

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, 92nd Congress) as amended,

Permit No. MO-0126161

Owner: Golden Triangle Energy, LLC
Address: 15053 Highway 111, Craig, MO 64437

Continuing Authority: Same as above
Address: Same as above

Facility Name: Golden Triangle Energy, LLC
Facility Address: 15053 Highway 111, Craig, MO 64437

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

Ethanol manufacturer - SIC code 2869

See Page 2

This permit authorizes only wastewater 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 644.051.6 of the Law.

September 1, 2014
Effective Date

Sara Parker Pauley, Director, Department of Natural Resources

August 31, 2019
Expiration Date

John Madras, Director, Water Protection Program

FACILITY DESCRIPTION (continued)

Permeate water from reverse osmosis treatment of evaporator condensate and sanitary wastewater is discharged to Craig POTW. Sludge is land applied by contract applicator.

Receiving Stream Watershed: a gaining stream setting that flows into Little Tarkio Creek

Storage Basins:

Freeboard for basin: 2 feet.

Storage volume (minimum to maximum water levels): 263,333 gallons

Land Application:

Irrigation areas: 50 acres available

Equipment type: Applied with traveling gun by contract applicator

Vegetation: Row crops

Application rate is based on: Plant Available Nitrogen (PAN)

Permitted Feature #001 – Detention basin for stormwater runoff from production plant area, sediment is retained in basin.

Legal Description: NE ¼, NW ¼, Sec. 13, T62N, R40W, Holt County

UTM Coordinates: X = 298672, Y = 4451252

Receiving Stream: Tributary to Old Channel Tarkio Creek (U)

First Classified Stream and ID: Little Tarkio Creek (P) (00248)

USGS Basin & Sub-watershed No.: (10240005-0903)

Permitted Feature #002 – Process wastewater/#1 and #2 cooling towers blow down/R.O. reject water.

Design Flow: 289,318 GPD

Average Flow: 212,400 GPD

Legal Description: NE ¼, NW ¼, Sec. 13, T62N, R40W, Holt County

UTM Coordinates: X = 298510, Y = 4451294

Receiving Stream: Tributary to Old Channel Tarkio Creek (U)

First Classified Stream and ID: Little Tarkio Creek (P) (00248)

USGS Basin & Sub-watershed No.: (10240005-0903)

Permitted Feature #003 – #1 and #2 broilers blow down/green sand backwash/ozone sludge decant/R.O. reclaim permeate/ rail car washout.

Design Flow: 62,000 GPD

Average Flow: 54,200 GPD

Legal Description: NE ¼, NW ¼, Sec. 13, T62N, R40W, Holt County

UTM Coordinates: X = 298558, Y = 4451294

Receiving Stream: Tributary to Old Channel Tarkio Creek (U)

First Classified Stream and ID: Little Tarkio Creek (P) (00248)

USGS Basin & Sub-watershed No.: (10240005-0903)

Permitted Feature #004 – Land application, North site 20 acres.

Legal Description: NE ¼, NW ¼, Sec. 13, T62N, R40W, Holt County

UTM Coordinates: X = 298792, Y = 4451436

Receiving Stream: Tributary to Old Channel Tarkio Creek (U)

First Classified Stream and ID: Little Tarkio Creek (P) (00248)

USGS Basin & Sub-watershed No.: (10240005-0903)

Permitted Feature #005 – Land application, South site 30 acres

Legal Description: SE ¼, NW ¼, Sec. 13, T62N, R40W, Holt County

UTM Coordinates: X = 298754, Y = 4451092

Receiving Stream: Tributary to Old Channel Tarkio Creek (U)

First Classified Stream and ID: Little Tarkio Creek (P) (00248)

USGS Basin & Sub-watershed No.: (10240005-0903)

PERMITTED FEATURE #001	TABLE A-1. STORMWATER BASIN LIMITATIONS AND MONITORING REQUIREMENTS				PAGE NUMBER 3 of 12	
	PERMIT NUMBER MO-0126161					
The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective September 1, 2014 , and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S) (Note 1)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/quarter***	24 hr. estimate
pH	SU	**		**	once/quarter***	grab
COD	mg/L	120		90	once/quarter***	grab
Total Suspended Solids	mg/L	100		70	once/quarter***	grab
Oil & Grease	mg/L	15		10	once/quarter***	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2015</u> .						

PERMITTED FEATURE #002	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
	The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective September 1, 2014 , and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S) (Note 1)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/month	24 hr. estimate
pH	SU	**		**	once/month	grab
Temperature	°F	90			once/month	grab
Conductivity	µmhos/cm	*		*	once/month	grab
Phosphorous	mg/L	*		*	once/month	grab
Ammonia as N	mg/L	*		*	once/month	grab
Nitrate + Nitrites as N	mg/L	10		10	once/month	grab
Sulfates + Chlorides	mg/L	1000		1000	once/month	grab
Total Residual Chlorine (Note 2)	µg /L	17 (130ML)		8 (130ML)	once/month	grab
Arsenic (Total Recoverable)	µg/L	20		20	once/month	grab
Iron (Total Recoverable)	µg/L	1000		400	once/month	grab
Manganese (Total)	µg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2014</u> .						

PERMITTED FEATURES #003	TABLE A-3. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS			PAGE NUMBER 4 of 12		
				PERMIT NUMBER MO-0126161		
The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective September 1, 2014 , and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETER(S) (Note 1)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/month	24 hr. estimate
pH	SU	**		**	once/month	grab
Temperature	°F	90			once/month	grab
Conductivity	µmhos/cm	*		*	once/month	grab
Phosphorous	mg/L	*		*	once/month	grab
Nitrate + Nitrites as N	mg/L	10		10	once/month	grab
Sulfates + Chlorides	mg/L	1000		1000	once/month	grab
Total Residual Chlorine (Note 2)	µg/L	17 (130ML)		8 (130ML)	once/month	grab
Aluminum (Total Recoverable)	µg/L	750		750	once/month	grab
Arsenic (Total Recoverable)	µg/L	20		20	once/month	grab
Iron (Total Recoverable)	µg/L	1000		400	once/month	grab
Manganese (Total)	µg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>OCTOBER 28, 2014</u> .						

OUTFALL #002 & #003	TABLE A-4. WHOLE EFFLUENT TOXICITY FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
	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 September 1, 2014 , 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
Acute Whole Effluent Toxicity	TU _a	*			once/year	24 hr. composite****
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2015</u> .						

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

PERMITTED FEATURES #004, #005	TABLE A-5. SLUDGE APPLICATION LIMITATIONS AND MONITORING REQUIREMENTS	PAGE NUMBER 5 of 12
		PERMIT NUMBER MO-0126161

The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective **September 1, 2014**, and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Sludge Land Application Operational Monitoring						
Amount Applied	Gallons	*			daily	total
Application Area	Acres	*			daily	total
Application Rate	gal./acre	*			daily	total

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE JANUARY 28, 2015.

Sludge Land Applied (Note 3)						
pH – Units	SU	*			once/year	grab
Total Kjeldahl Nitrogen as N (Note 3)	mg/kg	*			once/year	grab
Nitrate Nitrogen as N (Note 4)	mg/kg	*			once/year	grab
Total Phosphorus as P	mg/kg	*			once/year	grab
Percent Solids	mg/kg	*			once/year	grab

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE JANUARY 28, 2015.

Soil Monitoring (Note 5)						
pH – Units	SU	*			once/5 years	composite
Nitrate Nitrogen as N	mg/kg	*			once/5 years	composite
Available Phosphorus as P (Bray P1 Method)	mg/kg	*			once/5 years	composite

MONITORING REPORTS SHALL BE SUBMITTED EVERY 5 YEARS; THE FIRST REPORT IS DUE JANUARY 28, 2017.

- * Monitoring requirement only.
- ** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.
- *** See table below for quarterly sampling

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

Note 1 – Non-detects must be reported as "ND" along with the applicable method detection limit or minimum quantification limit in parentheses - e.g. ND (>0.001). If the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu a specified parameter then zero (0) is to be reported for that parameter

Note 2 - This permit contains a Total Residual Chlorine (TRC) limit.

- (a) This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values greater than or equal to the minimum quantification level of 130 µg/L will be considered violations of the permit and values less than the minimum quantification level of 130 µg/L will be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.
- (b) Disinfection is required year-round unless the permit specifically states that “Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31.” If your permit does not require disinfection during the non-recreational months, do not chlorinate in those months.
- (c) Do not chemically dechlorinate **if it is not needed to meet the limits in your permit.**
- (d) If no chlorine was used in a given sampling period, an actual analysis is not necessary. Simply report as “0 µg/L” TRC.

Note 3 – Sludge that is land applied shall be sampled at the storage basin or application vehicle. If no land application occurred during the report period, report as “No Application.”

Note 4 - Sludge application rates should not exceed a nitrogen application rate of 150 pounds total nitrogen per acre per year, and the applied sludge should not exceed ten (10) mg/L of nitrate nitrogen as N. If the nitrogen application exceeds a rate of 150 pounds total nitrogen per acre per year, and/or the applied wastewater exceeds ten (10) mg/l of nitrate nitrogen as N, see Special Condition 20.c for additional requirements.

Note 5 – Sample the upper 6 to 8 inches of soil. Composite samples shall be collected from each permitted land application site. See Special Condition 18.d Soil Monitoring for additional guidance.

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated August 1, 2014 and hereby incorporated as though fully set forth herein.

C. SPECIAL CONDITIONS

1. Emergency Discharge. An emergency discharge from land application sites shall constitute a permit violation and shall be reported in accordance with Standard Conditions, Part 1, Section B.2.b. Monitoring shall take place once per day while discharging. Test results are due on the 28th day of the following month after the cessation of the discharge. Permittee shall monitor for the following constituents:

Constituent	Units
Flow	MGD
Biochemical Oxygen Demand ₅	mg/L
Total Suspended Solids	mg/l
Ammonia as N	mg/L
pH – Units	SU
Oil & Grease	mg/L

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. SPECIAL CONDITIONS (continued)

- 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 permitted features s must be clearly marked in the field.

4. 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.

5. Public access to storage areas and land application sites must be controlled by either positive barriers or remoteness of site.

6. The permittee shall develop, maintain and implement an Operation and Maintenance (O&M) Manual that includes all necessary items to ensure the operation and integrity of the waste handling and land application systems, including key operating procedures, an aerial or topographic site map with the permitted features, land application fields, and irrigation buffer zones marked, and a brief summary of the operation of the facility. The O & M manual shall be made available to the operator and available to the department upon request. The O&M Manual shall be reviewed and updated at least every five years.

7. The berms of the storage basin(s) shall be mowed and kept free of any deep-rooted vegetation, animal dens, or other potential sources of damage to the berms.

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

9. Hazardous waste regulated under the Missouri Hazardous Waste Law and regulations shall not be land applied under this permit.

10. Any pesticide discharge from any point source shall comply with the requirements of Federal Insecticide, Fungicide and Rodenticide Act, as amended (7 U.S.C. 136 et. seq.) and the use of such pesticides shall be in a manner consistent with its label.

C. SPECIAL CONDITIONS (continued)

11. The permittee shall implement a Stormwater Pollution Prevention Plan (SWPPP) within ninety days of permit issuance. The SWPPP must be prepared and implemented upon permit issuance and kept on-site and should not be sent to the department unless specifically requested. The SWPPP must be reviewed and updated, if needed, every five (5) years or as site conditions change. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance 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. The SWPPP must include the following:
 - a. A listing of specific Best Management Practices (BMPs) and a narrative explaining how BMPs will be implemented to control and minimize the amount of potential contaminants that may enter stormwater.
 - b. The SWPPP must include a schedule for monthly inspections of BMP for effectiveness and brief written reports. Deficiencies must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report, including photographs. Any corrective measure that necessitates major construction may also need a construction permit. Inspection reports must be kept on site with the SWPPP and maintained for a period of five (5) years. These must be made available to department personnel upon request.
 - c. A provision for designating an individual to be responsible for environmental matters.
 - d. A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of the department.
12. Permittee shall adhere to the following minimum Best Management Practices (BMPs):
 - a. Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of stormwater from these substances.
 - b. Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
 - c. Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
 - d. Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
 - e. 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, to comply with effluent limits.
13. The purpose of the SWPPP and the BMPs listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was not effective in preventing pollution [10 CSR 20-2.010(56)] of waters of the state, and corrective actions means the facility took steps to eliminate the deficiency.
14. Before releasing water that has accumulated in secondary containment areas it must be examined for hydrocarbon odor and presence of a sheen. If the presence of hydrocarbons is indicated, this water must be tested for Total Petroleum Hydrocarbons (TPH). The suggested analytical method for testing TPH is non-Halogenated Organic by Gas Chromatography method 8015 (also known as OA1 and OA2). However, if the permittee so desires to use other approved testing methods (i.e. EPA 1664), they may do so. If the concentration for TPH exceeds 10mg/L, the water shall be taken to a WWTP for treatment.
15. Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. A record of each reportable spill shall be retained with the SWPPP and made available to the department upon request.
16. The facility shall ensure that adequate provisions are provided to prevent surface water intrusion into the storage basin(s) and to divert stormwater runoff around the storage basin(s) and protect embankments from erosion.
17. Wastewater storage structures shall be visually inspected at least once/month for structural integrity and visible leaks.

C. SPECIAL CONDITIONS (continued)

18. Land Application System.

- a. This special condition does not apply to fertilizer products that are exempted under the Missouri Clean Water Law and regulations, 10 CSR 20-6.015(3)(B)8.
- b. Permitted Sites. This permit authorizes land application of sludge to those sites that have been public noticed and listed in the "Facility Description" of this permit. Only those pollutants listed in the permit application may be land applied. Permittee requests for additional sites must follow permit modification procedures prior to land application. Additionally, the O&M Manual shall be updated to include the additional land application site(s).
- c. Public Access Restrictions. This permit does not authorize application of sludge to public use areas.
- d. Soil Monitoring.
 - (1) Composite soil samples shall be collected from each field listed in this permit where land application has occurred in the last 12 months or will occur in the next 12 months
 - (2) Soil sampling shall be in accordance with University of Missouri (MU) Guides G9215, Soil Sampling Pastures or
 - (3) G9217, Soil Sampling Hayfields and Row Crops or other methods approved by the department. The recommendation of one composite sample per 20 acres in G9215 and G9217 is not required by this permit, however, this is a useful tool to identify soil fertility fluctuations in larger fields due to past management practices, soil type, and variability of crop yields. There shall be at least one composite sample per 80 acres.
 - (4) Testing shall conform to Recommended Chemical Soil Testing Procedures for North Central Region (North Central Regional Research Publication 221 Revised), or Soil Testing in Missouri (MU Extension Guide EC923), or other methods approved by the department.

19. Land Application Requirements.

- a. Sludge shall be land applied at agronomic rates to ensure agricultural use of nutrients and prevent contamination of surface and ground water. Agronomic rate (i.e. fertilizer recommendation) is defined as the amount of nutrients needed by the planned crop to produce the expected yield. The volume of sludge applied is the amount of sludge needed to meet the agronomic rate.
- b. No land application shall occur during frozen, snow covered, or saturated soil conditions. There shall be no application if precipitation event that is likely to create runoff is forecasted to occur within 24 hours of a planned application.
- c. Land application shall occur only during daylight hours.
- d. The perimeter of land application fields shall be checked daily during land application to check for runoff. Sites that utilize spray irrigation shall monitor for the drifting of spray across property lines.
- e. Setback distances from sensitive features. There shall be no land application within:
 - (1) 300 feet of any well, sinkhole, losing stream, or cave entrance, water supply impoundment or stream intake;
 - (2) 150 feet of an occupied residence, public building, or public use area;
 - (3) 50 feet of gaining perennial or intermittent stream, public or privately owned pond or lake;
 - (4) 50 feet of property line or public road.
- f. Slope limitation for application sites are as follows:
 - (1) A slope 0 to 6 percent has no rate limitation
 - (2) 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
 - (3) 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

20. Nutrient Management

Land application fields listed in this permit shall use the following protocols to determine the agronomic rates and sludge application rates to ensure appropriate agricultural utilization of nutrients.

- a. Agronomic rate shall be based on the following:
 - (1) Crop nutrient removal rate estimates in MU Guide EQ202 Land Application Considerations for Animal Manure or from publications by other land grant universities in adjoining states,
 - (2) Realistic yield goal for each crop. Yield goals should be based on actual crop yield records from multiple years for each field. Good judgment should be used to counteract unusually high or low yields. If a field's yield history is not available the USDA county wide average or other approved source may be used, and
 - (3) The most current soil test.

C. SPECIAL CONDITIONS (continued)

- b. Sludge application rates shall be determined by one the following nutrient based management practices.
- (1) Nitrogen based management can be used when soil test phosphorus (P) levels are 120 pounds or less per acre using Bray P-1 test method, or if the field has been assessed by Missouri Phosphorus Index (P-index) with a low or medium rating. The annual total nitrogen application shall not exceed the application rate as determined by one of the following methods.
 - (a) For non-legume crops, the application rate as determined by paragraphs 1 and 3 of this section shall be adjusted to account for nitrogen credits from a preceding legume crop and residual nitrogen from the previous year's application.
 - (b) For legume crops, the nitrogen removal capacity of the legume crops should be based on the estimated nitrogen content of the harvested crop as defined in MU Guide EQ202 and a realistic yield goal. The estimated nitrogen content of the crop must be adjusted using nitrogen credits for residual nitrogen fertilizer from the previous year's application.
 - (2) Phosphorus based management practice must be used when soil test phosphorus (P) levels are above 120 pounds per acre using Bray P-1 test method, or if the P-index rating is high. The amount of phosphorus applied shall not exceed the planned crop's phosphorus removal estimate from MU Guide EQ822, or from publications by other land grant universities in adjoining states.

No land application can occur if the P-index rating for a field is very high.

- c. Nitrogen based management application rate calculation.
- (1) The application rates for nitrogen in any given year or growing season must be adjusted based on the most current sludge and soil test results, and the planned crop's nitrogen recommendation. Plant Available Nitrogen (PAN) from sludge must be calculated using the results of the most recent sludge analysis if the nitrogen application exceeds a rate of 150 pounds total nitrogen per acre per year, and/or the applied wastewater exceeds ten (10) mg/l of nitrate nitrogen as N.
$$\text{PAN} = [\text{Ammonia Nitrogen} \times \text{volatilization factor}^*] + [\text{Organic Nitrogen} \times 0.2] + [\text{Nitrate Nitrogen}]$$

*Volatilization factor is 0.7 for surface application and 1 for subsurface application
- d. Alternate nitrogen availability factors may be considered. Alternate factors shall be submitted to the department for approval.
- e. Phosphorus based management applications
- (1) When phosphorus based management practice is required the amount of phosphorus applied is to be determined as described in paragraph b2 of this section.
 - (2) Multi-year phosphorus applications. When phosphorus based management is required, sludge applications can exceed the annual planned phosphate removal estimate for the crop when a multi-year phosphorus application is utilized. The multi-year application must comply with the following conditions:
 - (a) application rate shall not exceed the nitrogen fertilizer recommendation or the estimated nitrogen removal capacity of the planned crop during the year of the application,
 - (b) the amount of phosphorus banked shall not exceed four years of the estimated crop removal rate for the planned crop rotation.
 - (c) the actual application rate shall not exceed the multi-year application rate
 - (d) no additional sludge applications shall occur until the applied phosphorus has been removed from the field by crop removal or harvest.
- f. Other Pollutant Limitations and Loading Rates
- (1) Oil and grease application shall not exceed 10,000 pounds oil/acre/year for subsurface injection or soil incorporation. For surface application to growing vegetation, the sludge shall not exceed 15% oil & grease content and shall not exceed 1,000 pounds oil/acre. Avoid heavy application of oil and grease within 30 days before planting of row crops.

21. Record Keeping

- a. A daily land application log shall be prepared and kept on file at the permittee office location for each application site showing dates of application, weather condition (sunny, overcast, raining, below freezing etc...), soil moisture condition, application method.
- b. A record of monthly visual storage structure inspections shall be maintained.
- c. A record of land application equipment inspections and calibrations as well as field perimeter inspections shall be maintained.
- d. A record of all PAN calculations.
- e. All records and monitoring results shall be maintained for at least five years and shall be made available to the department upon request.

C. SPECIAL CONDITIONS (continued)

22. Annual Report.

An annual report is required in addition to other reporting requirements under Section A of this permit. The annual report shall be submitted by January 28 of each year. The report shall include, but is not limited to, a summary of the following:

- a. Record of maintenance and repairs during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year.
- b. The number of days the storage structure discharged during the year, the discharge flow, reason the discharge occurred and effluent analysis performed.
- c. A summary for each field used for land application showing number of acres used number of days application occurred, crop grown and yield, and total amount of sludge applied (gal. or tons/acre)
- d. For fields where the total nitrogen application exceeds 150 lbs./acre, submit PAN calculations to document that the applied nitrogen will be utilized.
- e. The report shall include any soil test results. If none were taken during the reporting year, report the date samples were taken.
- f. Narrative summary of any problems or deficiencies identified, corrective action taken and improvements planned.

23. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT					
OUTFALL	AEC	Acute Toxic Unit (TU _a)	FREQUENCY	SAMPLE TYPE	MONTH
#002, #003	100%	*	once/year	24 hr. composite**	Any month

* Monitoring only

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

Dilution Series						
100%	50%	25%	12.5%	6.25%	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

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 fifth edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012, 2002; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour static non-renewal toxicity tests with the following vertebrate species:
 - (a) The fathead minnow, *Pimephales promelas* (Acute Toxicity Test Method 2000.0).
And the following invertebrate species:
 - (b) 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) 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 Northeast Regional Office, or by eDMR, with the permittee's Discharge Monitoring Reports annually by October, 28, 2015. The submittal shall include:
 - (a) A full laboratory report for all toxicity testing.
 - (b) Copies of chain-of-custody forms.

C. SPECIAL CONDITIONS (continued)

- (c) 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.
- c. Permit Reopener for Acute Toxicity
In accordance with 40 CFR Parts 122 and 124, this permit may be modified to include effluent limitations or permit conditions to address acute toxicity in the effluent or receiving waterbody, as a result of the discharge; or to implement new, revised, or newly interpreted water quality standards applicable to acute toxicity.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0126161
GOLDEN TRIANGLE ENERGY, LLC

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 Industrial Land Application

Part I – Facility Information

Facility Type: NON-POTW – Industrial wastewater, sludge land applied – SIC #2869

Facility Description:

Ethanol manufacturing plant. Permeate water from reverse osmosis treatment of evaporator condensate and sanitary wastewater is discharged to Craig POTW. Sludge is land applied by contract applicator.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation?

- No.

Application Date: 04/26/12

Expiration Date: 10/18/12

PERMITTED FEATURE(S) TABLE:

PERMITTED FEATURE	CFS	TREATMENT LEVEL	EFFLUENT TYPE
#001	Dependent upon precipitation	BMPs	Stormwater
#002, #003	0.45, 0.1	Primary Treatment	Industrial wastewater
#004, #005	NA	Land Application	Industrial sludge

Facility Performance History:

The facility was last inspected on November 20, 2010 and was found to be in compliance. The discharge monitoring reports for the last 5 years were reviewed and the facility had exceedances of total iron and sulfates + chlorides.

Part II – Receiving Stream Information

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)]:
- Special Stream [10 CSR 20-7.015(6)]:
- Subsurface Water [10 CSR 20-7.015(7)]:
- All Other Waters [10 CSR 20-7.015(8)]:

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 1st 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(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO CLASSIFIED SEGMENT	12-DIGIT HUC**
Tributary to Old Channel Tarkio Creek	U		General Criteria	4.0	10240005-0903
Little Tarkio Creek	P	00248	AQL, LWV, SCR, WBC		

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW). ** - Hydrologic Unit Code

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

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

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

Not Applicable; 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(c); 40 CFR Part 122.44(I)] 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.). DMR data for ammonia for the past 5 years was reviewed and shows no reasonable potential. The permit writer determined that previously established limits for BOD and TSS at the 001 stormwater outfall were not appropriate for this type of discharge. Those limits were modified to be more consistent with other stormwater permits.

ANTIDegradation:

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], 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 land applies biosolids in accordance with Standard Conditions III and a Department approved biosolids management plan. Land applied biosolids are clarified and do not contain sewage sludge.

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.

Not Applicable; The permittee/facility is not currently under Water Protection Program enforcement action.

Land Application System

The Missouri Soil Testing Association provides a list of accredited labs at <http://soilplantlab.missouri.edu/soil/msta.aspx>.

Nutrient Management

For more information or examples on calculating nitrogen application rates and PAN consult MU Guide 9186 Calculating Plant-Available Nitrogen and Residual Nitrogen Fertilizer Value in Manure.

Conversion Factors for laboratory testing results: [mg/L or mg/kg or ppm] x [conversion factor] = [pounds per Unit Volume]

<u>Unit Volume</u>	<u>Conversion Factors</u>
lbs./acre inch	0.226
lbs./1,000 gallons	0.0083
lbs./100 cubic feet	0.0062
lbs/ton (wet weight)	0.002

Oil and grease sludges with low nitrogen content, more than 20:1 Carbon to Nitrogen ratio, may require supplemental nitrogen application to provide proper decomposition of the oil content and prevent nitrogen deficiencies for the crop.

The Missouri P-Index is a tool to evaluate the potential for phosphorus loss from land application fields. It uses information from soil test phosphorus result, cropping practices, RUSLE, land cover, and distance to water to calculate a rating for phosphorus transport. The P-index is available at <http://nmplanner.missouri.edu/tools/pindex.asp0>

Agronomic rate can also be obtained by using the University of Missouri Extension online fertilizer recommendation calculator at <http://soilplantlab.missouri.edu/soil/scripts/manualentry.aspx>.

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 Golden Triangle Energy, LLC
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10 CSR 20-7.031(10), 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 SOCs, and attain a greater level of consistency, on October 25, 2012 the department issued a policy on development of SOCs. 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 an affordability analysis.

Not Applicable ; This permit does not contain a SOC.

SPILL REPORTING:

Per 10 CSR 24-3.010, any emergency involving a hazardous substance must be reported to the department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the Noncompliance Reporting requirement found in Standard Conditions Part I.

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.

Applicable ; A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.

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.

Not Applicable ; This operating permit is not drafted under premises of a petition for variance.

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], 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 that exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
- Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH₃)
- Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- Other – please justify.

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 20-2.010(11) defines a bypass as the diversion of wastewater from any portion of wastewater treatment facility or sewer system 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.

Not Applicable ; 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

Not Applicable ; This facility does not discharge to a 303(d) listed stream.

A TMDL was developed in 2006 for Little Tarkio Creek for sediment. The effluent limits in this permit for Total Suspended Solids (TSS) of 100 mg/l daily max. and 70 mg/l monthly avg. is lower than the 120 mg/l daily max. and 80 mg/l monthly avg. effluent limits for TSS in the TMDL.

Part IV – Permit Limits Determination

PERMITTED FEATURE #001 – STORMWATER DETENTION BASIN

STORMWATER DETENTION BASIN LIMITATIONS TABLE:

PARAMETER	UNIT	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Flow	MGD	*		*	NO	*
Chemical Oxygen Demand	mg/L	120		90	YES	BOD 80/30
Total Suspended Solids	mg/L	100		70	YES	50/50
pH	SU	*			YES	6.0-9.0
Oil & Grease	mg/L	15		10	NO	
Monitoring Frequency	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.					

* - Monitoring requirement only.

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

Basis for Limitations Codes:

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

PERMITTED FEATURE #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Chemical Oxygen Demand (BOD₅).** The EPA’s Multi-sector General Permit Sector C: Chemical and Allied Products Manufacturing & Refining may be applicable to this outfall’s discharges. COD limits of 120 mg/L daily maximum and 90 mg/L monthly average have been established for this permit cycle. These limits are consistent with COD limits for stormwater.
- **Total Suspended Solids (TSS).** The EPA’s Multi-sector General Permit Sector C: Chemical and Allied Products Manufacturing & Refining may be applicable to this outfall’s discharges. TSS limits of 100 mg/L daily maximum and 70 mg/L monthly average have been established for this permit cycle. These limits are consistent with TSS limits for stormwater.
- **pH.** In accordance with 10 CSR 20-7.031(5)(E), water contaminants shall not cause pH to be outside of the range of 6.5 -9.0 standard pH units.

- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/quarter	once/quarter
Chemical Oxygen Demand	once/quarter	once/quarter
Total Suspended Solids	once/quarter	once/quarter
pH	once/quarter	once/quarter
Oil & Grease	once/quarter	once/quarter

PERMITTED FEATURE #002 – PROCESS WASTEWATER

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Flow	MGD	1	*		*	NO	
pH	SU	1	**		**	NO	
Temperature	°F	1	90		*	NO	
Conductivity	µmhos/cm	1	*		*	NO	
Phosphorous	mg/L	1	*		*	NO	
Ammonia as N	mg/L	1	*		*	YES	5/5
Nitrate + Nitrites as N	mg/L	1	10		10	NO	
Sulfates + Chlorides	mg/L	1	1000		1000	NO	
Total Residual Chlorine	µg /L	1	17 (130ML)		8 (130ML)	YES	0.0019/0.010 mg/L
Arsenic (Total Recoverable)	µg/L	1	20		20	NO	
Iron (Total Recoverable)	µg/L	1	1000		400	NO	
Manganese (Total)	µg/L	1	*		*	NO	
Monitoring Frequency	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

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

Basis for Limitations Codes:

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

PERMITTED FEATURE #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.
- **pH.** In accordance with 10 CSR 20-7.031(5)(E), water contaminants shall not cause pH to be outside of the range of 6.5 -9.0 standard pH units.

- **Temperature.** Water contaminant sources shall not cause or contribute to stream temperature in excess of ninety degrees Fahrenheit (90 °F) (10 CSR 20-7.020).
- **Conductivity.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Phosphorous.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Ammonia as N.** The DMR data for ammonia for the last 5 years shows no reasonable potential; therefore the effluent limitation has been changed to monitoring only.
- **Nitrate + Nitrites as N.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Sulfates + Chlorides.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Total Residual Chlorine (TRC).** Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L.

Chronic WLA: $C_c = ((0.45 \text{Error! Reference source not found.} + 0.0)10 - (0.0 * 0.0))/0.45$
 $C_c = 10 \text{ µg/L}$

Acute WLA: $C_c = ((0.45 + 0.0)19 - (0.0 * 0.0))/0.45$
 $C_c = 19 \text{ µg/L}$

$LTA_c = 10 (0.527) = 5.3 \text{ µg/L}$ [CV = 0.6, 99th Percentile]
 $LTA_a = 19 (0.321) = 6.1 \text{ µg/L}$ [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a .

MDL = 5.3 (3.11) = 17 µg/L [CV = 0.6, 99th Percentile]
AML = 5.3 (1.55) = 8 µg/L [CV = 0.6, 95th Percentile, n = 4]

Total Residual Chlorine effluent limits of 17 µg/L daily maximum, 8 µg/L monthly average are recommended if chlorine is used as a disinfectant.

