is the same.
- (I) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247. The discharge from this facility is made up of treated domestic wastewater. No evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, any solid wastes received or produced at this facility are wholly contained in appropriate storage facilities, are not discharged, and are disposed of offsite. This discharge is subject to Standard Conditions Part III, which contains requirements for the management and disposal of sludge to prevent its discharge. Therefore, this discharge does not have reasonable potential to cause or contribute to an excursion of this criterion.

Part III – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream, and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

- ✓ The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(40)] & [10 CSR 20-7.031(1)(O)], or is an existing facility.

ANTI-BACKSLIDING:

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(o); 40 CFR Part 122.44(l)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- ✓ Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.
- ✓ Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.
 - **Ammonia as N.** Effluent limitations were re-calculated for Ammonia. The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation

approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation. The newly established limitations are still protective of water quality.

- **Copper, Total Recoverable.** A Reasonable Potential Analysis was conducted and it was determined that there is no reasonable potential to cause an excursion of water quality standards for Total Recoverable Copper in the receiving stream. As a result, monitoring requirements have been removed. This determination will be reassessed at renewal. Please see **Appendix – RPA Results** for more information.
 - **Instream Total Phosphorus and Total Nitrogen Monitoring.** The previous permit contained upstream instream monitoring requirements for Total Phosphorus and Total Nitrogen. The Department has made a determination that monitoring of background nutrients is not needed. This permit is still protective of water quality and this determination will be reassessed at the time of renewal.
 - **pH.** The previous permit contained final effluent limits of 6.5-9.0 SU. During the drafting of this permit, the permit writer made a reasonable potential determination based on effluent data submitted to the department that the discharge will not cause or contribute to an excursion of the water quality standard for pH instream. As a result, final effluent limits of 6.0-9.0 SU as required by 10 CSR 20-7.015 are substituted for the pH water quality criteria of 6.5-9.0 SU. The permit remains protective of water quality and this determination will be reevaluated during the next permit renewal.
 - **Sampling and Reporting Frequencies.** The previous permit contained monthly sampling and reporting frequencies for Oil & Grease and Selenium. This permit contains quarterly sampling and reporting frequencies due to the low design flow of the facility, consistency amongst effluent data, and compliance with effluent limits. The permit is still protective of water quality.
- ✓ The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).
- **General Criteria.** The previous permit contained a special condition which described a specific set of prohibitions related to general criteria found in 10 CSR 20-7.031(4). In order to comply with 40 CFR 122.44(d)(1), the permit writer has conducted reasonable potential determinations for each general criterion and established numeric effluent limitations where reasonable potential exists. While the removal of the previous permit special condition creates the appearance of backsliding, since this permit establishes numeric limitations where reasonable potential to cause or contribute to an excursion of the general criteria exists the permit maintains sufficient effluent limitations and monitoring requirements in order to protect water quality, this permit is equally protective as compared to the previous permit. Therefore, given this new information, and the fact that the previous permit special condition was not consistent with 40 CFR 122.44(d)(1), an error occurred in the establishment of the general criteria as a special condition of the previous permit. Please see Part VI – Effluent Limits Determination for more information regarding the reasonable potential determinations for each general criterion related to this facility.

ANTIDEGRADATION:

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)], for domestic wastewater discharge with new, altered, or expanding discharges, the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. In accordance with Missouri's water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See <http://dnr.mo.gov/env/wpp/permits/antideg-implementation.htm>

- ✓ No degradation proposed and no further review necessary. Facility did not apply for authorization to increase pollutant loading or to add additional pollutants to their discharge.

For stormwater discharges, the stormwater BMP chosen for the facility, through the antidegradation analysis performed by the facility, must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

- ✓ The facility must review and maintain stormwater BMPs as appropriate.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:

As per [10 CSR 20-6.010(2)(C)], ...An applicant may utilize a lower preference continuing authority by submitting, as part of the application, when a higher level authority is available, must submit information to the Department for review and approval, provided it does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the Department.

BIOSOLIDS & SEWAGE SLUDGE:

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

- ✓ Permittee is authorized to land apply biosolids in accordance with Standard Conditions III.

COMPLIANCE AND ENFORCEMENT:

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

Facility Performance History:

- ✓ This facility is not currently under Water Protection Program enforcement action; however, the City of Lake Ozark was previously under enforcement due to issues with the collection system. Enforcement actions have been resolved as of June 24, 2021 per a Satisfaction of Judgement issued by the Attorney General's Office.

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. This final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online. In an effort to aid facilities in the reporting of applicable information electronically, the Department has created several new forms including operational control monitoring forms and an I&I location and reduction form. These forms are optional and found on the Department's website at the following locations:

Operational Monitoring Lagoon: <http://dnr.mo.gov/forms/780-2801-f.pdf>

Operational Monitoring Mechanical: <http://dnr.mo.gov/forms/780-2800-f.pdf>

I&I Report: <http://dnr.mo.gov/forms/780-2690-f.pdf>

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a permittee must first submit an eDMR Waiver Request Form: <http://dnr.mo.gov/forms/780-2692-f.pdf>. Each facility must make a request. If a single entity owns or operates more than one facility, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is non-transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

- ✓ The permittee/facility is currently using the eDMR data reporting system.

NUMERIC LAKE NUTRIENT CRITERIA

- ✓ This facility does not discharge into a lake watershed where numeric lake nutrient criteria are applicable.

OPERATOR CERTIFICATION REQUIREMENTS

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], the permittee shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.020(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems with population equivalents greater than 200 and are owned or operated by or for municipalities, public sewer districts, counties, public water supply districts, private sewer companies regulated by the Public Service Commission and state or federal agencies.

- ✓ This facility is required to have a certified operator as it has a population equivalent greater than 200 and is owned or operated by or for a municipality, public sewer district, county, public water supply district, private sewer company regulated by the PSC, state or federal agency.

This facility currently requires a chief operator with an A Certification Level. Please see **Appendix - Classification Worksheet**. Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator's Name: Gary Hutchcraft
Certification Number: 7305
Certification Level: WW-A

The listing of the operator above only signifies that staff drafting this operating permit have reviewed appropriate Department records and determined that the name listed on the operating permit application has the correct and applicable Certification Level.

OPERATIONAL CONTROL TESTING

Missouri Clean Water Commission regulation 10 CSR 20-9.010 requires certain publicly owned treatment works and privately owned facilities regulated by the Public Service Commission to conduct internal operational control monitoring to further ensure proper operation of the facility and to be a safeguard or early warning for potential plant upsets that could affect effluent quality. This requirement is only applicable if the publicly owned treatment works and privately owned facilities regulated by the Public Service Commission has a Population Equivalent greater than two hundred (200).

10 CSR 20-9.010(3) allows the Department to modify the monitoring frequency required in the rule based upon the Department's judgement of monitoring needs for process control at the specified facility.

- ✓ As per [10 CSR 20-9.010(4)], the facility is required to conduct operational monitoring. These operational monitoring reports are to be submitted to the Department along with the MSOP discharge monitoring reports. The facility is a mechanical plant and is required to conduct operational control monitoring as follows:

Operational Monitoring Parameter	Frequency
Precipitation	Daily (M-F)
Flow – Influent or Effluent	Daily (M-F)
pH – Influent	Daily (M-F)
Temperature (Aeration basin)	Daily (M-F)
TSS – Influent	Weekly
TSS – Mixed Liquor	Weekly
Settleability – Mixed Liquor	Daily (M-F)
Dissolved Oxygen – Mixed Liquor	Daily (M-F)
Dissolved Oxygen – Aerobic Digester	Daily (M-F)

PRETREATMENT PROGRAM:

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Several special conditions pertaining to the permittee's pretreatment program may be included in the permit, and are as follows:

- Implementation and enforcement of the program,
- Annual pretreatment report submittal,
- Submittal of list of industrial users,
- Technical evaluation of need to establish local limitations, and
- Submittal of the results of the evaluation

✓ The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(1)(iii)] if the permit writer determines that any given pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

✓ An RPA was conducted on appropriate parameters. Please see **APPENDIX – RPA RESULTS**.

REMOVAL EFFICIENCY:

Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD₅) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals.

✓ Secondary Treatment is 85% removal [40 CFR Part 133.102(a)(3) & (b)(3)].

SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):

Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(12)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1.(13) mandates that the Department issue permits for discharges of water contaminants into the waters of this state, and also for the operation of sewer systems. Such permit conditions shall ensure compliance with all requirements as established by sections 644.006 to 644.141. Standard Conditions Part I, referenced in the permit, contains provisions requiring proper operation and maintenance of all facilities and systems of treatment and control. Missouri RSMo §644.026.1.(15) instructs the Department to require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities. To ensure that public health and the environment are protected, any noncompliance which may endanger public health or the environment must be reported to the Department within 24 hours of the time the permittee becomes aware of the noncompliance. Standard Conditions Part I, referenced in the permit, contains the reporting requirements for the permittee when bypasses and upsets occur. The permit also contains requirements for permittees to develop and implement a program for maintenance and repair of the collection system. The permit requires that the permittee submit an annual report to the Department for the previous calendar year that contains a summary of efforts taken by the permittee to locate and eliminate sources of excess I & I, a summary of general maintenance and repairs to the collection system, and a summary of any planned maintenance and repairs to the collection system for the upcoming calendar year.

✓ At this time, the Department recommends the US EPA's Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (Document # EPA 305-B-05-002) or the Departments' CMOM Model located at <http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc>. For additional information regarding the Departments' CMOM Model, see the CMOM Plan Model Guidance document at <http://dnr.mo.gov/pubs/pub2574.htm>. The CMOM identifies some of the criteria used to evaluate a collection system's management, operation, and maintenance and was intended for use by the EPA, state, regulated community, and/or third party entities. The CMOM is applicable to small, medium, and large systems; both public and privately owned; and both regional and satellite collection systems. The CMOM does not substitute for the Clean Water Act, the Missouri Clean Water Law, and both federal and state regulations, as it is not a regulation.

SCHEDULE OF COMPLIANCE (SOC):

Per 644.051.4 RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement, or if prohibited by other statute or regulation. A SOC includes an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. *See also* Section 502(17) of the Clean Water Act, and 40 CFR §122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR § 122.47(a)(1), 10 CSR 20-7.031(11), and 10 CSR 20-7.015(9), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, a SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.

A SOC is not allowed:

- For effluent limitations based on technology-based standards established in accordance with federal requirements, if the deadline for compliance established in federal regulations has passed. 40 CFR § 125.3.
- For a newly constructed facility in most cases. Newly constructed facilities must meet applicable effluent limitations when discharge begins, because the facility has installed the appropriate control technology as specified in a permit or antidegradation review. A SOC is allowed for a new water quality based effluent limit that was not included in a previously public noticed permit or antidegradation review, which may occur if a regulation changes during construction.
- To develop a TMDL, UAA, or other study that may result in site-specific criteria or alternative effluent limits. A facility is not prohibited from conducting these activities, but a SOC may not be granted for conducting these activities.

In order to provide guidance to Permit Writers in developing SOC's, and attain a greater level of consistency, on April 9, 2015 the Department issued an updated policy on development of SOC's. This policy provides guidance to Permit Writers on the standard time frames for schedules for common activities, and guidance on factors that may modify the length of the schedule such as a Cost Analysis for Compliance.

✓ This permit does not contain an SOC.

SEWER EXTENSION AUTHORITY SUPERVISED PROGRAM:

In accordance with [10 CSR 20-6.010(6)(A)], the Department may grant approval of a permittee's Sewer Extension Authority Supervised Program. These approved permittees regulate and approve construction of sanitary sewers and pump stations, which are tributary to this wastewater treatment facility. The permittee shall act as the continuing authority for the operation, maintenance, and modernization of the constructed collection system. See <http://dnr.mo.gov/env/wpp/permits/sewer-extension.htm>.

✓ The permittee does not have a Department approved Sewer Extension Authority Supervised Program.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in June 2015], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of stormwater discharges. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once

a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. For further guidance, consult the antidegradation implementation procedure (<http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf>).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs that are reasonable and cost effective. The AA evaluation should include practices that are designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why “no discharge” or “no exposure” is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure* (AIP), Section II.B.

If parameter-specific numeric exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the Department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification; the application is found at: <http://dnr.mo.gov/forms/index.html>.

- ✓ 10 CSR 20-6.200 and 40 CFR 122.26(b)(14)(ix) includes treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that is located within the confines of the facility, with a design flow of 1.0 MGD or more, or are required to have an approved pretreatment program under 40 CFR part 403, as an industrial activity in which permit coverage is required. In lieu of requiring sampling in the site-specific permit, the facility is required to develop and implement a Stormwater Pollution Prevention Plan (SWPPP).

A facility can apply for conditional exclusion for “no exposure” of industrial activities and materials to stormwater by submitting a permit modification via Form B2 (<http://dnr.mo.gov/forms/780-1805-f.pdf>) appropriate application filing fees and a completed No Exposure Certification for Exclusion from NPDES Stormwater Permitting under Missouri Clean Water Law (<https://dnr.mo.gov/forms/780-2828-f.pdf>) to the Department’s Water Protection Program, Operating Permits Section. Upon approval of the No Exposure Certification, the permit will be modified and the Special Condition to develop and implement a SWPPP will be removed.

VARIANCE:

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

- ✓ This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(86)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

- ✓ Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C_e = \frac{(Q_e + Q_s)C - (Q_s \times C_s)}{(Q_e)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration C_e = effluent concentration
C_s = upstream concentration Q_e = effluent flow
Q_s = upstream flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Number of Samples "n":

Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance, which should be, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For Total Ammonia as Nitrogen, "n = 30" is used.

WLA MODELING:

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

✓ A WLA study was either not submitted or determined not applicable by Department staff.

WHOLE EFFLUENT TOXICITY (WET) TEST:

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A) and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(J)2.A & B are being met. Under [10 CSR 20-6.010(8)(B)], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by facilities meeting the following criteria:

- ☒ Facility is a designated Major.
- ☐ Facility continuously or routinely exceeds its design flow.
- ☐ Facility that exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
- ☐ Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- ☐ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- ☐ Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH₃)
- ☒ Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- ☐ Other – please justify.

✓ The permittee is required to conduct WET test for this facility.

40 CFR 122.41(m) - BYPASSES:

The federal Clean Water Act (CWA), Section 402 prohibits wastewater dischargers from “bypassing” untreated or partially treated sewage (wastewater) beyond the headworks. A bypass is defined as an intentional diversion of waste streams from any portion of a treatment facility, [40 CFR 122.41(m)(1)(i)]. Additionally, Missouri regulation 10 CSR 20-7.015(9)(G) states a bypass means the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending, to waters of the state. Only under exceptional and specified limitations do the federal regulations allow for a facility to bypass some or all of the flow from its treatment process. Bypasses are prohibited by the CWA unless a permittee can meet all of the criteria listed in 40 CFR 122.41(m)(4)(i)(A), (B), & (C). Any bypasses from this facility are subject to the reporting required in 40 CFR 122.41(l)(6) and per Missouri’s Standard Conditions I, Section B, part 2.b. Additionally, Anticipated Bypasses include bypasses from peak flow basins or similar devices designed for peak wet weather flows.

- ✓ This facility does not anticipate bypassing.

Part IV – Cost Analysis for Compliance

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a “finding of affordability” on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

- ✓ The Department is required to determine “findings of affordability” because the permit applies to a combined or separate sanitary sewer system for a publicly-owned treatment works.

Cost Analysis for Compliance - The Department has made a reasonable search for empirical data indicating the permit is affordable. The search consisted of a review of Department records that might contain economic data on the community, a review of information provided by the applicant as part of the application, and public comments received in response to public notices of this draft permit. If the empirical cost data was used by the permit writer, this data may consist of median household income, any other ongoing projects that the Department has knowledge, and other demographic financial information that the community provided as contemplated by Section 644. 145.3.

The following table summarizes the results of the cost analysis. See **Appendix – Cost Analysis for Compliance** for detailed information.

Summary Table. Cost Analysis for Compliance Summary for the City of Lake of the Ozarks Regional WWTP #1

New Permit Requirements			
Monthly sampling for effluent Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate (increased from quarterly), and monthly sampling for influent Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate, and Ammonia as N			
Estimated Annual Cost	Annual Median Household Income (MHI)	Estimated Monthly User Rate	User Rate as a Percent of MHI
\$2,180	\$39,620	\$25.25	0.58%

Part V – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

WATER QUALITY STANDARD REVISION:

In accordance with section 644.058, RSMo, the Department is required to utilize an evaluation of the environmental and economic impacts of modifications to water quality standards of twenty-five percent or more when making individual site-specific permit decisions.

- ✓ This operating permit does not contain requirements for a water quality standard that has changed twenty-five percent or more since the previous operating permit.

PERMIT SYNCHRONIZATION:

The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together and all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the Department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than 4 years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit. With permit synchronization, this permit will expire in the 4th Quarter of calendar year 2025.

PUBLIC NOTICE:

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing. The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit. For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- ✓ The Public Notice period for this operating permit was from May 6, 2021 to June 7, 2021. Following the public notice period, which included one comment, Special Condition #8 was updated to require the Cities of Lake Ozark and Osage Beach to submit annual I&I reports to the Joint Sewer Board representative(s) for submission via eDMR.

DATE OF FACT SHEET: MARCH 29, 2021; **REVISED:** JULY 12, 2021

COMPLETED BY:

ASHLEY KEELY, ENVIRONMENTAL PROGRAM ANALYST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT
(573) 751-7326
ASHLEY.KEELY@DNR.MO.GOV

Appendices

APPENDIX - CLASSIFICATION WORKSHEET:

Item	Points Possible	Points Assigned
Maximum Population Equivalent (P.E.) served , peak day	1 pt./10,000 PE or major fraction thereof. (Max 10 pts.)	4
Design Flow (avg. day) or peak month's flow (avg. day) whichever is larger	1 pt. / MGD or major fraction thereof. (Max 10 pts.)	9
Effluent Discharge		
Missouri or Mississippi River	0	
All other stream discharges except to losing streams and stream reaches supporting whole body contact recreation	1	
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	3
Direct reuse or recycle of effluent	6	
Land Application/Irrigation		
Drip Irrigation	3	
Land application/irrigation	5	
Overland flow	4	
Variation in Raw Wastes (highest level only)		
Variations do not exceed those normally or typically expected	0	
Reoccurring deviations or excessive variations of 100 to 200 percent in strength and/or flow	2	2
Reoccurring deviations or excessive variations of more than 200 percent in strength and/or flow	4	
Department-approved pretreatment program	6	
Preliminary Treatment		
STEP systems (operated by the permittee)	3	
Screening and/or comminution	3	3
Grit removal	3	3
Plant pumping of main flow	3	
Flow equalization	5	
Primary Treatment		
Primary clarifiers	5	
Chemical addition (except chlorine, enzymes)	4	
Secondary Treatment		
Trickling filter and other fixed film media with or without secondary clarifiers	10	
Activated sludge (including aeration, oxidation ditches, sequencing batch reactors, membrane bioreactors, and contact stabilization)	15	15
Stabilization ponds without aeration	5	
Aerated lagoon	8	
Advanced Lagoon Treatment – Aerobic cells, anaerobic cells, covers, or fixed film	10	
Biological, physical, or chemical	12	12
Carbon regeneration	4	
Total from page ONE (1)	----	51

APPENDIX - CLASSIFICATION WORKSHEET (CONTINUED):

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Solids Handling		
Sludge Holding	5	
Anaerobic digestion	10	
Aerobic digestion	6	6
Evaporative sludge drying	2	
Mechanical dewatering	8	
Solids reduction (incineration, wet oxidation)	12	
Land application	6	6
Disinfection		
Chlorination or comparable	5	
On-site generation of disinfectant (except UV light)	5	
Dechlorination	2	
UV light	4	4
Required Laboratory Control Performed by Plant Personnel (highest level only)		
Lab work done outside the plant	0	
Push – button or visual methods for simple test such as pH, settleable solids	3	
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5	
More advanced determinations, such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	7
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	
Total from page TWO (2)	----	23
Total from page ONE (1)	---	51
Grand Total	---	74

- ☒ - A: 71 points and greater
☐ - B: 51 points – 70 points
☐ - C: 26 points – 50 points
☐ - D: 0 points – 25 points

APPENDIX – RPA RESULTS:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Ammonia as N – January (mg/L)	12.1	3.36	3.1	3.36	5	0.8/0.03	0.60	4.2	YES
Ammonia as N – February (mg/L)	10.1	2.77	2.7	2.772	5	0.66/0.02	0.60	4.2	YES
Ammonia as N – March (mg/L)	12.1	6.30	3.1	6.3	5	1.5/0.02	0.60	4.2	YES
Ammonia as N – April (mg/L)	12.1	1.30	2.7	1.302	5	0.31/0.05	0.60	4.2	NO
Ammonia as N – May (mg/L)	12.1	8.40	2.2	8.4	5	2/0.1	0.60	4.2	YES
Ammonia as N – June (mg/L)	12.1	7.56	1.7	7.56	5	1.8/0.08	0.60	4.2	YES
Ammonia as N – July (mg/L)	12.1	8.82	1.5	8.82	5	2.1/0.11	0.60	4.2	YES
Ammonia as N – August (mg/L)	10.1	4.20	1.3	4.2	5	1/0.07	0.60	4.2	YES
Ammonia as N – September (mg/L)	12.1	2.31	1.8	2.31	5	0.55/0.04	0.60	4.2	YES
Ammonia as N – October (mg/L)	12.1	2.69	2.5	2.688	5	0.64/0.03	0.60	4.2	YES
Ammonia as N – November (mg/L)	12.1	0.42	3.1	0.42	5	0.1/0.02	0.60	4.2	NO
Ammonia as N – December (mg/L)	12.1	7.98	3.1	7.98	5	1.9/0.07	0.60	4.2	YES
Selenium, Total Recoverable (µg/L)	NA	NA	5	2.27	52	1.7/0.01	0.309	1.33	YES
Cadmium, Total Recoverable (µg/L)	<i>Data submitted for Cadmium was not sufficiently sensitive; therefore, the permit writer was unable to make a reasonable potential determination. Monitoring requirements were retained.</i>								
Copper, Total Recoverable (µg/L)	39.3	15.5	23.7	15.5	15	13.4/10.0	0.086	1.16	YES

N/A – Not Applicable

* - Units are (µg/L) unless otherwise noted.

** - If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent. If the number of samples is < 10, then the default CV value must be used in the WQBEL for the applicable constituent.

*** - Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the Mean of the same sample set.

RWC – Receiving Water Concentration. It is the concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).

n – Is the number of samples.

MF – Multiplying Factor. 99% Confidence Level and 99% Probability Basis.

RP – Reasonable Potential. It is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

Reasonable Potential Analysis is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request.

APPENDIX – ALTERNATIVE:



APPENDIX – COST ANALYSIS FOR COMPLIANCE:

**Missouri Department of Natural Resources
Water Protection Program
Cost Analysis for Compliance
(In accordance with RSMo 644.145)**

**Lake of the Ozarks Regional Wastewater Treatment Plant #1 Permit Renewal
City of Lake Ozark and City of Osage Beach
Missouri State Operating Permit #MO-0103241**

Section 644.145 RSMo requires the Department of Natural Resources (Department) to make a “finding of affordability” when “issuing permits under” or “enforcing provisions of” state or federal clean water laws “pertaining to any portion of a combined or separate sanitary sewer system for publicly-owned treatment works.” This cost analysis does not dictate how the permittee will comply with new permit requirements.

New Permit Requirements

The permit requires compliance with new monitoring requirements for Total Kjeldahl Nitrogen, Nitrate + Nitrite, Ammonia and Total Phosphorus; and increased effluent sampling for Total Phosphorus, Total Kjeldahl Nitrogen and Nitrite + Nitrate.

Connections

The number of connections was obtained from the Department’s fee tracking website.

Connection Type	Number
Residential	654
Commercial and Industrial	171
Total	825

Data Collection for this Analysis

This cost analysis is based on data available to the Department as provided by the permittee and data obtained from readily available sources. For the most accurate analysis, it is essential that the permittee provides the Department with current information about the City’s financial and socioeconomic situation. The financial questionnaire available to permittees on the Department’s website (<http://dnr.mo.gov/forms/780-2511-f.pdf>) is a required attachment to the permit renewal application. If the financial questionnaire is not submitted with the renewal application, the Department sends a request to complete the form with the welcome correspondence. Though the Department has made attempts to gather financial information from the City of Lake Ozark and the City of Osage Beach; no information has been provided. The Department has relied heavily on readily available data to complete this analysis. If certain data was not provided by the permittee to the Department and the data is not obtainable through readily available sources, this analysis will state that the information is “unknown”.

Eight Criteria of 644.145 RSMo

The Department must consider the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with new permit requirements.

(1) A community’s financial capability and ability to raise or secure necessary funding;

Criterion 1 Table. Current Financial Information	Lake Ozark	Osage Beach
Current Monthly User Rates per 5,000 gallons*	\$31.55	\$25.03
Median Household Income (MHI) ¹	\$65,681	\$39,620
Current Annual Operating Costs (excludes depreciation)	unknown	unknown

*User Rates were obtained from the 2020 Missouri Public Utility Alliance Water and Wastewater Rate Survey.

(2) Affordability of pollution control options for the individuals or households at or below the median household income level of the community;

The following tables outline the estimated costs of the new permit requirements:

Criterion 2A Table. Estimated Cost Breakdown of New Permit Requirements			
New Requirement	Frequency	Estimated Cost	Estimated Annual Cost
Total Phosphorus – Influent	Monthly	\$24 x 12	\$288
Total Kjeldahl Nitrogen - Influent	Monthly	\$33 x 12	\$396
Nitrate + Nitrite - Influent	Monthly	\$40 x 12	\$480
Ammonia - Influent	Monthly	\$20 x 12	\$240
Total Phosphorus – Effluent	Quarterly to Monthly	\$24 x 8	\$192
Total Kjeldahl Nitrogen - Effluent	Quarterly to Monthly	\$33 x 8	\$264
Nitrate + Nitrite - Effluent	Quarterly to Monthly	\$40 x 8	\$320
Total Estimated Annual Cost of New Permit Requirements			\$2,180

Criterion 2B Table. Estimated Costs for New Permit Requirements		Lake Ozark	Osage Beach
(1)	Estimated Annual Cost	\$2,180	\$2,180
(2)	Estimated Monthly User Cost for New Requirements ²	\$0.22	\$0.22
	Estimated Monthly User Cost for New Requirements as a Percent of MHI ³	0.58%	0.76
(3)	Total Monthly User Cost*	\$31.77	\$25.25
	Total Monthly User Cost as a Percent of MHI ⁴	0.004%	0.007%

* Current User Rate + Estimated Monthly Costs of New Sampling Requirements

Due to the minimal cost associated with new permit requirements, the Department anticipates an extremely low to no rate increase will be necessary, which could impact individuals or households of this community.

(3) An evaluation of the overall costs and environmental benefits of the control technologies;

This analysis is being conducted based on new requirements in the permit, which will not require the addition of new control technologies at the facility. However, the new sampling requirements are being established in order to provide data regarding the health of the receiving stream's aquatic life and to ensure that the existing permit limits are providing adequate protection of aquatic life. Improved wastewater provides benefits such as avoided health costs due to water-related illness, enhanced environmental ecosystem quality, and improved natural resources. The preservation of natural resources has been proven to increase the economic value and sustainability of the surrounding communities. Maintaining Missouri's water quality standards fulfills the goal of restoring and maintaining the chemical, physical, and biological integrity of the receiving stream; and, where attainable, it achieves a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

(4) Inclusion of ongoing costs of operating and maintaining the existing wastewater collection and treatment system, including payments on outstanding debts for wastewater collection and treatment systems when calculating projected rates:

The community did not provide the Department with this information, nor could it be found through readily available data.

(5) An inclusion of ways to reduce economic impacts on distressed populations in the community, including but not limited to low and fixed income populations. This requirement includes but is not limited to:

- Allowing adequate time in implementation schedules to mitigate potential adverse impacts on distressed populations resulting from the costs of the improvements and taking into consideration local community economic considerations.
- Allowing for reasonable accommodations for regulated entities when inflexible standards and fines would impose a disproportionate financial hardship in light of the environmental benefits to be gained.

The following table characterizes the current overall socioeconomic condition of the community as compared to the overall socioeconomic condition of Missouri. The following information was compiled using the latest U.S. Census data.

Criterion 5 Table. Socioeconomic Data ^{1, 5-9} for the City of Lake Ozark

No.	Administrative Unit	Lake Ozark City	Missouri State	United States
1	Population (2019)	1,858	6,104,910	324,697,795
2	Percent Change in Population (2000-2019)	24.8%	9.1%	15.4%
3	2019 Median Household Income (in 2020 Dollars)	\$65,681	\$56,145	\$63,618
4	Percent Change in Median Household Income (2000-2019)	13.1%	-4.7%	-2.5%
5	Median Age (2019)	53.0	38.6	38.1
6	Change in Median Age in Years (2000-2019)	12.0	2.5	2.8
7	Unemployment Rate (2019)	6.3%	4.6%	5.3%
8	Percent of Population Below Poverty Level (2019)	12.5%	13.7%	13.4%
9	Percent of Household Received Food Stamps (2019)	8.6%	11.1%	11.7%
10	(Primary) County Where the Community Is Located	Miller County		

Criterion 5 Table. Socioeconomic Data ^{1, 5-9} for the City of Osage Beach

No.	Administrative Unit	Osage Beach City	Missouri State	United States
1	Population (2019)	5,080	6,104,910	324,697,795
2	Percent Change in Population (2000-2019)	38.7%	9.1%	15.4%
3	2019 Median Household Income (in 2020 Dollars)	\$39,620	\$56,145	\$63,618
4	Percent Change in Median Household Income (2000-2019)	-33.7%	-4.7%	-2.5%
5	Median Age (2019)	48.3	38.6	38.1
6	Change in Median Age in Years (2000-2019)	3.5	2.5	2.8
7	Unemployment Rate (2019)	7.5%	4.6%	5.3%
8	Percent of Population Below Poverty Level (2019)	28.6%	13.7%	13.4%
9	Percent of Household Received Food Stamps (2019)	15.5%	11.1%	11.7%
10	(Primary) County Where the Community Is Located	Camden County		

(6) An assessment of other community investments and operating costs relating to environmental improvements and public health protection;

The community did not report any other investments relating to environmental improvements.

(7) An assessment of factors set forth in the United States Environmental Protection Agency's guidance, including but not limited to the "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development" that may ease the cost burdens of implementing wet weather control plans, including but not limited to small system considerations, the attainability of water quality standards, and the development of wet weather standards;

The new requirements associated with this permit will not impose a financial burden on the community, nor will they require the City of Lake Ozark and the City of Osage Beach to seek funding from an outside source.

(8) An assessment of any other relevant local community economic conditions.

The community did not report any other relevant local economic conditions.

The Department contracted with Wichita State University to complete an assessment tool that would allow for predictions on rural Missouri community populations and future sustainability. The purpose of the study is to use a statistical modeling analysis in order to determine factors associated with each rural Missouri community that would predict the future population changes that could occur in each community. A stepwise regression model was applied to 19 factors which were determined as predictors of rural population change in Missouri. The model established a hierarchy of the predicting factors which allowed the model to place a weighted value on each of the factors. A total of 745 rural towns and villages in Missouri received a weighted value for each of the predicting factors. The weighted values for each town / village were then added together to determine an overall decision score. The overall decision scores were then divided into five categories and each town was assigned to a different categorical group based on the overall decision score. The categorical groups were developed from the range of overall scores across all rural towns and villages within Missouri.

Based on the assessment tool, the City of Lake Ozark has been determined to be a category 2 community. This means that the City of Lake Ozark could potentially face more challenging socioeconomic circumstances over time and may have significant declines in population in the future. The Department has determined an adequate schedule of compliance that will alleviate the potential financial burdens that the City of Lake Ozark may face due to the necessary upgrades required to meet the new permit requirements. If this community experiences a decline in population, which results in the inability to secure the necessary funding for an upgrade to meet the new requirements within this permit, a modification to the schedule of compliance may be necessary. The community may contact the Department and send an application for a modification to the schedule of compliance with justification for the time necessary to comply with this permit.

Based on the assessment tool, the City of Osage Beach has been determined to be a category 5 community. This means that the City of Osage Beach is predicted to be stable over time.

Conclusion and Finding

As a result of new regulations, the Department is proposing modifications to the current operating permit that may require the permittee to increase monitoring. The Department has considered the eight (8) criteria presented in subsection 644.145 RSMo to evaluate the cost associated with the new permit requirements.

This analysis examined whether the new sampling requirements affect the ability of an individual customer or household to pay a utility bill without undue hardship or unreasonable sacrifice in the essential lifestyle or spending patterns of the individual or household. After reviewing the above criteria, the Department finds that the new sampling requirements may result in a low burden with regard to the community's overall financial capability and a low financial impact for most individual customers/households; therefore, the new permit requirements are affordable.

References

1. 2019 MHI in 2019 Dollar: United States Census Bureau. 2015-2019 American Community Survey 5-Year Estimates, Table B19013: Median Household Income in the Past 12 Months (in 2019 Inflation-Adjusted Dollars).
<https://data.census.gov/cedsci/table?q=B19013&g=0400000US29.160000&tid=ACSDT5Y2019.B19013&hidePreview=false>.
(B) 2000 MHI in 1999 Dollar: (1) For United States, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-1 Part 1. United States Summary, Table 5. Work Status and Income in 1999: 2000, Washington, DC. <https://www.census.gov/prod/cen2000/phc-2-1-pt1.pdf>.
(2) For Missouri State, United States Census Bureau (2003) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-2-27, Missouri, Table 10. Work Status and Income in 1999: 2000, Washington, DC.
<https://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf>.
(C) 2020 CPI, 2019 CPI and 1999 CPI: U.S. Department of Labor Bureau of Labor Statistics (2020) Consumer Price Index - All Urban Consumers, U.S. City Average. All Items. 1982-84=100. <https://data.bls.gov/pdq/SurveyOutputServlet>.
(D) 2019 MHI in 2020 Dollar = 2019 MHI in 2019 Dollar x 2020 CPI / 2019 CPI; 2000 MHI in 2020 Dollar = 2000 MHI in 1999 Dollar x 2020 CPI / 1999 CPI.
(E) Percent Change in Median Household Income (2000-2019) = (2019 MHI in 2020 Dollar - 2000 MHI in 2020 Dollar) / (2000 MHI in 2020 Dollar).
2. $(\$2,180/825)/12 = \0.22 (Estimated Monthly User Cost for New Requirements)
3. $(\$0.22/(\$65,681/12))100\% = 0.004\%$ (New Sampling Only-Lake Ozark) and $(\$0.22/(\$39,620/12))100\% = 0.007\%$ (New Sampling Only-Osage Beach)
4. $(\$31.77/(\$65,681/12))100\% = 0.58\%$ (Total User Cost-Lake Ozark) and $(\$25.25/(\$39,620/12))100\% = 0.76\%$ (Total User Cost-Osage Beach)
5. Total Population in 2019: United States Census Bureau. 2015-2019 American Community Survey 5-Year Estimates, Table B01003: Total Population - Universe: Total Population.
<https://data.census.gov/cedsci/table?q=B01003&g=0400000US29.160000&tid=ACSDT5Y2019.B01003&hidePreview=false>.
(B) Total Population in 2000: (1) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC.
<https://www.census.gov/prod/cen2000/phc-1-1-pt1.pdf>.
(2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Place of Birth, Residence in 1995, and Language: 2000, Washington, DC.
<https://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf>.
(C) Percent Change in Population (2000-2019) = (Total Population in 2019 - Total Population in 2000) / (Total Population in 2000).
6. Median Age in 2019: United States Census Bureau. 2015-2019 American Community Survey 5-Year Estimates, Table B01002: Median Age by Sex - Universe: Total population.
<https://data.census.gov/cedsci/table?q=B01002&g=0400000US29.160000&tid=ACSDT5Y2019.B01002&hidePreview=false>.
(B) Median Age in 2000: (1) For United States, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, PHC-1-1 Part 1. United States Summary, Table 1. Age and Sex: 2000, Washington, DC., Page 2.
<https://www.census.gov/prod/cen2000/phc-1-1-pt1.pdf>.
(2) For Missouri State, United States Census Bureau (2002) 2000 Census of Population and Housing, Summary Population and Housing Characteristics, PHC-1-27, Missouri, Table 2. Place of Birth, Residence in 1995, and Language: 2000, Washington, DC.
<http://www.census.gov/prod/cen2000/phc-2-27-pt1.pdf>.
(C) Change in Median Age in Years (2000-2019) = (Median Age in 2019 - Median Age in 2000).
7. United States Census Bureau. 2015-2019 American Community Survey 5-Year Estimates, B23025: Employment Status for the Population 16 Years and Over - Universe: Population 16 years and Over.
<https://data.census.gov/cedsci/table?q=B23025&g=0400000US29.160000&tid=ACSDT5Y2019.B23025&hidePreview=false>.
8. United States Census Bureau. 2015-2019 American Community Survey 5-Year Estimates, Table S1701: Poverty Status in the Past 12 Months.
<https://data.census.gov/cedsci/table?q=S1701&g=0400000US29.160000&tid=ACSST5Y2019.S1701&hidePreview=false>.
9. United States Census Bureau. 2015-2019 American Community Survey 5-Year Estimates, Table B2201: Food Stamps/Supplemental Nutrition Assistance Program (SNAP) - Universe: Households.
<https://data.census.gov/cedsci/table?q=Receipt%20of%20Food%20Stamps&g=0400000US29.050000.29.160000&tid=ACSST5Y2019.S2201&hidePreview=true>



STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

Part I – General Conditions

Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
 - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
 - b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.
2. **Monitoring Requirements.**
 - a. Records of monitoring information shall include:
 - i. The date, exact place, and time of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;
 - iv. The individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and
 - vi. The results of such analyses.
 - b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.
3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.
4. **Test Procedures.** The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is “sufficiently sensitive” when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility’s discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.
5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee’s sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
 - a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
 - b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

Section B – Reporting Requirements

1. **Planned Changes.**
 - a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
 - i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
 - ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
 - iii. The alteration or addition results in a significant change in the permittee’s sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
 - iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.
2. **Non-compliance Reporting.**
 - a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.



STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

- b. The following shall be included as information which must be reported within 24 hours under this paragraph.
 - i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
 - ii. Any upset which exceeds any effluent limitation in the permit.
 - iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.
 - c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.
3. **Anticipated Noncompliance.** The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.
 4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.
 5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.
 6. **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.
 7. **Discharge Monitoring Reports.**
 - a. Monitoring results shall be reported at the intervals specified in the permit.
 - b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
 - c. Monitoring results shall be reported to the Department no later than the 28th day of the month following the end of the reporting period.
- b. Notice.
 - i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
 - ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
 - c. Prohibition of bypass.
 - i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
 1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 3. The permittee submitted notices as required under paragraph 2. b. of this section.
 - ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.
3. **Upset Requirements.**
 - a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - ii. The permitted facility was at the time being properly operated; and
 - iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
 - iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
 - c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section C – Bypass/Upset Requirements

1. **Definitions.**
 - a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
 - b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
 - c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. **Bypass Requirements.**
 - a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.

Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
 - a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
 - b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement



STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

- imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
- c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.
- d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed \$10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.
2. **Duty to Reapply.**
- a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
- b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
- c. A permittee with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
5. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
6. **Permit Actions.**
- a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
- i. Violations of any terms or conditions of this permit or the law;
- ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
- iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
- iv. Any reason set forth in the Law or Regulations.
- b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
7. **Permit Transfer.**
- a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
- b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
- c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.
8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.



STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.
11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
 - a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
 - d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.
12. **Closure of Treatment Facilities.**
 - a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
 - b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.
13. **Signatory Requirement.**
 - a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
 - b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
 - c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.
14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.



STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
MAY 1, 2013

PART II - SPECIAL CONDITIONS – PUBLICLY OWNED
TREATMENT WORKS
SECTION A – INDUSTRIAL USERS

1. Definitions

Definitions as set forth in the Missouri Clean Water Laws and approved by the Missouri Clean Water Commission shall apply to terms used herein.

