

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 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92<sup>nd</sup> Congress) as amended,

Permit No. MO-0025283  
Owner: City of Union  
Address: 500 East Locust Street, Union, MO 63084  
Continuing Authority: Same as above  
Address: Same as above  
Facility Name: Union West Wastewater Treatment Plant  
Facility Address: 671 Highway 47 South, Union, MO 63084  
Legal Description: See Page 2  
UTM Coordinates: See Page 2  
Receiving Stream: See Page 2  
First Classified Stream and ID: See Page 2  
USGS Basin & Sub-watershed No.: See Page 2

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 – SIC #4952

See Page 2

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. This permit may be appealed in accordance with Section 621.250 RSMo, Section 640.013 RSMo and Section 644.051.6 of the Law.

July 1, 2016  
Effective Date

Sara Parker Pauley, Director, Department of Natural Resources

June 30, 2020  
Expiration Date

John Madras, Director, Water Protection Program

**FACILITY DESCRIPTION (continued):**

Outfall #002 – POTW – SIC #4952

The use or operation of this facility shall be by or under the supervision of a Certified “C” Operator.

Influent lift station / activated sludge / UV disinfection / flow equalization basin / sludge holding basins / sludge is removed by contract hauler.

Design population equivalent is 15,000.

Design flow is 1.5 MGD.

Actual flow is 939,000 gallons per day.

Design sludge production is 422 dry tons/year.

Legal Description:	SE ¼, SW ¼, Sec. 26, T43N, R1W, Franklin County		
UTM Coordinates:	X= 674715, Y= 4256682		
Receiving Stream and ID:	Bourbeuse River (P) (2034)		
First Classified Stream and ID:	Bourbeuse River (P) (2034)	303(d) listed	
USGS Basin & Sub-watershed No.:	(07140103-0405)		

Permitted Feature #SM1 – Instream Monitoring

Instream monitoring location – Upstream – See Special Condition #24

Permitted Feature #SM2 – Instream Monitoring

Instream monitoring location – Downstream – bridge over Bourbeuse River on Highway 50

Legal Description:	NW ¼, SE ¼, Sec. 26, T43N, R1W, Franklin County		
UTM Coordinates:	X= 674956, Y= 4256973		
Receiving Stream and ID:	Bourbeuse River (P) (2034)		
First Classified Stream and ID:	Bourbeuse River (P) (2034)	303(d) listed	
USGS Basin & Sub-watershed No.:	(07140103-0405)		

<b>OUTFALL #002</b>	<b>TABLE A-1 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS</b>
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The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **July 1, 2016** 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
Flow	MGD	*		*	once/day	24 hr. total
Biochemical Oxygen Demand <sub>5</sub>	mg/L		45	30	once/week	composite**
Total Suspended Solids	mg/L		45	30	once/week	composite**
<i>E. coli</i> (Note 1)	#/100mL		630	126	once/week	grab
Ammonia as N (Apr 1 – Sep 30) (Oct 1 – Mar 31)	mg/L	14.9 14.9		3.2 2.9	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE **AUGUST 28, 2016**. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

EFFLUENT PARAMETER(S)	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units ***	SU	6.0		9.0	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE **AUGUST 28, 2016**.

- \* Monitoring requirement only.
- \*\* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.
- \*\*\* pH is measured in pH units and is not to be averaged.

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. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

<b>OUTFALL #002</b>	<b>TABLE A-2 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS</b>
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The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **July 1, 2016** 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
Oil & Grease	mg/L	15		10	once/quarter****	grab
Total Phosphorus	mg/L	*		*	once/quarter****	grab
Total Nitrogen	mg/L	*		*	once/quarter****	grab
Aluminum, Total Recoverable	µg/L	*		*	once/quarter****	grab
Arsenic, Total Recoverable	µg/L	*		*	once/quarter****	grab
Chromium III, Total Recoverable	µg/L	*		*	once/quarter****	grab
Chromium VI, Total Dissolved	µg/L	18.8		10.2	once/quarter****	grab
Copper, Total Recoverable	µg/L	*		*	once/quarter****	grab
Iron, Total Recoverable	µg/L	*		*	once/quarter****	grab
Lead, Total Recoverable	µg/L	29.4		8.7	once/quarter****	grab
Mercury, Total Recoverable	µg/L	*		*	once/quarter****	grab
Nickel, Total Recoverable	µg/L	*		*	once/quarter****	grab
Zinc, Total Recoverable	µg/L	226.1		112.7	once/quarter****	grab

MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE OCTOBER 28, 2016.

- \* Monitoring requirement only.
- \*\*\*\* See table below for quarterly sampling requirements.

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

OUTFALL #002	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	SAMPLE TYPE
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on <b>July 1, 2016</b> and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
Acute Whole Effluent Toxicity (Note 2)	TU <sub>a</sub>	*			once/year	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2017</u> .						
Chronic Whole Effluent Toxicity (Note 3)	TU <sub>c</sub>	*			once/permit cycle	composite**
<u>WET TEST</u> REPORTS SHALL BE SUBMITTED <u>ONCE PER PERMIT CYCLE</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2020</u> .						

TABLE B INFLUENT MONITORING REQUIREMENTS			
The facility is required to meet a removal efficiency of 85% or more as a monthly average. The monitoring requirements shall become effective on <b>July 1, 2016</b> and remain in effect until expiration of the permit. To determine removal efficiencies, the influent wastewater shall be monitored by the permittee as specified below:			
SAMPLING LOCATION AND PARAMETER(S)	UNITS	MONITORING REQUIREMENTS	
		MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand <sub>5</sub>	mg/L	once/month	composite**
Total Suspended Solids	mg/L	once/month	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>AUGUST 28, 2016</u> .			

\* 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 2 – The Acute WET test shall be conducted once per year during the 1<sup>st</sup>, 2<sup>nd</sup>, and 4<sup>th</sup> year of the permit cycle. See Special Condition #21 for additional requirements.

Note 3 –The Chronic WET test shall be conducted during the 3<sup>rd</sup> year of the permit cycle. See Special Condition #22 for additional requirements.

PERMITTED FEATURE #SM1	TABLE C-1 INSTREAM MONITORING REQUIREMENTS					
	PARAMETER(S)	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
The monitoring requirements shall become effective on <b>July 1, 2016</b> and remain in effect until expiration of the permit.						
Total Phosphorus	mg/L	*		*	once/quarter****	grab
Total Nitrogen	mg/L	*		*	once/quarter****	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2016</u> .						

PERMITTED FEATURE #SM2	TABLE C-2 INSTREAM MONITORING REQUIREMENTS					
	PARAMETER(S)	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
The monitoring requirements shall become effective on <b>July 1, 2016</b> and remain in effect until expiration of the permit.						
Hardness, Total	mg/L	*		*	once/quarter****	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2016</u> .						

- \* Monitoring requirement only.
- \*\*\*\* See table below for quarterly sampling

Minimum Sampling Requirements			
Quarter	Months	Total Nitrogen, Total Phosphorus, and Hardness	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 <sup>th</sup>
Second	April, May, June	Sample at least once during any month of the quarter	July 28 <sup>th</sup>
Third	July, August, September	Sample at least once during any month of the quarter	October 28 <sup>th</sup>
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 <sup>th</sup>

D. 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 March 1, 2015, and hereby incorporated as though fully set forth herein.

## E. SPECIAL CONDITIONS

1. This permit establishes final ammonia limitations based on Missouri's current Water Quality Standard. On August 22, 2013, the U.S. Environmental Protection Agency (EPA) published a notice in the Federal Register announcing of the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013, is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect the designated uses of the water bodies. The Department of Natural Resources has initiated stakeholder discussions on how to best incorporate these new criteria into the State's rules. A date for when this rule change will occur has not been determined. Also, refer to Section VI of this permit's factsheet for further information including estimated future effluent limits for this facility. It is recommended the permittee view the Department's 2013 EPA criteria Factsheet located at <http://dnr.mo.gov/pubs/pub2481.htm>.
2. This permit may be reopened and modified, or alternatively revoked and reissued, to:
  - (a) 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 Clean Water Act, 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) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
  - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.
  - (d) Incorporate the requirement to develop a pretreatment program pursuant to 40 CFR 403.8(a) when the Director of the Water Protection Program determines that a pretreatment program is necessary due to any new introduction of pollutants into the Publically Owned Treatment Works or any substantial change in the volume or character of pollutants being introduced. The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.
3. All outfalls must be clearly marked in the field. This does not include instream monitoring locations.
4. Permittee will cease discharge by connection to a facility with an area-wide management plan per 10 CSR 20-6.010(3)(B) within 90 days of notice of its availability.
5. Report as no-discharge when a discharge does not occur during the report period. For instream samples, report as "No Flow" if no stream flow occurs during the report period.
6. Water Quality Standards
  - (a) To the extent required by law, discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
  - (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
    - (1) 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;
    - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
    - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
    - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
    - (5) There shall be no significant human health hazard from incidental contact with the water;
    - (6) There shall be no acute toxicity to livestock or wildlife watering;
    - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
    - (8) 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.

E. SPECIAL CONDITIONS (continued)

7. Changes in existing pollutants or the addition of new pollutants to the treatment facility

The permittee must provide adequate notice to the Director of the following:

- (a) 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 those pollutants; and
- (b) Any substantial change in 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.
- (c) For purposes of this paragraph, adequate notice shall include information on:
  - (1) the quality and quantity of effluent introduced into the POTW, and
  - (2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

8. 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) The permittee shall use one-half of the detection limit for the non-detect result when calculating monthly averages.
- (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.

9. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

10. 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. If a modification of the monitoring frequencies listed in 10 CSR 20-9 is needed, the permittee shall submit a written request to the Department for review and, if deemed necessary, approval.

11. The permittee shall 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>.

The permittee shall also submit a report to the St. Louis Regional Office annually, by January 28<sup>th</sup>, for the previous calendar year. The report shall contain the following information:

- (a) A summary of the efforts to locate and eliminate 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.

12. 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.b. Bypasses are to be reported to the St. Louis Regional Office or by using the online Sanitary Sewer Overflow/Facility Bypass Application, located at: <http://dnr.mo.gov/modnrcag/> during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. 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.

13. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

14. At least one gate must be provided to access the wastewater treatment facility and provide for maintenance and mowing. The gate shall remain closed except when temporarily opened by; the permittee to access the facility, perform operational monitoring, sampling, maintenance, mowing, or for inspections by the Department. The gate shall be closed and locked when the facility is not staffed.

E. SPECIAL CONDITIONS (continued)

15. At least one (1) warning sign shall be placed on each side of the facility enclosure in such positions as to be clearly visible from all directions of approach. There shall also be one (1) sign placed for every five hundred feet (500') (150 m) of the perimeter fence. A sign shall also be placed on each gate. Minimum wording shall be SEWAGE TREATMENT FACILITY—KEEP OUT. Signs shall be made of durable materials with characters at least two inches (2") high and shall be securely fastened to the fence, equipment or other suitable locations.
16. 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.
17. An all-weather access road shall be provided to the treatment facility.
18. The discharge from the wastewater treatment facility shall be conveyed to the receiving stream via a closed pipe or a paved or rip-rapped open channel. Sheet or meandering drainage is not acceptable. The outfall sewer shall be protected against the effects of floodwater, ice or other hazards as to reasonably insure its structural stability and freedom from stoppage. The outfall shall be maintained so 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.
19. The berms of the basins shall be mowed and kept free of any deep-rooted vegetation, animal dens, or other potential sources of damage to the berms.
20. The facility shall ensure that adequate provisions are provided to prevent surface water intrusion into the basins and to divert stormwater runoff around the basins and protect embankments from erosion.
21. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:
  - (a) Freshwater Species and Test Methods
    - (1) 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:
      - The fathead minnow, *Pimephales promelas* (Acute Toxicity Test Method 2000.0).
      - The daphnid, *Ceriodaphnia dubia* (Acute Toxicity Test Method 2002.0).
    - (2) Chemical and physical analysis of an 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, synthetic laboratory control water may be used.
    - (3) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
    - (4) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analysis performed upon any other effluent concentration.
    - (5) The Allowable Effluent Concentration (AEC) for this facility is 80% with the dilution series being: 100%, 80%, 40%, 20%, and 10%.
    - (6) All chemical analyses shall be performed and results shall be recorded in the appropriate field of the report form. The parameters for chemical analysis include Temperature (°C), pH (SU), Conductivity (µmohs/cm), Dissolved Oxygen (mg/L), Total Residual Chlorine (mg/L), Un-ionized Ammonia (mg/L), Total Alkalinity (mg/L), and Total Hardness (mg/L).
  - (b) Reporting of Acute Toxicity Monitoring Results
    - (1) WET test results shall be submitted to the St. Louis Regional Office, or by eDMR, with the permittee's Discharge Monitoring Reports. The submittal shall include:
      - i. A full laboratory report for all toxicity testing.
      - ii. Copies of chain-of-custody forms.
      - iii. The WET form provided by the Department upon permit issuance.
    - (2) 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 toxic or effluent concentration that would cause death in 50 percent of the test organisms over a specified period of time.

## E. SPECIAL CONDITIONS (continued)

### 22. Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows:

#### (a) Freshwater Species and Test Methods

- (1) 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:
  - The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
  - The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).
- (2) Chemical and physical analysis of an 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, synthetic laboratory control water may be used.
- (3) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
- (4) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analysis performed upon any other effluent concentration.
- (5) The Allowable Effluent Concentration (AEC) for this facility is 28% with the dilution series being: 100%, 50%, 28%, 12.5%, and 6.25%.
- (6) All chemical analyses shall be performed and results shall be recorded in the appropriate field of the report form. The parameters for chemical analysis include, but are not limited to Temperature (°C), pH (SU), Conductivity (µMols), Dissolved Oxygen (mg/L), Total Residual Chlorine (mg/L), Un-ionized Ammonia (mg/L), Total Alkalinity (mg/L), and Total Hardness (mg/L).

#### (b) Reporting of Chronic Toxicity Monitoring Results

- (1) WET test results shall be submitted to the St. Louis Regional Office, or by eDMR, with the permittee's Discharge Monitoring Reports. The submittal shall include:
  - i. A full laboratory report for all toxicity testing.
  - ii. Copies of chain-of-custody forms.
  - iii. The WET form provided by the Department upon permit issuance.
- (2) 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.

### 23. Discharge Monitoring Reports

- (a) All reports and results required to be submitted by the permit, excluding 24-hr. bypass reporting, must be submitted to the Department via the electronic Discharge Monitoring Report Submission System (eDMR). In regards to Standard Conditions Part I, Section B, #7, the eDMR data reporting system is the only Department approved reporting method for this permit.
- (b) To access the eDMR data reporting system, use the following link in your web browser: <https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx>.

### 24. Receiving Water Monitoring Conditions

- (a) Downstream receiving water samples should be taken at the location(s) specified on Page 2 of this permit. In the event that a safe, accessible location is not present at the location(s) listed, a suitable location can be negotiated with the Department. Samples should be taken at least four feet from the bank or from the middle of the stream (whichever is less) and 6-inches below the surface. The upstream receiving water sample should be collected at a point upstream from any influence of the effluent, where the water is visibly flowing down stream.
- (b) When conducting in-stream monitoring, the permittee shall record observations that include: the time of day, weather conditions, unusual stream characteristics (e.g., septic conditions, algae growth, etc.), and the stream segment (e.g., riffle, pool or run) from where the sample was collected. These observations shall be submitted with the sample results.
- (c) Samples shall not be collected from areas with especially turbulent flow, still water or from the stream bank, unless these conditions are representative of the stream reach or no other areas are available for sample collection. Sampling should not be made when significant precipitation has occurred recently. The sampling event should be terminated and rescheduled if any of the following conditions occur:
  - If turbidity in the stream increases notably; or
  - If rainfall over the past two weeks exceeds 2.5 inches or exceeds 1 inch in the last 24 hours
- (d) Always use the correct sampling technique and handling procedure specified for the parameter of interest. Please refer to the latest edition of Standard Methods for the Examination of Water and Wastewater for further discussion of proper sampling techniques. All analyses must be conducted in accordance with an approved EPA method. Meters shall be calibrated immediately (within 1 hour) prior to the sampling event.
- (e) Please contact the Department if you need additional instructions or assistance.

E. SPECIAL CONDITIONS (continued)

25. Stormwater Pollution Prevention Plan (SWPPP): A SWPPP must be developed and implemented within 180 days of the effective date of the permit. 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 February 2009.
- (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 this Special Condition.
    - (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.

E. SPECIAL CONDITIONS (continued)

26. 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.
  - (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.
27. The permittee shall implement and enforce its approved pretreatment program in accordance with the requirements of 10 CSR 20-6.100. The approved pretreatment program is hereby incorporated by reference.

The permittee shall submit to the Department on or before March 31<sup>st</sup> of each year a report briefly describing its pretreatment activities during the previous calendar year. Only one annual report is required to be submitted for the City of Union (East and West Treatment Plants). At a minimum, the report shall include the following:

- (a) An updated list of the Permittee's Industrial Users, including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Permittee shall provide a brief explanation of each deletion. This list shall identify which Industrial Users are subject to categorical pretreatment Standards and specify which Standards are applicable to each Industrial User. The list shall indicate which Industrial Users are subject to local standards that are more stringent than the categorical Pretreatment Standards. The Permittee shall also list the Industrial Users that are subject only to local Requirements;
- (b) A summary of the status of Industrial User compliance over the reporting period;
- (c) A summary of compliance and enforcement activities (including inspections) conducted by the Permittee during the reporting period; and
- (d) Any other relevant information requested by the Department.

Pursuant to 40 CFR 122.44(j)(2)(ii), the permittee shall submit to the Department a written technical evaluation of the need to revise local limits under 40 CFR 403.5(c)(1) along with the application for renewal of this permit.

**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
FACT SHEET  
FOR THE PURPOSE OF RENEWAL  
OF  
MO-0025283  
UNION WEST WASTEWATER TREATMENT PLANT**

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution 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)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.

This Factsheet is for a Major.

**Part I – Facility Information**

Facility Type: POTW - SIC #4952

**Facility Description:**

Influent lift station / activated sludge / UV disinfection / flow equalization basin / sludge holding basins / sludge is removed by contract hauler.

Application Date: 02/27/15

Expiration Date: 06/30/15

**OUTFALL(S) TABLE:**

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
#002	2.33	Secondary	Domestic

**Facility Performance History:**

This facility had a Sanitary Sewer Overflow (SSO) inspection on May 21, 2012. The facility had a pretreatment program inspection on May 11, 2015. A review of the past five years of monitoring reports submitted by the permittee shows the following exceedances: *E. coli* in July 2015; ammonia in March – June 2012, June 2015, and July 2015; copper in December 2010, January 2011, October 2011, December 2011, and January 2013; zinc in August 2012.

**Comments:**

Changes in this permit include the addition of the following:

- Quarterly upstream monitoring of phosphorus and nitrogen
- Quarterly effluent monitoring of phosphorus and nitrogen
- Quarterly downstream hardness monitoring
- Chronic WET Tests once per permit cycle
- Quarterly effluent aluminum monitoring

See Part VII of the Fact Sheet for further information regarding the addition of effluent parameters.

Comments (continued):

The City of Union has an approved pretreatment program. The requirements in Special Condition #27 of this permit are the same as in Special Condition #20 of the Union East permit. Only one annual pretreatment report needs to be submitted for the City of Union.

Special conditions were updated to include the addition of reporting of Non-detects requirements, pretreatment program requirements, instream monitoring requirements, Stormwater Pollution Prevention Program (SWPPP) requirements, and eDMR reporting requirements.

**Part II – 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 or supervisors of operations 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, if applicable, as listed below:

Owned or operated by or for a

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> - Municipalities | <input type="checkbox"/> - Public Water Supply Districts                                    |
| <input type="checkbox"/> - State agency              | <input type="checkbox"/> - Private Sewer Company regulated by the Public Service Commission |
| <input type="checkbox"/> - Federal agency            | <input type="checkbox"/> - State agency   |
| <input type="checkbox"/> - Public Sewer District     | <input type="checkbox"/> - Federal agency   |
| <input type="checkbox"/> - County                    |   |

Each of the above entities are only applicable if they have a Population Equivalent greater than two hundred (200) or fifty (50) or more service connections.

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

Operator's Name: David Aguilar  
Certification Number: 8889  
Certification Level: 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.

**Part III– Operational Monitoring**

- As per [10 CSR 20-9.010(4)], the facility is required to conduct operational monitoring.

**Part IV – Receiving Stream Information**

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1<sup>st</sup> classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(4)].

**RECEIVING STREAM(S) TABLE: OUTFALL #002**

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Bourbeuse River	P	2034	IRR, LWW, AQL, HHP, CLF, WBC-A, SCR, DWS	(07140103-0405)	Direct Discharge

\* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

**RECEIVING STREAM(S) LOW-FLOW VALUES:**

RECEIVING STREAM (C, E, P, P1)	LOW-FLOW VALUES (CFS)*		
	1Q10	7Q10	30Q10
Bourbeuse River (P)	21.24	23.62	30.26

\* - Data from USGS Gauge Station 07016500 located on the Bourbeuse River at Union, MO

**MIXING CONSIDERATIONS TABLE:**

MIXING ZONE (CFS) [10 CSR 20-7.031(5)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(5)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
5.310	5.905	7.565	0.5310	0.5905	N/A

**RECEIVING STREAM MONITORING REQUIREMENTS:**

**Permitted Feature #SM1 – Upstream – See Special Condition #24**

Facilities with a design flow greater than 100,000 gallons per day are required to sample their effluent quarterly for Total Phosphorus and Total Nitrogen per 10 CSR 20-7.015(9)(D)7. Upstream monitoring for these parameters is necessary to determine background concentrations in order to complete calculations related to future effluent limit derivation where necessary or appropriate.

**Permitted Feature #SM2 – Downstream – See Page 2 of the permit**

Downstream hardness monitoring has been added to the permit in order to develop a site-specific hardness for determining reasonable potential and calculating hardness-dependent metals limits.

**Receiving Water Body's Water Quality**

The Bourbeuse River (P) (2034) is on the Missouri 2014 303(d) list for mercury in fish tissue with toxic atmospheric deposition as the source.

## **Part V – 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(36)] & [10 CSR 20-7.031(1)(N)], 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.

- Effluent limitations were recalculated for ammonia based new information derived from discharge monitoring reports and on the current Missouri Water Quality Standards for Ammonia.
- Statistical analysis using the past five years of copper data submitted by the permittee was conducted and determined there is no reasonable potential for copper to cause or contribute to an instream excursion of water quality standards. Because of this, monitoring only.

- The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).

- This permit changes WET test requirements for the facility from a pass/fail requirement to monitoring only for toxic units. This change reflects modifications to Missouri's Effluent Regulation found at 10 CSR 20-7.015. 40 CFR 122.44(d)(1)(ii) requires the Department to establish effluent limitations that control all parameters which have the reasonable potential to cause or contribute to an excursion above any state water quality standard, including state narrative criteria. The previous permit imposed a pass/fail limitation without collecting sufficient data to make a reasonable potential determination. Furthermore, the method of reporting associated with the pass/fail limitation prevented the Department from gathering the data necessary to make a finding of reasonable potential. Implementation of the toxic unit monitoring requirement will allow the Department to implement numeric acute criteria in accordance with water quality standards established under §303 of the CWA.

### **ANTIDegradation:**

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)], the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- 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.

### **AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:**

As per [10 CSR 20-6.010(3)(B)], ... An applicant may utilize a lower preference continuing authority by submitting, as part of the application, a statement waiving preferential status from each existing higher preference authority, providing the waiver 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. Additional information regarding biosolids and sludge is located at the following web address: <http://extension.missouri.edu/main/DisplayCategory.aspx?C=74>, items WQ422 through WQ449.

- Permittee is not authorized to land apply biosolids. Sludge/biosolids are removed by contract hauler.

**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.

- The facility is not currently under Water Protection Program enforcement action.

**DISCHARGE MONITORING REPORTS:**

On July 30, 2013, EPA proposed the Clean Water Act National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, which requires electronic reporting of NPDES information rather than the currently-required paper-based reports from permitted facilities. To comply with the upcoming federal rule, the Department is asking all permittees to begin submitting discharge monitoring data online. For permittees already using the Department's eDMR data reporting system, those permittees will be required to exclusively use the eDMR data reporting system.

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

**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

- This permittee has an approved pretreatment program in accordance with the requirements of [40 CFR Part 403] and [10 CSR 20-6.100] and is expected to implement and enforce its approved 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.

- A 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 (BOD<sub>5</sub>) 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(11)] 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 includes 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) and 10 CSR 20-7.031(11), 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 associated with development of a site specific criterion. 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 a SOC.

**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 February 2009], 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.

- 10 CSR 20-6.200 and 40 CFR 122.26 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. A facility can apply for conditional exclusion for "no exposure" of industrial activities and materials to stormwater by submitting to the Department a completed NPDES Form 3510-11 – No Exposure Certification for Exclusion from NPDES Stormwater Permitting. That document and additional information may be found at <http://water.epa.gov/polwaste/npdes/stormwater/Conditional-No-Exposure-Exclusion.cfm>. Upon approval on the "No Exposure", the permit can be modified to remove the SWPPP requirements. If the facility chooses to retain the conditional exclusion for "no exposure", the facility is required to renew the "No Exposure" exemption during the permit renewal period by submitting NPDES Form 3510-11 with Form B2.

**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(78)], 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<sub>e</sub> = effluent concentration  
Cs = upstream concentration              Q<sub>e</sub> = effluent flow  
Q<sub>s</sub> = 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.

**WATER QUALITY STANDARDS:**

Per [10 CSR 20-7.031(4)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

**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)7. and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], 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 exceeds its design population equivalent (PE) for BOD<sub>5</sub> whether or not its design flow is being exceeded.
- Facility (whether primarily domestic or industrial) 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 NH<sub>3</sub>)
- Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- Other – please justify.

**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.

**303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):**

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 discharges to a 303(d) listed stream. The Bourbeuse River (P) (2034) is on the Missouri 2014 303(d) list for mercury in fish tissue with toxic atmospheric deposition as the source.

**Part VI –2013 Water Quality Criteria for Ammonia**

Upcoming changes to the Water Quality Standard for ammonia may require significant upgrades to wastewater treatment facilities.

On August 22, 2013, the U.S. Environmental Protection Agency (EPA) finalized new water quality criteria for ammonia, based on toxicity studies of mussels and gill breathing snails. Missouri's current ammonia criteria are based on toxicity testing of several species, but did not include data from mussels or gill breathing snails. Missouri is home to 69 of North America's mussel species, which are spread across the state. According to the Missouri Department of Conservation nearly two-thirds of the mussel species in Missouri are considered to be "of conservation concern". Nine species are listed as federally endangered, with an additional species currently proposed as endangered and another species proposed as threatened.

The adult forms of mussels that are seen in rivers, lakes, and streams are sensitive to pollutants because they are sedentary filter feeders. They vacuum up many pollutants with the food they bring in and cannot escape to new habitats, so they can accumulate toxins in their bodies and die. But very young mussels, called glochidia, are exceptionally sensitive to ammonia in water. As a result of a citizen suit, the EPA was compelled to conduct toxicity testing and develop ammonia water quality criteria that would be protective if young mussels may be present in a waterbody. These new criteria will apply to any discharge with ammonia levels that may pose a reasonable potential to violate the standards. Nearly all discharging domestic wastewater treatment facilities (cities, subdivisions, mobile home parks, etc.), as well as certain industrial and stormwater dischargers with ammonia in their effluent, will be affected by this change in the regulations.

When new water quality criteria are established by the EPA, states must adopt them into their regulations in order to keep their authorization to issue permits under the National Pollutant Discharge Elimination System (NPDES). States are required to review their water quality standards every three years, and if new criteria have been developed they must be adopted. States may be more protective than the Federal requirements, but not less protective. Missouri does not have the resources to conduct the studies necessary for developing new water quality standards, and therefore our standards mirror those developed by the EPA; however, we will utilize any available flexibility based on actual species of mussels that are native to Missouri and their sensitivity to ammonia.