- **Arsenic (Total Recoverable).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Iron (Total Recoverable).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Manganese (Total Recoverable).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

- **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.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/month	once/month
pH	once/month	once/month
Temperature	once/month	once/month
Conductivity	once/month	once/month
Phosphorous	once/month	once/month
Ammonia as N	once/month	once/month
Nitrate + Nitrites as N	once/month	once/month
Sulfates + Chlorides	once/month	once/month
Total Residual Chlorine	once/month	once/month
Arsenic (Total Recoverable)	once/month	once/month
Iron (Total Recoverable)	once/month	once/month
Manganese (Total)	once/month	once/month

PERMITTED FEATURE #003– PROCESS WASTEWATER

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Flow	MGD	1	*		*	NO	
pH	SU	1	**		**	NO	
Temperature	°F	1	90		*	NO	
Conductivity	µmhos/cm	1	*		*	NO	
Phosphorous	mg/L	1	*		*	NO	
Nitrate + Nitrites as N	mg/L	1	10		10	NO	
Sulfates + Chlorides	mg/L	1	1000		1000	NO	
Total Residual Chlorine	µg /L	1	17 (130ML)		8 (130ML)	YES	0.0019/0.010 mg/L
Aluminum (Total Recoverable)	µg/L	1	750		750	NO	
Arsenic (Total Recoverable)	µg/L	1	20		20	NO	
Iron (Total Recoverable)	µg/L	1	1000		400	NO	
Manganese (Total)	µg/L	1	*		*	NO	
Monitoring Frequency	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

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

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 7. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 8. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 9. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 10. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 11. Ammonia Policy | 11. WET Test Policy |
| 12. Antidegradation Review | |

PERMITTED FEATURE #003– 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.
- **pH.** In accordance with 10 CSR 20-7.031(5)(E), water contaminants shall not cause pH to be outside of the range of 6.5 -9.0 standard pH units.
- **Temperature.** Water contaminant sources shall not cause or contribute to stream temperature in excess of ninety degrees Fahrenheit (90 °F) (10 CSR 20-7.020).
- **Conductivity.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Phosphorous.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Nitrate + Nitrites as N.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Sulfates + Chlorides.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Total Residual Chlorine. Total Residual Chlorine (TRC).** Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L.

Chronic WLA: $C_c = ((0.1 \text{Error! Reference source not found.} + 0.0)10 - (0.0 * 0.0))/0.1$
 $C_c = 10 \text{ µg/L}$

Acute WLA: $C_c = (0.1 + 0.0)19 - (0.0 * 0.0))/0.1$
 $C_c = 19 \text{ µg/L}$

$LTA_c = 10 (0.527) = 5.3 \text{ µg/L}$ [CV = 0.6, 99th Percentile]
 $LTA_a = 19 (0.321) = 6.1 \text{ µg/L}$ [CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a .

$MDL = 5.3 (3.11) = 17 \text{ µg/L}$ [CV = 0.6, 99th Percentile]
 $AML = 5.3 (1.55) = 8 \text{ µg/L}$ [CV = 0.6, 95th Percentile, n = 4]

Total Residual Chlorine effluent limits of 17 µg/L daily maximum, 8 µg/L monthly average are recommended if chlorine is used as a disinfectant.

- **Arsenic (Total Recoverable).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**
- **Aluminum (Total Recoverable).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

- **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.
- **Iron (Total Recoverable)**. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information**.
- **Manganese (Total Recoverable)**. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. Therefore, effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information**.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/month	once/month
pH	once/month	once/month
Temperature	once/month	once/month
Conductivity	once/month	once/month
Phosphorous	once/month	once/month
Nitrate + Nitrites as N	once/month	once/month
Sulfates + Chlorides	once/month	once/month
Total Residual Chlorine	once/month	once/month
Aluminum (Total Recoverable)	once/month	once/month
Arsenic (Total Recoverable)	once/month	once/month
Iron (Total Recoverable)	once/month	once/month
Manganese (Total)	once/month	once/month

PERMITTED FEATURE #004, #005 – SLUDGE APPLICATION

PARAMETER	UNIT	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Volume of Sludge Applied	gallons	*			NO	
Application Area	acres	*			NO	
Application Rate	Inches/acre	*			NO	
SOIL MONITORING						
Total Kjeldahl Nitrogen as N	mg/kg	*			NO	
Nitrate Nitrogen as N	mg/kg	*			NO	
pH - Units	SU	*			NO	
Available Phosphorus as P (Bray P I method)	mg/kg	*			NO	

* - Monitoring requirement only.

PERMITTED FEATURE #004, #005 – DERIVATION AND DISCUSSION OF LIMITS:

- **Volume of Sludge Applied.** Monitoring requirement only. Monitoring for the Volume Irrigated is included to determine if proper application is occurring on the land application fields.
- **Application Area.** Monitoring requirement only. Monitoring for the Application Area is included to determine if proper application is occurring on the land application fields.
- **Application Rate.** Monitoring requirement only. Monitoring for the Application Rate is included to determine if proper application is occurring on the land application fields.
- **Total Kjeldahl Nitrogen as N.** Monitoring requirement only. Monitoring for Ammonia as N is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **Nitrate Nitrogen as N.** Monitoring requirement only. Monitoring for Nitrate Nitrogen as N is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **pH.** Monitoring requirement only. Monitoring for pH is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **Available Phosphorus as P.** Monitoring requirement only. Monitoring for Available Phosphorus as P is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Volume of Sludge Applied	once/year	once/year
Application Area	once/year	once/year
Application Rate	once/year	once/year
SOIL MONITORING		
Total Kjeldahl Nitrogen as N	once/5 years	once/5 years
Nitrate Nitrogen as N	once/5 years	once/5 years
pH - Units	once/5 years	once/5 years
Available Phosphorus as P (Bray P1 method)	once/5 years	once/5 years

Permitted Feature #004, #005 – Emergency Discharge from Land Application Sites.

There are no effluent limits associated with Permitted Features #004, #005. No discharge is allowed from land application sites. However, the following monitoring is required for an emergency discharge. Monitoring requirement only based on best professional judgment.

EMERGENCY DISCHARGE TABLE:

PARAMETER	UNIT	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
Flow	MGD	*			NO	*
Biochemical Oxygen Demand ₅	mg/L	*			YES	45/45
Total Suspended Solids	mg/L	*			YES	45/45
Ammonia as N	mg/L	*			YES	12
pH	SU	*			YES	6.0-9.0
Oil & Grease	mg/L	*			YES	***
Monitoring Frequency	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.					

* - Monitoring requirement only

• **Minimum Sampling and Reporting Frequency Requirements.**

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/day while discharging	Test results are due on the 28 th day of the month after the cessation of the discharge
Biochemical Oxygen Demand ₅	once/day while discharging	
Total Suspended Solids	once/day while discharging	
Ammonia as N	once/day while discharging	
pH	once/day while discharging	
Oil & Grease	once/day while discharging	

Part V – Finding of Affordability

Pursuant to Section 644.145, RSMo., the Department is required to determine whether a permit or decision is affordable and makes a finding of affordability for certain permitting and enforcement decisions. This requirement applies to discharges from combined or separate sanitary sewer systems or publically-owned treatment works.

Not Applicable; The Department is not required to determine findings of affordability because the permit contains no new conditions or requirements that convey a new cost to the facility.

Part VI – 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 and all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than 4 years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

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 June 13, 2014 to July 14, 2014. No responses received.

DATE OF FACT SHEET: JULY 21, 2014

COMPLETED BY:

**GREG CALDWELL, ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
(573) 526-1426
greg.caldwell@dnr.mo.gov**

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	1.36	1.5	1.36	22	0.7/0.13	0.49	1.95	No
Total Ammonia as Nitrogen (Winter) mg/L	12.1	1.71	3.1	1.71	12	0.72/0.1	0.49	2.38	No

N/A – Not Applicable

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

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

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

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

n – Is the number of samples.

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

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

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



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(a)(1);
 - iii. The alteration or addition results in a significant change in the permittee’s sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
 - iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.
2. **Non-compliance Reporting.**
 - a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.



STANDARD CONDITIONS FOR NPDES PERMITS
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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 28th day of the month following the end of the reporting period.
- b. Notice.
 - i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
 - ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
 - c. Prohibition of bypass.
 - i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
 1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 3. The permittee submitted notices as required under paragraph 2. b. of this section.
 - ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.
3. **Upset Requirements.**
 - a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - ii. The permitted facility was at the time being properly operated; and
 - iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
 - iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
 - c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section C – Bypass/Upset Requirements

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

Section D – Administrative Requirements

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



STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
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MISSOURI CLEAN WATER COMMISSION
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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 permittee with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
5. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
6. **Permit Actions.**
- a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
- i. Violations of any terms or conditions of this permit or the law;
- ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
- iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
- iv. Any reason set forth in the Law or Regulations.
- b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
7. **Permit Transfer.**
- a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
- b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
- c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.
8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.



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MISSOURI CLEAN WATER COMMISSION
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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.



Golden Triangle Energy
15053 Highway 111
Craig, MO 64437

Application for NPDES Renewal

Permit # MO-0126161

Golden Triangle Energy, LLC
15053 Highway 111
Craig, MO 64437

April 2012



Golden Triangle Energy
15053 Highway 111
Craig, MO 64437

Contents

1. Application summary
2. Form A - Operating Permit Application
3. Form C – Manufacturing Operations
4. Form D – Primary Industries
5. Form R – Land application of Industrial Residuals
 - a. Outfall 004; Land Application Operation and Maintenance Plan, updated March 2012.
6. Appendix
 - a. Outfall 001, Inovatia labs, 3-16-12.
 - b. Outfall 002, PACE Labs, 4-3-12.
 - c. Outfall 003, PACE Labs, 4-3-12.
 - d. Outfalls 002 & 003; Pace Analytical, TTO test results for 2007.
 - e. Outfalls 002 & 003; Pace Analytical, WET test results for 2007 thru 2011.
 - f. Outfall 004; Inovatia Labs, 3-28-12.
 - g. Outfall 004, Midwest Labs, 10-5-11.
 - h. Outfall 004, Midwest Labs, 10-13-11.
 - i. Outfall 004, Midwest Labs, 12-7-10.
 - j. Soil, Inovatia Labs, 3-16-12.
 - k. Soil, Midwest Labs, 10-7-11.
 - l. Rainfall totals for Holt county Missouri, 2007 thru 2011.
 - m. MSDS sheet for input chemicals & industrial denaturants.
7. Maps and Drawings
 - a. Craig Quadrangle map.
 - b. Legal Description, Golden Triangle Energy, LLC.
 - c. County property map, Golden Triangle Energy, LLC.
 - d. Bartlett and West, Site Survey dated March 2010.



Golden Triangle Energy
15053 Highway 111
Craig, MO 64437

Application Summary

This operating permit application has been prepared to renew the existing permit which expires on October 18, 2012. This summary explains where the data came from for each outfall 001 through 004. Following the summary, forms A, B, D, and R are completed. The appendix includes the lab test data for each outfall and some miscellaneous rainfall and MSDS sheets that were used to complete the forms. A maps and drawing section contains all the location and plant layout design including the outfall locations and land application site.

Outfall 001, Stormwater discharge.

The discharge flow was determined by observing a calibrated stick that was erected in the pond. Each one inch of water level change on the stick corresponds approximately to 65,937 gallons of water discharged. This pond discharges intermittently. In 2011 the average flow over 365 days was 10,400 gallons per day. Only three discharges occurred as follows:

1. 2-22 - 2011 - 989,055 gallons over 72 hours.
2. 3-14 - 2011 - 1,516,551 gallons over 68 hours.
3. 8-29 - 2011, 1,298,959 gallons over 70 hours.

Outfall 002, Cooling tower and well water treatment discharge.

This flow is measured by an on-line flow meter that reads out to the digital computer system (DCS) in the control room. Flow transmitter FT 922-1 recorded the 2010 flow to outfall 002 as 212,401 gallons per day averaged over 365 days.

Outfall 003, Iron settling pond water overflow.

This flow is measured by an on-line flow meter that reads out to the digital computer system (DCS) in the control room. Flow transmitter FT 700-1 recorded the 2010 flow to the iron ponds as 54,200 gallons per day averaged over 365 days.

Outfall 004, Iron pond settled sludge to land.

The sludge removal from the ponds is a time and labor intensive process. Different methods have been tried. Two options are used including (1) pump sludge to a tank wagon and then apply to land by gravity drain through a spraybar on the wagon, and (2) pump the sludge to a dewatering filter bag. After the bag is filled it is cut open and end loading equipment is used to move sludge to a dump truck that spreads it on land. This is further described in the Land Application Operating and Maintenance Manual



Golden Triangle Energy
 15053 Highway 111
 Craig, MO 64437

attached. Filtered water is returned to the ponds. Records of sludge removal were recorded as:

Year	gallons	dry tons
2005	10,000	3.99
	14,000	4.47
2006	16,000	8.75
	9,000	3.04
2007	22,000	10.59
	12,000	5.33
2008	7,000	2.88
	11,000	5.36
2009	744,982	385.2
2010	656,639	257.1
2011	19,590	16.66
Average	217,500	100.5

A portion of the land application fields were flooded during the 2011 record floods of the Missouri River. Sludge was not applied during this time.

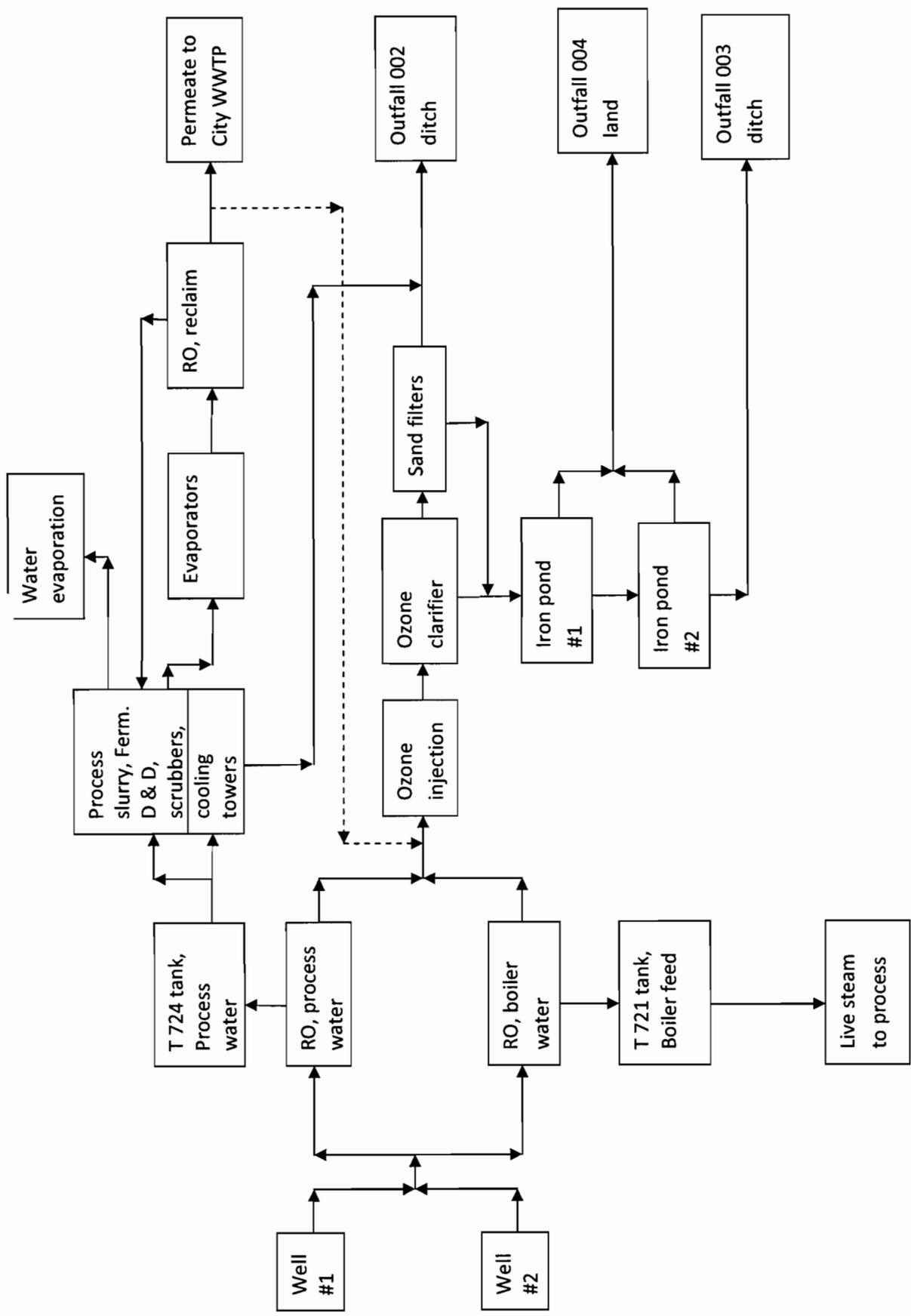
Other agronomic applications of fertilizer were applied to the fields, and crops were harvested as described in the Land Application Operating and Maintenance Manual. Some liquid byproducts approved and permitted (#02610) under the Missouri Fertilizer Law are applied to the land to supplement nutrients. This is a commercial fertilizer therefore no Form I for wastewater application was included.

Flow discharge to the City of Craig.

Permeate water from reverse osmosis treatment of evaporator condensate along with sanitary wastewater are discharged to the City. A water meter measures the permeate flow.

Date	Meter reading
1-3-2011	91,008,700 gallons
12-30-2011	105,709,300 gallons
Annual	40,609 gallons per day
Sanitary flow estimate	700 to 1200 gallons per day

The process flow diagram included shows a dashed line option to divert the reverse osmosis permeate from the City of Craig to the ozone treatment system and then to outfall 002. In the event that the City of Craig cannot handle the entire 41,000 gallon per day flow from Golden Triangle, an option becomes necessary.



411407



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
FORM A - APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT
UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER	No Fee Required
DATE RECEIVED	4/27/12
FEE SUBMITTED	0

Note ▶ PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.

1. This application is for:

- An operating permit and antidegradation review public notice
- A construction permit following an appropriate operating permit and antidegradation review public notice
- A construction permit and concurrent operating permit and antidegradation review public notice
- A construction permit (submitted before Aug. 30, 2008 or antidegradation review is not required)
- An operating permit for a new or unpermitted facility Construction Permit # _____
- An operating permit renewal: permit # [REDACTED] Expiration Date October 18, 2012
- An operating permit modification: permit # MO- Reason: _____

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

2. FACILITY

NAME		TELEPHONE WITH AREA CODE	
Golden Triangle Energy, LLC		(660) 683-5646	
FAX (660) 683-5302			
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
15053 Highway, 111	Craig	Mo	64437

3. OWNER

NAME		E-MAIL ADDRESS	TELEPHONE WITH AREA CODE
Golden Triangle Energy, LLC		rhill@goldentriangleenergy.com	(660) 683-5646
FAX (660) 683-5537		*see name box	
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
15053 Highway 111	Craig	Mo	64437

3.1 Request review of draft permit prior to public notice? YES NO

4. CONTINUING AUTHORITY

NAME		TELEPHONE WITH AREA CODE	
Same			
FAX			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

5. OPERATOR

NAME		CERTIFICATE NUMBER	TELEPHONE WITH AREA CODE
Roger Hill / Steve Doughty			(660) 683-5646
FAX (660) 683-5302			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
15053 Highway 111	Craig	Mo	64437

6. FACILITY CONTACT

NAME		TITLE	TELEPHONE WITH AREA CODE
Mr. Roger Hill		General Manager	(660) 683-5646
FAX (660) 683-5537			

7. ADDITIONAL FACILITY INFORMATION

7.1 Legal Description of Outfalls. (Attach additional sheets if necessary.)

001 NE 1/4 NW 1/4 Sec 13 T 62N R 40W Holt County
 UTM Coordinates Easting (X): 298662 53M E Northing (Y): 4451245 39M N
 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

002 NW 1/4 NW 1/4 Sec 13 T 62N R 40W Holt County
 UTM Coordinates Easting (X): 298500 22 E Northing (Y): 4451249 86M N

003 NE 1/4 NW 1/4 Sec 13 T 62N R 40W Holt County
 UTM Coordinates Easting (X): 298555 21M E Northing (Y): 4451246 48M N

004 ne se 1/4 NW 1/4 Sec 13 T 62N R 40W Holt County
 UTM Coordinates Easting (X): 298758 91M E Northing (Y): 4451245 39M N

7.2 Primary Standard Industrial Classification (SIC) and Facility North American Industrial Classification System (NAICS) Codes.

001 - SIC 2869 and NAICS 325193 002 - SIC 2085 and NAICS 312140
 003 - SIC _____ and NAICS _____ 004 - SIC _____ and NAICS _____

A

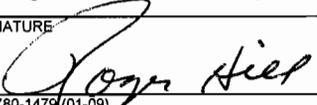
8. ADDITIONAL FORMS AND MAPS NECESSARY TO COMPLETE THIS APPLICATION.
(Complete all forms that are applicable.)

- A. Is your facility a manufacturing, commercial, mining or silviculture waste treatment facility? YES NO
If yes, complete Form C (unless storm water only, then complete U.S. Environmental Protection Agency Form 2F per Item C below).
- B. Is your facility considered a "Primary Industry" under EPA guidelines: YES NO
If yes, complete Forms C and D.
- C. Is application for storm water discharges only? YES NO
If yes, complete EPA Form 2F.
- D. Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.
- E. Is wastewater land applied? If yes, complete Form I. YES NO
- F. Is sludge, biosolids, ash or residuals generated, treated, stored or land applied? YES NO
If yes, complete Form R.

9. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary. See Instructions.
(PLEASE SHOW LOCATION ON MAP. SEE 8.D ABOVE)

NAME Ann Strauss Trust			
ADDRESS 5385 Saffron Dr.	CITY Dunwoody	STATE Ga	ZIP CODE 30338-3113

10. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law to the Missouri Clean Water Commission.

NAME AND OFFICIAL TITLE (TYPE OR PRINT) Mr. Roger Hill, General Manager	TELEPHONE WITH AREA CODE (660) 683-5646
SIGNATURE 	DATE SIGNED 4-18-2012

MO 780-1479 (01-09)

BEFORE MAILING, PLEASE ENSURE ALL SECTIONS ARE COMPLETED AND ADDITIONAL FORMS, IF APPLICABLE, ARE INCLUDED.

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

HAVE YOU INCLUDED:

- Appropriate Fees? Fees Paid Annually
- Map at 1" = 2000' scale? 1" = 60'
- Signature?
- Form C, if applicable?
- Form D, if applicable?
- Form 2F, if applicable?
- Form I (Irrigation), if applicable?
- Form R (Sludge), if applicable?

**INSTRUCTIONS FOR COMPLETING FORM A
APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT**

1. Check which option is applicable. **Do not check more than one item.** Construction and operating permit refer to permits issued by the Department of Natural Resources' Water Protection Program, Water Pollution Control Branch. Effective Sept. 1, 2008, a facility will be required to use *MISSOURI'S ANTIDegradation Rule AND IMPLEMENTATION PROCEDURE*. For more information, this document can be reviewed at www.dnr.mo.gov/env/wpp/docs/aip-cwc-appr-050708.pdf. This procedure will be applicable to new and expanded wastewater facilities and requires the proposed discharge to a water body to undergo a level of Antidegradation Review, which documents that the use of a water body's available assimilative capacity is justified.
- 1.1 An operating permit and antidegradation review public notice requires a Water Quality/Antidegradation Review Sheet to be submitted with the application (No fee required).

CONSTRUCTION PERMIT FEES

 - A. \$750 for a sewage treatment facility with a design flow of less than 500,000 gallons per day.
 - B. \$2,200 for a sewage treatment facility with a design flow of 500,000 gallons per day or more.

Different application and construction fees are applicable if only sewer and/or lift stations are to be constructed.

OPERATING PERMIT FEES

If the application is for a site-specific permit re-issuance, send no fees.. You will be invoiced separately by the department.

Discharges covered by section 644.052.4 RSMo. (Primary or Categorical Facilities)

 - \$3,500 for a design flow under 1 mgd
 - \$5,000 for a design flow of 1 mgd or more
 - A. Discharges covered by section 644.052.5 RSMo. (Secondary or Non-Categorical Facilities).
 - \$1,500 for a design flow under 1 million gallons per day (mpg)
 - \$2,500 for a design flow of 1 mgd or more

SITE-SPECIFIC STORM WATER DISCHARGE FEES

 - A. \$1,350 for a design flow under 1 mgd.
 - B. \$2,350 for a design flow of 1 mgd or more.

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

 - A. Municipals - \$200 each.
 - B. All others - 25 percent of annual fee.

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

Incomplete permit applications and/or related engineering documents will be returned by the department if they are not completed in the time frame established in a comment letter from the department to the owner. 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.
2. Facility - Provide the name by which this facility is known locally. Example: Southwest Sewage Treatment Plant, Country Club Mobile Home Park, etc. Also include the street address or location of the facility. If the facility lacks a street name or route number, give the names of the closest intersection, highway, county road, etc.
3. Owner - Provide the legal name and address of owner.
- 3.1 Prior to submitting a permit to public notice, the department shall provide the permit applicant 10 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. Check YES to review the draft permit prior to public notice. Check NO to waive the process and expedite the permit.
4. Continuing Authority - Permanent organization that 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 or contact the appropriate Department of Natural Resources Regional Office.
5. Operator - Provide the name, certificate number and telephone number of the person operating the facility.
6. Provide the name, title and work telephone number 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, if necessary.
- 7.1 An outfall is the point at which wastewater is discharged. Outfalls should be given in terms of the legal description of the facility. Global Positioning System, or GPS, is a satellite-based navigation system. The department prefers that a GPS receiver is used at the outfall pipe and the displayed coordinates submitted. If access to a GPS receiver is not available, please use a mapping system to approximate the coordinates; the department's mapping system is available at www.dnr.mo.gov/internetmapviewer/.
- 7.2 List only your primary Standard Industrial Classification, or SIC, and North American Industry Classification System code for each outfall. The SIC system was devised by the U.S. Office of Management and Budget to cover all economic activities. To find the correct SIC code, an applicant may check his or her unemployment insurance forms or contact the Missouri Division of Employment Security, 573-751-3215. The primary SIC code is that of the operation that generates the most revenue. If this information is not available, the number of employees or, secondly, production rate may be used to determine your SIC code. Additional information is on the Web for Standard Industrial Codes at www.osha.gov/pls/imis/sicsearch.html and for the North American Industry Classification System at www.census.gov/naics or contact the appropriate Department of Natural Resources Regional Office.
- 7.3

**INSTRUCTIONS FOR COMPLETING FORM A
APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT
(CONTINUED)**

8. If you answer yes to A, B, C, D, E or F, then you must complete and file the supplementary form(s) indicated. A U.S. Geological Survey 1" = 2,000' scale map must be submitted with the permit application showing all outfalls, the receiving stream and the location of the downstream property owners. This type of map is available on the Web at www.dnr.mo.gov/internetmapviewer/ or from the Missouri Department of Natural Resources' Division of Geology and Land Survey in Rolla at 573-368-2125.
9. Please provide the name and address of the first downstream landowner, different from that of the permitted facility, through whose property the discharge will flow. Also, please indicate the location on the map. For discharges that leave the permitted facility and flow under a road or highway, or along the right-of-way, the downstream property owner is the landowner that the discharge flows to after leaving the right-of-way. For no discharge facilities, provide this information for the location where discharge would flow if there was one. For land application sites, include the owners of the land application sites and all adjacent landowners.
10. **Signature - All applications must be signed as follows and the signature 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.

This completed form, along with the applicable permit fees, should be submitted to the appropriate Regional Office. Submittal of an incomplete application may result in the application being returned. A map of the department's regional offices with addresses and phone numbers can be viewed on the Web at www.dnr.mo.gov/regions/ro-map.pdf. If there are any questions concerning this form, contact the appropriate Regional Office or the Department of Natural Resources' Water Protection Program, Water Pollution Control Branch, Permits and Engineering Section at 573-751-6825.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
 (SEE MAP FOR APPROPRIATE REGIONAL OFFICE)
**FORM C – APPLICATION FOR DISCHARGE PERMIT – MANUFACTURING,
 COMMERCIAL, MINING AND SILVICULTURE OPERATIONS**

FOR AGENCY USE ONLY	
CHECK NO.	
DATE RECEIVED	FEE SUBMITTED

NOTE: DO NOT ATTEMPT TO COMPLETE THIS FORM BEFORE READING THE ACCOMPANYING INSTRUCTIONS

1.00 NAME OF FACILITY

Golden Triangle Energy, LLC.

1.10 THIS FACILITY IS NOW IN OPERATION UNDER MISSOURI OPERATING PERMIT NUMBER

MO-0126161

1.20 THIS IS A NEW FACILITY AND WAS CONSTRUCTED UNDER MISSOURI CONSTRUCTION PERMIT NUMBER (COMPLETE ONLY IF THIS FACILITY DOES NOT HAVE AN OPERATING PERMIT).

2.00 LIST THE STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES APPLICABLE TO YOUR FACILITY (FOUR DIGIT CODE)

A. FIRST 2869 B. SECOND 2085
 C. THIRD _____ D. FOURTH _____

2.10 FOR EACH OUTFALL GIVE THE LEGAL DESCRIPTION.

OUTFALL NUMBER (LIST) NW ¼ NW ¼ SEC 13 T 62N R 40W Holt County
 001 UTM: 298664 95 M E; 4451246 13 M N 002 UTM: 298497 46 M E; 4451246 77 M N
 003 UTM: 298554 95 M E ; 4451246 60 M N 004 UTM: 298716 41 M E; 4451107 65 M N

2.20 FOR EACH OUTFALL LIST THE NAME OF THE RECEIVING WATER.

OUTFALL NUMBER (LIST)	RECEIVING WATER
001, 002, 003, & 004	Unamed tributary to old channel Tarkio Creek, first classified is Little Tarkio Creek.

2.30 BRIEFLY DESCRIBE THE NATURE OF YOUR BUSINESS:

Production of fuel ethanol and beverage alcohol by fermentation and distillation of corn. A portion of the ethanol is specially denatured for industrial sales.

- A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, public sewers and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.
- B. For each outfall, provide a description of 1. All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water and storm water runoff. 2. The average flow contributed by each operation. 3. The treatment received by the wastewater. Continue on additional sheets if necessary.