Significant Industrial User (SIU). Except as provided in the *General Pretreatment Regulation* 10 CSR 20-6.100, the term Significant Industrial User means:

1. All Industrial Users subject to Categorical Pretreatment Standards; and
2. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the Publicly-Owned Treatment Works (POTW) (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's or for violating any Pretreatment Standard or requirement.

Clean Water Act (CWA) is the the federal Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002).

2. Identification of Industrial Discharges

Pursuant to 40 CFR 122.44(j)(1), all POTWs shall identify, in terms of character and volume of pollutants, any Significant Industrial Users discharging to the POTW subject to Pretreatment Standards under section 307(b) of the CWA and 40 CFR 403.

3. Application Information

Applications for renewal or modification of this permit must contain the information about industrial discharges to the POTW pursuant to 40 CFR 122.21(j)(6)

4. Notice to the Department

Pursuant to 40 CFR 122.42(b), all POTWs must provide adequate notice of the following:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging these pollutants; and
2. Any substantial change into the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on:
 - i. the quality and quantity of effluent introduced into the POTW, and
 - ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

For POTWs without an approved pretreatment program, the notice of industrial discharges which was not included in the permit application shall be made as soon as practicable. For POTWs with an approved pretreatment program, notice is to be included in the annual pretreatment report required in the special conditions of this permit. Notice may be sent to:

Missouri Department of Natural Resources
Water Protection Program
Attn: Pretreatment Coordinator
P.O. Box 176
Jefferson City, MO 65102

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
August 1, 2019

PART III – BIOSOLIDS AND SLUDGE FROM DOMESTIC TREATMENT FACILITIES

SECTION A – GENERAL REQUIREMENTS

1. PART III Standard Conditions pertain to biosolids and sludge requirements under the Missouri Clean Water Law and regulations for domestic and municipal wastewater and also incorporates federal sludge disposal requirements under 40 CFR Part 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR Part 503 for domestic biosolids and sludge.
2. PART III Standard Conditions apply only to biosolids and sludge generated at domestic wastewater treatment facilities, including public owned treatment works (POTW) and privately owned facilities.
3. Biosolids and Sludge Use and Disposal Practices:
 - a. The permittee is authorized to operate the biosolids and sludge generating, treatment, storage, use, and disposal facilities listed in the facility description of this permit.
 - b. The permittee shall not exceed the design sludge/biosolids volume listed in the facility description and shall not use biosolids or sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
 - c. For facilities operating under general operating permits that incorporate Standard Conditions PART III, the facility is authorized to operate the biosolids and sludge generating, treatment, storage, use and disposal facilities identified in the original operating permit application, subsequent renewal applications or subsequent written approval by the department.
4. Biosolids or Sludge Received from other Facilities:
 - a. Permittees may accept domestic wastewater biosolids or sludge from other facilities as long as the permittee's design sludge capacity is not exceeded and the treatment facility performance is not impaired.
 - b. The permittee shall obtain a signed statement from the biosolids or sludge generator or hauler that certifies the type and source of the sludge
5. Nothing in this permit precludes the initiation of legal action under local laws, except to the extent local laws are preempted by state law.
6. This permit does not preclude the enforcement of other applicable environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable biosolids or sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act or under Chapter 644 RSMo.
8. In addition to Standard Conditions PART III, the Department may include biosolids and sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Exceptions to Standard Conditions PART III may be authorized on a case-by-case basis by the Department, as follows:
 - a. The Department may modify a site-specific permit following permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR § 124.10, and 40 CFR § 501.15(a)(2)(ix)(E).
 - b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR Part 503.

SECTION B – DEFINITIONS

1. Best Management Practices are practices to prevent or reduce the pollution of waters of the state and include agronomic loading rates (nitrogen based), soil conservation practices, spill prevention and maintenance procedures and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge.
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food, feed or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR Part 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR Part 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Feed crops are crops produced primarily for consumption by animals.
8. Fiber crops are crops such as flax and cotton.
9. Food crops are crops consumed by humans which include, but is not limited to, fruits, vegetables and tobacco.
10. Industrial wastewater means any wastewater, also known as process wastewater, not defined as domestic wastewater. Per 40 CFR Part 122.2, process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Land application of industrial wastewater, residuals or sludge is not authorized by Standard Conditions PART III.
11. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological contact systems, and other similar facilities. It does not include wastewater treatment lagoons or constructed wetlands for wastewater treatment.
12. Plant Available Nitrogen (PAN) is nitrogen that will be available to plants during the growing seasons after biosolids application.
13. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
14. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs), sewage sludge incinerator ash, or grit/screenings generated during preliminary treatment of domestic sewage.
15. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen or concrete lined basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
16. Septage is the sludge pumped from residential septic tanks, cesspools, portable toilets, Type III marine sanitation devices, or similar treatment works such as sludge holding structures from residential wastewater treatment facilities with design populations of less than 150 people. Septage does not include grease removed from grease traps at a restaurant or material removed from septic tanks and other similar treatment works that have received industrial wastewater. The standard for biosolids from septage is different from other sludges. See Section H for more information.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Biosolids or sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and the requirements of Standard Conditions PART III or in accordance with Section A.3.c., above.
2. The permittee shall operate storage and treatment facilities, as defined by Section 644.016(23), RSMo, so that there is no biosolids or sludge discharged to waters of the state. Agricultural storm water discharges are exempt under the provisions of Section 644.059, RSMo.
3. Mechanical treatment plants shall have separate biosolids or sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove biosolids or sludge from these storage compartments on the required design schedule is a violation of this permit.

SECTION D – BIOSOLIDS OR SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR BY CONTRACT HAULER

1. Permittees that use contract haulers, under the authority of their operating permit, to dispose of biosolids or sludge, are responsible for compliance with all the terms of this permit. Contract haulers that assume the responsibility of the final disposal of biosolids or sludge, including biosolids land application, must obtain a Missouri State Operating Permit unless the hauler transports the biosolids or sludge to another permitted treatment facility.
2. Testing of biosolids or sludge, other than total solids content, is not required if biosolids or sludge are hauled to a permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Please be aware that sludge incineration facilities may be subject to the requirements of 40 CFR Part 503 Subpart E, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or, if the ash is determined to be hazardous, with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, mass of sludge incinerated and mass of ash generated. Permittee shall also provide the name of the ash disposal facility and permit number if applicable.

SECTION F – SURFACE DISPOSAL SITES AND BIOSOLIDS AND SLUDGE LAGOONS

1. Please be aware that surface disposal sites of biosolids or sludge from wastewater treatment facilities may be subject to other laws including the requirements in 40 CFR Part 503 Subpart C, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Biosolids or sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain biosolids or sludge storage lagoons as storage facilities, accumulated biosolids or sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of biosolids or sludge removed will be dependent on biosolids or sludge generation and accumulation in the facility. Enough biosolids or sludge must be removed to maintain adequate storage capacity in the facility.
 - a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of biosolids or sludge on the bottom of the lagoon, upon prior approval of the Department; or
 - b. Permittee shall close the lagoon in accordance with Section I.

SECTION G – LAND APPLICATION OF BIOSOLIDS

1. The permittee shall not land apply biosolids unless land application is authorized in the facility description, the special conditions of the issued NPDES permit, or in accordance with Section A.3.c., above.
2. This permit only authorizes “Class A” or “Class B” biosolids derived from domestic wastewater to be land applied onto grass land, crop land, timber, or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.
3. Class A Biosolids Requirements: Biosolids shall meet Class A requirements for application to public contact sites, residential lawns, home gardens or sold and/or given away in a bag or other container.
4. Class B biosolids that are land applied to agricultural and public contact sites shall comply with the following restrictions:
 - a. Food crops that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
 - b. Food crops below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
 - c. Food crops below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
 - d. Animal grazing shall not be allowed for 30 days after application of biosolids.
 - e. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
 - f. Turf shall not be harvested for one year after application of biosolids if used for lawns or high public contact sites in close proximity to populated areas such as city parks or golf courses.
 - g. After Class B biosolids have been land applied to public contact sites with high potential for public exposure, as defined in 40 CFR § 503.31, such as city parks or golf courses, access must be restricted for 12 months.
 - h. After Class B biosolids have been land applied public contact sites with low potential for public exposure as defined in 40 CFR § 503.31, such as a rural land application or reclamation sites, access must be restricted for 30 days.
5. Pollutant limits
 - a. Biosolids shall be monitored to determine the quality for regulated pollutants listed in Table 1, below. Limits for any pollutants not listed below may be established in the permit.
 - b. The number of samples taken is directly related to the amount of biosolids or sludge produced by the facility (See Section J, below). Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable Department approved material to achieve pollutant concentration below those identified in Table 1, below.
 - c. Table 1 gives the ceiling concentration for biosolids. Biosolids which exceed the concentrations in Table 1 may not be land applied.

TABLE 1

Biosolids ceiling concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

- d. Table 2 below gives the low metal concentration for biosolids. Because of its higher quality, biosolids with pollutant concentrations below those listed in Table 2 can safely be applied to agricultural land, forest, public contact sites, lawns, home gardens or be given away without further analysis. Biosolids containing metals in concentrations above the low metals concentrations but below the ceiling concentration limits may be land applied but shall not exceed the annual loading rates in Table 3 and the cumulative loading rates in Table 4. The permittee is required to track pollutant loading onto application sites for parameters that have exceeded the low metal concentration limits.

TABLE 2

Biosolids Low Metal Concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

- e. Annual pollutant loading rate.

Table 3

Biosolids Annual Loading Rate	
Pollutant	Kg/ha (lbs./ac) per year
Arsenic	2.0 (1.79)
Cadmium	1.9 (1.70)
Copper	75 (66.94)
Lead	15 (13.39)
Mercury	0.85 (0.76)
Nickel	21 (18.74)
Selenium	5.0 (4.46)
Zinc	140 (124.96)

- f. Cumulative pollutant loading rates.

Table 4

Biosolids Cumulative Pollutant Loading Rate	
Pollutant	Kg/ha (lbs./ac)
Arsenic	41 (37)
Cadmium	39 (35)
Copper	1500 (1339)
Lead	300 (268)
Mercury	17 (15)
Nickel	420 (375)
Selenium	100 (89)
Zinc	2800 (2499)

6. Best Management Practices. The permittee shall use the following best management practices during land application activities to prevent the discharge of biosolids to waters of the state.
- Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under § 4 of the Endangered Species Act or its designated critical habitat.
 - Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
 - The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop

nitrogen removal when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kgTN; or 2) When biosolids are land applied at an application rate greater than two dry tons per acre per year.

- i. PAN can be determined as follows:
(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor¹).
¹ Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
- ii. Crop nutrient production/removal to be based on crop specific nitrogen needs and realistic yield goals. **NOTE:** There are a number of reference documents on the Missouri Department of Natural Resources website that are informative to implement best management practices in the proper management of biosolids, including crop specific nitrogen needs, realistic yields on a county by county basis and other supporting references.
- iii. Biosolids that are applied at agronomic rates shall not cause the annual pollutant loading rates identified in Table 3 to be exceeded.
- d. Buffer zones are as follows:
 - i. 300 feet of a water supply well, sinkhole, water supply reservoir or water supply intake in a stream;
 - ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstanding state resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;
 - iii. 150 feet of dwellings or public use areas;
 - iv. 100 feet (35 feet if biosolids application is down-gradient or the buffer zone is entirely vegetated) of lake, pond, wetlands or gaining streams (perennial or intermittent);
 - v. 50 feet of a property line. Buffer distances from property lines may be waived with written permission from neighboring property owner.
 - vi. For the application of dry, cake or liquid biosolids that are subsurface injected, buffer zones identified in 5.d.i. through 5.d.iii above, may be reduced to 100 feet. The buffer zone may be reduced to 35 feet if the buffer zone is permanently vegetated. Subsurface injection does not include methods or technology reflective of combination surface/shallow soil incorporation.
- e. Slope limitation for application sites are as follows:
 - i. For slopes less than or equal to 6 percent, no rate limitation;
 - ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels;
 - iii. Slopes > 12 percent, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.
 - iv. Dry, cake or liquid biosolids that are subsurface injected, may be applied on slopes not to exceed 20 percent. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation.
- f. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
- g. Biosolids may be land applied to sites with soil that are snow covered, frozen, or saturated with liquid when site restrictions or other controls are provided to prevent pollutants from being discharged to waters of the state during snowmelt or stormwater runoff. During inclement weather or unfavorable soil conditions use the following management practices:
 - i. A maximum field slope of 6% and a minimum 300 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be utilized for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
 - ii. A maximum field slope of 2% and 100 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be used for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
 - iii. Other best management practices approved by the Department.

SECTION H – SEPTAGE

1. Haulers that land apply septage must obtain a state permit. An operating permit is not required for septage haulers who transport septage to another permitted treatment facility for disposal.
2. Do not apply more than 30,000 gallons of septage per acre per year or the volume otherwise stipulated in the operating permit.
3. Septic tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to mechanical treatment facilities.
4. Septage must comply with Class B biosolids regarding pathogen and vector attraction reduction requirements before it may be applied to crops, pastures or timberland. To meet required pathogen and vector reduction requirements, mix 50 pounds of hydrated lime for every 1,000 gallons of septage and maintain a septage pH of at least 12 pH standard units for 30 minutes or more prior to application.
5. Lime is to be added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.
6. As residential septage contains relatively low levels of metals, the testing of metals in septage is not required.

SECTION I– CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical and lagoons) and sludge or biosolids storage and treatment facilities. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain Department approval of a closure plan which addresses proper removal and disposal of all sludges and/or biosolids. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6.010 and 10 CSR 20 – 6.015.
3. Biosolids or sludge that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
 - a. Biosolids and sludge shall meet the monitoring and land application limits for agricultural rates as referenced in Section G, above.
 - b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
 - c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre. Alternative, site-specific application rates may be included in the closure plan for department consideration.
 - i. PAN can be determined as follows:
$$(\text{Nitrate} + \text{nitrite nitrogen}) + (\text{organic nitrogen} \times 0.2) + (\text{ammonia nitrogen} \times \text{volatilization factor}^1).$$
¹ Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
4. Domestic wastewater treatment lagoons with a design treatment capacity less than or equal to 150 persons, are “similar treatment works” under the definition of septage. Therefore the sludge within the lagoons may be treated as septage during closure activities. See Section B, above. Under the septage category, residuals may be left in place as follows:
 - a. Testing for metals or fecal coliform is not required.
 - b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
 - c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Biosolids or sludge left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, and unless otherwise approved, the lagoon berm shall be demolished, and the site shall be graded and contain $\geq 70\%$ vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. Alternative biosolids or sludge and soil mixing ratios may be included in the closure plan for department consideration.
6. Lagoon and earthen structure closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200.
7. When closing a mechanical wastewater plant, all biosolids or sludge must be cleaned out and disposed of in accordance with the Department approved closure plan before the permit for the facility can be terminated.
 - a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the Department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain $\geq 70\%$ vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate

- surface water drainage without creating erosion.
- b. Hazardous Waste shall not be land applied or disposed during mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations pursuant to 10 CSR 25.
 - c. After demolition of the mechanical plant, the site must only contain clean fill defined in Section 260.200.1(6) RSMo as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Department for fill, reclamation, or other beneficial use. Other solid wastes must be removed.
8. If biosolids or sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or I, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR Part 503, Subpart C.

SECTION J – MONITORING FREQUENCY

1. At a minimum, biosolids or sludge shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

TABLE 5

Biosolids or Sludge produced and disposed (Dry Tons per Year)	Monitoring Frequency (See Notes 1, and 2)		
	Metals, Pathogens and Vectors, Total Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN ¹	Priority Pollutants ²
319 or less	1/year	1 per month	1/year
320 to 1650	4/year	1 per month	1/year
1651 to 16,500	6/year	1 per month	1/year
16,501+	12/year	1 per month	1/year

¹ Calculate plant available nitrogen (PAN) when either of the following occurs: 1) when biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.

² Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) are required only for permit holders that must have a pre-treatment program. Monitoring requirements may be modified and incorporated into the operating permit by the Department on a case-by-case basis.

Note 1: Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.

Note 2: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. Permittees that operate wastewater treatment lagoons, peak flow equalization basins, combined sewer overflow basins or biosolids or sludge lagoons that are cleaned out once a year or less, may choose to sample only when the biosolids or sludge is removed or the lagoon is closed. Test one composite sample for each 319 dry tons of biosolids or sludge removed from the lagoon during the reporting year or during lagoon closure. Composite sample must represent various areas at one-foot depth.
3. Additional testing may be required in the special conditions or other sections of the permit.
4. Biosolids and sludge monitoring shall be conducted in accordance with federal regulation 40 CFR § 503.8, Sampling and analysis.

SECTION K – RECORD KEEPING AND REPORTING REQUIREMENTS

1. The permittee shall maintain records on file at the facility for at least five years for the items listed in Standard Conditions PART III and any additional items in the Special Conditions section of this permit. This shall include dates when the biosolids or sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
 - a. By February 19th of each year, applicable facilities shall submit an annual report for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and biosolids or sludge disposal facilities.
 - b. Permittees with wastewater treatment lagoons shall submit the above annual report only when biosolids or sludge are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Form. The annual report shall be prepared on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:
Major facilities, which are those serving 10,000 persons or more or with a design flow equal to or greater than 1 million gallons per day or that are required to have an approved pretreatment program, shall report to both the Department and EPA if the facility land applied, disposed of biosolids by surface disposal, or operated a sewage sludge incinerator. All other facilities shall maintain their biosolids or sludge records and keep them available to Department personnel upon request. State reports shall be submitted to the address listed as follows:

DNR regional or other applicable office listed in the
permit (see cover letter of permit)
ATTN: Sludge Coordinator

Reports to EPA must be electronically submitted online via the Central Data Exchange at: <https://cdx.epa.gov/> Additional information is available at: <https://www.epa.gov/biosolids/compliance-and-annual-reporting-guidance-about-clean-water-act-laws>

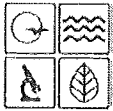
5. Annual report contents. The annual report shall include the following:
 - a. Biosolids and sludge testing performed. If testing was conducted at a greater frequency than what is required by the permit, all test results must be included in the report.
 - b. Biosolids or sludge quantity shall be reported as dry tons for the quantity produced and/or disposed.
 - c. Gallons and % solids data used to calculate the dry ton amounts.
 - d. Description of any unusual operating conditions.
 - e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
 - i. This must include the name and address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
 - ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
 - f. Contract Hauler Activities:

If using a contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate biosolids or sludge use permit.
 - g. Land Application Sites:
 - i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. The facility shall report PAN when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.
 - ii. If the “Low Metals” criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
 - iii. Report the method used for compliance with pathogen and vector attraction requirements.
 - iv. Report soil test results for pH and phosphorus. If no soil was tested during the year, report the last date when tested and the results.

RECEIVED

JAN 27 2020

34354



MISSOURI DEPARTMENT OF NATURAL RESOURCES *Water Protection Program*
 WATER PROTECTION PROGRAM
**FORM B2 – APPLICATION FOR AN OPERATING PERMIT FOR
 FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND
 HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY**

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED 1-27-20	FEE SUBMITTED [Signature]
JET PAY CONFIRMATION NUMBER	

PART A – BASIC APPLICATION INFORMATION**1. THIS APPLICATION IS FOR:**

- ☐ An operating permit for a new or unpermitted facility. Construction Permit # _____
 (Include completed Antidegradation Review or request to conduct an Antidegradation Review, see instructions)
- ☒ An operating permit renewal: Permit #MO- 0103241 Expiration Date 12/30/2020
- ☐ An operating permit modification: Permit #MO- _____ Reason: _____

1.1 Is the appropriate fee included with the application (see instructions for appropriate fee)? ☐ YES ☐ NO

2. FACILITY

NAME Lake of the Ozarks Regional Wastewater Treatment Plant #1		TELEPHONE NUMBER WITH AREA CODE 573-365-0455	
ADDRESS (PHYSICAL) #3 Anderson Road	CITY Lake Ozark	STATE MO	ZIP CODE 65049

2.1 **LEGAL DESCRIPTION** (Facility Site): Sec. 33, T 40N, R 15W

2.2 UTM Coordinates Easting (X): 535367 Northing (Y): 4226296
 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

2.3 Name of receiving stream: Bowling Hollow Creek/Tributary to Osage River (C)

2.4 Number of Outfalls: 1 wastewater outfalls: 1 stormwater outfalls: instream monitoring sites: 2

3. OWNER: The owner of the regulated activity/discharge being applied for and is not necessarily the owner of the real property on which the activity or discharge is occurring.

NAME Cities of Lake Ozark & Osage Beach		EMAIL ADDRESS collector@cityoflakeozark.net		TELEPHONE NUMBER WITH AREA CODE (573)365 5378 & (573)302 2000	
ADDRESS 2624 Bagnell Dam Blvd. & 1000 City Parkway	CITY Lake Ozark & Osage Beach	STATE MO	ZIP CODE 65049, 65065		

- 3.1 Request review of draft permit prior to Public Notice? ☒ YES ☐ NO
- 3.2 Are you a Publically Owned Treatment Works (POTW)? ☒ YES ☐ NO
 If yes, is the Financial Questionnaire attached? ☐ YES ☒ NO See: <https://dnr.mo.gov/forms/780-2511-f.pdf>
- 3.3 Are you a Privately Owned Treatment Facility? ☐ YES ☒ NO
- 3.4 Are you a Privately Owned Treatment Facility regulated by the Public Service Commission (PSC)? ☐ YES ☒ NO

4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.

NAME Sewer Board		EMAIL ADDRESS collector@cityoflakeozark.net		TELEPHONE NUMBER WITH AREA CODE (573)365-5378 & (573)302-2000	
ADDRESS 2624 Bagnell Dam Blvd. & 1000 City Parkway	CITY Lake Ozark & Osage Beach	STATE MO	ZIP CODE 65049, 65065		

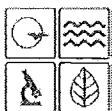
If the Continuing Authority is different than the Owner, include a copy of the contract agreement between the two parties and a description of the responsibilities of both parties within the agreement.

5. OPERATOR

NAME Gary Hutchcraft		TITLE Local Manager II		CERTIFICATE NUMBER (IF APPLICABLE) 7305	
EMAIL ADDRESS ghutchcraft@alliancewater.com		TELEPHONE NUMBER WITH AREA CODE (573) 365-0455			

6. FACILITY CONTACT

NAME Gary Hutchcraft		TITLE Local Manager II			
EMAIL ADDRESS ghutchcraft@alliancewater.com		TELEPHONE NUMBER WITH AREA CODE (573) 365-0455			
ADDRESS #3 Anderson Road	CITY Lake Ozark	STATE MO	ZIP CODE 65049		



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

**FORM B2 – APPLICATION FOR OPERATING PERMIT FOR FACILITIES THAT
RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN
100,000 GALLONS PER DAY**

RECEIVED
JAN 27 2020
Water Protection Program

FACILITY NAME

Lake of the Ozarks Regional Wastewater Treatment Plant #1

PERMIT NO.

MO-0103241

COUNTY

Miller

APPLICATION OVERVIEW

Form B2 has been developed in a modular format and consists of Parts A, B and C and a Supplemental Application Information (Parts D, E, F and G) packet. All applicants must complete Parts A, B and C. Some applicants must also complete parts of the Supplemental Application Information packet. The following items explain which parts of Form B2 you must complete. Submittal of an incomplete application may result in the application being returned.

BASIC APPLICATION INFORMATION

- A. Basic application information for all applicants. All applicants must complete Part A.
- B. Additional application information for all applicants. All applicants must complete Part B.
- C. Certification. All applicants must complete Part C.

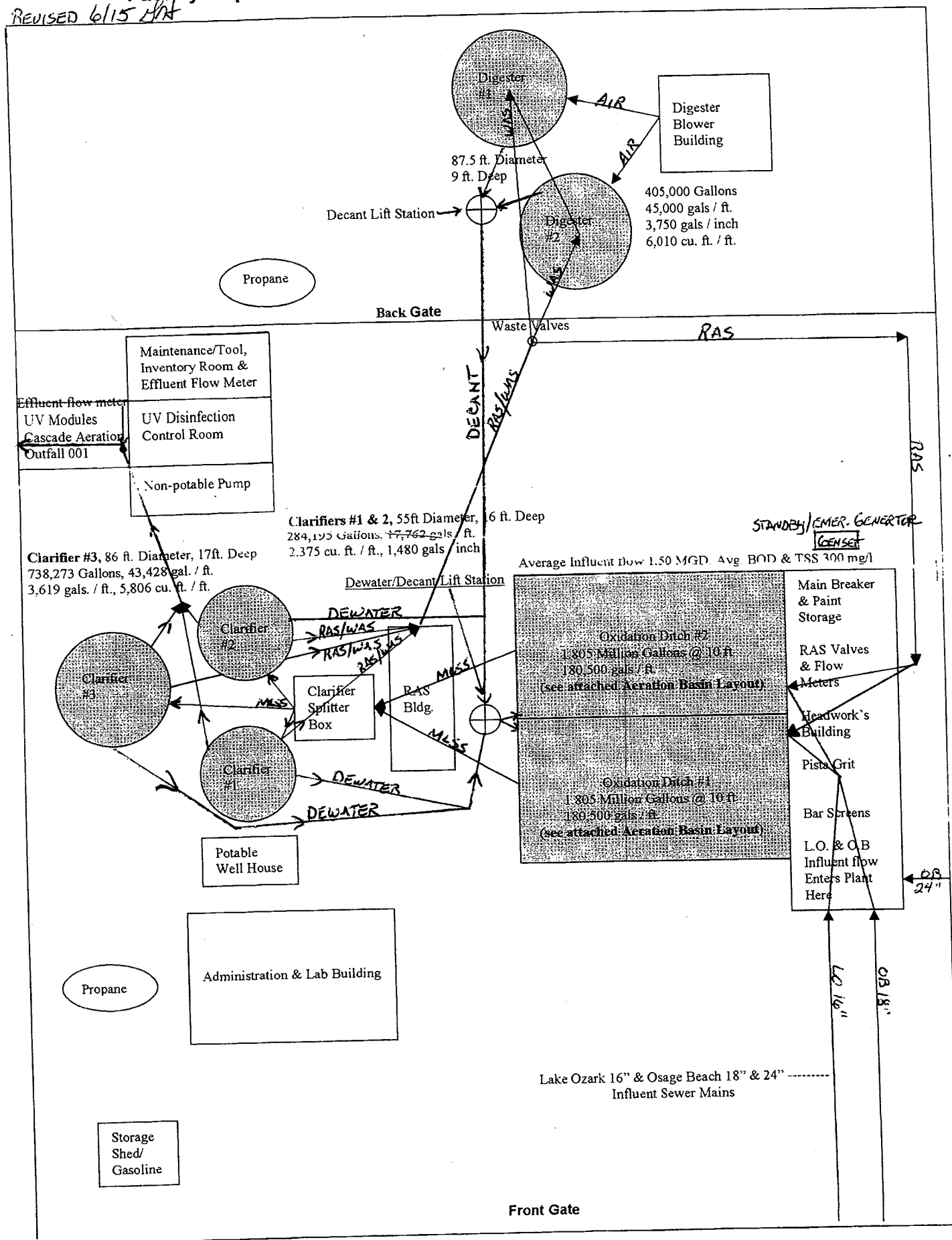
SUPPLEMENTAL APPLICATION INFORMATION

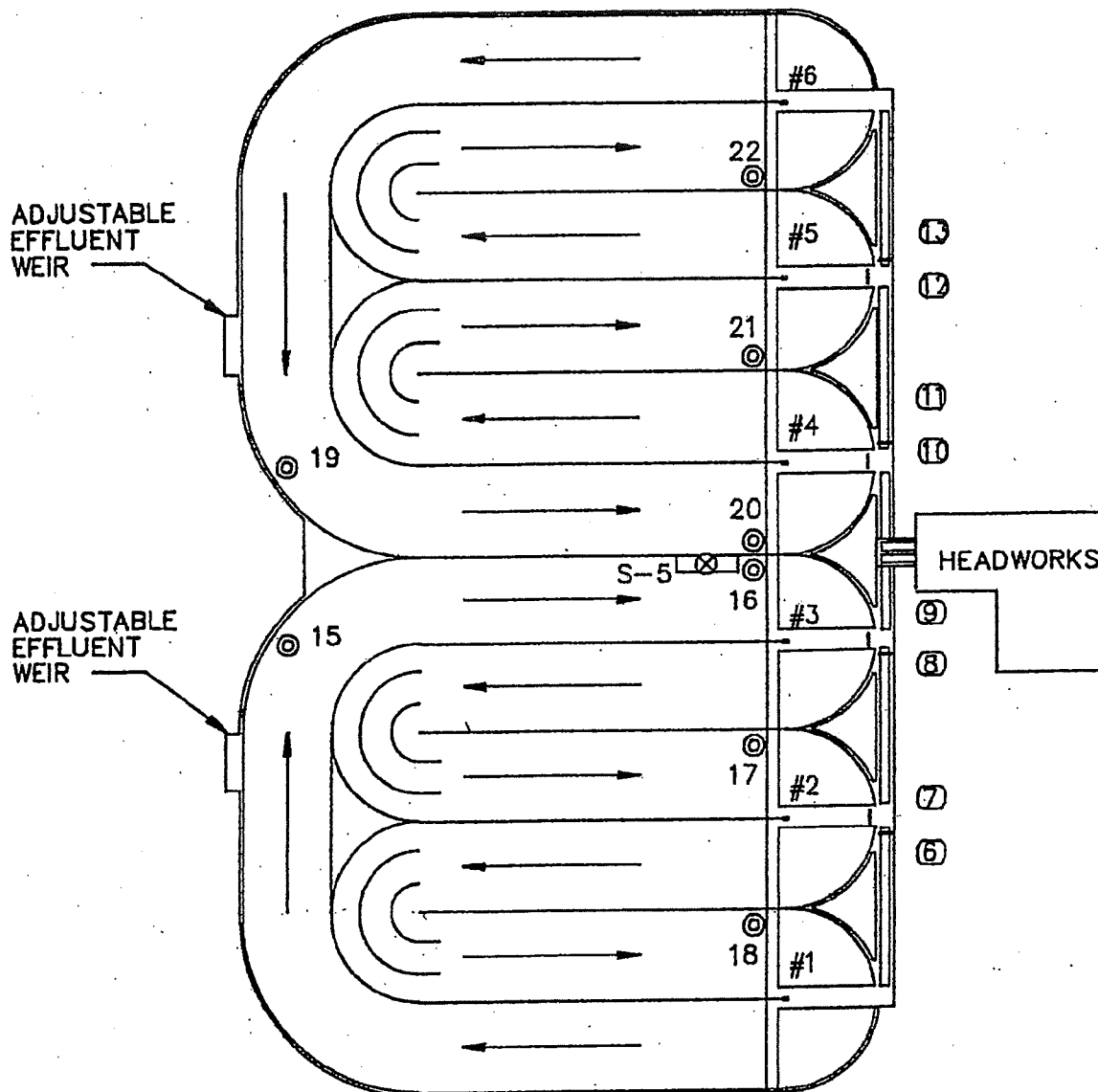
- D. Expanded Effluent Testing Data. A treatment works that discharges effluent to surface water of the United States and meets one or more of the following criteria must complete *Part D - Expanded Effluent Testing Data*:
 - 1. Has a design flow rate greater than or equal to 1 million gallons per day.
 - 2. Is required to have or currently has a pretreatment program.
 - 3. Is otherwise required by the permitting authority to provide the information.
- E. Toxicity Testing Data. A treatment works that meets one or more of the following criteria must complete *Part E - Toxicity Testing Data*:
 - 1. Has a design flow rate greater than or equal to 1 million gallons per day.
 - 2. Is required to have or currently has a pretreatment program.
 - 3. Is otherwise required by the permitting authority to provide the information.
- F. Industrial User Discharges and Resource Conservation and Recovery Act / Comprehensive Environmental Response, Compensation and Liability Act Wastes. A treatment works that accepts process wastewater from any significant industrial users, also known as SIUs, or receives a Resource Conservation and Recovery Act or CERCLA wastes must complete *Part F - Industrial User Discharges and Resource Conservation and Recovery Act / CERCLA Wastes*.
SIUs are defined as:
 - 1. All Categorical Industrial Users, or CIUs, subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations 403.6 and 40 Code of Federal Regulations 403.6 and 40 CFR Chapter 1, Subchapter N.
 - 2. Any other industrial user that meets one or more of the following:
 - i. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions).
 - ii. Contributes a process waste stream that makes up five percent or more of the average dry weather hydraulic or organic capacity of the treatment plant.
 - iii. Is designated as an SIU by the control authority.
 - iv. Is otherwise required by the permitting authority to provide the information.
- G. Combined Sewer Systems. A treatment works that has a combined sewer system must complete *Part G - Combined Sewer Systems*.

ALL APPLICANTS MUST COMPLETE PARTS A, B and C

FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO MO- 0103241	OUTFALL NO. 001
PART A – BASIC APPLICATION INFORMATION		
7. FACILITY INFORMATION		
<p>7.1 Process Flow Diagram or Schematic. Provide a diagram showing the processes of the treatment plant. Show all of the treatment units, including disinfection (e.g. – Chlorination and Dechlorination), influents, and outfalls. Specify where samples are taken. Indicate any treatment process changes in the routing of wastewater during dry weather and peak wet weather. Include a brief narrative description of the diagram. Attach sheets as necessary.</p> <p>(SEE ATTACHED FACILITY MAP/FLOW DIAGRAM)</p> <p>BRIEF DESCRIPTION: WE HAVE ONE 16 INCH INFLUENT FORCE MAIN COMING IN FROM LAKE OZARK AND ONE 18 INCH AND ONE 24 INCH INFLUENT FORCE MAIN COMING IN FROM OSAGE BEACH. BOTH FLOWS GO THROUGH PARSHALL FLUMES WITH ELECTRONIC FLOW METERS ON EACH FOR FLOW MEASUREMENT AND THEN BOTH GO THROUGH AUTOMATIC BAR SCREENS, THEN THROUGH A PISTA GRIT SYSTEM TO REMOVE GRIT BEFORE GOING INTO OXIDATION DITCHES. THE INFLUENT ENTERS THE OXIDATION DITCHES AT THE SAME PLACE THAT OUR RAS (RETURN ACTIVATED SLUDGE) IS RETURNED FROM THE CLARIFIERS AND IS MIXED AT THAT POINT AS IT ENTERS THE DITCH. THE MLSS (MIXED LIQUOR SUSPENDED SOLIDS) THEN HAS TO TRAVEL THROUGH THE DITCHES CARROUSEL SYSTEM SIMILAR TO A MAZE CONFIGURATION (SEE AERATION BASIN LAYOUT ATTACHMENT). THE MLSS IS MIXED AND AERATED AS IT GOES THROUGH THE CARROUSEL SYSTEM AND THEN EXITS THE DITCH AT THE FAR END INTO THE CLARIFIER SPLITTER BOX. THE MLSS THEN CONTINUES ON TO THE CLARIFIERS WHERE IT SETTLES OUT AND IS PICKED UP BY THE RAS (RETURN ACTIVATED SLUDGE) PUMPS AND IS RETURNED TO THE OXIDATION DITCHES AT A RATE OF 30 TO 150% OF THE FLOW TO KEEP THE MLSS BLANKETS DOWN IN THE CLARIFIERS. THE MLSS SETTLES IN THE CLARIFIERS AND THE CLEAR EFFLUENT COMES TO THE TOP GOES OVER THE V NOTCH WEIRS IN THE CLARIFIERS THEN GOES THROUGH THE UV (ULTRA VIOLET) DISINFECTION STAGE, THEN ON TO THE OUTFALL 001 AND DOWN THE CASCADE AERATION INTO BOWLING HOLLOW CREEK.</p> <p>WE WASTE AT A MINIMUM OF 2 TIMES A WEEK TO KEEP OUR MLSS LEVELS DOWN TO AN ACCEPTABLE NUMBER. WHEN IT GETS HIGHER WE USE THE RAS PUMPS TO WASTE. WE OPEN THE WASTE VALVES TO SEND THE WAS (WASTE ACTIVATED SLUDGE) OVER TO THE DIGESTERS/HOLDING TANK, THEN IT SETTLES MORE AND CLEAR DECANT WATER COMES TO THE TOP AND IS RETURNED BACK WITH THE DECANT LIFT STATION AT THE DIGESTERS AND IS SENT UP TO THE DECANT/DEWATER LIFT STATION AT THE AERATION BASINS. EACH CLARIFIER HAS SKIMMER ARMS & TROUGHS THAT SKIM ANY TRASH OR DEBRIS THAT MIGHT FLOAT AND IS DUMPED INTO A SKIMMER BASKET THAT CATCHES THE TRASH/DEBRIS THEN DEWATERED. THE BASKETS ARE CLEANED ON A REGULAR BASIS AND THE TRASH/DEBRIS IS PUT IN DUMPSTER. THE WATER FROM THE BASKET IS THEN SENT TO THE DEWATER/DECANT LIFT STATION AND PUMPED BACK INTO THE AERATION BASIN FOR FURTHER TREATMENT.</p>		

REVISED 6/15 JHT

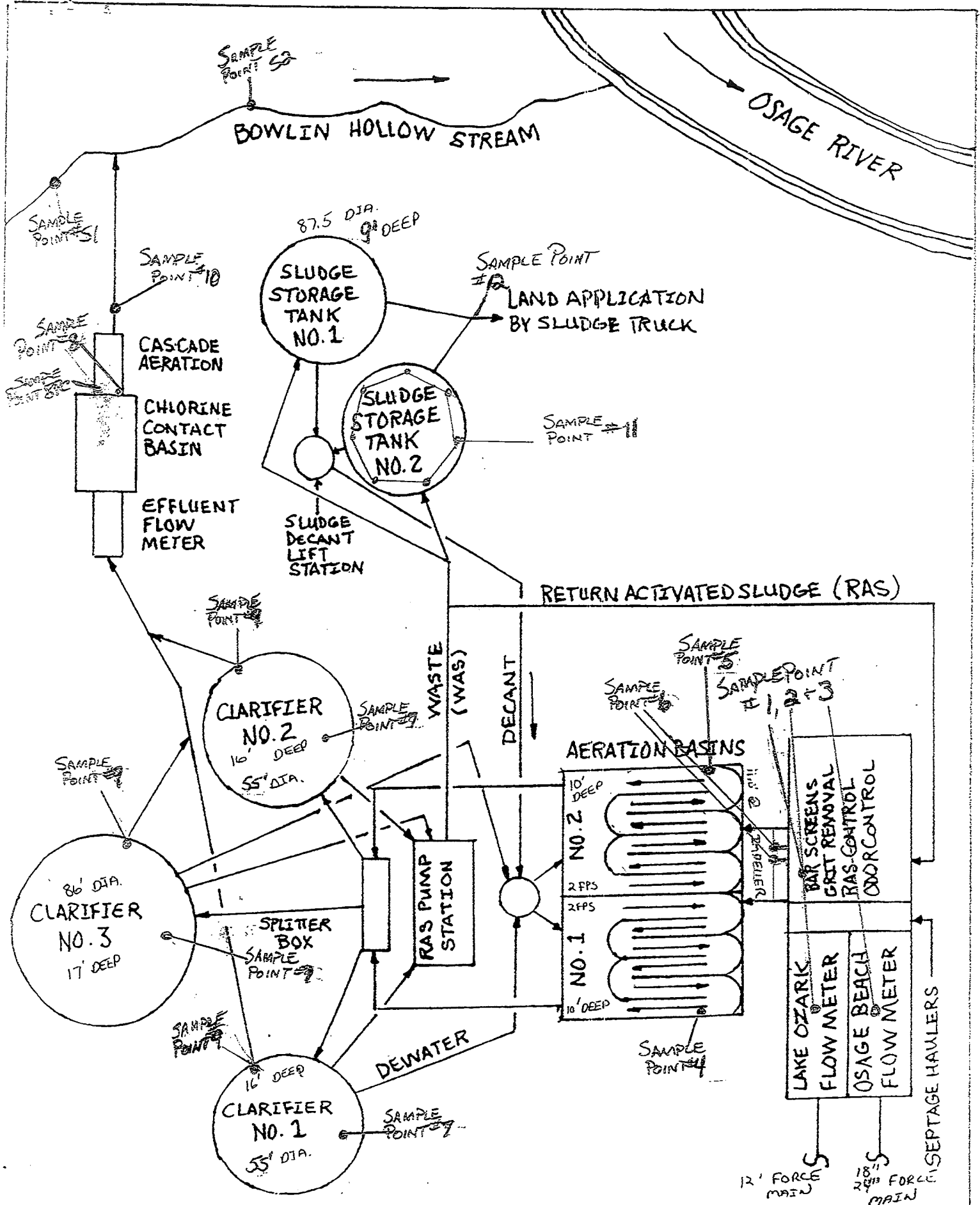




LEGEND

- #2 AERATOR
- (12) STOP GATE
- 21 (M) MUD VALVE
- ← DIRECTION OF CHANNEL FLOW
- S-5 SLUICE GATE

LAKE OF THE OZARKS		MOORE AND WOLFINBARGER ENGINEERS-SURVEYORS	
REGIONAL WASTEWATER TREATMENT PLANT NO. 1		DETAILED VAW	DESIGNED DLF
AERATION BASIN LAYOUT		CHECKED	APPROVED
		DATE 2-7-86	MW NO. 1551 FIGURE III - 4