Many treatment facilities in Missouri are currently scheduled to be upgraded to comply with the current water quality standards. But these new ammonia standards may require a different treatment technology than the one being considered by the permittee. It is important that permittees discuss any new and upcoming requirements with their consulting engineers to ensure that their treatment systems are capable of complying with the new requirements. The Department encourages permittees to construct treatment technologies that can attain effluent quality that supports the EPA ammonia criteria.

Ammonia toxicity varies by temperature and by pH of the water. Assuming a stable pH value, but taking into account winter and summer temperatures, Missouri includes two seasons of ammonia effluent limitations. Current effluent limitations in this permit are:

Summer – 14.9 mg/L daily maximum, 3.2 mg/L monthly average.

Winter – 14.9 mg/L daily maximum, 2.9 mg/L monthly average.

Under the new EPA criteria, where mussels of the family Unionidae are present or expected to be present, the estimated effluent limitations for a facility in a location such as this that discharges to a receiving stream with the mixing consideration listed in Part IV of the Fact Sheet will be:

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	0.7	3.4
Winter	6	7.8	2.3	13

Summer: April 1 – September 30

Chronic WLA:  $C_e = ((2.33 + 7.565)0.7 - (7.565 * 0.01))/2.33$   
 $C_e = 2.95 \text{ mg/L}$

Acute WLA:  $C_e = ((2.33 + 0.531)3.4 - (0.531 * 0.01))/2.33$   
 $C_e = 4.17 \text{ mg/L}$

$LTA_c = 2.95 \text{ mg/L} (0.540) = 1.59 \text{ mg/L}$

[CV = 1.58, 99<sup>th</sup> Percentile, 30 day avg.]

$LTA_a = 4.1786 \text{ mg/L} (0.139) = 0.58 \text{ mg/L}$

[CV = 1.58, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

$MDL = 0.58 \text{ mg/L} (7.20) = \mathbf{4.2 \text{ mg/L}}$

[CV = 1.58, 99<sup>th</sup> Percentile]

$AML = 0.58 \text{ mg/L} (1.53) = \mathbf{0.9 \text{ mg/L}}$

[CV = 1.58, 95<sup>th</sup> Percentile, n =30]

Winter: October 1 – March 31

Chronic WLA:  $C_e = ((2.33 + 7.565)2.3 - (7.565 * 0.01))/2.33$   
 $C_e = 9.75 \text{ mg/L}$

Acute WLA:  $C_e = ((2.33 + 0.531)13 - (0.531 * 0.01))/2.33$   
 $C_e = 15.97 \text{ mg/L}$

$LTA_c = 9.75 \text{ mg/L} (0.444) = 4.33 \text{ mg/L}$

[CV = 2.16, 99<sup>th</sup> Percentile, 30 day avg.]

$LTA_a = 15.97 \text{ mg/L} (0.111) = 1.78 \text{ mg/L}$

[CV = 2.16, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

$MDL = 1.78 \text{ mg/L} (8.99) = \mathbf{16.0 \text{ mg/L}}$

[CV = 2.16, 99<sup>th</sup> Percentile]

$AML = 1.78 \text{ mg/L} (1.74) = \mathbf{3.1 \text{ mg/L}}$

[CV = 2.16, 95<sup>th</sup> Percentile, n =30]

Summer – 4.2 mg/L daily maximum, 0.9 mg/L monthly average.

Winter – 16.0 mg/L daily maximum, 3.1 mg/L monthly average.

These estimated limits above are based in part on the actual performance of the plant at the time of the drafting of this permit and should not be construed as future effluent limitations. Future effluent limits, based on the EPA's 2013 water quality criteria for ammonia, will depend in part on the actual performance of the facility at the time the permit is renewed.

Operating permits for facilities in Missouri must be written based on current statutes and regulations. Therefore permits will be written with the existing effluent limitations until the new standards are adopted. To aid permittees in decision making, an advisory will be added to permit Fact Sheets notifying permittees of the expected effluent limitations for ammonia. When setting schedules of compliance for ammonia effluent limitations, consideration will be given to facilities that have recently constructed upgraded facilities to meet the current ammonia limitations.

For more information on this topic feel free to contact the Missouri Department of Natural Resources, Water Protection Program, Water Pollution Control Branch, Operating Permits Section at (573) 751-1300.

**Part VII – Effluent Limits Determination**

**APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:**

As per Missouri’s Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall’s Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]
- Lake or Reservoir [10 CSR 20-7.015(3)]
- Losing [10 CSR 20-7.015(4)]
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]
- Subsurface Water [10 CSR 20-7.015(7)]
- All Other Waters [10 CSR 20-7.015(8)]

**OUTFALL #002 – 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.

**EFFLUENT LIMITATIONS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Flow	MGD	1	*		*	*/*	Daily	Monthly	T
BOD <sub>5</sub>	mg/L	1		45	30	45/30	Weekly	Monthly	C
TSS	mg/L	1		45	30	45/30	Weekly	Monthly	C
<i>Escherichia coli</i> **	#/100mL	1, 3		630	126	630/126	Weekly	Monthly	G
Ammonia as N (Apr 1 – Sep 30)	mg/L	2, 3	14.9		3.2	14.4/2.8	Monthly	Monthly	G
Ammonia as N (Oct 1 – Mar 31)	mg/L	2, 3	14.9		2.9	14.4/2.8	Monthly	Monthly	G
Oil & Grease	mg/L	1, 3	15		10	15/10	Quarterly	Quarterly	G
Total Nitrogen	mg/L	1	*		*	***	Quarterly	Quarterly	G
Total Phosphorus	mg/L	1	*		*	***	Quarterly	Quarterly	G
Aluminum, Total Recoverable	µg/L	7	*		*	***	Quarterly	Quarterly	G
Arsenic, Total Recoverable	µg/L	2, 3	*		*	*/*	Quarterly	Quarterly	G
Chromium III, Total Recoverable	µg/L	2, 3	*		*	*/*	Quarterly	Quarterly	G
Chromium VI, Total Dissolved	µg/L	2, 3	18.8		10.2	*/*	Quarterly	Quarterly	G
Copper, Total Recoverable	µg/L	2, 3	*		*	18.3/9.1	Quarterly	Quarterly	G
Iron, Total Recoverable	µg/L	2, 3	*		*	*/*	Quarterly	Quarterly	G
Lead, Total Recoverable	µg/L	2, 3	29.4		8.7	*/*	Quarterly	Quarterly	G
Mercury, Total Recoverable	µg/L	2, 3	*		*	*/*	Quarterly	Quarterly	G
Nickel, Total Recoverable	µg/L	2, 3	*		*	*/*	Quarterly	Quarterly	G
Zinc, Total Recoverable	µg/L	2, 3	226.1		112.7	*/*	Quarterly	Quarterly	G
Acute Whole Effluent Toxicity	TUa	1, 9	*			Pass/Fail	Annually	Annually	C
Chronic Whole Effluent Toxicity	TUc	1, 9	*			***	Once/permit cycle	Once/permit cycle	C
PARAMETER	Unit	Basis for Limits	Minimum		Maximum	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
pH	SU	1	6.0		9.0	6.0-9.0	Monthly	Monthly	G

\* - Monitoring requirement only.

\*\* - #/100mL; the Monthly Average for *E. coli* is a geometric mean.

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

\*\*\*\* - C = 24-hour composite

G = Grab

T = 24-hr. total

**Basis for Limitations Codes:**

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

**OUTFALL #002 – 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 (BOD<sub>5</sub>).** Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Effluent Limits Determination.**
- **Total Suspended Solids (TSS).** Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Effluent Limits Determination.**
- **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), to protect Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C). 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 = 5<sup>th</sup> root of (1)(4)(6)(10)(5) = 5<sup>th</sup> 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.

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

**Summer: April 1 – September 30**

Chronic WLA:  $C_e = ((2.33 + 7.565)1.5 - (7.565 * 0.01))/2.33$   
 $C_e = 6.35 \text{ mg/L}$

Acute WLA:  $C_e = ((2.33 + 0.531)12.1 - (0.531 * 0.01))/2.33$   
 $C_e = 14.86 \text{ mg/L}$

$LTA_c = 6.35 \text{ mg/L} (0.540) = 3.43 \text{ mg/L}$

[CV = 1.58, 99<sup>th</sup> Percentile, 30 day avg.]

$LTA_a = 14.86 \text{ mg/L} (0.139) = 2.06 \text{ mg/L}$

[CV = 1.58, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

MDL = 2.06 mg/L (7.20) = **14.9 mg/L**

[CV = 1.58, 99<sup>th</sup> Percentile]

AML = 2.06 mg/L (1.53) = **3.2 mg/L**

[CV = 1.58, 95<sup>th</sup> Percentile, n =30]

**Winter: October 1 – March 31**

Chronic WLA:  $C_e = ((2.33 + 7.565)3.1 - (7.565 * 0.01))/2.33$   
 $C_e = 13.15 \text{ mg/L}$

Acute WLA:  $C_e = ((2.33 + 0.531)12.1 - (0.531 * 0.01))/2.33$   
 $C_e = 14.86 \text{ mg/L}$

$LTA_c = 13.15 \text{ mg/L} (0.444) = 5.84 \text{ mg/L}$

[CV = 2.16, 99<sup>th</sup> Percentile, 30 day avg.]

$LTA_a = 14.86 \text{ mg/L} (0.111) = 1.65 \text{ mg/L}$

[CV = 2.16, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

MDL = 1.65 mg/L (8.99) = **14.9 mg/L**

[CV = 2.16, 99<sup>th</sup> Percentile]

AML = 1.65 mg/L (1.74) = **2.9 mg/L**

[CV = 2.16, 95<sup>th</sup> Percentile, n =30]

- **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.** Monitoring required for facilities greater than 100,000 gpd design flow per 10 CSR 20-7.015(9)(D)7. Total Nitrogen shall be determined by testing for Total Kjeldahl Nitrogen (TKN) and Nitrate + Nitrite and reporting the sum of the results (reported as N). Nitrate + Nitrite can be analyzed together or separately.
- **pH.** 6.0-9.0 SU. Technology based limits [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.

**Metals**

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in the “Technical Support Document for Water Quality-based Toxic Controls” (EPA/505/2-90-001) and “The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit from a Dissolved Criterion” (EPA 823-B-96-007). General warm-water fishery criteria apply and a water hardness of 162 mg/L is used in the conversion below.

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the Department, partitioning evaluations may be considered and site-specific translators developed.

METAL	CONVERSION FACTORS	
	ACUTE	CHRONIC
Chromium VI	NA	NA
Lead	0.721	0.721
Zinc	0.980	0.980

Conversion factors for Pb and Zn are hardness dependent. Values calculated using equation found in Section 1.3 of EPA 823-B-96-007 and hardness = 162 mg/L.

- **Chromium VI, Total Dissolved.** Protection of Aquatic Life Chronic Criteria = 10.0 µg/L, Acute Criteria = 15.0 µg/L.

Chronic WLA:  $C_e = ((2.33 + 5.905)10.0 - (5.905 * 0.0))/2.33$   
 $C_e = 35.34 \mu\text{g/L}$

Acute WLA:  $C_e = ((2.33 + 0.5905)15.0 - (0.5905 * 0.0))/2.33$   
 $C_e = 18.80 \mu\text{g/L}$

$LTA_c = 35.34 (0.581) = 20.5 \mu\text{g/L}$

[CV = 0.50, 99<sup>th</sup> Percentile]

$LTA_a = 18.80 (0.373) = 7.01 \mu\text{g/L}$

[CV = 0.50, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

$MDL = 7.01 (2.68) = 18.8 \mu\text{g/L}$

[CV = 0.50, 99<sup>th</sup> Percentile]

$AML = 7.01 (1.45) = 10.2 \mu\text{g/L}$

[CV = 0.50, 95<sup>th</sup> Percentile, n = 4]

- **Lead, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 4.2 µg/L, Acute Criteria = 109 µg/L.

Chronic =  $4.2/0.721 = 5.88 \mu\text{g/L}$

Acute =  $109/0.721 = 15.082 \mu\text{g/L}$

Chronic WLA:  $C_e = ((2.33 + 5.905)5.88 - (5.905 * 0.0))/2.33$   
 $C_e = 20.82 \mu\text{g/L}$

Acute WLA:  $C_e = ((2.33 + 0.5905)15.082 - (0.5905 * 0.0))/2.33$   
 $C_e = 189.12 \mu\text{g/L}$

$LTA_c = 20.82 (0.115) = 2.4 \mu\text{g/L}$

[CV = 4.10, 99<sup>th</sup> Percentile]

$LTA_a = 189.12 (0.081) = 15.41 \mu\text{g/L}$

[CV = 4.10, 99<sup>th</sup> Percentile]

Use most protective number of  $LTA_c$  or  $LTA_a$ .

$MDL = 2.4 (12.28) = 29.4 \mu\text{g/L}$

[CV = 4.10, 99<sup>th</sup> Percentile]

$AML = 2.4 (3.63) = 8.7 \mu\text{g/L}$

[CV = 4.10, 95<sup>th</sup> Percentile, n = 4]

- **Zinc, Total Recoverable.** Protection of Aquatic Life Chronic Criteria = 176.71 µg/L, Acute Criteria = 176.71 µg/L.

$$\text{Chronic} = 176.71/0.980 = 182.32 \text{ } \mu\text{g/L}$$

$$\text{Acute} = 176.71/0.980 = 182.32 \text{ } \mu\text{g/L}$$

$$\begin{aligned} \text{Chronic WLA: } C_e &= ((2.33 + 5.905)182.32 - (5.905 * 0.0))/2.33 \\ C_e &= 638.29 \text{ } \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} \text{Acute WLA: } C_e &= ((2.33 + 0.5905)182.32 - (0.5905 * 0.0))/2.33 \\ C_e &= 226.11 \text{ } \mu\text{g/L} \end{aligned}$$

$$\text{LTA}_c = 638.29 (0.527) = 336.6 \text{ } \mu\text{g/L}$$

$$[\text{CV} = 0.60, 99^{\text{th}} \text{ Percentile}]$$

$$\text{LTA}_a = 226.11 (0.321) = 72.58 \text{ } \mu\text{g/L}$$

$$[\text{CV} = 0.60, 99^{\text{th}} \text{ Percentile}]$$

Use most protective number of  $\text{LTA}_c$  or  $\text{LTA}_a$ .

$$\text{MDL} = 72.58 (3.12) = \mathbf{226.1} \text{ } \mu\text{g/L}$$

$$[\text{CV} = 0.60, 99^{\text{th}} \text{ Percentile}]$$

$$\text{AML} = 72.58 (1.55) = \mathbf{112.7} \text{ } \mu\text{g/L}$$

$$[\text{CV} = 0.60, 95^{\text{th}} \text{ Percentile, } n = 4]$$

- **Arsenic, Chromium III, Copper, Iron, Mercury, and Nickel, Total Recoverable.** Monitoring only; statistical analysis was conducted using the past five years of metals data submitted by the permittee and determined no reasonable potential for these metals to cause or contribute to an instream excursion of water quality standards.
- **Aluminum, Total Recoverable.** Monitoring only to determine if reasonable potential to exceed water quality standards exists.

#### **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.  
$$\text{Acute AEC\%} = \{[(2.33 + 0.5905) / 2.33]^{-1}\} \times 100 = 80\%$$
- **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.  
$$\text{Chronic AEC\%} = \{[(2.33 + 5.905) / 2.33]^{-1}\} \times 100 = 28\%$$

#### **Sampling Frequency Justification:**

The sampling and reporting frequency for ammonia and pH has been reduced from weekly to monthly due to satisfactory facility performance and consistent effluent quality. The frequency for oil and grease and metals has been reduced from monthly to quarterly due to consistent effluent quality. Weekly sampling is required for *E. coli*, per 10 CSR 20-7.015(9)(D)6.A. Otherwise, sampling and reporting frequency was retained from previous permit.

**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 WET Tests shall be conducted no less than once per year for facilities designated as "Major".
- Chronic WET Tests shall be conducted no less than once per permit cycle for facilities with a design flow between 1 MGD and 10 MGD.

#### **Sampling Type Justification:**

As per 10 CSR 20-7.015, BOD<sub>5</sub>, TSS, and WET test samples collected for mechanical plants shall be a 24 hour composite sample. Grab samples, however, must be collected for pH, Ammonia as N, *E. coli*, Oil & Grease, Total Nitrogen, Total Phosphorus, and metals. This is due to the holding time restriction for *E. coli*, the volatility of Ammonia, and the fact that pH cannot be preserved and must be sampled in the field. As Ammonia, Oil & Grease, Total Nitrogen, Total Phosphorus, and metals samples must be immediately preserved, these samples are to be collected as a grab.

**PERMITTED FEATURE #SM1 – INSTREAM MONITORING (UPSTREAM)**  
**MONITORING REQUIREMENTS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Total Nitrogen	mg/L	7	*		*	***	Quarterly	Quarterly	G
Total Phosphorus	mg/L	7	*		*	***	Quarterly	Quarterly	G

\* - Monitoring requirement only.

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

\*\*\*\* - C = 24-hour composite  
G = Grab

**Basis for Limitations Codes:**

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

**PERMITTED FEATURE #SM1 – DERIVATION AND DISCUSSION OF MONITORING REQUIREMENTS:**

- **Total Phosphorus and Total Nitrogen.** Facilities with a design flow greater than 100,000 gallons per day are required to sample their effluent quarterly for Total Phosphorus and Total Nitrogen per 10 CSR 20-7.015(9)(D)7. Upstream monitoring for these parameters is necessary to determine background stream concentrations in order to complete calculations that determine instream nutrient loading.

**Sampling Frequency Justification:**

The sampling and reporting frequency for Total Phosphorus and Total Nitrogen has been established to match the required sampling frequency of these parameters in the effluent.

**Sampling Type Justification**

As Total Phosphorus and Total Nitrogen samples must be immediately preserved; these samples are to be collected as a grab.

**PERMITTED FEATURE #SM2 – INSTREAM MONITORING (DOWNSTREAM)**  
**MONITORING REQUIREMENTS TABLE:**

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Total Hardness	mg/L	7	*		*	***	Quarterly	Quarterly	G

\* - Monitoring requirement only.

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

\*\*\*\* - C = 24-hour composite  
G = Grab

**Basis for Limitations Codes:**

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

**PERMITTED FEATURE #SM2 – DERIVATION AND DISCUSSION OF MONITORING REQUIREMENTS:**

- **Total Hardness.**

**Sampling Frequency Justification:**

The sampling and reporting frequency for Total Hardness has been established to match the required sampling frequency of the metals parameters in the effluent.

**Sampling Type Justification**

As Total Hardness samples must be immediately preserved; these samples are to be collected as a grab.

## **Part VIII – 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 publically-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. See **Appendix – Cost Analysis for Compliance**

## **Part IX – 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.

### **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 will 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. This permit will expire in the 2<sup>nd</sup> Quarter of calendar year 2020.

### **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 January 15, 2016 – February 16, 2016. No comments were received.

**DATE OF FACT SHEET:** DECEMBER 2, 2015

### **COMPLETED BY:**

**ANGELA FALLS, ENVIRONMENTAL SPECIALIST  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT  
(573) 751-1419  
angela.falls@dnr.mo.gov**

**Appendices**

**APPENDIX - CLASSIFICATION WORKSHEET:**

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Maximum Population Equivalent (P.E.) served (Max 10 pts.)	1 pt./10,000 PE or major fraction thereof.	1
Maximum: 10 pt Design Flow (avg. day) or peak month; use greater (Max 10 pts.)	1 pt. / MGD or major fraction thereof.	1
<b>EFFLUENT DISCHARGE RECEIVING WATER SENSITIVITY:</b>		
Missouri or Mississippi River	0	-
All other stream discharges except to losing streams and stream reaches supporting whole body contact	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
<b>PRELIMINARY TREATMENT – Headworks</b>		
Screening and/or comminution	3	-
Grit removal	3	-
Plant pumping of main flow (lift station at the headworks)	3	3
<b>PRIMARY TREATMENT</b>		
Primary clarifiers	5	-
Combined sedimentation/digestion	5	-
Chemical addition (except chlorine, enzymes)	4	-
<b>REQUIRED LABORATORY CONTROL – performed by plant personnel (highest level only)</b>		
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	-
<b>ALTERNATIVE FATE OF EFFLUENT</b>		
Direct reuse or recycle of effluent	6	-
Land Disposal – low rate	3	-
High rate	5	-
Overland flow	4	-
<b>Total from page ONE (1)</b>	<b>----</b>	<b>15</b>

**APPENDIX - CLASSIFICATION WORKSHEET (CONTINUED):**

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
<b>VARIATION IN RAW WASTE (highest level only) (DMR exceedances and Design Flow exceedances)</b>		
Variation do not exceed those normally or typically expected	0	0
Recurring deviations or excessive variations of 100 to 200 % in strength and/or flow	2	-
Recurring deviations or excessive variations of more than 200 % in strength and/or flow	4	-
Raw wastes subject to toxic waste discharge	6	-
<b>SECONDARY TREATMENT</b>		
Trickling filter and other fixed film media with secondary clarifiers	10	-
Activated sludge with secondary clarifiers (including extended aeration and oxidation ditches)	15	15
Stabilization ponds without aeration	5	-
Aerated lagoon	8	-
Advanced Waste Treatment Polishing Pond	2	-
Chemical/physical – without secondary	15	-
Chemical/physical – following secondary	10	-
Biological or chemical/biological	12	-
Carbon regeneration	4	-
<b>DISINFECTION</b>		
Chlorination or comparable	5	-
Dechlorination	2	-
On-site generation of disinfectant (except UV light)	5	-
UV light	4	4
<b>SOLIDS HANDLING – SLUDGE</b>		
Solids Handling Thickening	5	-
Anaerobic digestion	10	-
Aerobic digestion	6	-
Evaporative sludge drying	2	-
Mechanical dewatering	8	-
Solids reduction (incineration, wet oxidation)	12	-
Land application	6	-
Total from page <b>TWO (2)</b>	----	19
Total from page <b>ONE (1)</b>	---	15
Grand Total	---	34

- 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
Total Ammonia as Nitrogen (Summer) mg/L	12.1	70.52	1.5	20.37	30.00	21.3/0	1.58	4.07	YES
Total Ammonia as Nitrogen (Winter) mg/L	12.1	74.35	3.1	21.48	28.00	16.55/0.06	2.16	5.52	YES
Total Ammonia as Nitrogen (Summer) mg/L ( <i>future</i> )	3.4	70.52	0.7	20.37	30.00	21.3/0	1.58	4.07	YES
Total Ammonia as Nitrogen (Winter) mg/L ( <i>future</i> )	8.1	74.35	2.3	21.48	28.00	16.55/0.06	2.16	5.52	YES
Arsenic, Total Recoverable	NA	7.21	20.0	2.55	58.00	5/0.34	0.74	1.81	NO
Chromium III, Total Recoverable	2676.9	25.82	128.0	9.15	58.00	22/0.5	0.45	1.47	NO
Chromium VI, Total Dissolved	15.0	26.79	10.0	9.49	58.00	22/0.5	0.50	1.53	YES
Copper, Total Recoverable	22.0	18.72	14.1	6.63	58.00	15/1.3	0.53	1.56	NO
Iron, Total Recoverable	NA	229.92	1000.0	81.45	19.00	130/17	0.55	2.22	NO
Lead, Total Recoverable	150.8	171.48	5.9	60.75	58.00	47/0.1	4.10	4.58	YES
Mercury, Total Recoverable	2.8	0.10	0.5	0.04	58.00	0.12/0.1	0.04	1.03	NO
Nickel, Total Recoverable	706.1	30.15	78.5	10.68	58.00	22/1	0.66	1.72	NO
Zinc, Total Recoverable	180.3	340.78	180.3	120.72	58.00	260/8.3	0.60	1.64	YES

\* 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.

NA - Not Applicable

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

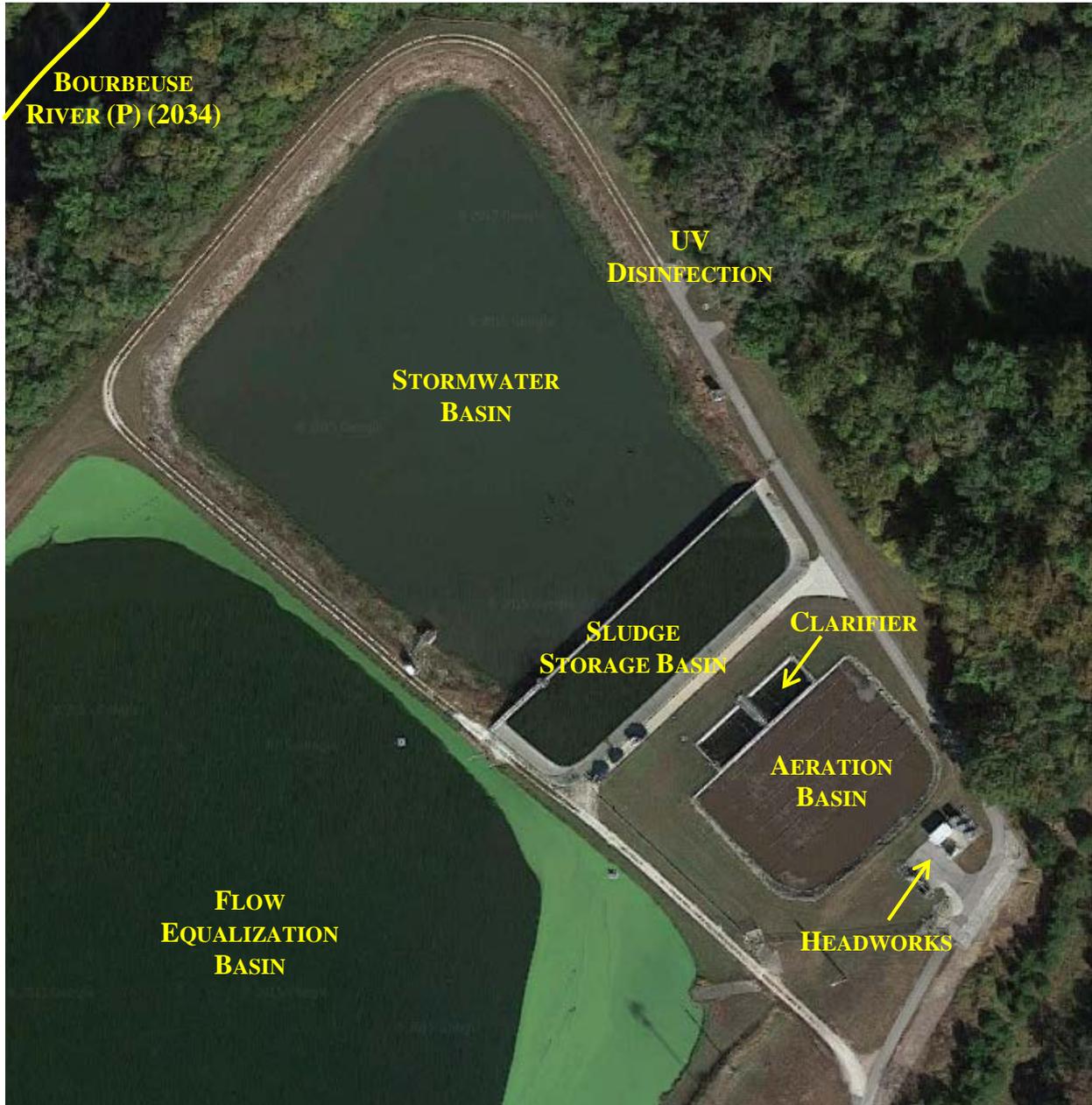
n - Number of samples.

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 – FACILITY LAYOUT:**



**APPENDIX – COST ANALYSIS FOR COMPLIANCE:**

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

**Union West Wastewater Treatment Plant, Permit Renewal  
City of Union  
Missouri State Operating Permit #MO-0025283**

Section 644.145 RSMo requires the Department of Natural Resources (DNR) 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.”