Ref. PFD #120220 Water Process Flow Diagram

1. OUTFALL NO. (LIST)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	A. OPERATION (LIST)	B. AVERAGE FLOW (INCLUDE UNITS) (MAXIMUM FLOW)	A. DESCRIPTION	B. LIST CODES FROM TABLE A
001	Storm Water Control	11,258 gallon GPD Average	Retention Pond & Evaporation	1-U, 1-F, 4A
	Max at 6" rainfall	10,423 GPD		
002	Well R.O. 1&2 Reject	111,200 GPD Average	R.O. / DeChlorinate	2-E, 4A
	Reclaim Permeate	0 to 40,600 GPD		
	Cooling Tower blow down	101,200		
	Permit Max	289,300		
003	Well R.O., Ozone & Sand Filter		Ozone + Settling Pond	2-G, 1-U, 4A
	Backwash	41,200 GPD		
	Ozone Clarifier Sludge	13,000 GPD Average		
	Permit Max	62,000 gallon per day Max		
004	Iron Pond Sludge (dry tons)	100.5 dry tons per year Average 385.2 dry tons per per day Max	Settling Pond	1-U, 5-P
	Iron Pond sludge (gal) Annual Max	217,500 Gal/year Avg. 745,000 Gal/year Max.		
City of Craig	R.O Reclaim Permeate	40,600 gallon per day Average	Aerated Lagoons	3-B, 4-A
	Sanitary	700 to 1200		
	Sum Max	41,800		

2.40 CONTINUED

C. EXCEPT FOR STORM RUNOFF, LEAKS, OR SPILLS, ARE ANY OF THE DISCHARGES DESCRIBED IN ITEMS A OR B INTERMITTENT OR SEASONAL?
 YES (COMPLETE THE FOLLOWING TABLE) NO (GO TO SECTION 2.50)

1. OUTFALL NUMBER (list)	2. OPERATION(S) CONTRIBUTING FLOW (list)	3. FREQUENCY		4. FLOW				C. DURATION (in days)
		A. DAYS PER WEEK (specify average)	B. MONTHS PER YEAR (specify average)	A. FLOW RATE (in mgd)		B. TOTAL VOLUME (specify with units)		
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	4. LONG TERM DAILY	3. MAXIMUM AVERAGE	
004	Iron sludge to land from well water treatment. Tank Wagon application method (apply liquid product)	5 per week for 2 weeks per year	0.5	0.152 for 10 days	0.288	6300 gal/day for 100 days	37,800 gal/day for 2 day +20% safety fac.	10 days per year
004	De-watering Bag Method (apply semi-dry product)	5 days/wk. 2 wk./year	0.5	100.5 dry tons/yr for 10 days	25.13 dry tons	25.13 Dry tons	25.13 Dry tons for 4 days	10 day/yr
001	Stormwater			0.104	0.535	0.435 MG	3.805 MG	10 days/yr

2.50 MAXIMUM PRODUCTION

A. DOES AN EFFLUENT GUIDELINE LIMITATION PROMULGATED BY EPA UNDER SECTION 304 OF THE CLEAN WATER ACT APPLY TO YOUR FACILITY?
 YES (COMPLETE B.) NO (GO TO SECTION 2.60) Ref. 40 CFR 414.11 (e) Applicability

B. ARE THE LIMITATIONS IN THE APPLICABLE EFFLUENT GUIDELINE EXPRESSED IN TERMS OF PRODUCTION (OR OTHER MEASURE OF OPERATION)?
 YES (COMPLETE C.) NO (GO TO SECTION 2.60)

C. IF YOU ANSWERED "YES" TO B. LIST THE QUANTITY THAT REPRESENTS AN ACTUAL MEASUREMENT OF YOUR MAXIMUM LEVEL OF PRODUCTION, EXPRESSED IN THE TERMS AND UNITS USED IN THE APPLICABLE EFFLUENT GUIDELINE AND INDICATE THE AFFECTED OUTFALLS.

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS (list outfall numbers)
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	

2.60 IMPROVEMENTS

A. ARE YOU NOW REQUIRED BY ANY FEDERAL, STATE OR LOCAL AUTHORITY TO MEET ANY IMPLEMENTATION SCHEDULE FOR THE CONSTRUCTION, UPGRADING OR OPERATION OF WASTEWATER TREATMENT EQUIPMENT OR PRACTICES OR ANY OTHER ENVIRONMENTAL PROGRAMS THAT MAY AFFECT THE DISCHARGES DESCRIBED IN THIS APPLICATION? THIS INCLUDES, BUT IS NOT LIMITED TO, PERMIT CONDITIONS, ADMINISTRATIVE OR ENFORCEMENT ORDERS, ENFORCEMENT COMPLIANCE SCHEDULE LETTERS, STIPULATIONS, COURT ORDERS AND GRANT OR LOAN CONDITIONS.
 YES (COMPLETE THE FOLLOWING TABLE) NO (GO TO 3.00)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
			A. REQUIRED	B. PROJECTED
Letter of Warning dated January 12, 2011	003	Exceeded permit monthly limit for iron		02/12/2012
Letter of Warning dated June 24, 2011	003	Exceeded permit monthly limit for iron		05/11/2011

B. OPTIONAL: YOU MAY ATTACH ADDITIONAL SHEETS DESCRIBING ANY ADDITIONAL WATER POLLUTION CONTROL PROGRAMS (OR OTHER ENVIRONMENTAL PROJECTS WHICH MAY AFFECT YOUR DISCHARGES) YOU NOW HAVE UNDER WAY OR WHICH YOU PLAN. INDICATE WHETHER EACH PROGRAM IS NOW UNDER WAY OR PLANNED, AND INDICATE YOUR ACTUAL OR PLANNED SCHEDULES FOR CONSTRUCTION.
 MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED.

3.00 INTAKE AND EFFLUENT CHARACTERISTICS

A. & B. SEE INSTRUCTIONS BEFORE PROCEEDING – COMPLETE ONE TABLE FOR EACH OUTFALL – ANNOTATE THE OUTFALL NUMBER IN THE SPACE PROVIDED.
 NOTE: TABLE 1 IS INCLUDED ON SEPARATE SHEETS NUMBERED FROM PAGE 6 TO PAGE 7.

See Attached

C. USE THE SPACE BELOW TO LIST ANY OF THE POLLUTANTS LISTED IN PART B OF THE INSTRUCTIONS, WHICH YOU KNOW OR HAVE REASON TO BELIEVE IS DISCHARGED OR MAY BE DISCHARGED FROM ANY OUTFALL. FOR EVERY POLLUTANT YOU LIST, BRIEFLY DESCRIBE THE REASONS YOU BELIEVE IT TO BE PRESENT AND REPORT ANY ANALYTICAL DATA IN YOUR POSSESSION.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
Outfall 001			
BOD/COD	Sediment, Grain	Ethyl Acetate	Denaturant, if spilled
TSS	Sediment	Hexane	Denaturant, if spilled
O&G	Trucks, Syrup	Isopropyl Alcohol	Denaturant, if spilled
Gasoline	Denaturant, if spilled	Methanol	Denaturant, if spilled
MgCl	Road Dust Suppressant	Tert Butyl Alcohol	Denaturant, if spilled
pH	Potential Caustic or Acid spilled	Bitrex	Denaturant, if spilled
Ammonia	Potential if spilled	Toluene	Denaturant, if spilled
		MiBK	Denaturant, if spilled
		EEP	Denaturant, if spilled
002			
Chlorine, Sulfit	Chlorination/ Dechlor	Disodium Phosphate	Nalco Trasar
Surfactant	Dispersant used	Sulfuric Acid (pH) control	pH control
All Others	Natural in Well Water	Polyalkylene glycol	Nalco 73551
Phosphorus	Process water potential		
BOD/COD	R.O. Reclaim Permeate		
003			
Surfactant	Dispersant Used		
Phosphorus	Process water potential		
All Others	Natural in well water		
TEH	Rotenone		
004			
Surfactant	Dispersant Used		
Phosphorus	Process Water Potential		
All Others	Natural in Well Water		

3.10 BIOLOGICAL TOXICITY TESTING DATA

DO YOU HAVE ANY KNOWLEDGE OR REASON TO BELIEVE THAT ANY BIOLOGICAL TEST FOR ACUTE OR CHRONIC TOXICITY HAS BEEN MADE ON ANY OF YOUR DISCHARGES OR ON A RECEIVING WATER IN RELATION TO YOUR DISCHARGE WITHIN THE LAST THREE YEARS?

YES (IDENTIFY THE TEST(S) AND DESCRIBE THEIR PURPOSES BELOW.) NO (GO TO 3.20)

Yes, per NPDES permit requirements for outfalls 002 and 003, annual W.E.T. tests have been performed.

3.20 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

YES (LIST THE NAME, ADDRESS AND TELEPHONE NUMBER OF AND POLLUTANTS ANALYZED BY EACH SUCH LABORATORY OR FIRM BELOW.) NO (GO TO 3.30)

A. NAME	B. ADDRESS	C. TELEPHONE (area code and number)	D. POLLUTANTS ANALYZED (list)
Pace Laboratories	9608 Loriet Blvd, Lenexa Ks. 66219	913-599-5665	Per NPDES Permit
Inovatia Laboratories	120 E Davis St. P.O. Box 30 Fayette, Mo. 65248	660-248-1911	Per NPDES Permit
Midwest Laboratories	16111 'B' Street Omaha, Ne. 68144	402-334-7770	Per NPDES Permit

3.30 CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS APPLICATION AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)

Roger Hill, General Manager

TELEPHONE NUMBER (AREA CODE AND NUMBER)

660-683-5646

SIGNATURE (SEE INSTRUCTIONS)

Roger Hill

DATE SIGNED

4-18-12

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)												OUTFALL NO. 001
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1. POLLUTANT	2. EFFLUENT				3. UNITS (specify if blank)				4. INTAKE (optional)							
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES		A. CONCENTRATION		B. MASS		A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES	
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) ANALYSES	(2) ANALYSES	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) ANALYSES	(2) MASS	(1) ANALYSES	(2) MASS
A. Biochemical Oxygen Demand (BOD)			7.2	0.62	3.79	0.33	9		mg/liter		lbs/day					
B. Chemical Oxygen Demand (COD)	35	3.04					1		mg/liter		lbs/day					
C. Total Organic Carbon (TOC)	9.5	0.82					1		mg/liter		lbs/day					
D. Total Suspended Solids (TSS)			64	5.55	33.0	2.86	9		mg/liter		lbs/day					
E. Ammonia (as N)	ND	0					1		mg/liter		lbs/day					
F. Flow	VALUE		VALUE	0.535	VALUE	0.0104	8		MGD							
G. Temperature (winter)	VALUE		VALUE	5.5	VALUE	5.5	3		°C							
H. Temperature (summer)	VALUE		VALUE	18.6	VALUE	18.6	2		°C							
I. pH	MINIMUM	MAXIMUM	MINIMUM	7.45	MAXIMUM	8.20	4		STANDARD UNITS							

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant, you must provide the results of at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)			
	A. BE- LIEVED PRE- SENT	B. BE- LIEVED AB- SENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	B. MAXIMUM 30 DAY VALUE (1) CONCENTRATION	C. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	D. NO. OF ANALYSES (2) MASS	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (2) MASS	B. NO. OF ANALYSES		
			(2) MASS	(2) MASS	(2) MASS	(2) MASS								
A. Bromide (24959-67-9)	X													
B. Chlorine Total Residual	X													
C. Color	X													
D. Fecal Coliform	X			not tested										
E. Fluoride (16984-48-8)	X													
F. Nitrate-Nitrite (as N)	X		5.6	0.49		1		mg/liter		lbs/day				

MO 780-1514 (6-04) PAGE 6 *MGD = million gallon per day

CONTINUED FROM FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)			B. NO. OF ANALYSES	
	A. BE ILLUSTRATED PRE-SENT	B. BE ILLUSTRATED POST-SENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if applicable)		C. LONG TERM AVRG. VALUE (if applicable)	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	(2) MASS	(1) CONCENTRATION		(2) MASS
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS									
G. Nitrogen Total Organic (as N)	X		2.04	0.18					1	mg/liter	lbs/day				
H. Oil and Grease	X				N/D	0	N/D	0	8	mg/liter	lbs/day				
I. Phosphorus (as P) Total (7723-14-0)	X		.379	0.03					1	mg/liter	lbs/day				
J. RADIOACTIVITY															
(1) Alpha Total		X													
(2) Beta Total		X													
(3) Radium Total		X													
(4) Radium 226 Total		X													
K. Sulfate (as SO ₄) (14808-79-8)	X		162	14.05					1	mg/liter	lbs/day				
L. Sulfide (as S)	X														
M. Sulfite (as SO ₃) (14265-45-3)	X		ND						1	mg/liter	lbs/day				
N. Surfactants		X													
O. Aluminum Total (7429-90-5)	X		.512	0.04					1	mg/liter	lbs/day				
P. Barium Total (7440-39-3)	X		.287	0.02					1	mg/liter	lbs/day				
Q. Boron Total (7440-42-8)	X		.176	0.02					1	mg/liter	lbs/day				
R. Cobalt Total (7440-48-4)	X		ND						1	mg/liter	lb/day				
S. Iron total (7439-89-6)	X		ND						1	mg/liter	lb/day				
T. Magnesium Total (7439-95-4)	X		90.7	7.67					1	mg/liter	lb.day				
U. Molybdenum Total (7439-98-7)	X		ND						1	mg/liter	lb/day				
V. Manganese Total (7439-96-5)	X		.717	0.06					1	mg/liter	lb/day				
W. Tin Total (7440-31-5)	X		ND						1	mg/liter	lb/day				
X. Titanium Total (7440-32-6)		X													

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)												OUTFALL NO. 002
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1. POLLUTANT	2. EFFLUENT				3. UNITS (specify if blank)				4. INTAKE (optional)		B. NO. OF ANAL-YSES	
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANAL-YSES		A. LONG TERM AVRG. VALUE			B. MASS
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) ANAL-YSES	(2) ANAL-YSES	(1) CONCENTRATION	(2) MASS		
A. Biochemical Oxygen Demand (BOD)	3.9	6.9					1		mg/l	lbs/day		
B. Chemical Oxygen Demand (COD)	19.9	35.2					1		mg/l	lbs/day		
C. Total Organic Carbon (TOC)	5.8	10.3					1		mg/l	lbs/day		
D. Total Suspended Solids (TSS)	10	17.7					1		mg/l	lbs/day		
E. Ammonia (as N)			0.72	1.3	0.07	0.1	13		mg/l	lbs/day		
F. Flow	VALUE		VALUE 0.203		VALUE 0.212		13		VALUE	MGD		
G. Temperature (winter)	VALUE		VALUE 16.9		VALUE 15.1		9		VALUE	°C		
H. Temperature (summer)	VALUE		VALUE 19.8		VALUE 17.9		9		VALUE	°C		
I. pH	MINIMUM	MAXIMUM	MINIMUM 7.31	MAXIMUM 7.86			13			STANDARD UNITS		

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant, you must provide the results of at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)		B. NO. OF ANAL-YSES	
	A. BE- LIEVED PRE- SENT	B. BE- LIEVED AB- SENT	A. MAXIMUM DAILY VALUE	B. MAXIMUM 30 DAY VALUE (if available)	C. LONG TERM AVRG. VALUE (if available)	D. NO. OF ANAL-YSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE	B. MASS	(1) CONCENTRATION	(2) MASS		
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		
A. Bromide (24959-67-9)		X												
B. Chlorine Total Residual	X			.02	.034	.016	.028	105	mg/l	lbs/day				
C. Color		X												
D. Fecal Coliform		X												
E. Fluoride (16984-48-8)	X		.75	1.33				1	mg/l	lbs/day				
F. Nitrate-Nitrite (as N)	X			1.60	2.80	.984	1.7	13	mg/l	lbs/day				

CONTINUED FROM FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)		B. NO. OF ANALYSES	
	A. BE LIVED PRE-SENT	B. BE LIVED AB-SENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVRG. VALUE (if available)	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	(2) MASS		
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS								
G. Nitrogen Total Organic (as N)		X												
H. Oil and Grease		X												
I. Phosphorus (as P) Total (7723-14-0)	X			0.58	0.75	0.082	0.113	13	mg/l	lbs/day				
J. RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												
K. Sulfate (as SO ₄) (14808-79-8)	X			134.0	211.22	112.62	155.74	13	mg/l	lbs/day				
L. Sulfide (as S)		X												
M. Sulfite (as SO ₃) (14265-45-3)	X								mg/l	lbs/day				
N. Surfactants	X								mg/l	lbs/day				
O. Aluminum Total (7429-90-5)	X				.16				ug/l	lbs/day				
P. Barium Total (7440-39-3)	X				1.07				ug/l	lbs/day				
Q. Boron Total (7440-42-8)	X				.513				ug/l	lbs/day				
R. Cobalt Total (7440-48-4)		X												
S. Iron Total (7439-89-6)	X			290	0.491	142.03	0.196	13	ug/l	lbs/day				
T. Magnesium Total (7439-95-4)		X												
U. Molybdenum Total (7439-98-7)	X								ug/l	lbs/day				
V. Manganese Total (7439-96-5)	X			2180	3.44	1559.39	2.156	13	ug/l	lbs/day				
W. Tin Total (7440-31-5)		X												
X. Titanium Total (7440-32-6)		X												

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)										OUTFALL NO. 003
---	--	--	--	--	--	--	--	--	--	--------------------

1. POLLUTANT	2. EFFLUENT				3. UNITS (specify if blank)				4. INTAKE (optional)		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES		A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	A. CONCENTRATION	B. MASS	(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	6.7	3.0					1	mg/l	lbs/day		
B. Chemical Oxygen Demand (COD)	110	49.54					1	mg/l	lbs/day		
C. Total Organic Carbon (TOC)	6.8	3.06					1	mg/l	lbs/day		
D. Total Suspended Solids (TSS)	16.0	7.20					1	mg/l	lbs/day		
E. Ammonia (as N)	ND						1	mg/l	lbs/day		
F. Flow	VALUE	0.061			VALUE	0.054	13		MGD	VALUE	
G. Temperature (winter)	VALUE	17.8			VALUE	9.9	9		°C	VALUE	
H. Temperature (summer)	VALUE	29.1			VALUE	23.4	6		°C	VALUE	
I. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM			13		STANDARD UNITS		

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant, you must provide the results of at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)	
	A. BE- LIEVED PRE- SENT	B. BE- LIEVED AB- SENT	A. MAXIMUM DAILY VALUE	B. MAXIMUM 30 DAY VALUE (if available)	C. LONG TERM AVRG. VALUE (if available)	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE	B. NO. OF ANALYSES		
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		
A. Bromide (24959-67-9)	X											
B. Chlorine Total Residual	X											
C. Color	X											
D. Fecal Coliform	X											
E. Fluoride (16984-48-8)	X		0.64				1	mg/l	lbs/day			
F. Nitrate-Nitrite (as N)	X			0.84	0.42	0.86	13	mg/l	lbs/day			

CONTINUED FROM FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS			5. INTAKE (optional)		B. NO. OF ANALYSES	
	A. BE- LUBED PRE- SENT	B. BE- LUBED PRE- SENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS					(1) CONCENTRATION		(2) MASS
G. Nitrogen Total Organic (as N)		X											
H. Oil and Grease		X											
I. Phosphorus (as P) Total (7723-14-0)	X			.024		0.06		0.02	13	mg/l	lb/day		
J. RADIOACTIVITY													
(1) Alpha Total		X											
(2) Beta Total		X											
(3) Radium Total		X											
(4) Radium 226 Total		X											
K. Sulfate (as SO ₄) (14808-79-8)	X			160		121.31		50.44	13	mg/l	lb/day		
L. Sulfide (as S)		X											
M. Sulfite (as SO ₃) (14265-45-3)	X								1	mg/l	lbs/day		
N. Surfactants	X								1	mg/l	lbs/day		
O. Aluminum Total (7429-90-5)	X			0.04		6.10		0.003	13	ug/l	lb/day		
P. Barium Total (7440-39-3)	X			0.219					1	ug/l	lbs/day		
Q. Boron Total (7440-42-8)	X			0.088					1	ug/l	lbs/day		
R. Cobalt Total (7440-48-4)		X											
S. Iron total (7439-89-6)	X			785		360.52		0.15	13	mg/l	lbs/day		
T. Magnesium Total (7439-95-4)		X											
U. Molybdenum Total (7439-98-7)	X								1	ug/l	lbs/day		
V. Manganese Total (7439-96-5)	X			1360		657.5		0.273	13	ug/l	lbs/day		
W. Tin Total (7440-31-5)		X											
X. Titanium Total (7440-32-6)		X											

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)												OUTFALL NO. 004
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1. POLLUTANT	2. EFFLUENT				3. UNITS (specify if blank)				4. INTAKE (optional)							
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANAL-YSES		A. CONCENTRATION		B. MASS		A. LONG TERM AVRG. VALUE		B. NO. OF ANAL-YSES	
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS
A. Biochemical Oxygen Demand (BOD)	1745						1		mg/l							
B. Chemical Oxygen Demand (COD)	2830						1		mg/l							
C. Total Organic Carbon (TOC)							0		mg/l							
D. Total Suspended Solids (TSS)		17.67			8.22		4		% (Total Solids)							
E. Ammonia (as N)		631		126.8	389.3		3		mg/kg		lbs/year					
F. Flow		VALUE		VALUE	100.5		5		VALUE		dry tons per yr.					
G. Temperature (winter)		VALUE		VALUE	18		9		VALUE		°C					
H. Temperature (summer)		VALUE		VALUE	29		6		VALUE		°C					
I. pH		MINIMUM		MINIMUM	7.1		4		STANDARD UNITS							

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant, you must provide the results of at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)					
	A. BE- LIEVED PRE- SENT	B. BE- LIEVED AB- SENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	B. MAXIMUM 30 DAY VALUE (1) CONCENTRATION	C. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	D. NO. OF ANAL-YSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (2) MASS	B. NO. OF ANAL-YSES		
			(2) MASS	(2) MASS	(2) MASS	(2) MASS										
A. Bromide (24959-67-9)	X															
B. Chlorine Total Residual	X															
C. Color	X															
D. Fecal Coliform	X															
E. Fluoride (16984-48-8)	X															
F. Nitrate-Nitrite (as N)	X			60		4			15		4					lbs/yr

CONTINUED FROM FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)		B. NO. OF ANALYSES	
	A. BE. LINED PRESENT	B. BE. LINED PRESENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		A. CONCEN-TRATION	B. MASS	D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE (1) CONCENTRATION		(2) MASS
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS						
G. Nitrogen Total Organic (as N)	X							2,422	486.8	4				
H. Oil and Grease		X	322	64.7						1				
I. Phosphorus (as P) Total (7723-14-0)	X							14,777	2,970.2	4				
J. RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												
K. Sulfate (as SO ₄) (14808-79-8)	X							1,711	343.9	2			(total sulfur reported)	
L. Sulfide (as S)		X												
M. Sulfite (as SO ₃) (14265-45-3)	X							Not Tested						
N. Surfactants	X							Not Tested						
O. Aluminum Total (7429-90-5)	X		999	200.8						1				
P. Barium Total (7440-39-3)	X							3,408	685.0	2				
Q. Boron Total (7440-42-8)	X							9	1.8	3				
R. Cobalt Total (7440-48-4)		X						Not Tested						
S. Iron Total (7439-89-6)	X							167,746	33,717	3				
T. Magnesium Total (7439-95-4)		X						6,162	1,238.5	2				
U. Molybdenum Total (7439-98-7)	X							0.78	0.2	3				
V. Manganese Total (7439-96-5)	X							5,333	1,072.0	4				
W. Tin Total (7440-31-5)		X	<0.250	0						1				
X. Titanium Total (7440-32-6)		X						not tested						

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PAGE 13

MO 780-1514 (6-04)

INSTRUCTIONS FOR FILLING OUT APPLICATION FOR DISCHARGE PERMIT FORM C – MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS

All blanks must be filled in when the application is submitted to the appropriate Regional Office (see map). The form **must be signed** as indicated.

This application is to be completed only for wastewater facilities with a discharge. Include any facility it is possible to discharge from even if normally there is no discharge. If this form is not adequate for you to describe your existing operation, then sufficient information should be attached so that an evaluation of the discharge can be made.

1.00 Name of Facility - By what title or name is this facility known locally?

1.10 and 1.20 Self-explanatory.

2.00 List in descending order of significance the four digit Standard Industrial Classification (SIC) codes that best describe your facility in terms of the principal products or services you produce or provide. Also, specify each classification in words.

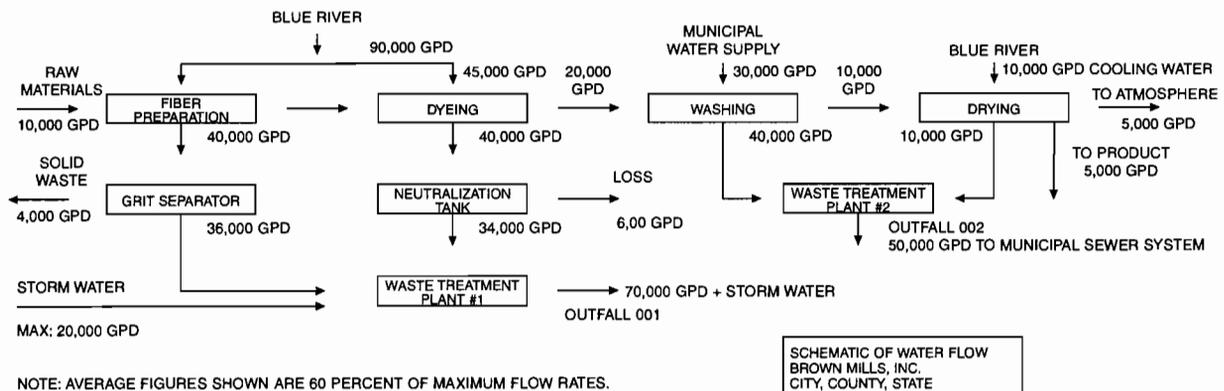
SIC code numbers are descriptions that may be found in the "Standard Industrial Classification Manual" prepared by the Executive Office of the President, Office of Management and Budget, that is available from the Government Printing Office, Washington, D.C. Use the current edition of the manual. If you have any questions concerning the appropriate SIC code for your facility, contact the Missouri Department of Natural Resources Regional Office in your area (see map).

2.10 Point of discharge should be given in terms of the legal description of the waste treatment plant, location or sufficient information so that it may be located by the Missouri Clean Water Commission staff.

2.20 Receiving Water – the name of the stream to which the discharge is directed and any subsequent tributary until a continuous flowing stream is reached.

2.30 Self-explanatory.

2.40 A. The line drawing should show generally the route taken by water in your facility from intake to discharge. Show all operations contributing wastewater, including process and production areas, sanitary flows, cooling water and storm water runoff. You may group similar operations into a single unit labeled to correspond to the more detailed listing. The water balance should show average and maximum flows. Show all significant losses of water to products, atmosphere, discharge and public sewer systems. You should use actual measurements whenever available; otherwise, use your best estimate. An example of any acceptable line drawing appears below.



B. List all sources of wastewater to each outfall. Operations may be described in general terms (for example, "dye-making reactor" or a "distillation tower"). You may estimate the flow contributed by each source if no data is available, and for storm water, you may use any reasonable measure of duration, volume or frequency. For each treatment unit, indicate its size, flow rate and retention time, and describe the ultimate disposal of any solid or liquid wastes not discharged. Treatment units should be listed in order and you should select the proper code from Table A to fill in column 3B for each treatment unit. Insert "XX" into column 3B if no code corresponds to a treatment unit you list.

TABLE A – CODES FOR TREATMENT UNITS

PHYSICAL TREATMENT PROCESSES

1-A Ammonia Stripping	1-M Grit Removal
1-B Dialysis	1-N Microstraining
1-C Diatomaceous Earth Filtration	1-O Mixing
1-D Distillation	1-P Moving Bed Filters
1-E Electrodialysis	1-Q Multimedia Filtration
1-F Evaporation	1-R Rapid Sand Filtration
1-G Flocculation	1-S Reverse Osmosis (Hyperfiltration)
1-H Flotation	1-T Screening
1-I Foam Fractionation	1-U Sedimentation (Settling)
1-J Freezing	1-V Slow Sand Filtration
1-K Gas-Phase Separation	1-W Solvent Extraction
1-L Grinding (Comminutors)	1-X Sorption

CHEMICAL TREATMENT PROCESSES

2-A Carbon Absorption	2-G Disinfection (Ozone)
2-B Chemical Oxidation	2-H Disinfection (Other)
2-C Chemical Precipitation	2-I Electrochemical Treatment
2-D Coagulation	2-J Ion Exchange
2-E Dechlorination	2-K Neutralization
2-F Disinfection (Chlorine)	2-L Reduction

BIOLOGICAL TREATMENT PROCESSES

3-A Activated Sludge	3-E Pre-Aeration
3-B Aerated Lagoons	3-F Spray Irrigation/Land Application
3-C Anaerobic Treatment	3-G Stabilization Ponds
3-D Nitrification-Denitrification	3-H Trickling Filtration

OTHER PROCESSES

4-A Discharge to Surface Water	4-C Reuse/Recycle of Treated Effluent
4-B Ocean Discharge Through Outfall	4-D Underground Injection

SLUDGE TREATMENT AND DISPOSAL PROCESSES

5-A Aerobic Digestion	5-M Heat Drying
5-B Anaerobic Digestion	5-N Heat Treatment
5-C Belt Filtration	5-O Incineration
5-D Centrifugation	5-P Land Application
5-E Chemical Conditioning	5-Q Landfill
5-F Chlorine Treatment	5-R Pressure Filtration
5-G Composting	5-S Pyrolysis
5-H Drying Beds	5-T Sludge Lagoons
5-I Elutriation	5-U Vacuum Filtration
5-J Flotation Thickening	5-V Vibration
5-K Freezing	5-W Wet Oxidation
5-L Gravity Thickening	

2.40 C. A discharge is intermittent unless it occurs without interruption during the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes or other similar activities. A discharge is seasonal if it occurs only during certain parts of the year. Fill in every applicable column in this item for each source of intermittent or seasonal discharges. Base your answers on actual data whenever available; otherwise, provide your best estimate. Report the highest daily value for flow rate and total volume in the "Maximum Daily" columns. Report the average of all daily values measured during days when discharge occurred within the last year in the "Long Term Average" columns.

2.50 A. All effluent guidelines promulgated by EPA appear in the Federal Register and are published annually in 40 CFR Subchapter N. A guideline applies to you if you have any operations contributing process wastewater in any subcategory covered by BPT, BCT, or BAT guidelines. If you are unsure whether you are covered by a promulgated effluent guideline, check with your Missouri Department of Natural Resources' Regional Office. You must check yes if an applicable effluent guideline has been promulgated, even if the guideline limitations are being contested in court. If you believe that a promulgated effluent guideline has been remanded for reconsideration by a court and does not apply to your operations, you may check no.