FLOW DIAGRAM
SAMPLE POINTS

LAKE OF THE OZARKS REGIONAL WASTEWATER TRMT PLANT #1
DATE: 3/10/05

LAKE OZARK/OSAGE BEACH

Sampling Log

SAMPLING SITE #	SITE	DATE	SAMPLE TAKEN BY	TIME	TEST PERFORMED BY	TIME
	INFLUENT					
Daily #1	pH					
Daily #1	Temp					
Weekly #1,2,3	TSS					
Weekly #1	NH ₃ N					
Daily #1	Sett. Solids					
	OXIDATION DITCH #1					
Daily #4	pH					
Daily #4	Temp					
Daily #4	DO					
Daily #4	Settleometer					
Daily #4	MLSS					
Daily #6	RAS					
	OXIDATION DITCH #2					
Daily #5	pH					
Daily #5	Temp					
Daily #5	DO					
Daily #5	Settleometer					
Daily #5	MLSS					
Daily #6	RAS					
	CLARIFIERS					
Daily #7	Sludge Blanket #1					
Daily #7	Sludge Blanket #2					
Daily #7	Sludge Blanket #3					
	EFFLUENT					
Daily #8	pH					
Daily #8	Temp					
Daily #8	DO					
Weekly #9	BOD					
Weekly #8	E. Coli Coliform					
Weekly #8	NH ₃ N					
Weekly #8PC	PC NH ₃ N					
Annually #10	Wet Test					
Monthly #8	O & G					
Quarterly #8	Selenium					
Quarterly #8	Zinc					
	SLUDGE					
Daily #12	TS %					
Quartly #11	Fecals					
Quartly #11	Metals					
Quartly #11	Sours					



0 100 200ft

FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO. MO- 0103241	OUTFALL NO. 001
PART A – BASIC APPLICATION INFORMATION		
7. FACILITY INFORMATION (continued)		
<p>7.2 Map. Attach to this application an aerial or topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. A map can be obtained by visiting the following website: https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=1d81212e0854478ca0dae87c33c8c5ce</p> <ol style="list-style-type: none"> The area surrounding the treatment plant, including all unit processes. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable. The actual point of discharge. Wells, springs, other surface water bodies and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, or disposed. 		
7.3 Facility SIC Code: 4952	Discharge SIC Code: 4952	
7.4 Number of people presently connected or population equivalent (P.E.): <u>5821</u> Design P.E. <u>42860</u>		
<p>7.5 Connections to the facility:</p> <p>Number of units presently connected: 4638</p> <p>Residential: <u>3856</u> Commercial: <u>782</u> Industrial <u>0</u></p>		
7.6 Design Flow 3.0 MGD	Actual Flow 1.6 MGD	
<p>7.7 Will discharge be continuous through the year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Discharge will occur during the following months: _____</p> <p>How many days of the week will discharge occur? _____</p>		
<p>7.8 Is industrial wastewater discharged to the facility? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>If yes, describe the number and types of industries that discharge to your facility. Attach sheets as necessary</p> <p>Refer to the APPLICATION OVERVIEW to determine whether additional information is needed for Part F.</p>		
7.9 Does the facility accept or process leachate from landfills?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
7.10 Is wastewater land applied? If yes, please attach Form I See: https://dnr.mo.gov/forms/780-1686-f.pdf	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
7.11 Does the facility discharge to a losing stream or sinkhole?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
7.12 Has a wasteload allocation study been completed for this facility?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
8. LABORATORY CONTROL INFORMATION		
LABORATORY WORK CONDUCTED BY PLANT PERSONNEL		
Lab work conducted outside of plant.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Push-button or visual methods for simple test such as pH, settleable solids.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Additional procedures such as Dissolved Oxygen, Chemical Oxygen Demand, Biological Oxygen Demand, titrations, solids, volatile content.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO MO- 0103241	OUTFALL NO. 001	
PART A – BASIC APPLICATION INFORMATION			
9. SLUDGE HANDLING, USE AND DISPOSAL			
9.1 Is the sludge a hazardous waste as defined by 10 CSR 25? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
9.2 Sludge production (Including sludge received from others): Design Dry Tons/Year 658.8 Actual Dry Tons/Year 248 in 2018			
9.3 Sludge storage provided: <u>111k</u> Cubic feet; <u>161</u> Days of storage; <u>3.0</u> Average percent solids of sludge; <input type="checkbox"/> No sludge storage is provided. <input type="checkbox"/> Sludge is stored in lagoon.			
9.4 Type of storage: <input checked="" type="checkbox"/> Holding Tank <input type="checkbox"/> Building <input type="checkbox"/> Basin <input type="checkbox"/> Lagoon <input type="checkbox"/> Concrete Pad <input type="checkbox"/> Other (Describe) _____			
9.5 Sludge Treatment: <input type="checkbox"/> Anaerobic Digester <input checked="" type="checkbox"/> Storage Tank <input type="checkbox"/> Lime Stabilization <input type="checkbox"/> Lagoon <input checked="" type="checkbox"/> Aerobic Digester <input type="checkbox"/> Air or Heat Drying <input type="checkbox"/> Composting <input type="checkbox"/> Other (Attach Description)			
9.6 Sludge use or disposal: <input checked="" type="checkbox"/> Land Application <input type="checkbox"/> Contract Hauler <input type="checkbox"/> Hauled to Another Treatment Facility <input type="checkbox"/> Solid Waste Landfill <input type="checkbox"/> Surface Disposal (Sludge Disposal Lagoon, Sludge Held For More Than Two Years) <input type="checkbox"/> Incineration <input type="checkbox"/> Other (Attach Explanation Sheet) _____			
9.7 Person responsible for hauling sludge to disposal facility: <input checked="" type="checkbox"/> By Applicant <input type="checkbox"/> By Others (complete below)			
NAME		EMAIL ADDRESS	
ADDRESS		CITY	STATE ZIP CODE
CONTACT PERSON		TELEPHONE NUMBER WITH AREA CODE	PERMIT NO. MO-
9.8 Sludge use or disposal facility: <input checked="" type="checkbox"/> By Applicant <input type="checkbox"/> By Others (Complete below)			
NAME		EMAIL ADDRESS	
Lake of the Ozarks Regional Wastewater Treatment Plant #1		ghutchcraft@alliancewater.com	
ADDRESS		CITY	STATE ZIP CODE
#3 Anderson Road		Lake Ozark	MO 65049
CONTACT PERSON		TELEPHONE NUMBER WITH AREA CODE	PERMIT NO.
Gary Hutchcraft		(573) 365-0455	MO- 0103241
9.9 Does the sludge or biosolids disposal comply with Federal Sludge Regulation 40 CFR 503? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Explain)			
END OF PART A			

FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO. MO- 0103241	OUTFALL NO. 001
PART B – ADDITIONAL APPLICATION INFORMATION		
10. COLLECTION SYSTEM		
10.1 Are there any municipal satellite collection systems connected to this facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes , please list all connected to this facility, contact phone number and length of each collection system		
FACILITY	CONTACT PHONE NUMBER	LENGTH OF SYSTEM (FEET OR MILES)
10.2 Length of sanitary sewer collection system in miles (If available, include totals from satellite collection systems) <u>170</u> miles		
10.3 Does significant infiltration occur in the collection system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, briefly explain any steps underway or planned to minimize inflow and infiltration: NONE AT THE TREATMENT PLANT, BOTH CITIES OF LAKE OZARK & OSAGE BEACH ARE RESPONSIBLE FOR THEIR OWN COLLECTION SYSTEMS AND BOTH HAVE THEIR OWN I & I PROGRAMS.		
11. BYPASSING		
Does any bypassing occur anywhere in the collection system or at the treatment facility? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, explain: NONE AT THE TREATMENT PLANT, BOTH CITIES OF LAKE OZARK & OSAGE BEACH ARE RESPONSIBLE FOR THEIR OWN COLLECTIONS SYSTEMS.		
12. OPERATION AND MAINTENANCE PERFORMED BY CONTRACTOR(S)		
Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of the contractor? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If Yes, list the name, address, telephone number and status of each contractor and describe the contractor's responsibilities. (Attach additional pages if necessary.)		
NAME ALLIANCE WATER RESOURCES, INC.		
MAILING ADDRESS 206 SOUTH KEENE STREET, COLUMBIA, MO 65201		
TELEPHONE NUMBER WITH AREA CODE (573) 874-8080	EMAIL ADDRESS ALLIANCEWATER.COM	
RESPONSIBILITIES OF CONTRACTOR OPERATION & MAINTENANCE OF THE WASTEWATER TREATMENT PLANT		
13. SCHEDULED IMPROVEMENTS AND SCHEDULES OF IMPLEMENTATION		
Provide information about any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses for each.		

FACILITY NAME Lake of the Ozarks Regional WWTP #1		PERMIT NO. MO- 0103241		OUTFALL NO. 001				
PART B – ADDITIONAL APPLICATION INFORMATION								
14. EFFLUENT TESTING DATA								
Applicants must provide effluent testing data for the following parameters. Provide the indicated effluent data for each outfall through which effluent is discharged . Do not include information of combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than four and one-half years apart. See 40 CFR 136.3 for sufficiently sensitive methods: https://www.ecfr.gov/cgi-bin/text-idx?SID=2d29852e2dcdf91badc043bd5fc3d4df&mc=true&node=se40.25.136_13&rgn=div8								
Outfall Number 001								
PARAMETER		MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE				
		Value	Units	Value	Units Number of Samples			
pH (Minimum)		7.52	S.U.	7.69	S.U. 31			
pH (Maximum)		7.79	S.U.	7.79	S.U. 31			
Flow Rate		3.603	MGD	1.564	MGD 31			
*For pH report a minimum and a maximum daily value								
POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE		ANALYTICAL METHOD	ML/MDL	
		Conc.	Units	Conc.	Units Number of Samples			
Conventional and Nonconventional Compounds								
BIOCHEMICAL OXYGEN DEMAND (Report One)	BOD ₅	4.80	mg/L	2.02	mg/L	24	SM5210-B	30/45
	CBOD ₅		mg/L		mg/L			
E. COLI		28	#/100 mL	< 20	#/100 mL	19	SM9222-B J	126/630
TOTAL SUSPENDED SOLIDS (TSS)		7.80	mg/L	2.15	mg/L	24	SM2540-D	30/45
TOTAL PHOSPHORUS		3.60	mg/L	2.58	mg/L	4	EPA 365.4	Report only
TOTAL KJELDAHL NITROGEN		9.90	mg/L	3.47	mg/L	4	EPA 351.2	T. Nit Calc
NITRITES + NITRATES		22.7	mg/L	12.58	mg/L	4	EPA 353.2	T. Nit Calc
AMMONIA AS N		0.80	mg/L	0.16	mg/L	26	SM4500-NH3 D	1.2/2.7 2.7/11.5
CHLORINE* (TOTAL RESIDUAL, TRC)			mg/L		mg/L			
DISSOLVED OXYGEN		8.70	mg/L	5.97	mg/L	186	SM4500-O G	N/A
OIL and GREASE		< 5.0	mg/L	< 4.9	mg/L	6	EPA 1664A	10/15
OTHER: Selenium		1.7 ug/L	mg/L	<1.0 ug/L	mg/L	6	EPA 200.8	4.0/9.1
*Report only if facility chlorinates								
END OF PART B								

FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO. MO- 0103241	OUTFALL NO. 001
--	---------------------------	--------------------

PART C – CERTIFICATION

15. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally-consistent set of data. **One of the following must be checked in order for this application to be considered complete.** Please visit <https://dnr.mo.gov/forms/780-2204-f.pdf> to access the eDMR application.

☐ - You have completed and submitted with this permit application the required documentation to participate in the eDMR system.

☒ - You have previously submitted the required documentation to participate in the eDMR system and/or you are currently using the eDMR system.

☐ - You have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.

16. JETPAY

Permit fees may be payed online by credit card or eCheck through a system called JetPay. Use the URL provided to access JetPay and make an online payment.

New Site Specific Permit: <https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/591/>
 Construction Permits: <https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/592/>
 Modification Fee: <https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/596/>

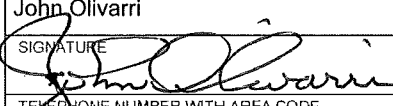
17. CERTIFICATION

All applicants must complete the Certification Section. This certification must be signed by an officer of the company or city official. All applicants must complete all applicable sections as explained in the Application Overview. By signing this certification statement, applicants confirm that they have reviewed the entire form and have completed all sections that apply to the facility for which this application is submitted.

ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PRINTED NAME John Olivari	OFFICIAL TITLE (MUST BE AN OFFICER OF THE COMPANY OR CITY OFFICIAL) OB Mayor/Joint Sewer Board President
------------------------------	---

SIGNATURE


TELEPHONE NUMBER WITH AREA CODE
 573-302-2000 ext 1000

DATE SIGNED
 1/21/20

Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

Send Completed Form to:

Department of Natural Resources
 Water Protection Program
 ATTN: NPDES Permits and Engineering Section
 P.O. Box 176
 Jefferson City, MO 65102-0176

END OF PART C

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH PARTS OF FORM B2 YOU MUST COMPLETE.

Do not complete the remainder of this application, unless at least one of the following statements applies to your facility:

1. Your facility design flow is equal to or greater than 1,000,000 gallons per day.
2. Your facility is a pretreatment treatment works.
3. Your facility is a combined sewer system.

Submittal of an incomplete application may result in the application being returned. Permit fees for returned applications shall be forfeited. Permit fees for applications being processed by the department that are withdrawn by the applicant shall be forfeited.

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME

Lake of the Ozarks Regional WWTP #1

PERMIT NO.

MO- 0103241

OUTFALL NO.

001

PART D – EXPANDED EFFLUENT TESTING DATA

18. EXPANDED EFFLUENT TESTING DATA

Refer to the APPLICATION OVERVIEW to determine whether Part D applies to the treatment works.

If the treatment works has a design flow greater than or equal to 1 MGD or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information **for each outfall through which effluent is discharged**. Do not include information of combined sewer overflows in this section. All information reported must be based on data collected and analyzed using sufficiently sensitive methods found in 40 CFR Part 136. See 40 CFR 136.3 for sufficiently sensitive methods: <https://www.ecfr.gov/cgi-bin/text-id.x?SID=2d29852e2dcdf91badc043bd5fc3d4df&mc=true&node=se40.25.136.13&rgn=div8>. In addition, all data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least **three pollutant scans** and must be no more than four and one-half years prior to the date of the permit application submittal. In the blank rows provided at the end of this list, include any additional data for pollutants not specifically listed in this form. Information may be written in the blanks below or provided as attached documents containing the laboratory test results.

Outfall Number (Complete Once for Each Outfall Discharging Effluent to Waters of the State.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	No. of Samples		

METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS AND HARDNESS

ALUMINUM	SEE ATTACHMENT										
ANTIMONY											
ARSENIC											
BERYLLIUM											
CADMIUM											
CHROMIUM III											
CHROMIUM VI											
COPPER											
IRON											
LEAD											
MERCURY											
NICKEL											
SELENIUM											
SILVER											
THALLIUM											
ZINC											
CYANIDE											
TOTAL PHENOLIC COMPOUNDS											
HARDNESS (as CaCO ₃)											

VOLATILE ORGANIC COMPOUNDS

ACROLEIN											
ACRYLONITRILE											
BENZENE											
BROMOFORM											
CARBON TETRACHLORIDE											

FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO. MO- 0103241	OUTFALL NO. 001
--	---------------------------	--------------------

PART D – EXPANDED EFFLUENT TESTING DATA

18. EXPANDED EFFLUENT TESTING DATA

Complete Once for Each Outfall Discharging Effluent to Waters of the State

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL	
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	No. of Samples			
CHLOROBENZENE	SEE ATTACHMENT											
CHLORODIBROMO-METHANE												
CHLOROETHANE												
2-CHLORO-ETHYLVINYL ETHER												
CHLOROFORM												
DICHLOROBROMO-METHANE												
1,1-DICHLORO-ETHANE												
1,2-DICHLORO-ETHANE												
TRANS-1,2-DICHLOROETHYLENE												
1,1-DICHLORO-ETHYLENE												
1,2-DICHLORO-PROPANE												
1,3-DICHLORO-PROPYLENE												
ETHYLBENZENE												
METHYL BROMIDE												
METHYL CHLORIDE												
METHYLENE CHLORIDE												
1,1,2,2-TETRA-CHLOROETHANE												
TETRACHLORO-ETHANE												
TOLUENE												
1,1,1-TRICHLORO-ETHANE												
1,1,2-TRICHLORO-ETHANE												
TRICHLOROETHYLENE												
VINYL CHLORIDE												

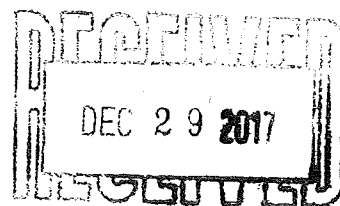
ACID-EXTRACTABLE COMPOUNDS

P-CHLORO-M-CRESOL											
2-CHLOROPHENOL											
2,4-DICHLOROPHENOL											
2,4-DIMETHYLPHENOL											
4,6-DINITRO-O-CRESOL											
2,4-DINITROPHENOL											
2-NITROPHENOL											
4-NITROPHENOL											

FACILITY NAME Lake of the Ozarks Regional WWTP #1				PERMIT NO. MO- 0103241				OUTFALL NO. 001			
PART D – EXPANDED EFFLUENT TESTING DATA											
18. EXPANDED EFFLUENT TESTING DATA											
Complete Once for Each Outfall Discharging Effluent to Waters of the State.											
POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	No. of Samples		
PENTACHLOROPHENOL											
PHENOL											
2,4,6-TRICHLOROPHENOL											
BASE-NEUTRAL COMPOUNDS											
ACENAPHTHENE											
ACENAPHTHYLENE											
ANTHRACENE											
BENZIDINE											
BENZO(A)ANTHRACENE											
BENZO(A)PYRENE											
3,4-BENZO-FLUORANTHENE											
BENZO(GH) PHERYLENE											
BENZO(K) FLUORANTHENE											
BIS (2-CHLOROTHOXY) METHANE											
BIS (2-CHLOROETHYL) – ETHER											
BIS (2-CHLOROISO-PROPYL) ETHER											
BIS (2-ETHYLHEXYL) PHTHALATE											
4-BROMOPHENYL PHENYL ETHER											
BUTYL BENZYL PHTHALATE											
2-CHLORONAPH-THALENE											
4-CHLORPHENYL PHENYL ETHER											
CHRYSENE											
DI-N-BUTYL PHTHALATE											
DI-N-OCTYL PHTHALATE											
DIBENZO (A,H) ANTHRACENE											
1,2-DICHLORO-BENZENE											
1,3-DICHLORO-BENZENE											
1,4-DICHLORO-BENZENE											
3,3-DICHLORO-BENZIDINE											
DIETHYL PHTHALATE											
DIMETHYL PHTHALATE											

December 26, 2017

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049



RE: Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

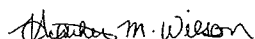
1ST ROUND OF TESTING FOR PERMIT RENEWAL

Dear Gary Hutchcraft:

Enclosed are the analytical results for sample(s) received by the laboratory on December 12, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60260023001	EXPANDED EFF TEST #1	Water	12/11/17 13:25	12/12/17 09:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60260023001	EXPANDED EFF TEST #1	EPA 200.7	TDS	3	PASI-K
		EPA 200.8	JGP	14	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 625	JMT	60	PASI-K
		EPA 624 Low	EAG	37	PASI-K
		Trivalent Chromium Calculation	LDB	1	PASI-K
		SM 3500-Cr B	HMM	1	PASI-K
		SM 4500-CN-E	RAD	1	PASI-K

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

Sample: EXPANDED EFF TEST #1 Lab ID: 60260023001 Collected: 12/11/17 13:25 Received: 12/12/17 09:40 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Calcium	61600	ug/L	100	1	12/14/17 10:30	12/15/17 19:05	7440-70-2	
Magnesium	33200	ug/L	50.0	1	12/14/17 10:30	12/15/17 19:05	7439-95-4	
Total Hardness by 2340B	290000	ug/L	500	1	12/14/17 10:30	12/15/17 19:05		
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	50.0	1	12/14/17 09:38	12/18/17 17:30	7429-90-5	
Antimony	ND	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7440-36-0	
Arsenic	ND	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7440-38-2	
Beryllium	ND	ug/L	0.50	1	12/14/17 09:38	12/18/17 17:30	7440-41-7	
Cadmium	ND	ug/L	0.50	1	12/14/17 09:38	12/18/17 17:30	7440-43-9	
Chromium	ND	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7440-47-3	
Copper	4.5	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7440-50-8	
Iron	120	ug/L	50.0	1	12/14/17 09:38	12/18/17 17:30	7439-89-6	
Lead	ND	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7439-92-1	
Nickel	1.8	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7440-02-0	
Selenium	ND	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7782-49-2	
Silver	ND	ug/L	0.50	1	12/14/17 09:38	12/18/17 17:30	7440-22-4	
Thallium	ND	ug/L	1.0	1	12/14/17 09:38	12/18/17 17:30	7440-28-0	
Zinc	41.2	ug/L	10.0	1	12/14/17 09:38	12/18/17 17:30	7440-66-6	
245.1 Mercury Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	ND	ug/L	0.20	1	12/13/17 09:42	12/14/17 12:59	7439-97-6	
625 MSSV Analytical Method: EPA 625 Preparation Method: EPA 625								
Acenaphthene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	83-32-9	
Acenaphthylene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	208-96-8	
Anthracene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	120-12-7	
Benzidine	ND	ug/L	48.5	1	12/15/17 15:00	12/18/17 16:30	92-87-5	M1
Benzo(a)anthracene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	56-55-3	
Benzo(a)pyrene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	101-55-3	
Butylbenzylphthalate	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	59-50-7	
bis(2-Chloroethoxy)methane	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	5.8	1	12/15/17 15:00	12/18/17 16:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	5.8	1	12/15/17 15:00	12/18/17 16:30	39638-32-9	L1
2-Chloronaphthalene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	91-58-7	
2-Chlorophenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	7005-72-3	
Chrysene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	53-70-3	
3,3'-Dichlorobenzidine	ND	ug/L	19.4	1	12/15/17 15:00	12/18/17 16:30	91-94-1	
2,4-Dichlorophenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	120-83-2	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

Sample: EXPANDED EFF TEST #1 Lab ID: 60260023001 Collected: 12/11/17 13:25 Received: 12/12/17 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	--------------	----	----------	----------	---------	------

625 MSSV

Analytical Method: EPA 625 Preparation Method: EPA 625

Diethylphthalate	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	84-66-2	
2,4-Dimethylphenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	105-67-9	
Dimethylphthalate	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	131-11-3	
Di-n-butylphthalate	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	24.3	1	12/15/17 15:00	12/18/17 16:30	534-52-1	
2,4-Dinitrophenol	ND	ug/L	48.5	1	12/15/17 15:00	12/18/17 16:30	51-28-5	
2,4-Dinitrotoluene	ND	ug/L	5.8	1	12/15/17 15:00	12/18/17 16:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	606-20-2	
Di-n-octylphthalate	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/L	7.8	1	12/15/17 15:00	12/18/17 16:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	117-81-7	
Fluoranthene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	206-44-0	
Fluorene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	87-68-3	
Hexachlorobenzene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	77-47-4	
Hexachloroethane	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	193-39-5	
Isophorone	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	78-59-1	
Naphthalene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	91-20-3	
Nitrobenzene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	98-95-3	
2-Nitrophenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	88-75-5	
4-Nitrophenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	86-30-6	
Pentachlorophenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	87-86-5	
Phenanthrene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	85-01-8	
Phenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	108-95-2	
Pyrene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	120-82-1	
2,4,6-Trichlorophenol	ND	ug/L	4.9	1	12/15/17 15:00	12/18/17 16:30	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	64	%	24-110	1	12/15/17 15:00	12/18/17 16:30	4165-60-0	
2-Fluorobiphenyl (S)	70	%	24-110	1	12/15/17 15:00	12/18/17 16:30	321-60-8	
Terphenyl-d14 (S)	74	%	35-118	1	12/15/17 15:00	12/18/17 16:30	1718-51-0	
Phenol-d6 (S)	23	%	11-42	1	12/15/17 15:00	12/18/17 16:30	13127-88-3	
2-Fluorophenol (S)	34	%	20-59	1	12/15/17 15:00	12/18/17 16:30	367-12-4	
2,4,6-Tribromophenol (S)	56	%	24-126	1	12/15/17 15:00	12/18/17 16:30	118-79-6	

624 Volatile Organics

Analytical Method: EPA 624 Low

Acrolein	ND	ug/L	100	1		12/13/17 20:06	107-02-8	
Acrylonitrile	ND	ug/L	20.0	1		12/13/17 20:06	107-13-1	
Benzene	ND	ug/L	1.0	1		12/13/17 20:06	71-43-2	
Bromodichloromethane	ND	ug/L	1.0	1		12/13/17 20:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		12/13/17 20:06	75-25-2	
Bromomethane	ND	ug/L	5.0	1		12/13/17 20:06	74-83-9	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

Sample: EXPANDED EFF TEST #1		Lab ID: 60260023001		Collected: 12/11/17 13:25		Received: 12/12/17 09:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
624 Volatile Organics		Analytical Method: EPA 624 Low							
Carbon tetrachloride	ND	ug/L	1.0	1		12/13/17 20:06	56-23-5		
Chlorobenzene	ND	ug/L	1.0	1		12/13/17 20:06	108-90-7		
Chloroethane	ND	ug/L	1.0	1		12/13/17 20:06	75-00-3		
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		12/13/17 20:06	110-75-8	c2	
Chloroform	ND	ug/L	1.0	1		12/13/17 20:06	67-66-3		
Chloromethane	ND	ug/L	1.0	1		12/13/17 20:06	74-87-3		
Dibromochloromethane	ND	ug/L	1.0	1		12/13/17 20:06	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		12/13/17 20:06	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		12/13/17 20:06	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		12/13/17 20:06	106-46-7		
1,1-Dichloroethane	ND	ug/L	1.0	1		12/13/17 20:06	75-34-3		
1,2-Dichloroethane	ND	ug/L	1.0	1		12/13/17 20:06	107-06-2		
1,1-Dichloroethene	ND	ug/L	1.0	1		12/13/17 20:06	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/17 20:06	156-59-2	N2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		12/13/17 20:06	156-60-5		
1,2-Dichloropropane	ND	ug/L	1.0	1		12/13/17 20:06	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/17 20:06	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		12/13/17 20:06	10061-02-6		
Ethylbenzene	ND	ug/L	1.0	1		12/13/17 20:06	100-41-4		
Methylene chloride	ND	ug/L	1.0	1		12/13/17 20:06	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		12/13/17 20:06	79-34-5		
Tetrachloroethene	ND	ug/L	1.0	1		12/13/17 20:06	127-18-4		
Toluene	ND	ug/L	1.0	1		12/13/17 20:06	108-88-3		
1,1,1-Trichloroethane	ND	ug/L	1.0	1		12/13/17 20:06	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	1.0	1		12/13/17 20:06	79-00-5		
Trichloroethene	ND	ug/L	1.0	1		12/13/17 20:06	79-01-6		
Vinyl chloride	ND	ug/L	1.0	1		12/13/17 20:06	75-01-4		
Surrogates									
4-Bromofluorobenzene (S)	112	%	80-120	1		12/13/17 20:06	460-00-4	HS	
Toluene-d8 (S)	100	%	80-120	1		12/13/17 20:06	2037-26-5		
1,2-Dichloroethane-d4 (S)	106	%	80-120	1		12/13/17 20:06	17060-07-0		
Preservation pH	6.0		1.0	1		12/13/17 20:06			
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	mg/L	0.0050	1		12/26/17 13:27	16065-83-1		
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B							
Chromium, Hexavalent	ND	mg/L	0.010	1		12/12/17 11:44	18540-29-9		
4500CNE Cyanide, Total		Analytical Method: SM 4500-CN-E							
Cyanide	ND	mg/L	0.0050	1		12/22/17 14:00	57-12-5		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

QC Batch: 507029 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60260023001

METHOD BLANK: 2077181 Matrix: Water
Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	12/14/17 12:02	

LABORATORY CONTROL SAMPLE: 2077182

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.4	88	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2077183 2077184

Parameter	Units	60259743001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Mercury	ug/L	ND	5	5	5.3	5.3	106	106	70-130	0 20	

MATRIX SPIKE SAMPLE: 2077185

Parameter	Units	60260023001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	4.8	96	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

QC Batch: 507332	Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7	Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60260023001	

METHOD BLANK: 2078265
Associated Lab Samples: 60260023001

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	ug/L	ND	100	12/15/17 18:35	
Magnesium	ug/L	ND	50.0	12/15/17 18:35	
Total Hardness by 2340B	ug/L	ND	500	12/15/17 18:35	

LABORATORY CONTROL SAMPLE: 2078266

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	9810	98	85-115	
Magnesium	ug/L	10000	9150	91	85-115	
Total Hardness by 2340B	ug/L		62200			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2078267 2078268

Parameter	Units	60260128001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	68700	10000	10000	81400	75600	128	70	70-130	7	20	
Magnesium	ug/L	36400	10000	10000	47300	44000	109	76	70-130	7	20	
Total Hardness by 2340B	ug/L	321000			398000	370000				7		

MATRIX SPIKE SAMPLE: 2078269

Parameter	Units	60260213002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L		30100	10000	40300	102	70-130
Magnesium	ug/L		20900	10000	29400	85	70-130
Total Hardness by 2340B	ug/L		161000		222000		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

QC Batch: 507314 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60260023001

METHOD BLANK: 2078161 Matrix: Water
Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	50.0	12/18/17 17:01	
Antimony	ug/L	ND	1.0	12/18/17 17:01	
Arsenic	ug/L	ND	1.0	12/18/17 17:01	
Beryllium	ug/L	ND	0.50	12/18/17 17:01	
Cadmium	ug/L	ND	0.50	12/18/17 17:01	
Chromium	ug/L	ND	1.0	12/18/17 17:01	
Copper	ug/L	ND	1.0	12/18/17 17:01	
Iron	ug/L	ND	50.0	12/18/17 17:01	
Lead	ug/L	ND	1.0	12/18/17 17:01	
Nickel	ug/L	ND	1.0	12/18/17 17:01	
Selenium	ug/L	ND	1.0	12/18/17 17:01	
Silver	ug/L	ND	0.50	12/18/17 17:01	
Thallium	ug/L	ND	1.0	12/18/17 17:01	
Zinc	ug/L	ND	10.0	12/18/17 17:01	

LABORATORY CONTROL SAMPLE: 2078162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	1000	996	100	85-115	
Antimony	ug/L	40	39.0	97	85-115	
Arsenic	ug/L	40	40.2	100	85-115	
Beryllium	ug/L	40	40.2	100	85-115	
Cadmium	ug/L	40	39.2	98	85-115	
Chromium	ug/L	40	39.6	99	85-115	
Copper	ug/L	40	40.0	100	85-115	
Iron	ug/L	1000	1040	104	85-115	
Lead	ug/L	40	38.1	95	85-115	
Nickel	ug/L	40	39.2	98	85-115	
Selenium	ug/L	40	38.2	95	85-115	
Silver	ug/L	20	19.4	97	85-115	
Thallium	ug/L	40	36.5	91	85-115	
Zinc	ug/L	100	98.8	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2078163

2078164

Parameter	Units	60260023001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Aluminum	ug/L	ND	1000	1000	925	928	91	92	70-130	0	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2078163 2078164												
Parameter	Units	60260023001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
Antimony	ug/L	ND	40	40	40.2	41.6	100	103	70-130	3	20	
Arsenic	ug/L	ND	40	40	40.2	41.4	100	103	70-130	3	20	
Beryllium	ug/L	ND	40	40	39.8	40.0	100	100	70-130	0	20	
Cadmium	ug/L	ND	40	40	36.7	37.9	92	95	70-130	3	20	
Chromium	ug/L	ND	40	40	38.3	39.6	95	98	70-130	3	20	
Copper	ug/L	4.5	40	40	40.9	41.5	91	93	70-130	2	20	
Iron	ug/L	120	1000	1000	1120	1140	101	102	70-130	1	20	
Lead	ug/L	ND	40	40	38.1	38.6	95	96	70-130	1	20	
Nickel	ug/L	1.8	40	40	36.9	38.1	88	91	70-130	3	20	
Selenium	ug/L	ND	40	40	35.8	37.0	89	92	70-130	3	20	
Silver	ug/L	ND	20	20	17.6	18.4	88	92	70-130	4	20	
Thallium	ug/L	ND	40	40	36.9	37.2	92	93	70-130	1	20	
Zinc	ug/L	41.2	100	100	130	131	89	90	70-130	1	20	

MATRIX SPIKE SAMPLE: 2078165								
Parameter	Units	60260182001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
Aluminum	ug/L	ND	1000	923	91	70-130		
Antimony	ug/L	ND	40	41.5	103	70-130		
Arsenic	ug/L	ND	40	41.3	102	70-130		
Beryllium	ug/L	ND	40	39.6	99	70-130		
Cadmium	ug/L	ND	40	38.0	95	70-130		
Chromium	ug/L	ND	40	39.7	98	70-130		
Copper	ug/L	2.7	40	39.9	93	70-130		
Iron	ug/L	68.4	1000	1100	103	70-130		
Lead	ug/L	ND	40	38.9	97	70-130		
Nickel	ug/L	ND	40	37.4	91	70-130		
Selenium	ug/L	ND	40	38.0	94	70-130		
Silver	ug/L	ND	20	18.1	90	70-130		
Thallium	ug/L	ND	40	37.4	93	70-130		
Zinc	ug/L	43.6	100	137	93	70-130		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

QC Batch: 507069	Analysis Method: EPA 624 Low
QC Batch Method: EPA 624 Low	Analysis Description: 624 MSV
Associated Lab Samples: 60260023001	

METHOD BLANK: 2077316 Matrix: Water
Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	1.0	12/13/17 18:56	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	12/13/17 18:56	
1,1,2-Trichloroethane	ug/L	ND	1.0	12/13/17 18:56	
1,1-Dichloroethane	ug/L	ND	1.0	12/13/17 18:56	
1,1-Dichloroethene	ug/L	ND	1.0	12/13/17 18:56	
1,2-Dichlorobenzene	ug/L	ND	1.0	12/13/17 18:56	
1,2-Dichloroethane	ug/L	ND	1.0	12/13/17 18:56	
1,2-Dichloropropane	ug/L	ND	1.0	12/13/17 18:56	
1,3-Dichlorobenzene	ug/L	ND	1.0	12/13/17 18:56	
1,4-Dichlorobenzene	ug/L	ND	1.0	12/13/17 18:56	
2-Chloroethylvinyl ether	ug/L	ND	10.0	12/13/17 18:56	
Acrolein	ug/L	ND	100	12/13/17 18:56	
Acrylonitrile	ug/L	ND	20.0	12/13/17 18:56	
Benzene	ug/L	ND	1.0	12/13/17 18:56	
Bromodichloromethane	ug/L	ND	1.0	12/13/17 18:56	
Bromoform	ug/L	ND	1.0	12/13/17 18:56	
Bromomethane	ug/L	ND	5.0	12/13/17 18:56	
Carbon tetrachloride	ug/L	ND	1.0	12/13/17 18:56	
Chlorobenzene	ug/L	ND	1.0	12/13/17 18:56	
Chloroethane	ug/L	ND	1.0	12/13/17 18:56	
Chloroform	ug/L	ND	1.0	12/13/17 18:56	
Chloromethane	ug/L	ND	1.0	12/13/17 18:56	
cis-1,2-Dichloroethene	ug/L	ND	1.0	12/13/17 18:56	N2
cis-1,3-Dichloropropene	ug/L	ND	1.0	12/13/17 18:56	
Dibromochloromethane	ug/L	ND	1.0	12/13/17 18:56	
Ethylbenzene	ug/L	ND	1.0	12/13/17 18:56	
Methylene chloride	ug/L	ND	1.0	12/13/17 18:56	
Tetrachloroethene	ug/L	ND	1.0	12/13/17 18:56	
Toluene	ug/L	ND	1.0	12/13/17 18:56	
trans-1,2-Dichloroethene	ug/L	ND	1.0	12/13/17 18:56	
trans-1,3-Dichloropropene	ug/L	ND	1.0	12/13/17 18:56	
Trichloroethene	ug/L	ND	1.0	12/13/17 18:56	
Vinyl chloride	ug/L	ND	1.0	12/13/17 18:56	
1,2-Dichloroethane-d4 (S)	%	103	80-120	12/13/17 18:56	
4-Bromofluorobenzene (S)	%	111	80-120	12/13/17 18:56	
Toluene-d8 (S)	%	99	80-120	12/13/17 18:56	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

LABORATORY CONTROL SAMPLE: 2077317

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	20	20.3	101	77-114	
1,1,2,2-Tetrachloroethane	ug/L	20	22.4	112	72-119	
1,1,2-Trichloroethane	ug/L	20	20.2	101	77-118	
1,1-Dichloroethane	ug/L	20	20.0	100	59-155	
1,1-Dichloroethene	ug/L	20	15.4	77	65-118	
1,2-Dichlorobenzene	ug/L	20	22.5	112	79-118	
1,2-Dichloroethane	ug/L	20	20.2	101	77-115	
1,2-Dichloropropane	ug/L	20	20.6	103	79-111	
1,3-Dichlorobenzene	ug/L	20	21.6	108	77-114	
1,4-Dichlorobenzene	ug/L	20	20.5	103	79-111	
2-Chloroethylvinyl ether	ug/L	20	17.6	88	32-167	
Acrolein	ug/L	200	109	55	10-183	
Acrylonitrile	ug/L	200	220	110	70-122	
Benzene	ug/L	20	20.0	100	81-111	
Bromodichloromethane	ug/L	20	21.3	106	78-117	
Bromoform	ug/L	20	19.6	98	67-122	
Bromomethane	ug/L	20	5.9	30	10-186	
Carbon tetrachloride	ug/L	20	21.1	106	72-117	
Chlorobenzene	ug/L	20	20.1	100	80-110	
Chloroethane	ug/L	20	11.8	59	34-168	
Chloroform	ug/L	20	20.0	100	74-112	
Chloromethane	ug/L	20	8.3	41	11-187	
cis-1,2-Dichloroethene	ug/L	20	18.4	92	75-111	N2
cis-1,3-Dichloropropene	ug/L	20	19.5	98	77-115	
Dibromochloromethane	ug/L	20	20.4	102	76-119	
Ethylbenzene	ug/L	20	19.6	98	80-111	
Methylene chloride	ug/L	20	17.3	87	72-114	
Tetrachloroethene	ug/L	20	19.8	99	77-111	
Toluene	ug/L	20	20.0	100	78-110	
trans-1,2-Dichloroethene	ug/L	20	19.2	96	72-113	
trans-1,3-Dichloropropene	ug/L	20	20.2	101	76-121	
Trichloroethene	ug/L	20	19.6	98	75-110	
Vinyl chloride	ug/L	20	14.3	71	32-165	
1,2-Dichloroethane-d4 (S)	%			104	80-120	
4-Bromofluorobenzene (S)	%			105	80-120	
Toluene-d8 (S)	%			98	80-120	