The Department is required to issue a permit with final effluent limits in accordance with 644.051.1.(1) RSMo, 644.051.1.(2) RSMo, and the Clean Water Act. The practical result of this analysis will be to allow longer compliance schedules to mitigate adverse impact to distressed populations resulting from the costs of upgrading the wastewater treatment facility.

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 DNR website (<http://dnr.mo.gov/forms/780-2511-f.pdf>) should have been submitted with the permit renewal application. If it was not received with the renewal application, the Department sent a request to complete it with the welcome letter.

**Facility Description:** Influent lift station / activated sludge / UV disinfection / flow equalization basin / sludge holding basins / sludge is removed by contract hauler.

Residential Connections:	2,951
Commercial Connections:	1,022
Industrial Connections:	187
Total Connections for this facility:	4,160

**New Permit Requirements:**

The permit requires compliance with the following new requirements:

- Quarterly upstream monitoring of phosphorus and nitrogen
- Quarterly effluent monitoring of phosphorus and nitrogen
- Quarterly downstream hardness monitoring
- Chronic WET Tests once per permit cycle
- Quarterly effluent aluminum monitoring
- Development and Implementation of a Stormwater Pollution Prevention Plan (SWPPP)

**Anticipated Costs Associated with Complying with the New Requirements:**

Following is a breakdown of the new permit requirements annually

Phosphorus and Nitrogen	\$800
Hardness	\$80
Chronic WET Test (cost divided over 5 years)	\$310
Aluminum	\$70
Development and Implementation of a SWPPP (cost divided over 5 years)	\$2,000
<b>TOTAL</b>	<b>\$3,260</b>

The total cost estimated for new permit requirements is \$3,260 annually. This cost, if financed through user fees, might cost each household an extra \$0.07<sup>1</sup> per month. A community sets their user rates based on several factors. The percentage of the current user rate that is available to cover new debt is unknown to the Department.

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

Due to the minimal cost associated with this new permit requirement, the Department anticipates the City of Union has the means to raise \$3,260 annually.

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

The total cost estimated for the new permit requirements is \$3,260 annually. This cost, if financed through user fees, might cost each household an extra \$0.07 per month. This would make the additional cost per household as a percent of median household income (MHI) 0.001%<sup>2</sup> based on the City’s MHI of \$43,650. Due to the minimal cost associated with this new requirement, the Department anticipates an extremely low to no rate increase will be necessary that could impact individuals or households of the community.

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

Nutrients are mineral compounds that are required for organisms to grow and thrive. Of the six (6) elemental macronutrients, Nitrogen and Phosphorus are generally not readily available and limit growth of organisms. Excess nitrogen and phosphorus will cause a shift in the ecosystem’s food web. Once excess nitrogen and phosphorus are introduced into a waterbody, some species’ populations will dramatically increase, while other populations will not be able to sustain life. Competition and productivity are two factors in which nutrients can alter aquatic ecosystems and the designated uses of a waterbody. For example, designated uses, such as drinking water sources and recreational uses become impaired when algal blooms take over a waterbody. These blooms can cause foul tastes and odors in the drinking water, unsightly appearance, and fish mortality in the waterbody. Some algae also produce toxins that may cause serious adverse health conditions such as liver damage, tumor promotion, paralysis, and kidney damage. The monitoring requirements for Nitrogen and Phosphorus have been added to the permit to provide data regarding the health of the receiving stream’s aquatic life. A healthy ecosystem is beneficial as it provides reduced impacts on human and aquatic health as well as recreational opportunities.

**(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 reported their outstanding debt for their current wastewater collection and treatment systems to be \$7,329,938. The community reported that they have two ¼ cent capital improvement taxes which are used toward payments on the current outstanding debt.

**(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:**

- (a) 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.
- (b) 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.

**Socioeconomic Data<sup>3-6:</sup>**

Potentially Distressed Populations – City of Union	
Unemployment	5.8%
Adjusted Median Household Income (MHI)*	\$43,650
Percent Change in MHI (1990-2012)	+10.2%
Percent Population Growth/Decline (1990-2012)	+34.7%
Change in Median Age in Years (1990-2012)	+0.7
Percent of Households in Poverty	10.9%
Percent of Households Relying on Food Stamps	8.7%

**(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 sampling requirements associated with this permit will not impose a financial burden on the community, nor will the new requirements require the City of Union to seek funding from an outside source.

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

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

**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 sampling. The Department identified the actions for which cost analysis for compliance is required under Section 644.145 RSMo.

The Department estimates the cost for new permit requirements is \$3,260 per year. Should these additional costs be financed through user fees, it may require user fees 0.001% of the community's MHI.

The Department considered the eight (8) criteria presented in subsection 644.145.3 when evaluating the cost associated with the relevant actions. Taking into consideration these criteria, this analysis examined whether the above referenced permit modifications affects 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. As a result of reviewing the above criteria, the Department hereby finds that the action described above 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.  $((3,260/4,160 \text{ connections})/12 \text{ months}) = \$0.07$
2.  $(\$0.07/(\$43650/12))*100 = 0.001\%$
3. Unemployment data was obtained from Missouri Department of Economic Development (July 2014) – <http://www.missourieconomy.org/pdfs/ure11407.pdf>
4. Median Household Income data from American Community Survey – Median income in the past 12 months – [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?\\_afpt=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table)
5. Population trend data was obtained from online at: 2012 Census Bureau Population Data - [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?\\_afpt=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table), 2000 Census Bureau Population Data - <http://www.census.gov/popest/data/cities/totals/2009/tables/SUB-EST2009-04-29.xls>, 1990 Census Bureau Population Data - <http://www.census.gov/prod/cen1990/cp1/cp-1-27.pdf>
6. Poverty data – American Community Survey- <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>



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.



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- 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 28<sup>th</sup> 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



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- 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 permittees 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.



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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.



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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

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**March 1, 2015**

**PART III – SLUDGE AND BIOSOLIDS FROM DOMESTIC AND INDUSTRIAL WASTEWATER  
TREATMENT FACILITIES**

**SECTION A – GENERAL REQUIREMENTS**

1. This permit pertains to sludge requirements under the Missouri Clean Water Law and regulation for domestic wastewater and industrial process wastewater. This permit also incorporates applicable federal sludge disposal requirements under 40 CFR 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR 503 for domestic wastewater. EPA has reviewed and accepted these standard sludge conditions. EPA may choose to issue a separate sludge addendum to this permit or a separate federal sludge permit at their discretion to further address the federal requirements.
2. These PART III Standard Conditions apply only to sludge and biosolids generated at domestic wastewater treatment facilities, including public owned treatment works (POTW), privately owned facilities and sludge or biosolids generated at industrial facilities.
3. Sludge and Biosolids Use and Disposal Practices:
  - a. The permittee is authorized to operate the sludge and biosolids treatment, storage, use, and disposal facilities listed in the facility description of this permit.
  - b. The permittee shall not exceed the design sludge volume listed in the facility description and shall not use sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
  - c. The permittee is authorized to operate the storage, treatment or generating sites listed in the Facility Description section of this permit.
4. Sludge Received from other Facilities:
  - a. Permittees may accept domestic wastewater sludge from other facilities including septic tank pumpings from residential sources as long as the design sludge volume is not exceeded and the treatment facility performance is not impaired.
  - b. The permittee shall obtain a signed statement from the sludge generator or hauler that certifies the type and source of the sludge
5. These permit requirements do not supersede nor remove liability for compliance with county and other local ordinances.
6. These permit requirements do not supersede nor remove liability for compliance with other 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 sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act under Chapter 644 RSMo.
8. In addition to STANDARD CONDITIONS, the Department may include sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Alternate Limits in the Site Specific Permit.

Where deemed appropriate, the Department may require an individual site specific permit in order to authorize alternate limitations:

  - a. A site specific permit must be obtained for each operating location, including application sites.
  - b. To request a site specific permit, an individual permit application, permit fee, and supporting documents shall be submitted for each operating location. This shall include a detailed sludge/biosolids management plan or engineering report.
10. Exceptions to these Standard Conditions may be authorized on a case-by-case basis by the Department, as follows:
  - a. The Department will prepare a permit modification and follow permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR 124.10, and 40 CFR 501.15(a)(2)(ix)(E). This includes notification of the owner of the property located adjacent to each land application site, where appropriate.
  - b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR 503.

## **SECTION B – DEFINITIONS**

1. Best Management Practices include agronomic loading rates, soil conservation practices 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 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 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 (PFRP) in accordance with 40 CFR 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. Industrial wastewater means any wastewater, also known as process water, not defined as domestic wastewater. Per 40 CFR Part 122, process water 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.
8. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including septic tanks, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological discs, and other similar facilities. It does not include wastewater treatment lagoons and constructed wetlands for wastewater treatment.
9. Operating location as defined in 10 CSR 20-2.010 is all contiguous lands owned, operated or controlled by one (1) person or by two (2) or more persons jointly or as tenants in common.
10. Plant Available Nitrogen (PAN) is the nitrogen that will be available to plants during the growing seasons after biosolids application.
11. 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.
12. 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)
13. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen 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.
14. Septage is the material pumped from residential septic tanks and similar treatment works (with a design population of less than 150 people). The standard for biosolids from septage is different from other sludges.

## **SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES**

1. Sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and sludge conditions of this permit.
2. The permittee shall operate the facility so that there is no sludge discharged to waters of the state.
3. Mechanical treatment plants shall have separate sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove sludge from these storage compartments on the required design schedule is a violation of this permit.

## **SECTION D – SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR CONTRACT HAULER**

1. This section applies to permittees that haul sludge to another treatment facility for disposal or use contract haulers to remove and dispose of sludge.
2. Permittees that use contract haulers are responsible for compliance with all the terms of this permit including final disposal, unless the hauler has a separate permit for sludge or biosolids disposal issued by the Department; or the hauler transports the sludge to another permitted treatment facility.
3. Haulers who land apply septage must obtain a state permit.
4. Testing of sludge, other than total solids content, is not required if sludge is hauled to a municipal wastewater treatment facility or other permitted wastewater treatment facility, unless it is required by the accepting facility.

## **SECTION E – INCINERATION OF SLUDGE**

1. Sludge incineration facilities shall comply with the requirements of 40 CFR 503 Subpart E; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
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, quantity of sludge incinerated, quantity of ash generated, quantity of ash stored, and ash used or disposal method, quantity, and location. Permittee shall also provide the name of the disposal facility and the applicable permit number.

## **SECTION F – SURFACE DISPOSAL SITES AND SLUDGE LAGOONS**

1. Surface disposal sites of domestic facilities shall comply with the requirements in 40 CFR 503 Subpart C; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
2. 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 sludge storage lagoons as storage facilities, accumulated 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 sludge removed will be dependent on sludge generation and accumulation in the facility. Enough 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 sludge on the bottom of the lagoon, upon prior approval of the Department; or
  - b. Permittee shall close the lagoon in accordance with Section H.

## **SECTION G – LAND APPLICATION**

1. The permittee shall not land apply sludge or biosolids unless land application is authorized in the facility description or the special conditions of the issued NPDES permit.
2. Land application sites within a 20 miles radius of the wastewater treatment facility are authorized under this permit when biosolids are applied for beneficial use in accordance with these standard conditions unless otherwise specified in a site specific permit. If the permittee's land application site is greater than a 20 mile radius of the wastewater treatment facility, approval must be granted from the Department.
3. Land application shall not adversely affect a threatened or endangered species or its designated critical habitat.
4. Biosolids shall not be applied unless authorized in this permit or exempted under 10 CSR 20, Chapter 6.
  - a. This permit does not authorize the land application of domestic sludge except for when sludge meets the definition of biosolids.
  - b. This permit authorizes "Class A or B" biosolids derived from domestic wastewater and/or process water sludge 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.
5. Public Contact Sites:

Permittees who wish to apply Class A biosolids to public contact sites must obtain approval from the Department after two years of proper operation with acceptable testing documentation that shows the biosolids meet Class A criteria. A shorter length of testing will be allowed with prior approval from the Department. Authorization for land applications must be provided in the special conditions section of this permit or in a separate site specific permit.

  - a. After Class B biosolids have been land applied, public access must be restricted for 12 months.
  - b. Class B biosolids are only land applied to root crops, home gardens or vegetable crops whose edible parts will not be for human consumption.
6. Agricultural and Silvicultural Sites:

Septage – Based on Water Quality guide 422 (WQ422) published by the University of Missouri

  - a. Haulers that land apply septage must obtain a state permit
  - b. Do not apply more than 30,000 gallons of septage per acre per year.
  - c. Septage 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 other mechanical type treatment facilities.
  - d. To meet Class B sludge requirements, maintain septage at 12 pH for at least thirty (30) minutes before land application. 50 pounds of hydrated lime shall be added to each 1,000 gallons of septage in order to meet pathogen and vector stabilization for septage biosolids applied to crops, pastures or timberland.
  - e. 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.

Biosolids - Based on Water Quality guide 423, 424, and 425 (WQ423, WQ424, WQ425) published by the University of Missouri;

- a. Biosolids shall be monitored to determine the quality for regulated pollutants
- b. The number of samples taken is directly related to the amount of sludge produced by the facility (See Section I of these Standard Conditions). Report as dry weight unless otherwise specified in the site specific permit. 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 reach the maximum concentration of pollutants allowed.
- c. Table 1 gives the maximum concentration allowable to protect water quality standards

**TABLE 1**

Biosolids ceiling concentration <sup>1</sup>	
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

<sup>1</sup> Land application is not allowed if the sludge concentration exceeds the maximum limits for any of these pollutants

- d. The low metal concentration biosolids has reduced requirements because of its higher quality and can safely be applied for 100 years or longer at typical agronomic loading rates. (See Table 2)

**TABLE 2**

Biosolids Low Metal Concentration <sup>1</sup>	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	36
Zinc	2,800

<sup>1</sup> You may apply low metal biosolids without tracking cumulative metal limits, provided the cumulative application of biosolids does not exceed 500 dry tons per acre.

- e. Each pollutant in Table 3 has an annual and a total cumulative loading limit, based on the allowable pounds per acre for various soil categories.

**TABLE 3**

Pollutant	CEC 15+		CEC 5 to 15		CEC 0 to 5	
	Annual	Total <sup>1</sup>	Annual	Total <sup>1</sup>	Annual	Total <sup>1</sup>
Arsenic	1.8	36.0	1.8	36.0	1.8	36.0
Cadmium	1.7	35.0	0.9	9.0	0.4	4.5
Copper	66.0	1,335.0	25.0	250.0	12.0	125.0
Lead	13.0	267.0	13.0	267.0	13.0	133.0
Mercury	0.7	15.0	0.7	15.0	0.7	15.0
Nickel	19.0	347.0	19.0	250.0	12.0	125.0
Selenium	4.5	89.0	4.5	44.0	1.6	16.0
Zinc	124.0	2,492.0	50.0	500.0	25.0	250.0

<sup>1</sup> Total cumulative loading limits for soils with equal or greater than 6.0 pH (salt based test) or 6.5 pH (water based test)

**TABLE 4** - Guidelines for land application of other trace substances <sup>1</sup>

Cumulative Loading	
Pollutant	Pounds per acre
Aluminum	4,000 <sup>2</sup>
Beryllium	100
Cobalt	50
Fluoride	800
Manganese	500
Silver	200
Tin	1,000
Dioxin	(10 ppt in soil) <sup>3</sup>
Other	<sup>4</sup>

<sup>1</sup> Design of land treatment systems for Industrial Waste, 1979. Michael Ray Overcash, North Carolina State University and Land Treatment of Municipal Wastewater, EPA 1981.)

<sup>2</sup> This applies for a soil with a pH between 6.0 and 7.0 (salt based test) or a pH between 6.5 to 7.5 (water based test). Case-by-case review is required for higher pH soils.

<sup>3</sup> Total Dioxin Toxicity Equivalents (TEQ) in soils, based on a risk assessment under 40 CFR 744, May 1998.

<sup>4</sup> Case by case review. Concentrations in sludge should not exceed the 95<sup>th</sup> percentile of the National Sewage Sludge Survey, EPA, January 2009.

Best Management Practices – Based on Water Quality guide 426 (WQ426) published by the University of Missouri

- a. Use best management practices when applying biosolids.
- b. Biosolids cannot discharge from the land application site
- c. Biosolid application is subject to the Missouri Department of Agriculture State Milk Board concerning grazing restrictions of lactating dairy cattle.
- d. Biosolid application must be in accordance with section 4 of the Endangered Species Act.
- e. Do not apply more than the agronomic rate of nitrogen needed.
- f. The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop removal 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.
  - i. PAN can be determined as follows and is in accordance with WQ426  
(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor<sup>1</sup>).  
<sup>1</sup>Volatilization factor is 0.7 for surface application and 1 for subsurface application.
- g. Buffer zones are as follows:
  - i. 300 feet of a water supply well, sinkhole, lake, pond, 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 if dwellings;
  - iv. 100 feet of wetlands or permanent flowing streams;
  - v. 50 feet of a property line or other waters of the state, including intermittent flowing streams.
- h. Slope limitation for application sites are as follows;
  - i. A slope 0 to 6 percent has 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.
- i. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
- j. Do not apply biosolids to sites with soil that is snow covered, frozen or saturated with liquid without prior approval by the Department.
- k. Biosolids / sludge applicators must keep detailed records up to five years.

## SECTION H – CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical, industrial, and lagoons) and sludge or biosolids storage and treatment facilities and incineration ash ponds. 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 residues, including sludge, biosolids. Mechanical plants, sludge lagoons, ash ponds and other storage structures must obtain approval of a closure plan from the Department. 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. Residuals 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. Residuals shall meet the monitoring and land application limits for agricultural rates as referenced in Section H of these standard conditions.
  - 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.
    - i. PAN can be determined as follows:  
$$(\text{Nitrate} + \text{nitrite nitrogen}) + (\text{organic nitrogen} \times 0.2) + (\text{ammonia nitrogen} \times \text{volatilization factor}^1).$$

<sup>1</sup> Volatilization factor is 0.7 for surface application and 1 for subsurface application.
4. When closing a domestic wastewater treatment lagoon with a design treatment capacity equal or less than 150 persons, the residuals are considered “septage” under the similar treatment works definition. See Section B of these standard conditions. 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. Residuals left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, 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.
6. Lagoons and/or earthen structure and/or ash pond 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 and/or industrial process wastewater plant; all 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. Per 10 CSR 20-6.015(4)(B)6, Hazardous Waste shall not be land applied or disposed during industrial and mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations under 10 CSR 25.
  - c. After demolition of the mechanical plant / industrial plant, the site must only contain clean fill defined in RSMo 260.200 (5) 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 or other beneficial use. Other solid wastes must be removed.
8. If sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or H, 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 503, Subpart C.

**SECTION I – MONITORING FREQUENCY**

- At a minimum, sludge or biosolids 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**

Design Sludge Production (dry tons per year)	Monitoring Frequency (See Notes 1, 2, and 3)			
	Metals, Pathogens and Vectors	Nitrogen TKN <sup>1</sup>	Nitrogen PAN <sup>2</sup>	Priority Pollutants and TCLP <sup>3</sup>
0 to 100	1 per year	1 per year	1 per month	1 per year
101 to 200	biannual	biannual	1 per month	1 per year
201 to 1,000	quarterly	quarterly	1 per month	1 per year
1,001 to 10,000	1 per month	1 per month	1 per week	-- <sup>4</sup>
10,001 +	1 per week	1 per week	1 per day	-- <sup>4</sup>

<sup>1</sup> Test total Kjeldahl nitrogen, if biosolids application is 2 dry tons per acre per year or less.

<sup>2</sup> 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.

<sup>3</sup> Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) and toxicity characteristic leaching procedure (40 CFR 261.24) is required only for permit holders that must have a pre-treatment program.

<sup>4</sup> One sample for each 1,000 dry tons of sludge.

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: Total Phosphorus: Total phosphorus and total potassium shall be tested at the same monitoring frequency as metals.

Note 3: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

- If you own a wastewater treatment lagoon or sludge lagoon that is cleaned out once a year or less, you may choose to sample only when the sludge is removed or the lagoon is closed. Test one composite sample for each 100 dry tons of sludge or biosolids removed from the lagoon during the year within the lagoon at closing. Composite sample must represent various areas at one-foot depth.
- Additional testing may be required in the special conditions or other sections of the permit. Permittees receiving industrial wastewater may be required to conduct additional testing upon request from the Department.
- At this time, the Department recommends monitoring requirements shall be performed in accordance with, "POTW Sludge Sampling and Analysis Guidance Document," United States Environmental Protection Agency, August 1989, and the subsequent revisions.

**SECTION J – RECORD KEEPING AND REPORTING REQUIREMENTS**

- The permittee shall maintain records on file at the facility for at least five years for the items listed in these standard conditions and any additional items in the Special Conditions section of this permit. This shall include dates when the sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
- Reporting period
  - By January 28<sup>th</sup> of each year, an annual report shall be submitted for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and sludge or biosolids disposal facilities.
  - Permittees with wastewater treatment lagoons shall submit the above annual report only when sludge or biosolids are removed from the lagoon during the report period or when the lagoon is closed.
- Report Forms. The annual report shall be submitted on report forms provided by the Department or equivalent forms approved by the Department.
- Reports shall be submitted as follows:

Major facilities (those serving 10,000 persons or 1 million gallons per day) shall report to both the Department and EPA. Other facilities need to report only to the Department. Reports shall be submitted to the addresses listed as follows:

DNR regional office listed in your permit  
 (see cover letter of permit)  
 ATTN: Sludge Coordinator

EPA Region VII  
 Water Compliance Branch (WACM)  
 Sludge Coordinator  
 11201 Renner Blvd.  
 Lenexa, KS 66219

5. Annual report contents. The annual report shall include the following:
- a. Sludge and biosolids testing performed. Include a copy or summary of all test results, even if not required by the permit.
  - b. Sludge or biosolids quantity shall be reported as dry tons for quantity generated by the wastewater treatment facility, the quantity stored on site at the end of the year, and the quantity used 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, 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 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 sludge or biosolids 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, CEC, and phosphorus. If none was tested during the year, report the last date when tested and results.

FEB 27 2015



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH  
**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**

**WATER PROTECTION PROGRAM**

FACILITY NAME Union West WWTP	
PERMIT NO. 0025283	COUNTY Franklin

**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**

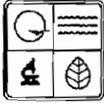
- D. Expanded Effluent Testing Data. A treatment works that discharges effluent to surface water of the United States and meets one or more of the following criteria must complete *Part D - Expanded Effluent Testing Data*:
  - 1. Has a design flow rate greater than or equal to 1 million gallons per day.
  - 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**

# RECEIVED

FEB 27 2015

AP20745



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH  
**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**

AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
2/27/15	ESB

<b>PART A – BASIC APPLICATION INFORMATION</b>			
<b>1. THIS APPLICATION IS FOR:</b>			
<input type="checkbox"/> An operating permit for a new or unpermitted facility. Construction Permit # _____ (Please include completed Antidegradation Review or request to conduct an Antidegradation Review, see instructions)			
<input checked="" type="checkbox"/> An operating permit renewal: Permit #MO-0025 283 Expiration Date _____			
<input type="checkbox"/> An operating permit modification: Permit #MO-_____ Reason: _____			
1.1 Is the appropriate fee included with the application (see instructions for appropriate fee)?			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>2. FACILITY</b>			
NAME Union West WWTP		TELEPHONE NUMBER WITH AREA CODE 636-583-3600	
ADDRESS (PHYSICAL) 671 Highway 47 South	CITY Union	STATE Mo	ZIP 63084
2.1 LEGAL DESCRIPTION (Facility Site): ¼, se ¼, sw ¼, Sec. 26, T 43n, R 1w		COUNTY Franklin	
2.2 UTM Coordinates Easting (X): _____ Northing (Y): _____ For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)			
2.3 Name of receiving stream: bourbeuse			
2.4 Number of Outfalls: 1 wastewater outfalls, stormwater outfalls, instream monitoring sites			
<b>3. OWNER</b>			
NAME City of Union		E-MAIL ADDRESS engdept@unionmissouri.org	TELEPHONE NUMBER WITH AREA CODE 6365831805
ADDRESS 500 east locust street	CITY Union	STATE Missouri	ZIP 63084
3.1 Request review of draft permit prior to Public Notice?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
3.2 Are you a Publically Owned Treatment Works (POTW)?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
3.3 Are you a Privately Owned Treatment Facility?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
3.4 Are you a Privately Owned Treatment Facility regulated by the Public Service Commission (PSC)?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
<b>4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.</b>			
NAME City of Union		E-MAIL ADDRESS engdept@unionmissouri.org	TELEPHONE WITH AREA CODE 6365833600
ADDRESS 500 east locust street	CITY union	STATE missouri	ZIP 63084
If the Continuing Authority is different than the Owner, please include a copy of the contract agreement between the two parties and a description of the responsibilities of both parties within the agreement.			
<b>5. OPERATOR</b>			
NAME David Aguilar		TITLE wwtp operator	CERTIFICATE NUMBER (IF APPLICABLE)
E-MAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE 6365833522	
<b>6. FACILITY CONTACT</b>			
NAME Jeff Voss		TITLE Water/Wastewater Foreman	
E-MAIL ADDRESS jvoss@unionmissouri.org		TELEPHONE NUMBER WITH AREA CODE 6365833522	
ADDRESS 500 East Locust Street	CITY Union	STATE Missouri	ZIP CODE 63084

SL  
Franklin

FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**PART A – BASIC APPLICATION INFORMATION**

**7. FACILITY INFORMATION**

**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. 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.

See Attached

FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**PART A – BASIC APPLICATION INFORMATION**

**7. FACILITY INFORMATION (continued)**

**7.2 Topographic Map.** Attach to this application a 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.

- The area surrounding the treatment plant, including all unit processes.
- The location of the downstream landowner(s). (See Item 10.)
- 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.

<b>7.3</b> Facility SIC Code: 4952	Discharge SIC Code: 4952
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**7.4** Number of people presently connected or population equivalent (P.E.): 10204      Design P.E. \_\_\_\_\_

**7.5** Connections to the facility:

Number of units presently connected:

Homes 2500    Trailers 251    Apartments 200    Other (including industrial) 187

Number of Commercial Establishments: \_\_\_\_\_

<b>7.6</b> Design Flow 1.5 MGD	Actual Flow 1.1 MGD
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**7.7** Will discharge be continuous through the year?    Yes     No   
 Discharge will occur during the following months:    How many days of the week will discharge occur?

**7.8** Is industrial waste discharged to the facility?    Yes     No   
 If yes, please describe the number and types of industries that discharge to your facility.

**Find attached information, industrial user survey**

Refer to the APPLICATION OVERVIEW to determine whether additional information is needed for Part F.

**7.9** Does the facility accept or process leachate from landfills?:    Yes     No

**7.10** Is wastewater land applied?    Yes     No   
 If yes, is Form I attached?    Yes     No

**7.11** Does the facility discharge to a losing stream or sinkhole?    Yes     No

**7.12** Has a wasteload allocation study been completed for this facility?    Yes     No

**8. LABORATORY CONTROL INFORMATION**

LABORATORY WORK CONDUCTED BY PLANT PERSONNEL

Lab work conducted outside of plant.	Yes <input checked="" type="checkbox"/>	No <input 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 Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**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  No

9.2 Sludge production (Including sludge received from others): Design Dry Tons/Year . Actual Dry Tons/Year 181.3

9.3 Sludge storage provided: 1336 Cubic feet; 700 Days of storage; 4.2 Average percent solids of sludge;  
 No sludge storage is provided.  Sludge is stored in lagoon.