B. An effluent guideline is expressed in terms of production (or other measure of operation) if the limitations are expressed as mass of pollutant per operational parameter; for example, "pounds of BOD per cubic foot of logs from which bark is removed," or "pounds of TSS per megawatt hour of electrical energy consumed by smelting furnace." An example of a guideline not expressed in terms of a measure of operation is one which limits the concentration of pollutants.

C. This item must be completed only if you checked yes to Item III-B. The production information requested here is necessary to apply effluent guidelines to your facility and you may not claim it as confidential. However, you do not have to indicate how the reported information was calculated.

Report quantities in the units of measurement used in the applicable effluent guideline. The figures provided must be a measure of actual operation over a one month period, such as the production for the highest month during the last twelve months, or the monthly average production for the highest year of the last five years, or other reasonable measure of actual operation, but may not be based on design capacity or on predictions of future increases in operation.

2.60 A. If you check yes to this question, complete all parts of the chart, or attach a copy of any previous submission you have made containing the same information.

B. You are not required to submit a description of future pollution control projects if you do not wish to or if none is planned.

3.00 These items require you to collect and report data on the pollutants discharged from each of your outfalls. Each part of this item addresses a different set of pollutants and must be completed in accordance with the specific instructions for that part. The following general instructions apply to the entire item.

GENERAL INSTRUCTIONS. Part A requires you to report at least one analysis for each pollutant listed. Part B requires you to mark "X" in either the "Believe Present" column or the "Believe Absent" column (column 2A or 2B, Part B) base don your best estimate, and test for those which you believe to be present. Part C requires you to list any of a group of pollutants which you believe to be present, with a brief explanation of why you believe it to be present. (See specific instructions on the form and below for Parts A through C).

Base your determination that a pollutant is present in or absent from your discharge on your knowledge of your raw materials, maintenance chemicals, intermediate and final products and byproducts, and any previous analyses known to you of your effluent or of any similar effluent. (For example, if you manufacture pesticides, you should expect those pesticides to be present in contaminated storm water runoff.) If you would expect a pollutant to be present solely as a result of its presence in your intake water, you must mark "Believe Present" but you are not required to analyze for that pollutant. Instead, mark an "X" in the "Intake" column.

REPORTING. All levels must be reported as a concentration and as total mass. You may report some or all of the required data by attaching separate sheets of paper. (Use the following abbreviations in the columns headed "Units" (column 3, Part A, and column 4, Part B).

CONCENTRATION

ppm parts per million
 mg/l milligrams per liter
 ppb parts per billion
 µg/l micrograms per liter

MASS

lbs pounds
 ton tons (English tons)
 mg milligrams
 g grams
 kg kilograms
 T tonnes (metric tons)

If you measure only one daily value, complete only the "Maximum Daily Values" columns and insert "1" into the "number of analyses" columns (columns 2A and 2B, Part A, and columns 3A and 3D, Part B). The Missouri Department of Natural Resources may require you to conduct additional analyses to further characterize your discharges.

For composite samples, the daily value is the total mass or average concentration found in a composite sample taken over the operating hours of the facility during a 24 hour period; for grab samples, the daily value is the arithmetic or flow-weighted total mass or average concentration found in a series of at least four grab samples taken over the operating hours of the facility during a 24 hour period.

If you measure more than one daily value for a pollutant, determine the average of all values within the last year and report the concentration and mass under the "Long Term Average Values" columns (column 2C, Part A, and column 3C, Part B), and the total number of daily values under the "Number of Analyses" columns (column 2D, Part A, and column 3D, Part B). Also, determine the average of all daily values taken during each calendar month, and report the highest average of all daily values taken during each calendar month, and report the highest average under the "Maximum 30 Day Values" columns (column 2B, Part A, and column 3B, Part B).

SAMPLING. The collection of the samples for the reported analyses should be supervised by a person experienced in performing sampling of industrial wastewater. You may contact your Missouri Department of Natural Resources' Regional Office for detailed guidance on sampling techniques and for answers to specific questions. Any specific requirements contained in the applicable analytical methods should be followed for sample containers, sample preservation, holding times, the collection of duplicate samples, etc. The time when you sample should be representative of your normal operation, to the extent feasible, with all processes which contribute wastewater in normal operation and with your treatment system operating properly with no system upsets. Samples should be collected from the center of the flow channel, where turbulence is at a maximum, at a site specified in your present permit or at any site adequate for the collection of a representative sample.

Grab and composite samples are defined as follows:

GRAB SAMPLE. An individual sample of at least 100 milliliters collected at a randomly selected time over a period not exceeding 15 minutes.

COMPOSITE SAMPLE. A combination of at least eight sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24 hour period. For volatile pollutants, aliquots must be combined in the laboratory immediately before analysis. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically.

ANALYSIS. You must use test methods promulgated in 40 CFR Part 136; however, if none has been promulgated for a particular pollutant, you may use any suitable method for measuring the level of the pollutant in your discharge provided that you submit a description of the method or a reference to a published method. Your description should include the sample holding times, preservation techniques and the quality control measures which you used.

If you have two or more substantially identical outfalls, you may request permission from the Missouri Department of Natural Resources to sample and analyze only one outfall and submit the results of the analysis for other substantially identical outfalls. If your request is granted by the Missouri Department of Natural Resources, on a separate sheet attached to the application form, identify which outfall you did test and describe why the outfalls which you did not test are substantially identical to the outfall which you did test.

REPORTING OF INTAKE DATA. You are not required to report data under the "Intake" columns unless you wish to demonstrate your eligibility for a "net" effluent limitation for one or more pollutants, that is, an effluent limitation adjusted by subtracting the average level of the pollutant(s) present in your intake water. National Pollutant Discharge Elimination System (NPDES) regulations allow net limitations only in certain circumstances. To demonstrate your eligibility, under the Intake columns report the average of the results of analyses on your intake water (if your water is treated before use, test the water after it is treated), and attach a separate sheet containing the following for each pollutant:

1. A statement that the intake water is drawn from the body of water into which the discharge is made. (Otherwise, you are not eligible for net limitations.)
2. A statement of the extent to which the level of the pollutant is reduced by treatment of your wastewater. (Your limitations will be adjusted only to the extent that the pollutant is not removed.)
3. When applicable, a demonstration of the extent to which the pollutants in the intake vary physically, chemically, or biologically from the pollutants contained in your discharge. For example, when the pollutant represents a class of compounds. Your limitations will be adjusted only to the extent that the intake pollutants do not vary from the discharged pollutants.

3.00 Part A must be completed by all applicants for all outfalls, including outfalls containing only noncontact cooling water or storm runoff. However, at your request, the Missouri Department of Natural Resources may waive the requirements to test for one or more of these pollutants, upon a determination that testing for the pollutant(s) is not appropriate for your effluent.

Use composite samples for all pollutants in this part, except use grab samples for pH and temperature. See discussion in instructions above for definitions of the columns in Part A. The "Long Term Average Values" column (column 2C) and "Maximum 30 Day Values" column (column 2B) are not compulsory but should be filled out if data is available.

3.00 Part B must be completed by all applicants for all outfalls, including outfalls containing only noncontact cooling water or storm runoff.

Use composite samples for all pollutants you analyze for in this part, except use grab samples for residual chlorine, oil and grease and fecal coliform. The Long Term Average Values column (column 3C) and Maximum 30 Day Values column (column 3B) are not compulsory but should be filled out if data is available.

3.00 List any pollutants in Table B that you believe to be present and explain why you believe them to be present. No analysis is required, but if you have analytical data, you must report it.

TABLE B – TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES REQUIRED TO BE IDENTIFIED BY APPLICANTS IF EXPECTED TO BE PRESENT

TOXIC POLLUTANT	HAZARDOUS SUBSTANCES	HAZARDOUS SUBSTANCES
Asbestos	Dichlorvos	Naled
	Diethyl amine	Napthenic acid
HAZARDOUS SUBSTANCES	Dimethyl amine	Nitrotoluene
	Dintrobenzene	Parathion
Acetaldehyde	Diquat	Phenolsulfonate
Allyl alcohol	Disulfoton	Phosgene
Allyl chloride	Diuron	Propargite
Amyl acetate	Epichlorohydrin	Propylene oxide
Aniline	Ethion	Pyrethrins
Benzonitrile	Ethylene diamine	Quinoline
Benzyl chloride	Ethylene dibromide	Resorcinol
Butyl acetate	Formaldehyde	Strontium
Butylamine	Furfural	Strychnine
Captan	Guthion	Sytrene

TABLE B – (continued)

HAZARDOUS SUBSTANCES	HAZARDOUS SUBSTANCES	HAZARDOUS SUBSTANCES
Carbaryl	Isoprene	2,4,5-T (2,4,5-Trichloro- phenoxyacetic acid)
Carbofuran	Isopropanolamine	TDE (Tetrachlorodiphenyl ethane)
Carbon disulfide	Kelthane	2,4,5-TP (2-(2,4,5-Trichloro- phenoxy) propanoic acid)
Chlorpyrifos	Kepone	Trichlorofon
Coumaphos	Malathion	Triethanolamine
Cresol	Mercaptodimethur	Triethylamine
Crotonaldehyde	Methoxychlor	Trimethylamine
Cyclohexane	Methyl mercaptan	Uranium
2,4-D (2,4-Dichloro- phenoxyacetic acid)	Methyl methacrylate	Vanadium
Diazinon	Methyl parathion	Vinyl acetate
Dicamba	Mevinphos	Xylene
Dichlobenil	Mexacarbate	Xylenol
2,2-Dichloropropionic acid	Monethyl amine	Zirconium

3.10 Self-explanatory. Additional information may be requested by the Missouri Department of Natural Resources.

3.20 Self-explanatory.

3.30 The Clean Water Act provides for severe penalties for submitting false information on this application form.

Section 309(c)(2) of the Clean Water Act provides that "Any person who knowingly makes any false statement, representation, or certification in any application . . . shall upon conviction, be punished by a fine of no more than \$10,000 or by imprisonment for not more than six months, or both."

All applications must be signed as follows and the signature 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.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)
**FORM D – APPLICATION FOR DISCHARGE PERMIT –
PRIMARY INDUSTRIES**

FOR AGENCY USE ONLY	
CHECK NO.	
DATE RECEIVED	FEE SUBMITTED

NOTE: DO NOT ATTEMPT TO COMPLETE THIS FORM BEFORE READING THE ACCOMPANYING INSTRUCTIONS

1.00 NAME OF FACILITY

Golden Triangle Energy. LLC

1.10 THIS FACILITY IS NOW IN OPERATION UNDER MISSOURI OPERATING PERMIT NUMBER

MO - 0126161

This form is to be filled out in addition to forms A and C "Application for Discharge Permit" for the Industries listed below:

INDUSTRY CATEGORY

Adhesives and sealants	Ore mining
Aluminum forming	Organic chemicals manufacturing
Auto and other laundries	Paint and ink formulation
Battery manufacturing	Pesticides
Coal mining	Petroleum refining
Coil coating	Pharmaceutical preparations
Copper forming	Photographic equipment and supplies
Electric and electronic compounds	Plastic and synthetic materials manufacturing
Electroplating	Plastic processing
Explosives manufacturing	Porcelain enameling
Foundries	Printing and publishing
Gum and wood chemicals	Pulp and paperboard mills
Inorganic chemicals manufacturing	Rubber processing
Iron and steel manufacturing	Soap and detergent manufacturing
Leather tanning and finishing	Steam electric power plants
Landfill	Textile mills
Mechanical products manufacturing	Timber products processing
Nonferrous metals manufacturing	

**APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES**

TABLE II	
NPDES # (IF ASSIGNED) MO-0126161	OUTFALL NUMBER 001

* No Process Water

1.20 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (all seven pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
METALS, AND TOTAL PHENOLS												
1M. Antimony, Total (7440-36-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									
2M. Beryllium, Total (7440-41-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3M. Magnesium Total (7439-95-4)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			55.4	4.8	28.70	2.5	10	mg/l	lbs/day
4M. Molybdenum Total (7439-98-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND						1	mg/l	lbs/day
5M. Tin Total (7440-31-5)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ND						1	mg/l	lbs/day
6M. Titanium Total (7440-32-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7M. Mercury, Total (7439-97-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8M. Selenium, Total (7782-49-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9M. Thallium, Total (7440-28-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10M. Phenols, Total	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

DIOXIN

DESCRIBE RESULTS		
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTINUED FROM PAGE 3

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN- TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
2V. Acrylonitrile (107-13-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
3V. Benzene (71-43-2)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l	lbs/day			
4V. Bis (Chloromethyl) Ether (542-88-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
5V. Bromoform (75-25-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
6V. Carbon Tetrachloride (56-23-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
7V. Chlorobenzene (108-90-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
8V. Chlorodibromomethane (124-48-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
9V. Chloroethane (75-00-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
10V. 2-Chloroethylvinyl Ether (110-75-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
11V. Chloroform (67-66-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
12V. Dichlorobromomethane (75-27-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
13V. Dichloro- difluoromethane (75-71-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
14V. 1,1 – Dichloroethane (75-34-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
15V. 1,2 – Dichloroethane (107-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
16V. 1,1 – Dichloroethylene (75-35-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
17V. 1,2 – Dichloropropane (78-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
18V. 1,2 – Dichloropropylene (542-75-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
19V. Ethylbenzene (100-41-4)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l	lbs/day			
20V. Methyl Bromide (74-83-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
21V. Methyl Chloride (74-87-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												

* No Process Water

NPDES # (IF ASSIGNED)

OUTFALL NUMBER 001

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				D. NO. OF ANALYSES	4. UNITS		5. INTAKE (optional)		
	A. TESTING RE-REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		A. LONG TERM VALUE	B. NO. OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION		(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS
GC/MS FRACTION – VOLATILE COMPOUNDS (continued)												
22V. Methylene Chloride (75-09-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
24V. Tetrachloroethylene (127-18-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
25V. Toluene (108-88-3)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ND				1	ug/l	lbs/day		
26V. 1,2 – Trans Dichloroethylene (156-60-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
27V. 1,1,1 – Tri-chloroethane (71-55-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
28V. 1,1,2 – Tri-chloroethane (79-00-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
29V. Trichloro – ethylene (79-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
30V. Trichloro – fluoromethane (75-69-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
31V. Vinyl Chloride (75-01-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
GC/MS FRACTION – ACID COMPOUNDS												
1A. 2 – Chlorophenol (95-57-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2A. 2,4 – Dichloro – phenol (120-83-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3A. 2,4 – Dimethyl – phenol (105-67-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4A. 4,6 – Dinitro – O-Cresol (534-52-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5A. 2,4 – Dinitro – phenol (51-28-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6A. 2-Nitrophenol (88-75-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7A. 4-Nitrophenol (100-02-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8A. P – Chloro – M Cresol (59-50-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9A. Pentachloro – phenol (87-86-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10A. Phenol (108-952)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11A. 2,4,6 – Trichloro-phenol (88-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN- TRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	B. NO OF ANALYSES (2) MASS
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS					
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS														
1B. Acenaphthene (83-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
2B. Acenaphthylene (208-96-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
3B. Anthracene (120-12-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
4B. Benzidine (92-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
5B. Benzo (a) Anthracene (56-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
6B. Benzo (a) Pyrene (50-32-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
7B. 3,4 – Benzofluoranthene (205-99-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
8B. Benzo (ghi) Perylene (191-24-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
9B. Benzo (k) Fluoranthene (207-08-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
11B. Bis (2-Chloroethyl) Ether (111-44-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
15B. Butyl Benzyl Phthalate (85-68-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
16B. 2-Chloronaphthalene (91-58-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
18B. Chrysene (218-01-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
19B. Dibenzo (a,h) Anthracene (53-70-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
20B. 1,2 – Dichlorobenzene (95-50-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
21B. 1,3 – Dichlorobenzene (541-73-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											

CONTINUED FROM PAGE 5

NPDES # (IF ASSIGNED)

OUTFALL NUMBER 001

*No Process Water

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				D. NO. OF ANALYSES	4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		C. LONG TERM AVRG. VALUE (if available)		A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION						(2) MASS
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)												
22B. 1, 4-Dichlorobenzene (106-46-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
23B. 3, 3'-Dichlorobenzidine (91-94-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
24B. Diethyl Phthalate (84-66-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
25B. Dimethyl Phthalate (131-11-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
26B. Di-N-butyl Phthalate (84-74-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
27B. 2, 4-Dinitrotoluene (121-14-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
28B. 2, 6-Dinitrotoluene (606-20-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
29B. Di-N-Octyl Phthalate (117-84-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
30B. 1, 2-Diphenylhydrazine (as Azobenzene) (122-66-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
31B. Fluoranthene (206-44-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
32B. Fluorene (86-73-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
33B. Hexachlorobenzene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
34B. Hexachlorobutadiene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
35B. Hexachlorocyclopentadiene (77-47-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
36B. Hexachloroethane (67-72-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
38B. Isophorone (78-59-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
39B. Naphthalene (91-20-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
40B. Nitrobenzene (98-95-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
41B. N-Nitrosodimethylamine (62-75-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)												
42B. N-Nitroso N-Propylamine (621-64-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
43B. N-Nitrosodiphenylamine (86-30-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
44B. Phenanthrene (85-01-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
45B. Pyrene (129-00-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
46B. 1,2,4-Trichlorobenzene (120-82-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
GC/MS FRACTION - PESTICIDES												
1P. Aldrin (309-00-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2P. α-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3P. β-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4P. γ-BHC (58-89-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5P. δ-BHC (319-86-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6P. Chlordane (57-74-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7P. 4,4'-DDT (50-29-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8P. 4,4'-DDE (72-56-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9P. 4,4'-DDD (72-54-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10P. Dieldrin (60-57-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11P. α-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
12P. β-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
13P. Endosulfan Sulfate (1031-07-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
14P. Endrin (72-20-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
15P. Endrin Aldehyde (7421-93-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
16P. Heptachlor (76-44-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

**APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES**

TABLE II	
NPDES # (IF ASSIGNED) MO-0126161	OUTFALL NUMBER 002

*No Process Water

1.20 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (all seven pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
METALS, AND TOTAL PHENOLS												
1M. Antimony, Total (7440-36-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2M. Beryllium, Total (7440-41-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3M. Magnesium Total (7439-95-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4M. Molybdenum Total (7439-98-7)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ND						1	ug/l	
5M. Tin Total (7440-31-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									
6M. Titanium Total (7440-32-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7M. Mercury, Total (7439-97-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8M. Selenium, Total (7782-49-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9M. Thallium, Total (7440-28-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10M. Phenols, Total	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
DIOXIN												
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

DESCRIBE RESULTS

CONTINUED FROM PAGE 3

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)				
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION -- VOLATILE COMPOUNDS														
1V. Acrolein (107-02-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
2V. Acrylonitrile (107-13-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
3V. Benzene (71-43-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
4V. Bis (Chloromethyl) Ether (542-88-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
5V. Bromoform (75-25-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
6V. Carbon Tetrachloride (56-23-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
7V. Chlorobenzene (108-90-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
8V. Chlorodibromomethane (124-48-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
9V. Chloroethane (75-00-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
10V. 2-Chloroethylvinyl Ether (110-75-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
11V. Chloroform (67-66-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
12V. Dichlorobromomethane (75-27-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
13V. Dichloro-difluoromethane (75-71-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
14V. 1,1 - Dichloroethane (75-34-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
15V. 1,2 - Dichloroethane (107-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
16V. 1,1 - Dichloroethylene (75-35-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
17V. 1,2 - Dichloropropane (78-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
18V. 1,2 - Dichloropropylene (542-75-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
19V. Ethylbenzene (100-41-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
20V. Methyl Bromide (74-83-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
21V. Methyl Chloride (74-87-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											

MO 780-1516 (01-11)

CONTINUE ON PAGE 4

*No Process Water

NPDES # (IF ASSIGNED)
MO-0126161

OUTFALL NUMBER
002

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "x"			3. EFFLUENT						4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS					
GC/MS FRACTION – VOLATILE COMPOUNDS (continued)														
22V. Methylene Chloride (75-09-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
24V. Tetrachloroethylene (127-18-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
25V. Toluene (108-88-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
26V. 1,2 – Trans Dichloroethylene (156-60-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
27V. 1,1,1 – Tri-chloroethane (71-55-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
28V. 1,1,2 – Tri-chloroethane (79-00-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
29V. Trichloro – ethylene (79-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
30V. Trichloro – fluoromethane (75-69-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
31V. Vinyl Chloride (75-01-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
GC/MS FRACTION – ACID COMPOUNDS														
1A. 2 – Chlorophenol (95-57-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
2A. 2,4 – Dichloro – phenol (120-83-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
3A. 2,4 – Dimethyl – phenol (105-67-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
4A. 4,6 – Dinitro – O-Cresol (534-52-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
5A. 2,4 – Dinitro – phenol (51-28-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
6A. 2-Nitrophenol (88-75-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
7A. 4-Nitrophenol (100-02-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
8A. p – Chloro – M Cresol (59-50-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
9A. Pentachloro – phenol (87-86-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
10A. Phenol (108-952)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
11A. 2,4,6 – Trichloro-phenol (88-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>											

CONTINUE ON PAGE 5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS												
1B. Acenaphthene (83-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2B. Acenaphthylene (208-96-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3B. Anthracene (120-12-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4B. Benzidine (92-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5B. Benzo (a) Anthracene (56-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6B. Benzo (a) Pyrene (50-32-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7B. 3,4 – Benzofluoranthene (205-99-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8B. Benzo (ghi) Perylene (191-24-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9B. Benzo (k) Fluoranthene (207-08-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11B. Bis (2-Chloroethyl) Ether (111-44-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
15B. Butyl Benzyl Phthalate (85-68-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
16B. 2-Chloronaphthalene (91-58-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
18B. Chrysene (218-01-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
19B. Dibenzo (a,h) Anthracene (53-70-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
20B. 1,2 – Dichlorobenzene (95-50-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
21B. 1,3 – Dichlorobenzene (541-73-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

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NPDES # (IF ASSIGNED)
MO-0126161

OUTFALL NUMBER
002

*No Process Water

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			(1) CONCENTRATION	(2) MASS
GC/MS FRACTION -- BASE/NEUTRAL COMPOUNDS (continued)											
22B. 1, 4-Dichlorobenzene (106-46-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
23B. 3, 3'-Dichlorobenzidine (91-94-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
24B. Diethyl Phthalate (84-66-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
25B. Dimethyl Phthalate (131-11-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
26B. Di-N-butyl Phthalate (84-74-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
27B. 2,4-Dinitrotoluene (121-14-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
28B. 2,6-Dinitrotoluene (606-20-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
29B. Di-N-Octyl Phthalate (117-84-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
31B. Fluoranthene (206-44-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
32B. Fluorene (86-73-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
33B. Hexachlorobenzene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
34B. Hexachlorobutadiene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
35B. Hexachlorocyclopentadiene (77-47-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
36B. Hexachloroethane (67-72-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
38B. Isophorone (78-59-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
39B. Naphthalene (91-20-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
40B. Nitrobenzene (98-95-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
41B. N-Nitrosodimethylamine (62-75-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS		5. INTAKE (optional)	
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)										
42B. N-Nitroso N-Propylamine (621-64-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
43B. N-Nitrosodiphenylamine (86-30-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
44B. Phenanthrene (85-01-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
45B. Pyrene (129-00-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
46B. 1,2,4-Trichlorobenzene (120-82-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
GC/MS FRACTION - PESTICIDES										
1P. Aldrin (309-00-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
2P. α-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
3P. β-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
4P. γ-BHC (58-89-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
5P. δ-BHC (319-86-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
6P. Chlordane (57-74-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
7P. 4,4'-DDT (50-29-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
8P. 4,4'-DDE (72-85-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
9P. 4,4'-DDD (72-84-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
10P. Dieldrin (60-57-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
11P. α-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
12P. β-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
13P. Endosulfan Sulfate (1031-07-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
14P. Endrin (72-20-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
15P. Endrin Aldehyde (7421-93-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
16P. Heptachlor (76-44-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>							

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**APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES**

TABLE II	
NPDES # (IF ASSIGNED)	OUTFALL NUMBER
MO-0126161	003 * No Process Water Present

1.20 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (all seven pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO. OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			(1) CONCENTRATION	(2) MASS
METALS, AND TOTAL PHENOLS													
1M. Antimony, Total (7440-36-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
2M. Beryllium, Total (7440-41-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
3M. Magnesium Total (7439-95-4)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not Tested									
4M. Molybdenum Total (7439-98-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND						1	mg/l	lbs/day	
5M. Tin Total (7440-31-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
6M. Titanium Total (7440-32-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
7M. Mercury, Total (7439-97-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
8M. Selenium, Total (7782-49-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
9M. Thallium, Total (7440-28-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
10M. Phenols, Total	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
DIOXIN													
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
DESCRIBE RESULTS													

CONTINUED FROM PAGE 3

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		(1) CONCENTRATION	(2) MASS
GC/MS FRACTION – VOLATILE COMPOUNDS												
1V. Acrolein (107-02-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2V. Acrylonitrile (107-13-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3V. Benzene (71-43-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4V. Bis (Chloromethyl) Ether (542-88-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5V. Bromoform (75-25-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6V. Carbon Tetrachloride (56-23-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7V. Chlorobenzene (108-90-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8V. Chlorodibromomethane (124-48-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9V. Chloroethane (75-00-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10V. 2-Chloroethylvinyl Ether (110-75-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11V. Chloroform (67-66-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
12V. Dichlorobromomethane (75-27-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
13V. Dichlorodifluoromethane (75-71-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
14V. 1,1 – Dichloroethane (75-34-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
15V. 1,2 – Dichloroethane (107-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
16V. 1,1 – Dichloroethylene (75-35-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
17V. 1,2 – Dichloropropane (78-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
18V. 1,2 – Dichloropropylene (542-75-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
19V. Ethylbenzene (100-41-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
20V. Methyl Bromide (74-83-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
21V. Methyl Chloride (74-87-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

NPDES # (IF ASSIGNED)
MO-0126161

OUTFALL NUMBER 003

*No Process Water

CONTINUED FROM THE FRONT		3. EFFLUENT			4. UNITS		5. INTAKE (optional)				
1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"	3. EFFLUENT			4. UNITS		5. INTAKE (optional)				
		A. TESTING RE-REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE	B. MAXIMUM 30 DAY VALUE (if available)	C. LONG TERM AVRG. VALUE (if available)	D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES	
					(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (continued)											
22V. Methylene Chloride (75-09-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
24V. Tetrachloroethylene (127-18-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
25V. Toluene (108-88-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
26V. 1,2 – Trans Dichloroethylene (156-60-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
27V. 1,1,1 – Tri-chloroethane (71-55-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
28V. 1,1,2 – Tri-chloroethane (79-00-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
29V. Trichloro – ethylene (79-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
30V. Trichloro – fluoromethane (75-69-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
31V. Vinyl Chloride (75-01-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
GC/MS FRACTION – ACID COMPOUNDS											
1A. 2 – Chlorophenol (95-57-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
2A. 2,4 – Dichloro – phenol (120-83-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
3A. 2,4 – Dimethyl – phenol (105-67-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
5A. 2,4 – Dinitro – phenol (51-28-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
6A. 2-Nitrophenol (88-75-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
7A. 4-Nitrophenol (100-02-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
8A. P – Chloro – M Cresol (59-50-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
9A. Pentachloro – phenol (87-86-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
10A. Phenol (108-952)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
11A. 2,4,6 – Trichloro-phenol (88-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								

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1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS												
1B. Acenaphthene (83-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2B. Acenaphthylene (208-96-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3B. Anthracene (120-12-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4B. Benzidine (92-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5B. Benzo (a) Anthracene (56-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6B. Benzo (a) Pyrene (50-32-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7B. 3,4-Benzofluoranthene (205-99-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8B. Benzo (ghi) Perylene (191-24-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9B. Benzo (k) Fluoranthene (207-08-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11B. Bis (2-Chloroethyl) Ether (111-44-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
15B. Butyl Benzyl Phthalate (85-68-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
16B. 2-Chloronaphthalene (91-58-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
18B. Chrysene (218-01-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
19B. Dibenzo (a,h) Anthracene (53-70-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
20B. 1,2-Dichlorobenzene (95-50-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
21B. 1,3-Dichlorobenzene (541-73-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

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NPDES # (IF ASSIGNED)
MO-0126161

OUTFALL NUMBER 003

*No Process Water

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			(1) CONCENTRATION	(2) MASS
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)													
22B. 1, 4-Dichlorobenzene (106-46-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
23B. 3, 3'-Dichlorobenzidine (91-94-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
24B. Diethyl Phthalate (84-66-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
25B. Dimethyl Phthalate (131-11-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
26B. Di-N-butyl Phthalate (84-74-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
27B. 2,4-Dinitrotoluene (121-14-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
28B. 2,6-Dinitrotoluene (606-20-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
29B. Di-N-Octyl Phthalate (117-84-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
31B. Fluoranthene (206-44-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
32B. Fluorene (86-73-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
33B. Hexachlorobenzene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
34B. Hexachlorobutadiene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
35B. Hexachlorocyclopentadiene (77-47-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
36B. Hexachloroethane (67-72-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
38B. Isophorone (78-59-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
39B. Naphthalene (91-20-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
40B. Nitrobenzene (98-95-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
41B. N-Nitrosodimethylamine (62-75-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)												
42B. N-Nitroso N-Propylamine (621-64-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
43B. N-Nitrosodiphenylamine (86-30-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
44B. Phenanthrene (85-01-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
45B. Pyrene (129-00-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
46B. 1,2,4-Trichlorobenzene (120-82-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
GC/MS FRACTION - PESTICIDES												
1P. Aldrin (309-00-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2P. α-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3P. β-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4P. γ-BHC (58-89-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5P. δ-BHC (319-86-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6P. Chlordane (57-74-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7P. 4,4'-DDT (50-29-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8P. 4,4'-DDE (72-55-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9P. 4,4'-DDD (72-54-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10P. Dieldrin (60-57-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11P. α-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
12P. β-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
13P. Endosulfan Sulfate (1031-07-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
14P. Endrin (72-20-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
15P. Endrin Aldehyde (7421-93-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
16P. Heptachlor (76-44-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

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**APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES**

TABLE II	
NPDES # (IF ASSIGNED) MO-0126161	OUTFALL NUMBER

004 * No Process Water Present

1.20 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (all seven pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)					
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
2M. Beryllium, Total (7440-41-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.075						1					
3M. Magnesium Total (7439-95-4)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					6,162	1,238.5	2	mg/l	lbs/day			
4M. Molybdenum Total (7439-98-7)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					0.78	0.2	3	mg/l	lbs/day			
5M. Tin Total (7440-31-5)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ND											
6M. Titanium Total (7440-32-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
7M. Mercury, Total (7439-97-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
8M. Selenium, Total (7782-49-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
9M. Thallium, Total (7440-28-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
10M. Phenols, Total	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
DIOXIN															
2,3,7,8 - Tetra - chlorodibenzo-P-Dioxin (1764-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
DESCRIBE RESULTS															