MATRIX SPIKE SAMPLE: 2077318

Parameter	Units	60260023001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	20	21.2	106	52-162	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	23.3	117	46-157	
1,1,2-Trichloroethane	ug/L	ND	20	20.8	104	52-150	
1,1-Dichloroethane	ug/L	ND	20	20.7	103	59-159	
1,1-Dichloroethene	ug/L	ND	20	15.7	78	41-148	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

MATRIX SPIKE SAMPLE:		2077318					
Parameter	Units	60260023001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	ND	20	21.5	108	62-128	
1,2-Dichloroethane	ug/L	ND	20	19.7	99	61-126	
1,2-Dichloropropane	ug/L	ND	20	21.9	109	60-124	
1,3-Dichlorobenzene	ug/L	ND	20	21.8	109	59-156	
1,4-Dichlorobenzene	ug/L	ND	20	20.5	103	62-122	
2-Chloroethylvinyl ether	ug/L	ND	20	19.4	97	10-169	
Acrolein	ug/L	ND	200	52.8J	26	10-178	
Acrylonitrile	ug/L	ND	200	224	112	49-134	
Benzene	ug/L	ND	20	20.2	101	37-151	
Bromodichloromethane	ug/L	ND	20	21.5	107	35-155	
Bromoform	ug/L	ND	20	19.6	98	45-169	
Bromomethane	ug/L	ND	20	5.5	28	10-178	
Carbon tetrachloride	ug/L	ND	20	21.5	107	70-140	
Chlorobenzene	ug/L	ND	20	20.3	101	63-123	
Chloroethane	ug/L	ND	20	10.7	53	14-230	
Chloroform	ug/L	ND	20	20.5	103	51-138	
Chloromethane	ug/L	ND	20	7.4	37	10-178	
cis-1,2-Dichloroethene	ug/L	ND	20	19.1	96	54-128	N2
cis-1,3-Dichloropropene	ug/L	ND	20	19.3	96	57-126	
Dibromochloromethane	ug/L	ND	20	19.4	97	54-134	
Ethylbenzene	ug/L	ND	20	19.9	99	64-127	
Methylene chloride	ug/L	ND	20	16.4	82	55-121	
Tetrachloroethene	ug/L	ND	20	19.9	99	64-148	
Toluene	ug/L	ND	20	20.6	103	47-150	
trans-1,2-Dichloroethene	ug/L	ND	20	19.4	97	54-156	
trans-1,3-Dichloropropene	ug/L	ND	20	20.4	102	58-131	
Trichloroethene	ug/L	ND	20	19.6	98	71-157	
Vinyl chloride	ug/L	ND	20	13.2	66	10-172	
1,2-Dichloroethane-d4 (S)	%				106	80-120	
4-Bromofluorobenzene (S)	%				107	80-120	HS
Toluene-d8 (S)	%				101	80-120	
Preservation pH		6.0		6.0			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

QC Batch:	507475	Analysis Method:	EPA 625
QC Batch Method:	EPA 625	Analysis Description:	625 MSS
Associated Lab Samples:	60260023001		

METHOD BLANK: 2079008 Matrix: Water
Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	5.0	12/18/17 09:04	
1,2-Diphenylhydrazine	ug/L	ND	8.0	12/18/17 09:04	
2,4,6-Trichlorophenol	ug/L	ND	5.0	12/18/17 09:04	
2,4-Dichlorophenol	ug/L	ND	5.0	12/18/17 09:04	
2,4-Dimethylphenol	ug/L	ND	5.0	12/18/17 09:04	
2,4-Dinitrophenol	ug/L	ND	50.0	12/18/17 09:04	
2,4-Dinitrotoluene	ug/L	ND	6.0	12/18/17 09:04	
2,6-Dinitrotoluene	ug/L	ND	5.0	12/18/17 09:04	
2-Chloronaphthalene	ug/L	ND	5.0	12/18/17 09:04	
2-Chlorophenol	ug/L	ND	5.0	12/18/17 09:04	
2-Nitrophenol	ug/L	ND	5.0	12/18/17 09:04	
3,3'-Dichlorobenzidine	ug/L	ND	20.0	12/18/17 09:04	
4,6-Dinitro-2-methylphenol	ug/L	ND	25.0	12/18/17 09:04	
4-Bromophenylphenyl ether	ug/L	ND	5.0	12/18/17 09:04	
4-Chloro-3-methylphenol	ug/L	ND	5.0	12/18/17 09:04	
4-Chlorophenylphenyl ether	ug/L	ND	5.0	12/18/17 09:04	
4-Nitrophenol	ug/L	ND	5.0	12/18/17 09:04	
Acenaphthene	ug/L	ND	5.0	12/18/17 09:04	
Acenaphthylene	ug/L	ND	5.0	12/18/17 09:04	
Anthracene	ug/L	ND	5.0	12/18/17 09:04	
Benidine	ug/L	ND	50.0	12/18/17 09:04	
Benzo(a)anthracene	ug/L	ND	5.0	12/18/17 09:04	
Benzo(a)pyrene	ug/L	ND	5.0	12/18/17 09:04	
Benzo(b)fluoranthene	ug/L	ND	5.0	12/18/17 09:04	
Benzo(g,h,i)perylene	ug/L	ND	5.0	12/18/17 09:04	
Benzo(k)fluoranthene	ug/L	ND	5.0	12/18/17 09:04	
bis(2-Chloroethoxy)methane	ug/L	ND	5.0	12/18/17 09:04	
bis(2-Chloroethyl) ether	ug/L	ND	6.0	12/18/17 09:04	
bis(2-Chloroisopropyl) ether	ug/L	ND	6.0	12/18/17 09:04	
bis(2-Ethylhexyl)phthalate	ug/L	ND	5.0	12/18/17 09:04	
Butylbenzylphthalate	ug/L	ND	5.0	12/18/17 09:04	
Chrysene	ug/L	ND	5.0	12/18/17 09:04	
Di-n-butylphthalate	ug/L	ND	5.0	12/18/17 09:04	
Di-n-octylphthalate	ug/L	ND	5.0	12/18/17 09:04	
Dibenz(a,h)anthracene	ug/L	ND	5.0	12/18/17 09:04	
Diethylphthalate	ug/L	ND	5.0	12/18/17 09:04	
Dimethylphthalate	ug/L	ND	5.0	12/18/17 09:04	
Fluoranthene	ug/L	ND	5.0	12/18/17 09:04	
Fluorene	ug/L	ND	5.0	12/18/17 09:04	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	12/18/17 09:04	
Hexachlorobenzene	ug/L	ND	5.0	12/18/17 09:04	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

METHOD BLANK: 2079008

Matrix: Water

Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Hexachlorocyclopentadiene	ug/L	ND	5.0	12/18/17 09:04	
Hexachloroethane	ug/L	ND	5.0	12/18/17 09:04	
Indeno(1,2,3-cd)pyrene	ug/L	ND	5.0	12/18/17 09:04	
Isophorone	ug/L	ND	5.0	12/18/17 09:04	
N-Nitroso-di-n-propylamine	ug/L	ND	5.0	12/18/17 09:04	
N-Nitrosodimethylamine	ug/L	ND	5.0	12/18/17 09:04	
N-Nitrosodiphenylamine	ug/L	ND	5.0	12/18/17 09:04	
Naphthalene	ug/L	ND	5.0	12/18/17 09:04	
Nitrobenzene	ug/L	ND	5.0	12/18/17 09:04	
Pentachlorophenol	ug/L	ND	5.0	12/18/17 09:04	
Phenanthrene	ug/L	ND	5.0	12/18/17 09:04	
Phenol	ug/L	ND	5.0	12/18/17 09:04	
Pyrene	ug/L	ND	5.0	12/18/17 09:04	
2,4,6-Tribromophenol (S)	%	78	24-126	12/18/17 09:04	
2-Fluorobiphenyl (S)	%	81	24-110	12/18/17 09:04	
2-Fluorophenol (S)	%	42	20-59	12/18/17 09:04	
Nitrobenzene-d5 (S)	%	81	24-110	12/18/17 09:04	
Phenol-d6 (S)	%	28	11-42	12/18/17 09:04	
Terphenyl-d14 (S)	%	83	35-118	12/18/17 09:04	

LABORATORY CONTROL SAMPLE: 2079009

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	35.9	72	54-93	
1,2-Diphenylhydrazine	ug/L	50	43.7	87	62-105	
2,4,6-Trichlorophenol	ug/L	50	37.4	75	63-100	
2,4-Dichlorophenol	ug/L	50	35.7	71	59-95	
2,4-Dimethylphenol	ug/L	50	32.1	64	55-92	
2,4-Dinitrophenol	ug/L	50	38.7J	77	36-137	
2,4-Dinitrotoluene	ug/L	50	41.9	84	65-113	
2,6-Dinitrotoluene	ug/L	50	39.9	80	65-108	
2-Chloronaphthalene	ug/L	50	38.7	77	60-98	
2-Chlorophenol	ug/L	50	33.8	68	51-89	
2-Nitrophenol	ug/L	50	36.6	73	54-110	
3,3'-Dichlorobenzidine	ug/L	50	51.3	103	64-163	
4,6-Dinitro-2-methylphenol	ug/L	50	41.3	83	58-125	
4-Bromophenylphenyl ether	ug/L	50	39.9	80	61-107	
4-Chloro-3-methylphenol	ug/L	50	38.7	77	62-96	
4-Chlorophenylphenyl ether	ug/L	50	39.1	78	63-102	
4-Nitrophenol	ug/L	50	15.8	32	18-50	
Acenaphthene	ug/L	50	40.0	80	62-101	
Acenaphthylene	ug/L	50	40.1	80	62-100	
Anthracene	ug/L	50	41.0	82	63-105	
Benzidine	ug/L	50	27J	54	10-123	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 12/26/2017 03:37 PM

Page 16 of 25

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

LABORATORY CONTROL SAMPLE: 2079009

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzo(a)anthracene	ug/L	50	40.4	81	65-105	
Benzo(a)pyrene	ug/L	50	41.4	83	59-110	
Benzo(b)fluoranthene	ug/L	50	40.6	81	60-114	
Benzo(g,h,i)perylene	ug/L	50	41.7	83	60-110	
Benzo(k)fluoranthene	ug/L	50	44.1	88	59-110	
bis(2-Chloroethoxy)methane	ug/L	50	39.0	78	60-97	
bis(2-Chloroethyl) ether	ug/L	50	38.7	77	53-97	
bis(2-Chloroisopropyl) ether	ug/L	50	49.6	99	54-98	L1
bis(2-Ethylhexyl)phthalate	ug/L	50	42.2	84	61-121	
Butylbenzylphthalate	ug/L	50	42.5	85	59-125	
Chrysene	ug/L	50	41.7	83	63-109	
Di-n-butylphthalate	ug/L	50	41.3	83	65-112	
Di-n-octylphthalate	ug/L	50	43.7	87	56-127	
Dibenz(a,h)anthracene	ug/L	50	42.1	84	60-111	
Diethylphthalate	ug/L	50	40.1	80	65-103	
Dimethylphthalate	ug/L	50	40.2	80	64-103	
Fluoranthene	ug/L	50	40.3	81	64-108	
Fluorene	ug/L	50	40.0	80	65-101	
Hexachloro-1,3-butadiene	ug/L	50	36.2	72	48-94	
Hexachlorobenzene	ug/L	50	38.0	76	59-106	
Hexachlorocyclopentadiene	ug/L	100	36.8	37	19-56	
Hexachloroethane	ug/L	50	38.3	77	47-90	
Indeno(1,2,3-cd)pyrene	ug/L	50	41.5	83	60-110	
Isophorone	ug/L	50	40.6	81	62-97	
N-Nitroso-di-n-propylamine	ug/L	50	44.9	90	59-100	
N-Nitrosodimethylamine	ug/L	50	26.8	54	20-67	
N-Nitrosodiphenylamine	ug/L	50	40.5	81	64-102	
Naphthalene	ug/L	50	38.8	78	58-94	
Nitrobenzene	ug/L	50	40.7	81	59-98	
Pentachlorophenol	ug/L	50	39.1	78	54-121	
Phenanthrene	ug/L	50	40.8	82	63-105	
Phenol	ug/L	50	16.2	32	17-44	
Pyrene	ug/L	50	42.1	84	63-108	
2,4,6-Tribromophenol (S)	%			83	24-126	
2-Fluorobiphenyl (S)	%			86	24-110	
2-Fluorophenol (S)	%			46	20-59	
Nitrobenzene-d5 (S)	%			86	24-110	
Phenol-d6 (S)	%			31	11-42	
Terphenyl-d14 (S)	%			92	35-118	

MATRIX SPIKE SAMPLE: 2079010

Parameter	Units	60260023001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	48.5	34.2	70	44-109	
1,2-Diphenylhydrazine	ug/L	ND	48.5	40.7	84	16-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

MATRIX SPIKE SAMPLE:		2079010	60260023001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers	
2,4,6-Trichlorophenol	ug/L	ND	48.5	32.6	67	37-123		
2,4-Dichlorophenol	ug/L	ND	48.5	33.9	70	39-115		
2,4-Dimethylphenol	ug/L	ND	48.5	31.5	65	32-116		
2,4-Dinitrophenol	ug/L	ND	48.5	12.2J	25	10-154		
2,4-Dinitrotoluene	ug/L	ND	48.5	35.1	72	39-122		
2,6-Dinitrotoluene	ug/L	ND	48.5	34.7	72	50-119		
2-Chloronaphthalene	ug/L	ND	48.5	36.4	75	60-110		
2-Chlorophenol	ug/L	ND	48.5	31.2	64	35-91		
2-Nitrophenol	ug/L	ND	48.5	24.3	50	29-132		
3,3'-Dichlorobenzidine	ug/L	ND	48.5	41.2	85	10-156		
4,6-Dinitro-2-methylphenol	ug/L	ND	48.5	18.3J	38	10-158		
4-Bromophenylphenyl ether	ug/L	ND	48.5	35.9	74	53-115		
4-Chloro-3-methylphenol	ug/L	ND	48.5	36.6	75	39-105		
4-Chlorophenylphenyl ether	ug/L	ND	48.5	36.5	75	29-111		
4-Nitrophenol	ug/L	ND	48.5	14.0	29	17-49		
Acenaphthene	ug/L	ND	48.5	36.8	76	47-110		
Acenaphthylene	ug/L	ND	48.5	37.4	77	33-110		
Anthracene	ug/L	ND	48.5	38.6	80	27-114		
Benzidine	ug/L	ND	48.5	ND	7	10-18	M1	
Benzo(a)anthracene	ug/L	ND	48.5	39.0	80	33-113		
Benzo(a)pyrene	ug/L	ND	48.5	38.5	79	26-116		
Benzo(b)fluoranthene	ug/L	ND	48.5	36.7	76	28-121		
Benzo(g,h,i)perylene	ug/L	ND	48.5	38.4	79	24-118		
Benzo(k)fluoranthene	ug/L	ND	48.5	42.3	87	26-116		
bis(2-Chloroethoxy)methane	ug/L	ND	48.5	36.2	75	33-109		
bis(2-Chloroethyl) ether	ug/L	ND	48.5	35.8	74	27-106		
bis(2-Chloroisopropyl) ether	ug/L	ND	48.5	44.0	91	36-113		
bis(2-Ethylhexyl)phthalate	ug/L	ND	48.5	39.5	81	33-129		
Butylbenzylphthalate	ug/L	ND	48.5	37.1	76	32-131		
Chrysene	ug/L	ND	48.5	38.7	80	30-116		
Di-n-butylphthalate	ug/L	ND	48.5	38.8	80	31-120		
Di-n-octylphthalate	ug/L	ND	48.5	38.2	79	27-142		
Dibenz(a,h)anthracene	ug/L	ND	48.5	39.0	80	25-119		
Diethylphthalate	ug/L	ND	48.5	37.2	77	30-112		
Dimethylphthalate	ug/L	ND	48.5	36.8	76	29-111		
Fluoranthene	ug/L	ND	48.5	38.3	79	28-115		
Fluorene	ug/L	ND	48.5	36.9	76	59-111		
Hexachloro-1,3-butadiene	ug/L	ND	48.5	35.9	74	24-103		
Hexachlorobenzene	ug/L	ND	48.5	35.1	72	28-111		
Hexachlorocyclopentadiene	ug/L	ND	97.1	25.7	26	10-68		
Hexachloroethane	ug/L	ND	48.5	35.0	72	40-110		
Indeno(1,2,3-cd)pyrene	ug/L	ND	48.5	39.1	81	25-117		
Isophorone	ug/L	ND	48.5	37.8	78	28-107		
N-Nitroso-di-n-propylamine	ug/L	ND	48.5	41.6	86	28-110		
N-Nitrosodimethylamine	ug/L	ND	48.5	28.6	59	16-66		
N-Nitrosodiphenylamine	ug/L	ND	48.5	36.6	75	26-111		
Naphthalene	ug/L	ND	48.5	36.1	74	23-107		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

MATRIX SPIKE SAMPLE:		2079010					
Parameter	Units	60260023001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrobenzene	ug/L	ND	48.5	37.4	77	35-118	
Pentachlorophenol	ug/L	ND	48.5	31.3	64	14-147	
Phenanthrene	ug/L	ND	48.5	38.4	79	54-113	
Phenol	ug/L	ND	48.5	14.3	29	16-42	
Pyrene	ug/L	ND	48.5	39.8	82	52-115	
2,4,6-Tribromophenol (S)	%				67	24-126	
2-Fluorobiphenyl (S)	%				78	24-110	
2-Fluorophenol (S)	%				39	20-59	
Nitrobenzene-d5 (S)	%				77	24-110	
Phenol-d6 (S)	%				26	11-42	
Terphenyl-d14 (S)	%				85	35-118	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

QC Batch: 506935	Analysis Method: SM 3500-Cr B
QC Batch Method: SM 3500-Cr B	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 60260023001	

METHOD BLANK: 2076782 Matrix: Water
Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	12/12/17 11:44	

LABORATORY CONTROL SAMPLE: 2076783

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.1	0.096	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2076784 2076785

Parameter	Units	60260023001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.1	.1	0.10	0.10	94	95	85-115	1 20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

QC Batch:	508436	Analysis Method:	SM 4500-CN-E
QC Batch Method:	SM 4500-CN-E	Analysis Description:	4500CNE Cyanide, Total
Associated Lab Samples:	60260023001		

METHOD BLANK: 2083350 Matrix: Water
Associated Lab Samples: 60260023001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/L	ND	0.0050	12/22/17 13:57	

LABORATORY CONTROL SAMPLE: 2083351

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/L	.1	0.11	110	69-126	

MATRIX SPIKE SAMPLE: 2083352

Parameter	Units	60260023001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/L	ND	.1	0.097	97	61-126	

SAMPLE DUPLICATE: 2083401

Parameter	Units	60260842001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cyanide	mg/L	ND	ND		46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: EXPANDED EFF TEST # 1

Pace Project No.: 60260023

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

HS	Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
c2	Acid preservation may not be appropriate for the analysis of 2-Chloroethylvinyl ether.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: EXPANDED EFF TEST # 1
Pace Project No.: 60260023

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60260023001	EXPANDED EFF TEST #1	EPA 200.7	507332	EPA 200.7	507390
60260023001	EXPANDED EFF TEST #1	EPA 200.8	507314	EPA 200.8	507394
60260023001	EXPANDED EFF TEST #1	EPA 245.1	507029	EPA 245.1	507102
60260023001	EXPANDED EFF TEST #1	EPA 625	507475	EPA 625	507666
60260023001	EXPANDED EFF TEST #1	EPA 624 Low	507069		
60260023001	EXPANDED EFF TEST #1	Trivalent Chromium Calculation	508677		
60260023001	EXPANDED EFF TEST #1	SM 3500-Cr B	506935		
60260023001	EXPANDED EFF TEST #1	SM 4500-CN-E	508436		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Sample Condition Upon Receipt

WO#: 60260023



60260023

Client Name: Alliance Water Resource

Courier: FedEx ☐ UPS ☒ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1Z5AR061030000986 Pace Shipping Label Used? Yes ☒ No ☐

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other ☐

Thermometer Used: T-286 / T-239 Type of Ice: Wet Blue ☐ None ☐

Cooler Temperature (°C): As-read 1.4 Corr. Factor CF 0.0 / CF +0.2 Corrected 1.4

RH 12/12/17
Date and Initials of person
examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Cr⁶⁺</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>-2 Containers from Sample</u>
Sample labels match COC: Date / time / ID / analyses	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>"Extended EFT Test #1 625508"</u>
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>Contains the incorrect time</u>
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Trip Blank present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>2(2009u)</u>
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

REVIEWED

By Sara Carson at 4:40 pm, 12/12/17

F-KS-C-003-Rev.10, August 18, 2016

Page 24 of 25

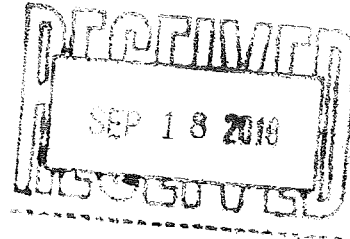
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Address	#3 Anderson Road Lake Ozark, MO 65049	Copy To:	Company Name:	REGULATORY AGENCY			
Email To:	ghutchcraft@alliancewater.com	Purchase Order No.:	Address:	<input checked="" type="checkbox"/> NPDES	<input type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER	
Phone:	(573) 365-0455	Project Name:	Place Order Reference:	<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER	
Fax:		Project Number:	Heather Wilson (913) 563-1407	Site Location		MO	
Requested Due Date/TAT:		Requested Due Date/TAT:	9964, 7	STATE:			

[illegible]

September 18, 2018

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049



EXPANDED EFF TEST #2
FOR PERMIT RENEWAL

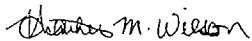
RE: Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

Dear Gary Hutchcraft:

Enclosed are the analytical results for sample(s) received by the laboratory on September 05, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC

9608 Loiret Blvd.

Lenexa, KS 66219

(913)599-5665

CERTIFICATIONS

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60279538001	EXPANDED EFF TEST #2	Water	09/04/18 13:53	09/05/18 09:54
60279538002	TRIP BLANK	Water	09/04/18 13:53	09/05/18 09:54

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60279538001	EXPANDED EFF TEST #2	EPA 200.7	TDS	3	PASI-K
		EPA 200.8	JGP	14	PASI-K
		EPA 245.1	CTR	1	PASI-K
		EPA 625	JMT	60	PASI-K
		EPA 624 Low	JKL, PGH	37	PASI-K
		Trivalent Chromium Calculation	LDB	1	PASI-K
		SM 3500-Cr B	ZMH	1	PASI-K
		SM 4500-CN-E	RAD	1	PASI-K
60279538002	TRIP BLANK	EPA 624 Low	JKL, PGH	37	PASI-K

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

Sample: EXPANDED EFF TEST #2		Lab ID: 60279538001	Collected: 09/04/18 13:53	Received: 09/05/18 09:54	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

200.7 Metals, Total

Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Calcium	65700	ug/L	200	1	09/06/18 11:05	09/07/18 15:12	7440-70-2	
Magnesium	33900	ug/L	50.0	1	09/06/18 11:05	09/07/18 15:12	7439-95-4	
Total Hardness by 2340B	304000	ug/L	500	1	09/06/18 11:05	09/07/18 15:12		

200.8 MET ICPMS

Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Aluminum	ND	ug/L	50.0	1	09/06/18 15:00	09/14/18 21:16	7429-90-5	
Antimony	ND	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7440-36-0	
Arsenic	ND	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7440-38-2	
Beryllium	ND	ug/L	0.50	1	09/06/18 15:00	09/14/18 21:16	7440-41-7	
Cadmium	ND	ug/L	0.50	1	09/06/18 15:00	09/14/18 21:16	7440-43-9	
Chromium	ND	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7440-47-3	
Copper	1.3	ug/L	1.0	1	09/17/18 12:00	09/17/18 17:49	7440-50-8	
Iron	55.9	ug/L	50.0	1	09/06/18 15:00	09/14/18 21:16	7439-89-6	
Lead	ND	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7439-92-1	
Nickel	2.1	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7440-02-0	
Selenium	ND	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7782-49-2	
Silver	ND	ug/L	0.50	1	09/06/18 15:00	09/14/18 21:16	7440-22-4	
Thallium	ND	ug/L	1.0	1	09/06/18 15:00	09/14/18 21:16	7440-28-0	
Zinc	37.9	ug/L	10.0	1	09/06/18 15:00	09/14/18 21:16	7440-66-6	

245.1 Mercury

Analytical Method: EPA 245.1 Preparation Method: EPA 245.1

Mercury	ND	ug/L	0.20	1	09/10/18 15:49	09/11/18 10:38	7439-97-6	
---------	----	------	------	---	----------------	----------------	-----------	--

625 MSSV

Analytical Method: EPA 625 Preparation Method: EPA 625

Acenaphthene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	83-32-9	
Acenaphthylene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	208-96-8	
Anthracene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	120-12-7	
Benzidine	ND	ug/L	48.1	1	09/11/18 15:50	09/12/18 17:01	92-87-5	
Benzo(a)anthracene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	56-55-3	
Benzo(a)pyrene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	207-08-9	
4-Bromophenylphenyl ether	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	101-55-3	
Butylbenzylphthalate	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	59-50-7	
bis(2-Chloroethoxy)methane	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	5.8	1	09/11/18 15:50	09/12/18 17:01	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	5.8	1	09/11/18 15:50	09/12/18 17:01	39638-32-9	
2-Chloronaphthalene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	91-58-7	
2-Chlorophenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	7005-72-3	
Chrysene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	53-70-3	
3,3'-Dichlorobenzidine	ND	ug/L	19.2	1	09/11/18 15:50	09/12/18 17:01	91-94-1	
2,4-Dichlorophenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	120-83-2	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

Sample: EXPANDED EFF TEST #2		Lab ID: 60279538001	Collected: 09/04/18 13:53	Received: 09/05/18 09:54	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

625 MSSV

Analytical Method: EPA 625 Preparation Method: EPA 625

Diethylphthalate	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	84-66-2	
2,4-Dimethylphenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	105-67-9	
Dimethylphthalate	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	131-11-3	
Di-n-butylphthalate	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	24.0	1	09/11/18 15:50	09/12/18 17:01	534-52-1	
2,4-Dinitrophenol	ND	ug/L	48.1	1	09/11/18 15:50	09/12/18 17:01	51-28-5	
2,4-Dinitrotoluene	ND	ug/L	5.8	1	09/11/18 15:50	09/12/18 17:01	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	606-20-2	
Di-n-octylphthalate	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	117-84-0	
1,2-Diphenylhydrazine	ND	ug/L	7.7	1	09/11/18 15:50	09/12/18 17:01	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	117-81-7	
Fluoranthene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	206-44-0	
Fluorene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	87-68-3	
Hexachlorobenzene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	77-47-4	
Hexachloroethane	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	193-39-5	
Isophorone	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	78-59-1	
Naphthalene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	91-20-3	
Nitrobenzene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	98-95-3	
2-Nitrophenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	88-75-5	
4-Nitrophenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	100-02-7	
N-Nitrosodimethylamine	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	86-30-6	
Pentachlorophenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	87-86-5	
Phenanthrene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	85-01-8	
Phenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	108-95-2	
Pyrene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	120-82-1	
2,4,6-Trichlorophenol	ND	ug/L	4.8	1	09/11/18 15:50	09/12/18 17:01	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%	24-110	1	09/11/18 15:50	09/12/18 17:01	4165-60-0	
2-Fluorobiphenyl (S)	63	%	24-110	1	09/11/18 15:50	09/12/18 17:01	321-60-8	
Terphenyl-d14 (S)	75	%	35-118	1	09/11/18 15:50	09/12/18 17:01	1718-51-0	
Phenol-d6 (S)	22	%	11-42	1	09/11/18 15:50	09/12/18 17:01	13127-88-3	
2-Fluorophenol (S)	34	%	20-59	1	09/11/18 15:50	09/12/18 17:01	367-12-4	
2,4,6-Tribromophenol (S)	83	%	24-126	1	09/11/18 15:50	09/12/18 17:01	118-79-6	

624 Volatile Organics

Analytical Method: EPA 624 Low

Acrolein	ND	ug/L	100	1	09/10/18 16:55	107-02-8
Acrylonitrile	ND	ug/L	20.0	1	09/10/18 16:55	107-13-1
Benzene	ND	ug/L	1.0	1	09/10/18 16:55	71-43-2
Bromodichloromethane	ND	ug/L	1.0	1	09/10/18 16:55	75-27-4
Bromoform	ND	ug/L	1.0	1	09/10/18 16:55	75-25-2
Bromomethane	ND	ug/L	5.0	1	09/10/18 16:55	74-83-9

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

Sample: EXPANDED EFF TEST #2 Lab ID: 60279538001 Collected: 09/04/18 13:53 Received: 09/05/18 09:54 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics		Analytical Method: EPA 624 Low						
Carbon tetrachloride	ND	ug/L	1.0	1		09/10/18 16:55	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		09/10/18 16:55	108-90-7	
Chloroethane	ND	ug/L	1.0	1		09/10/18 16:55	75-00-3	
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		09/11/18 20:15	110-75-8	c2
Chloroform	ND	ug/L	1.0	1		09/10/18 16:55	67-66-3	
Chloromethane	ND	ug/L	1.0	1		09/10/18 16:55	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		09/10/18 16:55	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/10/18 16:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/10/18 16:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/10/18 16:55	106-46-7	
1,1-Dichloroethane	ND	ug/L	1.0	1		09/10/18 16:55	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/10/18 16:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		09/10/18 16:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		09/10/18 16:55	156-59-2	N2
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		09/10/18 16:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		09/10/18 16:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		09/10/18 16:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		09/10/18 16:55	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		09/10/18 16:55	100-41-4	
Methylene chloride	ND	ug/L	1.0	1		09/10/18 16:55	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/10/18 16:55	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		09/10/18 16:55	127-18-4	
Toluene	ND	ug/L	1.0	1		09/10/18 16:55	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		09/10/18 16:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/10/18 16:55	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		09/10/18 16:55	79-01-6	
Vinyl chloride	ND	ug/L	1.0	1		09/10/18 16:55	75-01-4	
Surrogates								
4-Bromofluorobenzene (S)	96	%	80-120	1		09/10/18 16:55	460-00-4	HS
Toluene-d8 (S)	101	%	80-120	1		09/10/18 16:55	2037-26-5	
1,2-Dichloroethane-d4 (S)	96	%	80-120	1		09/10/18 16:55	17060-07-0	
Preservation pH	7.0		1.0	1		09/10/18 16:55		

Trivalent Chromium Calculation

Chromium, Trivalent ND mg/L 0.010 1 09/17/18 15:38 16065-83-1

Chromium, Hexavalent

Chromium, Hexavalent ND mg/L 0.010 1 09/05/18 12:24 18540-29-9

4500CNE Cyanide, Total

Cyanide ND mg/L 0.0050 1 09/11/18 14:48 57-12-5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

Sample: TRIP BLANK		Lab ID: 60279538002	Collected: 09/04/18 13:53	Received: 09/05/18 09:54	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics		Analytical Method: EPA 624 Low						
Acrolein	ND	ug/L	100	1		09/10/18 16:41	107-02-8	
Acrylonitrile	ND	ug/L	20.0	1		09/10/18 16:41	107-13-1	
Benzene	ND	ug/L	1.0	1		09/10/18 16:41	71-43-2	
Bromodichloromethane	ND	ug/L	1.0	1		09/10/18 16:41	75-27-4	
Bromoform	ND	ug/L	1.0	1		09/10/18 16:41	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/10/18 16:41	74-83-9	
Carbon tetrachloride	ND	ug/L	1.0	1		09/10/18 16:41	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		09/10/18 16:41	108-90-7	
Chloroethane	ND	ug/L	1.0	1		09/10/18 16:41	75-00-3	
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		09/11/18 20:30	110-75-8	c2
Chloroform	ND	ug/L	1.0	1		09/10/18 16:41	67-66-3	
Chloromethane	ND	ug/L	1.0	1		09/10/18 16:41	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		09/10/18 16:41	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/10/18 16:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/10/18 16:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/10/18 16:41	106-46-7	
1,1-Dichloroethane	ND	ug/L	1.0	1		09/10/18 16:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/10/18 16:41	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		09/10/18 16:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		09/10/18 16:41	156-59-2	N2
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		09/10/18 16:41	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		09/10/18 16:41	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		09/10/18 16:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		09/10/18 16:41	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		09/10/18 16:41	100-41-4	
Methylene chloride	ND	ug/L	1.0	1		09/10/18 16:41	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/10/18 16:41	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		09/10/18 16:41	127-18-4	
Toluene	ND	ug/L	1.0	1		09/10/18 16:41	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		09/10/18 16:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/10/18 16:41	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		09/10/18 16:41	79-01-6	
Vinyl chloride	ND	ug/L	1.0	1		09/10/18 16:41	75-01-4	
Surrogates								
4-Bromofluorobenzene (S)	101	%	80-120	1		09/10/18 16:41	460-00-4	
Toluene-d8 (S)	100	%	80-120	1		09/10/18 16:41	2037-26-5	
1,2-Dichloroethane-d4 (S)	97	%	80-120	1		09/10/18 16:41	17060-07-0	
Preservation pH	6.0		1.0	1		09/10/18 16:41		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 09/18/2018 03:54 PM

Page 8 of 28

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

QC Batch:	543774	Analysis Method:	EPA 245.1
QC Batch Method:	EPA 245.1	Analysis Description:	245.1 Mercury
Associated Lab Samples:	60279538001		

METHOD BLANK:	2228336	Matrix:	Water
Associated Lab Samples:	60279538001		

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	09/11/18 10:04	

LABORATORY CONTROL SAMPLE: 2228337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2228338 2228339

Parameter	Units	60279627003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Mercury	ug/L	ND	5	5	4.8	4.8	95	94	70-130	1 20	

MATRIX SPIKE SAMPLE: 2228340

Parameter	Units	60279630002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	4.8	95	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

QC Batch: 543206 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60279538001

METHOD BLANK: 2225862 Matrix: Water
Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	ug/L	ND	200	09/07/18 14:36	
Magnesium	ug/L	ND	50.0	09/07/18 14:36	
Total Hardness by 2340B	ug/L	ND	500	09/07/18 14:36	

LABORATORY CONTROL SAMPLE: 2225863

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	10000	100	85-115	
Magnesium	ug/L	10000	9850	98	85-115	
Total Hardness by 2340B	ug/L		65600			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2225864 2225865

Parameter	Units	60279538001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Calcium	ug/L	65700	10000	10000	73900	73500	82	78	70-130	0	20
Magnesium	ug/L	33900	10000	10000	44000	43700	101	98	70-130	1	20
Total Hardness by 2340B	ug/L	304000			366000	364000				1	

MATRIX SPIKE SAMPLE: 2225866

Parameter	Units	60279581006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	60700	10000	70400	97	70-130	
Magnesium	ug/L	9580	10000	19300	97	70-130	
Total Hardness by 2340B	ug/L	191000		255000			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

QC Batch:	543248	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60279538001		

METHOD BLANK: 2226044 Matrix: Water
Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	50.0	09/14/18 20:48	
Antimony	ug/L	ND	1.0	09/14/18 20:48	
Arsenic	ug/L	ND	1.0	09/14/18 20:48	
Beryllium	ug/L	ND	0.50	09/14/18 20:48	
Cadmium	ug/L	ND	0.50	09/14/18 20:48	
Chromium	ug/L	ND	1.0	09/14/18 20:48	
Iron	ug/L	ND	50.0	09/14/18 20:48	
Lead	ug/L	ND	1.0	09/14/18 20:48	
Nickel	ug/L	ND	1.0	09/14/18 20:48	
Selenium	ug/L	ND	1.0	09/14/18 20:48	
Silver	ug/L	ND	0.50	09/14/18 20:48	
Thallium	ug/L	ND	1.0	09/14/18 20:48	
Zinc	ug/L	ND	10.0	09/14/18 20:48	

LABORATORY CONTROL SAMPLE: 2226045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	1000	942	94	85-115	
Antimony	ug/L	40	40.0	100	85-115	
Arsenic	ug/L	40	40.1	100	85-115	
Beryllium	ug/L	40	40.1	100	85-115	
Cadmium	ug/L	40	39.6	99	85-115	
Chromium	ug/L	40	39.7	99	85-115	
Iron	ug/L	1000	956	96	85-115	
Lead	ug/L	40	38.9	97	85-115	
Nickel	ug/L	40	38.3	96	85-115	
Selenium	ug/L	40	42.6	107	85-115	
Silver	ug/L	20	19.4	97	85-115	
Thallium	ug/L	40	37.8	94	85-115	
Zinc	ug/L	100	102	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2226046 2226047

Parameter	Units	60279708001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Aluminum	ug/L	1160	1000	1000	2180	2110	102	95	70-130	3	20	
Antimony	ug/L	0.55J	40	40	40.9	41.1	101	101	70-130	0	20	
Arsenic	ug/L	5.2	40	40	47.6	47.3	106	105	70-130	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2226046 2226047												
Parameter	Units	60279708001 Result	MS		MSD		MS		MSD		% Rec	
			Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Qual
Beryllium	ug/L	0.39J	40	40	41.0	40.5	101	100	70-130	1	20	
Cadmium	ug/L	5.2	40	40	43.8	43.7	97	96	70-130	0	20	
Chromium	ug/L	1.8	40	40	42.7	42.3	102	101	70-130	1	20	
Iron	ug/L	3930	1000	1000	4950	4900	102	97	70-130	1	20	
Lead	ug/L	64.6	40	40	102	103	93	95	70-130	1	20	
Nickel	ug/L	19.9	40	40	57.9	57.5	95	94	70-130	1	20	
Selenium	ug/L	1.1	40	40	42.5	42.8	104	104	70-130	0	20	
Silver	ug/L	<0.070	20	20	18.7	18.6	93	93	70-130	0	20	
Thallium	ug/L	0.16J	40	40	35.7	36.3	89	90	70-130	2	20	
Zinc	ug/L	335	100	100	432	431	97	96	70-130	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

QC Batch: 544877	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET
Associated Lab Samples: 60279538001	

METHOD BLANK: 2232957 Matrix: Water
Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	1.0	09/17/18 17:46	

LABORATORY CONTROL SAMPLE: 2232958

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec. Limits	Qualifiers
Copper	ug/L	40	39.4	99	85-115	

SAMPLE DUPLICATE: 2232959

Parameter	Units	60279538001 Result	Dup Result	RPD	Max RPD	Qualifiers
Copper	ug/L	1.3	.97J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

QC Batch: 543763 Analysis Method: EPA 624 Low
QC Batch Method: EPA 624 Low Analysis Description: 624 MSV
Associated Lab Samples: 60279538001, 60279538002

METHOD BLANK: 2228299 Matrix: Water

Associated Lab Samples: 60279538001, 60279538002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	1.0	09/10/18 16:13	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/10/18 16:13	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/10/18 16:13	
1,1-Dichloroethane	ug/L	ND	1.0	09/10/18 16:13	
1,1-Dichloroethene	ug/L	ND	1.0	09/10/18 16:13	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/10/18 16:13	
1,2-Dichloroethane	ug/L	ND	1.0	09/10/18 16:13	
1,2-Dichloropropane	ug/L	ND	1.0	09/10/18 16:13	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/10/18 16:13	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/10/18 16:13	
Acrolein	ug/L	ND	100	09/10/18 16:13	
Acrylonitrile	ug/L	ND	20.0	09/10/18 16:13	
Benzene	ug/L	ND	1.0	09/10/18 16:13	
Bromodichloromethane	ug/L	ND	1.0	09/10/18 16:13	
Bromoform	ug/L	ND	1.0	09/10/18 16:13	
Bromomethane	ug/L	ND	5.0	09/10/18 16:13	
Carbon tetrachloride	ug/L	ND	1.0	09/10/18 16:13	
Chlorobenzene	ug/L	ND	1.0	09/10/18 16:13	
Chloroethane	ug/L	ND	1.0	09/10/18 16:13	
Chloroform	ug/L	ND	1.0	09/10/18 16:13	
Chloromethane	ug/L	ND	1.0	09/10/18 16:13	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/10/18 16:13	N2
cis-1,3-Dichloropropene	ug/L	ND	1.0	09/10/18 16:13	
Dibromochloromethane	ug/L	ND	1.0	09/10/18 16:13	
Ethylbenzene	ug/L	ND	1.0	09/10/18 16:13	
Methylene chloride	ug/L	ND	1.0	09/10/18 16:13	
Tetrachloroethene	ug/L	ND	1.0	09/10/18 16:13	
Toluene	ug/L	ND	1.0	09/10/18 16:13	
trans-1,2-Dichloroethene	ug/L	ND	1.0	09/10/18 16:13	
trans-1,3-Dichloropropene	ug/L	ND	1.0	09/10/18 16:13	
Trichloroethene	ug/L	ND	1.0	09/10/18 16:13	
Vinyl chloride	ug/L	ND	1.0	09/10/18 16:13	
1,2-Dichloroethane-d4 (S)	%	97	80-120	09/10/18 16:13	
4-Bromofluorobenzene (S)	%	98	80-120	09/10/18 16:13	
Toluene-d8 (S)	%	100	80-120	09/10/18 16:13	