9.4 Type of storage:  Holding Tank  Building  
 Basin  Lagoon  
 Concrete Pad  Other (Please describe) \_\_\_\_\_

9.5 Sludge Treatment:  
 Anaerobic Digester  Storage Tank  Lime Stabilization  Lagoon  
 Aerobic Digester  Air or Heat Drying  Composting  Other (Attach Description)

9.6 Sludge use or disposal:  
 Land Application  Contract Hauler  Hauled to Another Treatment Facility  Solid Waste Landfill  
 Surface Disposal (Sludge Disposal Lagoon, Sludge Held For More Than Two Years)  Incineration  
 Other (Attach Explanation Sheet) \_\_\_\_\_

9.7 Person responsible for hauling sludge to disposal facility:  
 By Applicant  By Others (complete below)

NAME Septic Services (Low Bidder, bid out every two years)		E-MAIL ADDRESS	
ADDRESS 7059 Highway 47 South	CITY Union	STATE Mo	ZIP CODE 63084
CONTACT PERSON Dave Flagg	TELEPHONE WITH AREA CODE (636) 583-5564	PERMIT NO. MO- 0116777	

9.8 Sludge use or disposal facility:  
 By Applicant  By Others (Please complete below)

NAME Septic Services (Low bidder, bid out every two years)		E-MAIL ADDRESS	
ADDRESS 7059 Highway 47 South	CITY Union	STATE Mo	ZIP CODE 63084
CONTACT PERSON Dave Flagg	TELEPHONE WITH AREA CODE (636) 583-5564	PERMIT NO. MO- 0116777	

9.9 Does the sludge or biosolids disposal comply with Federal Sludge Regulation 40 CFR 503?  
 Yes  No (Please explain)

**END OF PART A**

FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**PART B – ADDITIONAL APPLICATION INFORMATION**

**10. COLLECTION SYSTEM**

10.1 Length of sanitary sewer collection system in miles  
50.5

10.2 Does significant infiltration occur in the collection system?  Yes  No  
If yes, briefly explain any steps underway or planned to minimize inflow and infiltration:  
We currently video and visually inspect. We aggressively replacing cracked or failed sewer. We budget approximately \$40,000.00 per year for repair/maintenance.

**11. BYPASSING**

Does any bypassing occur anywhere in the collection system or at the treatment facility? Yes  No   
If yes, explain:

**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  No   
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

MAILING ADDRESS

TELEPHONE NUMBER WITH AREA CODE

EMAIL ADDRESS

RESPONSIBILITIES OF CONTRACTOR

**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 Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**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.

Outfall Number

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	7.3	S.U.	7.37	S.U.	3
pH (Maximum)	7.5	S.U.	7.5	S.U.	3
Flow Rate	2.7	MGD	.876	MGD	90

\*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 <sub>5</sub>	9.1	mg/L	7.03	mg/L	3	sm5210b	
	CBOD <sub>5</sub>		mg/L		mg/L	3		
E. COLI	11200	#/100 mL	7906.7	#/100 mL	3	sm 9223b-qt		
TOTAL SUSPENDED SOLIDS (TSS)	3.6	mg/L	3.5	mg/L	3	sm 2540d		
AMMONIA (as N)	3.8	mg/L	1.7	mg/L	3	sm 4500-nh3 b f		
CHLORINE* (TOTAL RESIDUAL, TRC)	0.1	mg/L	0.1	mg/L	3	sm4500-ci g		
DISSOLVED OXYGEN	6.5	mg/L	5.6	mg/L	3	sm 4500-o g		
OIL and GREASE	5.1	mg/L	5.06	mg/L	3	epa 1664		
OTHER		mg/L		mg/L				

\*Report only if facility chlorinates

**END OF PART B**

FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**PART C – CERTIFICATION**

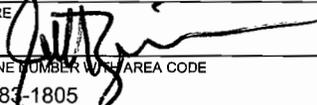
**15. CERTIFICATION**

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 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 Jonathan Zimmermann	OFFICIAL TITLE (MUST BE AN OFFICER OF THE COMPANY OR CITY OFFICIAL) City Engineer
-------------------------------------	--

SIGNATURE 

TELEPHONE NUMBER WITH AREA CODE  
(636) 583-1805

DATE SIGNED  
2/24/15

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

**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 Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**PART D -- EXPANDED EFFLUENT TESTING DATA**

**16. 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 million gallons per day 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 through analysis conducted using 40 CFR Part 136 methods. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. 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. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. 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 apart.

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**

ANTIMONY	0.3	ug/l			0.3	ug/l			3	epa 200.8	
ARSENIC	0.77	ug/l			0.67	ug/l			3	epa 200.8	
BERYLLIUM	0.1	ug/l			0.1	ug/l			3	epa 200.8	
CADMIUM	0.1	ug/l			0.1	ug/l			3	epa 200.8	
CHROMIUM III	0.005	mg/l			0.005	mg/l			3		
CHROMIUM VI	0.005	mg/l			0.005	mg/l			3	sm 3500-Cr D	
COPPER	3.6	ug/l			3.1	ug/l			3	epa 200.8	
LEAD	0.44	ug/l			0.40	ug/l			3	epa 200.8	
MERCURY	0.2	ug/l			0.2	ug/l			3	epa 245.1	
NICKEL	3.0	ug/l			2.63	ug/l			3	epa 200.8	
SELENIUM	1.7	ug/l			1.3	ug/l			3	epa 200.8	
SILVER	0.5	ug/l			0.5	ug/l			3	epa 200.8	
THALLIUM	0.1	ug/l			0.1	ug/l			3	epa 200.8	
ZINC	36.0	ug/l			33.67	ug/l			3	epa 200.8	
CYANIDE	0.005	mg/l			0.005	mg/l			3	sm 4500-cn c e	
TOTAL PHENOLIC COMPOUNDS	0.05	mg/l			0.05	mg/l			3	epa 420.1	
HARDNESS (as CaCO <sub>3</sub> )	250	mg/l			230	mg/l			3	sm 2340 b	

**VOLATILE ORGANIC COMPOUNDS**

ACROLEIN	<50.0	ug/l			<50.0	ug/l			3	epa 624	
ACRYLONITRILE	<10.0	ug/l			<10.0	ug/l			3	epa 624	
BENZENE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
BROMOFORM	<5.0	ug/l			<5.0	ug/l			3	epa 624	
CARBON TETRACHLORIDE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
CHLORO BENZENE	<5.0	ug/l			<5.0	ug/l			3	epa 624	

FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
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**PART D – EXPANDED EFFLUENT TESTING DATA**

**16. 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		
CHLORODIBROMO-METHANE											
CHLOROETHANE	<10.0	ug/l			<10.0	ug/l			3	epa 624	
2-CHLORO-ETHYL VINYL ETHER	<5.0	ug/l			<5.0	ug/l			3	epa 624	
CHLOROFORM	<5.0	ug/l			<5.0	ug/l			3	epa 624	
DICHLOROBROMO-METHANE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
1,1-DICHLORO-ETHANE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
1,2-DICHLORO-ETHANE	<5.0	ug/l			<5.0	ug/l			3		
TRANS-1,2-DICHLOROETHYLENE											
1,1-DICHLORO-ETHYLENE											
1,2-DICHLORO-PROPANE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
1,3-DICHLORO-PROPYLENE											
ETHYLBENZENE											
METHYL BROMIDE											
METHYL CHLORIDE											
METHYLENE CHLORIDE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
1,1,2,2-TETRA-CHLOROETHANE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
TETRACHLORO-ETHANE											
TOLUENE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
1,1,1-TRICHLORO-ETHANE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
1,1,2-TRICHLORO-ETHANE	<5.0	ug/l			<5.0	ug/l			3	epa 624	
TRICHLORETHYLENE											
VINYL CHLORIDE	<5.0	ug/l			<5.0	ug/l			3	epa 624	

**ACID-EXTRACTABLE COMPOUNDS**

P-CHLORO-M-CRESOL											
2-CHLOROPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
2,4-DICHLOROPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
2,4-DIMETHYLPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
4,6-DINITRO-O-CRESOL											
2,4-DINITROPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
2-NITROPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
4-NITROPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	

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**PART D – EXPANDED EFFLUENT TESTING DATA**

**16. 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	<10.0	ug/l			<10.0	ug/l			3	epa 625	
PHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
2,4,6-TRICHLOROPHENOL	<10.0	ug/l			<10.0	ug/l			3	epa 625	
<b>BASE-NEUTRAL COMPOUNDS</b>											
ACENAPHTHENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
ACENAPHTHYLENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
ANTHRACENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BENZIDINE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BENZO(A)ANTHRACENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BENZO(A)PYRENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
3,4-BENZO-FLUORANTHENE											
BENZO(GH) PHERYLENE											
BENZO(K) FLUORANTHENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BIS (2-CHLOROTHOXY) METHANE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BIS (2-CHLOROETHYL) – ETHER	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BIS (2-CHLOROISO-PROPYL) ETHER	<10.0	ug/l			<10.0	ug/l			3	epa 625	
BIS (2-ETHYLHEXYL) PHTHALATE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
4-BROMOPHENYL PHENYL ETHER											
BUTYL BENZYL PHTHALATE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
2-CHLORONAPH-THALENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
4-CHLORPHENYL PHENYL ETHER	<10.0	ug/l			<10.0	ug/l			3	epa 625	
CHRYSENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
DI-N-BUTYL PHTHALATE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
DI-N-OCTYL PHTHALATE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
DIBENZO (A,H) ANTHRACENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
1,2-DICHLORO-BENZENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
1,3-DICHLORO-BENZENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
1,4-DICHLORO-BENZENE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
3,3-DICHLORO-BENZIDINE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
DIETHYL PHTHALATE	<10.0	ug/l			<10.0	ug/l			3	epa 625	
DIMETHYL PHTHALATE	<10.0	ug/l			<10.0	ug/l			3	epa 625	



**MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL**

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**PART E – TOXICITY TESTING DATA**

**17. 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.

- 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
  - 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.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years: \_\_\_\_\_ chronic \_\_\_\_\_ 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 <sup>ND</sup> Most Recent	3 <sup>RD</sup> Most Recent
<b>A. Test Information</b>			
Test Method Number	See Attached	See Attached	See Attached
Final Report Number			
Outfall Number			
Dates Sample Collected			
Date Test Started			
Duration			
<b>B. Toxicity Test Methods Followed</b>			
Manual Title			
Edition Number and Year of Publication			
Page Number(s)			
<b>C. Sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used</b>			
24-Hour Composite			
Grab			
<b>D. Indicate where the sample was taken in relation to disinfection (Check all that apply for each)</b>			
Before Disinfection			
After Disinfection	—	—	—
After Dechlorination			
<b>E. Describe the point in the treatment process at which the sample was collected</b>			
Sample Was Collected:			
<b>F. Indicate whether the test was intended to assess chronic toxicity, acute toxicity, or both</b>			
Chronic Toxicity			
Acute Toxicity			
<b>G. Provide the type of test performed</b>			
Static		—	
Static-renewal	—		
Flow-through	—		—
<b>H. Source of dilution water. If laboratory water, specify type; if receiving water, specify source</b>			
Laboratory Water		—	—
Receiving Water			—

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**PART E – TOXICITY TESTING DATA**

**17. TOXICITY TESTING DATA (continued)**

	Most Recent	2 <sup>ND</sup> Most Recent	3 <sup>RD</sup> Most Recent
I. Type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used.			
Fresh Water			
Salt Water			
J. Percentage of effluent used for all concentrations in the test series			
K. Parameters measured during the test (State whether parameter meets test method specifications)			
pH			
Salinity			
Temperature			
Ammonia			
Dissolved Oxygen			
L. Test Results			
Acute:			
Percent Survival in 100% Effluent			
LC <sub>50</sub>			
95% C.I.			
Control Percent Survival			
Other (Describe)			
Chronic:			
NOEC			
IC <sub>25</sub>			
Control Percent Survival			
Other (Describe)			
M. Quality Control/ Quality Assurance			
Is reference toxicant data available?			
Was reference toxicant test within acceptable bounds?			
What date was reference toxicant test run (MM/DD/YYYY)?			
Other (Describe)			
Is the treatment works involved in a toxicity reduction evaluation? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, describe:			
If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.			
Date Submitted (MM/DD/YYYY)			
Summary of Results (See Instructions)			
See Attached			
<b>END OF PART E</b>			
<b>REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.</b>			





<b>MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL</b>			
FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002	
<b>PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES</b>			
Refer to the APPLICATION OVERVIEW to determine whether Part F applies to the treatment works.			
<b>18. GENERAL INFORMATION</b>			
18.1 Does the treatment works have, or is it subject to, an approved pretreatment program? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
18.2 Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works: Number of non-categorical SIUs    2 Number of CIUs                      1			
<b>19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION</b>			
Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.			
NAME Tops			
MAILING ADDRESS 850 West Park Road		CITY Union	STATE    ZIP Mo        63084
19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge ink tinting			
19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge. Principal Product(s): index cards, file folders  Raw Material(s): Ink, paper			
19.3 Flow Rate a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent. 3000    gpd <input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent  b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent. 3500    gpd <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent			
19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following: a. Local Limits <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No b. Categorical Pretreatment Standards <input type="checkbox"/> Yes <input type="checkbox"/> No If subject to categorical pretreatment standards, which category and subcategory?			
19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  If Yes, describe each episode			

<b>MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL</b>		
FACILITY NAME Union West WWTP	PERMIT NO. MO- 0025283	OUTFALL NO. 002
<b>PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES</b>		
<b>20. RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE</b>		
20.1 Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail or dedicated pipe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
20.2 Method by which RCRA waste is received. (Check all that apply) <input type="checkbox"/> Truck <input type="checkbox"/> Rail <input type="checkbox"/> Dedicated Pipe		
20.3 Waste Description		
EPA Hazardous Waste Number	Amount (volume or mass)	Units
<b>21. CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER</b>		
21.1 Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Provide a list of sites and the requested information for each current and future site.		
21.2 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).		
21.3 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)		
21.4 Waste Treatment		
a. Is this waste treated (or will it be treated) prior to entering the treatment works? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, describe the treatment (provide information about the removal efficiency):		
b. Is the discharge (or will the discharge be) continuous or intermittent? <input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent If intermittent, describe the discharge schedule:		
<b>END OF PART F</b>		
<b>REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.</b>		



**INSTRUCTIONS FOR COMPLETING 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. Form 780-1805**  
(Facilities less than or equal to 100,000 gallons per day of domestic waste must use Form B - 780-1512.)

**PART A – BASIC APPLICATION INFORMATION**

1. Check the appropriate box. **Do not check more than one item.** Operating permits refer to permits issued by the Department of Natural Resources, Water Protection Program. If an Antidegradation Review has not been conducted, please submit the application located at the following link to the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102: [dnr.mo.gov/forms/780-1893-f.pdf](http://dnr.mo.gov/forms/780-1893-f.pdf).

1.1 **Fees Information:**

**DOMESTIC OPERATING PERMIT FEES – PRIVATE**

Annual operating permit fees are based on flow.

Annual fee/Design flow	Annual fee/Design flow	Annual fee/Design flow
\$100.....<5,000 gpd	\$375.....10,000-10,999 gpd	\$650.....16,000-16,999 gpd
\$150.....5,000-5,999 gpd	\$400.....11,000-11,999 gpd	\$800.....17,000-19,999 gpd
\$175.....6,000-6,999 gpd	\$450.....12,000-12,999 gpd	\$1,000.....20,000-22,999 gpd
\$200.....7,000-7,999 gpd	\$500.....13,000-13,999 gpd	\$2,000.....23,000-24,999 gpd
\$225.....8,000-8,999 gpd	\$550.....14,000-14,999 gpd	\$2,500.....25,000-29,999 gpd
\$250.....9,000-9,999 gpd	\$600.....15,000-15,999 gpd	\$3,000.....30,000 gpd -1 mgd

New domestic wastewater treatment facilities must submit the annual fee with the original application.

**If the application is for a site-specific permit re-issuance, send no fees.** You will be invoiced separately by the department on the anniversary date of the original permit. Permit fees must be current for the department to reissue the operating permit. Late fees of two percent per month are charged and added to outstanding annual fees.

**PUBLIC SEWER SYSTEM OPERATING PERMIT FEES** (City, Public Sewer District, Public Water District, or other publicly owned treatment works). Annual fee is based on number of service connections. The table of fees is in 10 CSR 20-6.011 and is available at [www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf](http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf). New Public Sewer System facilities should not submit any fee as the department will invoice the permittee.

**OPERATING PERMIT MODIFICATIONS**, including transfers, are subject to the following fees:

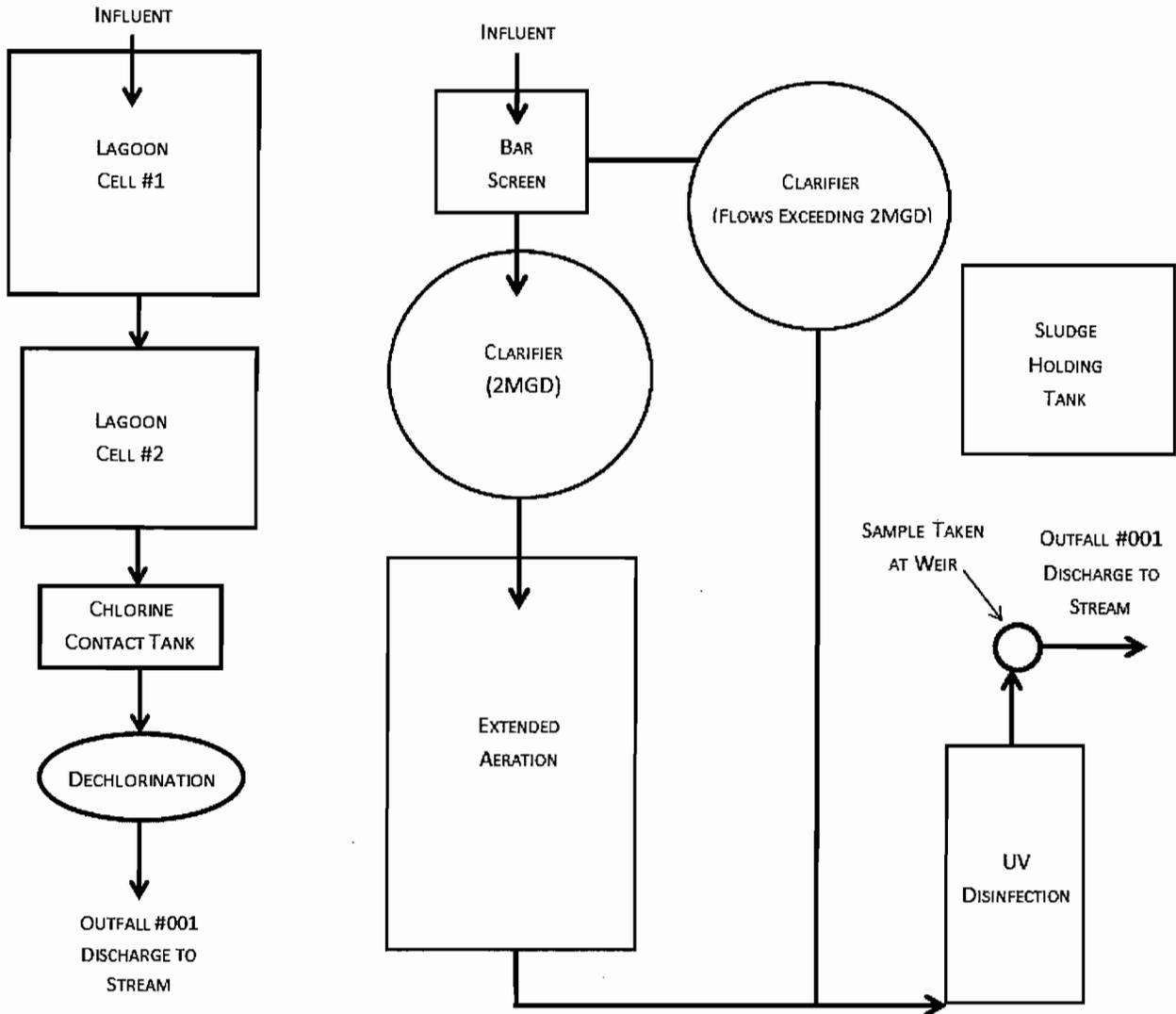
- a. Municipals - \$200 each.
- b. All others – \$100 each.

Note: Facility name or address changes where owner, operator and continuing authority remain the same are not considered transfers.

2. Name of Facility – Include the name by which this facility is locally known. Example: Southwest Sewage Treatment Plant, Country Club Mobile Home Park, etc. Provide the street address or location of the facility. If the facility lacks a street name or route number, provide the names of the closest intersection, highway, country road, etc.
  - 2.1 Self-explanatory.
  - 2.2 Global Positioning System, or GPS, is a satellite-based navigation system. The department prefers that a GPS receiver is used and the displayed coordinates submitted. If access to a GPS receiver is not available, use a mapping system to approximate the coordinates; the department’s mapping system is available at [www.dnr.mo.gov/internetmapviewer/](http://www.dnr.mo.gov/internetmapviewer/).
  - 2.3-2.4 Self-explanatory.
3. Owner – Provide the legal name, mailing address, phone number, and e-mail address of the owner.
  - 3.1 Prior to submitting a permit to public notice, the Department of Natural Resources shall provide the permit applicant 15 days to review the draft permit for nonsubstantive drafting errors. In the interest of expediting permit issuance, permit applicants may waive the opportunity to review draft permits prior to public notice.
    - 3.2-3.4 Self-explanatory.
4. Continuing Authority – Provide information for the permanent organization which will serve as the continuing authority for the operation, maintenance, and modernization of the facility. The regulatory requirement regarding continuing authority is available at [www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf](http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf) or contact the Department of Natural Resources Water Protection Program (see contact information below).
5. Operator – Provide the name, certificate number, title, mailing address, phone number, and e-mail address of the operator of the facility.
6. Provide the name, title, mailing address, work phone number, and e-mail address of a person who is thoroughly familiar with the operation of the facility and with the facts reported in this application and who can be contacted by the department.

7.1 Process Flow Diagram Examples

WASTEWATER TREATMENT LAGOON WASTEWATER TREATMENT FACILITY



- 7.2 A topographic map is available on the web at [www.dnr.mo.gov/internetmapviewer/](http://www.dnr.mo.gov/internetmapviewer/) or from the Department of Natural Resources' Geological Survey in Rolla at 573-368-2125.
- 7.3 For Standard Industrial Codes visit [www.osha.gov/pls/imis/sicsearch.htm](http://www.osha.gov/pls/imis/sicsearch.htm) and for the North American Industry Classification System, visit [www.census.gov/naics](http://www.census.gov/naics) or contact the Department of Natural Resources Water Protection Program.
- 7.4-7.8 Self – explanatory.
- 7.9 If wastewater is land applied please submit form I: [www.dnr.mo.gov/forms/780-1686-f.pdf](http://www.dnr.mo.gov/forms/780-1686-f.pdf).
- 7.10-8. Self-explanatory
- 9.1 A copy of 10 CSR 25 is available at [www.sos.mo.gov/adrules/csr/current/10csr/10csr.asp#10-25](http://www.sos.mo.gov/adrules/csr/current/10csr/10csr.asp#10-25).
- 9.2-9.9 Self – explanatory.

**INSTRUCTIONS FOR COMPLETING 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  
(continued)**

**PART B – ADDITIONAL APPLICATION INFORMATION**

10.-14. Self-explanatory

**PART C – CERTIFICATION**

15. Signature – All applications must be signed as follows and the signatures must be original:
- a. For a corporation, by an officer having responsibility for the overall operation of the regulated facility or activity or for environmental matters.
  - b. For a partnership or sole proprietorship, by a general partner or the proprietor.
  - c. For a municipal, state, federal or other public facility, by either a principal executive officer or by an individual having overall responsibility for environmental matters at the facility.

**PART D – EXPANDED EFFLUENT TESTING DATA**

16. Self-explanatory. ML/MDL means minimum limit or minimum detection limit.

**PART E – TOXICITY TESTING DATA**

17. Self-explanatory.

**PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES**

18. Federal regulations are available through the U.S. Government Printing Office at [www.gpoaccess.gov/cfr/index.html](http://www.gpoaccess.gov/cfr/index.html).

18.1 Self-explanatory

- 18.2 A non-categorical significant industrial user is an industrial user that is not a CIU and 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.

19.-21.4 Self-explanatory.

**PART G – COMBINED SEWER SYSTEMS**

22.-23.4 Self-explanatory.

**Submittal of an incomplete application may result in the application being returned.**

This completed form and any attachments along with the applicable permit fees, should be submitted to:

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

If there are any questions concerning this form, contact the appropriate Department of Natural Resources regional office or the Water Protection Program at 573-751-6825. A map of the department's regional offices with addresses and phone numbers is available at [www.dnr.mo.gov/regions/ro-map.pdf](http://www.dnr.mo.gov/regions/ro-map.pdf).

# Extended Sampling Report



PDC Laboratories, Inc.

3278 N Highway 87 • Florissant, MO 63033
(314) 432-0550 • (800) 333-FAST • FAX (314) 432-4977



Union WWTP
500 E Locust St
Union, MO 63084
Attn: David Aguilar

Date Received: 11/25/14 15:51
Report Date: 12/10/14
Customer #: 276613

\*Laboratory Results\*

Sample No: 4113464-01
Sample Description: MO-0025283 Expanded

Collect Date: 11/25/14 10:10
Matrix: Waste Water

Table with 6 columns: Parameters, Result, Qual, Analysis Date, Analyst, Method. Rows include General Chemistry - STL (BOD, Chlorine, Cyanide, etc.), Microbiology - STL (E. coli), Nutrients - STL (Ammonia), and Semivolatile Organics - STL (1,2,4-Trichlorobenzene, etc.).