CONTINUED FROM PAGE 3

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)	
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		
GC/MS FRACTION – VOLATILE COMPOUNDS											
1V. Acrolein (107-02-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
2V. Acrylonitrile (107-13-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
3V. Benzene (71-43-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
4V. Bis (Chloromethyl) Ether (542-88-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
5V. Bromoform (75-25-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
6V. Carbon Tetrachloride (56-23-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
7V. Chlorobenzene (108-90-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
8V. Chlorodibromomethane (124-48-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
9V. Chloroethane (75-00-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
10V. 2-Chloroethylvinyl Ether (110-75-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
11V. Chloroform (67-66-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
12V. Dichlorobromomethane (75-27-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
13V. Dichlorodifluoromethane (75-71-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
14V. 1,1 – Dichloroethane (75-34-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
15V. 1,2 – Dichloroethane (107-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
16V. 1,1 – Dichloroethylene (75-35-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
17V. 1,2 – Dichloropropane (78-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
18V. 1,2 – Dichloropropylene (542-75-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
19V. Ethylbenzene (100-41-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
20V. Methyl Bromide (74-83-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
21V. Methyl Chloride (74-87-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>								

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NPDES # (IF ASSIGNED)
MO-0126161

OUTFALL NUMBER
004

*No Process Water Present

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				D. NO. OF ANALYSES	4. UNITS		5. INTAKE (optional)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)	D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO. OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION						(2) MASS
GC/MS FRACTION – VOLATILE COMPOUNDS (continued)												
22V. Methylene Chloride (75-09-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
24V. Tetrachloroethylene (127-18-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
25V. Toluene (108-88-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
26V. 1,2 – Trans Dichloroethylene (156-60-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
27V. 1,1,1 – Tri-chloroethane (71-55-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
28V. 1,1,2 – Tri-chloroethane (79-00-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
29V. Trichloro – ethylene (79-01-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
30V. Trichloro – fluoromethane (75-69-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
31V. Vinyl Chloride (75-01-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
GC/MS FRACTION – ACID COMPOUNDS												
1A. 2 – Chlorophenol (95-57-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
2A. 2,4 – Dichloro – phenol (120-83-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
3A. 2,4 – Dimethyl – phenol (105-67-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
5A. 2,4 – Dinitro – phenol (51-28-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
6A. 2-Nitrophenol (88-75-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
7A. 4-Nitrophenol (100-02-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
8A. P – Chloro – M Cresol (59-50-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
9A. Pentachloro – phenol (87-86-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
10A. Phenol (108-952)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
11A. 2,4,6 – Trichloro-phenol (88-06-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>									

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CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
2B. Acenaphthylene (208-96-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
3B. Anthracene (120-12-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
4B. Benzidine (92-87-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
5B. Benzo (a) Anthracene (56-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
6B. Benzo (a) Pyrene (50-32-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
7B. 3,4 - Benzo(a)fluoranthene (205-99-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
8B. Benzo (ghi) Perylene (191-24-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
9B. Benzo (k) Fluoranthene (207-08-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
11B. Bis (2-Chloroethyl) Ether (111-44-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
15B. Butyl Benzyl Phthalate (85-68-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
16B. 2-Chloronaphthalene (91-58-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
18B. Chrysene (218-01-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
19B. Dibenzo (a,h) Anthracene (53-70-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
20B. 1,2 - Dichlorobenzene (95-50-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
21B. 1,3 - Dichlorobenzene (541-73-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												

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NPDES # (IF ASSIGNED)
MO-0126161

OUTFALL NUMBER 004

*No Proess Water Present

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES	
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			(1) CONCENTRATION	(2) MASS
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)													
22B. 1, 4-Dichlorobenzene (106-46-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
23B. 3, 3'-Dichlorobenzidine (91-94-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
24B. Diethyl Phthalate (84-66-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
25B. Dimethyl Phthalate (131-11-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
26B. Di-N-butyl Phthalate (84-74-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
27B. 2,4-Dinitrotoluene (121-14-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
28B. 2,6-Dinitrotoluene (606-20-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
29B. Di-N-Octyl Phthalate (117-84-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
31B. Fluoranthene (206-44-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
32B. Fluorene (86-73-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
33B. Hexachlorobenzene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
34B. Hexachlorobutadiene (87-68-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
35B. Hexachloro-cyclopentadiene (77-47-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
36B. Hexachloroethane (67-72-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
38B. Isophorone (78-59-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
39B. Naphthalene (91-20-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
40B. Nitrobenzene (98-95-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
41B. N-Nitrosodimethylamine (62-75-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										

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CONTINUE ON PAGE 7

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"			3. EFFLUENT				4. UNITS		5. INTAKE (optional)														
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. LONG TERM AVRG. VALUE	B. NO OF ANALYSES												
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			(1) CONCENTRATION	(2) MASS											
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)																								
42B. N-Nitroso N-Propylamine (621-64-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
43B. N-Nitrosodiphenylamine (86-30-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
44B. Phenanthrene (85-01-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
45B. Pyrene (129-00-0)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
46B. 1,2,4-Tri chlorobenzene (120-82-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
GC/MS FRACTION - PESTICIDES																								
1P. Aldrin (309-00-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
2P. α-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
3P. β-BHC (319-84-6)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
4P. γ-BHC (58-89-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
5P. δ-BHC (319-86-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
6P. Chlordane (57-74-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
7P. 4,4'-DDT (50-29-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
8P. 4,4'-DDE (72-55-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
9P. 4,4'-DDD (72-54-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
10P. Dieldrin (60-57-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
11P. α-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
12P. β-Endosulfan (115-29-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
13P. Endosulfan Sulfate (1031-07-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
14P. Endrin (72-20-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
15P. Endrin Aldehyde (7421-93-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					
16P. Heptachlor (76-44-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																					

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2.00 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

A. IS ANY POLLUTANT LISTED IN ITEM 1.20 A SUBSTANCE OR A COMPONENT OF A SUBSTANCE WHICH YOU DO OR EXPECT THAT YOU WILL OVER THE NEXT FIVE YEARS USE OR MANUFACTURE AS AN INTERMEDIATE OR FINAL PRODUCT OR BYPRODUCT?

YES (LIST ALL SUCH POLLUTANTS BELOW) NO (GO TO B)

B. ARE YOUR OPERATIONS SUCH THAT YOUR RAW MATERIALS, PROCESSES OR PRODUCTS CAN REASONABLE BE EXPECTED TO VARY SO THAT YOUR DISCHARGES OF POLLUTANTS MAY DURING THE NEXT FIVE YEARS EXCEED TWO TIMES THE MAXIMUM VALUES REPORTED IN ITEM 1.20?

YES (COMPLETE C BELOW) NO (GO TO SECTION 3.00)

C. IF YOU ANSWERED "YES" TO ITEM B, EXPLAIN BELOW AND DESCRIBE IN DETAIL THE SOURCES AND EXPECTED LEVELS OF SUCH POLLUTANTS THAT YOU ANTICIPATE WILL BE DISCHARGED FROM EACH OUTFALL OVER THE NEXT FIVE YEARS, TO THE BEST OF YOUR ABILITY AT THIS TIME. CONTINUE ON ADDITIONAL SHEETS IF YOU NEED MORE SPACE.

3.00 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED IN 1.20 PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

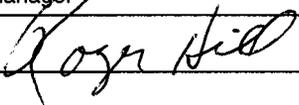
YES (LIST THE NAME, ADDRESS, AND TELEPHONE NUMBER OF, AND ANALYZED BY, EACH SUCH LABORATORY OR FIRM BELOW)

NO (GO TO SECTION 4.00)

A. NAME	B. ADDRESS	C. TELEPHONE (area code and number)	D. POLLUTANTS ANALYZED (list)
Pace Analytical Services	9608 Loriet Blvd Lenexa, Ks. 66219	913-599-5665	GC/MS
Inovatia Laboratories	120 E. Davis Street Fayette, Mo. 65248	660-2348-1911	GC/MS
Midwest Laboratories	13611 B. Sreet Omaha Ne., 68144	402-334-7770	GC/MS

4.00 CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME AND OFFICIAL TITLE (TYPE OR PRINT) Roger Hill, General Manager	PHONE NUMBER (AREA CODE AND NUMBER) 660-683-5646
SIGNATURE 	DATE SIGNED 4/18/12

**INSTRUCTIONS FOR FILLING OUT APPLICATION FOR DISCHARGE
PERMIT FORM D – PRIMARY INDUSTRIES**

All blanks must be filled in when the applications is submitted to the appropriate Regional Office (see map). The form **must be signed** as indicated.

This application is to be completed only for wastewater facilities from which there is a discharge. Include any facility that it is possible to discharge from even if normally there is no discharge. If this form is not adequate for you to describe your existing operation, the sufficient information should be attached so that an evaluation of the discharge can be made.

1.00 Name of Facility – By what title or name is this facility known locally?

1.10 Self-explanatory.

1.20 **GENERAL INSTRUCTIONS.** For some pollutants, you may be required to mark "X" in the "Testing Required" column (column 2-A) and test (sample and analyze) and report the levels of the pollutants in your discharge whether or not you expect them to be present in your discharge. For all others, you must mark "X" in either the "Believe Present" column or the "Believe Absent" column (column 2-B or 2-C) based on your best estimate, and test for those which you believe to be present.

Base your determination that a pollutant is present in or absent from your discharge on your knowledge of your raw materials, maintenance chemicals, intermediate and final products and byproducts and any previous analyses known to you of your effluent or of any similar effluent. (For example, if you manufacture pesticides, you should expect those pesticides to be present in contaminated storm water runoff). If you would expect a pollutant to be present solely as a result of its presence in your intake water, you must mark "Believe Present" but you are not required to analyze for that pollutant. Instead, mark an "X" in the "Intake" column.

REPORTING. All levels must be reported as concentration and as total mass. You may report some or all of the required data by attaching separate sheets of paper instead of filling out Table II if the separate sheets contain all the required information in a format which is consistent with Table II in spacing and in identification of pollutants and columns. (For example, the data system used in your GC/MS analysis may be able to print data in the proper format). Use the following abbreviations in the columns headed "Units". (column 4)

CONCENTRATION

ppm.....parts per million
mg/l.....miligrams per liter
ppb.....parts per billion
µg/l.....micrograms per liter

MASS

lbs.....pounds
ton.....tons (English tons)
mg.....milligrams
g.....grams
kg.....kilograms
T.....tonnes (metric tons)

If you measure only one daily value, complete only the "Maximum Daily Values" columns and insert "1" into the "Number of Analyses" columns (columns 3-A and 3-D). Missouri Department of Natural Resources may require you to conduct additional analyses to further characterize your discharges.

For composite samples, the daily value is the total mass or average concentration found in a composite sample taken over the operating hours of the facility during a 24 hour period; for grab samples, the daily value is the arithmetic or flow-weighted total mass or average concentration found in a series of at least four grab samples taken over the operating hours of the facility during a 24 hour period.

If you measure more than one daily value for a pollutant, determine the average of all values within the last year and report the concentration and mass under the "Long Term Average Values" column (column 3-C), and the total number of daily values under the "Number of Analyses" columns (column 3-D). Also, determine the average of all daily values taken during each calendar month, and report the highest average under the "Maximum 30 Day Value" column (column 3-B)

SAMPLING. The collection of the samples for the reported analyses should be supervised by a person experienced in performing sampling of industrial wastewater. You may contact your Missouri Department of Natural Resources' Regional Office for detailed guidance on sampling techniques and for answers to specific questions. Any specific requirements contained in the applicable analytical methods should be followed for sample containers, sample preservation, holding times, the collection of duplicate samples, etc. The time when you sample should be representative of your normal operation, to the extent feasible, with all processes that contribute wastewater in normal operation, and with your treatment system operating properly with no system upsets. Samples should be collected from the center of the flow channel, where turbulence is at a maximum, at a site specified in your present permit or at any site adequate for the collection of a representative sample.

Grab and composite samples are defined as follows:

GRAB SAMPLES. An individual sample of at least 100 milliliters collected at a randomly selected time over a period not exceeding 15 minutes.

COMPOSITE SAMPLE. For the purposes of this application, A combination of at least eight sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24 hour period. For volatile pollutants, aliquots must be combined in the laboratory immediately before analysis. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically.

ANALYSIS. You must use test methods promulgated in 40 CFR Part 136; however, if none has been promulgated for a particular pollutant, you may use any suitable method for measuring the level of the pollutant in your discharge provided that you submit a description of the method or a reference to a published method. Your description should include the sample holding times, preservation techniques and the quality control measures which you used.

If you have two or more substantially identical outfalls, you may request permission from the Missouri Department of Natural Resources to sample and analyze only one outfall and submit the results of the analysis for other substantially identical outfalls. If your request is granted by the Missouri Department of Natural Resources, on a separate sheet attached to the application form, identify which outfall you did test and describe why the outfalls which you did not test are substantially identical to the outfall which you did test.

REPORTING OF INTAKE DATA. You are not required to report data under the "Intake" columns unless you wish to demonstrate your eligibility for a "net" effluent limitation for one or more pollutants, that is, an effluent limitation adjusted by subtracting the average level of the pollutant(s) present in your intake water. National Pollutant Discharge Elimination System (NPDES) regulations allow net limitations only in certain circumstances. To demonstrate your eligibility, under the "Intake" columns report the average of the results of analyses on your intake water (if your water is treated before use, test the water after it is treated), and attach a separate sheet containing the following for each pollutant:

1. A statement that the intake water is drawn from the body of water into which the discharge is made. (Otherwise, you are not eligible for net limitations.)
2. A statement of the extent to which the level of the pollutant is reduced by treatment of your wastewater. (Your limitations will be adjusted only to the extent that the pollutant is not removed.)
3. When applicable, a demonstration of the extent to which the pollutant in the intake vary physically, chemically or biologically from the pollutants contained in your discharge. For example, when the pollutant represents a class of compounds. Your limitations will be adjusted only to the extent that the intake pollutants do not vary from the discharged pollutants.

SPECIFIC INSTRUCTIONS. Table A lists the 34 "primary" industry categories in the left-hand column. For each outfall, if any of your processes that contribute wastewater falls into one of those categories, you must mark "X" in "Testing Required" column (column 2-A) and test for: A. All of the toxic metals, cyanide and total phenols; and B. The organic toxic pollutants contained in the gas chromatography/mass spectrometry (GS/MS) fractions indicated in Table A as applicable to your category, unless you qualify as a small business (see below). The organic toxic pollutants are listed by GC/MS fractions in Table II in 1.20. For example, the Organic Chemicals Industry has an "X" in all four

fractions; therefore, applicants in this category must test for all organic toxic pollutants in 1.20. If you are applying for a permit for a privately owned treatment works, determine your testing requirements on the basis of the industry categories of your contributors. When you determine which industry category you are in to find your testing requirements, you are not determining your category for any other purpose and you are not giving up your right to challenge your inclusion in that category (for example, for deciding whether an effluent guideline is applicable) before your permit is issued.

TABLE A – TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS INDUSTRY CATEGORY

INDUSTRY CATEGORY	VOLATILE	GC/MS FRACTION		PESTICIDE
		ACID	BASE/NEUTRAL	
Adhesives and sealants	X	X	X	-
Aluminum forming	X	X	X	-
Auto and other laundries	X	X	X	X
Battery manufacturing	X	-	X	-
Coal mining	X	X	X	X
Coil coating	X	X	X	-
Copper forming	X	X	X	-
Electric and electronic compounds	X	X	X	X
Electroplating	X	X	X	-
Explosives manufacturing	X	X	X	-
Foundries	X	X	X	-
Gum and wood chemicals	X	X	X	X
Inorganic chemicals manufacturing	X	X	X	-
Iron and steel manufacturing	X	X	X	-
Leather tanning and finishing	X	X	X	X
Mechanical products manufacturing	X	X	X	-
Nonferrous metals manufacturing	X	X	X	X
Ore Mining	X	X	X	X
Organic chemicals manufacturing	X	X	X	X
Paint and ink formulation	X	X	X	X
Pesticides	X	X	X	X
Petroleum refining	X	X	X	X
Pharmaceutical preparations	X	X	X	-
Photographic equipment and supplies	X	X	X	X
Plastic and synthetic materials mfg.	X	X	X	X
Plastic processing	X	-	-	-
Porcelain enameling	X	-	X	X
Printing and publishing	X	X	X	X
Pulp and paperboard mills	X	X	X	X
Rubber processing	X	X	X	-
Soap and detergent manufacturing	X	X	X	-
Stream electric power plants	X	X	X	-
Textile mills	X	X	X	X
Timber products	X	X	X	X

1 The pollutants in each fraction are listed in Item 1.20
X = Testing required
- = Testing not required

For all other cases (nonprocess wastewater outfalls and nonrequired GC/MS fractions), you must mark "X" in either the "Believed Present" column (column 2-B) or the "Believed Absent" column (column 2-C) for each pollutant, and test for those you believe present (those marked "X" in column 2-B). If you qualify as a small business (see below) you are exempt from testing for the organic toxic pollutants, listed in Table II. For pollutants in intake water, see discussion above. The "Long Term Average Values" column (column 5-2) are not compulsory but should be filled out if data is available.

Use composite samples for all pollutants in this part, except use grab samples for total phenols and cyanide.

You are required to mark "Testing Required" for dioxin if you use or manufacture one of the following compounds:

1. 2,4,5-trichlorophenoxy acetic acid (2,4,5-T);
2. 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP);
3. 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon);
4. O,O-dimethyl O-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel);
5. Hexachlorophene (HCP).

If you mark "Testing Required" or "Believe Present," you must perform a screening analysis for dioxins, using gas chromatography with an electron capture detector. A TCDD standard for quantification is not required. Describe the results of this analysis in the space provided; for example, "no measurable baseline deflection at the retention time of TCDD" or "a measurable peak within the tolerances of the retention time of TCDD." The permitting authority may require you to perform a quantitative analysis if you report a positive result.

The Effluent Guidelines Division of EPA has collected and analyzed samples from some plants for the pollutants listed in Part C in the course of its BAT guidelines development program. If your effluents were sampled and analyzed as part of this program in the last three years, you may use this data to answer provided that the Missouri Department of Natural Resources approves, and provided that no process change or change in raw materials or operating practices has occurred since the samples were taken that would make the analyses unrepresentative of your current discharge.

SMALL BUSINESS EXEMPTION. If you qualify as a "small business" you are exempt from the reporting requirements for the organic toxic pollutants, listed in Table II. If your facility is a coal mine, and if your probable total annual production is less than 100,000 tons per year, you may submit past production data or estimated future production (such as a schedule of estimated total production under 30 CFR Section 795.14(c)) instead of conducting analysis for the organic toxic pollutants. If your facility is not a coal mine, and if your gross total annual sales for the most recent three years average less than \$100,000 per year, in second quarter 1980 dollars, you may submit sales data for those years instead of conducting analyses for the organic toxic pollutants.

The production or sales data must be for the facility that is the source of the discharge. The data should not be limited to production or sales for the process or processes which contribute to the discharge, unless those are the only processes at your facility. For sales data, in situations involving intra-corporate transfers of goods and services, the transfer price per unit should approximate market prices for those goods and services as closely as possible. Sales figures for years after 1980 should be indexed to the second quarter of 1980 by using the gross national produce price deflator (second quarter of 1980 = 100). This index is available in "National Income and Product Accounts of the United States" (Department of Commerce, Bureau of Economic Analysis).

- 2.00 A. You may not claim this information as confidential; however, you do not have to distinguish between use or production of the pollutants or list the amounts. Under NPDES regulations your permit will contain limits to control all pollutants you report in answer to this question, as well as all pollutants reported in item 1.20 to 2.00 B at levels exceeding the technology-based limits appropriate to your facility. Your permit will also require you to report to Missouri Department of Natural Resources if you, in the future, begin or expect that you will begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which you did not report here. Your permit may be modified at that time if necessary to control that pollutant.
- B. For this item, consider only those variations which may result in concentrations of pollutants in effluents which may exceed two times the maximum values you reported in 1.20. These variations may be part of your routine operations or part of your regular cleaning cycles.

Under NPDES regulations your permit will contain limits to control any pollutant you report in answer to this question at levels exceeding the technology-based limits appropriate to your facility. Your permit will also require you to report to the Missouri Department of Natural Resources if you know or have reason to believe that any activity has occurred or will occur which would make your discharge of any toxic pollutant five times the maximum values reported in 1.20 or in this item, and your permit may be modified at that time if necessary to control the pollutant.

Do not consider variations which are the result of bypasses or upsets. Increased levels of pollutants that are discharged as a result of bypasses or upsets are regulated separately under NPDES regulations.

C. Examples of the types of variations to be described here include:

Changes in raw or intermediate materials;
Changes in process equipment or materials;
Changes in product lines;
Significant chemical reactions between pollutants in waste streams; and
Significant variation in removal efficiencies of pollution control equipment.

You may indicate other types of variations as well, except those which are the result of bypasses or upsets. Missouri Department of Natural Resources may require you to further investigate or document variations you report here.

Base your prediction of expected levels of these pollutants upon your knowledge of your processes, raw materials, past and projected product ranges, etc., or upon any testing conducted upon your effluents that indicates the range of variability that can be expected in your effluent over the next five years.

EXAMPLE: Outfall 001 discharges water used to clean six 500 gallon tanks. These tanks are used for formulation of dispersions of synthetic resins in water (adhesives). Use of toxic pollutants that can be expected in the next five years is:

1. Copper acetate inhibitor, ½ lb. per tank;
2. Dibutyl phthalate, 50 lbs. per tank;
3. Toulene, 5 lbs. per tank; and
4. Antimony oxide, 1 lb. per tank.

Based on normal cleaning an average of 1 percent and a maximum of 3 percent of the contents of each tank is collected and discharged once every two weeks in the 150 gallons of water used for cleaning. Treatment (pH adjustment, flocculation, filtration) removes 85 percent of metals and 50 percent of organic compounds.

3.00 Self-explanatory.

4.00 The Federal Clean Water Act provides for severe penalties for submitting false information on this application form.

Section 309(c)(2) of the Federal Clean Water Act provides that "Any person who knowingly makes any false statement, representation, or certification in any application..... shall upon conviction, be punished by a fine of no more than \$10,000 or by imprisonment for not more than six months, or both."

STATE REGULATIONS REQUIRE THE CERTIFICATION TO BE SIGNED AS FOLLOWS

1. For a corporation, by a officer of at least the level of plant manager;
2. For a partnership or sole proprietorship, by a general partner or the proprietor; or
3. For a municipality, state, federal, or other public facility, by either a principal executive officer or ranking public official.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
 (SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

**FORM R – PERMIT APPLICATION FOR LAND APPLICATION
 OF INDUSTRIAL WASTEWATER BIOSOLIDS AND RESIDUALS**

FOR AGENCY USE ONLY

PERMIT NUMBER

MO - 0126161

DATE RECEIVED

INSTRUCTIONS: FORMS A & C or F (CAFOs) (and D where applicable) must also be submitted for land application of industrial wastewater sludge biosolids or residuals. Submit FORMS E and G for land disturbance permit if construction areas total five acres or more.

Attach **FORM I**, if wastewater will be land applied or irrigated.

1.00 FACILITY INFORMATION

1.10 Facility Name

Golden Triangle Energy, LLC

1.20 Application for: Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8.020)
 Operating Permit (if no construction permit, attach engineering documents)
 Date Land Application System Began Operation: _____
 Operating Permit Renewal

1.30 Months when the business or enterprise will operate or generate sludge or residuals:

12 months per year Part of year (list Months): _____

1.40 List the Facility outfalls which will be applicable to the land application system from outfalls listed on Form A, C, D and F.

Outfall Nos. ~004 _____

2.00 STORAGE BASINS

2.10 Number of storage basins: 2 Type of basin: Steel Concrete Fiberglass Earthen
 Earthen with membrane liner

2.20 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

(Complete Attachment A: Profile Sketch)

Basin #1: Length 65' Width 30' Depth 8' Freeboard 2' Berm Width 10' % Slope 3:1

Basin #2: Length 65' Width 30' Depth 8' Freeboard 2' Berm Width 10' % Slope 3:1

2.21 Storage basin volumes (gallons): Permanent volume means two foot water depth for seal protection, and any required treatment volume capacity.

Basin #1: Gallons: 263,333 Permanent Volume + 34,417 Storage = 299,080 Total volume (gallons)

Basin #2: Gallons: 263,333 Permanent Volume + 34,417 Storage = 299,080 Total volume (gallons)

2.30 Storage Basin operating levels (report as feet below emergency overflow level)

Basin #1: Maximum water level 8' ft. Minimum operating water level 3' ft.

Basin #2: Maximum water level 8' ft. Minimum operating water level 3' ft.

2.40 Storage Basin design storage capacity: (storage between minimum and maximum operating levels for 1-in-10 year storm water flows.)

Basin #1: 5 days Basin #2: 5 days Basin #3: _____ days

2.50 Attach Water Balance Test results to verify earthen basin seal in accordance with 10 CSR 20-8.020(13) and (16), when required by the department. NA

2.60 Attach a sludge management plan for materials that are not land applied. NA

2.70 Attach a closure plan for lagoons, storage basins and treatment units. NA, Ongoing Operation

3.00 LAND APPLICATION SYSTEM

3.10 Number of application sites 1 Total Available Acres 50 Minimum & Maximum % field slopes 0.08
 Location: _____ ¼ NE ¼ NW ¼ 13 Sec. 62N T 40WR Holt County 20 Acres
 Location: _____ ¼ SE ¼ NW ¼ 13 Sec. 62N T 40WR Holt County 30 Acres

Attach extra sheets as necessary.

3.12 Type of vegetation: Grass hay Pasture Timber Row crops Other (describe) _____
 Specific Crops and Yields/acre: soybeans 50 bu corn 150 bu Actual for last five years: soybeans 30 bu corn 113 bu

3.20 Annual sludge production (gallons per year): 217,500 Actual 8,813 Design Design Ref. Bennett & Assoc. 1/4/2001
 (dry tons per year): 100.5 Actual 5.2 Design
 Human Population Equivalent: NA Actual NA Design

3.21 Land Application rate per acre:
 Design: 0.1 dry ton/year 0.10.017 dry ton/application 1-6 No. applications/year
 Actual: 2.01 dry ton/year 2.01-0.34 dry ton/application 1-6 No. applications/year
 Total amount land applied each year (total all sites) Design 5.2 dry ton/year Actual 100.5 dry ton/year
 Actual months used for land application: Jan Feb Mar Apr May Jun Jul Aug Sep
 Oct Nov Dec

3.22 Land Application Rate is based on:
 Nutrient Management Plan (N&P) PAN Conservative
 Hydraulic Loading Limiting Pollutant (Specify) _____
 Other (describe) _____

3.30 Equipment type: Tank wagon Tank truck Subsurface injection Slinger spreader Dry spreader
 Other (describe) Dewatering bag, 10' dia. x 100' long. Front end loader, dump truck.
 Equipment Capacity: 36,000 Gallons (cubic feet) per hour 105 Total hours of operation per year

3.40 Public Use/Access Sites: If public use or access to land application site, describe pathogen treatment and site access restrictions. If human, animal, or organic wastes, refer to 40 CFR 503.32 for pathogen treatment methods. Attach extra sheets as necessary.
NA

3.50 Separation distance (in feet) from the outside edge of the biosolids application area to down gradient features:
40' Permanent flowing stream NA Losing Stream NA Intermittent (wet weather) stream NA Lake or pond
40' Property boundary >500 Dwellings >500 Water supply well _____ Other (describe) _____

3.60 SOILS INFORMATION: Use information from the County Soil Survey, NRCS, or professional soil scientist.
 NOTE: On-site soils classification by a professional soil scientist may be required by the department where appropriate.
 Soil Series Name 81 wabash Depth of bedrock >5' Feet Depth to water table 3.2-3.6' Feet
 Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges:
 0 to 0.06 In/hr for 0-12 inch soil depth 0 to 0.06 In/hr for 12-24 inch soil depth 0 to 0.06 In/hr for 24-60 inch soil depth

3.70 Attach Nutrient Management Plan (NMP) including calculations for plant available nitrogen (PAN) and other nutrients, crop requirements, crop yields and other management factors. Include USDA/NRCS phosphorus recommendations. Ref. March 2012

3.80 Geologic Investigation: 10/2000 Date of most recent Geologic Report by Department's Division of Geology and Land Survey.

3.81 Ground Water Monitoring Wells: (Attach Groundwater Monitoring Plan when required by department)
 NONE EXISTING PLANNED NUMBER: _____ Monitoring Wells _____ Lysimeters

3.90 Attach a current copy of the Operation and Maintenance (O&M) Plan for the land application system. Date of O&M Plan: March 2012

3.91 Attach a site map showing topography, storage basins, land application sites, property boundary, streams, wells, roads, dwellings and other pertinent features.

3.92 Attach a facility sketch showing treatment units, storage basins, pipelines, application sites and other features.

4.00 INDUSTRIAL PROCESS INFORMATION

4.10 Brief description of treatment processes prior to land application and note any changes made in last five years. (Attach extra sheets as necessary.)
Iron and Manganese from well water is treated by reverse osmosis, ozone and sand filters. Sludge is generated and settled in ponds.

4.11 Detailed description of industrial production processes. Also indicate any changes made in last five years. (attach extra sheets as necessary)
A portion of the fuel grade ethanol was purified for industrial specially denatured or beverage grade alcohol. A new boiler and a new cooling tower were added.

4.20 List of raw materials, chemicals, additives, products, and by-products (Attach extra sheets as necessary)
Ozone, Potassium Permanganate, Sodium Hydroxide, Sulfuric Acid, Sodium Hypochlorite, and Hydrogen Peroxide, and Nalco Polymers.

4.31 Attach following FORMS for wastewater to be land applied.
 FORM C or F is required for all applicants. Use Form F for CAFOs.
 FORM D is required for those industries listed in the Form D instructions or when required by the department.
 Use actual testing results within last 12 months. For new operations use testing results from other similar operations or from published literature.

4.32 Are there any listed hazardous wastes in the material to be land applied: YES NO (If YES, attach testing results)

4.40 A. Are any Pollutants listed in 40 CFR 268.40 believed to be present in detectable concentrations: YES NO
 B. Are any Pollutants listed in 10 CSR 20-7.031 believed to be present in detectable concentrations: YES NO
 C. Are any Pollutants listed in EPA Process Design Manual for Land Treatment of Municipal Wastewater publication EPA-625/1-81-013, Table 4-5 and Table 4-16 believed present in detectable concentrations: YES NO
 (Attach a copy of testing results for any pollutants that may be present in detectable concentrations.)

4.50 Environmental Assessment. Do any of the pollutants detected exceed the criteria for pollutant concentrations of limitations contained in the publications referenced in Section 4.40 of this form: YES NO
 If YES, attach a copy of the Environmental Assessment as required in 10 CSR 20-8.020(3)(D).