LABORATORY CONTROL SAMPLE: 2228300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	20	21.3	106	77-114	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

LABORATORY CONTROL SAMPLE: 2228300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,2,2-Tetrachloroethane	ug/L	20	18.5	92	72-119	
1,1,2-Trichloroethane	ug/L	20	19.9	99	77-118	
1,1-Dichloroethane	ug/L	20	21.8	109	59-155	
1,1-Dichloroethene	ug/L	20	21.4	107	65-118	
1,2-Dichlorobenzene	ug/L	20	21.5	107	79-118	
1,2-Dichloroethane	ug/L	20	19.5	98	77-115	
1,2-Dichloropropane	ug/L	20	20.5	102	79-111	
1,3-Dichlorobenzene	ug/L	20	20.8	104	77-114	
1,4-Dichlorobenzene	ug/L	20	20.6	103	79-111	
Acrolein	ug/L	200	289	144	10-183	
Acrylonitrile	ug/L	200	206	103	70-122	
Benzene	ug/L	20	21.1	106	81-111	
Bromodichloromethane	ug/L	20	21.8	109	78-117	
Bromoform	ug/L	20	19.4	97	67-122	
Bromomethane	ug/L	20	29.3	146	10-186	
Carbon tetrachloride	ug/L	20	19.6	98	72-117	
Chlorobenzene	ug/L	20	20.8	104	80-110	
Chloroethane	ug/L	20	18.6	93	34-168	
Chloroform	ug/L	20	20.7	104	74-112	
Chloromethane	ug/L	20	14.7	74	11-187	
cis-1,2-Dichloroethene	ug/L	20	21.3	106	75-111 N2	
cis-1,3-Dichloropropene	ug/L	20	22.3	111	77-115	
Dibromochloromethane	ug/L	20	19.7	99	76-119	
Ethylbenzene	ug/L	20	20.8	104	80-111	
Methylene chloride	ug/L	20	20.0	100	72-114	
Tetrachloroethene	ug/L	20	20.7	104	77-111	
Toluene	ug/L	20	21.1	105	78-110	
trans-1,2-Dichloroethene	ug/L	20	20.8	104	72-113	
trans-1,3-Dichloropropene	ug/L	20	21.0	105	76-121	
Trichloroethene	ug/L	20	21.6	108	75-110	
Vinyl chloride	ug/L	20	22.8	114	32-165	
1,2-Dichloroethane-d4 (S)	%			100	80-120	
4-Bromofluorobenzene (S)	%			99	80-120	
Toluene-d8 (S)	%			99	80-120	

MATRIX SPIKE SAMPLE: 2228301

Parameter	Units	60279538001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	20	23.3	117	52-162	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.0	90	46-157	
1,1,2-Trichloroethane	ug/L	ND	20	20.5	103	52-150	
1,1-Dichloroethane	ug/L	ND	20	23.5	117	59-159	
1,1-Dichloroethene	ug/L	ND	20	23.4	117	41-148	
1,2-Dichlorobenzene	ug/L	ND	20	21.0	105	62-128	
1,2-Dichloroethane	ug/L	ND	20	20.1	99	61-126	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

MATRIX SPIKE SAMPLE: 2228301

Parameter	Units	60279538001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloropropane	ug/L	ND	20	21.6	108	60-124	
1,3-Dichlorobenzene	ug/L	ND	20	21.4	107	59-156	
1,4-Dichlorobenzene	ug/L	ND	20	20.2	101	62-122	
Acrolein	ug/L	ND	200	190	95	10-178	
Acrylonitrile	ug/L	ND	200	198	99	49-134	
Benzene	ug/L	ND	20	21.8	109	37-151	
Bromodichloromethane	ug/L	ND	20	23.1	115	35-155	
Bromoform	ug/L	ND	20	20.4	102	45-169	
Bromomethane	ug/L	ND	20	30.5	152	10-178	
Carbon tetrachloride	ug/L	ND	20	23.5	118	70-140	
Chlorobenzene	ug/L	ND	20	21.2	106	63-123	
Chloroethane	ug/L	ND	20	22.0	110	14-230	
Chloroform	ug/L	ND	20	21.3	106	51-138	
Chloromethane	ug/L	ND	20	24.3	122	10-178	
cis-1,2-Dichloroethene	ug/L	ND	20	21.9	110	54-128	N2
cis-1,3-Dichloropropene	ug/L	ND	20	23.0	115	57-126	
Dibromochloromethane	ug/L	ND	20	21.1	106	54-134	
Ethylbenzene	ug/L	ND	20	21.8	109	64-127	
Methylene chloride	ug/L	ND	20	22.3	112	55-121	
Tetrachloroethene	ug/L	ND	20	23.5	118	64-148	
Toluene	ug/L	ND	20	22.4	112	47-150	
trans-1,2-Dichloroethene	ug/L	ND	20	23.2	116	54-156	
trans-1,3-Dichloropropene	ug/L	ND	20	22.1	110	58-131	
Trichloroethene	ug/L	ND	20	23.6	118	71-157	
Vinyl chloride	ug/L	ND	20	26.5	133	10-172	
1,2-Dichloroethane-d4 (S)	%				101	80-120	
4-Bromofluorobenzene (S)	%				95	80-120	HS
Toluene-d8 (S)	%				100	80-120	
Preservation pH		7.0		7.0			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

QC Batch: 543921 Analysis Method: EPA 624 Low

QC Batch Method: EPA 624 Low Analysis Description: 624 MSV

Associated Lab Samples: 60279538001, 60279538002

METHOD BLANK: 2228801

Matrix: Water

Associated Lab Samples: 60279538001, 60279538002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2-Chloroethylvinyl ether	ug/L	ND	10.0	09/11/18 18:42	
1,2-Dichloroethane-d4 (S)	%	103	80-120	09/11/18 18:42	
4-Bromofluorobenzene (S)	%	107	80-120	09/11/18 18:42	
Toluene-d8 (S)	%	104	80-120	09/11/18 18:42	

LABORATORY CONTROL SAMPLE: 2228802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Chloroethylvinyl ether	ug/L	20	8.6J	43	32-167	
1,2-Dichloroethane-d4 (S)	%			100	80-120	
4-Bromofluorobenzene (S)	%			101	80-120	
Toluene-d8 (S)	%			105	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

QC Batch: 543868

Analysis Method: EPA 625

QC Batch Method: EPA 625

Analysis Description: 625 MSS

Associated Lab Samples: 60279538001

METHOD BLANK: 2228602

Matrix: Water

Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	5.0	09/12/18 13:43	
1,2-Diphenylhydrazine	ug/L	ND	8.0	09/12/18 13:43	
2,4,6-Trichlorophenol	ug/L	ND	5.0	09/12/18 13:43	
2,4-Dichlorophenol	ug/L	ND	5.0	09/12/18 13:43	
2,4-Dimethylphenol	ug/L	ND	5.0	09/12/18 13:43	
2,4-Dinitrophenol	ug/L	ND	50.0	09/12/18 13:43	
2,4-Dinitrotoluene	ug/L	ND	6.0	09/12/18 13:43	
2,6-Dinitrotoluene	ug/L	ND	5.0	09/12/18 13:43	
2-Chloronaphthalene	ug/L	ND	5.0	09/12/18 13:43	
2-Chlorophenol	ug/L	ND	5.0	09/12/18 13:43	
2-Nitrophenol	ug/L	ND	5.0	09/12/18 13:43	
3,3'-Dichlorobenzidine	ug/L	ND	20.0	09/12/18 13:43	
4,6-Dinitro-2-methylphenol	ug/L	ND	25.0	09/12/18 13:43	
4-Bromophenylphenyl ether	ug/L	ND	5.0	09/12/18 13:43	
4-Chloro-3-methylphenol	ug/L	ND	5.0	09/12/18 13:43	
4-Chlorophenylphenyl ether	ug/L	ND	5.0	09/12/18 13:43	
4-Nitrophenol	ug/L	ND	5.0	09/12/18 13:43	
Acenaphthene	ug/L	ND	5.0	09/12/18 13:43	
Acenaphthylene	ug/L	ND	5.0	09/12/18 13:43	
Anthracene	ug/L	ND	5.0	09/12/18 13:43	
Benzydine	ug/L	ND	50.0	09/12/18 13:43	
Benzo(a)anthracene	ug/L	ND	5.0	09/12/18 13:43	
Benzo(a)pyrene	ug/L	ND	5.0	09/12/18 13:43	
Benzo(b)fluoranthene	ug/L	ND	5.0	09/12/18 13:43	
Benzo(g,h,i)perylene	ug/L	ND	5.0	09/12/18 13:43	
Benzo(k)fluoranthene	ug/L	ND	5.0	09/12/18 13:43	
bis(2-Chloroethoxy)methane	ug/L	ND	5.0	09/12/18 13:43	
bis(2-Chloroethyl) ether	ug/L	ND	6.0	09/12/18 13:43	
bis(2-Chloroisopropyl) ether	ug/L	ND	6.0	09/12/18 13:43	
bis(2-Ethylhexyl)phthalate	ug/L	ND	5.0	09/12/18 13:43	
Butylbenzylphthalate	ug/L	ND	5.0	09/12/18 13:43	
Chrysene	ug/L	ND	5.0	09/12/18 13:43	
Di-n-butylphthalate	ug/L	ND	5.0	09/12/18 13:43	
Di-n-octylphthalate	ug/L	ND	5.0	09/12/18 13:43	
Dibenz(a,h)anthracene	ug/L	ND	5.0	09/12/18 13:43	
Diethylphthalate	ug/L	ND	5.0	09/12/18 13:43	
Dimethylphthalate	ug/L	ND	5.0	09/12/18 13:43	
Fluoranthene	ug/L	ND	5.0	09/12/18 13:43	
Fluorene	ug/L	ND	5.0	09/12/18 13:43	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	09/12/18 13:43	
Hexachlorobenzene	ug/L	ND	5.0	09/12/18 13:43	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

METHOD BLANK: 2228602

Matrix: Water

Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Hexachlorocyclopentadiene	ug/L	ND	5.0	09/12/18 13:43	
Hexachloroethane	ug/L	ND	5.0	09/12/18 13:43	
Indeno(1,2,3-cd)pyrene	ug/L	ND	5.0	09/12/18 13:43	
Isophorone	ug/L	ND	5.0	09/12/18 13:43	
N-Nitroso-di-n-propylamine	ug/L	ND	5.0	09/12/18 13:43	
N-Nitrosodimethylamine	ug/L	ND	5.0	09/12/18 13:43	
N-Nitrosodiphenylamine	ug/L	ND	5.0	09/12/18 13:43	
Naphthalene	ug/L	ND	5.0	09/12/18 13:43	
Nitrobenzene	ug/L	ND	5.0	09/12/18 13:43	
Pentachlorophenol	ug/L	ND	5.0	09/12/18 13:43	
Phenanthrene	ug/L	ND	5.0	09/12/18 13:43	
Phenol	ug/L	ND	5.0	09/12/18 13:43	
Pyrene	ug/L	ND	5.0	09/12/18 13:43	
2,4,6-Tribromophenol (S)	%	85	24-126	09/12/18 13:43	
2-Fluorobiphenyl (S)	%	65	24-110	09/12/18 13:43	
2-Fluorophenol (S)	%	33	20-59	09/12/18 13:43	
Nitrobenzene-d5 (S)	%	59	24-110	09/12/18 13:43	
Phenol-d6 (S)	%	21	11-42	09/12/18 13:43	
Terphenyl-d14 (S)	%	76	35-118	09/12/18 13:43	

LABORATORY CONTROL SAMPLE: 2228603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	30.9	62	54-93	
1,2-Diphenylhydrazine	ug/L	50	34.9	70	62-105	
2,4,6-Trichlorophenol	ug/L	50	38.4	77	63-100	
2,4-Dichlorophenol	ug/L	50	35.1	70	59-95	
2,4-Dimethylphenol	ug/L	50	33.9	68	55-92	
2,4-Dinitrophenol	ug/L	50	42.5J	85	36-137	
2,4-Dinitrotoluene	ug/L	50	39.0	78	65-113	
2,6-Dinitrotoluene	ug/L	50	38.9	78	65-108	
2-Chloronaphthalene	ug/L	50	34.0	68	60-98	
2-Chlorophenol	ug/L	50	30.8	62	51-89	
2-Nitrophenol	ug/L	50	36.4	73	54-110	
3,3'-Dichlorobenzidine	ug/L	50	47.2	94	64-163	
4,6-Dinitro-2-methylphenol	ug/L	50	45.7	91	58-125	
4-Bromophenylphenyl ether	ug/L	50	39.5	79	61-107	
4-Chloro-3-methylphenol	ug/L	50	37.1	74	62-96	
4-Chlorophenylphenyl ether	ug/L	50	37.3	75	63-102	
4-Nitrophenol	ug/L	50	14.3	29	18-50	
Acenaphthene	ug/L	50	35.9	72	62-101	
Acenaphthylene	ug/L	50	34.5	69	62-100	
Anthracene	ug/L	50	37.7	75	63-105	
Benzidine	ug/L	50	23.3J	47	10-123	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

LABORATORY CONTROL SAMPLE: 2228603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzo(a)anthracene	ug/L	50	38.3	77	65-105	
Benzo(a)pyrene	ug/L	50	37.5	75	59-110	
Benzo(b)fluoranthene	ug/L	50	43.1	86	60-114	
Benzo(g,h,i)perylene	ug/L	50	38.0	76	60-110	
Benzo(k)fluoranthene	ug/L	50	34.7	69	59-110	
bis(2-Chloroethoxy)methane	ug/L	50	34.1	68	60-97	
bis(2-Chloroethyl) ether	ug/L	50	31.3	63	53-97	
bis(2-Chloroisopropyl) ether	ug/L	50	30.2	60	54-98	
bis(2-Ethylhexyl)phthalate	ug/L	50	37.6	75	61-121	
Butylbenzylphthalate	ug/L	50	37.8	76	59-125	
Chrysene	ug/L	50	37.3	75	63-109	
Di-n-butylphthalate	ug/L	50	37.9	76	65-112	
Di-n-octylphthalate	ug/L	50	38.4	77	56-127	
Dibenz(a,h)anthracene	ug/L	50	38.0	76	60-111	
Diethylphthalate	ug/L	50	37.8	76	65-103	
Dimethylphthalate	ug/L	50	38.0	76	64-103	
Fluoranthene	ug/L	50	39.2	78	64-108	
Fluorene	ug/L	50	37.5	75	65-101	
Hexachloro-1,3-butadiene	ug/L	50	28.4	57	48-94	
Hexachlorobenzene	ug/L	50	39.5	79	59-106	
Hexachlorocyclopentadiene	ug/L	100	26.4	26	19-56	
Hexachloroethane	ug/L	50	25.2	50	47-90	
Indeno(1,2,3-cd)pyrene	ug/L	50	38.2	76	60-110	
Isophorone	ug/L	50	33.9	68	62-97	
N-Nitroso-di-n-propylamine	ug/L	50	33.8	68	59-100	
N-Nitrosodimethylamine	ug/L	50	19.3	39	20-67	
N-Nitrosodiphenylamine	ug/L	50	39.0	78	64-102	
Naphthalene	ug/L	50	33.3	67	58-94	
Nitrobenzene	ug/L	50	32.0	64	59-98	
Pentachlorophenol	ug/L	50	43.6	87	54-121	
Phenanthrene	ug/L	50	38.0	76	63-105	
Phenol	ug/L	50	13.7	27	17-44	
Pyrene	ug/L	50	37.6	75	63-108	
2,4,6-Tribromophenol (S)	%			87	24-126	
2-Fluorobiphenyl (S)	%			69	24-110	
2-Fluorophenol (S)	%			34	20-59	
Nitrobenzene-d5 (S)	%			62	24-110	
Phenol-d6 (S)	%			23	11-42	
Terphenyl-d14 (S)	%			78	35-118	

MATRIX SPIKE SAMPLE: 2228604

Parameter	Units	60279699001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	51	33.5	66	44-109	
1,2-Diphenylhydrazine	ug/L	ND	51	35.1	69	16-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

MATRIX SPIKE SAMPLE: 2228604

Parameter	Units	60279699001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	51	42.5	83	37-123	
2,4-Dichlorophenol	ug/L	ND	51	42.2	83	39-115	
2,4-Dimethylphenol	ug/L	ND	51	39.4	77	32-116	
2,4-Dinitrophenol	ug/L	ND	51	49.7J	97	10-154	
2,4-Dinitrotoluene	ug/L	ND	51	39.1	77	39-122	
2,6-Dinitrotoluene	ug/L	ND	51	40.1	79	50-119	
2-Chloronaphthalene	ug/L	ND	51	35.5	70	60-110	
2-Chlorophenol	ug/L	ND	51	37.4	73	35-91	
2-Nitrophenol	ug/L	ND	51	41.7	82	29-132	
3,3'-Dichlorobenzidine	ug/L	ND	51	13.5J	26	10-156	
4,6-Dinitro-2-methylphenol	ug/L	ND	51	46.8	92	10-158	
4-Bromophenylphenyl ether	ug/L	ND	51	39.3	77	53-115	
4-Chloro-3-methylphenol	ug/L	ND	51	41.4	81	39-105	
4-Chlorophenylphenyl ether	ug/L	ND	51	37.8	74	29-111	
4-Nitrophenol	ug/L	ND	51	18.7	37	17-49	
Acenaphthene	ug/L	ND	51	37.0	73	47-110	
Acenaphthylene	ug/L	ND	51	35.0	69	33-110	
Anthracene	ug/L	ND	51	36.2	71	27-114	
Benzidine	ug/L	ND	51	ND	0	10-18	M1
Benzo(a)anthracene	ug/L	ND	51	38.9	76	33-113	
Benzo(a)pyrene	ug/L	ND	51	36.7	72	26-116	
Benzo(b)fluoranthene	ug/L	ND	51	42.9	84	28-121	
Benzo(g,h,i)perylene	ug/L	ND	51	35.8	70	24-118	
Benzo(k)fluoranthene	ug/L	ND	51	35.2	69	26-116	
bis(2-Chloroethoxy)methane	ug/L	ND	51	35.8	70	33-109	
bis(2-Chloroethyl) ether	ug/L	ND	51	35.3	69	27-106	
bis(2-Chloroisopropyl) ether	ug/L	ND	51	32.6	64	36-113	
bis(2-Ethylhexyl)phthalate	ug/L	ND	51	44.4	84	33-129	
Butylbenzylphthalate	ug/L	ND	51	40.7	80	32-131	
Chrysene	ug/L	ND	51	37.5	74	30-116	
Di-n-butylphthalate	ug/L	ND	51	38.3	75	31-120	
Di-n-octylphthalate	ug/L	ND	51	41.5	81	27-142	
Dibenz(a,h)anthracene	ug/L	ND	51	37.0	72	25-119	
Diethylphthalate	ug/L	ND	51	37.9	74	30-112	
Dimethylphthalate	ug/L	ND	51	38.4	75	29-111	
Fluoranthene	ug/L	ND	51	39.1	77	28-115	
Fluorene	ug/L	ND	51	38.4	75	59-111	
Hexachloro-1,3-butadiene	ug/L	ND	51	28.8	56	24-103	
Hexachlorobenzene	ug/L	ND	51	38.0	75	28-111	
Hexachlorocyclopentadiene	ug/L	ND	102	26.8	26	10-68	
Hexachloroethane	ug/L	ND	51	26.1	51	40-110	
Indeno(1,2,3-cd)pyrene	ug/L	ND	51	36.4	71	25-117	
Isophorone	ug/L	ND	51	34.8	68	28-107	
N-Nitroso-di-n-propylamine	ug/L	ND	51	37.1	73	28-110	
N-Nitrosodimethylamine	ug/L	ND	51	22.4	44	16-66	
N-Nitrosodiphenylamine	ug/L	ND	51	35.4	69	26-111	
Naphthalene	ug/L	ND	51	35.2	69	23-107	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

MATRIX SPIKE SAMPLE:		2228604	60279699001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers	
Nitrobenzene	ug/L	ND	51	39.4	77	35-118		
Pentachlorophenol	ug/L	ND	51	46.8	92	14-147		
Phenanthrene	ug/L	ND	51	37.6	74	54-113		
Phenol	ug/L	ND	51	17.0	31	16-42		
Pyrene	ug/L	ND	51	38.6	76	52-115		
2,4,6-Tribromophenol (S)	%				90	24-126		
2-Fluorobiphenyl (S)	%				71	24-110		
2-Fluorophenol (S)	%				42	20-59		
Nitrobenzene-d5 (S)	%				67	24-110		
Phenol-d6 (S)	%				29	11-42		
Terphenyl-d14 (S)	%				79	35-118		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

QC Batch: 543052

Analysis Method: SM 3500-Cr B

QC Batch Method: SM 3500-Cr B

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 60279538001

METHOD BLANK: 2225101

Matrix: Water

Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	09/05/18 12:23	

LABORATORY CONTROL SAMPLE: 2225102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.1	0.094	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2225103 2225104

Parameter	Units	60279538001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.1	.1	0.098	0.10	91	93	85-115	2	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF TEST #2
Pace Project No.: 60279538

QC Batch: 543922	Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E	Analysis Description: 4500CNE Cyanide, Total
Associated Lab Samples: 60279538001	

METHOD BLANK: 2228806
Associated Lab Samples: 60279538001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/L	ND	0.0050	09/11/18 14:43	

LABORATORY CONTROL SAMPLE: 2228807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/L	.1	0.10	101	69-126	

MATRIX SPIKE SAMPLE: 2228808

Parameter	Units	60280147001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/L	ND	.1	0.087	87	55-124	

SAMPLE DUPLICATE: 2228809

Parameter	Units	60279918001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cyanide	mg/L	ND	ND		46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNi - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

BATCH QUALIFIERS

Batch: 543921

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

N2 The lab does not hold NELAC/TNI accreditation for this parameter.

c2 Acid preservation may not be appropriate for the analysis of 2-Chloroethylvinyl ether.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: EXPANDED EFF TEST #2

Pace Project No.: 60279538

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60279538001	EXPANDED EFF TEST #2	EPA 200.7	543206	EPA 200.7	543218
60279538001	EXPANDED EFF TEST #2	EPA 200.8	543248	EPA 200.8	543269
60279538001	EXPANDED EFF TEST #2	EPA 200.8	544877	EPA 200.8	544917
60279538001	EXPANDED EFF TEST #2	EPA 245.1	543774	EPA 245.1	543817
60279538001	EXPANDED EFF TEST #2	EPA 625	543868	EPA 625	544212
60279538001	EXPANDED EFF TEST #2	EPA 624 Low	543763		
60279538001	EXPANDED EFF TEST #2	EPA 624 Low	543921		
60279538002	TRIP BLANK	EPA 624 Low	543763		
60279538002	TRIP BLANK	EPA 624 Low	543921		
60279538001	EXPANDED EFF TEST #2	Trivalent Chromium Calculation	544945		
60279538001	EXPANDED EFF TEST #2	SM 3500-Cr B	543052		
60279538001	EXPANDED EFF TEST #2	SM 4500-CN-E	543922		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

**Sample Condition Upon Receipt****WO#: 60279538**Client Name: Alliance WaterCourier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐Tracking #: 7826 1956 6917 Pace Shipping Label Used? Yes ☐ No ☒Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐Packing Material: Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other ☒ XPKThermometer Used: T299 Type of Ice: Wet Blue ☐ None ☐Cooler Temperature (°C): As-read 0.0 Corr. Factor +0.1 Corrected 0.1Date and initials of person examining contents: 9.5.18 HF

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Or +4</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Samples 3-4 Time on</u>
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Container is 1.53</u>
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, U&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Trip Blank present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>6 DG9U</u>
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

Project Manager Review:

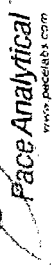
Date:

REVIEWEDBy hwilson at 9:15 am, 9/6/18

F-KS-C-003-Rev.11, February 28, 2018

CHAIN-OF-CUSTODY / Analytical Request Document

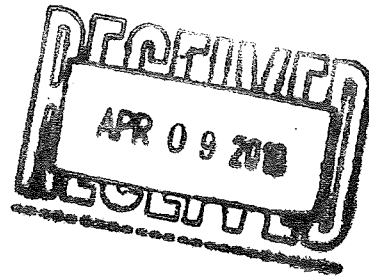
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A Required Client Information: Company: Alliance Water Resources Address: #3 Anderson Road Lake Ozark, MO 65049 Email To: ghutchcraft@alliancewater.com Phone: (573) 365-0455 Fax: Requested Due Date/TAT:		Section B Required Project Information: Report To: Gary Hutchcraft Copy To: Purchase Order No.: Project Name: Project Number:		Section C Invoice Information: Attention: Same Company Name: Address: State: MO City:		Section D Required Client Information: Sample ID (A-Z, 0-9, /, -) Sample IDs MUST BE UNIQUE Valid Matrix Codes: DW DRINKING WATER WT WASTE WATER PP WASTE PRODUCT SL SOIL/SEDIMENT OL OIL WF WASTE FLUID AS AIR OT OTHER TS TISSUE	
Regulatory Agency: <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		Site Location: STATE: MO		Pace Project No./ Lab I.D.: 60279538		Requested Analysis Filtered (Y/N)	
Preservatives: H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other		# OF CONTAINERS: Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other		Analysis Test: Hexavalent Chromium Trivalent Chromium 200.7 Total Hardness 200.8 Total Metals 245.1 Total Mercury Cyanide 525 SVOCs 524 VOCs		Residual Chlorine (Y/N)	
COLLECTED COMPOSITE START DATE TIME		COLLECTED COMPOSITE END/GRAB DATE TIME		SAMPLE TEMP AT COLLECTION DATE TIME		ACCEPTED BY / AFFILIATION DATE TIME	
MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP)		RELINQUISHED BY / AFFILIATION DATE TIME		ADDITIONAL COMMENTS *Ca, Mg, Hardness **Be, Al, Cr, Ni, Cu, Zn, As, Se, Ag, Cd, Sb, Ti, Pb, Fe		SAMPLE CONDITIONS Temp in °C Received on (Y/N) Cooled Sealed (Y/N) Samples Intact (Y/N)	

April 09, 2019

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049



EXPANDED EFF #3

RE: Project: EXPANDED EFF. #3
Pace Project No.: 60296522

Dear Gary Hutchcraft:

Enclosed are the analytical results for sample(s) received by the laboratory on March 13, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: EXPANDED EFF. #3
Pace Project No.: 60296522

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60296522001	EXPANDED EFF. #3	Water	03/12/19 09:30	03/13/19 06:00
60296522002	TRIP BLANK	Water	03/12/19 09:30	03/13/19 06:00

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60296522001	EXPANDED EFF. #3	EPA 200.7	EMR	3	PASI-K
		EPA 200.8	JGP	14	PASI-K
		EPA 245.1	LRS	1	PASI-K
		EPA 625	JMT	60	PASI-K
		EPA 624 Low	EAG, PGH	37	PASI-K
		Trivalent Chromium Calculation	ZMH	1	PASI-K
		SM 3500-Cr B	RAD	1	PASI-K
		SM 4500-CN-E	MJK	1	PASI-K
		EPA 624 Low	EAG, PGH	37	PASI-K
60296522002	TRIP BLANK				

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Sample: EXPANDED EFF. #3		Lab ID: 60296522001	Collected: 03/12/19 09:30	Received: 03/13/19 06:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Calcium	60500	ug/L	200	1	03/15/19 15:26	03/18/19 19:32	7440-70-2	
Magnesium	34800	ug/L	50.0	1	03/15/19 15:26	03/18/19 19:32	7439-95-4	
Total Hardness by 2340B	295000	ug/L	500	1	03/15/19 15:26	03/18/19 19:32		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum	ND	ug/L	50.0	1	03/20/19 10:52	03/21/19 14:22	7429-90-5	
Antimony	ND	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7440-36-0	
Arsenic	ND	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7440-38-2	
Beryllium	ND	ug/L	0.50	1	03/20/19 10:52	03/21/19 14:22	7440-41-7	
Cadmium	ND	ug/L	0.50	1	03/20/19 10:52	03/21/19 11:14	7440-43-9	
Chromium	ND	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7440-47-3	
Copper	2.4	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7440-50-8	
Iron	80.8	ug/L	50.0	1	03/20/19 10:52	03/21/19 14:22	7439-89-6	
Lead	ND	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7439-92-1	
Nickel	1.4	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7440-02-0	
Selenium	ND	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7782-49-2	
Silver	ND	ug/L	0.50	1	03/20/19 10:52	03/21/19 11:14	7440-22-4	
Thallium	ND	ug/L	1.0	1	03/20/19 10:52	03/21/19 11:14	7440-28-0	
Zinc	39.8	ug/L	10.0	1	03/20/19 10:52	03/21/19 11:14	7440-66-6	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND	ug/L	0.20	1	03/14/19 13:40	03/18/19 16:11	7439-97-6	
625 MSSV		Analytical Method: EPA 625 Preparation Method: EPA 625						
Acenaphthene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	83-32-9	
Acenaphthylene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	208-96-8	
Anthracene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	120-12-7	
Benidine	ND	ug/L	47.6	1	03/13/19 21:52	03/18/19 22:19	92-87-5	M1
Benzo(a)anthracene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	56-55-3	
Benzo(a)pyrene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	207-08-9	
4-Bromophenylphenyl ether	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	101-55-3	
Butylbenzylphthalate	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	59-50-7	
bis(2-Chloroethoxy)methane	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	5.7	1	03/13/19 21:52	03/18/19 22:19	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	5.7	1	03/13/19 21:52	03/18/19 22:19	39638-32-9	
2-Chloronaphthalene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	91-58-7	M1
2-Chlorophenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	7005-72-3	
Chrysene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	53-70-3	
3,3'-Dichlorobenzidine	ND	ug/L	19.0	1	03/13/19 21:52	03/18/19 22:19	91-94-1	
2,4-Dichlorophenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	120-83-2	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Sample: EXPANDED EFF. #3		Lab ID: 60296522001	Collected: 03/12/19 09:30	Received: 03/13/19 06:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
625 MSSV Analytical Method: EPA 625 Preparation Method: EPA 625								
Diethylphthalate	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	84-66-2	
2,4-Dimethylphenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	105-67-9	
Dimethylphthalate	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	131-11-3	
Di-n-butylphthalate	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	23.8	1	03/13/19 21:52	03/18/19 22:19	534-52-1	
2,4-Dinitrophenol	ND	ug/L	47.6	1	03/13/19 21:52	03/18/19 22:19	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/L	5.7	1	03/13/19 21:52	03/18/19 22:19	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	606-20-2	
Di-n-octylphthalate	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	117-84-0	
1,2-Diphenylhydrazine	ND	ug/L	7.6	1	03/13/19 21:52	03/18/19 22:19	122-66-7	M1
bis(2-Ethylhexyl)phthalate	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	117-81-7	
Fluoranthene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	206-44-0	L2
Fluorene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	86-73-7	M1
Hexachloro-1,3-butadiene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	87-68-3	
Hexachlorobenzene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	77-47-4	
Hexachloroethane	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	193-39-5	
Isophorone	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	78-59-1	
Naphthalene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	91-20-3	
Nitrobenzene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	98-95-3	
2-Nitrophenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	88-75-5	
4-Nitrophenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	100-02-7	
N-Nitrosodimethylamine	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	86-30-6	
Pentachlorophenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	87-86-5	
Phenanthrene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	85-01-8	
Phenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	108-95-2	
Pyrene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	120-82-1	
2,4,6-Trichlorophenol	ND	ug/L	4.8	1	03/13/19 21:52	03/18/19 22:19	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	55	%	24-110	1	03/13/19 21:52	03/18/19 22:19	4165-60-0	
2-Fluorobiphenyl (S)	55	%	24-110	1	03/13/19 21:52	03/18/19 22:19	321-60-8	
Terphenyl-d14 (S)	67	%	35-118	1	03/13/19 21:52	03/18/19 22:19	1718-51-0	
Phenol-d6 (S)	21	%	11-42	1	03/13/19 21:52	03/18/19 22:19	13127-88-3	
2-Fluorophenol (S)	33	%	20-59	1	03/13/19 21:52	03/18/19 22:19	367-12-4	
2,4,6-Tribromophenol (S)	64	%	24-126	1	03/13/19 21:52	03/18/19 22:19	118-79-6	
624 Volatile Organics Analytical Method: EPA 624 Low								
Acrolein	ND	ug/L	100	1		03/16/19 06:00	107-02-8	L1,M0
Acrylonitrile	ND	ug/L	20.0	1		03/16/19 06:00	107-13-1	
Benzene	ND	ug/L	1.0	1		03/16/19 06:00	71-43-2	
Bromodichloromethane	ND	ug/L	1.0	1		03/16/19 06:00	75-27-4	
Bromoform	ND	ug/L	1.0	1		03/16/19 06:00	75-25-2	
Bromomethane	ND	ug/L	5.0	1		03/19/19 15:06	74-83-9	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Sample: EXPANDED EFF. #3		Lab ID: 60296522001		Collected: 03/12/19 09:30		Received: 03/13/19 06:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
624 Volatile Organics		Analytical Method: EPA 624 Low							
Carbon tetrachloride	ND	ug/L	1.0	1		03/16/19 06:00	56-23-5		
Chlorobenzene	ND	ug/L	1.0	1		03/16/19 06:00	108-90-7		
Chloroethane	ND	ug/L	1.0	1		03/16/19 06:00	75-00-3		
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		03/16/19 06:00	110-75-8	c2	
Chloroform	ND	ug/L	1.0	1		03/16/19 06:00	67-66-3		
Chloromethane	ND	ug/L	1.0	1		03/16/19 06:00	74-87-3		
Dibromochloromethane	ND	ug/L	1.0	1		03/16/19 06:00	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		03/16/19 06:00	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		03/16/19 06:00	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		03/16/19 06:00	106-46-7		
1,1-Dichloroethane	ND	ug/L	1.0	1		03/16/19 06:00	75-34-3		
1,2-Dichloroethane	ND	ug/L	1.0	1		03/16/19 06:00	107-06-2		
1,1-Dichloroethene	ND	ug/L	1.0	1		03/16/19 06:00	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		03/16/19 06:00	156-59-2	N2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		03/16/19 06:00	156-60-5		
1,2-Dichloropropane	ND	ug/L	1.0	1		03/16/19 06:00	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		03/16/19 06:00	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		03/16/19 06:00	10061-02-6		
Ethylbenzene	ND	ug/L	1.0	1		03/16/19 06:00	100-41-4		
Methylene chloride	ND	ug/L	1.0	1		03/16/19 06:00	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		03/16/19 06:00	79-34-5		
Tetrachloroethene	ND	ug/L	1.0	1		03/16/19 06:00	127-18-4		
Toluene	ND	ug/L	1.0	1		03/16/19 06:00	108-88-3		
1,1,1-Trichloroethane	ND	ug/L	1.0	1		03/16/19 06:00	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	1.0	1		03/16/19 06:00	79-00-5		
Trichloroethene	ND	ug/L	1.0	1		03/16/19 06:00	79-01-6		
Vinyl chloride	ND	ug/L	1.0	1		03/16/19 06:00	75-01-4		
Surrogates									
4-Bromofluorobenzene (S)	101	%	80-120	1		03/16/19 06:00	460-00-4		
Toluene-d8 (S)	100	%	80-120	1		03/16/19 06:00	2037-26-5		
1,2-Dichloroethane-d4 (S)	107	%	80-120	1		03/16/19 06:00	17060-07-0		
Preservation pH	6.0		1.0	1		03/16/19 06:00			
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	mg/L	0.010	1		03/25/19 16:41	16065-83-1		
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/13/19 08:51	18540-29-9		
4500CNE Cyanide, Total		Analytical Method: SM 4500-CN-E							
Cyanide	ND	mg/L	0.0050	1		03/20/19 19:58	57-12-5		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Sample: TRIP BLANK		Lab ID: 60296522002		Collected: 03/12/19 09:30		Received: 03/13/19 06:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
624 Volatile Organics		Analytical Method: EPA 624 Low							
Acrolein	ND	ug/L	100	1		03/16/19 06:14	107-02-8	L1	
Acrylonitrile	ND	ug/L	20.0	1		03/16/19 06:14	107-13-1		
Benzene	ND	ug/L	1.0	1		03/16/19 06:14	71-43-2		
Bromodichloromethane	ND	ug/L	1.0	1		03/16/19 06:14	75-27-4		
Bromoform	ND	ug/L	1.0	1		03/16/19 06:14	75-25-2		
Bromomethane	ND	ug/L	5.0	1		03/19/19 15:21	74-83-9		
Carbon tetrachloride	ND	ug/L	1.0	1		03/16/19 06:14	56-23-5		
Chlorobenzene	ND	ug/L	1.0	1		03/16/19 06:14	108-90-7		
Chloroethane	ND	ug/L	1.0	1		03/16/19 06:14	75-00-3		
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		03/16/19 06:14	110-75-8	c2	
Chloroform	ND	ug/L	1.0	1		03/16/19 06:14	67-66-3		
Chloromethane	ND	ug/L	1.0	1		03/16/19 06:14	74-87-3		
Dibromochloromethane	ND	ug/L	1.0	1		03/16/19 06:14	124-48-1		
1,2-Dichlorobenzene	ND	ug/L	1.0	1		03/16/19 06:14	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	1.0	1		03/16/19 06:14	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	1.0	1		03/16/19 06:14	106-46-7		
1,1-Dichloroethane	ND	ug/L	1.0	1		03/16/19 06:14	75-34-3		
1,2-Dichloroethane	ND	ug/L	1.0	1		03/16/19 06:14	107-06-2		
1,1-Dichloroethene	ND	ug/L	1.0	1		03/16/19 06:14	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		03/16/19 06:14	156-59-2	N2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		03/16/19 06:14	156-60-5		
1,2-Dichloropropane	ND	ug/L	1.0	1		03/16/19 06:14	78-87-5		
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		03/16/19 06:14	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		03/16/19 06:14	10061-02-6		
Ethylbenzene	ND	ug/L	1.0	1		03/16/19 06:14	100-41-4		
Methylene chloride	ND	ug/L	1.0	1		03/16/19 06:14	75-09-2		
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		03/16/19 06:14	79-34-5		
Tetrachloroethene	ND	ug/L	1.0	1		03/16/19 06:14	127-18-4		
Toluene	ND	ug/L	1.0	1		03/16/19 06:14	108-88-3		
1,1,1-Trichloroethane	ND	ug/L	1.0	1		03/16/19 06:14	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	1.0	1		03/16/19 06:14	79-00-5		
Trichloroethene	ND	ug/L	1.0	1		03/16/19 06:14	79-01-6		
Vinyl chloride	ND	ug/L	1.0	1		03/16/19 06:14	75-01-4		
Surrogates									
4-Bromofluorobenzene (S)	102	%	80-120	1		03/16/19 06:14	460-00-4		
Toluene-d8 (S)	100	%	80-120	1		03/16/19 06:14	2037-26-5		
1,2-Dichloroethane-d4 (S)	110	%	80-120	1		03/16/19 06:14	17060-07-0		
Preservation pH	6.0		1.0	1		03/16/19 06:14			