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Report Date: 12/10/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4113464-01  
Sample Description: MO-0025283 Expanded

Collect Date: 11/25/14 10:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Semivolatile Organics - STL</b>					
Acenaphthylene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Anthracene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Azobenzene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzidine	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzo(a)anthracene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzo(a)pyrene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzo(b&k)fluoranthene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzo(b)fluoranthene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzo(g,h,i)perylene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Benzo(k)fluoranthene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Bis(2-chloroethoxy) methane	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Bis(2-chloroethyl) ether	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Bis(2-chloroisopropyl) ether	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Bis(2-ethylhexyl) phthalate	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Butyl benzyl phthalate	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Chrysene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Dibenzo(a,h)anthracene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Diethyl phthalate	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Dimethyl phthalate	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Di-n-butyl phthalate	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Di-n-octyl phthalate	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Diphenylamine	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Fluoranthene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Fluorene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Hexachlorobenzene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Hexachlorobutadiene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Hexachlorocyclopentadiene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Hexachloroethane	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Indeno(1,2,3-cd)pyrene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Isophorone	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Naphthalene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Nitrobenzene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
N-Nitrosodimethylamine	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
N-Nitrosodi-n-propylamine	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Pentachlorophenol	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Phenanthrene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Phenol	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625



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500 E Locust St  
Union, MO 63084  
Attn: David Aguilar

Date Received: 11/25/14 15:51  
Report Date: 12/10/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4113464-01  
Sample Description: MO-0025283 Expanded

Collect Date: 11/25/14 10:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Semivolatile Organics - STL</b>					
Pyrene	< 10.0 ug/L		12/03/14 21:41	BP	EPA 625
Surrogate: 2-Fluorophenol	21 % 10-121		12/03/14 21:41	BP	EPA 625
Surrogate: Phenol- d5	14 % 10-157		12/03/14 21:41	BP	EPA 625
Surrogate: Nitrobenzene-d5	63 % 10-109		12/03/14 21:41	BP	EPA 625
Surrogate: 2-Fluorobiphenyl	53 % 10-107		12/03/14 21:41	BP	EPA 625
Surrogate: 2,4,6-Tribromophenol	53 % 10-74		12/03/14 21:41	BP	EPA 625
Surrogate: p-Terphenyl-d14	72 % 10-133		12/03/14 21:41	BP	EPA 625
<b>Total Metals - PIA</b>					
Mercury	< 0.20 ug/L		12/04/14 16:26	KJP	EPA 245.1
Antimony	< 0.30 ug/L		12/04/14 09:41	KMC	EPA 200.8
Arsenic	0.68 ug/L		12/04/14 09:41	KMC	EPA 200.8
Beryllium	< 0.10 ug/L		12/04/14 09:41	KMC	EPA 200.8
Hardness	200 mg/L		12/04/14 15:35	JMW	SM 2340B
Cadmium	< 0.10 ug/L		12/04/14 09:41	KMC	EPA 200.8
Calcium	45 mg/L		12/04/14 15:35	JMW	EPA 200.7
Chromium	1.5 ug/L		12/04/14 09:41	KMC	EPA 200.8
Copper	2.6 ug/L		12/04/14 09:41	KMC	EPA 200.8
Lead	0.36 ug/L		12/04/14 09:41	KMC	EPA 200.8
Magnesium	22 mg/L		12/04/14 15:35	JMW	EPA 200.7
Nickel	2.2 ug/L		12/04/14 09:41	KMC	EPA 200.8
Selenium	0.80 ug/L		12/04/14 09:41	KMC	EPA 200.8
Silver	< 0.50 ug/L		12/04/14 09:41	KMC	EPA 200.8
Thallium	< 0.10 ug/L		12/04/14 09:41	KMC	EPA 200.8
Zinc	33 ug/L		12/04/14 09:41	KMC	EPA 200.8
<b>Total Metals - STL</b>					
Trivalent Chromium	< 0.005 mg/L		12/04/14 09:41	ACV	
<b>Volatile Organics - STL</b>					
1,1,1-Trichloroethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,1,2,2-Tetrachloroethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,1,2-Trichloroethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,1-Dichloroethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,1-Dichloroethene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,2-Dichlorobenzene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,2-Dichloroethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,2-Dichloropropane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624



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Date Received: 11/25/14 15:51  
Report Date: 12/10/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4113464-01  
Sample Description: MO-0025283 Expanded

Collect Date: 11/25/14 10:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b><u>Volatile Organics - STL</u></b>					
1,3-Dichlorobenzene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
1,4-Dichlorobenzene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
2-Chloroethylvinyl ether	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Acrolein	< 50 ug/L		12/04/14 17:53	DAW	EPA 624
Acrylonitrile	< 10 ug/L		12/04/14 17:53	DAW	EPA 624
Benzene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Bromodichloromethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Bromoform	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Bromomethane	< 10 ug/L		12/04/14 17:53	DAW	EPA 624
Carbon tetrachloride	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Chlorobenzene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Chloroethane	< 10 ug/L		12/04/14 17:53	DAW	EPA 624
Chloroform	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Chloromethane	< 10 ug/L		12/04/14 17:53	DAW	EPA 624
cis-1,3-Dichloropropene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Dibromochloromethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Ethylbenzene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
m,p-Xylene	< 10 ug/L		12/04/14 17:53	DAW	EPA 624
Methylene chloride	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
o-Xylene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Tetrachloroethene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Toluene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
trans-1,2-Dichloroethene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
trans-1,3-Dichloropropene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Trichloroethene	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Trichlorofluoromethane	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Vinyl chloride	< 5.0 ug/L		12/04/14 17:53	DAW	EPA 624
Surrogate: 1,2-Dichloroethane-d4	93 % 60.7-121		12/04/14 17:53	DAW	EPA 624
Surrogate: Toluene-d8	85 % 60.6-116		12/04/14 17:53	DAW	EPA 624
Surrogate: Bromofluorobenzene	101 % 69.7-113		12/04/14 17:53	DAW	EPA 624



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Union WWTP  
500 E Locust St  
Union, MO 63084  
Attn: David Aguilar

Date Received: 12/02/14 16:10  
Report Date: 12/12/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4120502-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/02/14 11:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - STL</b>					
BOD	< 6.0 mg/L		12/03/14 09:33	KLA	SM 5210B
Chlorine- total residual	< 0.10 mg/L	H, U	12/03/14 14:18	DWM	SM 4500-Cl G
Cyanide	< 0.0050 mg/L		12/10/14 08:00	DWM	SM 4500-CN C E
Dissolved Oxygen	4.8 mg/L	H	12/03/14 13:23	DWM	SM 4500-O G
Hexavalent chromium	< 0.005 mg/L		12/02/14 16:15	DAW	SM 3500-Cr D
Oil & Grease - total	< 5.1 mg/L		12/09/14 15:28	KLA	EPA 1664
Phenol	< 0.050 mg/L		12/05/14 14:30	DWM	EPA 420.1
Solids - total suspended solids (TSS)	3.2 mg/L		12/04/14 09:16	KLA	SM 2540D
<b>Microbiology - STL</b>					
E. coli	10100 MPN/100 mL		12/02/14 16:15	KLA	SM 9223B - QT
<b>Nutrients - STL</b>					
Ammonia - N distilled	1.1 mg/L		12/05/14 13:00	DAW	SM 4500-NH3 B F
<b>Semivolatile Organics - STL</b>					
1,2,4-Trichlorobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
1,2-Dichlorobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
1,3-Dichlorobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
1,4-Dichlorobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,4,5-Trichlorophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,4,6-Trichlorophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,4-Dichlorophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,4-Dimethylphenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,4-Dinitrophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,4-Dinitrotoluene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2,6-Dimethylaniline	< 5.00 ug/L		12/11/14 16:20	BP	EPA 625
2,6-Dinitrotoluene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2-Chloronaphthalene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2-Chlorophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
2-Nitrophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
3,3'-Dichlorobenzidine	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
4,6-Dinitro-2-methylphenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
4-Bromophenyl phenyl ether	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
4-Chloro-3-methylphenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
4-Chlorophenylphenyl ether	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
4-Nitrophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Acenaphthene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625



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Attn: David Aguilar

Date Received: 12/02/14 16:10  
Report Date: 12/12/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4120502-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/02/14 11:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Semivolatile Organics - STL</b>					
Acenaphthylene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Anthracene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Azobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzidine	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzo(a)anthracene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzo(a)pyrene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzo(b&k)fluoranthene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzo(b)fluoranthene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzo(g,h,i)perylene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Benzo(k)fluoranthene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Bis(2-chloroethoxy) methane	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Bis(2-chloroethyl) ether	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Bis(2-chloroisopropyl) ether	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Bis(2-ethylhexyl) phthalate	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Butyl benzyl phthalate	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Chrysene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Dibenzo(a,h)anthracene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Diethyl phthalate	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Dimethyl phthalate	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Di-n-butyl phthalate	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Di-n-octyl phthalate	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Diphenylamine	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Fluoranthene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Fluorene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Hexachlorobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Hexachlorobutadiene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Hexachlorocyclopentadiene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Hexachloroethane	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Indeno(1,2,3-cd)pyrene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Isophorone	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Naphthalene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Nitrobenzene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
N-Nitrosodimethylamine	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
N-Nitrosodi-n-propylamine	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Pentachlorophenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Phenanthrene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Phenol	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625



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Date Received: 12/02/14 16:10  
Report Date: 12/12/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4120502-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/02/14 11:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Semivolatile Organics - STL</b>					
Pyrene	< 10.0 ug/L		12/11/14 16:20	BP	EPA 625
Surrogate: 2-Fluorophenol	22 % 10-121		12/11/14 16:20	BP	EPA 625
Surrogate: Phenol- d5	15 % 10-157		12/11/14 16:20	BP	EPA 625
Surrogate: Nitrobenzene-d5	48 % 10-109		12/11/14 16:20	BP	EPA 625
Surrogate: 2-Fluorobiphenyl	52 % 10-107		12/11/14 16:20	BP	EPA 625
Surrogate: 2,4,6-Tribromophenol	44 % 10-74		12/11/14 16:20	BP	EPA 625
Surrogate: p-Terphenyl-d14	65 % 10-133		12/11/14 16:20	BP	EPA 625
<b>Total Metals - PIA</b>					
Mercury	< 0.20 ug/L		12/10/14 10:55	KJP	EPA 245.1
Antimony	< 0.30 ug/L		12/10/14 12:08	KMC	EPA 200.8
Arsenic	0.56 ug/L		12/10/14 12:08	KMC	EPA 200.8
Beryllium	< 0.10 ug/L		12/10/14 12:08	KMC	EPA 200.8
Hardness	240 mg/L		12/08/14 13:57	JMW	SM 2340B
Cadmium	< 0.10 ug/L		12/10/14 12:08	KMC	EPA 200.8
Calcium	51 mg/L		12/08/14 13:57	JMW	EPA 200.7
Chromium	2.4 ug/L		12/10/14 12:08	KMC	EPA 200.8
Copper	3.6 ug/L		12/11/14 09:10	KMC	EPA 200.8
Lead	0.44 ug/L		12/10/14 12:08	KMC	EPA 200.8
Magnesium	28 mg/L		12/08/14 13:57	JMW	EPA 200.7
Nickel	2.7 ug/L	B	12/10/14 12:08	KMC	EPA 200.8
Selenium	1.7 ug/L		12/10/14 12:08	KMC	EPA 200.8
Silver	< 0.50 ug/L		12/10/14 12:08	KMC	EPA 200.8
Thallium	< 0.10 ug/L		12/10/14 12:08	KMC	EPA 200.8
Zinc	36 ug/L	Ba	12/10/14 12:08	KMC	EPA 200.8
<b>Total Metals - STL</b>					
Trivalent Chromium	< 0.005 mg/L		12/10/14 12:08	DAW	
<b>Volatile Organics - STL</b>					
1,1,1-Trichloroethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,1,2,2-Tetrachloroethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,1,2-Trichloroethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,1-Dichloroethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,1-Dichloroethene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,2-Dichlorobenzene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,2-Dichloroethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,2-Dichloropropane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624



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Date Received: 12/02/14 16:10  
Report Date: 12/12/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4120502-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/02/14 11:10  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Volatile Organics - STL</b>					
1,3-Dichlorobenzene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
1,4-Dichlorobenzene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
2-Chloroethylvinyl ether	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Acrolein	< 50 ug/L		12/04/14 18:15	DAW	EPA 624
Acrylonitrile	< 10 ug/L		12/04/14 18:15	DAW	EPA 624
Benzene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Bromodichloromethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Bromoform	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Bromomethane	< 10 ug/L		12/04/14 18:15	DAW	EPA 624
Carbon tetrachloride	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Chlorobenzene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Chloroethane	< 10 ug/L		12/04/14 18:15	DAW	EPA 624
Chloroform	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Chloromethane	< 10 ug/L		12/04/14 18:15	DAW	EPA 624
cis-1,3-Dichloropropene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Dibromochloromethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Ethylbenzene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
m,p-Xylene	< 10 ug/L		12/04/14 18:15	DAW	EPA 624
Methylene chloride	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
o-Xylene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Tetrachloroethene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Toluene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
trans-1,2-Dichloroethene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
trans-1,3-Dichloropropene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Trichloroethene	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Trichlorofluoromethane	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Vinyl chloride	< 5.0 ug/L		12/04/14 18:15	DAW	EPA 624
Surrogate: 1,2-Dichloroethane-d4	83 % 60.7-121		12/04/14 18:15	DAW	EPA 624
Surrogate: Toluene-d8	80 % 60.6-116		12/04/14 18:15	DAW	EPA 624
Surrogate: Bromofluorobenzene	94 % 69.7-113		12/04/14 18:15	DAW	EPA 624



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Date Received: 12/09/14 14:40  
Report Date: 12/23/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4121572-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/09/14 10:45  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b><u>Distilled Nutrients - STL</u></b>					
Ammonia-N	3.8 mg/L		12/19/14 08:14	DAS	EPA 350.1
<b><u>General Chemistry - STL</u></b>					
BOD	9.1 mg/L		12/11/14 09:02	KLA	SM 5210B
Chlorine- total residual	< 0.10 mg/L	H, U	12/10/14 14:50	DAW	SM 4500-Cl G
Cyanide	< 0.0050 mg/L		12/15/14 13:00	DWM	SM 4500-CN C E
Dissolved Oxygen	5.5 mg/L	H	12/10/14 14:04	DAS	SM 4500-O G
Hexavalent chromium	< 0.005 mg/L		12/09/14 15:15	DAW	SM 3500-Cr D
Oil & Grease - total	< 5.1 mg/L		12/17/14 16:25	KLA	EPA 1664
Phenol	< 0.050 mg/L		12/17/14 08:00	DWM	EPA 420.1
Solids - total suspended solids (TSS)	3.6 mg/L		12/10/14 17:45	das	SM 2540D
<b><u>Microbiology - STL</u></b>					
E. coli	>2420 MPN/100 mL		12/09/14 15:30	KLA	SM 9223B - QT
<b><u>Semivolatile Organics - STL</u></b>					
1,2,4-Trichlorobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
1,2-Dichlorobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
1,3-Dichlorobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
1,4-Dichlorobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,4,5-Trichlorophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,4,6-Trichlorophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,4-Dichlorophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,4-Dimethylphenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,4-Dinitrophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,4-Dinitrotoluene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2,6-Dimethylaniline	< 5.00 ug/L		12/16/14 14:12	BP	EPA 625
2,6-Dinitrotoluene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2-Chloronaphthalene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2-Chlorophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
2-Nitrophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
3,3'-Dichlorobenzidine	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
4,6-Dinitro-2-methylphenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
4-Bromophenyl phenyl ether	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
4-Chloro-3-methylphenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
4-Chlorophenylphenyl ether	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
4-Nitrophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Acenaphthene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625



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Date Received: 12/09/14 14:40  
Report Date: 12/23/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4121572-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/09/14 10:45  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Semivolatile Organics - STL</b>					
Acenaphthylene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Anthracene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Azobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzidine	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzo(a)anthracene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzo(a)pyrene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzo(b&k)fluoranthene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzo(b)fluoranthene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzo(g,h,i)perylene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Benzo(k)fluoranthene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Bis(2-chloroethoxy) methane	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Bis(2-chloroethyl) ether	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Bis(2-chloroisopropyl) ether	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Bis(2-ethylhexyl) phthalate	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Butyl benzyl phthalate	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Chrysene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Dibenzo(a,h)anthracene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Diethyl phthalate	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Dimethyl phthalate	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Di-n-butyl phthalate	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Di-n-octyl phthalate	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Diphenylamine	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Fluoranthene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Fluorene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Hexachlorobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Hexachlorobutadiene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Hexachlorocyclopentadiene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Hexachloroethane	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Indeno(1,2,3-cd)pyrene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Isophorone	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Naphthalene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Nitrobenzene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
N-Nitrosodimethylamine	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
N-Nitrosodi-n-propylamine	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Pentachlorophenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Phenanthrene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Phenol	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625

4121572



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Date Received: 12/09/14 14:40  
Report Date: 12/23/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4121572-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/09/14 10:45  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Semivolatile Organics - STL</b>					
Pyrene	< 10.0 ug/L		12/16/14 14:12	BP	EPA 625
Surrogate: 2-Fluorophenol	18 % 10-121		12/16/14 14:12	BP	EPA 625
Surrogate: Phenol- d5	12 % 10-157		12/16/14 14:12	BP	EPA 625
Surrogate: Nitrobenzene-d5	40 % 10-109		12/16/14 14:12	BP	EPA 625
Surrogate: 2-Fluorobiphenyl	49 % 10-107		12/16/14 14:12	BP	EPA 625
Surrogate: 2,4,6-Tribromophenol	45 % 10-74		12/16/14 14:12	BP	EPA 625
Surrogate: p-Terphenyl-d14	58 % 10-133		12/16/14 14:12	BP	EPA 625
<b>Total Metals - PIA</b>					
Mercury	< 0.20 ug/L		12/23/14 10:42	KJP	EPA 245.1
Antimony	< 0.30 ug/L		12/15/14 17:49	KMC	EPA 200.8
Arsenic	0.77 ug/L		12/15/14 17:49	KMC	EPA 200.8
Beryllium	< 0.10 ug/L		12/15/14 17:49	KMC	EPA 200.8
Hardness	250 mg/L		12/22/14 15:46	JMW	SM 2340B
Cadmium	< 0.10 ug/L		12/15/14 17:49	KMC	EPA 200.8
Calcium	54 mg/L		12/22/14 15:46	JMW	EPA 200.7
Chromium	2.1 ug/L		12/15/14 17:49	KMC	EPA 200.8
Copper	3.1 ug/L		12/15/14 17:49	KMC	EPA 200.8
Lead	0.41 ug/L		12/15/14 17:49	KMC	EPA 200.8
Magnesium	29 mg/L		12/22/14 15:46	JMW	EPA 200.7
Nickel	3.0 ug/L		12/15/14 17:49	KMC	EPA 200.8
Selenium	1.4 ug/L		12/15/14 17:49	KMC	EPA 200.8
Silver	< 0.50 ug/L		12/15/14 17:49	KMC	EPA 200.8
Thallium	< 0.10 ug/L		12/15/14 17:49	KMC	EPA 200.8
Zinc	32 ug/L	B	12/15/14 17:49	KMC	EPA 200.8
<b>Total Metals - STL</b>					
Trivalent Chromium	< 0.005 mg/L		12/15/14 17:49	DAW	
<b>Volatile Organics - STL</b>					
1,1,1-Trichloroethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,1,2,2-Tetrachloroethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,1,2-Trichloroethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,1-Dichloroethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,1-Dichloroethene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,2-Dichlorobenzene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,2-Dichloroethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,2-Dichloropropane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624



PDC Laboratories, Inc.

3278 N Highway 67 • Florissant, MO 63033  
(314) 432-0550 • (800) 333-FAST • FAX (314) 432-4977



Union WWTP  
500 E Locust St  
Union, MO 63084  
Attn: David Aguilar

Date Received: 12/09/14 14:40  
Report Date: 12/23/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4121572-01  
Sample Description: MO-0025283 Expanded

Collect Date: 12/09/14 10:45  
Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Volatile Organics - STL</b>					
1,3-Dichlorobenzene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
1,4-Dichlorobenzene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
2-Chloroethylvinyl ether	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Acrolein	< 50 ug/L		12/10/14 19:42	DAW	EPA 624
Acrylonitrile	< 10 ug/L		12/10/14 19:42	DAW	EPA 624
Benzene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Bromodichloromethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Bromoform	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Bromomethane	< 10 ug/L		12/10/14 19:42	DAW	EPA 624
Carbon tetrachloride	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Chlorobenzene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Chloroethane	< 10 ug/L		12/10/14 19:42	DAW	EPA 624
Chloroform	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Chloromethane	< 10 ug/L		12/10/14 19:42	DAW	EPA 624
cis-1,3-Dichloropropene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Dibromochloromethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Ethylbenzene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
m,p-Xylene	< 10 ug/L		12/10/14 19:42	DAW	EPA 624
Methylene chloride	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
o-Xylene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Tetrachloroethene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Toluene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
trans-1,2-Dichloroethene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
trans-1,3-Dichloropropene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Trichloroethene	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Trichlorofluoromethane	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Vinyl chloride	< 5.0 ug/L		12/10/14 19:42	DAW	EPA 624
Surrogate: 1,2-Dichloroethane-d4	94 % 60.7-121		12/10/14 19:42	DAW	EPA 624
Surrogate: Toluene-d8	83 % 60.6-116		12/10/14 19:42	DAW	EPA 624
Surrogate: Bromofluorobenzene	103 % 69.7-113		12/10/14 19:42	DAW	EPA 624

# Wet Tests Summaries/Reports

October 09, 2012

Mr. David Aguilar  
City of Union  
500 East Locust  
Union, MO 63084

RE: Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

Dear Mr. Aguilar:

Enclosed are the analytical results for sample(s) received by the laboratory on September 26, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,



Connie Sparks

connie.sparks@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

---

### **Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219  
A2LA Certification #: 2456.01  
Arkansas Certification #: 12-019-0  
Illinois Certification #: 002885  
Iowa Certification #: 118  
Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055  
Nevada Certification #: KS000212008A  
Oklahoma Certification #: 9205/9935  
Texas Certification #: T104704407-12-3  
Utah Certification #: KS000212012-2

---

### SAMPLE SUMMARY

Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60129922002	2-MO-0025283EFF	Water	09/25/12 08:30	09/26/12 11:00
60129922003	2-MO-0025283EFF	Water	09/25/12 08:30	09/26/12 18:29

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: MO-0025283 Wet Test

Pace Project No.: 60129922

---

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60129922002	2-MO-0025283EFF	EPA 821/R-02/012	TDH	1
60129922003	2-MO-0025283EFF	EPA 350.1	SEL	1

### REPORT OF LABORATORY ANALYSIS

### ANALYTICAL RESULTS

Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

Sample: 2-MO-0025283EFF	Lab ID: 60129922002	Collected: 09/25/12 08:30	Received: 09/26/12 11:00	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

09/28/12 13:00

Sample: 2-MO-0025283EFF	Lab ID: 60129922003	Collected: 09/25/12 08:30	Received: 09/26/12 18:29	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**350.1 Ammonia**

Analytical Method: EPA 350.1

Nitrogen, Ammonia

**0.61 mg/L**

0.10 1

10/09/12 14:11 7664-41-7

### QUALITY CONTROL DATA

Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

QC Batch: WETA/21919      Analysis Method: EPA 350.1  
QC Batch Method: EPA 350.1      Analysis Description: 350.1 Ammonia  
Associated Lab Samples: 60129922003

METHOD BLANK: 1074021      Matrix: Water  
Associated Lab Samples: 60129922003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	10/09/12 14:19	

LABORATORY CONTROL SAMPLE: 1074022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.1	103	90-110	

MATRIX SPIKE SAMPLE: 1074023

Parameter	Units	60129811001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	2	2.1	103	90-110	

MATRIX SPIKE SAMPLE: 1074025

Parameter	Units	60129856008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	2	1.1	53	90-110	M1

SAMPLE DUPLICATE: 1074024

Parameter	Units	60129840001 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Ammonia	mg/L	6.2	6.2	0	18	

## QUALIFIERS

Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

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.

### ANALYTE QUALIFIERS

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

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MO-0025283 Wet Test  
Pace Project No.: 60129922

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60129922002	2-MO-0025283EFF	EPA 821/R-02/012	BIO/1566		
60129922003	2-MO-0025283EFF	EPA 350.1	WETA/21919		



**Sample Condition Upon Receipt**

Client Name: City of Union Project # 60129922

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other VIA  
 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 zpc  
 Thermometer Used: T-191 / T-194 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Optional
Proj. Due Date:
Proj. Name: <u>10/6</u>

Cooler Temperature: 0.2  
 Temperature should be above freezing to 6°C

Date and Initials of person examining contents: <u>9/27/12</u>
--

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>NO tests</u>
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-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	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/analyses Matrix: <u>UT</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed _____ Lot # of added preservative _____
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank lot # (if purchased):		
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State: _____ <u>NC</u>

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/ Resolution: \_\_\_\_\_

Project Manager Review: CS Date: 9/28/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

## Sample Condition Upon Receipt

*Analytical*

Client Name: Union

Project # 60129922

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  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-193 Type of Ice:  Wet  Blue  None Samples on ice, cooling process has begun

Cooler Temperature: 3.0

Temperature should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: MB 9/26/12-1100

Chain of Custody present:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time requested:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Correct volume:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-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	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11.
Correct volume received for dissolved tests	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	12.
Sample labels match COC	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	13.
Includes date/time/ID/analyses Matrix			<u>WT</u>	
All containers needing preservation have been checked	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Exceptions VOA coliform TOC O&G WI-DRO (water). Phenolics	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No		Initial when completed _____
				Lot # of added preservative _____
Trip Blank present	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank lot # (if purchased):				
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	17. List State _____

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review CS

Date: 9/28/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples a copy of this form will be sent to the North Carolina DFHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



PACE # 60129922

**Pace Analytical Services, Inc.**  
9608 Loiret Blvd.  
Lenexa, KS 66219  
Phone: 913.599.5665  
Fax: 913.599.1759

October 1, 2012

Dave Aguilar  
City of Union  
500 E. Locust  
Union, MO 63084

Re: Lab Project Number: 60129922  
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](mailto:Tim.Harrell@pacelabs.com)  
Technical Director

Kansas' NELAP Certification Number 15-10116  
Utah Certification Number 9135995665  
Texas Certification Number T104704407-08-TX  
Oklahoma Certification Number 9205/9935  
Louisiana Certification Number 03055  
Arkansas Certification Number 05-008-0

Enclosures

## REPORT OF LABORATORY ANALYSIS

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**Pace Analytical Services, Inc.**  
**808 West McKay, Frontenac, KS 66763**

**LABORATORY REPORT:**

<b>CLIENT: Dave Aguilar</b> City of Union 500 E Locust Union, MO 63084 1-636-583-8522	<b>Date Reported: 10-1-12</b> <b>Date Initiated: 9-26-12</b> <b>Time Arrived: 11:00</b> <b>Date Terminated: 9-28-12</b>
---	--

**BIOMONITORING STUDY**

**ACUTE TOXICITY**

**Permit # MO-0025283**

**FINDING AND CONCLUSIONS:**

Acute toxicity testing was performed on duplicate samples of effluent collected from the City of Union (West Plant) 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 (AEC), 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:**

City of Union (West Plant) personnel collected a sample at the City of Union (West Plant) effluent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

**REPORT OF LABORATORY ANALYSIS**

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## INTRODUCTION:

The purpose of this test was to determine the acute toxicity of the City of Union (West Plant) effluent on the freshwater invertebrate, Ceriodaphnia dubia and the fathead minnow, Pimephalas 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 were originally 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).

City of Union (West Plant) personnel collected the effluent tested from the City of Union (West Plant) discharge. Testing was performed using a 100% effluent, a series of dilutions, an upstream, 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

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**Pimephales ACUTE METHODS:**

This static toxicity test was conducted using 1000 ml mason jars 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. Statistical analysis is accomplished by following steps in EPA/600/4-90/027F, August 1993 and by use of Toxstat version 3.4.

**REPORT OF LABORATORY ANALYSIS**

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**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
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
83%	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**

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**THE Pimephales RESULTS** - Minnows exposed to effluent collected at the City of Union (West Plant) 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	9	9	10
"	3	10	10	10	0
"	4	10	10	10	0
12.5%	1	10	10	10	0
"	2	10	9	9	10
"	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
83%	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**

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**WATER CHEMISTRY RESULTS:**

Total residual chlorine (Cl<sub>2</sub>) - The effluent sample from the City of Union (West Plant) discharge 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 sample was 7.50 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 7.86 upon receipt in the laboratory and the synthetic control had a 7.69. At termination the pH measurement in the 100% effluent sample was 8.44.

Conductance - The conductance of the effluent sample was 852 umhos and the synthetic control was 423 umhos.