5.00 SOIL TESTING RESULTS: Complete information for each pollutant listed and each land application site. Attach results of any other soil testing performed in the last 12 months. Soil sampling and testing should conform to University publication G9110, Sampling Your Soil for Testing; Soil Test Procedures for North Central Region (North Dakota Agricultural Experiment Bulletin 499-Revised); Methods of Soil Analysis, American Society of Agronomy, Inc.; Soil Testing and Plant Analysis, Soil Science Society of America, Inc.; EPA Methods; or other methods approved by the department. Attach extra sheets as necessary.

Total area sampled is 50 acres. Each composite sample covers 0.83 acres. Each composite consists of 60 subsamples.
 Sample depth: 0-6 inches 0-12 inches Other (describe) _____

Pollutant	Concentration (mg/kg or ppm)			Pounds/ Acre	No. Composite Samples	Sample Period
	Minimum	Maximum	Average			
Organic Nitrogen as N			1928 mg/k		1	March 2012
Ammonia Nitrogen as N			9.0 mg/kg		1	March 2012
Nitrate Nitrogen as N	4.0	9.0	6.5 ppm		2	* Date code (a)
Phosphorus as P (Bray 1P)	6	36	21 ppm		2	* Date Code (a)
Exchangeable Sodium %			0.5%		2	* Date Code (a)
Organic Matter (percent)	2.1	3.1	2.6%		2	* Date Code (a)
Cation Exchange Capacity	22.5	29.3	25.9		2	* Date Code (a)
pH (standard units)			6.9			

Other pollutants present in the material to be land applied: (Attach extra sheets as necessary)

Sulfer			9 mg/kg		1	March 2012
Potassium	250	268	259 mg/kg		2	* Date Code (a)
Manganese			8 mg/kg		1	March 2012
Iron			137 ppm		1	October 2011

6.00 LAND LIMITING CONSTITUENTS FOR LAND APPLICATION

6.10 Metals of Concern for Land Application. Complete information for each pollutant listed. Analysis results must be for "TOTAL METALS". (Do NOT use TCLP, dissolved, total recoverable or other extraction methods. Include all test results for the last 5 years and a minimum of 4 separate samples. *reported as dry weight basis*

Pollutant (total metals)	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					
Aluminum			999 mg/kg		Grab	1	sampled bottoms	03/12
Arsenic	30.7	40	28.3 mg/k		Grab	3	"	* (b)
Beryllium			ND		Grab	1	"	03/12
Cadium	ND	17.6	7.44 mg/k		Grab	3	"	* (b)
Chromium	ND	2.56	0.85 mg/k		Grab	3	"	* (b)
Copper	ND	4.64	1.55 mg/k		Grab	3	"	* (b)
Fluoride			34.1 mg/k		Grab	1	"	03/12
Lead	ND	1.36	0.45 mg/k		Grab	3	"	* (b)
Manganese	1859	10,100	4855 mg/k		Grab	3	"	* (b)
Mercury			N/D		Grab	3	"	* (b)
Molybdenum	ND	2.34	0.78 mg/k		Grab	3	"	* (b)
Nickel	ND	1.85	0.62 mg/k		Grab	3	"	* (b)
Selenium			ND		Grab	3	"	* (b)
Silver			ND		Grab	3	"	* (b)
Tin			ND		Grab	1	"	03/12
Zinc	ND	22.1	12.2 mg/k		Grab	3	"	* (b)

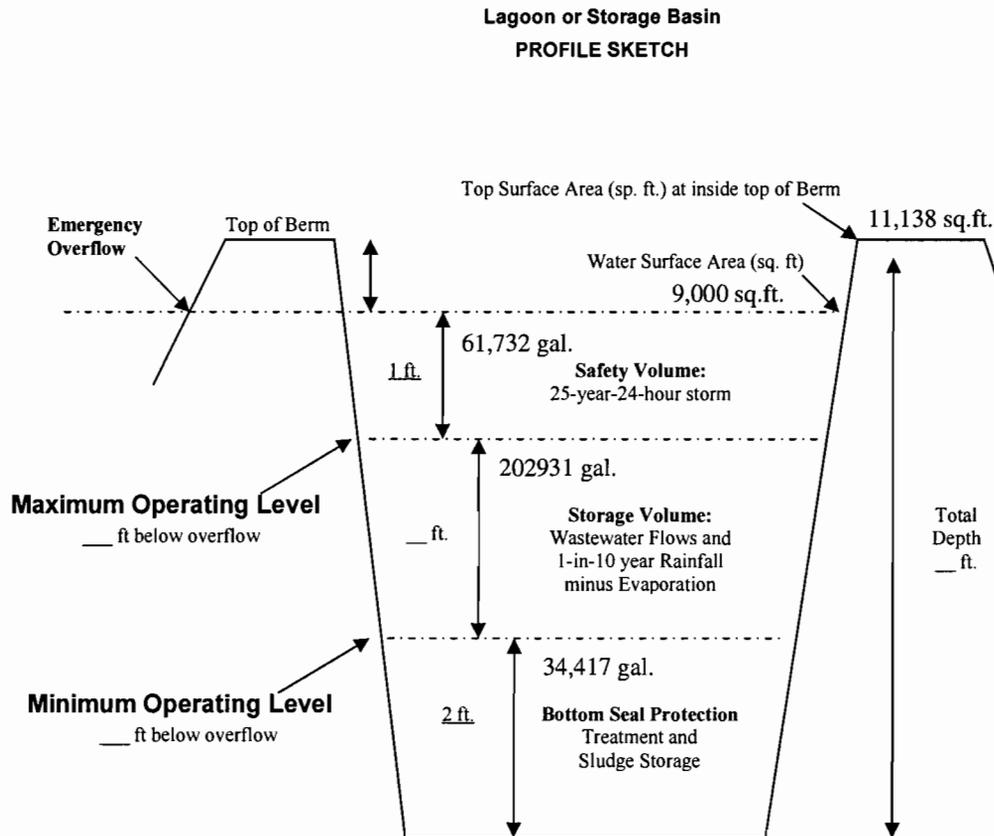
*date
Code

6.20 Major Pollutants of Concern for Land Application. Complete information for each pollutant listed. Include any other pollutants that are most limiting for determining land application rates. Attach extra sheets as necessary.

Organic Nitrogen as N	1800	2007	1928 mg/k		Grab	3	"	* (b)
Ammonia Nitrogen as N	188	631	348 mg/		Grab	3	"	* (b)
Nitrate Nitrogen as N	ND	60	20 mg/kg		Grab	3	"	* (b)
Total Nitrogen as N	2033	2630	2288 mg/k		Grab	3	"	* (b)
Plant Available Nitrogen (PAN)	742	1135	901 mg/kg		Grab	3	"	* (b)
Total Phosphorus as P	1333	20,900	16,149 mg		Grab	4	"	* (c)
Boron	ND	27	9 mg/kg		Grab	3	"	* (b)
Chlorides	922	8067	3100 mg/k		Grab	4	"	* (c)
Sodium	578	6160	2545 mg/k		Grab	4	"	* (c)
COD			2820 mg/l	(Mg/Liter)	Grab	1	"	03/12
TPH			322 mg/kg		Grab	1	"	03/12
Total Suspended Solids	1.5	17.67	8.22%		Grab	4	"	* (c)
Oil & Grease			not tested.		Grab	0	"	
Sodium Absorption Ration (SAR)			5.19		Grab	1	"	03/12
pH (standard units)	7.1	7.51	N/A		Grab	4	"	* (c)

ATTACHMENT A

(To be included with Form I and Form R)



DEFINITION OF TERMS (REFER TO THE PROFILE SKETCH ABOVE).

- a. Freeboard is depth from top of berm to emergency spillway (minimum 1 foot);
- b. Safety Volume is depth for 25-year, 24-hour storm (minimum of 1 foot);
- c. Maximum Operating Level is at bottom of the safety volume (minimum of 2 feet below top of berm).
- d. Minimum Operating Level is 2 feet above bottom of lagoon for seal protection per 10 CSR 20-8.
The minimum operating level may be greater than 2 feet when additional treatment volume is included.
- e. Storage Volume and days storage are based on the volume between Minimum and Maximum Operating Levels.
- f. Total Depth is from top of berm to bottom of basin including freeboard.

Operation and Maintenance Manual Land Application

Golden Triangle Energy, LLC
Craig, MO

NPDES Permit # MO-0126161 expiring Oct. 18, 2012
Special Condition #13 page 15
Revised March 13, 2012

Operation and Maintenance Plan

NPDES Special Condition #13 page 15

Land Application of Well Water Sludge
Golden Triangle Energy, Craig, MO

A. Detailed topographic map.

See attached map: GTE Land apply Google Map_120314.

B. Start up procedures, field supervision during operation, and shutdown procedures of irrigation equipment.

The employee applying the sludge will make sure the field is not saturated or frozen before setting-up the equipment. The plant environmental coordinator approves each land application event and records the appropriate data. The portable pump is then set-up next to the sludge settling ponds and the suction and discharge hoses are connected.

Option 1: A tank wagon is parked next to the ponds and the pump discharge hose is set into the wagon to fill. The pump suction hose is slowly moved along the bottom of the pond so as to uniformly remove the sludge blanket without stirring-up the solids. When the wagon is full, the driver hauls to the designated application area of the permitted field. The sludge is uniformly distributed to the land through a gravity spraybar applicator.

Option 2: A sludge dewatering bag is placed in a shallow bermed area lined with 10 mm polyethylene sheeting. Sludge from the bottom of the pond is pumped into the 15' by 100', 50 mesh, 300 micron filter bag. Filtered water from the bag is pumped back into the settling basin. When the free water has been filtered out of the sludge bag, the bag is cut open. A front end loader scoops the sludge from the bag and dumps it into an adjacent dump truck. The truck hauls the sludge to the designated section of the 50 acre land application site. The truck dumps the sludge in spaced intervals. A tractor with a blade attachment spreads the sludge thinly. A disc turns it into the top six inches of soil. This alternative was granted a one-time approval after which a permit revision would be required; reference Jimmy Coles, MDNR letter dated May 6, 2011.

The process is repeated until the sludge blanket has been removed from the ponds, or until the weather or land condition requires stopping the application process. At the completion of the land-apply event, the equipment is cleaned and returned to storage.

C. Procedures for providing the separation distances required by this permit and as specified in 10 CSR 20-8.020 (15) (B).

Each employee applying sludge will be aware of the separation distance away from any ditch or waterway per 10CSR 20-8.020 (15) (B). The topographic map was used to measure separation distances of 100' from the ditches and 50' from property lines. The set-backs are marked by landmarks and all sludge application drivers are instructed on the landmark locations.

D. Sample collection, preservation, and testing procedures.

Representative samples of each sludge application event are composited. At least 250 ml from each truck load is composited to a sample container. The sample containers are supplied by an approved EPA testing laboratory. Samples are then put in insulated coolers and packed with ice and shipped to the laboratory for analysis. For samples that are analyzed on site, the sample is stored in a refrigerator until the analysis is conducted using Standard Methods.

Samples are tested for the parameters listed for outfall 004 in the MDNR permit # MO-0126161. They are BOD5, TSS, pH, NH3, NO3/NO2, TKN, chloride, iron, available phosphorus, sodium, exchangeable sodium, cation exchange capacity, manganese, and boron.

E. Procedures for determining Plant Available Nitrogen (PAN) loading rates.

See calculation 1 in Section Q Nutrient Management Plan below.

F. Record keeping forms for tracking each field, tract and storage structure. This shall include testing results, crops, yields, and application rates for each field. Records for each field and tract shall include dates and amounts applied.

GTE will keep logs and records for the types of crops grown and yield. Also records will be kept for the number of loads and gallons and the date it was applied, where it was applied, percent solids, and dry tons.

See the attached: Land Apply LogSheet_120313.

G. A procedure for promptly reporting spills or discharges to the permittee plant manager and to DNR.

Any spills or discharges that occur into waterways or ditches will be immediately reported to the plant manager and environmental coordinator. The plant manager will report to MDNR. GTE will determine how the spill happened and the approximate quantity. GTE's spill prevention control and countermeasure plan (SPCC) will be activated if applicable.

H. A procedure for recording repair work on gravity sewer lines, recycle lines, and irrigation lines to include the reason for the repair work and the material used for the repair.

NA

I. A program to eliminate debris and blockages of sewer lines and recycle lines and to keep debris out of storage structures.

NA

J. A procedure for routine visual inspections of the storage and irrigation system for overflows or other operational problems.

The lagoons where the sludge is stored will be inspected daily along with the inspections required by the SPCC Plan. The pond water is observed for the absence pin floc scouring up from the sludge blanket to the overflow pipe. Sludge blanket depth is measured and recorded quarterly. When the blanket reaches a design depth of two feet, it is removed and land applied. Erosion control inspection includes cutting weeds from the normally seeded grassy dike exterior. Rip rap is observed for cleanliness and effectiveness as a lining for the inside of the dike. The pond fence and warning sign are observed.

The land application site inspection includes field observation during an unusually heavy rainfall. Any emergency runoff observed will be sampled for lab analysis. The total perimeter of the field where any sludge has been applied will be inspected. Evidence of any erosion that may have been caused by water runoff will be documented and subsequently corrected. General soil color and any rusty discoloration will be noted. Drainage ditches that run parallel to the field will be inspected for any evidence of runoff.

K. A program for routine, unannounced inspections of land application sites and records to ensure that all directives for land application from the permittee's central office are being followed. Records of the inspections shall be maintained by the permittee and made available to the department upon request.

GTE will inspect the lagoons and the land application site to make sure there is not any runoff and to make sure we are in compliance with our permit regulations. A log of inspections will be kept.

L. A procedure to assure that all appropriate employees are properly trained in operation of the waste systems and are familiar with the O&M Manual.

All employees responsible for spreading sludge will be trained on the application procedure. They will be trained on how to run the spreader, where to apply the

sludge, how far away from any waterways or ditches, when and when not to apply. They will also have read and understood the O&M manual.

M. Procedure for adjusting application periods and rates based on soil infiltration capacity, soil moisture content, and percent of soil field (saturation) capacity

GTE will normally apply approximately two times a year, usually in April or May and October or November. GTE will only apply when ground is suitable. GTE will not apply if ground is saturated or frozen.

N. List of number, size, and capacity of waste removal, hauling and land application equipment.

1. A 1,034 gallon honey wagon tank to haul and spread the sludge. The number of loads per application will vary based on how much sludge was accumulated since the last hauling.
2. Fill pump is rated at 25 gpm and has connection size of 1 1/4" x 1".
3. Sludge dewatering bag, 15' diameter by 100' long, 50 micron openings.
4. Rental grinder pump.
5. GTE front end loader used to empty the sludge bag.
6. Rental dump truck to haul sludge to land and dump.
7. Rental tractor with spreader blade and with disc for incorporating sludge.

O. Number of suitable days each year when land application will occur based on historical one in ten year wettest precipitation and capacity of spreading equipment and personnel available.

Calculation: 365 days - 90 frozen days – 30 wet days = 245 suitable application days.

P. Procedure to avoid application if there is a weather forecast for significant precipitation within 24 hours.

GTE will not land-apply until weather is permitting. The ponds have sludge storage capacity.

Q. Nutrient Management Plan.

The nutrient management plan procedure follows NPDES special conditions #11 and #12 on pages 11- 14.

S.C. #11 Nutrient management:

- a. Nitrogen; the amount of sludge applied is limited by the plant available nitrogen (PAN) applied to the crop bearing soils. See calculations in S.C. #12 PAN procedure below.

- b. Phosphorus; the soil must be tested annually for Bray-1 phosphorus content. If the content is < 120 lb/acre, the sludge application is not limited by phosphorus. If > 120 lb/acre, then agronomic uptake rates of phosphorus become limiting. Converting 120 lb/acre to ppm using 43,560 sq ft/acre, and 70 lb/cu ft soil weight, and the top 6" of soil as the agronomic active zone, the 120 lb/acre is equal to 78.7 ppm or mg/kg Bray 1 phosphorus.
 - i. Sept. 19, 2005 Midwest Labs report #5-264-0141, 29 ppm phosphorus Bray -1.
 - ii. Oct. 7, 2011 Midwest Labs report #11-280-0959, 36 ppm phosphorus Bray -1.

Conclude: Phosphorus is not limiting based on soil test results since the last permit renewal.

- c. Actual sludge application rates will be managed based on the soil test results and the crop yields.
 - i. 2011 Crop yield on the GTE application site was 30 bushels/acre because the fields were flooded from the Missouri River.
 - ii. Historical crop yield is 30 Bu/acre soybeans or 113 Bu/acre corn. Crops are rotated every other year.
- d. This nutrient management plan will be modified after the EPA issues a new Comprehensive Nutrient Management Plan to replace the PAN and phosphorus methods.

S.C. #12 Plant Available Nitrogen procedure (PAN):

- a. Allowable wastewater, sludge, and fertilizer nitrogen applications shall not exceed crop uptake rates. The calculation equation is

$$\text{PAN allowable} = \text{CNR} - \text{SRN} - \text{CFN}$$

Where,

PAN = plant available nitrogen, lb N/acre

CNR = crop uptake, lb N/acre

SRN = soil residual nitrogen, lb N/acre

CFN = commercial (or other) fertilizer nitrogen lb N/acre.

- b. PAN available from sludge = (ammonia N * f_{NH_3}) + (organic N * $f_{\text{Org. N}}$) + (nitrate n * f_{NO_2}).
- c. PAN availability factors are
 $f_{\text{Org. N}} = 0.35$ for over 3 years application from an aerobic lagoon.

$f_{\text{NH}_3} = 0.6$ for surface application
 $f_{\text{NO}_2} = 0.9$ for surface application.

- i. Dec. 7, 2005 Midwest Labs report #10-347-2209, sludge
NH₃ = 513 mg/kg dry
TKN = 3945 mg/kg dry
Organic N = 3432 mg/kg dry
- ii. Oct. 13, 2011 Midwest Labs report #11-305-2151, sludge
NH₃ = 188 mg/kg dry
NO₃ = 60 mg/kg dry
Organic N = 1800 mg/kg dry
- iii. Oct. 5, 2011 Midwest Labs report #11-290-2068, sludge
NH₃ = 225 mg/kg dry
NO₃ = 0 mg/kg dry
Organic N = 1977 mg/kg dry

Calculated averages from test data on sludge,
NH₃ = $(513 + 188 + 225) / 3 = 309$ mg/kg dry
NO₃ = $(60 + 0) / 2 = 30$ mg/kg dry
Organic N = $(3432 + 1800 + 1977) / 3 = 2403$ mg/kg dry

PAN available from sludge = (ammonia N * f_{NH_3}) + (organic N * $f_{\text{Org. N}}$) + (nitrate N * f_{NO_2}) = $(309 * 0.6) + (2403 * 0.35) + (30 * 0.9) = 1053.45$ mg/kg dry applied.

Amount of sludge applied; reference GTE "Land Apply Logsheet_120313":

2005	8.5 dry tons
2006	11.8
2007	15.9
2008	8.2
2009	385.2
2010	257.1
2011	16.7
Average	100.5 dry tons/year generated/applied.

PAN available from sludge generated/applied = $(1053.45 \text{ mg/kg}) * (100.5 \text{ ton/yr} * 2000 \text{ lb/ton}) / 1,000,000 = 211.7$ lb N/year.

PAN available from sludge generated/applied over 50 acres = $211.7 \text{ lb} / 50 \text{ acres} = 4.23$ lb N / acre-year.

CFN available from wastewater fertilizer = (ammonia N * f_{NH_3}) + (organic N * $f_{Org. N}$) + (nitrate n * f_{NO_2}).

- i. Jan. 20, 2005 Midwest Labs report #05-027-2087, syrup
NH3 = 68.7 mg/l wet
NO3 = 18.3 mg/l wet
Organic N = 5533 mg/l wet
- ii. Jan. 5, 2004 Midwest Labs report #04-009-2141, thin stillage
NH3 = 8.11 mg/l wet
NO3 = 0.3 mg/l wet
Organic N = 1954 mg/l wet
- iii. Jan. 5, 2004 Midwest Labs report #04-009-2138, evaporator condensate
NH3 = 0.19 mg/l wet
NO3 = 0 mg/l wet
Organic N = 1.16 mg/l wet

CFN calculated averages from test data on wastewater fertilizer,
NH3 = $(68.7 + 8.11 + 0.19) / 3 = 25.7$ mg/l wet
NO3 = $(18.3 + 0.3 + 0) / 3 = 6.2$ mg/l wet
Organic N = $(5533 + 1954 + 1.16) / 3 = 2496$ mg/l wet

CFN available from wastewater fertilizer = (ammonia N * f_{NH_3}) + (organic N * $f_{Org. N}$) + (nitrate N * f_{NO_2}) = $(25.7 * 0.6) + (2496 * 0.35) + (6.2 * 0.9) = 894.6$ mg/l wet applied.

Amount of wastewater fertilizer applied; reference GTE "Missouri Semi-Annual Fertilizer Tonnage Report":

2005	357 wet tons	85,112 gallons
2006	567	135,971
2007	99	23,741
2008	359	86,091
2009	366	87,770
2010	268	64,269
2011	28	6,715

Average 69,953 gallons/year generated/applied.

CFN available from wastewater fertilizer generated/applied = $(894.6 \text{ mg/l}) * 8.34 \text{ lb/gal} * 69,953 / 1,000,000 \text{ million gal /yr} = 521.9 \text{ lb N/year}$.

CFN available from wastewater fertilizer generated/applied over 50 acres = $521.9 \text{ lb} / 50 \text{ acres} = 10.4 \text{ lb N / acre-year}$.

CFN available from commercial fertilizer application: Reference invoice from Drewes Farms, Inc. for crop year 2011. 13,167 lb anhydrous ammonia applied over 63 acres. CFN available from Drewes commercial fertilizer disc ripped application = $13,167 \text{ lb}/63 \text{ acres} = (209 \text{ lb NH}_3/\text{acre}) * 14/17 = 172 \text{ lb N/acre}$.

d. Soil residual nitrogen (SRN).

For annual crops,

$\text{SRN lb N/acre} = \% \text{ organic matter} * \text{soil availability factor}$

- i. Sept. 19, 2005 Midwest Labs report #5-264-0141, 2.7% organic matter.
- ii. Oct. 7, 2011 Midwest Labs report #11-280-0959, 3.1% organic matter.
- iii. Soil availability factor for summer annual crops and cation exchange capacity (CEC) $>18 = 10$; per NPDES page 13 table.

$\text{SRN lb N/acre} = (2.7 + 3.1)/2 * 10 = 29.0 \text{ lb N/acre}$.

e. Crop nitrogen requirement (CNR)

Ref. Metcalf & Eddy, 2003, Eq. 14-37 page 1615 and EPA 1981, "Process Design Manual for Land Treatment of Municipal Wastewater."

Corn uptake rate = 155 to 180 lb N/acre and soybeans = 220 lb N/acre. Use an average 194 lb N/acre for corn and soybeans crop rotation every other year.

Summary:

1. PAN plant available nitrogen applied from sludge = 4.2 lb N/acre.
2. CFN commercial fertilizer nitrogen applied from wastewater fertilizer = 10.4 lb N/acre.
3. SRN soil residual nitrogen from soil testing = 29.0 LB N/acre.
4. CNR crop nitrogen requirement = 194 lb N/acre.
5. CFN commercial fertilizer from purchased anhydrous ammonia = $(194 - 4.2 - 10.4 - 29.0) = 150.4 \text{ lb N/acre}$.

Conclude:

1. The PAN available from sludge applied was 4.2 lb N/acre and the CFN due to wastewater fertilizer application was 10.4 lb N/acre. In order to satisfy an average crop nitrogen requirement (CRN) of 194 lb N/acre when the soil residual nitrogen (SRN) is 29 lb N/acre, the purchased commercial anhydrous ammonia should be controlled not to exceed the plant available nitrogen requirement. For the

reporting period the CFN commercial fertilizer available nitrogen applied from purchased anhydrous ammonia was 172 lb N/acre. An excess of $172 - 150.4 = 21.6$ lb N/acre was applied.

2. Phosphorus does not limit sludge and wastewater fertilizer applications based on soil test results that showed <78 mg/kg or <120 lb Bray-1 P per acre.

Annual Reporting for NPDES:

1. Section 1 is the application amounts. Example for 2011, 97 cu yd were applied from the sludge dewatering bag. The solids were 17.67% and the weight applied was 16.7 dry tons. The wastewater fertilizer applied was 28 tons or 6,715 gallons. The commercial purchased anhydrous ammonia addition was 13,167 lb over 63 acres.
2. Reporting Section 2 is the plant available nitrogen (PAN) calculations. Use the model calculations above, for each year's report but supplying data for the reporting year. Add commercial purchased anhydrous ammonia based on the calculated amount needed.
3. Section 3 is the crop removal rate for the reporting year. For example, the historical average was 30 Bu/acre soybeans or 113 Bu/acre corn. Corn was planted in 2012; the yield was 30 Bu/acre. Reference Golden Triangle Energy phone on 3-12-2012.
4. Maintain the record keeping data on "Land Apply Logsheet_120313", see attachment 1.

References:

1. NPDES permit # MO-0126161, expires Oct. 18, 2012.
2. Metcalf & Eddy, "Wastewater Engineering Treatment and Reuse" 4th Ed. 2003.

Attachments:

1. GTE Land Apply Google Map_120314.
2. Land Apply LogSheet_120313.
3. 2005 to 2011; GTE: "Missouri Semi-Annual Fertilizer Tonnage Report".
4. Jan. 5, 2004 Midwest Labs report #04-009-2141, thin stillage
5. Jan. 5, 2004 Midwest Labs report #04-009-2138, evaporator condensate
6. Jan. 20, 2005 Midwest Labs report #05-027-2087, syrup.
7. Sept. 19, 2005 Midwest Labs report #5-264-0141, soil.
8. Dec. 7, 2005 Midwest Labs report #10-347-2209, sludge
9. Oct. 13, 2011 Midwest Labs report #11-305-2151, sludge

Golden Triangle Energy, LLC
O&M Land Apply

March 2012

10. Oct. 5, 2011 Midwest Labs report #11-290-2068, sludge
11. Oct. 7, 2011 Midwest Labs report #11-280-0959, soil.

a. Outfall 001, Inovatia Labs, 03-16-12



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ANALYSIS REPORT

Client Information:
Golden Triangle Energy
15053 Highway 59
Craig, MO 64437
Attn: Steve Doughty

Date Received: March 16, 2012 **Chain of Custody Number:** I2-0235
Time Received: 11:15 **Project Name:** NPDES 2012
Relinquished by: UPS **Project Number:** N/A
Sampler: Steve Doughty **Sample Number:** BOD
Sample Matrix: Water **Lab Number:** I21334
Sample Type: N/A **Page:** 2 of 3

Analysis	Result	Units	Reporting Limit	Analysis Method	Date - Analyst
Biochemical Oxygen Demand (5-day)	11.1	mg/L	2	SM 5210	3/16/2012 - DS
Chemical Oxygen Demand (COD)	35	mg/L	5	ASTM D1252-95-B	3/20/2012 - MWL
Nitrogen, Ammoniacal	< 0.10	mg/L	0.10	SM 4500-NH3 C	3/22/2012 - MWL
Nitrogen, Nitrate-Nitrite	5.6	mg/L	0.2	EPA 353.2	3/21/2012 - MWL
Nitrogen, Organic	2.04	mg/L	n/a	Calculation	3/17/2012 - MWL
Hexane Extractable Material (HEM)	< 5	mg/L	5	EPA 1664 A	3/22/2012 - JM/RT
Total Suspended Solids (TSS)	39	mg/L	5	SM 2540 D	3/22/2012 - DS
Total Organic Carbon (TOC)	9.5	mg/L	1.0	SM 5310 B	3/21/2012 - MWL
Sulfide	< 1.0	mg/L	1.0	SM 4500S F	3/22/2012 - MWL
Sulfite	< 2	mg/L	2	SM 4500 SO3 B	3/19/2012 - MWL
Sulfate	162	mg/L	10	EPA 300.0	3/19/2012 - MWL
Boron, Total	0.176	mg/L	0.075	EPA 200.8	3/22/2012 - DS
Magnesium, Total	90.7	mg/L	2.00	EPA 200.8	3/26/2012 - DS
Aluminum, Total	0.512	mg/L	0.030	EPA 200.8	3/26/2012 - DS
Phosphorus, Total	0.379	mg/L	0.150	EPA 200.8	3/22/2012 - DS
Manganese, Total	0.717	mg/L	0.150	EPA 200.8	3/26/2012 - DS
Iron, Total	< 0.200	mg/L	0.200	EPA 200.8	3/26/2012 - DS
Cobalt, Total	< 0.015	mg/L	0.015	EPA 200.8	3/26/2012 - DS
Molybdenum, Total	< 0.020	mg/L	0.020	EPA 200.8	3/26/2012 - DS
Tin, Total	< 0.015	mg/L	0.015	EPA 200.8	3/26/2012 - DS
Barium, Total	0.287	mg/L	0.015	EPA 200.8	3/26/2012 - DS
Benzene	< 5	ug/L	5	EPA 8260B	3/19/2012 - JM/RT

Notes:

J - The analyte was positively identified; the associated value is the approximate concentration.