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

QC Batch: 573597

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury

Associated Lab Samples: 60296522001

METHOD BLANK: 2352716

Matrix: Water

Associated Lab Samples: 60296522001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	03/18/19 15:39	

LABORATORY CONTROL SAMPLE: 2352717

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2352718

2352719

Parameter	Units	60296424001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.20	5	5	4.0	4.1	79	81	70-130	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

QC Batch: 573878

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60296522001

METHOD BLANK: 2353783

Matrix: Water

Associated Lab Samples: 60296522001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	ug/L	ND	200	03/18/19 18:57	
Magnesium	ug/L	ND	50.0	03/18/19 18:57	
Total Hardness by 2340B	ug/L	ND	500	03/18/19 18:57	

LABORATORY CONTROL SAMPLE: 2353784

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	9580	96	85-115	
Magnesium	ug/L	10000	9970	100	85-115	
Total Hardness by 2340B	ug/L		65000			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2353785 2353786

Parameter	Units	60295639003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	83800	10000	10000	93500	91200	97	74	70-130	3	20	
Magnesium	ug/L	14000	10000	10000	23000	22700	90	88	70-130	1	20	
Total Hardness by 2340B	ug/L	267000			328000	321000				2		

MATRIX SPIKE SAMPLE: 2353787

Parameter	Units	60296707003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	59600	10000	68800	93	70-130	
Magnesium	ug/L	3760	10000	13500	97	70-130	
Total Hardness by 2340B	ug/L	164000		227000			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

QC Batch: 574546

Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8

Analysis Description: 200.8 MET

Associated Lab Samples: 60296522001

METHOD BLANK: 2356520

Matrix: Water

Associated Lab Samples: 60296522001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	50.0	03/21/19 11:10	
Antimony	ug/L	ND	1.0	03/21/19 11:10	
Arsenic	ug/L	ND	1.0	03/21/19 11:10	
Beryllium	ug/L	ND	0.50	03/21/19 14:19	
Cadmium	ug/L	ND	0.50	03/21/19 11:10	
Chromium	ug/L	ND	1.0	03/21/19 11:10	
Copper	ug/L	ND	1.0	03/21/19 11:10	
Iron	ug/L	ND	50.0	03/21/19 11:10	
Lead	ug/L	ND	1.0	03/21/19 11:10	
Nickel	ug/L	ND	1.0	03/21/19 11:10	
Selenium	ug/L	ND	1.0	03/21/19 11:10	
Silver	ug/L	ND	0.50	03/21/19 11:10	
Thallium	ug/L	ND	1.0	03/21/19 11:10	
Zinc	ug/L	ND	10.0	03/21/19 11:10	

LABORATORY CONTROL SAMPLE: 2356521

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	1000	1020	102	85-115	
Antimony	ug/L	40	40.5	101	85-115	
Arsenic	ug/L	40	41.1	103	85-115	
Beryllium	ug/L	40	41.0	103	85-115	
Cadmium	ug/L	40	40.7	102	85-115	
Chromium	ug/L	40	39.9	100	85-115	
Copper	ug/L	40	40.9	102	85-115	
Iron	ug/L	1000	1040	104	85-115	
Lead	ug/L	40	38.4	96	85-115	
Nickel	ug/L	40	40.6	101	85-115	
Selenium	ug/L	40	43.0	107	85-115	
Silver	ug/L	20	18.0	90	85-115	
Thallium	ug/L	40	36.8	92	85-115	
Zinc	ug/L	100	103	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2356522 2356523

Parameter	Units	60296658004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Aluminum	ug/L	590	1000	1000	1850	1900	126	131	70-130	3	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2356522											
2356523											
Parameter	Units	60296658004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Antimony	ug/L	ND	40	40	39.1	38.7	97	96	70-130	1	20
Arsenic	ug/L	2.8	40	40	42.9	42.8	100	100	70-130	0	20
Beryllium	ug/L	ND	40	40	39.8	39.3	99	98	70-130	1	20
Cadmium	ug/L	ND	40	40	36.4	36.1	91	90	70-130	1	20
Chromium	ug/L	ND	40	40	40.9	40.9	101	101	70-130	0	20
Copper	ug/L	4.6	40	40	40.3	40.0	89	88	70-130	1	20
Iron	ug/L	559	1000	1000	1640	1680	108	113	70-130	2	20
Lead	ug/L	ND	40	40	39.9	39.8	98	98	70-130	0	20
Nickel	ug/L	2.0	40	40	39.5	39.4	94	93	70-130	0	20
Selenium	ug/L	2.7	40	40	41.3	41.6	97	97	70-130	1	20
Silver	ug/L	ND	20	20	15.5	15.5	77	77	70-130	0	20
Thallium	ug/L	ND	40	40	37.4	37.3	93	93	70-130	0	20
Zinc	ug/L	ND	100	100	94.6	94.0	87	86	70-130	1	20

MATRIX SPIKE SAMPLE:		2356524					
Parameter	Units	60297211003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	ND	1000	1140	109	70-130	
Antimony	ug/L	ND	40	40.3	99	70-130	
Arsenic	ug/L	ND	40	42.6	104	70-130	
Beryllium	ug/L	ND	40	40.1	100	70-130	
Cadmium	ug/L	ND	40	37.6	94	70-130	
Chromium	ug/L	ND	40	43.5	107	70-130	
Copper	ug/L	3.3	40	40.3	93	70-130	
Iron	ug/L	183	1000	1220	103	70-130	
Lead	ug/L	3.8	40	40.4	91	70-130	
Nickel	ug/L	3.5	40	42.4	97	70-130	
Selenium	ug/L	1.8	40	39.3	94	70-130	
Silver	ug/L	ND	20	16.1	80	70-130	
Thallium	ug/L	ND	40	38.1	95	70-130	
Zinc	ug/L	35.3	100	125	90	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

QC Batch: 573913 Analysis Method: EPA 624 Low

QC Batch Method: EPA 624 Low Analysis Description: 624 MSV

Associated Lab Samples: 60296522001, 60296522002

METHOD BLANK: 2353995

Matrix: Water

Associated Lab Samples: 60296522001, 60296522002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	1.0	03/16/19 05:45	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	03/16/19 05:45	
1,1,2-Trichloroethane	ug/L	ND	1.0	03/16/19 05:45	
1,1-Dichloroethane	ug/L	ND	1.0	03/16/19 05:45	
1,1-Dichloroethene	ug/L	ND	1.0	03/16/19 05:45	
1,2-Dichlorobenzene	ug/L	ND	1.0	03/16/19 05:45	
1,2-Dichloroethane	ug/L	ND	1.0	03/16/19 05:45	
1,2-Dichloropropane	ug/L	ND	1.0	03/16/19 05:45	
1,3-Dichlorobenzene	ug/L	ND	1.0	03/16/19 05:45	
1,4-Dichlorobenzene	ug/L	ND	1.0	03/16/19 05:45	
2-Chloroethylvinyl ether	ug/L	ND	10.0	03/16/19 05:45	
Acrolein	ug/L	ND	100	03/16/19 05:45	
Acrylonitrile	ug/L	ND	20.0	03/16/19 05:45	
Benzene	ug/L	ND	1.0	03/16/19 05:45	
Bromodichloromethane	ug/L	ND	1.0	03/16/19 05:45	
Bromoform	ug/L	ND	1.0	03/16/19 05:45	
Carbon tetrachloride	ug/L	ND	1.0	03/16/19 05:45	
Chlorobenzene	ug/L	ND	1.0	03/16/19 05:45	
Chloroethane	ug/L	ND	1.0	03/16/19 05:45	
Chloroform	ug/L	ND	1.0	03/16/19 05:45	
Chloromethane	ug/L	ND	1.0	03/16/19 05:45	
cis-1,2-Dichloroethene	ug/L	ND	1.0	03/16/19 05:45	N2
cis-1,3-Dichloropropene	ug/L	ND	1.0	03/16/19 05:45	
Dibromochloromethane	ug/L	ND	1.0	03/16/19 05:45	
Ethylbenzene	ug/L	ND	1.0	03/16/19 05:45	
Methylene chloride	ug/L	ND	1.0	03/16/19 05:45	
Tetrachloroethene	ug/L	ND	1.0	03/16/19 05:45	
Toluene	ug/L	ND	1.0	03/16/19 05:45	
trans-1,2-Dichloroethene	ug/L	ND	1.0	03/16/19 05:45	
trans-1,3-Dichloropropene	ug/L	ND	1.0	03/16/19 05:45	
Trichloroethene	ug/L	ND	1.0	03/16/19 05:45	
Vinyl chloride	ug/L	ND	1.0	03/16/19 05:45	
1,2-Dichloroethane-d4 (S)	%	100	80-120	03/16/19 05:45	
4-Bromofluorobenzene (S)	%	102	80-120	03/16/19 05:45	
Toluene-d8 (S)	%	100	80-120	03/16/19 05:45	

LABORATORY CONTROL SAMPLE: 2353996

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	20	20.1	101	80-114	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

LABORATORY CONTROL SAMPLE: 2353996

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,2,2-Tetrachloroethane	ug/L	20	18.8	94	67-123	
1,1,2-Trichloroethane	ug/L	20	19.0	95	80-117	
1,1-Dichloroethane	ug/L	20	18.9	95	75-117	
1,1-Dichloroethene	ug/L	20	16.4	82	66-126	
1,2-Dichlorobenzene	ug/L	20	20.7	103	81-115	
1,2-Dichloroethane	ug/L	20	18.9	95	71-110	
1,2-Dichloropropane	ug/L	20	20.4	102	78-115	
1,3-Dichlorobenzene	ug/L	20	20.0	100	81-115	
1,4-Dichlorobenzene	ug/L	20	19.8	99	80-113	
2-Chloroethylvinyl ether	ug/L	20	15.3	77	10-167	
Acrolein	ug/L	200	1200	598	10-195	L1
Acrylonitrile	ug/L	200	172	86	72-121	
Benzene	ug/L	20	20.0	100	79-114	
Bromodichloromethane	ug/L	20	20.8	104	79-116	
Bromoform	ug/L	20	20.5	102	72-128	
Carbon tetrachloride	ug/L	20	20.0	100	70-130	
Chlorobenzene	ug/L	20	20.0	100	65-135	
Chloroethane	ug/L	20	14.3	72	41-138	
Chloroform	ug/L	20	19.4	97	78-110	
Chloromethane	ug/L	20	11.5	58	17-148	
cis-1,2-Dichloroethene	ug/L	20	18.5	92	80-114	N2
cis-1,3-Dichloropropene	ug/L	20	19.3	97	79-116	
Dibromochloromethane	ug/L	20	20.0	100	70-135	
Ethylbenzene	ug/L	20	19.9	100	83-116	
Methylene chloride	ug/L	20	16.1	81	70-118	
Tetrachloroethene	ug/L	20	19.9	99	74-124	
Toluene	ug/L	20	19.8	99	82-115	
trans-1,2-Dichloroethene	ug/L	20	16.9	84	75-116	
trans-1,3-Dichloropropene	ug/L	20	19.1	96	81-116	
Trichloroethene	ug/L	20	20.8	104	82-124	
Vinyl chloride	ug/L	20	15.8	79	39-159	
1,2-Dichloroethane-d4 (S)	%			100	80-120	
4-Bromofluorobenzene (S)	%			102	80-120	
Toluene-d8 (S)	%			100	80-120	

MATRIX SPIKE SAMPLE: 2353997

Parameter	Units	60296522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	20	18.6	93	52-162	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.6	93	46-157	
1,1,2-Trichloroethane	ug/L	ND	20	18.5	93	52-150	
1,1-Dichloroethane	ug/L	ND	20	17.3	87	59-155	
1,1-Dichloroethene	ug/L	ND	20	16.3	81	10-234	
1,2-Dichlorobenzene	ug/L	ND	20	18.8	94	18-190	
1,2-Dichloroethane	ug/L	ND	20	18.2	90	49-155	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

MATRIX SPIKE SAMPLE:		2353997						
Parameter	Units	60296522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
1,2-Dichloropropane	ug/L	ND	20	19.8	99	10-210		
1,3-Dichlorobenzene	ug/L	ND	20	18.6	93	59-156		
1,4-Dichlorobenzene	ug/L	ND	20	18.0	90	18-190		
2-Chloroethylvinyl ether	ug/L	ND	20	14.5	72	10-225		
Acrolein	ug/L	ND	200	725	362	10-175	M0	
Acrylonitrile	ug/L	ND	200	162	81	35-134		
Benzene	ug/L	ND	20	19.0	95	37-151		
Bromodichloromethane	ug/L	ND	20	20.2	101	35-155		
Bromoform	ug/L	ND	20	19.7	99	45-169		
Carbon tetrachloride	ug/L	ND	20	18.6	93	70-140		
Chlorobenzene	ug/L	ND	20	19.4	97	37-160		
Chloroethane	ug/L	ND	20	13.7	68	14-230		
Chloroform	ug/L	ND	20	16.7	82	51-138		
Chloromethane	ug/L	ND	20	9.9	48	10-273		
cis-1,2-Dichloroethene	ug/L	ND	20	16.3	81	43-132	N2	
cis-1,3-Dichloropropene	ug/L	ND	20	18.3	92	10-227		
Dibromochloromethane	ug/L	ND	20	19.2	96	53-149		
Ethylbenzene	ug/L	ND	20	19.8	99	37-162		
Methylene chloride	ug/L	ND	20	15.1	75	10-221		
Tetrachloroethene	ug/L	ND	20	18.9	95	64-148		
Toluene	ug/L	ND	20	19.7	98	47-150		
trans-1,2-Dichloroethene	ug/L	ND	20	16.2	81	54-156		
trans-1,3-Dichloropropene	ug/L	ND	20	18.1	90	17-183		
Trichloroethene	ug/L	ND	20	20.2	101	70-157		
Vinyl chloride	ug/L	ND	20	13.9	70	10-251		
1,2-Dichloroethane-d4 (S)	%				98	80-120		
4-Bromofluorobenzene (S)	%				102	80-120		
Toluene-d8 (S)	%				100	80-120		
Preservation pH		6.0		6.0				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

QC Batch: 574401 Analysis Method: EPA 624 Low
QC Batch Method: EPA 624 Low Analysis Description: 624 MSV
Associated Lab Samples: 60296522001, 60296522002

METHOD BLANK: 2355781 Matrix: Water

Associated Lab Samples: 60296522001, 60296522002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromomethane	ug/L	ND	5.0	03/19/19 14:52	
1,2-Dichloroethane-d4 (S)	%	97	80-120	03/19/19 14:52	
4-Bromofluorobenzene (S)	%	101	80-120	03/19/19 14:52	
Toluene-d8 (S)	%	98	80-120	03/19/19 14:52	

LABORATORY CONTROL SAMPLE: 2355782

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromomethane	ug/L	20	21.9	109	15-185	
1,2-Dichloroethane-d4 (S)	%			104	80-120	
4-Bromofluorobenzene (S)	%			101	80-120	
Toluene-d8 (S)	%			98	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3
Pace Project No.: 60296522

QC Batch: 573345 Analysis Method: EPA 625
QC Batch Method: EPA 625 Analysis Description: 625 MSS
Associated Lab Samples: 60296522001

METHOD BLANK: 2351663 Matrix: Water
Associated Lab Samples: 60296522001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	5.0	03/18/19 12:29	
1,2-Diphenylhydrazine	ug/L	ND	8.0	03/18/19 12:29	
2,4,6-Trichlorophenol	ug/L	ND	5.0	03/18/19 12:29	
2,4-Dichlorophenol	ug/L	ND	5.0	03/18/19 12:29	
2,4-Dimethylphenol	ug/L	ND	5.0	03/18/19 12:29	
2,4-Dinitrophenol	ug/L	ND	50.0	03/18/19 12:29	
2,4-Dinitrotoluene	ug/L	ND	6.0	03/18/19 12:29	
2,6-Dinitrotoluene	ug/L	ND	5.0	03/18/19 12:29	
2-Chloronaphthalene	ug/L	ND	5.0	03/18/19 12:29	
2-Chlorophenol	ug/L	ND	5.0	03/18/19 12:29	
2-Nitrophenol	ug/L	ND	5.0	03/18/19 12:29	
3,3'-Dichlorobenzidine	ug/L	ND	20.0	03/18/19 12:29	
4,6-Dinitro-2-methylphenol	ug/L	ND	25.0	03/18/19 12:29	
4-Bromophenylphenyl ether	ug/L	ND	5.0	03/18/19 12:29	
4-Chloro-3-methylphenol	ug/L	ND	5.0	03/18/19 12:29	
4-Chlorophenylphenyl ether	ug/L	ND	5.0	03/18/19 12:29	
4-Nitrophenol	ug/L	ND	5.0	03/18/19 12:29	
Acenaphthene	ug/L	ND	5.0	03/18/19 12:29	
Acenaphthylene	ug/L	ND	5.0	03/18/19 12:29	
Anthracene	ug/L	ND	5.0	03/18/19 12:29	
Benzidine	ug/L	ND	50.0	03/18/19 12:29	
Benzo(a)anthracene	ug/L	ND	5.0	03/18/19 12:29	
Benzo(a)pyrene	ug/L	ND	5.0	03/18/19 12:29	
Benzo(b)fluoranthene	ug/L	ND	5.0	03/18/19 12:29	
Benzo(g,h,i)perylene	ug/L	ND	5.0	03/18/19 12:29	
Benzo(k)fluoranthene	ug/L	ND	5.0	03/18/19 12:29	
bis(2-Chloroethoxy)methane	ug/L	ND	5.0	03/18/19 12:29	
bis(2-Chloroethyl) ether	ug/L	ND	6.0	03/18/19 12:29	
bis(2-Chloroisopropyl) ether	ug/L	ND	6.0	03/18/19 12:29	
bis(2-Ethylhexyl)phthalate	ug/L	ND	5.0	03/18/19 12:29	
Butylbenzylphthalate	ug/L	ND	5.0	03/18/19 12:29	
Chrysene	ug/L	ND	5.0	03/18/19 12:29	
Di-n-butylphthalate	ug/L	ND	5.0	03/18/19 12:29	
Di-n-octylphthalate	ug/L	ND	5.0	03/18/19 12:29	
Dibenz(a,h)anthracene	ug/L	ND	5.0	03/18/19 12:29	
Diethylphthalate	ug/L	ND	5.0	03/18/19 12:29	
Dimethylphthalate	ug/L	ND	5.0	03/18/19 12:29	
Fluoranthene	ug/L	ND	5.0	03/18/19 12:29	
Fluorene	ug/L	ND	5.0	03/18/19 12:29	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	03/18/19 12:29	
Hexachlorobenzene	ug/L	ND	5.0	03/18/19 12:29	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

METHOD BLANK: 2351663

Matrix: Water

Associated Lab Samples: 60296522001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Hexachlorocyclopentadiene	ug/L	ND	5.0	03/18/19 12:29	
Hexachloroethane	ug/L	ND	5.0	03/18/19 12:29	
Indeno(1,2,3-cd)pyrene	ug/L	ND	5.0	03/18/19 12:29	
Isophorone	ug/L	ND	5.0	03/18/19 12:29	
N-Nitroso-di-n-propylamine	ug/L	ND	5.0	03/18/19 12:29	
N-Nitrosodimethylamine	ug/L	ND	5.0	03/18/19 12:29	
N-Nitrosodiphenylamine	ug/L	ND	5.0	03/18/19 12:29	
Naphthalene	ug/L	ND	5.0	03/18/19 12:29	
Nitrobenzene	ug/L	ND	5.0	03/18/19 12:29	
Pentachlorophenol	ug/L	ND	5.0	03/18/19 12:29	
Phenanthrene	ug/L	ND	5.0	03/18/19 12:29	
Phenol	ug/L	ND	5.0	03/18/19 12:29	
Pyrene	ug/L	ND	5.0	03/18/19 12:29	
2,4,6-Tribromophenol (S)	%	55	24-126	03/18/19 12:29	
2-Fluorobiphenyl (S)	%	49	24-110	03/18/19 12:29	
2-Fluorophenol (S)	%	34	20-59	03/18/19 12:29	
Nitrobenzene-d5 (S)	%	49	24-110	03/18/19 12:29	
Phenol-d6 (S)	%	22	11-42	03/18/19 12:29	
Terphenyl-d14 (S)	%	74	35-118	03/18/19 12:29	

LABORATORY CONTROL SAMPLE: 2351664

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	30.4	61	54-93	
1,2-Diphenylhydrazine	ug/L	50	41.3	83	62-105	
2,4,6-Trichlorophenol	ug/L	50	35.4	71	63-100	
2,4-Dichlorophenol	ug/L	50	34.6	69	59-95	
2,4-Dimethylphenol	ug/L	50	29.2	58	55-92	
2,4-Dinitrophenol	ug/L	50	27.7J	55	36-137	
2,4-Dinitrotoluene	ug/L	50	35.9	72	65-113	
2,6-Dinitrotoluene	ug/L	50	36.4	73	65-108	
2-Chloronaphthalene	ug/L	50	34.5	69	60-98	
2-Chlorophenol	ug/L	50	34.1	68	51-89	
2-Nitrophenol	ug/L	50	30.7	61	54-110	
3,3'-Dichlorobenzidine	ug/L	50	67.0	134	64-163	
4,6-Dinitro-2-methylphenol	ug/L	50	31.7	63	58-125	
4-Bromophenylphenyl ether	ug/L	50	34.9	70	61-107	
4-Chloro-3-methylphenol	ug/L	50	34.7	69	62-96	
4-Chlorophenylphenyl ether	ug/L	50	38.6	77	63-102	
4-Nitrophenol	ug/L	50	15.3	31	18-50	
Acenaphthene	ug/L	50	36.9	74	62-101	
Acenaphthylene	ug/L	50	34.9	70	62-100	
Anthracene	ug/L	50	36.6	73	63-105	
Benzidine	ug/L	50	10.6J	21	10-123	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

LABORATORY CONTROL SAMPLE: 2351664

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzo(a)anthracene	ug/L	50	37.3	75	65-105	
Benzo(a)pyrene	ug/L	50	37.9	76	59-110	
Benzo(b)fluoranthene	ug/L	50	36.0	72	60-114	
Benzo(g,h,i)perylene	ug/L	50	30.8	62	60-110	
Benzo(k)fluoranthene	ug/L	50	42.0	84	59-110	
bis(2-Chloroethoxy)methane	ug/L	50	33.7	67	60-97	
bis(2-Chloroethyl) ether	ug/L	50	34.3	69	53-97	
bis(2-Chloroisopropyl) ether	ug/L	50	34.9	70	54-98	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.2	82	61-121	
Butylbenzylphthalate	ug/L	50	40.8	82	59-125	
Chrysene	ug/L	50	38.7	77	63-109	
Di-n-butylphthalate	ug/L	50	34.3	69	65-112	
Di-n-octylphthalate	ug/L	50	35.5	71	56-127	
Dibenz(a,h)anthracene	ug/L	50	36.9	74	60-111	
Diethylphthalate	ug/L	50	38.1	76	65-103	
Dimethylphthalate	ug/L	50	36.0	72	64-103	
Fluoranthene	ug/L	50	29.8	60	64-108	L2
Fluorene	ug/L	50	39.1	78	65-101	
Hexachloro-1,3-butadiene	ug/L	50	29.7	59	48-94	
Hexachlorobenzene	ug/L	50	37.4	75	59-106	
Hexachlorocyclopentadiene	ug/L	100	21.5	22	19-56	
Hexachloroethane	ug/L	50	27.9	56	47-90	
Indeno(1,2,3-cd)pyrene	ug/L	50	36.2	72	60-110	
Isophorone	ug/L	50	34.5	69	62-97	
N-Nitroso-di-n-propylamine	ug/L	50	36.2	72	59-100	
N-Nitrosodimethylamine	ug/L	50	24.9	50	20-67	
N-Nitrosodiphenylamine	ug/L	50	41.8	84	64-102	
Naphthalene	ug/L	50	33.3	67	58-94	
Nitrobenzene	ug/L	50	33.9	68	59-98	
Pentachlorophenol	ug/L	50	33.6	67	54-121	
Phenanthrene	ug/L	50	37.7	75	63-105	
Phenol	ug/L	50	15.9	32	17-44	
Pyrene	ug/L	50	39.5	79	63-108	
2,4,6-Tribromophenol (S)	%			81	24-126	
2-Fluorobiphenyl (S)	%			63	24-110	
2-Fluorophenol (S)	%			50	20-59	
Nitrobenzene-d5 (S)	%			63	24-110	
Phenol-d6 (S)	%			26	11-42	
Terphenyl-d14 (S)	%			76	35-118	

MATRIX SPIKE SAMPLE: 2351665

Parameter	Units	60296522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	47.6	24.5	51	44-109	
1,2-Diphenylhydrazine	ug/L	ND	47.6	2.6J	5	16-120	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

MATRIX SPIKE SAMPLE:		2351665					
Parameter	Units	60296522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	47.6	31.0	65	37-123	
2,4-Dichlorophenol	ug/L	ND	47.6	25.8	54	39-115	
2,4-Dimethylphenol	ug/L	ND	47.6	21.8	46	32-116	
2,4-Dinitrophenol	ug/L	ND	47.6	2J	4	10-154	M1
2,4-Dinitrotoluene	ug/L	ND	47.6	31.2	66	39-122	
2,6-Dinitrotoluene	ug/L	ND	47.6	30.1	63	50-119	
2-Chloronaphthalene	ug/L	ND	47.6	25.8	54	60-110	M1
2-Chlorophenol	ug/L	ND	47.6	28.1	59	35-91	
2-Nitrophenol	ug/L	ND	47.6	27.1	57	29-132	
3,3'-Dichlorobenzidine	ug/L	ND	47.6	50.0	105	10-156	
4,6-Dinitro-2-methylphenol	ug/L	ND	47.6	5.3J	11	10-158	
4-Bromophenylphenyl ether	ug/L	ND	47.6	32.9	69	53-115	
4-Chloro-3-methylphenol	ug/L	ND	47.6	28.7	60	39-105	
4-Chlorophenylphenyl ether	ug/L	ND	47.6	26.2	55	29-111	
4-Nitrophenol	ug/L	ND	47.6	11.4	24	17-49	
Acenaphthene	ug/L	ND	47.6	30.1	63	47-110	
Acenaphthylene	ug/L	ND	47.6	29.2	61	33-110	
Anthracene	ug/L	ND	47.6	34.1	72	27-114	
Benzidine	ug/L	ND	47.6	ND	7	10-18	M1
Benzo(a)anthracene	ug/L	ND	47.6	30.2	63	33-113	
Benzo(a)pyrene	ug/L	ND	47.6	39.1	82	26-116	
Benzo(b)fluoranthene	ug/L	ND	47.6	36.5	77	28-121	
Benzo(g,h,i)perylene	ug/L	ND	47.6	26.7	56	24-118	
Benzo(k)fluoranthene	ug/L	ND	47.6	39.8	84	26-116	
bis(2-Chloroethoxy)methane	ug/L	ND	47.6	29.3	62	33-109	
bis(2-Chloroethyl) ether	ug/L	ND	47.6	28.9	61	27-106	
bis(2-Chloroisopropyl) ether	ug/L	ND	47.6	30.4	64	36-113	
bis(2-Ethylhexyl)phthalate	ug/L	ND	47.6	35.9	75	33-129	
Butylbenzylphthalate	ug/L	ND	47.6	29.2	61	32-131	
Chrysene	ug/L	ND	47.6	31.5	66	30-116	
Di-n-butylphthalate	ug/L	ND	47.6	41.0	86	31-120	
Di-n-octylphthalate	ug/L	ND	47.6	43.5	91	27-142	
Dibenz(a,h)anthracene	ug/L	ND	47.6	32.8	69	25-119	
Diethylphthalate	ug/L	ND	47.6	30.6	64	30-112	
Dimethylphthalate	ug/L	ND	47.6	31.1	65	29-111	
Fluoranthene	ug/L	ND	47.6	38.2	80	28-115	
Fluorene	ug/L	ND	47.6	25.6	54	59-111	M1
Hexachloro-1,3-butadiene	ug/L	ND	47.6	22.1	46	24-103	
Hexachlorobenzene	ug/L	ND	47.6	33.7	71	28-111	
Hexachlorocyclopentadiene	ug/L	ND	95.2	17.0	18	10-68	
Hexachloroethane	ug/L	ND	47.6	22.9	48	40-110	
Indeno(1,2,3-cd)pyrene	ug/L	ND	47.6	32.4	68	25-117	
Isophorone	ug/L	ND	47.6	28.1	59	28-107	
N-Nitroso-di-n-propylamine	ug/L	ND	47.6	30.8	65	28-110	
N-Nitrosodimethylamine	ug/L	ND	47.6	15.7	33	16-66	
N-Nitrosodiphenylamine	ug/L	ND	47.6	25.4	53	26-111	
Naphthalene	ug/L	ND	47.6	28.1	59	23-107	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

MATRIX SPIKE SAMPLE: 2351665

Parameter	Units	60296522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrobenzene	ug/L	ND	47.6	28.1	59	35-118	
Pentachlorophenol	ug/L	ND	47.6	28.5	60	14-147	
Phenanthrene	ug/L	ND	47.6	32.3	68	54-113	
Phenol	ug/L	ND	47.6	12.9	27	16-42	
Pyrene	ug/L	ND	47.6	30.7	65	52-115	
2,4,6-Tribromophenol (S)	%				56	24-126	
2-Fluorobiphenyl (S)	%				63	24-110	
2-Fluorophenol (S)	%				37	20-59	
Nitrobenzene-d5 (S)	%				57	24-110	
Phenol-d6 (S)	%				25	11-42	
Terphenyl-d14 (S)	%				68	35-118	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

QC Batch: 573328

Analysis Method: SM 3500-Cr B

QC Batch Method: SM 3500-Cr B

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 60296522001

METHOD BLANK: 2351608

Matrix: Water

Associated Lab Samples: 60296522001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/13/19 08:49	

LABORATORY CONTROL SAMPLE: 2351609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.1	0.097	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2351610 2351611

Parameter	Units	60296522001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	0.1	0.1	0.097	0.095	97	95	85-115	2 20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: EXPANDED EFF. #3
Pace Project No.: 60296522

QC Batch: 574531	Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E	Analysis Description: 4500CNE Cyanide, Total
Associated Lab Samples: 60296522001	

METHOD BLANK: 2356467
Associated Lab Samples: 60296522001

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/L	ND	0.0050	03/20/19 19:31	

LABORATORY CONTROL SAMPLE: 2356468

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/L	0.1	0.10	100	69-126	

MATRIX SPIKE SAMPLE: 2356469

Parameter	Units	60296294001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/L	ND	0.1	0.065	65	55-124	

SAMPLE DUPLICATE: 2356470

Parameter	Units	60296353001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cyanide	mg/L	ND	ND		46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

BATCH QUALIFIERS

Batch: 574401

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

c2 Acid preservation may not be appropriate for the analysis of 2-Chloroethylvinyl ether.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: EXPANDED EFF. #3

Pace Project No.: 60296522

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60296522001	EXPANDED EFF. #3	EPA 200.7	573878	EPA 200.7	574036
60296522001	EXPANDED EFF. #3	EPA 200.8	574546	EPA 200.8	574684
60296522001	EXPANDED EFF. #3	EPA 245.1	573597	EPA 245.1	573925
60296522001	EXPANDED EFF. #3	EPA 625	573345	EPA 625	574127
60296522001	EXPANDED EFF. #3	EPA 624 Low	573913		
60296522001	EXPANDED EFF. #3	EPA 624 Low	574401		
60296522002	TRIP BLANK	EPA 624 Low	573913		
60296522002	TRIP BLANK	EPA 624 Low	574401		
60296522001	EXPANDED EFF. #3	Trivalent Chromium Calculation	575472		
60296522001	EXPANDED EFF. #3	SM 3500-Cr B	573328		
60296522001	EXPANDED EFF. #3	SM 4500-CN-E	574531		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Sample Condition Upon Receipt

WO#: 60296522



Client Name:

Alliance Water Resources

Courier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #:

Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other: XZPIC

Thermometer Used: T300 Type of Ice: Wet Blue ☐ None ☐

Cooler Temperature (°C): As-read 0.4 Corr. Factor +0.4 Corrected 0.8

Date and initials of person examining contents: 5-15-18 at

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>CRT+6</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Trip Blank present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Copy COC to Client? Y ☒ N ☐

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

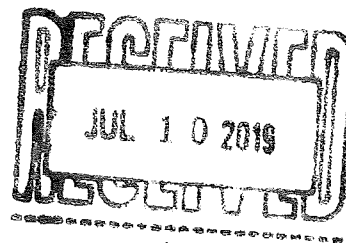
Project Manager Review:

Date:

Page 27 of 27

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL			
FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO. MO- 0103241	OUTFALL NO. 001	
PART E – TOXICITY TESTING DATA			
19. TOXICITY TESTING DATA			
Refer to the APPLICATION OVERVIEW to determine whether Part E applies to the treatment works.			
Publicly owned treatment works, or POTWs, meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points.			
<div style="margin-left: 20px;"> A. POTWs with a design flow rate greater than or equal to 1 million gallons per day B. POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403) C. POTWs required by the permitting authority to submit data for these parameters <ul style="list-style-type: none"> • At a minimum, these results must include quarterly testing for a 12-month period within the past one year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute or chronic toxicity, depending on the range of receiving water dilution. Do not include information about combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. • If EPA methods were not used, report the reason for using alternative methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E. If no biomonitoring data is required, do not complete Part E. Refer to the application overview for directions on which other sections of the form to complete. </div>			
Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years: 1___chronic 3___acute			
Complete the following chart for the last three whole effluent toxicity tests . Allow one column per test. Copy this page if more than three tests are being reported.			
	Most Recent	2 ND Most Recent	3 RD Most Recent
A. Test Information			
Test Method Number	See attachment	See attachment	See attachment
Final Report Number			
Outfall Number			
Dates Sample Collected			
Date Test Started			
Duration			
B. Toxicity Test Methods Followed			
Manual Title			
Edition Number and Year of Publication			
Page Number(s)			
C. Sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used			
24-Hour Composite			
Grab			
D. Indicate where the sample was taken in relation to disinfection (Check all that apply for each)			
Before Disinfection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After Disinfection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
After Dechlorination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Describe the point in the treatment process at which the sample was collected			
Sample Was Collected:	after cascade aeration	after cascade aeration	after cascade aeration
F. Indicate whether the test was intended to assess chronic toxicity, acute toxicity, or both			
Chronic Toxicity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acute Toxicity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
G. Provide the type of test performed			
Static	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Static-renewal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flow-through	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Source of dilution water. If laboratory water, specify type; if receiving water, specify source			
Laboratory Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Receiving Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

July 10, 2019



Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049

1 YEAR / PERMIT
CHRONIC WET TEST

RE: Project: CHRONIC WET TEST
Pace Project No.: 60306838

Dear Gary Hutchcraft:

Enclosed are the analytical results for sample(s) received by the laboratory on June 25, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: CHRONIC WET TEST
Pace Project No.: 60306838

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Missouri SEKS Micro Certification: 10070
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587

Southeast Kansas Certification IDs

808 West McKay, Frontenac, KS 66763
Arkansas Certification #: 18-016-0
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10426

Louisiana Certification #: 03055
Oklahoma Certification #: 9935
Texas Certification #: T104704407
Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: CHRONIC WET TEST

Pace Project No.: 60306838

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60306838001	EFF WET CHRONIC	Water	06/24/19 08:00	06/25/19 10:50
60306838002	UPSTREAM	Water	06/24/19 08:15	06/25/19 10:50
60306838003	EFF AMM/SEL	Water	06/24/19 08:30	06/25/19 18:20

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: CHRONIC WET TEST
Pace Project No.: 60306838

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60306838001	EFF WET CHRONIC	EPA 821/R-02/013	TDH	1	PASI-SE
60306838003	EFF AMM/SEL	EPA 200.8	JGP	1	PASI-K
		EPA 350.1	LDB	1	PASI-K
		EPA 350.1	JES	1	PASI-K

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: CHRONIC WET TEST
Pace Project No.: 60306838

Sample: EFF WET CHRONIC		Lab ID: 60306838001	Collected: 06/24/19 08:00	Received: 06/25/19 10:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

Chronic Toxicity

Analytical Method: EPA 821/R-02/013

Toxicity, Chronic

Complete

1.0 1

06/25/19 11:30

Sample: EFF AMM/SEL		Lab ID: 60306838003	Collected: 06/24/19 08:30	Received: 06/25/19 18:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

Field Data

Analytical Method:

Collected By

Client

1

06/25/19 08:30

Field pH

7.81

Std. Units

0.10 1

06/25/19 08:30

Field Temperature

22.7

deg C

0.50 1

06/25/19 08:30

200.8 MET ICPMS

Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Selenium

ND

ug/L

1.0 1

07/08/19 10:33 07/08/19 17:49 7782-49-2

350.1 Ammonia, Unionized

Analytical Method: EPA 350.1

Unionized Ammonia as NH3

0.0

mg/L

0.0 1

07/10/19 13:55

350.1 Ammonia

Analytical Method: EPA 350.1

Nitrogen, Ammonia

ND

mg/L

0.10 1

07/02/19 12:17 7664-41-7

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: CHRONIC WET TEST

Pace Project No.: 60306838

QC Batch: 594925

Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8

Analysis Description: 200.8 MET

Associated Lab Samples: 60306838003

METHOD BLANK: 2437892

Matrix: Water

Associated Lab Samples: 60306838003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Selenium	ug/L	ND	1.0	07/08/19 17:45	

LABORATORY CONTROL SAMPLE: 2437893

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	40	41.7	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2437894 2437895

Parameter	Units	60307051001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Selenium	ug/L	1.6	40	40	40.0	40.6	96	98	70-130	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: CHRONIC WET TEST

Pace Project No.: 60306838

QC Batch: 593950

Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1

Analysis Description: 350.1 Ammonia

Associated Lab Samples: 60306838003

METHOD BLANK: 2434671

Matrix: Water

Associated Lab Samples: 60306838003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	07/02/19 12:01	

LABORATORY CONTROL SAMPLE: 2434672

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	99	90-110	

MATRIX SPIKE SAMPLE: 2434673

Parameter	Units	60307309001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2.5	5	7.3	96	90-110	

MATRIX SPIKE SAMPLE: 2434675

Parameter	Units	60307105001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	0.14	5	5.2	101	90-110	

SAMPLE DUPLICATE: 2434674

Parameter	Units	60306882003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Ammonia	mg/L	2.4	2.4	0	18	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: CHRONIC WET TEST
Pace Project No.: 60306838

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City
PASI-SE Pace Analytical Services - SE Kansas

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHRONIC WET TEST

Pace Project No.: 60306838

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60306838001	EFF WET CHRONIC	EPA 821/R-02/013	594744		
60306838003	EFF AMM/SEL		595443		
60306838003	EFF AMM/SEL	EPA 200.8	594925	EPA 200.8	595094
60306838003	EFF AMM/SEL	EPA 350.1	595750		
60306838003	EFF AMM/SEL	EPA 350.1	593950		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Sample Condition Upon Receipt

WO#: 60306838Client Name: AWRCourier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☒Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐Thermometer Used: T-296 Type of Ice: Ver Blue ☐ None ☒Cooler Temperature (°C): As-read 2.9 Corr. Factor -1.0 Corrected 1.9

Date and initials of person examining contents:

6/25/19

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

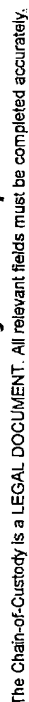
Client Notification/ Resolution: _____ Copy COC to Client? Y / N _____ Field Data Required? Y / N _____

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____

Date: _____



The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Sample Condition Upon Receipt

60306838

Client Name: AWR

Courier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-243 Type of Ice: Wet Blue ☐ None ☐

Cooler Temperature (°C): As-read 3.6 Corr. Factor -1.9 Corrected 2.7

Date and initials of person examining contents:

6/25/19
MB/MSO

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Flush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC. Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (NO ₃ , H ₂ SO ₄ , HCl<2, NaOH>9 Sulfide, NaOH>10 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO		
Cyanide water sample checks:		
Rad acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Tip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area. State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y ☒ N ☐ Field Data Required? Y ☐ N ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

REFERENCE #60306838

July 5, 2019

Gary Hutchcraft
Alliance Water Resources (Lake of Ozarks)
#3 Anderson Road
Lake Ozark, MO 65049

Re: Lab Project Number: 60306838
Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any question concerning this report, please feel free to contact me.