**REPORT OF LABORATORY ANALYSIS**

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**INITIAL WATER QUALITY:**

Initial Measurements Synthetic Water

pH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.69	8.10	423	<0.2	<0.1	25	96	60

Initial Measurements of Upstream

PH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
8.14	8.30	422	N/A	<0.1	25	184	148

Initial Measurements of 100% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.86	7.50	852	N/A	<0.1	25	292	212

**TEST WATER QUALITY:**

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.71	7.60	25	468
Upstream	8.40	7.30	25	466
12.5%	8.41	7.40	25	475
25%	8.42	7.40	25	490
50%	8.45	7.50	25	685
83%	8.47	7.50	25	800
100%	8.48	7.60	25	862

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.70	7.50	25	470
Upstream	8.35	7.30	25	487
12.5%	8.36	7.30	25	492
25%	8.36	7.30	25	512
50%	8.37	7.40	25	726
83%	8.40	7.40	25	845
100%	8.44	7.50	25	909

**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	1	0
2.5 g/l	20	14	9
2.0 g/l	20	19	19
1.5 g/l	20	20	20
1.0 g/l	20	20	20

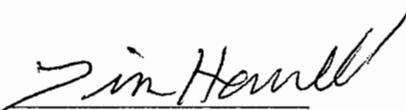
LC50 = 2.45 g/l NaCl

**REFERENCE TOXICANT (NaCl)**  
**Pimephales**  
**# OF LIVE ORGANISMS**

CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
10.0 g/l	40	9	0
8.0 g/l	40	31	26
6.0 g/l	40	39	38
4.0 g/l	40	40	40
2.0 g/l	40	40	40

LC50 = 8.32 g/l NaCl

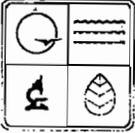
Submitted By:



**Timothy Harrell**  
**Technical Director**

**REPORT OF LABORATORY ANALYSIS**

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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)

<b>PART A - TO BE COMPLETED IN FULL BY PERMITTEE</b>	
FACILITY NAME	DATE AND TIME COLLECTED EFFLUENT _____ UPSTREAM _____
PERMIT NUMBER	PERMIT OUTFALL NUMBER
COLLECTOR'S NAME	
RECEIVING STREAM COLLECTION SITE AND DESCRIPTION	
PERMIT ALLOWABLE EFFLUENT CONCENTRATION (AEC)	EFFLUENT SAMPLE TYPE (CHECK ONE) <input type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
SAMPLE NUMBER EFFLUENT _____ UPSTREAM _____	UPSTREAM SAMPLE TYPE (CHECK ONE) <input type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR CHLORINE _____ mg/L	PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR AMMONIA _____ mg/L

<b>PART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY</b>		
PERFORMING LABORATORY PACE ANALYTICAL SERVICES	TEST TYPE Acute	
FINAL REPORT NUMBER 60129922	TEST DURATION 48 HOURS	
DATE OF LAST REFERENCE TOXICANT TESTING 9/5/12	TEST METHOD EPA 2000 AND 2002	
DATE AND TIME SAMPLES RECEIVED AT LABORATORY 9/26/12 11:00	TEST START DATE AND TIME 9/26/12 14:30	TEST END DATE AND TIME 9/27/12 13:00
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 <sup>1</sup> 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 0	EFFLUENT ORGANISM #2 PERCENT MORTALITY AT AEC 0
SAMPLE FILTERED 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

<b>PART A - TO BE COMPLETED IN FULL BY PERMITTEE</b>			
PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25	SM 2550B	9/26/12
pH Standard Units	7.86	SM 4500-H+ B	9/26/12
Conductance µMols	852	EPA 120.1	9/26/12
Dissolved Oxygen mg/L	7.50	SM 4500-O G	9/26/12
Total Residual Chlorine mg/L	<1	SM 4500-CL G	9/26/12
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	212	SM 2320 B	9/26/12
* Total Hardness mg/L	292	SM2340 B	9/26/12

\* 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 SAMPLE<sup>3</sup>**

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25	SM 2550B	9/26/12
pH Standard Units	8.14	SM 4500-H+ B	9/26/12
Conductance µMohs	422	EPA 120.1	9/26/12
Dissolved Oxygen mg/L	8.30	SM 4500-O G	9/26/12
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	9/26/12
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	148	SM 2320 B	9/26/12
* Total Hardness mg/L	184	SM2340 B	9/26/12

\* 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 SAMPLE<sup>3</sup>**

**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.

<sup>3</sup> Where no upstream control is available, enter results from laboratory or synthetic control.

September 23, 2013

Mr. David Aguilar  
City of Union  
500 East Locust  
Union, MO 63084

RE: Project: NPDES Lagoon Wet Test 9/10/13  
Pace Project No.: 60152829

Dear Mr. Aguilar:

Enclosed are the analytical results for sample(s) received by the laboratory on September 11, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: NPDES Lagoon Wet Test 9/10/13

Pace Project No.: 60152829

---

### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

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### 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 #: 2012-051

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Minnesota Certification #: 495004

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: NPDES Lagoon Wet Test 9/10/13

Pace Project No.: 60152829

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60152829001	MO 0025283WT-EFF	Water	09/10/13 09:00	09/11/13 10:30
60152829002	MO 0025283WT-EFF	Water	09/10/13 09:30	09/11/13 18:35

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: NPDES Lagoon Wet Test 9/10/13  
Pace Project No.: 60152829

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60152829001	MO 0025283WT-EFF	EPA 821/R-02/012	TDH	1
60152829002	MO 0025283WT-EFF	EPA 350.1	NDL	1

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: NPDES Lagoon Wet Test 9/10/13

Pace Project No.: 60152829

Sample: MO 0025283WT-EFF	Lab ID: 60152829001	Collected: 09/10/13 09:00	Received: 09/11/13 10:30	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

09/11/13 11:00

Sample: MO 0025283WT-EFF	Lab ID: 60152829002	Collected: 09/10/13 09:30	Received: 09/11/13 18:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**350.1 Ammonia**

Analytical Method: EPA 350.1

Nitrogen, Ammonia

0.19 mg/L

0.10 1

09/13/13 11:19 7664-41-7

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: NPDES Lagoon Wet Test 9/10/13  
Pace Project No.: 60152829

QC Batch: WETA/26191 Analysis Method: EPA 350.1  
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia  
Associated Lab Samples: 60152829002

METHOD BLANK: 1251802 Matrix: Water  
Associated Lab Samples: 60152829002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	09/13/13 10:48	

LABORATORY CONTROL SAMPLE: 1251803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.0	100	90-110	

MATRIX SPIKE SAMPLE: 1251804

Parameter	Units	60152674001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	2	1.9	89	90-110	M1

MATRIX SPIKE SAMPLE: 1251806

Parameter	Units	60152710003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	2	1.9	90	90-110	

SAMPLE DUPLICATE: 1251805

Parameter	Units	60152706003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Ammonia	mg/L	ND	ND		18	

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## QUALIFIERS

Project: NPDES Lagoon Wet Test 9/10/13  
Pace Project No.: 60152829

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

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.

### ANALYTE QUALIFIERS

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

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: NPDES Lagoon Wet Test 9/10/13  
Pace Project No.: 60152829

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60152829001	MO 0025283WT-EFF	EPA 821/R-02/012	BIO/1652		
60152829002	MO 0025283WT-EFF	EPA 350.1	WETA/26191		

**REPORT OF LABORATORY ANALYSIS**

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PACE # 60152829

**Pace Analytical Services, Inc.**  
9608 Lolret Blvd.  
Lenexa, KS 66219  
Phone: 913.599.5665  
Fax: 913.599.1759

September 20, 2013

Dave Aguilar  
City of Union  
500 E. Locust  
Union, MO 63084

Re: Lab Project Number: 60152829  
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](mailto:Tim.Harrell@pacelabs.com)  
Technical Director

## REPORT OF LABORATORY ANALYSIS

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**Pace Analytical Services, Inc.**

**808 West McKay, Frontenac, KS 66763**

**LABORATORY REPORT:**

<b>CLIENT: Dave Aguilar</b> City of Union 500 E Locust Union, MO 63084 1-636-583-8522	<b>Date Reported: 9-20-13</b> <b>Date Initiated: 9-11-13</b> <b>Time Arrived: 10:30</b> <b>Date Terminated: 9-13-13</b>
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**BIOMONITORING STUDY**

**ACUTE TOXICITY**

**Permit # MO-0025283**

**FINDING AND CONCLUSIONS:**

Acute toxicity testing was performed on duplicate samples of effluent collected from the City of Union (West Plant) 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 (AEC), 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:**

City of Union (West Plant) personnel collected a sample at the City of Union (West Plant) effluent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

**REPORT OF LABORATORY ANALYSIS**

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PACE # 60152829

**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 City of Union (West Plant) 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 were originally 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).

City of Union (West Plant) personnel collected the effluent tested from the City of Union (West Plant) discharge. Testing was performed using a 100% effluent, series of dilutions, and Upstream, 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

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PACE # 60152829

**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 1000 ml mason jars 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. Statistical analysis is accomplished by following steps in EPA/600/4-90/027F, August 1993 and by use of Toxstat version 3.4.

### **REPORT OF LABORATORY ANALYSIS**

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**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
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
83%	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**

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**THE Pimephales RESULTS** - Minnows exposed to effluent collected at the City of Union (West Plant) 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
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
83%	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**

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PACE # 60152829

**Pace Analytical Services, Inc.**  
9608 Lolret Blvd.  
Lenexa, KS 66219  
Phone: 913.599.5665  
Fax: 913.599.1759

**WATER CHEMISTRY RESULTS:**

Total residual chlorine (Cl<sub>2</sub>) - The effluent sample from the City of Union (West Plant) discharge 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 sample was 6.70 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 6.20 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 7.97 upon receipt in the laboratory and the synthetic control had a 7.67. At termination the pH measurement in the 100% effluent sample was 8.69.

Conductance - The conductance of the effluent sample was 889 umhos and the synthetic control was 360 umhos.

**REPORT OF LABORATORY ANALYSIS**

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**INITIAL WATER QUALITY:**

Initial Measurements Synthetic Water

pH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.67	8.10	360	<0.2	<0.1	25	98	58

Initial Measurements of Upstream

PH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.97	7.40	457	N/A	<0.1	25	184	142

Initial Measurements of 100% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.97	6.70	889	N/A	<0.1	25	262	212

**TEST WATER QUALITY:**

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.76	7.90	25	420
Upstream	8.37	7.30	25	512
12.5%	8.39	7.20	25	584
25%	8.42	7.10	25	645
50%	8.46	6.80	25	765
83%	8.46	6.50	25	900
100%	8.47	6.50	25	912

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.96	7.10	25	440
Upstream	8.60	7.00	25	560
12.5%	8.60	6.80	25	602
25%	8.62	6.80	25	698
50%	8.66	6.50	25	784
83%	8.68	6.30	25	998
100%	8.69	6.20	25	1045

**REPORT OF LABORATORY ANALYSIS**

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**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**

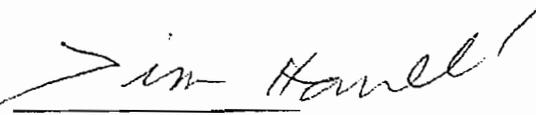
CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
3.0 g/l	20	5	0
2.5 g/l	20	16	7
2.0 g/l	20	20	19
1.5 g/l	20	20	20
1.0 g/l	20	20	20

LC50 = 2.38 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	32	22
6.0 g/l	40	40	40
4.0 g/l	40	39	39
2.0 g/l	40	39	39

LC50 = 8.12 g/l NaCl

Submitted By: 

**Timothy Harrell**  
**Technical Director**

**REPORT OF LABORATORY ANALYSIS**

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**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: **CITY OF UNION**  
Address: **300 E. 100th St, Union MO 63084**  
Phone: **630820** Fax: \_\_\_\_\_  
Requested Date Data/AT: \_\_\_\_\_

**Section B**  
Required Project Information:

Report To: **DRD Rasmussen**  
Copy To: \_\_\_\_\_  
Purchase Order No.: \_\_\_\_\_  
Project Name: **LAB WT 913**  
Project Number: **913**

**Section C**  
Invoice Information:

Attention: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Pacslabs Reference: \_\_\_\_\_  
Pacslabs Profile #: \_\_\_\_\_

Page: \_\_\_\_\_ of \_\_\_\_\_  
1372061

**REGULATORY AGENCY**

NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER \_\_\_\_\_

**Requested Analysis Filtered (Y/N)**

Residual Chlorine (Y/N) **601528229**

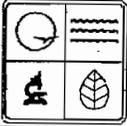
ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
					COMPOSITE START	COMPOSITE END/GRAB						
1	NO 002528229 WT - EFF	WW	C	9/10/13 AM	9/10/13 PM	9:30	1	Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Multi-dilution Acute			
2	NO 002528229 WT - UP STRM	WW	G									
3												
4												
5												
6												
7												
8												
9												
0												
1												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Sanitation	9/11/13	10:45	Sanitation	9/11/13	10:30	Y

ORIGINAL

**SAMPLER NAME AND SIGNATURE**  
PRINT Name of SAMPLER: **Trinity Rasmussen**  
SIGNATURE of SAMPLER: *[Signature]*  
DATE Signed (MM/DD/YY): **9-10-13**

Important Note: By signing this form you are accepting Pacslabs' NET 30 day payment terms and agreeing to a charge of 1.5% per month for any invoices not paid within 30 days.



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	DATE AND TIME COLLECTED EFFLUENT _____ UPSTREAM _____
PERMIT NUMBER	PERMIT OUTFALL NUMBER
COLLECTOR'S NAME	
RECEIVING STREAM COLLECTION SITE AND DESCRIPTION	
PERMIT ALLOWABLE EFFLUENT CONCENTRATION (AEC)	EFFLUENT SAMPLE TYPE (CHECK ONE) <input type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
SAMPLE NUMBER EFFLUENT _____ UPSTREAM _____	UPSTREAM SAMPLE TYPE (CHECK ONE) <input type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR CHLORINE _____ mg/L	PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR AMMONIA _____ mg/L

**PART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY**

PERFORMING LABORATORY PACE ANALYTICAL SERVICES	TEST TYPE Acute	
FINAL REPORT NUMBER 60152829	TEST DURATION 48 HOURS	
DATE OF LAST REFERENCE TOXICANT TESTING 8/27/13	TEST METHOD EPA 2000 AND 2002	
DATE AND TIME SAMPLES RECEIVED AT LABORATORY 9/11/13 10:30	TEST START DATE AND TIME 9/11/13 11:00	TEST END DATE AND TIME 9/13/13 10:15
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 10 DAYS
SAMPLE FILTERED <sup>1</sup> 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 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	SM 2550B	9/11/13
pH Standard Units	7.97	SM 4500-H+ B	9/11/13
Conductance µMohs	889	EPA 120.1	9/11/13
Dissolved Oxygen mg/L	6.70	SM 4500-O G	9/11/13
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	9/11/13
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	212	SM 2320 B	9/11/13
* Total Hardness mg/L	262	SM2340 B	9/11/13

\* Recommended by EPA guidance, not a required analysis.

<sup>1</sup> Samples shall only be filtered if indigenous organisms are present that may be confused with, or attack the test organisms.  
<sup>2</sup> 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 SAMPLE<sup>3</sup>**

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25	SM 2550B	9/11/13
pH Standard Units	7.97	SM 4500-H+ B	9/11/13
Conductance µMohs	457	EPA 120.1	9/11/13
Dissolved Oxygen mg/L	7.40	SM 4500-O G	9/11/13
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	9/11/13
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	142	SM 2320 B	9/11/13
* Total Hardness mg/L	184	SM2340 B	9/11/13

\* 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 SAMPLE<sup>3</sup>**

**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.

<sup>3</sup> Where no upstream control is available, enter results from laboratory or synthetic control.



Sample Condition Upon Receipt

WO#: 60152829



Client Name: City of Union

Courier: Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other [X] VLA

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes [ ] No [ ]

Custody Seal on Cooler/Box Present: Yes [X] No [ ] Seals intact: Yes [X] No [ ]

Packing Material: Bubble-Wrap [ ] Bubble Bags [ ] Foam [ ] None [ ] Other [X] Air

Thermometer Used: T-11 / T-194 Type of Ice: Wet Blue None [ ] Samples received on ice, cooling process has begun.

Cooler Temperature: 2.0 4.9

Date and initials of person examining contents: S 9/11

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	1
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses Matrix: WT		13
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		15
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	16
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	17. List State:

Client Notification/ Resolution: Copy COC to Client? Y [ ] N [X] Field Data Required? Y [ ] N [X]

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: ARB Date 9/12/13



Sample Condition Upon Receipt

Client Name: Unid

Project # 60752829

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  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  Samples on ice, cooling process has begun

Optional  
Proj. Due Date:  
Proj. Name:

Cooler Temperature: 3.8  
Temperature should be above freezing to 6°C

Date and Initials of person examining contents: TH 9/11/13 10:30

Comments:

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-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	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/analyses Matrix:		
All containers needing preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	<input type="checkbox"/> Yes <input type="checkbox"/> No	Initial when completed _____ Lot # of added preservative _____
Trip Blank present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank lot # (if purchased):		
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State: _____

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, Inc.  
9608 Loiret Blvd.  
Lenexa, KS 66219  
(913)599-5665

September 30, 2014

Mr. David Aguilar  
City of Union  
500 East Locust  
Union, MO 63084

RE: Project: LAGWET 914  
Pace Project No.: 60178221

Dear Mr. Aguilar:

Enclosed are the analytical results for sample(s) received by the laboratory on September 18, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Richard Mannz  
richard.mannz@pacelabs.com  
PM Lab Management

Enclosures



#### REPORT OF LABORATORY ANALYSIS

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

## CERTIFICATIONS

Project: LAGWET 914  
Pace Project No.: 60178221

---

### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219  
WY STR Certification #: 2456.01  
Arkansas Certification #: 13-012-0  
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

---

### 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 #: 2012-051  
Texas Certification #: T104704407-13-4  
Utah Certification #: KS000212013-3  
Minnesota Certification #: 495004

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## REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219  
(913)599-5665

### SAMPLE SUMMARY

Project: LAGWET 914  
Pace Project No.: 60178221

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60178221001	EFF	Water	09/17/14 13:15	09/18/14 09:45
60178221002	EFF	Water	09/17/14 13:15	09/18/14 18:50

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### SAMPLE ANALYTE COUNT

Project: LAGWET 914  
Pace Project No.: 60178221

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60178221001	EFF	EPA 821/R-02/012	TDH	1
60178221002	EFF	EPA 350.1	AJM	1

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**ANALYTICAL RESULTS**

Project: LAGWET 914  
 Pace Project No.: 60178221

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

<b>Sample: EFF</b>	<b>Lab ID: 60178221001</b>	Collected: 09/17/14 13:15	Received: 09/18/14 09:45	Matrix: Water				
<b>Acute Toxicity</b>	Analytical Method: EPA 821/R-02/012							
Toxicity, Acute	<b>Complete</b>		1.0	1		09/18/14 11:30		

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

<b>Sample: EFF</b>	<b>Lab ID: 60178221002</b>	Collected: 09/17/14 13:15	Received: 09/18/14 18:50	Matrix: Water				
<b>350.1 Ammonia</b>	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	<b>8.4 mg/L</b>		0.50	5		09/27/14 11:30	7664-41-7	

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**QUALITY CONTROL DATA**

Project: LAGWET 914  
 Pace Project No.: 60178221

QC Batch: WETA/31144 Analysis Method: EPA 350.1  
 QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia  
 Associated Lab Samples: 60178221002

METHOD BLANK: 1450265 Matrix: Water  
 Associated Lab Samples: 60178221002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	09/27/14 10:19	

LABORATORY CONTROL SAMPLE: 1450266

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.1	106	90-110	

MATRIX SPIKE SAMPLE: 1450267

Parameter	Units	60178113002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	0.60	2	2.5	95	90-110	

MATRIX SPIKE SAMPLE: 1450268

Parameter	Units	60178113003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	30.4	20	46.8	82	90-110	M1

SAMPLE DUPLICATE: 1450269

Parameter	Units	60178116003 Result	Dup Result	RPD	Max RPD	Qualifiers
Nitrogen, Ammonia	mg/L	ND	ND		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.

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## QUALIFIERS

Project: LAGWET 914  
Pace Project No.: 60178221

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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 (8270 listed analyte) decomposes to Azobenzene.

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.

### ANALYTE QUALIFIERS

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

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LAGWET 914  
Pace Project No.: 60178221

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60178221001	EFF	EPA 821/R-02/012	BIO/1746		
60178221002	EFF	EPA 350.1	WETA/31144		

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Phone: 913.599.5665  
Fax: 913.599.1759

September 24, 2014

Dave Aguilar  
City of Union  
500 E. Locust  
Union, MO 63084

Re: Lab Project Number: 60178221  
Client Project ID: Wct 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 NELAP 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](mailto:Tim.Harrell@pacelabs.com)  
Technical Director

## REPORT OF LABORATORY ANALYSIS

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**Pace Analytical Services, Inc.**  
**808 West McKay, Frontenac, KS 66763**

**LABORATORY REPORT:**

<b>CLIENT:</b> Dave Aguilar City of Union 500 E Locust Union, MO 63084 1-636-583-8522	<b>Date Reported:</b> 9-24-14 <b>Date Initiated:</b> 9-18-14 <b>Time Set:</b> 11:00 <b>Date Terminated:</b> 9-20-14
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**BIOMONITORING STUDY**

**ACUTE TOXICITY**

**Permit # MO-0025283**

**FINDING AND CONCLUSIONS:**

Acute toxicity testing was performed on duplicate samples of effluent collected from the City of Union (West Plant) 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 (AEC), 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:**

City of Union (West Plant) personnel collected a sample at the City of Union (West Plant) effluent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

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## INTRODUCTION:

The purpose of this test was to determine the acute toxicity of the City of Union (West Plant) 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).

City of Union (West Plant) personnel collected the effluent tested from the City of Union (West Plant) discharge. Testing was performed using a 100% effluent, a series of dilutions, 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.

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#### 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. Statistical analysis is accomplished by following steps in EPA/600/4-90/027E, August 1993 and by use of Toxstat version 3.4.

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**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
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
83%	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	4	20
"	3	5	5	5	0
"	4	5	5	5	0

**AVG. MORTALITY @ AEC (100% EFFLUENT) = 5.0%**

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**THE Pimephales RESULTS** - Minnows exposed to effluent collected at the City of Union (West Plant) 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	9	10
"	4	10	10	10	0
Upstream	1	10	10	10	0
"	2	10	10	9	10
"	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
83%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	9	9	10
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%**

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**WATER CHEMISTRY RESULTS:**

Total residual chlorine (Cl<sub>2</sub>) - The effluent sample from the The City of Union (West Plant) discharge 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 sample was 8.10 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 6.80 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 7.71 upon receipt in the laboratory and the synthetic control had a 7.85. At termination the pH measurement in the 100% effluent sample was 8.63.

Conductance - The conductance of the effluent sample was 930 umhos and the synthetic control was 410 umhos.

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**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)
7.85	8.30	410	<0.1	25.0	98	62

Initial Measurements of Upstream

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.74	8.00	890	<0.1	25.0	236	244

Initial Measurements of 100% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	Cl2 (mg/l)	Temp (C)	Hard (mg/l)	Alk (mg/l)
7.71	8.10	930	<0.1	25.0	222	230

**TEST WATER QUALITY:**

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.75	7.70	24.8	450
Upstream	8.40	7.20	24.8	980
12.5%	8.40	7.20	24.8	980
25%	8.43	7.20	24.8	980
50%	8.43	7.20	24.8	995
83%	8.45	7.20	24.8	1020
100%	8.47	7.20	24.8	1025

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.89	7.00	24.9	465
Upstream	8.55	7.00	24.9	1050
12.5%	8.55	7.00	24.9	1070
25%	8.58	6.90	24.9	1096
50%	8.58	6.90	24.9	1108
83%	8.60	6.80	24.9	1150
100%	8.63	6.80	24.9	1175

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**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**

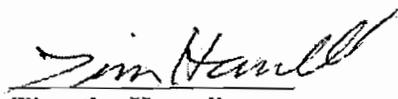
CONC OF TOXICANT	TEST INITIATION	24 HOUR EXPOSURE	48 HOUR EXPOSURE
3.0 g/l	20	4	0
2.5 g/l	20	17	10
2.0 g/l	20	20	19
1.5 g/l	20	20	20
1.0 g/l	20	20	20

LC50 = 2.45 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	7	0
8.0 g/l	40	36	24
6.0 g/l	40	39	38
4.0 g/l	40	40	40
2.0 g/l	40	40	40

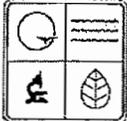
LC50 = 8.22g/l NaCl

Submitted By:   
**Timothy Harrell**  
 Technical Director

**REPORT OF LABORATORY ANALYSIS**

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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:	DATE AND TIME COLLECTED
PERMIT NUMBER	EFFLUENT _____ UPSTREAM _____
COLLECTOR'S NAME:	PERMIT OUTLET NUMBER
RECEIVING STREAM COLLECTION SITE AND DESCRIPTION	
PERMIT ALLOWABLE EFFLUENT CONCENTRATION (AEC)	EFFLUENT SAMPLE TYPE (CHECK ONE)
SAMPLE NUMBER	<input type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
EFFLUENT _____ UPSTREAM _____	UPSTREAM SAMPLE TYPE (CHECK ONE)
PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR CHLORINE _____ mg/L	<input type="checkbox"/> 24 HR COMPOSITE <input type="checkbox"/> GRAB <input type="checkbox"/> OTHER _____
	PERMITTED EFFLUENT DAILY MAXIMUM LIMITATION FOR AMMONIA _____ mg/L

**PART B - TO BE COMPLETED IN FULL BY PERFORMING LABORATORY**

PERFORMING LABORATORY	TEST TYPE	
PACE ANALYTICAL SERVICES	Acute	
FINAL REPORT NUMBER	TEST DURATION	
60178221	48 HOURS	
DATE OF LAST REFERENCE TOXICANT TESTING	TEST METHOD	
9/17/14	EPA 2000 AND 2002	
DATE AND TIME SAMPLES RECEIVED AT LABORATORY	TEST START DATE AND TIME	TEST END DATE AND TIME
9/18/14 9:45	9/18/14 11:30	9/20/14 11:00
SAMPLE DECHLORINATED PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TEST ORGANISM #1 AND AGE	TEST ORGANISM #2 AND AGE
EFFLUENT _____ UPSTREAM _____	DUBIA <24 HOURS	FATHEAD 9 DAYS
SAMPLE FILTERED PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	90 PERCENT OR GREATER SURVIVAL IN SYNTHETIC CONTROL? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	DILUTION WATER USED TO ACHIEVE AEC
EFFLUENT _____ UPSTREAM _____		
FILTER MESH SIZE 2	EFFLUENT ORGANISM #1 PERCENT MORTALITY AT AEC	EFFLUENT ORGANISM #2 PERCENT MORTALITY AT AEC
	5.0	0
SAMPLE AERATED DURING TESTING? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	UPSTREAM ORGANISM #1 PERCENT MORTALITY	UPSTREAM ORGANISM #2 PERCENT MORTALITY
	0	2.5
pH ADJUSTED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TEST RESULT AT AEC FOR ORGANISM #1	TEST RESULT AT AEC FOR ORGANISM #2
EFFLUENT _____ UPSTREAM _____	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	<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	SM 2550B	9/18/14
pH Standard Units	7.71	SM 4500-H+ B	9/18/14
Conductance µMhos	930	EPA 120 1	9/18/14
Dissolved Oxygen mg/L	8.10	SM 4500-O G	9/18/14
Total Residual Chlorine mg/L	<.1	SM 4500-CL G	9/18/14
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	244	SM 2320 B	9/18/14
* Total Hardness mg/L	236	SM2340 B	9/18/14

\* Recommended by EPA guidance, not a required analysis.

<sup>1</sup> Samples shall only be filtered if indigenous organisms are present that may be confused with, or attack the test organisms  
<sup>2</sup> 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 SAMPLE<sup>3</sup>**

PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25	SM 2550B	9/18/14
pH Standard Units	7.74	SM 4500-H+ B	9/18/14
Conductance µMols	890	EPA 120 1	9/18/14
Dissolved Oxygen mg/L	8.00	SM 4500-O G	9/18/14
Total Residual Chlorine mg/L	< 1	SM 4500-CL G	9/18/14
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	230	SM 2320 B	9/18/14
* Total Hardness mg/L	222	SM2340 B	9/18/14

\* 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 SAMPLE<sup>3</sup>**

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.