03/30/12
Date

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ANALYSIS REPORT

Client Information:
Golden Triangle Energy
15053 Highway 59
Craig, MO 64437
Attn: Steve Doughty

Date Received: March 16, 2012 **Chain of Custody Number:** 12-0235
Time Received: 11:15 **Project Name:** NPDES 2012
Relinquished by: UPS **Project Number:** N/A
Sampler: Steve Doughty **Sample Number:** BOD
Sample Matrix: Water **Lab Number:** 121334
Sample Type: N/A **Page:** 3 of 3

Analysis	Result	Units	Reporting Limit	Analysis Method	Date - Analyst
Toluene	< 5	ug/L	5	EPA 8260B	3/19/2012 - JM/RT
Ethylbenzene	< 5	ug/L	5	EPA 8260B	3/19/2012 - JM/RT

Notes:

03/30/12
Date

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b. Outfall 002, Pace Labs, 04-02-12



ANALYTICAL RESULTS

Project: Monthly NPDES
 Pace Project No.: 60118682

Sample: OUTFALL #002		Lab ID: 60118682001	Collected: 04/03/12 13:00	Received: 04/04/12 10:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010						
Aluminum	90.5	ug/L	75.0	1	04/06/12 09:15	04/10/12 16:46	7429-90-5	
Barium	605	ug/L	10.0	1	04/06/12 09:15	04/11/12 15:12	7440-39-3	
Boron	290	ug/L	100	1	04/06/12 09:15	04/10/12 16:46	7440-42-8	
Molybdenum	ND	ug/L	20.0	1	04/06/12 09:15	04/11/12 15:12	7439-98-7	
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	10	mg/L	5.0	1		04/05/12 08:55		
4500CL G Chlorine, Residual		Analytical Method: SM 4500-Cl G						
Chlorine, Total Residual	ND	mg/L	0.050	1		04/04/12 12:53	7782-50-5	H6
4500SO3B Sulfite, Iodometric		Analytical Method: SM 4500-SO3 B						
Sulfite	ND	mg/L	2.0	1		04/04/12 15:30		H6
5210B BOD, 5 day		Analytical Method: SM 5210B Preparation Method: SM 5210B						
BOD, 5 day	3.9	mg/L	2.0	1	04/05/12 07:30	04/10/12 09:50		
5540C MBAS Surfactants		Analytical Method: SM 5540C						
Surfactants	ND	mg/L	0.20	1		04/05/12 12:07		SU
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Fluoride	0.75	mg/L	0.20	1		04/07/12 23:00	16984-48-8	
350.1 Ammonia		Analytical Method: EPA 350.1						
Nitrogen, Ammonia	0.24	mg/L	0.10	1		04/06/12 11:18	7664-41-7	
410.4 COD		Analytical Method: EPA 410.4						
Chemical Oxygen Demand	19.9	mg/L	10.0	1		04/11/12 15:09		
5310C TOC		Analytical Method: SM 5310C						
Total Organic Carbon	5.8	mg/L	1.0	1		04/06/12 23:08	7440-44-0	

c. Outfall 003, Pace Labs, 04-03-12



ANALYTICAL RESULTS

Project: Monthly NPDES
 Pace Project No.: 60118682

Sample: OUTFALL #003		Lab ID: 60118682002	Collected: 04/03/12 13:00	Received: 04/04/12 10:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010						
Aluminum	ND	ug/L	75.0	1	04/06/12 09:15	04/10/12 16:48	7429-90-5	
Barium	486	ug/L	10.0	1	04/06/12 09:15	04/11/12 15:15	7440-39-3	
Boron	196	ug/L	100	1	04/06/12 09:15	04/10/12 16:48	7440-42-8	
Molybdenum	ND	ug/L	20.0	1	04/06/12 09:15	04/11/12 15:15	7439-98-7	
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	16.0	mg/L	5.0	1		04/05/12 08:55		
4500CL G Chlorine, Residual		Analytical Method: SM 4500-Cl G						
Chlorine, Total Residual	0.080	mg/L	0.050	1		04/04/12 12:54	7782-50-5	H6
4500SO3B Sulfite, Iodometric		Analytical Method: SM 4500-SO3 B						
Sulfite	ND	mg/L	2.0	1		04/04/12 15:30		H6
5210B BOD, 5 day		Analytical Method: SM 5210B Preparation Method: SM 5210B						
BOD, 5 day	6.7	mg/L	2.0	1	04/05/12 07:30	04/10/12 09:52		
5540C MBAS Surfactants		Analytical Method: SM 5540C						
Surfactants	ND	mg/L	0.20	1		04/05/12 12:13		SU
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Fluoride	0.64	mg/L	0.20	1		04/07/12 23:16	16984-48-8	
350.1 Ammonia		Analytical Method: EPA 350.1						
Nitrogen, Ammonia	ND	mg/L	0.10	1		04/06/12 11:19	7664-41-7	
410.4 COD		Analytical Method: EPA 410.4						
Chemical Oxygen Demand	110	mg/L	10.0	1		04/11/12 15:10		
5310C TOC		Analytical Method: SM 5310C						
Total Organic Carbon	6.8	mg/L	1.0	1		04/06/12 23:22	7440-44-0	

d. Outfalls 002 & 003, Pace Analytical, TTO test results for 2007



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

September 06, 2007

Mr. Steve Doughty
Golden Triangle Energy
15053 Hwy. 111
Craig, MO 64437

RE: Project: Aug-07
Pace Project No.: 6026808 *TTO (002/003)*

Dear Mr. Doughty:

Enclosed are the analytical results for sample(s) received by the laboratory on August 08, 2007. 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 questions concerning this report, please feel free to contact me.

Sincerely,

Angie Brown

Angie.Brown@pacelabs.com
Project Manager

A2LA Certification Number: 2456.01
Arkansas Certification Number: 05-008-0
Illinois Certification Number: 001191
Iowa Certification Number: 118
Kansas/NELAP Certification Number: E-10116
Louisiana Certification Number: 03055
Oklahoma Certification Number: 9205/9935
Utah Certification Number: 9135995665

Enclosures

REPORT OF LABORATORY ANALYSIS

Page 1 of 24

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Pace Analytical Services, Inc.
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Lenexa, KS 66219
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SAMPLE SUMMARY

Project: Aug-07
Pace Project No.: 6026808

Lab ID	Sample ID	Matrix	Date Collected	Date Received
6026808001	OUTFALL #002	Water	08/07/07 10:00	08/08/07 09:40
6026808002	OUTFALL #003	Water	08/07/07 10:00	08/08/07 09:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Aug-07
Pace Project No.: 6026808

Lab ID	Sample ID	Method	Analytes Reported
6026808001	OUTFALL #002	EPA 608	27
		EPA 624 Low	49
		EPA 625	63
		SM 2340C	1
6026808002	OUTFALL #003	EPA 608	27
		EPA 624 Low	49
		EPA 625	63
		SM 2340C	1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: **OUTFALL #002** Lab ID: **6026808001** Collected: 08/07/07 10:00 Received: 08/08/07 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
608SF GCS Pesticides and PCBs Analytical Method: EPA 608 Preparation Method: EPA 608 SF								
Aldrin	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	309-00-2	
alpha-BHC	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	319-84-6	
beta-BHC	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	319-85-7	
delta-BHC	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	58-89-9	
Chlordane (Technical)	ND	ug/L	0.20	1	08/14/07 00:00	08/30/07 05:50	57-74-9	
4,4'-DDD	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	72-54-8	
4,4'-DDE	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	72-55-9	
4,4'-DDT	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	50-29-3	
Dieldrin	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	60-57-1	
Endosulfan I	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	959-98-8	
Endosulfan II	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	1031-07-8	
Endrin	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	72-20-8	
Endrin aldehyde	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 05:50	7421-93-4	
Heptachlor	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	76-44-8	
Heptachlor epoxide	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 05:50	1024-57-3	
PCB-1016 (Aroclor 1016)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 05:50	11096-82-5	
Toxaphene	ND	ug/L	2.5	1	08/14/07 00:00	08/30/07 05:50	8001-35-2	
Tetrachloro-m-xylene (S)	79 %		40-105	1	08/14/07 00:00	08/30/07 05:50	877-09-8	
Decachlorobiphenyl (S)	102 %		44-118	1	08/14/07 00:00	08/30/07 05:50	2051-24-3	

625 MSSV Analytical Method: EPA 625 Preparation Method: EPA 625								
Acenaphthene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	83-32-9	
Acenaphthylene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	208-96-8	
Anthracene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	120-12-7	
Benzidine	ND	ug/L	50.0	1	08/13/07 00:00	08/18/07 20:29	92-87-5	
Benzo(a)anthracene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	56-55-3	
Benzo(a)pyrene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	207-08-9	
4-Bromophenylphenyl ether	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	101-55-3	
Butylbenzylphthalate	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	59-50-7	
bis(2-Chloroethoxy)methane	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	6.0	1	08/13/07 00:00	08/18/07 20:29	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	6.0	1	08/13/07 00:00	08/18/07 20:29	39638-32-9	
2-Chloronaphthalene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	91-58-7	
2-Chlorophenol	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:29	7005-72-3	

Date: 09/06/2007 01:37 PM

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: OUTFALL #002	Lab ID: 6026808001	Collected: 08/07/07 10:00	Received: 08/08/07 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

625 MSSV

Analytical Method: EPA 625 Preparation Method: EPA 625

Chrysene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	218-01-9	
Dibenz(a,h)anthracene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	53-70-3	
1,2-Dichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	95-50-1	
1,3-Dichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	541-73-1	
1,4-Dichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	106-46-7	
3,3'-Dichlorobenzidine	ND ug/L		20.0	1	08/13/07 00:00	08/18/07 20:29	91-94-1	
2,4-Dichlorophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	120-83-2	
Diethylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	84-66-2	
2,4-Dimethylphenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	105-67-9	
Dimethylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	131-11-3	
Di-n-butylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	84-74-2	
4,6-Dinitro-2-methylphenol	ND ug/L		25.0	1	08/13/07 00:00	08/18/07 20:29	534-52-1	
2,4-Dinitrophenol	ND ug/L		50.0	1	08/13/07 00:00	08/18/07 20:29	51-28-5	
2,4-Dinitrotoluene	ND ug/L		6.0	1	08/13/07 00:00	08/18/07 20:29	121-14-2	
2,6-Dinitrotoluene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	606-20-2	
Di-n-octylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	117-84-0	
1,2-Diphenylhydrazine	ND ug/L		8.0	1	08/13/07 00:00	08/18/07 20:29	122-66-7	
bis(2-Ethylhexyl)phthalate	5.8 ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	117-81-7	
Fluoranthene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	206-44-0	
Fluorene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	86-73-7	
Hexachloro-1,3-butadiene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	87-68-3	
Hexachlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	118-74-1	
Hexachlorocyclopentadiene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	77-47-4	
Hexachloroethane	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	67-72-1	
Indeno(1,2,3-cd)pyrene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	193-39-5	
Isophorone	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	78-59-1	
Naphthalene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	91-20-3	
Nitrobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	98-95-3	
2-Nitrophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	88-75-5	
4-Nitrophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	100-02-7	
N-Nitrosodimethylamine	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	62-75-9	
N-Nitroso-di-n-propylamine	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	621-64-7	
N-Nitrosodiphenylamine	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	86-30-6	
Pentachlorophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	87-86-5	
Phenanthrene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	85-01-8	
Phenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	108-95-2	
Pyrene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	129-00-0	
1,2,4-Trichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	120-82-1	
2,4,6-Trichlorophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:29	88-06-2	
Nitrobenzene-d5 (S)	90 %		38-104	1	08/13/07 00:00	08/18/07 20:29	4165-60-0	
2-Fluorobiphenyl (S)	94 %		44-106	1	08/13/07 00:00	08/18/07 20:29	321-60-8	
Terphenyl-d14 (S)	101 %		7-147	1	08/13/07 00:00	08/18/07 20:29	1718-51-0	
Phenol-d6 (S)	95 %		18-125	1	08/13/07 00:00	08/18/07 20:29	13127-88-3	
2-Fluorophenol (S)	23 %		30-101	1	08/13/07 00:00	08/18/07 20:29	367-12-4	1e
2,4,6-Tribromophenol (S)	101 %		46-129	1	08/13/07 00:00	08/18/07 20:29	118-79-6	





ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: **OUTFALL #002** Lab ID: **6026808001** Collected: 08/07/07 10:00 Received: 08/08/07 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics LowLevel		Analytical Method: EPA 624 Low						
Acetone	ND	ug/L	10.0	1		08/15/07 16:39	67-64-1	
Acrolein	ND	ug/L	100	1		08/15/07 16:39	107-02-8	
Acrylonitrile	ND	ug/L	20.0	1		08/15/07 16:39	107-13-1	
Benzene	ND	ug/L	1.0	1		08/15/07 16:39	71-43-2	
Bromodichloromethane	ND	ug/L	1.0	1		08/15/07 16:39	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/15/07 16:39	75-25-2	
Bromomethane	ND	ug/L	1.0	1		08/15/07 16:39	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		08/15/07 16:39	78-93-3	
Carbon disulfide	ND	ug/L	10.0	1		08/15/07 16:39	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		08/15/07 16:39	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/15/07 16:39	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/15/07 16:39	75-00-3	
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		08/15/07 16:39	110-75-8	
Chloroform	ND	ug/L	1.0	1		08/15/07 16:39	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/15/07 16:39	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		08/15/07 16:39	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/15/07 16:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/15/07 16:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/15/07 16:39	106-46-7	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/15/07 16:39	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/15/07 16:39	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		08/15/07 16:39	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/15/07 16:39	75-35-4	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/15/07 16:39	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/15/07 16:39	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/15/07 16:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/15/07 16:39	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		08/15/07 16:39	100-41-4	
2-Hexanone	ND	ug/L	10.0	1		08/15/07 16:39	591-78-6	
Methylene chloride	ND	ug/L	1.0	1		08/15/07 16:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		08/15/07 16:39	108-10-1	
Styrene	ND	ug/L	1.0	1		08/15/07 16:39	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/15/07 16:39	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		08/15/07 16:39	127-18-4	
Toluene	ND	ug/L	1.0	1		08/15/07 16:39	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/15/07 16:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/15/07 16:39	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/15/07 16:39	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/15/07 16:39	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		08/15/07 16:39	76-13-1	
Vinyl chloride	ND	ug/L	1.0	1		08/15/07 16:39	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		08/15/07 16:39	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		08/15/07 16:39	1330-20-7	
o-Xylene	ND	ug/L	1.0	1		08/15/07 16:39	95-47-6	
4-Bromofluorobenzene (S)	98 %		85-115	1		08/15/07 16:39	460-00-4	
Dibromofluoromethane (S)	102 %		86-115	1		08/15/07 16:39	1868-53-7	
Toluene-d8 (S)	102 %		84-111	1		08/15/07 16:39	2037-26-5	

Date: 09/06/2007 01:37 PM

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: OUTFALL #002		Lab ID: 6026808001	Collected: 08/07/07 10:00	Received: 08/08/07 09:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics LowLevel	Analytical Method: EPA 624 Low							
1,2-Dichloroethane-d4 (S)	107 %		80-113	1		08/15/07 16:39	17060-07-0	
Preservation pH	1.0			1		08/15/07 16:39		
2340C Hardness, Total	Analytical Method: SM 2340C							
Total Hardness	1280 mg/L		1.0	1		08/13/07 00:00		





ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: **OUTFALL #003** Lab ID: **6026808002** Collected: 08/07/07 10:00 Received: 08/08/07 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
608SF GCS Pesticides and PCBs Analytical Method: EPA 608 Preparation Method: EPA 608 SF								
Aldrin	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	309-00-2	
alpha-BHC	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	319-84-6	
beta-BHC	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	319-85-7	
delta-BHC	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	58-89-9	
Chlordane (Technical)	ND	ug/L	0.20	1	08/14/07 00:00	08/30/07 06:08	57-74-9	
4,4'-DDD	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	72-54-8	
4,4'-DDE	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	72-55-9	
4,4'-DDT	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	50-29-3	
Dieldrin	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	60-57-1	
Endosulfan I	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	959-98-8	
Endosulfan II	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	1031-07-8	
Endrin	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	72-20-8	
Endrin aldehyde	ND	ug/L	0.10	1	08/14/07 00:00	08/30/07 06:08	7421-93-4	
Heptachlor	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	76-44-8	
Heptachlor epoxide	ND	ug/L	0.050	1	08/14/07 00:00	08/30/07 06:08	1024-57-3	
PCB-1016 (Aroclor 1016)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	1.0	1	08/14/07 00:00	08/30/07 06:08	11096-82-5	
Toxaphene	ND	ug/L	2.5	1	08/14/07 00:00	08/30/07 06:08	8001-35-2	
Tetrachloro-m-xylene (S)	76 %		40-105	1	08/14/07 00:00	08/30/07 06:08	877-09-8	
Decachlorobiphenyl (S)	112 %		44-118	1	08/14/07 00:00	08/30/07 06:08	2051-24-3	

625 MSSV Analytical Method: EPA 625 Preparation Method: EPA 625								
Acenaphthene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	83-32-9	
Acenaphthylene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	208-96-8	
Anthracene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	120-12-7	
Benzidine	ND	ug/L	50.0	1	08/13/07 00:00	08/18/07 20:54	92-87-5	
Benzo(a)anthracene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	56-55-3	
Benzo(a)pyrene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	207-08-9	
4-Bromophenylphenyl ether	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	101-55-3	
Butylbenzylphthalate	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	59-50-7	
bis(2-Chloroethoxy)methane	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	6.0	1	08/13/07 00:00	08/18/07 20:54	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	6.0	1	08/13/07 00:00	08/18/07 20:54	39638-32-9	
2-Chloronaphthalene	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	91-58-7	
2-Chlorophenol	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	5.0	1	08/13/07 00:00	08/18/07 20:54	7005-72-3	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: OUTFALL #003	Lab ID: 6026808002	Collected: 08/07/07 10:00	Received: 08/08/07 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

625 MSSV

Analytical Method: EPA 625 Preparation Method: EPA 625

Chrysene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	218-01-9	
Dibenz(a,h)anthracene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	53-70-3	
1,2-Dichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	95-50-1	
1,3-Dichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	541-73-1	
1,4-Dichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	106-46-7	
3,3'-Dichlorobenzidine	ND ug/L		20.0	1	08/13/07 00:00	08/18/07 20:54	91-94-1	
2,4-Dichlorophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	120-83-2	
Diethylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	84-66-2	
2,4-Dimethylphenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	105-67-9	
Dimethylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	131-11-3	
Di-n-butylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	84-74-2	
4,6-Dinitro-2-methylphenol	ND ug/L		25.0	1	08/13/07 00:00	08/18/07 20:54	534-52-1	
2,4-Dinitrophenol	ND ug/L		50.0	1	08/13/07 00:00	08/18/07 20:54	51-28-5	
2,4-Dinitrotoluene	ND ug/L		6.0	1	08/13/07 00:00	08/18/07 20:54	121-14-2	
2,6-Dinitrotoluene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	606-20-2	
Di-n-octylphthalate	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	117-84-0	
1,2-Diphenylhydrazine	ND ug/L		8.0	1	08/13/07 00:00	08/18/07 20:54	122-66-7	
bis(2-Ethylhexyl)phthalate	12.7 ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	117-81-7	
Fluoranthene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	206-44-0	
Fluorene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	86-73-7	
Hexachloro-1,3-butadiene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	87-68-3	
Hexachlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	118-74-1	
Hexachlorocyclopentadiene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	77-47-4	
Hexachloroethane	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	67-72-1	
Indeno(1,2,3-cd)pyrene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	193-39-5	
Isophorone	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	78-59-1	
Naphthalene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	91-20-3	
Nitrobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	98-95-3	
2-Nitrophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	88-75-5	
4-Nitrophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	100-02-7	
N-Nitrosodimethylamine	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	62-75-9	
N-Nitroso-di-n-propylamine	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	621-64-7	
N-Nitrosodiphenylamine	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	86-30-6	
Pentachlorophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	87-86-5	
Phenanthrene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	85-01-8	
Phenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	108-95-2	
Pyrene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	129-00-0	
1,2,4-Trichlorobenzene	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	120-82-1	
2,4,6-Trichlorophenol	ND ug/L		5.0	1	08/13/07 00:00	08/18/07 20:54	88-06-2	
Nitrobenzene-d5 (S)	58 %		38-104	1	08/13/07 00:00	08/18/07 20:54	4165-60-0	
2-Fluorobiphenyl (S)	65 %		44-106	1	08/13/07 00:00	08/18/07 20:54	321-60-8	
Terphenyl-d14 (S)	90 %		7-147	1	08/13/07 00:00	08/18/07 20:54	1718-51-0	
Phenol-d6 (S)	63 %		18-125	1	08/13/07 00:00	08/18/07 20:54	13127-88-3	
2-Fluorophenol (S)	50 %		30-101	1	08/13/07 00:00	08/18/07 20:54	367-12-4	
2,4,6-Tribromophenol (S)	68 %		46-129	1	08/13/07 00:00	08/18/07 20:54	118-79-6	



ANALYTICAL RESULTS

Project: Aug-07
Pace Project No.: 6026808

Sample: OUTFALL #003 **Lab ID: 6026808002** Collected: 08/07/07 10:00 Received: 08/08/07 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics LowLevel		Analytical Method: EPA 624 Low						
Acetone	ND	ug/L	10.0	1		08/15/07 17:01	67-64-1	
Acrolein	ND	ug/L	100	1		08/15/07 17:01	107-02-8	
Acrylonitrile	ND	ug/L	20.0	1		08/15/07 17:01	107-13-1	
Benzene	ND	ug/L	1.0	1		08/15/07 17:01	71-43-2	
Bromodichloromethane	ND	ug/L	1.0	1		08/15/07 17:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		08/15/07 17:01	75-25-2	
Bromomethane	ND	ug/L	1.0	1		08/15/07 17:01	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	1		08/15/07 17:01	78-93-3	
Carbon disulfide	ND	ug/L	10.0	1		08/15/07 17:01	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		08/15/07 17:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		08/15/07 17:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		08/15/07 17:01	75-00-3	
2-Chloroethylvinyl ether	ND	ug/L	10.0	1		08/15/07 17:01	110-75-8	
Chloroform	ND	ug/L	1.0	1		08/15/07 17:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		08/15/07 17:01	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		08/15/07 17:01	124-48-1	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		08/15/07 17:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		08/15/07 17:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		08/15/07 17:01	106-46-7	
1,1-Dichloroethane	ND	ug/L	1.0	1		08/15/07 17:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		08/15/07 17:01	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	1.0	1		08/15/07 17:01	540-59-0	
1,1-Dichloroethene	ND	ug/L	1.0	1		08/15/07 17:01	75-35-4	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		08/15/07 17:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		08/15/07 17:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		08/15/07 17:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		08/15/07 17:01	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		08/15/07 17:01	100-41-4	
2-Hexanone	ND	ug/L	10.0	1		08/15/07 17:01	591-78-6	
Methylene chloride	ND	ug/L	1.0	1		08/15/07 17:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	1		08/15/07 17:01	108-10-1	
Styrene	ND	ug/L	1.0	1		08/15/07 17:01	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		08/15/07 17:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		08/15/07 17:01	127-18-4	
Toluene	ND	ug/L	1.0	1		08/15/07 17:01	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		08/15/07 17:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		08/15/07 17:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		08/15/07 17:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		08/15/07 17:01	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		08/15/07 17:01	76-13-1	
Vinyl chloride	ND	ug/L	1.0	1		08/15/07 17:01	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		08/15/07 17:01	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		08/15/07 17:01	1330-20-7	
o-Xylene	ND	ug/L	1.0	1		08/15/07 17:01	95-47-6	
4-Bromofluorobenzene (S)	96	%	85-115	1		08/15/07 17:01	460-00-4	
Dibromofluoromethane (S)	100	%	86-115	1		08/15/07 17:01	1868-53-7	
Toluene-d8 (S)	101	%	84-111	1		08/15/07 17:01	2037-26-5	

Date: 09/06/2007 01:37 PM

REPORT OF LABORATORY ANALYSIS

Page 10 of 24

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

ANALYTICAL RESULTS

Project: Aug-07
 Pace Project No.: 6026808

Sample: OUTFALL #003		Lab ID: 6026808002	Collected: 08/07/07 10:00	Received: 08/08/07 09:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics LowLevel	Analytical Method: EPA 624 Low							
1,2-Dichloroethane-d4 (S)	97 %		80-113	1		08/15/07 17:01	17060-07-0	
Preservation pH	1.0			1		08/15/07 17:01		
2340C Hardness, Total	Analytical Method: SM 2340C							
Total Hardness	441 mg/L		1.0	1		08/13/07 00:00		



e. Outfalls 002 & 003, Pace Analytical, Wet test results for 2007 thru 2011.



PACE # 60109380

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

November 7, 2011

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 60109380
Client Project ID: Wet Test (002)

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-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

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PACE # 60109380-002

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

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

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 11-7-11 Date Initiated: 11-1-11 Time Arrived: 12:15 Date Terminated: 11-3-11
---	--

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Golden Triangle (002) 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 95% effluent (AEC), and was not detected in fathead minnows exposed to the 95% effluent. The LC50 for the Ceriodaphnia was >95% and >95% 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:

Golden Triangle (002) personnel collected a sample at the Golden Triangle (002) 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 Golden Triangle (002) 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).

Golden Triangle (002) personnel collected the effluent tested from the Golden Triangle (002) discharge. Testing was performed using a 95% effluent, 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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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 95% effluent concentrations. There was no significant mortality in the synthetic control. The LC50 value of the sample to Ceriodaphnia is approximately >95%.

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
95%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0

AVG. MORTALITY @ AEC (95% EFFLUENT) =0.0%

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.

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THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle (002) effluent discharge exhibited no significant mortality in the 95% 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 >95%.

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
95%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0

AVG. MORTALITY @ AEC (95% EFFLUENT) =0.0%

REPORT OF LABORATORY ANALYSIS

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PACE # 60109380-002

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

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the Golden Triangle (002) 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 95% effluent sample was 10.30 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.70 mg/l in the 95% effluent, which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the 95% effluent was 7.92 upon receipt in the laboratory and the synthetic control had a 7.46. At termination the pH measurement in the 95% effluent sample was 8.31.

Conductance - The conductance of the effluent sample was 1480 umhos and the synthetic control was 386 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)
7.46	8.70	386	<0.2	<0.1	25	98	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)
7.90	9.10	529	N/A	<0.1	25	226	190

Initial Measurements of 95% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l) At 100%	Alk (mg/l) At 100%
7.92	10.30	1480	N/A	<0.1	25	910	770

TEST WATER QUALITY:

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.50	8.20	25	442
Upstream	8.20	8.10	25	547
95%	8.13	8.10	25	1092

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.68	7.80	25	492
Upstream	8.38	7.80	25	606
95%	8.31	7.70	25	1350

REPORT OF LABORATORY ANALYSIS

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PACE # 60109380-002

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Phone: 913.599.5665
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November 7, 2011

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 60109380-002
Client Project ID: Wet Test - (608)

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-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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Fax: 913.599.1759

Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 11-7-11 Date Initiated: 11-1-11 Time Arrived: 12:15 Date Terminated: 11-3-11
---	--

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Golden Triangle (003) 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 95% effluent (AEC), and was not detected in fathead minnows exposed to the 95% effluent. The LC50 for the Ceriodaphnia was >95% and >95% 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:

Golden Triangle (003) personnel collected a sample at the Golden Triangle (003) 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 Golden Triangle (003) 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).

Golden Triangle (003) personnel collected the effluent tested from the Golden Triangle (003) discharge. Testing was performed using a 95% effluent, 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-Karber method. Statistical analysis is accomplished by following steps in EPA/600/4-90/027E, August 1993 and by use of Toxstat version 3.4.

REPORT OF LABORATORY ANALYSIS

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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 95% effluent concentrations. There was no significant mortality in the synthetic control. The LC50 value of the sample to Ceriodaphnia is approximately >95%.

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
95%	1	5	5	5	0
"	2	5	5	5	0
"	3	5	5	5	0
"	4	5	5	5	0

AVG. MORTALITY @ AEC (95% EFFLUENT) =0.0%

THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle (003) effluent discharge exhibited no significant mortality in the 95% 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 >95%.

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
95%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0

AVG. MORTALITY @ AEC (95% EFFLUENT) = 0.0%

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the Golden Triangle (003) 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 95% effluent sample was 9.00 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.80 mg/l in the 95% effluent, which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the 95% effluent was 7.65 upon receipt in the laboratory and the synthetic control had a 7.46. At termination the pH measurement in the 95% effluent sample was 8.19.

Conductance - The conductance of the effluent sample was 1433 umhos and the synthetic control was 386 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)
7.46	8.70	386	<0.2	<0.1	25	98	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)
7.90	9.10	529	N/A	<0.1	25	226	190

Initial Measurements of 95% Effluent

PH	D.O. (mg/l)	Cond. (umhos)	NH3-N (mg/l)	Cl2 (mg/l)	Temp (C)	Hard (mg/l) At 100%	Alk (mg/l) At 100%
7.65	9.00	1433	N/A	<0.1	25	940	870

TEST WATER QUALITY:

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.50	8.20	25	442
Upstream	8.20	8.10	25	547
95%	7.78	8.20	25	1054

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.68	7.80	25	492
Upstream	8.38	7.80	25	606
95%	8.19	7.80	25	1025

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	0	0
2.5 g/l	20	15	8
2.0 g/l	20	20	20
1.5 g/l	20	20	20
1.0 g/l	20	20	20

LC50 = 2.43 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	36	27
6.0 g/l	40	39	39
4.0 g/l	40	40	40
2.0 g/l	40	40	40

LC50 = 8.36 g/l NaCl

Submitted By:



Timothy Harrell
Technical Director

REPORT OF LABORATORY ANALYSIS

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PACE # 6083996-001

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

August 25, 2010

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6083996-001
Client Project ID: Wet Test - (002)

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-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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Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 8-25-10 Date Initiated: 8-18-10 Time Arrived: 10:30 Date Terminated: 8-20-10
---	--

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Golden Triangle Energy (Outfall 002) 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:

Golden Triangle Energy personnel collected a sample at the Golden Triangle Energy (Outfall 002) 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 # 6083996-001

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 Golden Triangle Energy (Outfall 002) 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).

Golden Triangle Energy personnel collected the effluent tested from the Golden Triangle Energy (Outfall 002) discharge. Testing was performed using a 100% effluent, 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 before testing.

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 Analytical Services, Inc.
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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
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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PACE # 6083996-001

Pace Analytical Services, Inc.
 9608 Loiret Blvd.
 Lenexa, KS 66219
 Phone: 913.599.5665
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THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle Energy (Outfall 002) effluent discharge sampled by Golden Triangle Energy personnel 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
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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PACE # 6083996-001

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9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the Golden Triangle Energy (Outfall 002) effluent 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 7.90 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 6.90 mg/l in the 100% effluent, which falls into acceptable limits. Aeration was not used prior to test set up.

pH - The pH of the 100% effluent was 7.56 upon receipt in the laboratory and the synthetic control had a 7.52. At termination the pH measurement in the 100% effluent sample was 8.41.

Conductance - The conductance of the effluent sample was 1865 umhos and the synthetic control was 335 umhos.

REPORT OF LABORATORY ANALYSIS

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PACE # 6083996-002

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

August 25, 2010

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6083996-002
Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-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

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Fax: 913.599.1759

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

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 8-25-10 Date Initiated: 8-18-10 Time Arrived: 10:30 Date Terminated: 8-20-10
---	--

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Golden Triangle Energy (Outfall 003) 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:

Golden Triangle Energy personnel collected a sample at the Golden Triangle Energy (Outfall 003) 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 Golden Triangle Energy (Outfall 003) 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).

Golden Triangle Energy personnel collected the effluent tested from the Golden Triangle Energy (Outfall 003) discharge. Testing was performed using a 100% effluent, 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 before testing.

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 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.

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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
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%

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THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle Energy (Outfall 003) effluent discharge sampled by Golden Triangle Energy personnel 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%.