Sincerely,



Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

REFERENCE #60306838

**CHRONIC TOXICITY TEST FOR
Alliance Water Resources (Lake of Ozarks)**

PERMIT # MO-0103241

PERFORMED ON:

Pimephales promelas

and

Ceriodaphnia dubia

PREPARED FOR:

Alliance Water Resources (Lake of Ozarks)
Attn: Gary Hutchcraft
#3 Anderson Road
Lake Ozark, MO 65049
573-365-0455

PREPARED BY:
Pace Analytical Services, Inc.
808 West McKay
Frontenac, KS 66763
1-620-235-0003

July 5, 2019

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
SUMMARY	4
INTRODUCTION	5
TEST MATERIAL	5
TEST METHODS	5
TEST ORGANISMS	5
RESULTS	6
TEST CONDITIONS	11
TEST VALIDITY	17
CONCLUSIONS	17
APPENDIX A – STATISTICAL ANALYSIS	
APPENDIX B - CHAIN OF CUSTODY FORMS	
APPENDIX C – REFERENCE TOXICANT SUMMARY	

SUMMARY

A Chronic Whole Effluent Toxicity Test using the 7-day chronic fathead minnows (Pimephales promelas), static renewal larval survival and growth test, and three brood 7-day chronic Cladoceran (Ceriodaphnia dubia), static renewal survival and reproduction test, was conducted on effluent discharge water collected at Alliance Water Resources (Lake of Ozarks) effluent discharge from June 24, 2019 to June 28, 2019. All the test methods followed are as listed in EPA 821-R-02-013, "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms."

Statistically significant ($p < 0.05$) mortality is determined by Dunnett's procedure using average percent survival of each test concentration versus the average survival of the controls. If significant mortality occurs, median lethal concentrations are calculated using effluent concentrations and their corresponding percent mortality data. The 95% confidence intervals are calculated where appropriate by the Spearman-Kärber method. Statistical analysis is accomplished by following steps in EPA 821-R-02-013, June 2002 and by use of Toxstat version 3.4.

In minnow section of testing, it was observed that the effluent had no significant effect on the survival of the larvae at the 100% concentration. No significant mortality was observed in the other effluent concentrations after the 7-day exposure period. The No Observed Effect Concentration (NOEC) was determined to be 100% for survival. No significant reduction in growth was observed in the 100% effluent concentration. The Toxic Units is < 1 . The IC_{25} is > 100 . The NOEC for growth in effluent was determined to be 100%.

In Cladoceran section of testing, it was observed that the effluent had no significant effect on the survival of the organisms in the 100% effluent concentration. No significant mortality was observed in the other effluent concentrations after the 7-day exposure period. The No Observed Effect Concentration (NOEC) was determined to be 100% for survival. No significant reduction in reproduction was observed in the 100% effluent concentrations. The Toxic Units is < 1 . The IC_{25} is > 100 . The NOEC for reproduction in effluent was determined to be 100%.

The chronic toxicity exhibited by the fathead minnows and the Ceriodaphnia treated by the effluent sampled from June 24 to June 28 from the Alliance Water Resources (Lake of Ozarks) effluent discharge, is acceptable as described in EPA 821-R-02-013.

INTRODUCTION

Pace Analytical was contracted to perform this chronic toxicity test on effluent from Alliance Water Resources (Lake of Ozarks) effluent discharge. Chronic toxicity was measured using the Pimephales promelas at larval for survival and growth test and the Ceriodaphnia dubia survival and reproduction test described in EPA 821-R-02-013, "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." The raw data of the study is stored at Pace Analytical Services, INC. 808 West McKay, Frontenac, KS 66763.

TEST MATERIAL

Alliance Water Resources (Lake of Ozarks) personnel collected sampling of the effluent. A sample of the effluent was delivered to Pace by commercial carrier on 6-25-19. Subsequent samples followed by delivery on 6-27-19 and on 6-29-19. All samples were stored at $\leq 6^{\circ}$ Celsius. Upstream was used as a control and also to make the required dilutions in the test as described in EPA 821-R-02-013.

TEST METHODS

Pace used EPA test method 1000.0 for conducting the Fathead Minnow, Pimephales promelas, Larval Survival and Growth Test. EPA test method 1002.0 was used for conducting the Cladoceran, Ceriodaphnia dubia, Survival and Reproduction Test. The tests were conducted to estimate the LC50, NOEC, and LOEC for survival, growth, and reproduction of these test species.

The Pimephales and Ceriodaphnia tests were initiated on 6-25-19 and carried out until 7-2-19. The Pimephales tests were conducted in 500 ml plastic jars with 250 ml of test solution. Ten larvae were placed in each of at least 4 replicates to make a total of 40 larvae per sample concentration. The Ceriodaphnia tests were carried out in 35ml vials containing 25 ml of test solution. One Neonate was placed in each of 10 replicates to make a total of 10 neonates per sample concentration.

TEST ORGANISMS

The organisms used in these tests were cultured at Pace under controlled temperature and photoperiod conditions and/or were purchased from an external supplier. Pace maintains records of all culture techniques used in producing organisms.

REFERENCE #60306838

RESULTS

TABLE 1

Permittee: Alliance Water Resources (Lake of Ozarks) Effluent discharge.

Date Sampled	No. 1: 6-24-19	8:00
	No. 2: 6-26-19	8:00
	No. 3: 6-28-19	8:00

Test Initiated: 11:30 Date: 6-25-19

Dilution Water used: Upstream

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL
(*Pimephales promelas*)

DATA TABLE FOR GROWTH OF FATHEAD MINNOWS

Effluent Concentration (%)	Average Dry Weight in Milligrams in Replicate Chambers				Mean Dry Weight (mg)	CV% *
	A	B	C	D		
Upstream 0%	0.535	0.553	0.556	0.558	0.551	1.91
Dilution 1 6.25%	0.560	0.439	0.491	0.387	0.469	15.75
Dilution 2 12.5%	0.522	0.551	0.441	0.543	0.514	9.79
Dilution 3 25%	0.424	0.493	0.472	0.485	0.469	6.60
Dilution 4 50%	0.560	0.440	0.582	0.512	0.499	12.72
Dilution 5 100%	0.440	0.487	0.596	0.523	0.512	12.86

* Coefficient of Variation = Standard Deviation X 100 / Mean

REFERENCE #60306838

Permittee: Alliance Water Resources (Lake of Ozarks) Effluent discharge.

FATHEAD MINNOW SURVIVAL

Conc. %	Percent Survival in Replicate Chambers				Mean Percent Survival			CV %
	A	B	C	D	24hr	48hr	7 day	
Upstream 0%	100	100	100	100	100	100	100	0.00
Dilution 1 6.25%	100	100	100	90	100	100	97.5	5.94
Dilution 2 12.5%	100	100	100	100	100	100	100	0.00
Dilution 3 25%	90	100	100	100	100	100	97.5	5.94
Dilution 4 50%	100	90	100	100	100	100	97.5	5.94
Dilution 5 100%	90	100	100	100	100	100	97.5	5.94

Permittee: Alliance Water Resources (Lake of Ozarks) Effluent discharge.

CERIODAPHNIA SURVIVAL AND REPRODUCTION

DATA TABLE FOR CERIODAPHNIA YOUNG PRODUCTION

Replicate	Upstream 0%	Dilution 1 6.25%	Dilution 2 12.5%	Dilution 3 25%	Dilution 4 50%	Dilution 5 100%
1	20	18	15	17	18	20
2	19	18	21	25	19	18
3	25	24	24	16	20	23
4	24	23	27	18	23	24
5	20	17	24	21	21	25
6	24	24	18	20	26	22
7	18	19	25	23	20	24
8	23	23	23	24	23	21
9	26	21	17	24	18	19
10	18	24	21	27	17	22
Mean	21.7	21.1	21.5	21.5	20.5	21.8
SD	3.020	2.846	3.837	3.689	2.799	2.300
CV %	13.92	13.49	17.85	17.16	13.65	10.55

REFERENCE #60306838

Permittee: Alliance Water Resources (Lake of Ozarks) Effluent discharge

CERIODAPHNIA MEAN PERCENT SURVIVAL

Percent Effluent (%)						
Time Elapsed	Upstream 0%	Dilution 1 6.25%	Dilution 2 12.5%	Dilution 3 25%	Dilution 4 50%	Dilution 5 100%
24 hrs	100	100	100	100	100	100
48 hrs	100	100	100	100	100	100
7-day	100	100	100	100	100	100
SD	0.000	0.000	0.000	0.000	0.000	0.000
CV %	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 2
SUMMARY OF TEST CONDITIONS FOR THE FATHEAD MINNOW
(*Pimephales promelas*) LARVAL SURVIVAL AND GROWTH TEST

1. Test type	Static renewal
2. Temperature	25 degrees Celsius
3. Light quality	Ambient laboratory light
4. Light intensity	Ambient laboratory levels
5. Photoperiod	16 hr light, 8 hr dark
6. Test chamber size	500 ml
7. Test solution volume	250 ml
8. Renewal of test concentrations	Daily
9. Age of test organism	< 24 hours
10. No. larvae/chamber	10
11. No. replicates/concentration	4
12. No. larvae/concentration	40
13. Feeding regime	Feed 0.15 g newly hatched brine shrimp nauplii two times daily. Larvae are not fed 12 hours prior to termination of test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None

TABLE 2 (CONT.)

16. Dilution Water	Upstream
17. Effluent concentrations	0%, 6.25%, 12.5%, 25%, 50%, 100%
18. Test duration	7 days
19. Endpoints	Survival and growth
20. Test acceptability	80% or greater survival in the controls, Average dry weight in controls >0.25 mg, Coefficient of variation in the control must not exceed 40%.

TABLE 2 (CONT.)

**SUMMARY OF TEST CONDITIONS FOR THE CLADOCERAN
(*Ceriodaphnia dubia*) SURVIVAL AND REPRODUCTION TEST**

1. Test type	Static renewal
2. Temperature	25 degrees Celsius
3. Light quality	Ambient laboratory light
4. Light intensity	Ambient laboratory levels
5. Photoperiod	16 hr light, 8 hr dark
6. Test chamber size	30 ml
7. Test solution volume	25 ml

TABLE 2 (CONT.)

REFERENCE #60306838

8. Renewal of test concentrations	Daily
9. Age of test organism	< 24 hours
10. No. larvae/chamber	1
11. No. replicates/concentration	10
12. No. larvae/concentration	10
13. Feeding regime	Feed 0.1 ml YCT and 0.1 ml of Algae daily. Larvae are not fed 12 hours prior to termination of test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None
16. Dilution Water	Upstream
17. Effluent concentrations	0%, 6.25%, 12.5%, 25%, 50%, 100%
18. Test duration	Until 60% or more surviving control females have three broods or a maximum of 8 days.
19. Endpoints	Survival and Reproduction
20. Test acceptability	80% or greater survival in the controls, Average reproduction rate of 15 young / adult. Coefficient of variation in the control must not exceed 40%.

TABLE 2 (SECTION 2)

BIOMONITORING CHRONIC TOXICITY REPORT
FATHEAD MINNOW (Pimephales promelas)
CHEMICAL PARAMETERS CHART

Permittee: Alliance Water Resources (Lake of Ozarks) Effluent discharge.

ANALYSTS: Pace Analytical Services, Inc.
Timothy Harrell
Mike Bollin

SAMPLE NO. 1 COLLECTED: DATE: 6-24-19

SAMPLE NO. 2 COLLECTED: DATE: 6-26-19

SAMPLE NO. 3 COLLECTED: DATE: 6-28-19

TABLE 2 (SECTION 2)
INITIAL WATER QUALITY
EFFLUENT CONCENTRATION

	Upstream	100%
PH	8.12	8.20
D.O.	8.30	8.30
Temp	25.0	25.0
Alk	250	302
Hard	272	314
Cond	690	1350
Chlorine	<0.1	<0.1

- * D.O. is reported as mg/L
- Alkalinity is reported as mg/L CaCO₃
- Hardness is reported as mg/L CaCO₃
- Conductance is reported as umhos
- Chlorine is reported as mg/L

TEST WATER QUALITY

24-Hour Water Quality Measurements

Effluent Concentration (%)	PH	D.O. (mg/l)	Temperature (C)
0% Upstream	8.40	7.20	24.9
6.25% Effluent	8.43	7.20	24.9
12.5% Effluent	8.47	7.30	24.9
25% Effluent	8.50	7.30	24.9
50% Effluent	8.53	7.30	24.9
100% Effluent	8.56	7.40	24.9

48-Hour Water Quality Measurements

Effluent Concentration (%)	PH	D.O. (mg/l)	Temperature (C)
0% Upstream	8.43	7.30	25.0
6.25% Effluent	8.45	7.30	25.0
12.5% Effluent	8.49	7.30	25.0
25% Effluent	8.51	7.30	25.0
50% Effluent	8.55	7.30	25.0
100% Effluent	8.59	7.30	25.0

REFERENCE #60306838

FINAL WATER QUALITY

EFFLUENT CONCENTRATION

	Upstream	100%
pH	8.55	8.52
D.O.	7.10	7.20
Temp	25.2	25.2
Alk	262	316
Hard	280	324
Cond	724	1411

- * D.O. is reported as mg/L
- Alkalinity is reported as mg/L CaCO₃
- Hardness is reported as mg/L CaCO₃
- Conductance is reported as umhos

TEST VALIDITY

The Pimephales promelas control survival rate was 100. The mean dry weight (growth) of the Pimephales promelas was determined at 0.551 g/organism in the controls. The percent coefficient of variation (%CV) values for the fathead minnow control for survival and growth were 0.00 and 1.91. The Ceriodaphnia dubia survival rates were 100 in the control. The Ceriodaphnia in the control produced an average of 21.7 young over the seven-day exposure period. Percent CV values for Ceriodaphnia dubia control survival and reproduction was 0.00 and 13.92. Control data met or exceeded all criteria set out by EPA 821-R-02-013 for test acceptance.

CONCLUSIONS

The No Observed Effect Concentration (NOEC) for Pimephales promelas was 100% for survival and 100% for growth. The No Observed Effect Concentration (NOEC) for Ceriodaphnia dubia was 100% for Survival and 100% for Reproduction. The tests were ran using an upstream control against effluent concentrations of 6.25%, 12.5%, 25%, 50%, and 100%. The effluent sampled on 6-24-19, 6-26-19, and 6-28-19 exhibited acceptable chronic toxicity in Pimephales promelas and in Ceriodaphnia dubia during the exposure period as described in EPA 821-R-02-013.

APPENDIX C

REFERENCE TOXICANTS

The absence of significant control mortality during this test indicated the health of the organisms and indicated that any significant mortality in the test concentrations was not due to contaminants or variations in testing conditions.

Reference toxicity testing is routinely performed by staff members in our biomonitoring - bioassay laboratory.

Start: 6/25/19 11:30

End: 7/2/19 10:45

Reference Toxicant (NaCl) Pimephales promelas

Concentration of Toxicant	Avg. # of Live Organisms/replicate			
	0 hrs	24 hrs	48 hrs	7 days
10 g/l	40	11	2	0
8 g/l	40	30	20	4
6 g/l	40	36	32	23
4 g/l	40	40	40	38
2 g/l	40	40	40	40

IC25 (4.85 g/l Sodium Chloride)

Survival NOEC: 4.0 g/l

Reference Toxicant (NaCl) Ceriodaphnia Dubia

Concentration of Toxicant	Avg. # of Live Organisms/replicate			
	0 hrs	24 hrs	48 hrs	7 days
2.5 g/l	10	5	0	0
2.0 g/l	10	10	7	0
1.5 g/l	10	10	10	10
1.0 g/l	10	10	10	10
0.5 g/l	10	10	10	10

IC25 (1.15 g/l Sodium Chloride)

Survival NOEC: 1.5 g/l

Submitted By:


Timothy Harrell, Technical Director

60306838 AWR FATHEAD SURVIVAL

File: 6306838A Transform: ARC SINE(SQUARE ROOT(Y))

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.608	5.808	9.168	5.808	1.608
OBSERVED	0	4	20	0	0

Calculated Chi-Square goodness of fit test statistic = 22.3848

Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

60306838 AWR FATHEAD SURVIVAL

File: 6306838A Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's test for normality

D = 0.080

W = 0.664

Critical W (P = 0.05) (n = 24) = 0.916

Critical W (P = 0.01) (n = 24) = 0.884

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

60306838 AWR FATHEAD SURVIVAL

File: 6306838A Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Upstream	4	1.412	1.412	1.412
2	6.25%	4	1.249	1.412	1.371
3	12.5%	4	1.412	1.412	1.412
4	25%	4	1.249	1.412	1.371
5	50%	4	1.249	1.412	1.371
6	100%	4	1.249	1.412	1.371

60306838 AWR FATHEAD SURVIVAL

File: 6306838A Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Upstream	0.000	0.000	0.000	0.00
2	6.25%	0.007	0.081	0.041	5.94
3	12.5%	0.000	0.000	0.000	0.00
4	25%	0.007	0.081	0.041	5.94
5	50%	0.007	0.081	0.041	5.94
6	100%	0.007	0.081	0.041	5.94

60306838 AWR FATHEAD SURVIVAL

File: 6306838A Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.009	0.002	0.400
Within (Error)	18	0.080	0.004	
Total	23	0.089		

Critical F value = 2.77 (0.05,5,18)

Since $F < \text{Critical } F$ FAIL TO REJECT H_0 : All equal

60306838 AWR FATHEAD SURVIVAL

File: 6306838A Transform: ARC SINE(SQUARE ROOT(Y))

DUNNETT'S TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	Upstream	1.412	1.000		
2	6.25%	1.371	0.975	0.866	
3	12.5%	1.412	1.000	0.000	
4	25%	1.371	0.975	0.866	
5	50%	1.371	0.975	0.866	
6	100%	1.371	0.975	0.866	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

60306838 AWR FATHEAD SURVIVAL

File: 6306838A

Transform: ARC SINE(SQUARE ROOT(Y))

DUNNETT'S TEST

TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	Upstream	4			
2	6.25%	4	0.047	4.7	0.025
3	12.5%	4	0.047	4.7	0.000
4	25%	4	0.047	4.7	0.025
5	50%	4	0.047	4.7	0.025
6	100%	4	0.047	4.7	0.025

60306838 AWR FATHEAD GROWTH

File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

Shapiro - Wilk's test for normality

D = 0.052

W = 0.950

Critical W (P = 0.05) (n = 24) = 0.916

Critical W (P = 0.01) (n = 24) = 0.884

Data PASS normality test at P=0.01 level. Continue analysis.

60306838 AWR FATHEAD GROWTH

File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance

Calculated B1 statistic = 8.37

Table Chi-square value = 15.09 (alpha = 0.01, df = 5)

Table Chi-square value = 11.07 (alpha = 0.05, df = 5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

60306838 AWR FATHEAD GROWTH
File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Upstream	4	0.535	0.558	0.551
2	6.25%	4	0.387	0.560	0.469
3	12.5%	4	0.441	0.551	0.514
4	25%	4	0.424	0.493	0.469
5	50%	4	0.440	0.582	0.499
6	100%	4	0.440	0.596	0.512

60306838 AWR FATHEAD GROWTH
File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Upstream	0.000	0.011	0.005	1.91
2	6.25%	0.005	0.074	0.037	15.75
3	12.5%	0.003	0.050	0.025	9.79
4	25%	0.001	0.031	0.015	6.60
5	50%	0.004	0.063	0.032	12.72
6	100%	0.004	0.066	0.033	12.86

60306838 AWR FATHEAD GROWTH
File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.019	0.004	1.323
Within (Error)	18	0.052	0.003	
Total	23	0.071		

Critical F value = 2.77 (0.05,5,18)

Since $F < \text{Critical } F$ FAIL TO REJECT H_0 : All equal

60306838 AWR FATHEAD GROWTH
File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

DUNNETT'S TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	Upstream	0.551	0.551		
2	6.25%	0.469	0.469	2.133	
3	12.5%	0.514	0.514	0.952	
4	25%	0.469	0.469	2.153	
5	50%	0.499	0.499	1.365	
6	100%	0.512	0.512	1.024	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

60306838 AWR FATHEAD GROWTH

File: C:\TOXSTAT\6306838B.

Transform: NO TRANSFORMATION

DUNNETT'S TEST

TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	Upstream	4			
2	6.25%	4	0.092	16.7	0.081
3	12.5%	4	0.092	16.7	0.036
4	25%	4	0.092	16.7	0.082
5	50%	4	0.092	16.7	0.052
6	100%	4	0.092	16.7	0.039

FISHER'S EXACT TEST

=====			
NUMBER OF			

IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS
-----	-----	-----	-----
CONTROL	10	0	10
6.25%	10	0	10
-----	-----	-----	-----
TOTAL	20	0	20
=====			

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10.
 Since b is greater than 6 there is no significant difference
 between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

=====			
NUMBER OF			

IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS
-----	-----	-----	-----
CONTROL	10	0	10
12.5%	10	0	10
-----	-----	-----	-----
TOTAL	20	0	20
=====			

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10.
 Since b is greater than 6 there is no significant difference
 between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

=====			
NUMBER OF			

IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS
-----	-----	-----	-----
CONTROL	10	0	10
25%	10	0	10
-----	-----	-----	-----

TOTAL	20	0	20
-------	----	---	----

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10.
 Since b is greater than 6 there is no significant difference
 between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

IDENTIFICATION	NUMBER OF		
	ALIVE	DEAD	TOTAL ANIMALS
CONTROL	10	0	10
50%	10	0	10
TOTAL	20	0	20

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10.
 Since b is greater than 6 there is no significant difference
 between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

IDENTIFICATION	NUMBER OF		
	ALIVE	DEAD	TOTAL ANIMALS
CONTROL	10	0	10
100%	10	0	10
TOTAL	20	0	20

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10.
 Since b is greater than 6 there is no significant difference
 between CONTROL and TREATMENT at the 0.05 level.

SUMMARY OF FISHER'S EXACT TESTS

NUMBER	NUMBER	SIG
--------	--------	-----

GROUP	IDENTIFICATION	EXPOSED	DEAD	(P=.05)
	CONTROL	10	0	
1	6.25%	10	0	
2	12.5%	10	0	
3	25%	10	0	
4	50%	10	0	
5	100%	10	0	

60306838 AWR CERIODAPHNIA DUBIA SURVIVA

File: C:\TOXSTAT\6306838D.

Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Upstream	10	1.000	1.000	1.000
2	6.25%	10	1.000	1.000	1.000
3	12.5%	10	1.000	1.000	1.000
4	25%	10	1.000	1.000	1.000
5	50%	10	1.000	1.000	1.000
6	100%	10	1.000	1.000	1.000

60306838 AWR CERIODAPHNIA DUBIA SURVIVA

File: C:\TOXSTAT\6306838D.

Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Upstream	0.000	0.000	0.000	0.00
2	6.25%	0.000	0.000	0.000	0.00
3	12.5%	0.000	0.000	0.000	0.00
4	25%	0.000	0.000	0.000	0.00
5	50%	0.000	0.000	0.000	0.00
6	100%	0.000	0.000	0.000	0.00

60306838 AWR CERIODAPHNIA DUBIA REPRODU
File: 6306838E Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	4.020	14.520	22.920	14.520	4.020
OBSERVED	2	20	14	23	1

Calculated Chi-Square goodness of fit test statistic = 13.7760

Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

60306838 AWR CERIODAPHNIA DUBIA REPRODU
File: 6306838E Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance

Calculated B1 statistic = 3.06

Table Chi-square value = 15.09 (alpha = 0.01, df = 5)

Table Chi-square value = 11.07 (alpha = 0.05, df = 5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

60306838 AWR CERIODAPHNIA DUBIA REPRODU

File: 6306838E

Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Upstream	10	18.000	26.000	21.700
2	6.25%	10	17.000	24.000	21.100
3	12.5%	10	15.000	27.000	21.500
4	25%	10	16.000	27.000	21.500
5	50%	10	17.000	26.000	20.500
6	100%	10	18.000	25.000	21.800

60306838 AWR CERIODAPHNIA DUBIA REPRODU

File: 6306838E

Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Upstream	9.122	3.020	0.955	13.92
2	6.25%	8.100	2.846	0.900	13.49
3	12.5%	14.722	3.837	1.213	17.85
4	25%	13.611	3.689	1.167	17.16
5	50%	7.833	2.799	0.885	13.65
6	100%	5.289	2.300	0.727	10.55

60306838 AWR CERIODAPHNIA DUBIA REPRODU

File: 6306838E

Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	11.550	2.310	0.236
Within (Error)	54	528.100	9.780	
Total	59	539.650		

Critical F value = 2.45 (0.05,5,40)

Since $F < \text{Critical } F$ FAIL TO REJECT H_0 : All equal

60306838 AWR CERIODAPHNIA DUBIA REPRODU

File: 6306838E

Transform: NO TRANSFORMATION

DUNNETT'S TEST

TABLE 1 OF 2

Ho: Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	Upstream	21.700	21.700		
2	6.25%	21.100	21.100	0.429	
3	12.5%	21.500	21.500	0.143	
4	25%	21.500	21.500	0.143	
5	50%	20.500	20.500	0.858	
6	100%	21.800	21.800	-0.072	

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, df=40,5)

60306838 AWR CERIODAPHNIA DUBIA REPRODU

File: 6306838E

Transform: NO TRANSFORMATION

DUNNETT'S TEST

TABLE 2 OF 2

Ho: Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	Upstream	10			
2	6.25%	10	3.231	14.9	0.600
3	12.5%	10	3.231	14.9	0.200
4	25%	10	3.231	14.9	0.200
5	50%	10	3.231	14.9	1.200
6	100%	10	3.231	14.9	-0.100

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	6.25	12.5	25	50	100
Response 1	20	18	15	17	18	20
Response 2	19	18	21	25	19	18
Response 3	25	24	24	16	20	23
Response 4	24	23	27	18	23	24
Response 5	20	17	24	21	21	25
Response 6	24	24	18	20	26	22
Response 7	18	19	25	23	20	24
Response 8	23	23	23	24	23	21
Response 9	26	21	17	24	18	19
Response 10	18	24	21	27	17	22

*** Inhibition Concentration Percentage Estimate ***

Toxicant/Effluent: AWR

Test Start Date: 6/25/19 Test Ending Date: 7/2/19

Test Species: Dubia

Test Duration: 7 day

DATA FILE:

Conc. ID	Number Replicates	Concentration	Response Means	Std. Dev.	Pooled Response Means
1	10	0.000	21.700	3.020	21.700
2	10	6.250	21.100	2.846	21.367
3	10	12.500	21.500	3.837	21.367
4	10	25.000	21.500	3.689	21.367
5	10	50.000	20.500	2.799	21.150
6	10	100.000	21.800	2.300	21.150

*** No Linear Interpolation Estimate can be calculated from the input data since none of the (possibly pooled) group response means were less than 75% of the control response mean.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	6.25	12.5	25	50	100
Response 1	.535	.560	.522	.424	.560	.440
Response 2	.553	.439	.551	.493	.440	.487
Response 3	.556	.491	.441	.472	.582	.596
Response 4	.558	.387	.543	.485	.512	.523

*** Inhibition Concentration Percentage Estimate ***

Toxicant/Effluent: AWR

Test Start Date: 6/25/19 Test Ending Date: 7/2/19

Test Species: Fathead

Test Duration: 7 day

DATA FILE:

Conc. ID	Number Replicates	Concentration	Response Means	Std. Dev.	Pooled Response Means
1	4	0.000	0.551	0.011	0.551
2	4	6.250	0.469	0.074	0.497
3	4	12.500	0.514	0.050	0.497
4	4	25.000	0.469	0.031	0.497
5	4	50.000	0.524	0.063	0.497
6	4	100.000	0.512	0.066	0.497

*** No Linear Interpolation Estimate can be calculated from the input data since none of the (possibly pooled) group response means were less than 75% of the control response mean.



CHAIN-OF-CUSTODY / Analytical Request Document

Section A

Required Client Information:

Section B

Required Project Information:

Section C

Invoice Information:

Company: Alliance Water Resources

Report To: Gary Hulcraft

Attention: Same

Address: #3 Anderson Road
Lake Ozark, MO 65049

Copy To:

Company Name:

Email To: ghulcraft@alliancewater.com

Purchase Order No.:

Address:

Phone: (573) 365-0455 Fax:

Project Name: Chronic Wet Test

Reference: Heather Wilson (913) 563-1407

Requested Due Date/TAT:

Project Number:

Price Profile #: 13100, 1 & 2

REGULATORY AGENCY

☒ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA

Site Location: MO

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER WASTE WATER WASTE WATER PRODUCT SOIL/SOLID OIL WPE AIR OTHER Tissue	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Chronic Wet Test	Unionized Ammonia*	350.1 Ammonia	200.8 Total Selenium	Residual Chlorine (Y/N)	Pace Project No./ Lab ID.
					DATE	TIME			DATE	TIME						
1	EFF. WET CARBON		WET C	G	6/24/19	8:30	18	1								6306 838
2	WDS/AMM		WDS G	G	6/24/19	8:30	18	1								Field pH: 7.81
3	EFF AMM		EFF G	G	6/24/19	8:30	18	1								Field Temp: 22.7°C
4	SL		SL G	G	6/24/19	8:30	18	1								
5																
6																
7																
8																
9																
10																
11																
12																

Section E

Additional Comments:

Field pH & Temperature is required in order to calculate the Unionized Ammonia

1140 RAIN EVENT 175"

Handwritten signature: Gary Hulcraft

Handwritten signature: Heather Wilson

Handwritten signature: Gary Hulcraft

Handwritten signature: Gary Hulcraft

Handwritten signature: Gary Hulcraft

Handwritten signature: Gary Hulcraft

Handwritten signature: Gary Hulcraft

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company:	Alliance Water Resources
Address:	#3 Anderson Road Lake Ozark, MO 65049
Email to:	ghutchcraft@alliancewater.com
Phone:	(573) 365-0455
Requested Due Date/TAT:	Standard 10 day TAT

Section B Required Project Information:

Report to:	Gary Hutchcraft
Copy To:	
Purchase Order No.:	
Project Name:	Chronic Wet Test
Project Number:	

Section C Invoice Information:

Attention:	Same
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson (913) 563-1407
Pace Profile #:	13100, 1 & 2

REGULATORY AGENCY

<input checked="" type="checkbox"/> NPDES	<input type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER

Site Location	MO
STATE:	

Requested Analysis Filtered (Y/N)

<input checked="" type="checkbox"/> Chronic Wet Test
<input checked="" type="checkbox"/> Unionized Ammonia
<input checked="" type="checkbox"/> 350.1 Ammonia
<input checked="" type="checkbox"/> 200.8 Total Selenium

Residual Chlorine (Y/N)

Pace Project No./Lab ID.

Section D Required Client Information		Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOIL/SOLID OL OIL WIFE WP AIR AR OTHER OT TISSUE TS																																																																																																																																																																																																																																																																																		
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE																																																																																																																																																																																																																																																																																				
ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED																																																																																																																																																																																																																																																																																	
	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Residual Chlorine (Y/N)	Pace Project No / Lab I.D.																																																																																																																																																																																																																																																																										
1	EFT DET CHARGE	C	6/24/19	8:00	6/24/19	8:00	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Chronic Wet Test	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION

DATE

TIME

ACCEPTED BY / AFFILIATION

DATE

TIME

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY):

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Sample Condition Upon Receipt

Lake Ozark

Client Name:

AWR

Courier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #:

Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-243 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 29 Corr. Factor -1.9 Corrected 2.0

Date and initials of person examining contents

Temperature should be above freezing to 6°C

Chain of Custody present: ☒ Yes ☐ No ☐ N/A

Chain of Custody relinquished: ☒ Yes ☐ No ☐ N/A

Samples arrived within holding time: ☒ Yes ☐ No ☐ N/A

Short Hold Time analyses (<72hr): ☒ Yes ☐ No ☐ N/A

Rush Turn Around Time requested: ☐ Yes ☒ No ☐ N/A

Sufficient volume: ☒ Yes ☐ No ☐ N/A

Correct containers used: ☒ Yes ☐ No ☐ N/A

Pace containers used: ☒ Yes ☐ No ☐ N/A

Containers intact: ☒ Yes ☐ No ☐ N/A

Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? ☐ Yes ☐ No ☒ N/A

Filtered volume received for dissolved tests? ☐ Yes ☐ No ☒ N/A

Sample labels match COC: Date / time / ID / analyses ☒ Yes ☐ No ☐ N/A

Samples contain multiple phases? Matrix: ☐ Yes ☒ No ☐ N/A

Containers requiring pH preservation in compliance? ☐ Yes ☐ No ☒ N/A

(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)

(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)

Cyanide water sample checks:

Lead acetate strip turns dark? (Record only) ☐ Yes ☐ No

Potassium iodide test strip turns blue/purple? (Preserve) ☐ Yes ☐ No

Trip Blank present: ☐ Yes ☐ No ☒ N/A

Headspace in VOA vials (>6mm): ☐ Yes ☐ No ☒ N/A

Samples from USDA Regulated Area: State: ☐ Yes ☐ No ☒ N/A

Additional labels attached to 5035A / TX1005 vials in the field? ☐ Yes ☐ No ☒ N/A

List sample IDs, volumes, lot #'s of preservative and the date/time added.

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

Project Manager Review:

Date:

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company: Alliance Water Resources
Address: #3 Anderson Road
Lake Ozark, MO 65049
Email To: ghutchcraft@alliancewater.com
Phone: (573) 365-0455
Fax: Standard 10 day TAT
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Gary Hutchcraft
Copy To:
Purchase Order No.:
Project Name: Chronic Wet Test
Project Number:

Section C Invoice Information:

Company Name: Same
Address:
Reference: Same
Project Manager: Heather Wilson (313) 563-1407
Page Profile #: 13100, 1 & 2

REGULATORY AGENCY

☒ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location: MO
STATE:

Requested Analysis Filtered (Y/N)

☒ Chronic Wet Test
☒ Unionized Ammonia
☒ 350.1 Ammonia
☒ 200.8 Total Selenium

Residual Chlorine (Y/N)

Page Project No./Lab I.D.

Section D Required Client Information		Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW WASTE WATER PRODUCT P SOLID WASTE SL DILUTE WASTE WL WASTE AIR WA OTHER TISSUE OT TS									
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE											
ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED								
	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Y/N	Residual Chlorine (Y/N)	Pace Project No./Lab I.D. G016-001 ✓ 008
1	EFF. WET CHRONIC	C	6/21/19	8:00 AM	6/21/19	8:00 AM	✓	Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Chronic Wet Test Unionized Ammonia 350.1 Ammonia 200.8 Total Selenium	✓	
2	UPSTREAM	G	6/21/19	8:15 AM	6/21/19	8:15 AM	✓				
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
ADDITIONAL COMMENTS		REINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Sampled at 11:55		6/21/19	11:55		6/21/19	8:00 AM		Y	Y		

ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION: Same
DATE: 6/21/19
TIME: 8:00 AM

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gary Hutchcraft

SIGNATURE of SAMPLER: Gary Hutchcraft

DATE Signed (MM/DD/YYYY): 6/28/19

**Sample Condition Upon Receipt**Lake OzarkClient Name: AWRCourier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☒Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐Thermometer Used: T-243 2.1 Type of Ice: Wet Blue NoneCooler Temperature (°C): As-read 3.1 Corr. Factor -0.9 Corrected 1.2

Date and initials of person examining contents:

6/29/19
EW 8:00Temperature should be above freezing to 6°C 6/29/19

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted: _____

Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____

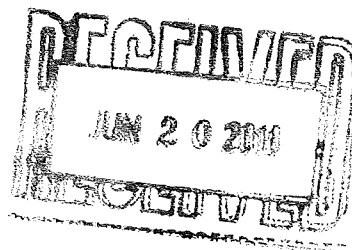
Date: _____



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

June 20, 2018

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049



RE: Project: ACUTE WET TEST
Pace Project No.: 60271899

2018 ANNUAL ACUTE
WET TEST

Dear Gary Hutchcraft:

Enclosed are the analytical results for sample(s) received by the laboratory on June 06, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC

9608 Loiret Blvd.

Lenexa, KS 66219

(913)599-5665

CERTIFICATIONS

Project: ACUTE WET TEST

Pace Project No.: 60271899

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

Southeast Kansas Certification IDs

808 West McKay, Frontenac, KS 66763

Arkansas Certification #: 17-016-0

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Oklahoma Certification #: 9935

Texas Certification #: T104704407

Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: ACUTE WET TEST

Pace Project No.: 60271899

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60271899001	INSTREAM WET	Water	06/05/18 09:00	06/06/18 08:00
60271899003	INSTREAM EFF AMM/SEL	Water	06/05/18 09:05	06/06/18 18:50

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: ACUTE WET TEST

Pace Project No.: 60271899

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60271899001	INSTREAM WET	EPA 821/R-02/012	MEB	1	PASI-SE
60271899003	INSTREAM EFF AMM/SEL	EPA 200.8	JGP	1	PASI-K
		EPA 350.1	LDB	1	PASI-K
		EPA 350.1	LDF	1	PASI-K

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: ACUTE WET TEST

Pace Project No.: 60271899

Sample: INSTREAM WET		Lab ID: 60271899001		Collected: 06/05/18 09:00		Received: 06/06/18 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
Acute Toxicity		Analytical Method: EPA 821/R-02/012							
Toxicity, Acute	Complete		1.0	1		06/06/18 10:30			

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 06/20/2018 03:08 PM

Page 5 of 24



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: ACUTE WET TEST

Pace Project No.: 60271899

Sample: INSTREAM EFF AMM/SEL Lab ID: 60271899003 Collected: 06/05/18 09:05 Received: 06/06/18 18:50 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Selenium	ND	ug/L	1.0	1	06/08/18 11:00	06/19/18 13:18	7782-49-2	
350.1 Ammonia, Unionized Analytical Method: EPA 350.1								
Unionized Ammonia as NH ₃	0	mg/L		1		06/18/18 12:54		
350.1 Ammonia Analytical Method: EPA 350.1								
Nitrogen, Ammonia	ND	mg/L	0.10	1		06/07/18 12:06	7664-41-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 06/20/2018 03:08 PM

Page 6 of 24

QUALITY CONTROL DATA

Project: ACUTE WET TEST
Pace Project No.: 60271899

QC Batch: 529134	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET
Associated Lab Samples: 60271899003	

METHOD BLANK: 2167817
Associated Lab Samples: 60271899003

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Selenium	ug/L	ND	1.0	06/19/18 12:24	

LABORATORY CONTROL SAMPLE: 2167818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	40	41.7	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2167819 2167820

Parameter	Units	60272022001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Selenium	ug/L	4.9	40	40	45.4	45.9	101	102	70-130	1 20	

MATRIX SPIKE SAMPLE: 2167821

Parameter	Units	60271970001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	<1.0	40	41.9	103	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: ACUTE WET TEST
Pace Project No.: 60271899

QC Batch: 528960 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 60271899003

METHOD BLANK: 2166934
Associated Lab Samples: 60271899003

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	06/07/18 11:22	

LABORATORY CONTROL SAMPLE: 2166935

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	99	90-110	

MATRIX SPIKE SAMPLE: 2166936

Parameter	Units	60272006001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	9.2	5	14.2	100	90-110	

MATRIX SPIKE SAMPLE: 2166938

Parameter	Units	60271917002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	5	5.2	103	90-110	

SAMPLE DUPLICATE: 2166937

Parameter	Units	60271914001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Ammonia	mg/L	0.84	0.84	1	18	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: ACUTE WET TEST
Pace Project No.: 60271899

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City
PASI-SE Pace Analytical Services - SE Kansas

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: ACUTE WET TEST

Pace Project No.: 60271899

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271899001	INSTREAM WET	EPA 821/R-02/012	529232		
60271899003	INSTREAM EFF AMM/SEL	EPA 200.8	529134	EPA 200.8	529235
60271899003	INSTREAM EFF AMM/SEL	EPA 350.1	530416		
60271899003	INSTREAM EFF AMM/SEL	EPA 350.1	528960		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Sample Condition Upon Receipt

WO#: 60271899



Client Name: AWR

Courier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-298 Type of Ice: Wet Blue ☐ None ☐

Cooler Temperature (°C): As-read 0.9 Corr. Factor +1.1 Corrected 2.0

Date and initials of person examining contents:

6/6/18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted: Gary Hutchcraft Date/Time: _____

Comments/ Resolution: Field pH for the unionized ammonia calculation? HMW 6/7/18

Project Manager Review:

Date: _____

REVIEWED

By hwilson at 9:03 am, 6/7/18

F-KS-C-003-Rev.11, February 28, 2018

The Chain-of-Custody is a LEGAL DOCUMENT - all relevant fields must be completed accurately.