<sup>3</sup> Where no upstream control is available, enter results from laboratory or synthetic control

# Pretreatment Survey, Industrial/Commercial Users

### Checklist for Wastewater Discharge Permits

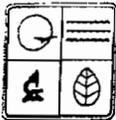
<u>Name of Business</u>	<u>Address of Business</u>	<u>Date Delivered</u>	<u>Rec'd</u>	<u>Average Monthly Flow</u>	<u>Notes</u>
ACF Machine	701 West Park Road	7/29/2010	1	4,458	
ADB	21 Progress Parkway	7/29/2010		25,895	
Advanced Automotive	519 East Independence	7/29/2010	1	3,373	
Ameren UE	500 East Independence	7/29/2010	1	86,854	
American Plastics Group	715 West Park Road	7/26/2010	1	15,376	
Arby's Roast Beef	1535 Denmark Road	7/26/2010		15,731	
Aurora Caskets	517 East Independence	7/29/2010	1	948	
B & M Stone	890 North Oak Street	7/27/2010		1,502	
Benitos	116 South Oak Street	7/30/2010	1	10,589	
BoCo Electric	16 Williams Drive	7/26/2010	1	2,277	
Buchheit Automotive	439 East Independence	7/29/2010	1	2,490	
Bugsies	201 East Main Street	7/26/2010		39,875	
Café Central (ECC)	1964 Prairie Dell Road	7/26/2010	1	442,583	3 meters total
Casey's General Store	812 Hwy 50 West	7/26/2010		15,750	
Central Automotive Electric	275 Brown Street	7/27/2010		1,210	
Central Elementary	205 South Jefferson	?	1	103,935	
Childrens Factory	510 S. McKinley	7/26/2010	1	12,629	
China King	1510 Denmark Road	7/26/2010		2,750	
Circle Environmental	6 Chad Lane	?		6,975	
Clark-Vitt Elementary	500 Clark Street	?	1	59,404	
Cloud Manufacturing	10 Williams Drive	7/27/2010		6,083	
Cochran Engineering	530 East Independence	7/29/2010	1	7,188	
Contech Construction	14 Williams Drive	?		2,948	
Corrosion Technologies	25 Progress Parkway	7/26/2010		8,677	
County Seat Motors	504 Highway 50 East	?		2,581	
County Wide Collision	1319 Old Highway 50 East	7/29/2010		-	
Crystal Extrusions	704 West Park Road	7/26/2010	1	215,967	
D & M Machine	161 Independence Drive	7/29/2010		652	
Dairy Queen	1500 Denmark Road	7/26/2010	1	5,906	

D'Angelo's	241 N. Washington Avenue	7/26/2010	1	16,298	
Domino's Pizza	408 Hwy 50 West	7/26/2010		10,458	
E & E Hydraulics	1320 Stylemaster Drive	7/26/2010		3,348	
E & S Food Products	12 Cedar Court	7/26/2010	1	14,896	
Earth Circle Recycling	1215 Old Smelter Road	7/29/2010		850	
East Central College	1964 Prairie Dell Road	?	1	(See Café Central)	
El Ranchito's	501 East Main Street	7/26/2010		28,125	
Esselte (Park Road) Truck	815 West Park Road	7/26/2010	1	253,000	
Esselte (Williams Drive)	15 Williams Drive	7/29/2010	1	34,063	
Euro Trix Auto Repair LLC	6 Williams Drive	7/29/2010	1	819	
Franklin County Concrete	720 N. Christina	?		Closed (0)	
Fricks Market	10 East Locust Street	7/26/2010	1	Water not metered	
Frueh Services	9 Progress Drive	7/27/2010		2,221	
Gaebe Contracting	1230 Old Smelter Road	7/29/2010	1	6,527	
Gala Event Center	42 Prairie Dell Plaza Drive	7/26/2010	1	5,700	
Hagies	618 N. Washington Avenue	7/26/2010	1	30,358	
Hardees	300 Highway 50 East	7/26/2010	1	85,917	
Haven Materials	527 East Independence Drive	7/29/2010	1	121,500	
Ideaman Graphics	7 Cedar Court	7/26/2010	1	14,625	
Immaculate Conception Schools	111 North Washington Ave.	?		59,391	
Imo's Pizza	1612 Denmark Road	7/26/2010	1	19,188	
Innovative Machine	1300 Stylemaster Drive	7/27/2010	1	810	
Intek Corporation	290 Independence Drive	7/27/2010	1	15,177	
Jack in the Box	101 Bourbeuse River Access	7/26/2010		15,771	
James Kee	2 Industrial Court	?		?	
Jasper Development	5 Truman Court	7/27/2010	1	2,794	
Jerrys Auto Body	1399 North Church	7/28/2010	1	5,354	
Jim Trenary Chevrolet	1000 North Church	7/27/2010		9,435	
Johnny's Auto Service	4025 Highway A	7/29/2010	1	599	
John's Fiberglass	1206 Old Smelter Road	7/29/2010	1	1,052	
Jonny's Sports Bar & Grill	1298 North Hwy 47	7/26/2010		23,598	
Junie Moon Café	300 Hwy 50 West	7/26/2010	1	15,833	
K-D Machine	806 North Jefferson	7/29/2010		4,054	
Kinsley & Sons Inc.	24 South Church	7/29/2010	1	4,000	

LPRC	1203 Old Smelter Road	7/29/2010	1	1,400
Lakebrink Heating & Cooling	151 Independence Drive	7/27/2010	1	4,690
Lewis & Associates	1211 Old Smelter Road	7/29/2010	1	488
Lindsay Windows	11 Cedar Court	7/26/2010	1	27,063
Livengoods Transmission	701 North Washington Ave.	7/27/2010		2,734
Lucky's Chinese	710 Hwy 50 West	7/26/2010	1	17,194
Master Auto Tech	607 North Christina	7/29/2010	1	2,892
McDonalds	1010 East Main Street	7/26/2010		56,542
Meineke Car Care	1311 Old Highway 50 East	7/29/2010		no water
Mentz Foundations	57 Corporate Drive	7/29/2010	1	1,583
Metcalf & Sons Construction	12 Williams Drive	?		667
Missouri Dept. of Corrections	3 Truman Court	7/27/2010	1	9,796
Missouri Natural Gas	6 Progress Parkway	7/29/2010	1	12,148
Mosley Electronics	1325 Stylemaster Drive	7/27/2010	1	638
Nieder Fabricating Solutions	805 North Oak Street	7/27/2010	1	636
Oasis Lanes	120 Del Centre Way	7/26/2010	1	28,738
OATS Inc.	519B East Independence Drive	7/27/2010	1	Meter not separate - 0
Pasta House	101 East Independence Drive	7/26/2010	1	235,000
Pharma Tech	1310 Stylemaster Drive	7/27/2010	1	45,304
Pizza Hut	2 Highway 50 East	7/26/2010	1	29,500
Pizza Pasta and More	3 Prairie Dell Plaza Drive	7/26/2010		57,025
Progress Engineering	801 North Church	7/27/2010	1	1,698
Purschke Tire	405 Hwy 50 East	7/27/2010	1	3,685
Quick Trip	100 Bourbeuse River Access	7/26/2010		34,333
Quip-Con (10 Cedar Court)	10 Cedar Court	?		125
Quip-Con (27 Corporate Drive)	27 Corporate Drive	?		382
Region Welding	4 Truman Court	7/27/2010	1	5,292
Rexam Containers	710 West Park	7/26/2010		438,323
Romer Labs	1301 Stylemaster Drive	7/27/2010	1	5,063
S Cohn & Sons	1225 Old Smelter Road	7/29/2010	1	1,046
Savco Manufacturing	1315 Stylemaster Drive	7/27/2010	1	1,548
ServPro	2 Truman Court	7/27/2010	1	2,355
Short Run Box	7 Williams Drive	7/26/2010	1	771
Siedhoff Truck Repair Center	1090 Vondera	7/28/2010	1	2,440

Siesco Valley Screw	8 Williams Drive	7/26/2010	1	11,017	
Sieve Construction	9 Rolling Hills Drive	?		1,015	
Simmons Tool & Die	604 Old County Farm Road	?		5,804	
SK8ters	181 Audry Lane	7/26/2010	1	9,021	
Sonic	3 Highway 50 East	7/26/2010	1	16,167	
Spartan Showcase	702 West Park Road	7/26/2010	1	28,988	
Strubberg Plumbing	560 East Independence Drive	7/29/2010	1	1,525	
Stylemaster	7 Progress Parkway	7/26/2010	1	3,068	
Subway	31 Silo Drive	7/26/2010	1	7,515	
Superior Coatings	5 Rolling Hills Drive	7/26/2010	1	9,575	
Taco Bell	301 Crestview Drive	7/26/2010	1	29,417	
Tami Luehr Bonds/Jerry Alvey	2 Truman Court	?		2,355	
Thebeau Builders	17 Progress Parkway	7/29/2010		550	
Thrifty Grocery & Storage	806 North Union Ave.	7/27/2010	1	0	
Toolco	330 Independence	7/26/2010	1	5,027	
Town & Country Metals	10 Progress Parkway	7/26/2010	1	1,337	
Transaction Technologies	1 Trans Tech Drive	7/26/2010		20,625	
Trophies T's & More	1510 Denmark Road	7/27/2010	1	(See China King)	
Turn Key Tool And Die	8 Progress Parkway	7/26/2010		3,417	
Union Auto Care	510 Highway 50 West	?	1	10,870	
Union Grill	340 Highway 50 West	7/26/2010	1	18,108	
Union High School	1217 West Main Street	?	1	130,050	
Union Machinery	40 Mel Goers Court	7/26/2010	1	11,375	
Union Middle Schools	503 West End Avenue	7/27/2010	1	157,504	
Union Recycling	141 Independence Drive	7/27/2010	1	No Water	
United Parcel Service	1207 Old Smelter Road	7/29/2010		11,715	
Vallarta Mexican	1555 Denmark Road	7/26/2010	1	45,646	
Wahls Woodworking	3 Williams Drive	7/26/2010	1	5,533	
Walgreens Drug	807 Hwy 50 East	7/29/2010		5,958	
Walmart	1445 East Central Court	7/26/2010	1	71,711	
White Rose	208 East Main Street	7/26/2010	1	42,708	
Wiese Planning & Engineering	1210 Old Smelter Road	?		338	
Wildcat Donuts	324 Hwy 50 West	7/26/2010		4,417	

# Sludge Report



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM S - SECTION 1. DOMESTIC SLUDGE REPORTING**

**GENERAL INFORMATION**

REPORTING PERIOD: (YEAR)

2014

FACILITY NAME

Union West Wastewater Treatment Facility

CITY NAME

Union

PERMIT NUMBER

MO-0025283

COUNTY NAME

Franklin Co.

Instructions: See Instruction Sheet for directions

1. Sludge Production, including sludge received from others:

ACTUAL DRY TONS/YEAR	ACTUAL POPULATION EQUIVALENT
181.3	10204

2. Sludge Treatment

- Anaerobic Digester       Aerobic Digester       Composting  
 Storage Tank       Air or Heat Drying  
 Lime Stabilization       Other, Describe. \_\_\_\_\_

3. Sludge Use or Disposal: Complete the rest of this form only for the sections applicable to your method of sludge and biosolids use or disposal.

- All Permittees      Complete Section 1  
 Land Application (LA)      Complete Sections 2 and 3  
 Contract Hauler (CH) >150 PE      Complete Sections 2 and 4  
 Contract Hauler (CH) <150 PE      Complete Section 4  
 Hauled to another Treatment Facility (HT)      Complete Section 4  
 Solid Waste Landfill (LF)      Complete Section 4  
 Sludge Disposal Lagoon (SD)      Complete Section 5  
 Incineration (IN)      Complete Section 6  
 Sludge Hauled to Incinerator (IO)      Complete Section 6

4. Certification: I certify under penalty of law that the information contained in this report and attachments are true and correct. This determination has been made under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information used to determine these requirements have been met. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment.

NAME (TYPE OR PRINT)

Jeffrey Yoss

OFFICIAL TITLE

Water/Wastewater Superintendent

SIGNATURE

*Jeffrey Yoss*

DATE

2-4-15

PHONE

636-583-3522



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM S - SECTION 2 - LABORATORY RESULTS - FORM SA**

**SLUDGE MONITORING RESULTS FOR METALS, NUTRIENTS, PATHOGENS AND VETORS**

PERMIT NO:

MO - 0025283

REPORT PERIOD: (CALENDAR YEAR)

2014

FACILITY NAME

*Union West Wastewater Treatment Facility*

Use this form to report sludge monitoring required under Standard Conditions for NPDES Permits, Part III, dated Aug. 15, 1994. For a copy, contact the department at (573) 751-6825.

If the facility has a design population equivalent (P.E.) of 150 or less, treat the sludge generated as septage and consequently, no testing is required. See WQ 422 guide, *Land Application of Septage*, for further guidance.

Report all results on **dry weight** basis.

**Attach copies of all laboratory results for the items below.**

**A. MINIMUM MONITORING LIST FOR ALL PERMITTEES**

PARAMETER	UNITS	AVERAGE	MINIMUM	MAXIMUM	NUMBER OF SAMPLES
TOTAL SOLIDS	%	4.2	4.2	4.2	1
TOTAL ARSENIC	mg/kg	< 7.1	< 7.1	< 7.1	1
TOTAL CADMIUM	mg/kg	2.0	2.0	2.0	1
TOTAL CHROMIUM	mg/kg	25	25	25	1
TOTAL COPPER	mg/kg	640	640	640	1
TOTAL LEAD	mg/kg	58	58	58	1
TOTAL MERCURY	mg/kg	1.7	1.7	1.7	1
TOTAL MOLYBDENUM	mg/kg	16	16	16	1
TOTAL NICKEL	mg/kg	28	28	28	1
TOTAL SELENIUM	mg/kg	5.8	5.8	5.8	1
TOTAL ZINC	mg/kg	990	990	990	1

**B. ADDITIONAL MONITORING FOR LAND APPLICATION**

PARAMETER	UNITS	AVERAGE	MINIMUM	MAXIMUM	NUMBER OF SAMPLES
TOTAL KJELDAHL NITROGEN	mg/kg	29000	29000	29000	1
TOTAL PHOSPHORUS AS P	mg/kg	11000	11000	11000	1
TOTAL POTASSIUM AS K	mg/kg	1400	1400	1400	1

If more than two dry tons of sludge per acre/year is applied complete the following:

ORGANIC NITROGEN AS N	mg/kg	22000	22000	22000	1
AMMONIA NITROGEN AS N	mg/kg	7200	7200	7200	1
NITRATE NITROGEN AS N	mg/kg	< 120	< 120	< 120	1

C. POLLUTANT LIMITS			
POLLUTANT	AVERAGE SAMPLE CONCENTRATION mg/kg DRY WEIGHT	LOW METAL CONCENTRATION mg/kg DRY WEIGHT	CEILING CONCENTRATION mg/kg DRY WEIGHT
ARSENIC	< 7.1	41	75
CADMIUM	2.0	39	85
CHROMIUM	25	1,200	3,000
COPPER	640	1,500	4,300
LEAD	58	300	840
MERCURY	1.7	17	57
MOLYBDENUM	16	18	75
NICKEL	28	420	420
SELENIUM	5.8	36	100
ZINC	990	2,800	7,500

**D. PATHOGENS**

Pathogen testing is required for all sludges to show operational compliance, including sludges treated by a PSRP approved method.

The geometric mean of the density of fecal coliform is less than 2,000,000 Most Probable Number (MPN) or Colony Forming Units (CFU) per gram of total solids (dry weight basis) for each group of seven samples:

Yes     No

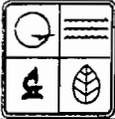
Sampling frequency 1 Time  
Batch Disposal from Storage Tank

Geometric mean per gram of total solids for each group of seven samples was:

MPN/CFU	17000	SAMPLE DATE	09-09-14
MPN/CFU		SAMPLE DATE	
MPN/CFU		SAMPLE DATE	

**E. VECTOR REDUCTION PROCESSES**

- 38 percent volatile solids reduction (attach calculations).
- SOUR test, mg O/hr/g (attach graph and calculations).
- Other. Attach explanation.



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM S - SECTION 2 - LABORATORY RESULTS - FORM SB**

**SLUDGE MONITORING RESULTS FOR METALS, NUTRIENTS, PATHOGENS AND VETORS**

PERMIT NO: **MO - 0025283** REPORT PERIOD: (CALENDAR YEAR) **2014**

FACILITY NAME  
**Union West Wastewater Treatment Facility**

Report all results on **dry weight** basis.

**F. PRIORITY POLLUTANTS**

Report only those pollutants that were above detection limits. Do not repeat pollutants listed in section 2A. Attach additional sheets as needed.

PARAMETER	UNITS	AVERAGE	MINIMUM	MAXIMUM	NUMBER OF SAMPLES
<i>Priority Pollutants were overlooked in 2014.</i>					
<i>We will complete Priority Pollutants Sampling and Analysis at the next batch disposal.</i>					

**G. OTHER SPECIAL MONITORING REQUIRED BY PERMIT**

Report results of any additional testing required under the Special Conditions section of your permit.

PARAMETER	UNITS	AVERAGE	MINIMUM	MAXIMUM	NUMBER OF SAMPLES
<i>None</i>					



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM S - SECTION 3. LAND APPLICATION**

PERMIT NO. MO-0025283 REPORTING PERIOD: CALENDAR YEAR 2014

FACILITY NAME  
Union West Wastewater Treatment Facility

**3.00 Land Application - General**

This section is based on Standard Conditions for NPDES Permits, Part III, dated Aug. 15, 1994. For a copy, contact the department at (573) 751-6825.

Complete this section if sludge or biosolids were land applied for beneficial use by permittee or by contract hauler under permittee authority.

3.01  dry tons of sludge applied during the report period. 181.3 dry tons  
 average percent solids 4.2%  
 If less than 12 percent solids: \_\_\_ total gallons for year. 1 035 000 gallons  
 If 12 percent solids or greater: \_\_\_ cubic yards for year.

3.02 SLUDGE STORAGE PROVIDED  
227 300 cubic feet; 1 000 days of storage.  
 Number of days each month that sludge was land applied:  
 Jan  Feb  Mar  Apr  May  June  July  Aug  Sept  Oct  Nov  Dec

3.03 WHO APPLIES YOUR SLUDGE  
 Permittee personnel  Yes  No  
 Contract person  Yes  No  
 Other, describe: \_\_\_\_\_

**3.10 Applicability (Per Section H or Part III Standard Conditions)**

3.11 ARE THERE ANY LAND APPLICATION SITES FARTHER THAN 20 MILES FROM THE WASTEWATER TREATMENT FACILITY?  
 Yes  No If yes, a separate permit is required for those sites. Indicate permit numbers or submit new permit application for each site.  
 Permit numbers: \_\_\_\_\_

3.12 ARE ANY INDUSTRIAL SLUDGES LAND APPLIED BY THE PERMITTEE?  
 Yes  No If yes, complete the following: Permit No: \_\_\_\_\_  
 Type of Sludge \_\_\_\_\_ SIC Code \_\_\_\_\_

3.13 ARE ALTERNATE LIMITS OR EXCEPTIONS LISTED IN THE SPECIAL CONDITIONS SECTION OF THE PERMIT?  
 Yes  No If yes, attach explanation sheet.

3.14 IS SLUDGE RECEIVED FROM ANY OUT-OF-STATE GENERATORS?  
 Yes  No If this sludge is handled separately, complete separate Sections 2 and 3 of Form S for the out-of-state sludge.

**3.20 Pollutant Limitations**

3.21 ARE METALS WITHIN THE CEILING CONCENTRATION LIMIT?  
 Yes  No If no, attach explanation sheet.

3.22 ARE METALS WITHIN THE LOW METALS CONCENTRATIONS AND THE TOAL OF ALL SLUDGE APPLICATIONS TO DATE (INCLUDING PREVIOUS YEARS) HAVE NOT EXCEEDED 500 DRY TONS/ACRE?  
 Yes  No Attach list of sites using Form SC.

3.23 IF YOU ANSWERED NO TO 3.22, COMPLETE THE FOLLOWING:  
 Have metals application rates reached any of the cumulative metals loadings? This is based on contributions from all historical sludge loadings, including industrial sludges.  
 Yes  No Attach a list of sites using Form SD.  
 Soil test results for metals may be used if historical use is not known. Test metals concentration in parts per million (ppm) dry weight for the top six inches of soil and calculate pounds per acre using this formula:  
 ppm (dry wt) in soil x 2 = pounds per acre for 6 inches soil depth.

**3.30 Management Practices**

**3.31 NITROGEN LIMITATIONS**

Which of the following nitrogen approaches was used?

Sludge applied up to two dry tons/acre/year.  Yes  No

Plant Available Nitrogen (PAN) approach.  Yes  No

1 Number of composite samples. Results for PAN in mg/kg dry weight and pounds per dry ton of sludge (lb/dt) [lb/dt = 0.002 x mg/kg]:

	AVERAGE		MINIMUM		MAXIMUM
PAN	13600	mg/kg	13600	mg/kg	13600 mg/kg
PAN		lb/dT		lb/dT	lb/dT

**3.32 HAVE SLUDGE APPLICATIONS COMPLIED WITH THE FOLLOWING MANAGEMENT PRACTICES AS LISTED IN THE UNIVERSITY OF MISSOURI WQ 426 GUIDE, BEST MANAGEMENT PRACTICES FOR BIOSOLIDS LAND APPLICATION?**

- 1. No discharge of biosolids from application site.  Yes  No
- 2. Public contact sites restriction.  Yes  No
- 3. Crop restrictions.  Yes  No
- 4. Harvest and grazing restrictions.  Yes  No
- 5. Threatened or endangered species protection.  Yes  No
- 6. Nitrogen limitations.  Yes  No
- 7. Buffer zones.  Yes  No
- 8. Slope limitations for application sites.  Yes  No
- 9. Storm water runoff  Yes  No
- 10. Frozen, snow-covered or saturated soil conditions.  Yes  No
- 11. Biosolids storage.  Yes  No
- 12. Application rates.  Yes  No
- 13. Application equipment.  Yes  No
- 14. Soil pH limitations.  Yes  No
- 15. Soil phosphorus limitations.  Yes  No
- 16. Soil depth limitations.  Yes  No
- 17. Record keeping:  Yes  No

If No, attach sheet with explanation

**3.33 CLASS A SLUDGE (PER WQ 424 GUIDE – BIOSOLIDS STANDARDS FOR PATHOGENS AND VECTORS).**

Does the sludge meet Class A pathogen reduction?  Yes  No

Has Class A sludge been applied to public use sites?  Yes  No

If yes to the second question in 3.33, contact Department of Natural Resources

**3.40 Operational Standards for Class B Biosolids (See WQ 424).**

- Class B pathogen reduction requirements were met by either fecal coliform limits under section 2D or a PSRP listed in WQ 424, Table 2. Attach supporting data and indicate process option used. *Lab Results Attached.*
- Class B pathogen requirements not currently met. Attach explanation and schedule of compliance.

3.41 VECTOR ATTRACTION REDUCTION REQUIREMENTS WERE MET.  
 YES     NO

**3.50 Monitoring Frequency (Per WQ 424 – Monitoring Requirements for Biosolids Land Application.)**

Attach a summary of the monitoring results on Form SA.

3.51 SLUDGE TESTING FOR METALS WAS PERFORMED:

- once/year                                     once/six months
- once/quarter                                     once/month
- once/week                                     once/100 dry tons removed from lagoon.
- other, specify: \_\_\_\_\_

3.52 PERMITTEE IS REQUIRED TO HAVE AN APPROVED PRETREATMENT PROGRAM.  
 YES     NO    If Yes, attach Form SB.

3.53 TOTAL SOLIDS TESTING WAS PERFORMED AT LEAST ONCE PER DAY DURING LAND APPLICATION PERIODS?  
 YES     NO    If No, attach explanation. *Storage Tank Average is 4.2 % TS*

3.54 NITROGEN TESTING WAS PERFORMED PER THE FREQUENCY IN WQ 423. *Once per Batch Disposal of Stored Sludge.*  
This frequency is \_\_\_\_\_  YES     NO    If No, attach explanation.

3.55 TOTAL PHOSPHORUS AND TOTAL POTASSIUM WERE TESTED AT THE SAME FREQUENCY REQUIRED FOR METALS AS INDICATED IN WQ 423.  
 YES     NO    If No, attach explanation. *Once per Batch disposal of Stored Sludge*

3.56 SOIL TESTING FOR PH AND CATION EXCHANGE CAPACITY (CEC) AND AVAILABLE PHOSPHORUS HAS BEEN CONDUCTED WITHIN THE LAST FIVE YEARS.  
 YES     NO    If No, attach explanation

3.57 WAS ANY ADDITIONAL SLUDGE OR SOIL TESTING REQUIRED UNDER THE SPECIAL CONDITIONS SECTION OF YOUR WATER POLLUTION CONTROL (NPDES) PERMIT?  
 YES     NO    If Yes, attach a summary using Form SB.

PERMIT NO <i>MO-0025283</i>	REPORT PERIOD: CALENDAR YEAR <i>2014</i>
--------------------------------	---

FACILITY NAME  
*Union West Wastewater Treatment Facility*

**3.60 Certification for Land Application**

Check all that apply.

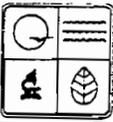
I certify under penalty of law that:

- records on testing, and pollutant loadings, as listed above in Section 2, have been kept in accordance with 40 CFR 503.17,
- the management practices, as listed above in Section 2, have been met in accordance with 40 CFR 503.14
- the Class B pathogen requirements and the site restrictions, as listed above in Section 2, have been met in accordance with 40 CFR 503.15 and 503.32.
- one of the vector attraction requirements, as listed above in Section 2, have been met in accordance with 40 CFR 503.15 and 503.33.

This determination has been made under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information used to determine these requirements have been met. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment.

NAME <i>Jeffrey Voss</i>	OFFICIAL TITLE <i>Water and Wastewater Superintendent</i>
-----------------------------	--

SIGNATURE <i>Jeffrey Voss</i>	DATE <i>2-4-15</i>
----------------------------------	-----------------------



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM SD - CUMULATIVE METAL LOADINGS FOR LAND APPLICATION OF BIOSOLIDS**

Use this form for application sites that have received biosolids that exceed the low metals concentrations or have exceeded a cumulative site loading of 500 dry tons/acre of biosolids per Section 3.22 of Form S. Enter the site number for each field based on the site maps on file at the facility. Attach additional copies of this sheet as needed.

PERMIT NO. MO-0025283 REPORTING PERIOD: CALENDAR YEAR 2014

FACILITY NAME Union West Wastewater Treatment Facility

SITE NO. #2 LAND OWNERS NAME Viola Helling

LEGAL SE 1/4, NE 1/4, Sec 6, T42N, R1E, County Franklin

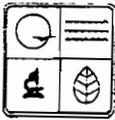
BIOSOLIDS 2.96 dt/ac/yr 16 acres NITROGEN 55.6 lbs/ac/yr (TKN OR PAN)

CROPS GROWN Soybeans

PARAMETER	UNITS	CUMULATIVE LOADINGS			PERCENT OF** ALLOWED LOAD
		PREVIOUS TOTAL	ADDED THIS YEAR	CURRENT TOTAL	
BIOSOLIDS	TON/ACRE*	0.79	2.96	3.75	
TOTAL ARSENIC	LBS/ACRE*	0.07	0.04	0.11	< 10 %
TOTAL CADMIUM	LBS/ACRE*	0.01	0.01	0.02	< 10 %
TOTAL CHROMIUM	LBS/ACRE*	0.05	0.15	0.20	< 10 %
TOTAL COPPER	LBS/ACRE*	1.28	3.79	5.07	< 10 %
TOTAL LEAD	LBS/ACRE*	0.12	0.34	0.46	< 10 %
TOTAL MERCURY	LBS/ACRE*	0.004	0.009	0.013	< 10 %
TOTAL MOLYBDENUM	LBS/ACRE*	0.05	0.09	0.14	< 10 %
TOTAL NICKEL	LBS/ACRE*	0.04	0.17	0.21	< 10 %
TOTAL SELENIUM	LBS/ACRE*	0.04	0.04	0.08	< 10 %
TOTAL ZINC	LBS/ACRE*	1.90	5.86	7.76	< 10 %
SOIL pH (SALT TEST)	pH UNITS	6.2			
SOIL CEC	meg/100g SOIL	13.1			

\* Report as dry weight.

\*\* Report the percentage of the allowable cumulative loading for the site based on the limits in Permit Standard Conditions Part III. Round to the nearest 5 percent. If less than 10 percent, report as <10.



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM SD - CUMULATIVE METAL LOADINGS FOR LAND APPLICATION OF BIOSOLIDS**

Use this form for application sites that have received biosolids that exceed the low metals concentrations or have exceeded a cumulative site loading of 500 dry tons/acre of biosolids per Section 3.22 of Form S. Enter the site number for each field based on the site maps on file at the facility. Attach additional copies of this sheet as needed.