The Chain-of-Custody is a LEGAL DOCUMENT - all relevant fields must be completed accurately.

Page 12 of 24

Sample Condition Upon Receipt

(Lake Ozark)

60271899

Client Name:

AWR

Courier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #:

Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-111 Type of Ice: Wet ☒ Blue ☐ None ☐

Cooler Temperature (°C): As-read 4.2 Corr. Factor -1.0 Corrected 3.2

Date and Initials of person examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (NO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Cyanide water sample checks:	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Tip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Client Notification/ Resolution:

Copy COC to Client? Y ☐ N ☒

Field Data Required? Y ☐ N ☒

Person Contacted:

Date/Time:

Comments/ Resolution:

Project Manager Review:

Date:



PACE # 60271899

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

June 8, 2018

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049

Re: Lab Project Number: 60271899
Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any question concerning this report, please feel free to contact me.

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60271899

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Gary Hutchcraft Alliance Water Resources #3 Anderson Road Lake Ozark, MO 65049	Date Reported: 6-8-18 Date Initiated: 6-6-18 Time Set: 10:30 Date Terminated: 6-8-18
--	---

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0103241

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Alliance Water Resources Lake Ozark WWTP effluent discharge. Acute toxicity, as defined by significant mortality for at least one of two aquatic test species during a 48 hour period of exposure, was not detected in Ceriodaphnia exposed to the 100% effluent, and was not detected in fathead minnows exposed to the 100% effluent. The LC50 for the Ceriodaphnia was >100% and >100% for the Pimephales. The test species utilized in this test were the water flea, Ceriodaphnia dubia and the fathead minnow, Pimephales promelas. Detailed results of the toxicity testing are provided in the Acute Toxicity Reports. In addition to the acute toxicity testing, water temperature, pH, dissolved oxygen, total hardness, total alkalinity, conductivity, and chlorine determinations were performed on the effluent and control samples.

SAMPLING PROCEDURES:

Alliance Water Resources Lake Ozark WWTP personnel collected a sample at the Alliance Water Resources Lake Ozark WWTP effluent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60271899

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

INTRODUCTION:

The purpose of this test was to determine the acute toxicity of the Alliance Water Resources Lake Ozark WWTP effluent on the freshwater invertebrate, Ceriodaphnia dubia and the fathead minnow, Pimephales promelas. These tests were conducted at Pace Analytical Services, Inc., Frontenac, KS.

TEST ORGANISMS:

Ceriodaphnia dubia - The genetic stock of Ceriodaphnia dubia used in this acute toxicity Test were originally obtained from a private breeder. Ceriodaphnia are cultured in house at Pace Analytical Services, Inc. Culture methods of Ceriodaphnia were obtained from EPA821-C-02-006 November 2002.

Pimephales promelas - The fathead minnows used in this acute toxicity test were cultured in-house at Pace Analytical Services, Inc., Frontenac, KS and/or were obtained from a private breeder. Fathead minnows are maintained at Pace Analytical Services until use for acute toxicity between the ages of 1 and 14 days. Information for culturing fathead minnows was taken from EPA821-C-02-006 November 2002.

MATERIALS AND METHODS:

Procedures used in the acute toxicity tests are described in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (USEPA, 2002).

Alliance Water Resources Lake Ozark WWTP personnel collected the effluent tested from the Alliance Water Resources Lake Ozark WWTP discharge. Testing was performed using a 100% effluent, an upstream, a series of dilution, and a synthetic control. The toxicity test was initiated within 36 hours of sample collection.

Effluent and synthetic control test solutions were not aerated during the testing period.

Ceriodaphnia ACUTE METHODS:

This static test was ran using 40 ml glass vials containing 25 ml of test solution. Food was administered before the test. Five Ceriodaphnia neonates (<24 hr old) were randomly selected and placed in each of 4 replicates of test solution. A total of 20 organisms per concentration were tested. Observations of mortality were made at 24 and 48 hours of exposure.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60271899

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Pimephales ACUTE METHODS:

This static toxicity test was conducted using 500 ml polypropylene container as test chambers containing 250 ml of test solution. Food was administered prior to test initiation, but not during the testing period. Ten Pimephales, 1 – 14 days old, from a single spawn, were randomly selected and placed in each of 4 test chambers. A total of 40 organisms were exposed to each test concentration. Observations of mortality were made at 24 and 48 hours of exposure.

WATER QUALITY METHODS:

Prior to test initiation, temperature, dissolved oxygen, pH, total alkalinity, total hardness, and total residual chlorine were measured in the effluent and in the controls. At 24 and 48 hours of exposure, temperature, dissolved oxygen, pH, and conductance were measured in the effluent sample and the controls.

DATA ANALYSIS:

Statistically significant ($p < 0.05$) mortality is determined by Dunnet's procedure using average percent survival of each test concentration versus the average survival of the controls. If significant mortality occurs, median lethal concentrations (LC50) are calculated using effluent concentrations and their corresponding percent mortality data. The LC50's and the 95% confidence intervals are calculated where appropriate by the Spearman-Kärber method. TUa is calculated by $TUa = 100/LC50$. Statistical analysis is accomplished by following steps in EPA/600/4-90/027E, August 1993 and by use of Toxstat version 3.4.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.





PACE # 60271899

Pace Analytical Services, Inc.
 9608 Lolret Blvd.
 Lenexa, KS 66219
 Phone: 913.599.5665
 Fax: 913.599.1759

RESULTS:

THE Ceriodaphnia MORTALITY RESULTS - There was no significant mortality observed of the freshwater invertebrate, Ceriodaphnia dubia, during the 48 hour exposure period to the 100% effluent concentrations. There was no significant mortality in the synthetic control. The LC50 value of the sample to Ceriodaphnia is approximately >100%, TUa <1.

Ceriodaphnia MORTALITY DATA

ALIVE

CONC.	REP #	0 HOURS	24 HOURS	48 HOURS	% MORT.
SYNTHETIC	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
Upstream	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
6.25%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
12.5%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
25%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
50%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
100%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0

AVG. MORTALITY @ (100% EFFLUENT) =0.0%

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.



PACE # 60271899

Pace Analytical Services, Inc.
 9608 Loiret Blvd.
 Lenexa, KS 66219
 Phone: 913.599.5665
 Fax: 913.599.1759

THE Pimephales RESULTS - Minnows exposed to effluent collected at the Alliance Water Resources Lake Ozark WWTP effluent discharge exhibited no significant mortality in the 100% effluent concentration during the 48 hr exposure period. The synthetic control showed no significant mortality during the testing period. The LC50 value of the effluent to fathead minnows is estimated to be >100%, TUa <1.

CONC.	REP #	0 HOURS	24 HOURS	48 HOURS	% MORTALITY
SYNTHETIC	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
Upstream	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
6.25%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
12.5%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
25%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
50%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
100%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0

AVG. MORTALITY @ (100% EFFLUENT) =0.0%

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.



PACE # 60271899

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The sample from the Alliance Water Resources Lake Ozark WWTP had <0.1 mg/l detectable level of total residual chlorine upon receipt in the laboratory.

Dissolved Oxygen (D.O.) - Dissolved oxygen reading of the 100% effluent was 9.20 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.40 mg/l in the 100% effluent, which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the 100% effluent was 8.13 upon receipt in the laboratory and the synthetic control had a 7.54. At termination the pH measurement in the 100% effluent was 8.72.

Conductance - The conductance of the 100% effluent was 1419 umhos and the synthetic control was 331 umhos.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



INITIAL WATER QUALITY:

Initial Measurements Synthetic Water

pH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.54	8.30	331	<0.1	25.0	90	64

Initial Measurements of 100% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
8.13	9.20	1419	<0.1	25.0	364	330

Initial Measurements of Upstream

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.58	8.80	677	<0.1	25.0	342	312

TEST WATER QUALITY:

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.89	7.90	25.1	390
Upstream	8.63	7.60	25.1	686
6.25%	8.63	7.70	25.1	736
12.5%	8.63	7.70	25.1	790
25%	8.64	7.70	25.1	902
50%	8.64	7.80	25.1	1122
100%	8.66	7.90	25.1	1495

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.93	7.50	25.2	412
Upstream	8.40	7.40	25.2	735
6.25%	8.42	7.40	25.2	742
12.5%	8.49	7.40	25.2	756
25%	8.51	7.40	25.2	801
50%	8.59	7.40	25.2	1200
100%	8.72	7.40	25.2	1510

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60271899

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

QUALITY ASSURANCE:

The absence of control mortality during this test indicated the health of the organisms and indicated that any significant mortality in the test concentrations is not due to contaminants or variations in test conditions. Reference toxicity tests are routinely performed by staff members of our Toxicology Department.

REFERENCE TOXICANT (NaCl)

Ceriodaphnia

OF LIVE ORGANISMS

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
3.0 g/l	20	2	0
2.5 g/l	20	15	10
2.0 g/l	20	20	19
1.5 g/l	20	20	20
1.0 g/l	20	20	20

LC50 = 2.50 g/l NaCl

REFERENCE TOXICANT (NaCl)

Pimephales

OF LIVE ORGANISMS

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
10.0 g/l	40	8	0
8.0 g/l	40	35	26
6.0 g/l	40	38	36
4.0 g/l	40	40	40
2.0 g/l	40	40	40

LC50 = 8.32g/l NaCl

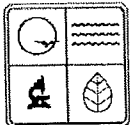
Submitted By:

Tim Harrell

Timothy Harrell
Technical Director

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WHOLE EFFLUENT TOXICITY (WET) TEST REPORT
(TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

PART A - TO BE COMPLETED IN FULL BY PERMITTEE

FACILITY NAME <u>LAKE OF THE OZARKS REGIONAL WWTP</u>		DATE AND TIME COLLECTED <u>6/5/18 0900</u>
PERMIT NUMBER <u>MO-0163241</u>		EFFLUENT <u>6/5/18 0910</u> UPSTREAM <u>6/5/18 0910</u>
COLLECTOR'S NAME <u>GARY HUTCHCRAFT</u>		PERMIT OUTFALL NUMBER <u>001</u>
RECEIVING STREAM COLLECTION SITE AND DESCRIPTION <u>BOWLIN HOLLOW CREEK</u>		
PERMIT ALLOWABLE EFFLUENT CONCENTRATION (AEC) <u>100%</u>		EFFLUENT SAMPLE TYPE (CHECK ONE) <input checked="" type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
SAMPLE NUMBER EFFLUENT <u>60271899001</u> UPSTREAM <u>60271899003</u>		UPSTREAM SAMPLE TYPE (CHECK ONE) <input type="checkbox"/> 24 HR COMPOSITE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR CHLORINE <u>N/A</u> mg/L		PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR AMMONIA <u>6.0</u> mg/L

PART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY

PERFORMING LABORATORY <u>PACE ANALYTICAL SERVICES</u>	TEST TYPE <u>ACUTE</u>	
FINAL REPORT NUMBER <u>60271899</u>	TEST DURATION <u>48 HOURS</u>	
DATE OF LAST REFERENCE TOXICANT TESTING <u>5/29/18</u>	TEST METHOD <u>EPA 2002 AND 2000</u>	
DATE AND TIME SAMPLES RECEIVED AT LABORATORY <u>6/6/18 8:00</u>	TEST START DATE AND TIME <u>6/6/18 10:30</u>	TEST END DATE AND TIME <u>6/8/18 10:00</u>
SAMPLE DECHLORINATED PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO EFFLUENT _____ UPSTREAM _____	TEST ORGANISM #1 AND AGE <u>DUBIA <24 HOURS</u>	TEST ORGANISM #2 AND AGE <u>FATHEAD 2 DAYS</u>
SAMPLE FILTERED ¹ PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO EFFLUENT _____ UPSTREAM _____	90 PERCENT OR GREATER SURVIVAL IN SYNTHETIC CONTROL? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	DILUTION WATER USED TO ACHIEVE AEC _____
FILTER MESH SIEVE SIZE 2 _____	EFFLUENT ORGANISM #1 PERCENT MORTALITY AT AEC <u>0</u>	EFFLUENT ORGANISM #2 PERCENT MORTALITY AT AEC <u>0</u>
SAMPLE AERATED DURING TESTING? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	UPSTREAM ORGANISM #1 PERCENT MORTALITY <u>0</u>	UPSTREAM ORGANISM #2 PERCENT MORTALITY <u>0</u>
pH ADJUSTED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO EFFLUENT _____ UPSTREAM _____	TEST RESULT AT AEC FOR ORGANISM #1 <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	TEST RESULT AT AEC FOR ORGANISM #2 <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

PART A - TO BE COMPLETED IN FULL BY PERMITTEE

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25.0	SM 2550B	6/6/18
pH Standard Units	8.13	SM 4500-H+ B	6/6/18
Conductance µMhos	1419	EPA 120.1	6/6/18
Dissolved Oxygen mg/L	9.20	SM 4500-O G	6/6/18
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	6/6/18
Unionized Ammonia mg/L	0	EPA 350.1	6/6/18
* Total Alkalinity mg/L	330	SM 2320 B	6/6/18
* Total Hardness mg/L	364	SM2340 C	6/6/18

* Recommended by EPA guidance, not a required analysis.

- ¹ Samples shall only be filtered if indigenous organisms are present that may be confused with, or attack the test organisms.
² Filters shall have a sieve size of 60 microns or greater.

WHOLE EFFLUENT TOXICITY (WET) TEST REPORT (Continued)

(TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE³

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25.0	SM 2550B	6/6/18
pH Standard Units	7.58	SM 4500-H+ B	6/6/18
Conductance µMhos	677	EPA 120.1	6/6/18
Dissolved Oxygen mg/L	8.80	SM 4500-O G	6/6/18
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	6/6/18
Un-ionized Ammonia mg/L	0	EPA 350.1	6/6/18
* Total Alkalinity mg/L	312	SM 2320 B	6/6/18
* Total Hardness mg/L	342	SM 2340 C	6/6/18

* Recommended by EPA guidance, not a required analysis.

**PRELIMINARY TEST ACCEPTABILITY MATRIX (FOR USE BY PERMITTEE IN DETERMINING TEST VALIDITY)
MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE³****PERMIT ALLOWABLE EFFLUENT CONCENTRATION, or AEC:** As indicated on permit. Test is invalid otherwise.**EFFLUENT SAMPLE TYPE:** As indicated on permit. Test is invalid otherwise.**TEST TYPE:** Acute Static Non-Renewal Test or other as indicated on permit. Test is invalid otherwise.**TEST DURATION:** Forty-eight hours or as indicated on permit. Test is invalid otherwise.**TEST ORGANISMS:** As indicated on permit. Test is invalid otherwise.**DILUTION WATER USED TO ACHIEVE AEC:** Upstream receiving water required if available.**TEST METHOD:** The only acceptable method is the **most current edition** of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, or other as specifically assigned by EPA for determining National Pollutant Discharge Elimination System, or NPDES, compliance. Test is invalid otherwise.**TEST START DATE AND TIME:** Unless otherwise specified in writing by EPA, if >36 hours lapse between collection and initiation, test is invalid.**FILTER MESH SIEVE SIZE:** Unless otherwise specified in writing by EPA, if sieve size is smaller than 60 microns, test is invalid.**90 PERCENT OR GREATER SURVIVAL IN LABORATORY CONTROL(S) (Y/N):** If no, test is invalid.

PARAMETER	RESULT	NOTES	WHEN ANALYZED
Temperature °C	0 – 6	Unless received by the laboratory on the same day as collected, values outside this range invalidate the test.	Upon receipt.

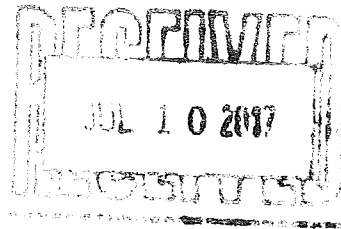
³ Where no upstream control is available, enter results from laboratory or synthetic control.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 10, 2017

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049



2017
ANNUAL ACUTE
WET TEST

RE: Project: ACUTE WET TEST
Pace Project No.: 60246950

Dear Gary Hutchcraft:

Enclosed are the analytical results for sample(s) received by the laboratory on June 21, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Heather M. Wilson

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: ACUTE WET TEST

Pace Project No.: 60246950

Sample: INSTREAM EFF.		Lab ID: 60246950003	Collected: 06/20/17 09:00	Received: 06/21/17 19:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Selenium	ND	ug/L	1.0	1	06/23/17 17:20	06/27/17 15:51	7782-49-2	
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Unionized Ammonia as NH3	0	mg/L		1		07/10/17 11:41		
350.1 Ammonia		Analytical Method: EPA 350.1						
Nitrogen, Ammonia	ND	mg/L	0.10	1		07/07/17 13:07	7664-41-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: ACUTE WET TEST
Pace Project No.: 60246950

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055

Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

Southeast Kansas Certification IDs

808 West McKay, Frontenac, KS 66763
Arkansas Certification #: 13-012-0
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055
Oklahoma Certification #: 2016-082
Texas Certification #: T104704407-13-4
Utah Certification #: KS000212013-3

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: ACUTE WET TEST
Pace Project No.: 60246950

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60246950001	INSTREAM EFF WET	Water	06/20/17 09:00	06/21/17 08:15
60246950003	INSTREAM EFF.	Water	06/20/17 09:00	06/21/17 19:45

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: ACUTE WET TEST
Pace Project No.: 60246950

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60246950001	INSTREAM EFF WET	EPA 821/R-02/012	MEB	1	PASI-SE
60246950003	INSTREAM EFF.	EPA 200.8	JGP	1	PASI-K
		EPA 350.1	JMC1	1	PASI-K
		EPA 350.1	RAD	1	PASI-K

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: ACUTE WET TEST

Pace Project No.: 60246950

Sample: INSTREAM EFF WET		Lab ID: 60246950001	Collected: 06/20/17 09:00	Received: 06/21/17 08:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Acute Toxicity		Analytical Method: EPA 821/R-02/012						
Toxicity, Acute	Complete		1.0	1		06/21/17 13:40		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: ACUTE WET TEST
Pace Project No.: 60246950

QC Batch:	482377	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60246950003		

METHOD BLANK: 1975921
Associated Lab Samples: 60246950003

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Selenium	ug/L	ND	1.0	06/27/17 15:26	

LABORATORY CONTROL SAMPLE: 1975922

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	40	38.4	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1976223 1976224

Parameter	Units	60246950003		MS		MSD		MS		MSD		% Rec Limits	Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	RPD	RPD				
Selenium	ug/L	ND	40	40	40	36.1	35.6	90	89	70-130	1	20			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: ACUTE WET TEST

Pace Project No.: 60246950

QC Batch:	484375	Analysis Method:	EPA 350.1
QC Batch Method:	EPA 350.1	Analysis Description:	350.1 Ammonia
Associated Lab Samples:	60246950003		

METHOD BLANK: 1984019
Associated Lab Samples: 60246950003

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	07/07/17 13:03	

LABORATORY CONTROL SAMPLE: 1984020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.1	103	90-110	

MATRIX SPIKE SAMPLE: 1984021

Parameter	Units	60247676002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1.4	5	6.7	107	90-110	

MATRIX SPIKE SAMPLE: 1984023

Parameter	Units	60247679003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	5	5.3	106	90-110	

SAMPLE DUPLICATE: 1984022

Parameter	Units	60247634002 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Ammonia	mg/L	19.8	19.8	0	18	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: ACUTE WET TEST
Pace Project No.: 60246950

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City
PASI-SE Pace Analytical Services - SE Kansas

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: ACUTE WET TEST
Pace Project No.: 60246950

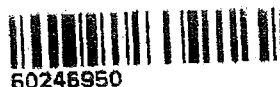
Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60246950001	INSTREAM EFF WET	EPA 821/R-02/012	482859		
60246950003	INSTREAM EFF.	EPA 200.8	482377	EPA 200.8	482514
60246950003	INSTREAM EFF.	EPA 350.1	484592		
60246950003	INSTREAM EFF.	EPA 350.1	484375		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

**Sample Condition Upon Receipt**

WO#: 60246950

Client Name: AllisonCourier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐Tracking #: _____ Pace Shipping Label Used? Yes ☒ No ☐Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.0 Corr. Factor CF +2.9 CF +0.2 Corrected 1.2Date and initials of person
examining contents: 6/21/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted: _____

Date/Time: _____

Comments/ Resolution: _____

Project Manager Review:

REVIEWEDBy hwilson at 4:13 pm, 6/22/17

Date: _____



Sample Condition Upon Receipt

60246950

Client Name:

A LUR / LAKE OZARK

Courier: FedEx ☐ UPS ☐ VIA ☒ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Packing #:

Pace Shipping Label Used? Yes ☐ No ☒

custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-193 Type of Ice: Wet ☒ Blue ☐ None ☐

Cooler Temperature (°C): As-read 3.1 Corr. Factor -.5 Corrected 2.6

Date and Initials of person examining contents:

6/21/17

Temperature should be above freezing to 6°C

Chain of Custody present:

☒ Yes ☐ No ☐ N/A

Chain of Custody relinquished:

☒ Yes ☐ No ☐ N/A

Samples arrived within holding time:

☒ Yes ☐ No ☐ N/A

Short Hold Time analyses (<72hr):

☒ Yes ☐ No ☐ N/A

Push Turn Around Time requested:

☒ Yes ☐ No ☐ N/A

Sufficient volume:

☒ Yes ☐ No ☐ N/A

Correct containers used:

☒ Yes ☐ No ☐ N/A

Proper containers used:

☒ Yes ☐ No ☐ N/A

Containers intact:

☒ Yes ☐ No ☐ N/A

Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?

☐ Yes ☐ No ☒ N/A

Filtered volume received for dissolved tests?

☐ Yes ☐ No ☒ N/A

Sample labels match COC: Date / time / ID / analyses

☒ Yes ☐ No ☐ N/A

Samples contain multiple phases? Matrix:

☐ Yes ☒ No ☐ N/A

Containers requiring pH preservation in compliance?

☐ Yes ☐ No ☒ N/A

NO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)

Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)

Cyanide water sample checks:

Rad acetate strip turns dark? (Record only)

☐ Yes ☐ No

Stassium iodide test strip turns blue/purple? (Preserve)

☐ Yes ☐ No

Blank present:

☐ Yes ☐ No ☒ N/A

Headspace in VOA vials (>6mm):

☐ Yes ☐ No ☒ N/A

Samples from USDA Regulated Area: State:

☐ Yes ☐ No ☒ N/A

Additional labels attached to 5035A / TX1005 vials in the field? ☐ Yes ☐ No ☒ N/A

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

Project Manager Review:

Date:



PACE # 60246950

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

June 26 2017

Gary Hutchcraft
Alliance Water Resources
#3 Anderson Road
Lake Ozark, MO 65049

Re: Lab Project Number: 60246950
Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any question concerning this report, please feel free to contact me.

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60246950

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

INTRODUCTION:

The purpose of this test was to determine the acute toxicity of the Alliance Water Resources Lake Ozark WWTP effluent on the freshwater invertebrate, Ceriodaphnia dubia and the fathead minnow, Pimephales promelas. These tests were conducted at Pace Analytical Services, Inc., Frontenac, KS.

TEST ORGANISMS:

Ceriodaphnia dubia - The genetic stock of Ceriodaphnia dubia used in this acute toxicity Test were originally obtained from a private breeder. Ceriodaphnia are cultured in house at Pace Analytical Services, Inc. Culture methods of Ceriodaphnia were obtained from EPA821-C-02-006 November 2002.

Pimephales promelas - The fathead minnows used in this acute toxicity test were cultured in-house at Pace Analytical Services, Inc., Frontenac, KS and/or were obtained from a private breeder. Fathead minnows are maintained at Pace Analytical Services until use for acute toxicity between the ages of 1 and 14 days. Information for culturing fathead minnows was taken from EPA821-C-02-006 November 2002.

MATERIALS AND METHODS:

Procedures used in the acute toxicity tests are described in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (USEPA, 2002).

Alliance Water Resources Lake Ozark WWTP personnel collected the effluent tested from the Alliance Water Resources Lake Ozark WWTP discharge. Testing was performed using a 100% effluent, an upstream, a series of dilution, and a synthetic control. The toxicity test was initiated within 36 hours of sample collection.

Effluent and synthetic control test solutions were not aerated during the testing period.

Ceriodaphnia ACUTE METHODS:

This static test was ran using 40 ml glass vials containing 25 ml of test solution. Food was administered before the test. Five Ceriodaphnia neonates (<24 hr old) were randomly selected and placed in each of 4 replicates of test solution. A total of 20 organisms per concentration were tested. Observations of mortality were made at 24 and 48 hours of exposure.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60246950

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Pimephales ACUTE METHODS:

This static toxicity test was conducted using 500 ml polypropylene container as test chambers containing 250 ml of test solution. Food was administered prior to test initiation, but not during the testing period. Ten Pimephales, 1 – 14 days old, from a single spawn, were randomly selected and placed in each of 4 test chambers. A total of 40 organisms were exposed to each test concentration. Observations of mortality were made at 24 and 48 hours of exposure.

WATER QUALITY METHODS:

Prior to test initiation, temperature, dissolved oxygen, pH, total alkalinity, total hardness, and total residual chlorine were measured in the effluent and in the controls. At 24 and 48 hours of exposure, temperature, dissolved oxygen, pH, and conductance were measured in the effluent sample and the controls.

DATA ANALYSIS:

Statistically significant ($p < 0.05$) mortality is determined by Dunnet's procedure using average percent survival of each test concentration versus the average survival of the controls. If significant mortality occurs, median lethal concentrations (LC50) are calculated using effluent concentrations and their corresponding percent mortality data. The LC50's and the 95% confidence intervals are calculated where appropriate by the Spearman-Kärber method. TUa is calculated by $TUa = 100/LC50$. Statistical analysis is accomplished by following steps in EPA/600/4-90/027E, August 1993 and by use of Toxstat version 3.4.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.





PACE # 60246950

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

RESULTS:

THE Ceriodaphnia MORTALITY RESULTS - There was no significant mortality observed of the freshwater invertebrate, Ceriodaphnia dubia, during the 48 hour exposure period to the 100% effluent concentrations. There was no significant mortality in the synthetic control. The LC50 value of the sample to Ceriodaphnia is approximately >100%.

Ceriodaphnia MORTALITY DATA

ALIVE

CONC.	REP #	0 HOURS	24 HOURS	48 HOURS	% MORT.
SYNTHETIC	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
Upstream	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
6.25%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
12.5%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
25%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
50%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0
100%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0

AVG. MORTALITY @ AEC (100% EFFLUENT) =0.0%

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60246950

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

THE Pimephales RESULTS - Minnows exposed to effluent collected at the Alliance Water Resources Lake Ozark WWTP effluent discharge exhibited no significant mortality in the 100% effluent concentration during the 48 hr exposure period. The synthetic control showed no significant mortality during the testing period. The LC50 value of the effluent to fathead minnows is estimated to be >100%.

CONC.	REP #	0 HOURS	24 HOURS	48 HOURS	% MORTALITY
SYNTHETIC	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
Upstream	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
6.25%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
12.5%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
25%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
50%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
100%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0

AVG. MORTALITY @ AEC (100% EFFLUENT) = 0.0%

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



PACE # 60246950

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The sample from the Alliance Water Resources Lake Ozark WWTP had <0.1 mg/l detectable level of total residual chlorine upon receipt in the laboratory.

Dissolved Oxygen (D.O.) - Dissolved oxygen reading of the 100% effluent was 8.00 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.50 mg/l in the 100% effluent, which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the 100% effluent was 8.30 upon receipt in the laboratory and the synthetic control had a 7.48. At termination the pH measurement in the 100% effluent was 8.67.

Conductance - The conductance of the 100% effluent was 1361 umhos and the synthetic control was 328 umhos.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

INITIAL WATER QUALITY:

Initial Measurements Synthetic Water

pH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.48	8.20	338	<0.1	25.0	94	62

Initial Measurements of 100% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
8.30	8.00	1361	<0.1	25.0	380	294

Initial Measurements of Upstream

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
8.14	8.10	704	<0.1	25.0	294	282

TEST WATER QUALITY:

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.48	7.40	25.1	354
Upstream	8.41	7.50	25.1	715
6.25%	8.42	7.50	25.1	736
12.5%	8.43	7.50	25.1	788
25%	8.46	7.50	25.1	804
50%	8.54	7.60	25.1	922
100%	8.60	7.60	25.1	1385

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.79	7.20	25.0	361
Upstream	8.50	7.30	25.0	791
6.25%	8.52	7.30	25.0	804
12.5%	8.54	7.40	25.0	815
25%	8.57	7.40	25.0	832
50%	8.60	7.50	25.0	960
100%	8.67	7.50	25.0	1401

REPORT OF LABORATORY ANALYSIS

QUALITY ASSURANCE:

The absence of control mortality during this test indicated the health of the organisms and indicated that any significant mortality in the test concentrations is not due to contaminants or variations in test conditions. Reference toxicity tests are routinely performed by staff members of our Toxicology Department.

REFERENCE TOXICANT (NaCl)

Ceriodaphnia

OF LIVE ORGANISMS

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
3.0 g/l	20	4	0
2.5 g/l	20	16	10
2.0 g/l	20	20	18
1.5 g/l	20	20	20
1.0 g/l	20	20	20

LC50 = 2.5 g/l NaCl

REFERENCE TOXICANT (NaCl)

Pimephales

OF LIVE ORGANISMS

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
10.0 g/l	40	10	0
8.0 g/l	40	35	25
6.0 g/l	40	39	37
4.0 g/l	40	40	40
2.0 g/l	40	40	40

LC50 = 8.27g/l NaCl

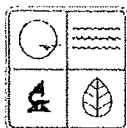
Submitted By:

Tim Harrell

Timothy Harrell
Technical Director

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WHOLE EFFLUENT TOXICITY (WET) TEST REPORT
(TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

PART A - TO BE COMPLETED IN FULL BY PERMITTEE

FACILITY NAME LAKE OF THE OZARKS REGIONAL WWTP #1		DATE AND TIME COLLECTED EFFLUENT 6/19/17 0900 UPSTREAM 6/30/17 0905	
PERMIT NUMBER MO-0103241		PERMIT OUTFALL NUMBER OUTFALL # 001	
COLLECTOR'S NAME GARY HUTCHCRAFT			
RECEIVING STREAM COLLECTION SITE AND DESCRIPTION BOWLIN HOLLOW CREEK			
PERMIT ALLOWABLE EFFLUENT CONCENTRATION (AEC) 100%		EFFLUENT SAMPLE TYPE (CHECK ONE) <input checked="" type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____	
SAMPLE NUMBER EFFLUENT 6024645000 UPSTREAM 6024645000.3		UPSTREAM SAMPLE TYPE (CHECK ONE) <input type="checkbox"/> 24 HR COMPOSITE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____	
PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR CHLORINE N/A mg/L		PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR AMMONIA 6.0 mg/L	

PART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY

PERFORMING LABORATORY PACE ANALYTICAL SERVICES		TEST TYPE ACUTE	
FINAL REPORT NUMBER 60246950		TEST DURATION 48 HOURS	
DATE OF LAST REFERENCE TOXICANT TESTING 6/6/17		TEST METHOD EPA 2002 AND 2000	
DATE AND TIME SAMPLES RECEIVED AT LABORATORY 6/21/17 8:15		TEST START DATE AND TIME 6/21/17 13:40	TEST END DATE AND TIME 6/23/17 13:50
SAMPLE DECHLORINATED PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO EFFLUENT _____ UPSTREAM _____		TEST ORGANISM #1 AND AGE DUBIA <24 HOURS	TEST ORGANISM #2 AND AGE FATHEAD 8 DAYS
SAMPLE FILTERED ¹ PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO EFFLUENT _____ UPSTREAM _____		90 PERCENT OR GREATER SURVIVAL IN SYNTHETIC CONTROL? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	DILUTION WATER USED TO ACHIEVE AEC UPSTREAM
FILTER MESH SIEVE SIZE 2		EFFLUENT ORGANISM #1 PERCENT MORTALITY AT AEC 0	EFFLUENT ORGANISM #2 PERCENT MORTALITY AT AEC 0
SAMPLE AERATED DURING TESTING? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		UPSTREAM ORGANISM #1 PERCENT MORTALITY 0	UPSTREAM ORGANISM #2 PERCENT MORTALITY 0
pH ADJUSTED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO EFFLUENT _____ UPSTREAM _____		TEST RESULT AT AEC FOR ORGANISM #1 <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	TEST RESULT AT AEC FOR ORGANISM #2 <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

PART A - TO BE COMPLETED IN FULL BY PERMITTEE

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25.0	SM 2550B	6/21/17
pH Standard Units	8.30	7.95SM 4500-H+ B	6/21/17
Conductance µMhos	1361	EPA 120.1	6/21/17
Dissolved Oxygen mg/L	8.00	SM 4500-O G	6/21/17
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	6/21/17
Unionized Ammonia mg/L	<.1	EPA 350.1	7/10/17
* Total Alkalinity mg/L	294	SM 2320 B	6/21/17
* Total Hardness mg/L	380	SM2340 C	6/21/17

* Recommended by EPA guidance, not a required analysis.

¹ Samples shall only be filtered if indigenous organisms are present that may be confused with, or attack the test organisms.
² Filters shall have a sieve size of 60 microns or greater.

WHOLE EFFLUENT TOXICITY (WET) TEST REPORT (Continued)
(TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE³

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25.0	SM 2550B	6/21/17
pH Standard Units	8.19	SM 4500-H+ B	6/21/17
Conductance µMhos	704	EPA 120.1	6/21/17
Dissolved Oxygen mg/L	8.10	SM 4500-O G	6/21/17
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	6/21/17
Unionized Ammonia mg/L	<.1	EPA 350.1	7/10/17
* Total Alkalinity mg/L	282	SM 2320 B	6/21/17
* Total Hardness mg/L	294	SM2340 C	6/21/17
* Recommended by EPA guidance, not a required analysis.			

PRELIMINARY TEST ACCEPTABILITY MATRIX (FOR USE BY PERMITTEE IN DETERMINING TEST VALIDITY)
MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE³

PERMIT ALLOWABLE EFFLUENT CONCENTRATION, or AEC: As indicated on permit. Test is invalid otherwise.

EFFLUENT SAMPLE TYPE: As indicated on permit. Test is invalid otherwise.

TEST TYPE: Acute Static Non-Renewal Test or other as indicated on permit. Test is invalid otherwise.

TEST DURATION: Forty-eight hours or as indicated on permit. Test is invalid otherwise.

TEST ORGANISMS: As indicated on permit. Test is invalid otherwise.

DILUTION WATER USED TO ACHIEVE AEC: Upstream receiving water required if available.

TEST METHOD: The only acceptable method is the most current edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, or other as specifically assigned by EPA for determining National Pollutant Discharge Elimination System, or NPDES, compliance. Test is invalid otherwise.

TEST START DATE AND TIME: Unless otherwise specified in writing by EPA, if >36 hours lapse between collection and initiation, test is invalid.

FILTER MESH SIEVE SIZE: Unless otherwise specified in writing by EPA, if sieve size is smaller than 60 microns, test is invalid.

90 PERCENT OR GREATER SURVIVAL IN LABORATORY CONTROL(S) (Y/N): If no, test is invalid.

PARAMETER	RESULT	NOTES	WHEN ANALYZED
Temperature °C	0 – 6	Unless received by the laboratory on the same day as collected, values outside this range invalidate the test.	Upon receipt.

³ Where no upstream control is available, enter results from laboratory or synthetic control.

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page:10

—

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: 2714 H. T. HODGE

SIGNATURE OF SAMPLER:

DATE Signed _____

DATE Signed 1/27/2007

Temp in °CReceived on

Study Series

Examples Interac

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME

Lake of the Ozarks Regional WWTP #1

PERMIT NO.

MO- 0103241

OUTFALL NO.

001

PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES**22. RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE**

22.1 Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail or dedicated pipe? ☐ Yes ☒ No

22.2 Method by which RCRA waste is received. (Check all that apply)

☐ Truck☐ Rail☐ Dedicated Pipe**22.3 Waste Description**

EPA Hazardous Waste Number	Amount (volume or mass)	Units

23. CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER

23.1 Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

☐ Yes☒ No

Provide a list of sites and the requested information for each current and future site.

23.2 Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

23.3 List the hazardous constituents that are received (or are expected to be received). Included data on volume and concentration, if known. (Attach additional sheets if necessary)

23.4 Waste Treatment

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

☐ Yes☒ No

If Yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

☒ Continuous☐ Intermittent

If intermittent, describe the discharge schedule:

END OF PART F**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.**

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL		
FACILITY NAME Lake of the Ozarks Regional WWTP #1	PERMIT NO. MO- 0103241	OUTFALL NO. 001
PART G – COMBINED SEWER SYSTEMS		
Refer to the APPLICATION OVERVIEW to determine whether Part G applies to the treatment works.		
24. GENERAL INFORMATION		
24.1 System Map. Provide a map indicating the following: (May be included with basic application information.) A. All CSO Discharges. B. Sensitive Use Areas Potentially Affected by CSOs. (e.g., beaches, drinking water supplies, shellfish beds, sensitive aquatic ecosystems and Outstanding Natural Resource Waters.) C. Waters that Support Threatened and Endangered Species Potentially Affected by CSOs.		
24.2 System Diagram. Provide a diagram, either in the map provided above or on a separate drawing, of the Combined Sewer Collection System that includes the following information: A. Locations of Major Sewer Trunk Lines, Both Combined and Separate Sanitary. B. Locations of Points where Separate Sanitary Sewers Feed into the Combined Sewer System. C. Locations of In-Line or Off-Line Storage Structures. D. Locations of Flow-Regulating Devices. E. Locations of Pump Stations.		
24.3 Percent of collection system that is combined sewer None		
24.4 Population served by combined sewer collection system None		
24.5 Name of any satellite community with combined sewer collection system None		
25. CSO OUTFALLS. COMPLETE THE FOLLOWING ONCE FOR EACH CSO DISCHARGE POINT		
25.1 Description of Outfall a. Outfall Number b. Location c. Distance from Shore (if applicable) _____ ft d. Depth Below Surface (if applicable) _____ ft e. Which of the following were monitored during the last year for this CSO? <input type="checkbox"/> Rainfall <input type="checkbox"/> CSO Pollutant Concentrations <input type="checkbox"/> CSO <input type="checkbox"/> CSO Flow Volume <input type="checkbox"/> Receiving Water Quality f. How many storm events were monitored last year?		
25.2 CSO Events a. Give the Number of CSO Events in the Last Year Events <input type="checkbox"/> Actual <input type="checkbox"/> Approximate b. Give the Average Duration Per CSO Event Hours <input type="checkbox"/> Actual <input type="checkbox"/> Approximate c. Give the Average Volume Per CSO Event Million Gallons <input type="checkbox"/> Actual <input type="checkbox"/> Approximate d. Give the minimum rainfall that caused a CSO event in the last year _____ inches of rainfall		
25.3 Description of Receiving Waters a. Name of Receiving Water b. Name of Watershed/River/Stream System c. U.S. Soil Conservation Service 14-Digit Watershed Code (If Known) d. Name of State Management/River Basin e. U.S. Geological Survey 8- Digit Hydrologic Cataloging Unit Code (If Known)		
25.4 CSO Operations Describe any known water quality impacts on the receiving water caused by this CSO (e.g., permanent or intermittent beach closings, permanent or intermittent shellfish bed closings, fish kills, fish advisories, other recreational loss, or violation of any applicable state water quality standard.)		
END OF PART G		
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.		