PERMIT NO. MO - 0025283 REPORTING PERIOD: CALENDAR YEAR 2014

FACILITY NAME Union West Wastewater Treatment Facility

SITE NO. #3 LAND OWNERS NAME Viola Helling

LEGAL SW 1/4, NE 1/4, Sec 6, T42N, R1E, County Franklin

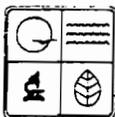
BIOSOLIDS 2.80 dt/ac/yr 20 acres NITROGEN 52.6 lbs/ac/yr (TKN OR PAN)

CROPS GROWN Hay

PARAMETER	UNITS	CUMULATIVE LOADINGS			
		PREVIOUS TOTAL	ADDED THIS YEAR	CURRENT TOTAL	PERCENT OF** ALLOWED LOAD
BIOSOLIDS	TON/ACRE*	2.38	2.80	5.18	
TOTAL ARSENIC	LBS/ACRE*	0.20	0.04	0.24	< 10 %
TOTAL CADMIUM	LBS/ACRE*	0.03	0.01	0.04	< 10 %
TOTAL CHROMIUM	LBS/ACRE*	0.14	0.14	0.28	< 10 %
TOTAL COPPER	LBS/ACRE*	3.86	3.58	7.44	< 10 %
TOTAL LEAD	LBS/ACRE*	0.35	0.33	0.68	< 10 %
TOTAL MERCURY	LBS/ACRE*	0.01	0.01	0.02	< 10 %
TOTAL MOLYBDENUM	LBS/ACRE*	0.15	0.09	0.24	< 10 %
TOTAL NICKEL	LBS/ACRE*	0.13	0.16	0.29	< 10 %
TOTAL SELENIUM	LBS/ACRE*	0.13	0.03	0.16	< 10 %
TOTAL ZINC	LBS/ACRE*	5.71	5.54	11.25	< 10 %
SOIL pH (SALT TEST)	pH UNITS	6.8			
SOIL CEC	meg/100g SOIL	11.7			

\* Report as dry weight.

\*\* Report the percentage of the allowable cumulative loading for the site based on the limits in Permit Standard Conditions Part III. Round to the nearest 5 percent. If less than 10 percent, report as <10.



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM SD - CUMULATIVE METAL LOADINGS FOR LAND APPLICATION OF BIOSOLIDS**

Use this form for application sites that have received biosolids that exceed the low metals concentrations or have exceeded a cumulative site loading of 500 dry tons/acre of biosolids per Section 3.22 of Form S. Enter the site number for each field based on the site maps on file at the facility. Attach additional copies of this sheet as needed.

PERMIT NO. MO - 0025283 REPORTING PERIOD: CALENDAR YEAR 2014

FACILITY NAME Union West Wastewater Treatment Facility

SITE NO. #4 LAND OWNERS NAME Randy Klenke

LEGAL 1/4, SW 1/4, Sec 25, T 43N, R 1W, County Franklin

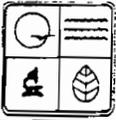
BIOSOLIDS 0.54 dt/ac/yr 67 acres NITROGEN 10.2 lbs/ac/yr (TKN OR PAN)

CROPS GROWN Corn

PARAMETER	UNITS	CUMULATIVE LOADINGS			
		PREVIOUS TOTAL	ADDED THIS YEAR	CURRENT TOTAL	PERCENT OF** ALLOWED LOAD
BIOSOLIDS	TON/ACRE*	0	0.54	0.54	
TOTAL ARSENIC	LBS/ACRE*	0	0.008	0.008	< 10 %
TOTAL CADMIUM	LBS/ACRE*	0	0.002	0.002	< 10 %
TOTAL CHROMIUM	LBS/ACRE*	0	0.027	0.027	< 10 %
TOTAL COPPER	LBS/ACRE*	0	0.691	0.691	< 10 %
TOTAL LEAD	LBS/ACRE*	0	0.063	0.063	< 10 %
TOTAL MERCURY	LBS/ACRE*	0	0.002	0.002	< 10 %
TOTAL MOLYBDENUM	LBS/ACRE*	0	0.017	0.017	< 10 %
TOTAL NICKEL	LBS/ACRE*	0	0.030	0.030	< 10 %
TOTAL SELENIUM	LBS/ACRE*	0	0.007	0.007	< 10 %
TOTAL ZINC	LBS/ACRE*	0	1.069	1.069	< 10 %
SOIL pH (SALT TEST)	pH UNITS	5.5			
SOIL CEC	meg/100g SOIL	9.0			

\* Report as dry weight.

\*\* Report the percentage of the allowable cumulative loading for the site based on the limits in Permit Standard Conditions Part III. Round to the nearest 5 percent. If less than 10 percent, report as <10.



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM SD - CUMULATIVE METAL LOADINGS FOR LAND APPLICATION OF BIOSOLIDS**

Use this form for application sites that have received biosolids that exceed the low metals concentrations or have exceeded a cumulative site loading of 500 dry tons/acre of biosolids per Section 3.22 of Form S. Enter the site number for each field based on the site maps on file at the facility. Attach additional copies of this sheet as needed.

PERMIT NO. MO - 0025283 REPORTING PERIOD: CALENDAR YEAR 2014

FACILITY NAME Union West Wastewater Treatment Facility

SITE NO. #8 LAND OWNERS NAME Maple Ridge Farm LLC

LEGAL W 1/2 SW 1/4 Sec 6  
NW 1/4, NW 1/4, Sec 7, T 42N, R 1E, County Franklin

BIOSOLIDS 1.19 dt/ac/yr 35 acres NITROGEN 22.4 lbs/ac/yr (TKN OR PAN)

CROPS GROWN Soybeans

PARAMETER	UNITS	CUMULATIVE LOADINGS			
		PREVIOUS TOTAL	ADDED THIS YEAR	CURRENT TOTAL	PERCENT OF** ALLOWED LOAD
BIOSOLIDS	TON/ACRE*	0	1.19	1.19	
TOTAL ARSENIC	LBS/ACRE*	0	0.017	0.017	< 10 %
TOTAL CADMIUM	LBS/ACRE*	0	0.005	0.005	< 10 %
TOTAL CHROMIUM	LBS/ACRE*	0	0.060	0.060	< 10 %
TOTAL COPPER	LBS/ACRE*	0	1.523	1.523	< 10 %
TOTAL LEAD	LBS/ACRE*	0	0.138	0.138	< 10 %
TOTAL MERCURY	LBS/ACRE*	0	0.004	0.004	< 10 %
TOTAL MOLYBDENUM	LBS/ACRE*	0	0.038	0.038	< 10 %
TOTAL NICKEL	LBS/ACRE*	0	0.067	0.067	< 10 %
TOTAL SELENIUM	LBS/ACRE*	0	0.014	0.014	< 10 %
TOTAL ZINC	LBS/ACRE*	0	2.356	2.356	< 10 %
SOIL pH (SALT TEST)	pH UNITS	5.6			
SOIL CEC	meg/100g SOIL	10.0			

\* Report as dry weight.

\*\* Report the percentage of the allowable cumulative loading for the site based on the limits in Permit Standard Conditions Part III. Round to the nearest 5 percent. If less than 10 percent, report as <10.



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM SC - LAND APPLICATION OF BIOSOLIDS WITH LOW METALS CONCENTRATIONS**

Use this form for application sites that have received biosolids with low metal(s) concentrations per section 3.22 of Form S. Enter the site number for each field based on the site maps on file at the facility. Report biosolids application rate in dry tons per acre per year (dt/ac/yr). Attach additional copies of this sheet as needed.

PERMIT NO. MO - 0025283 REPORTING PERIOD: CALENDAR YEAR 2014

FACILITY NAME Union West Wastewater Treatment Facility

SITE NO. #2 OWNERS NAME Viola Helling

LEGAL SE 1/4, NE 1/4, Sec 6, T42N, R1E, County Franklin

BIOSOLIDS 2.96 dt/ac/yr 16 acres NITROGEN 55.6 lbs/ac/yr (TKN/PAN)

CROPS GROWN Soybeans SOIL pH 6.2

SITE NO. #3 OWNERS NAME Viola Helling

LEGAL SW 1/4, NE 1/4, Sec 6, T42N, R1E, County Franklin

BIOSOLIDS 2.80 dt/ac/yr 20 acres NITROGEN 52.6 lbs/ac/yr (TKN/PAN)

CROPS GROWN Hay SOIL pH 6.8

SITE NO. #4 OWNERS NAME Randy Klenke

LEGAL 1/4, SW 1/4, Sec 25, T43N, R1W, County Franklin

BIOSOLIDS 0.54 dt/ac/yr 67 acres NITROGEN 10.2 lbs/ac/yr (TKN/PAN)

CROPS GROWN Corn SOIL pH 5.5

SITE NO. #8 OWNERS NAME Maple Ridge Farm LLC

LEGAL W 1/4, SW 1/4, Sec 6, NW 1/4, NW 1/4, Sec 7, T42N, R1E, County Franklin

BIOSOLIDS 1.19 dt/ac/yr 35 acres NITROGEN 22.4 lbs/ac/yr (TKN/PAN)

CROPS GROWN Soybeans SOIL pH 5.6

SITE NO. \_\_\_\_\_ OWNERS NAME \_\_\_\_\_

LEGAL \_\_\_\_\_ 1/4, \_\_\_\_\_ 1/4, Sec \_\_\_\_\_, T \_\_\_\_\_, R \_\_\_\_\_, County \_\_\_\_\_

BIOSOLIDS \_\_\_\_\_ dt/ac/yr \_\_\_\_\_ acres NITROGEN \_\_\_\_\_ lbs/ac/yr (TKN/PAN)

CROPS GROWN \_\_\_\_\_ SOIL pH \_\_\_\_\_

SITE NO. \_\_\_\_\_ OWNERS NAME \_\_\_\_\_

LEGAL \_\_\_\_\_ 1/4, \_\_\_\_\_ 1/4, Sec \_\_\_\_\_, T \_\_\_\_\_, R \_\_\_\_\_, County \_\_\_\_\_

BIOSOLIDS \_\_\_\_\_ dt/ac/yr \_\_\_\_\_ acres NITROGEN \_\_\_\_\_ lbs/ac/yr (TKN/PAN)

CROPS GROWN \_\_\_\_\_ SOIL pH \_\_\_\_\_

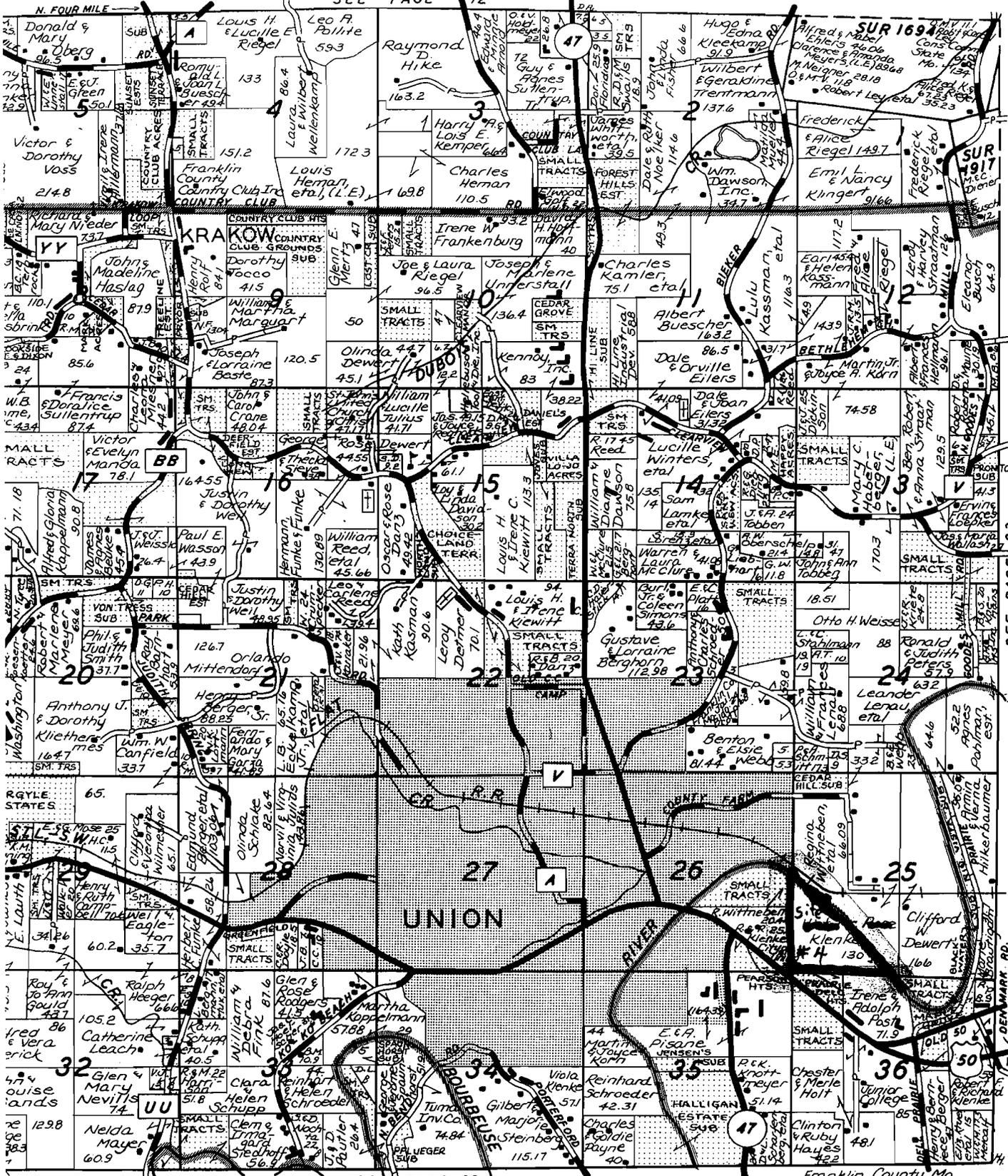


Klenke  
Site # 4 Sec 25

# ION JOHN NORTHWEST CENTRAL PART

# T.43N.-R.1W.

SEE PAGE 12



SEE PAGE 22

CENTRAL TWP.

SEE PAGE 28  
← CENTRAL TWP      ← CENTRAL TWP

Franklin County, Mo.

### SOUR - SPECIFIC OXYGEN UPTAKE RATE

The SOUR or specific oxygen uptake rate may be used to meet the requirements for vector attraction reduction of aerobically digested sludge. The SOUR is expressed as mg of O<sub>2</sub> /hr-gram of total solids at 20°C. To meet the new requirements for vector attraction reduction, the SOUR must be less than or equal to 1.5 mg of O<sub>2</sub> /hr-gram of total solids.

Procedure: Take a one liter sample of the digested sludge. Shake the sample well in a sample bottle which is less than full to saturate the sample with dissolved oxygen. Fill a BOD bottle with this sample. Immediately insert a self-stirring DO probe into the bottle and take the initial DO reading. Take readings every minute for 10 minutes. Record the readings in the table below to complete the calculations as shown below.

TIME	DO	ΔDO
0 minute	8.6	
1 minute	8.2	0.4
2 minutes	7.9	0.3
3 minutes	7.5	0.4
4 minutes	7.1	0.4
5 minutes	6.8	0.3
6 minutes	6.4	0.4
7 minutes	6.1	0.3
8 minutes	5.7	0.4
9 minutes	5.3	0.4
10 minutes	4.9	0.4

Date: 09-19-14 Time: 10:00 AM

Sample Temp.: @ 20°C

Facility: Union West Wastewater Treatment Plant

Name: John Zimmermann

Sample Location: Sludge Storage Tank

$$\text{Average } \Delta\text{DO} = \frac{\text{sum of } \Delta\text{DO}}{\text{Number of readings}} = \frac{3.7}{10} = 0.37$$

$$\Delta\text{DO} = \text{change in DO} = 0.37$$

$$\Delta\text{DO/hr} = \Delta\text{DO/min} \times 60 = 0.37 \times 60 = 22.2$$

$$\text{SOUR} = \frac{\Delta\text{DO/hr} \times 1000}{\text{mg/l total solids}} = \frac{22.2 \times 1000}{22900}$$

$$\text{SOUR} = \underline{0.97} \text{ mg O}_2 \text{ per hr-gram solids}$$

$$1\% \text{ solids} = 10,000 \text{ mg/l}$$

= 3.7

W<sub>1</sub> 40.7041  
W<sub>2</sub> 71.0050  
W<sub>3</sub> 41.3990

$$\frac{0.6949 \times 100}{30.3009} = \frac{69.49}{30.3009} = 2.29\% \text{ Total Solids}$$



PDC Laboratories, Inc.  
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 (314) 432-0550 • (800) 333-FAST • FAX (314) 432-4977



Union WWTP  
 500 E Locust St  
 Union, MO 63084  
 Attn: David Aguilar

Date Received: 09/09/14 15:35  
 Report Date: 09/19/14  
 Customer #: 276613

**\*Laboratory Results\***

Sample No: 4091371-01  
 Sample Description: LAGSWS14

Collect Date: 09/09/14 08:30  
 Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b><u>Anions - STL</u></b>					
Nitrite / Nitrate	< 240 mg/kg dry		09/16/14 12:44	DWM	
Nitrate-N	< 120 mg/kg dry		09/11/14 21:44	DWM	SW 9056*
Nitrite-N	< 110 mg/kg dry		09/16/14 12:44	DWM	SW 9056*
<b><u>Distilled Nutrients - PIA</u></b>					
Ammonia-N	7200 mg/kg dry		09/15/14 14:41	Igbrs	EPA 350.1 - QC 10-107-06-1-I & J
<b><u>General Chemistry - PIA</u></b>					
Solids - total solids (TS)	4.2 %		09/10/14 16:15	DAS	SM 2540G 18Ed*
Nitrogen - total organic	22000 mg/kg dry dr		09/15/14 14:41	Igbrs	calculation
<b><u>General Chemistry - STL</u></b>					
pH	6.7 pH Units	H	09/10/14 13:00	ACV	SW 9045C 04KS
Solids - total volatile solids (TVS)	41 %		09/12/14 08:30	DAS	SM 2540G 18th Ed*
<b><u>Nutrients - PIA</u></b>					
Total Kjeldahl Nitrogen (TKN)	29000 mg/kg dry		09/15/14 12:06	Igbrs	SM 4500-N B & NH3-H 18Ed* WI
<b><u>Nutrients - STL</u></b>					
PAN surface application	9400 mg/kg dry		09/19/14 13:49	BGP	CALCULATION*
PAN subsurface application	11600 mg/kg dry		09/19/14 13:49	BGP	CALCULATION*
<b><u>Total Metals - STL</u></b>					
Mercury	1.7 mg/kg dry		09/19/14 11:54	WPS	SW 7471A 04KS
Phosphorus	11000 mg/kg dry	Q4	09/11/14 09:31	WPS	SW 6010B*
Arsenic	< 7.1 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Cadmium	2.0 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Chromium	25 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Copper	640 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Lead	58 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Molybdenum	16 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Nickel	28 mg/kg dry		09/11/14 09:31	WPS	SW 6010B 04KS
Potassium	1400 mg/kg dry	Q4	09/11/14 09:31	WPS	SW 6010B 04KS
Selenium	5.8 mg/kg dry	Q3	09/11/14 09:31	WPS	SW 6010B 04KS
Zinc	990 mg/kg dry	Q4	09/11/14 09:31	WPS	SW 6010B 04KS



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Union WWTP  
 500 E Locust St  
 Union, MO 63084  
 Attn: David Aguilar

Date Received: 09/09/14 15:35  
 Report Date: 09/19/14  
 Customer #: 276613

**\*Laboratory Results\***

Sample No: 4091371-02  
 Sample Description: Fecal #1

Collect Date: 09/09/14 08:30  
 Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	4.1 %		09/09/14 16:20	DAS	SM 2540G 18Ed*
<b>Microbiology - STL</b>					
Fecal coliform bacteria	24000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*

Sample No: 4091371-03  
 Sample Description: Fecal #2

Collect Date: 09/09/14 08:30  
 Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	4.0 %		09/09/14 16:20	DAS	SM 2540G 18Ed*
<b>Microbiology - STL</b>					
Fecal coliform bacteria	< 25000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*

Sample No: 4091371-04  
 Sample Description: Fecal #3

Collect Date: 09/09/14 08:30  
 Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	4.0 %		09/09/14 16:20	DAS	SM 2540G 18Ed*
<b>Microbiology - STL</b>					
Fecal coliform bacteria	< 25000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*

Sample No: 4091371-05  
 Sample Description: Fecal #4

Collect Date: 09/09/14 08:30  
 Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	4.1 %		09/09/14 16:20	DAS	SM 2540G 18Ed*

4091371



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Union WWTP  
500 E Locust St  
Union, MO 63084  
Attn: David Aguilar

Date Received: 09/09/14 15:35  
Report Date: 09/19/14  
Customer #: 276613

\*Laboratory Results\*

Sample No: 4091371-05  
Sample Description: Fecal #4

Collect Date: 09/09/14 08:30  
Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Microbiology - STL</b>					
Fecal coliform bacteria	< 25000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*

Sample No: 4091371-06  
Sample Description: Fecal #5

Collect Date: 09/09/14 08:30  
Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	4.2 %		09/09/14 16:20	DAS	SM 2540G 18Ed*
<b>Microbiology - STL</b>					
Fecal coliform bacteria	48000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*

Sample No: 4091371-07  
Sample Description: Fecal #6

Collect Date: 09/09/14 08:30  
Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	4.0 %		09/09/14 16:20	DAS	SM 2540G 18Ed*
<b>Microbiology - STL</b>					
Fecal coliform bacteria	< 25000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*

Sample No: 4091371-08  
Sample Description: Fecal #7

Collect Date: 09/09/14 08:30  
Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>General Chemistry - PIA</b>					
Solids - total solids (TS)	3.9 %		09/09/14 16:20	DAS	SM 2540G 18Ed*
<b>General Chemistry - STL</b>					
Solids - total solids (TS)	4.0 %		09/09/14 16:20	DAS	SM 2540 - Geometric Mean*

4091371



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Union WWTP  
 500 E Locust St  
 Union, MO 63084  
 Attn: David Aguilar

Date Received: 09/09/14 15:35  
 Report Date: 09/19/14  
 Customer #: 276613

**\*Laboratory Results\***

Sample No: 4091371-08  
 Sample Description: Fecal #7

Collect Date: 09/09/14 08:30  
 Matrix: Sludge

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Microbiology - STL</b>					
Fecal coliform bacteria	< 26000 CFU/g dry		09/09/14 15:50	KLA	SM 9222 D*
Fecal coliform bacteria - Geometric Mean	17000 CFU/g dry w/		09/09/14 15:50	KLA	SM 9222 D*



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 500 E Locust St  
 Union, MO 63084  
 Attn: David Aguilar

Date Received: 09/09/14 15:35  
 Report Date: 09/19/14  
 Customer #: 276613

**\*Laboratory Results\***

**Notes**

This report shall not be reproduced, except in full, without the written approval of the laboratory.

PDC Laboratories participates in the following accreditation/certification and proficiency programs at the following locations. Endorsement by Federal or State Governments or their agencies is not implied.

- PIA PDC Laboratories - Peoria, IL  
 NELAC Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230  
 Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553  
 Drinking Water Certifications: Kansas (E-10338); Missouri (870); Wisconsin (998284430); Iowa (240)  
 Wastewater Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
 Hazardous/Solid Waste Certifications; Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
 UST Certification; Iowa (240)
- SPM PDC Laboratories - Springfield, MO  
 EPA DMR-QA Program
- STL PDC Laboratories - St. Louis, MO  
 TNI Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS Lab No. E-10389  
 Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 171050  
 Missouri Department of Natural Resources Drinking Water Certifications: Missouri (1050)

\* Not a TNI accredited analyte

- Q4 The matrix spike recovery result is unusable since the analyte concentration in the sample is greater than four times the spike level. The associated blank spike was acceptable.
- Q3 MS/MSD both failed %R
- H Test performed after the expiration of the appropriate regulatory/advisory maximum allowable hold time.

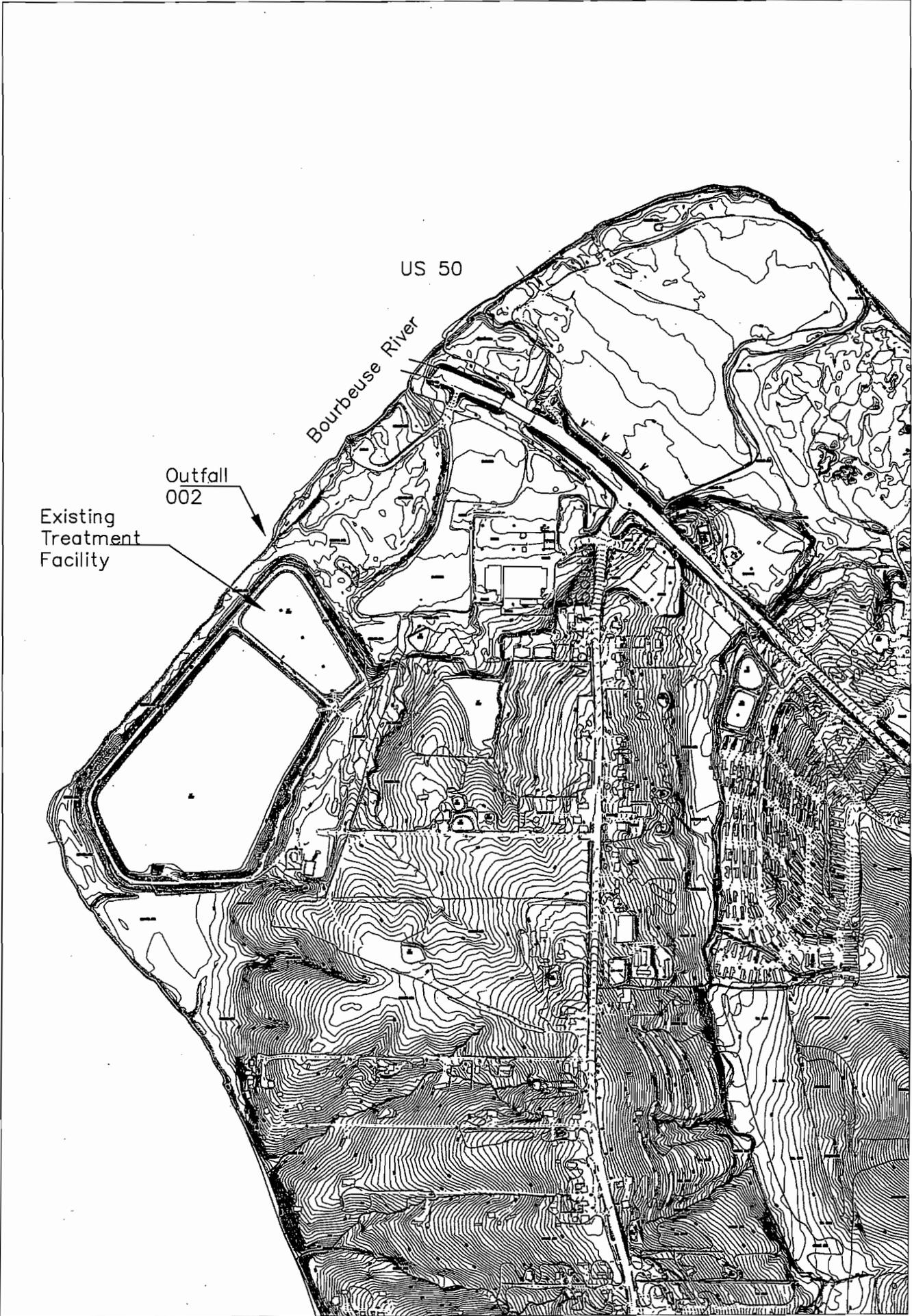
*Barbara G. Pandolfo*

Certified by: Barb Pandolfo, Project Manager



# Facility/Process Maps





US 50

Bourbeuse River

Outfall  
002

Existing  
Treatment  
Facility