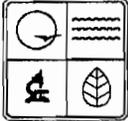
CONC.	REP #	0 HOURS	24 HOURS	48 HOURS	% MORTALITY
SYNTHETIC	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
Upstream	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0
100%	1	10	10	10	0
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0

AVG. MORTALITY@AEC (100% EFFLUENT) =0.0%

REPORT OF LABORATORY ANALYSIS

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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 GOLDEN TRIANGLE	DATE AND TIME COLLECTED EFFLUENT _____ UPSTREAM _____
PERMIT NUMBER	PERMIT OUTFALL NUMBER 3
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 6083996-002	TEST DURATION 48 HOURS	
DATE OF LAST REFERENCE TOXICANT TESTING 8/17/10	TEST METHOD EPA 2000 AND 2002	
DATE AND TIME SAMPLES RECEIVED AT LABORATORY 8/18/10 14:45	TEST START DATE AND TIME 8/18/10 15:30	TEST END DATE AND TIME 8/20/10 15:00
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 ¹ PRIOR TO ANALYSIS? <input type="checkbox"/> YES <input 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	8/18/10
pH Standard Units	7.58	SM 4500-H+ B	8/18/10
Conductance µMols	1765	EPA 120.1	8/18/10
Dissolved Oxygen mg/L	10.50	SM 4500-O G	8/18/10
Total Residual Chlorine mg/L	<1	SM 4500-CL G	8/18/10
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	706	SM 2320 B	8/18/10
* Total Hardness mg/L	808	SM2340 B	8/18/10

* Recommended by EPA guidance, not a required analysis.

¹ Samples shall only be filtered if indigenous organisms are present that may be confused with, or attack the test organisms.
² Filters shall have a sieve size of 60 microns or greater.

WHOLE EFFLUENT TOXICITY (WET) TEST REPORT (Continued)
 (TO BE ATTACHED TO WET TESTS FOR SUBMISSION TO THE REGULATORY AUTHORITY)

MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE³			
PARAMETER	RESULT	METHOD	WHEN ANALYZED
Temperature °C	25	SM 2550B	8/18/10
pH Standard Units	7.61	SM 4500-H+ B	8/18/10
Conductance µMols	435	EPA 120.1	8/18/10
Dissolved Oxygen mg/L	9.20	SM 4500-O G	8/18/10
Total Residual Chlorine mg/L	<1	SM 4500-CL G	8/18/10
Unionized Ammonia mg/L			
* Total Alkalinity mg/L	176	SM 2320 B	8/18/10
* Total Hardness mg/L	220	SM2340 B	8/18/10
* Recommended by EPA guidance, not a required analysis.			

PRELIMINARY TEST ACCEPTABILITY MATRIX (FOR USE BY PERMITTEE IN DETERMINING TEST VALIDITY)
MINIMUM REQUIRED ANALYTICAL RESULTS FOR THE 100 PERCENT UPSTREAM SAMPLE³
PERMIT ALLOWABLE EFFLUENT CONCENTRATION, or AEC: As indicated on permit. Test is invalid otherwise.
EFFLUENT SAMPLE TYPE: As indicated on permit. Test is invalid otherwise.
TEST TYPE: Acute Static Non-Renewal Test or other as indicated on permit. Test is invalid otherwise.
TEST DURATION: Forty-eight hours or as indicated on permit. Test is invalid otherwise.
TEST ORGANISMS: As indicated on permit. Test is invalid otherwise.
DILUTION WATER USED TO ACHIEVE AEC: Upstream receiving water required if available.
TEST METHOD: The only acceptable method is the most current edition of <i>Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms</i> , or other as specifically assigned by EPA for determining National Pollutant Discharge Elimination System, or NPDES, compliance. Test is invalid otherwise.
TEST START DATE AND TIME: Unless otherwise specified in writing by EPA, if >36 hours lapse between collection and initiation, test is invalid.
FILTER MESH SIEVE SIZE: Unless otherwise specified in writing by EPA, if sieve size is smaller than 60 microns, test is invalid.
90 PERCENT OR GREATER SURVIVAL IN LABORATORY CONTROL(S) (Y/N): If no, test is invalid.

PARAMETER	RESULT	NOTES	WHEN ANALYZED
Temperature °C	0 – 6	Unless received by the laboratory on the same day as collected, values outside this range invalidate the test.	Upon receipt.

³ Where no upstream control is available, enter results from laboratory or synthetic control.



PACE # 6065066-003

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

August 31, 2009

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6065066-003
Client Project ID: Wet Test - (002)

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-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

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



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

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 8-31-09 Date Initiated: 8-26-09 Time Arrived: 9:35 Date Terminated: 8-28-09
---	---

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Golden Triangle (Outfall 002) 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:

GOLDEN TRIANGLE personnel collected a sample at the Golden Triangle (Outfall 002) 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 Golden Triangle (Outfall 002) 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).

GOLDEN TRIANGLE personnel collected the effluent tested from the Golden Triangle (Outfall 002) discharge. Testing was performed using a 100% effluent, 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.

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/600/4-90/027E, 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
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%

THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle (Outfall 002) effluent discharge sampled by Golden Triangle personnel 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
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 # 6065066-004

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

August 31, 2009

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6065066-004
Client Project ID: Wet Test - 003

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-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:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 8-31-09 Date Initiated: 8-26-09 Time Arrived: 9:35 Date Terminated: 8-28-09
---	---

BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the Golden Triangle (Outfall 003) 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:

GOLDEN TRIANGLE personnel collected a sample at the Golden Triangle (Outfall 003) effluent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc.

INTRODUCTION:

The purpose of this test was to determine the acute toxicity of the Golden Triangle (Outfall 003) 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).

GOLDEN TRIANGLE personnel collected the effluent tested from the Golden Triangle (Outfall 003) discharge. Testing was performed using a 100% effluent, 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
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%

THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle (Outfall 003) effluent discharge sampled by Golden Triangle personnel 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
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%

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the Golden Triangle (Outfall 003) effluent 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 8.60 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.40 mg/l in the 100% effluent, which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the 100% effluent was 7.96 upon receipt in the laboratory and the synthetic control had a 7.64. At termination the pH measurement in the 100% effluent sample was 8.50.

Conductance - The conductance of the effluent sample was 840 umhos and the synthetic control was 320 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)
7.64	8.30	320	<0.2	<0.1	25	98	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)
7.99	8.70	435	N/A	<0.1	25	192	172

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)
7.96	8.60	840	N/A	<0.1	25	414	372

TEST WATER QUALITY:

24-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.70	7.60	25	332
Upstream	8.31	7.80	25	480
100%	8.54	7.70	25	965

48-hour Water Quality Measurements

EFFLUENT CONC (%)	PH	D.O. (mg/l)	TEMP (C)	COND. (umhos)
Synthetic	7.77	7.40	25	356
Upstream	8.46	7.50	25	553
100%	8.50	7.40	25	992

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

Page: 1 of 1

Required Client Information: **Section A** Required Client Information: **Section B** Client Information (Check quote/contract): To Be Completed by Pace Analytical Client: **Section C**

Company: Golden Triangle Energy Report To: Steve Doughty Requested Due Date: Quote Reference: Project Manager:

Address: 15053 Hwy. 111 Copy To: Invoice To: **Shel Sharp** * Turn around time less than 14 days subject to laboratory and contractual obligations and may vary in a Rush Turnaround Surcharges. Project #:

Craig, Missouri 64437 P.O. Project Name: **Yearly Wet Testing** Profile #:

Phone: 660.683.5646 Fax 660.683.5302 Project Number: Turn Around Time (TAT) in calendar days.

Required Client Information: **Section D**

Valid Matrix Codes: Matrix, Water, Soil, Oil, Wipe, Air, Tissue, Other

Code: WT, SI, OL, WP, AR, TS, OT

SAMPLE ID (One character per box.)

ITEM NUMBER	MATRIX CODE	DATE COLLECTED	# Containers	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Whole Effluent Testing	TOT.PHOS.	Nitrogen Ammonia	Nitrates as 'N'	Nitrites as 'N'	Chlorides	Sulfates	Iron	Arsenic	Aluminum	Manganese	REMARKS / Lab ID		
1	WT	25-Aug	1								X		X										(Opposite side)	
2	WT	25-Aug	1								X		X											
3	WT	25-Aug	1								X		X											

SHIPMENT METHOD: AIRBILL NO. SHIPPING DATE: 8/25/2009 NO. OF COOLERS: 1

ITEM # RELINQUISHED BY / AFFILIATION DATE TIME ACCEPTED BY / AFFILIATION DATE TIME

UPS 8/25/2009 1 Steve Doughty 8/25/09 1:00P Steve Doughty 8/26/09 9:35

SAMPLE CONDITION: SAMPLE NOTES:

Temp In C: 1.8

Received on Ice: N

Sealed Cooler: N

Sample Intact: N

Additional Comments:

SAMPLER NAME AND SIGNATURE: Steve Doughty

PRINT Name of SAMPLER: Steve Doughty

SIGNATURE of: LER DATE: 08/25/2009



PACE # 6045334-001

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

August 25, 2008

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6045334-001
Client Project ID: Wet Test - (002)

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-10116

Enclosures

REPORT OF LABORATORY ANALYSIS

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PACE # 6045334-001

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

Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Steve Doughty 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 8-25-08 Date Initiated: 8-20-08 Time Arrived: 10:00 Date Terminated: 8-22-08
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BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the GOLDEN TRIANGLE ENERGY (002) 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:

Golden Triangle Energy personnel collected a sample at the GOLDEN TRIANGLE ENERGY (002) 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 # 6045334-001

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 GOLDEN TRIANGLE ENERGY (002) 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).

Golden Triangle Energy collected the effluent tested from the GOLDEN TRIANGLE ENERGY (002) discharge. Testing was performed using a 100% effluent, 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.

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Pace Analytical Services, Inc.
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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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PACE # 6045334-001

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

THE Pimephales RESULTS - Minnows exposed to effluent collected at the GOLDEN TRIANGLE ENERGY (002) effluent discharge sampled by Golden Triangle Energy 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	9	10
Upstream	1	10	10	10	0
"	2	10	10	9	10
"	3	10	10	10	0
"	4	10	10	10	0
100%	1	10	10	10	0
"	2	10	10	8	20
"	3	10	10	10	0
"	4	10	10	9	10

AVG. MORTALITY @ AEC (100% EFFLUENT) =7.5%

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PACE # 6045334-001

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

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the GOLDEN TRIANGLE ENERGY (002) effluent 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 effluent sample was 8.50 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 6.70 mg/l in the effluent which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the effluent was 7.89 upon receipt in the laboratory and the synthetic control had a 7.64. At termination the pH measurement in the effluent sample was 8.45.

Conductance - The conductance of the effluent sample was 2375 umhos and the synthetic control was 365 umhos.

REPORT OF LABORATORY ANALYSIS

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PACE # 6045334-003

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

August 25, 2008

Steve Doughty
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6045334-003
Client Project ID: Wet Test - (003)

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-10116

Enclosures

REPORT OF LABORATORY ANALYSIS

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PACE # 6045334-003

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

Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Shaun O' Riley 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 8-25-08 Date Initiated: 8-20-08 Time Arrived: 10:00 Date Terminated: 8-22-08
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BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the GOLDEN TRIANGLE ENERGY (003) 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:

Golden Triangle Energy personnel collected a sample at the GOLDEN TRIANGLE ENERGY (003) 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 GOLDEN TRIANGLE ENERGY (003) 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).

Golden Triangle Energy collected the effluent tested from the GOLDEN TRIANGLE ENERGY (003) discharge. Testing was performed using a 100% effluent, 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.



PACE # 6045334-003

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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/600/4-90/027E, 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
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%

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THE Pimephales RESULTS - Minnows exposed to effluent collected at the GOLDEN TRIANGLE ENERGY (003) effluent discharge sampled by Golden Triangle Energy 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	9	10
Upstream	1	10	10	10	0
"	2	10	10	9	10
"	3	10	10	10	0
"	4	10	10	10	0
100%	1	10	10	9	10
"	2	10	10	10	0
"	3	10	10	10	0
"	4	10	10	10	0

AVG. MORTALITY @ AEC (100% EFFLUENT) =2.5%

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Lenexa, KS 66219
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WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the GOLDEN TRIANGLE ENERGY (003) effluent 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 effluent sample was 8.90 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.00 mg/l in the effluent which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the effluent was 8.12 upon receipt in the laboratory and the synthetic control had a 7.64. At termination the pH measurement in the effluent sample was 8.48.

Conductance - The conductance of the effluent sample was 863 umhos and the synthetic control was 365 umhos.

REPORT OF LABORATORY ANALYSIS

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PACE # 6026885-001

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

August 13, 2007

Shaun O'Riley
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6026885-001
Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-10116

Enclosures

REPORT OF LABORATORY ANALYSIS

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PACE # 6026885-001

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Phone: 913.599.5665
Fax: 913.599.1759

Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Shaun O' Riley 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 08-13-07 Date Initiated: 8-08-07 Time Arrived: 8:00 Date Terminated: 8-10-07
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BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the GOLDEN TRIANGLE ENERGY (002) 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:

Golden Triangle Energy (002) personnel collected a sample at the GOLDEN TRIANGLE ENERGY (002) effluent discharge. The sample was preserved with ice and transported to Pace Analytical by commercial carrier.

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PACE # 6026885-001

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 GOLDEN TRIANGLE ENERGY (002) 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).

Golden Triangle Energy personnel collected the effluent tested from the GOLDEN TRIANGLE ENERGY (002) discharge. Testing was performed using an 100% effluent, 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.

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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.

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RESULTS:

THE Ceriodaphnia MORTALITY RESULTS - There was not 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
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 Golden Triangle Energy (002) effluent discharge by GOLDEN TRIANGLE ENERGY personnel 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
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 # 6026885-001

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

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the GOLDEN TRIANGLE ENERGY (002) effluent 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 effluent sample was 9.40 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 6.80 mg/l in the effluent which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the effluent was 7.86 upon receipt in the laboratory and the synthetic control had a 7.66. At termination the pH measurement in the effluent sample was 8.33.

Conductance - The conductance of the effluent sample was 2508 umhos and the synthetic control was 374 umhos.

REPORT OF LABORATORY ANALYSIS

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PACE # 6026885-002

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

August 13, 2007

Shaun O'Riley
Golden Triangle Energy
15053 Hwy 111
Craig, MO 64437

Re: Lab Project Number: 6026885-002
Client Project ID: Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Tim Harrell
Tim.Harrell@pacelabs.com
Technical Director

Kansas/ NELAP Certification Number E-10116

Enclosures

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.

808 West McKay, Frontenac, KS 66763

LABORATORY REPORT:

CLIENT: Golden Triangle Energy Attn: Shaun O' Riley 15053 Hwy. 111 Craig, MO 64437 1-660-683-5646	Date Reported: 08-13-07 Date Initiated: 8-08-07 Time Arrived: 8:00 Date Terminated: 8-10-07
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BIOMONITORING STUDY

ACUTE TOXICITY

Permit # MO-0126161

FINDING AND CONCLUSIONS:

Acute toxicity testing was performed on duplicate samples of effluent collected from the GOLDEN TRIANGLE ENERGY (003) 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:

Golden Triangle Energy (003) personnel collected a sample at the GOLDEN TRIANGLE ENERGY (003) 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 GOLDEN TRIANGLE ENERGY (003) 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).

Golden Triangle Energy personnel collected the effluent tested from the GOLDEN TRIANGLE ENERGY (003) discharge. Testing was performed using an 100% effluent, 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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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 not 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
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%

THE Pimephales RESULTS - Minnows exposed to effluent collected at the Golden Triangle Energy (003) effluent discharge by GOLDEN TRIANGLE ENERGY personnel 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
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 # 6026885-002

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

WATER CHEMISTRY RESULTS:

Total residual chlorine (Cl₂) - The effluent sample from the GOLDEN TRIANGLE ENERGY (003) effluent 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 effluent sample was 9.90 mg/l after being raised to the test temperature of 25° C. At termination D.O. was 7.10 mg/l in the effluent which falls into acceptable limits. Aeration was not required in this test.

pH - The pH of the effluent was 8.08 upon receipt in the laboratory and the synthetic control had a 7.66. At termination the pH measurement in the effluent sample was 8.60.

Conductance - The conductance of the effluent sample was 1074 umhos and the synthetic control was 374 umhos.

REPORT OF LABORATORY ANALYSIS

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f. Outfall 004, Inovatia Labs, 03-28-12.



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P.O. Box 30
Fayette, MO 65248-0030

Phone: (660) 248-1911
Fax: (660) 248-1921
http://www.inovatia.com

ANALYSIS REPORT

Client Information:
Golden Triangle Energy
15053 Highway 59
Craig, MO 64437
Attn: Steve Doughty

Date Received: March 28, 2012 **Chain of Custody Number:** 12-0278
Time Received: 10:45
Relinquished by: UPS **Project Name:** NPDES Sludge Sample
Sampler: Steve Doughty **Sample Number:** N/A
Sample Matrix: Sludge **Sample Number:** 2012 Sludge
Sample Type: N/A **Lab Number:** 121517
Page: 2 of 3

Analysis	Result	Units	Reporting Limit	Analysis Method	Date - Analyst
Beryllium, Total *	< 0.075	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Boron, Total *	< 1.25	mg/Kg	1.25	EPA 200.8	4/10/2012 - DS
Sodium, Total *	1130	mg/Kg	2.50	EPA 200.8	4/10/2012 - DS
Aluminum, Total *	999	mg/Kg	3.75	EPA 200.8	4/10/2012 - DS
Phosphorus, Total *	20900	mg/Kg	125	EPA 200.8	4/10/2012 - DS
Chromium, Total *	2.56	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Manganese, Total *	10100	mg/Kg	37.5	EPA 200.8	4/10/2012 - DS
Nickel, Total *	1.85	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Copper, Total *	4.64	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Zinc, Total *	14.4	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Arsenic, Total *	30.7	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Selenium, Total *	< 0.075	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Molybdenum, Total *	2.34	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Silver, Total *	< 0.075	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Cadmium, Total *	< 0.075	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Tin, Total *	< 0.250	mg/Kg	0.250	EPA 200.8	4/10/2012 - DS
Mercury, Total *	< 0.008	mg/Kg	0.008	EPA 7470	4/6/2012 - MWL
Lead, Total *	1.36	mg/Kg	0.075	EPA 200.8	4/10/2012 - DS
Chemical Oxygen Demand (COD)	2820	mg/L	250	ASTM D1252-95-B	4/3/2012 - MWL
Nitrogen, Ammoniacal*	631	mg/Kg	1	SM 4500-NH3	4/1/2012 - MWL
Nitrogen, Total *	2630	mg/Kg	5	Calculation	4/2/2012 - MWL
Nitrogen, Nitrate-Nitrite *	< 1	mg/Kg	1	ASA 9/EPA 353.2	4/3/2012 - MWL

Notes:

* Results on a Dry Weight Basis

04/16/12
Date

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 Fayette, MO 65248-0030

Phone: (660) 248-1911
 Fax: (660) 248-1921
<http://www.inovatia.com>

ANALYSIS REPORT

Client Information:
 Golden Triangle Energy
 15053 Highway 59
 Craig, MO 64437
 Attn: Steve Doughty

Date Received: March 28, 2012 **Chain of Custody Number:** 12-0278
Time Received: 10:45 **Project Name:** NPDES Sludge Sample
Relinquished by: UPS **Project Number:** N/A
Sampler: Steve Doughty **Sample Number:** 2012 Sludge
Sample Matrix: Sludge **Lab Number:** 121517
Sample Type: N/A **Page:** 3 of 3

Analysis	Result	Units	Reporting Limit	Analysis Method	Date - Analyst
Nitrogen, Organic*	2007	mg/Kg	N/A	Calculation	3/24/2012 - MWL
pH (Solid)*	7.51	SU	N/A	EPA 9045	3/30/2012 - JM/RT
Chloride *	2040	mg/Kg	25	SM 4500-ClE	4/5/2012 - MWL
Fluoride*	34.1	mg/Kg	1	EPA 340.2	4/4/2012 - MWL
Percent Solids	5.78	%	0.01	SM 2540 G	3/29/2012 - MWL
Sodium Absorption Ration*	5.19	N/A	N/A	Calculation	3/29/2012 - MWL
Plant Available Nitrogen*	1.66	lb/Ton of Dry Sludge	N/A	Calculation	4/16/2012 - JV

Notes:

* Results on a Dry Weight Basis

04/16/12
 Date

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g. Outfall 004, Midwest Labs, 10-05-11.

Report Number:

11-290-2068v2

Account:

11804

Page: 1 of 3**Midwest****Laboratories, Inc.****Date Reported:**

10/26/11

Date Received:

10/06/11

Date Sampled:

10/05/11

13611 B Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121 • www.midwestlabs.com
This report supersedes all prior reports for the following reason(s): Added TSS.**GOLDEN TRIANGLE ENERGY****SHAUN O RILEY****15053 HWY 111****CRAIG MO 64437-****SLUDGE ANALYSIS**

PO/Project #: NRDES

RECEIVED
10-28-11

Analysis Performed	As Received	Dry Weight Basis	Units	Detection Limit	Method	Analyst Date	Verifier Date
Lab number: 1908944 Sample ID: IRON SLUDGE FROM SETTLING PONDS							
Boron (total)	n.d.	n.d.	mg/kg	5	EPA 6010	rrd/10-20	bab/10-24
Chloride	163	922	mg/kg	25	SM 4500-CL E	jad/10-11	cmw/10-17
Total suspended solids	279,900	1,584,041	mg/L	4	SM 2540 D	jsa/10-19	cmw/10-26
Total Kjeldahl nitrogen (TKN)	389	2201	mg/kg	5	PAI - DK 01	lkd/10-14	cmw/10-17
Phosphorus (total)	1525	8630	mg/kg	10	EPA 6010	rrd/10-13	bab/10-14
Potassium (total)	33.0	187	mg/kg	10	EPA 6010	rrd/10-13	bab/10-14
Sulfur (total)	132	749	mg/kg	25	EPA 6010	rrd/10-13	bab/10-14
Calcium (total)	7192	40,702	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Magnesium (total)	281	1590	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Sodium (total)	102	578	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Iron (total)	13,536	76,604	mg/kg	5	EPA 6010	rrd/10-13	bab/10-14
Manganese (total)	328	1859	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Copper (total)	n.d.	n.d.	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Zinc (total)	n.d.	n.d.	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Ammoniacal Nitrogen	39.7	225	mg/kg	2.5	SM 4500-NH3	lkd/10-14	cmw/10-17
Nitrate/Nitrite Nitrogen	n.d.	n.d.	mg/kg	0.2	EPA 353.2	jjd/10-12	cmw/10-17
Arsenic (total)	2.49	14.1	mg/kg	0.5	EPA 6020	akj/10-13	bab/10-14
Barium (total)	268	1516	mg/kg	0.5	EPA 6010	rrd/10-13	bab/10-14
Cadmium (total)	0.84	4.73	mg/kg	0.5	EPA 6010	rrd/10-13	bab/10-14
Chromium (total)	n.d.	n.d.	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Lead (total)	n.d.	n.d.	mg/kg	5	EPA 6010	rrd/10-13	bab/10-14
Mercury (total)	n.d.	n.d.	mg/kg	0.05	EPA 7471	cjm/10-13	bab/10-14
Molybdenum (total)	n.d.	n.d.	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Nickel (total)	n.d.	n.d.	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Selenium (total)	n.d.	n.d.	mg/kg	0.5	EPA 6020	akj/10-13	bab/10-14
Silver (total)	n.d.	n.d.	mg/kg	1	EPA 6010	rrd/10-13	bab/10-14
Percent solids	17.67	%		0.01	SM 2540 G	jsa/10-11	cmw/10-17
pH	7.3	S.U.			EPA 9045	jdb/10-10	cmw/10-17
Organic nitrogen	349	1975	mg/Kg		CALC	cmw/10-06	aut/10-06
Calculated Phosphate P2O5	3492	19,764	mg/Kg		CALC	cmw/10-06	aut/10-06
Calculated Potash K2O	40	225	mg/Kg		CALC	cmw/10-06	aut/10-06

For questions contact

Heather Ramig

Heather Ramig

Client Service Representative

heather@midwestlabs.com (402)829-9891

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Report Number:
11-287-2150
Account:
11804
Page: 1 of 3



Date Reported:
10/14/11
Date Received:
10/06/11
Date Sampled:
10/05/11

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**GOLDEN TRIANGLE ENERGY
SHAUN O RILEY
15053 HWY 111
CRAIG MO 64437-**



RECEIVED
10-17-11

SOIL ANALYSIS

PO/Project #: NPDES

Analysis Performed	As Received	Dry Weight Basis	Units	Detection Limit	Method	Analyst Date	Verifier Date
Lab number: 1908943 Sample ID: OUTFALL #004 SOIL							
Boron (total)	n.d.		mg/kg	5	EPA 6010	rrd/10-11	bab/10-12
Cation Exchange Capacity		32.6	meq/100g	0.1	EPA 9081	mgn/10-14	mjs/10-14
Manganese (total)	455		mg/kg	1	EPA 6010	rrd/10-11	bab/10-12
Sodium (total)	117		mg/kg	1	EPA 6010	rrd/10-11	bab/10-12

For questions contact

Heather Ramig
Heather Ramig
Client Service Representative
heather@midwestlabs.com (402)829-9891

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Report Number	Lab Number	Date Received	Date Reported	Grower ID	Sample Id	OM	Phosphorus				K	Mg	Ca	Na	pH	Bidx	CEC meq/100	Percent Base Saturation				Nitrate			S	Zn										
							P ₁	P ₂	Bic	%								K	Mg	Ca	Na	Surface		Total												
																						rate	ppm				rate	ppm	rate	ppm	rate	ppm	bs/A	depth in	bs/A	rate
05-264-0141	6518434	SEP 19, 2005	SEP 21, 2005	SOIL SAMPLES #004 FIELD	1	2.7	M	29	H	66	VH		346	VH	797	VH	3275	H	31		6.8		24.0	3.7	27.7	68.0	0.0	0.6	4	7	0-6	7	16	M	1.5	M
11-280-0959	22887776	OCT 7, 2011	OCT 12, 2011	STEVE DOUGHTY NPDES	1	3.1	M	36	VH	75	VH		250	M	799	VH	4359	H	53		6.9		29.3	2.2	22.7	74.3	0.8	9	16	0-6	16					

h. Outfall 004, Midwest Labs, 10-13-11.



REPORT NUMBER
11-280-0959
 ACCOUNT
11804
 REPORT DATE
Oct 12, 2011
 RECEIVED DATE
Oct 7, 2011

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SHAUN O RILEY
15053 HWY 111
CRAIG MO 64437-

STEVE DOUGHTY
NPDES

RECEIVED
 10-14-11

SOIL ANALYSIS REPORT

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I. percent RATE	PHOSPHORUS			POTASSIUM			CALCIUM			SODIUM			PH	CATION EXCHANGE CAPACITY C.E.C. meq/100g	PERCENT BASE SATURATION (COMPUTED)			
			P ₁ (WEAK BRAY) 1:7 ppm RATE	P ₂ (STRONG BRAY) 1:7 ppm RATE	P ₃ CLSEN BICARBONATE P ppm RATE	K ppm RATE	Mg ppm RATE	Ca ppm RATE	Na ppm RATE	SOIL pH 1:1	% K	% Mg	% Ca	% H			% Na			
87776 1		3.1 M	36 VH	75 VH		250 M	799 VH	4359 H	53				6.9	29.3	2.2	22.7	74.3	0.0	0.8	

LAB NUMBER	NITRATE-N (FIA)				SULFUR S ICAP ppm RATE	ZINC Zn DTPA ppm RATE	MANGANESE Mn DTPA ppm RATE	IRON Fe DTPA ppm RATE	COPPER Cu DTPA ppm RATE	BORON B SORB. DTPA ppm RATE	SOLUBLE SALTS mmhos/cm RATE
	SURFACE	SUBSOIL 1	SUBSOIL 2	Total lbs/A							
	ppm	depth (in)	depth (in)	depth (in)	ppm	ppm	ppm	ppm	ppm	ppm	mmhos/cm
87776	9	16	0-6	16				137			L 0.7 L

The above analytical results apply only to the sample(s) submitted. Samples are retained a maximum of 30 days.

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IDENTIFICATION
**STEVE DOUGHTY
NPDES**

**GOLDEN TRIANGLE ENERGY
SHAUN O RILEY
15053 HWY 111
CRAIG MO 64437-**

ADDITIONAL SOIL ANALYSIS

LAB NUMBER	SAMPLE IDENTIFICATION	CHLORIDE ppm	TKN_PPM ppm
22887776	1	8	1370

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STEVE DOUGHTY

NPDES

GOLDEN TRIANGLE ENERGY

SHAUN O RILEY

15053 HWY 111

CRAIG MO 64437-

ADDITIONAL SOIL ANALYSIS

LAB NUMBER	SAMPLE IDENTIFICATION	CHLORIDE ppm	TKN_PPM ppm
22887776	1	8	1370

The above analytical results apply only to the sample(s) submitted. Samples are retained a maximum of 30 days.

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i. Outfall 004, Midwest Labs, 12-07-10.

Report Number:

10-347-2209

Account:

11804

Page: 1 of 3



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Date Reported:

12/14/10

Date Received:

12/08/10

Date Sampled:

12/07/10

**GOLDEN TRIANGLE ENERGY
SHAUN O RILEY
15053 HWY 111
CRAIG MO 64437-**



12-16-10

SAMPLE ANALYSIS*Sludge*

PO/Project #: STEVE DOUGHTY

Analysis Performed	As Received	Dry Weight Basis	Units	Detection Limit	Method	Analyst Date	Verifier Date
Lab number: 1789668 Sample ID: 004							
Ammoniacal Nitrogen	40.8	513	mg/kg	2.5	SM 4500-NH3	lkd/12-10	cmw/12-13
Biochemical oxygen demand	1745		mg/L	20	SM 5210B	kkr/12-08	cmw/12-13
Boron (total)	2.1	27	mg/kg	0.5	EPA 6010	rrd/12-13	kkh/12-13
Chloride	109	1369	mg/kg	25	SM 4500-CL E	jad/12-10	cmw/12-13
Iron (total)	11,863	149,033	mg/kg	0.5	EPA 6010	rrd/12-13	kkh/12-13
Manganese (total)	539	6767	mg/kg	0.1	EPA 6010	rrd/12-13	kkh/12-13
Nitrate/Nitrite Nitrogen	n.d.	n.d.	mg/kg	0.2	EPA 353.2	gjj/12-09	cmw/12-13
Percent solids	7.96		%	0.01	SM 2540 G	jsa/12-09	cmw/12-13
Phosphorus (total)	1333	16,746	mg/kg	1	EPA 6010	rrd/12-13	kkh/12-13
Sodium (total)	88.5	1111	mg/kg	0.1	EPA 6010	rrd/12-13	kkh/12-13
Total Kjeldahl nitrogen (TKN)	314	3945	mg/kg	12.5	PAI - DK 01	lkd/12-10	cmw/12-13
Total suspended solids	93,900	1,179,648	mg/L	4	SM 2540 D	jsa/12-09	cmw/12-13
pH	7.4		S.U.		EPA 9045	jdb/12-08	cmw/12-13

For questions contact

Heather Ramig

Heather Ramig

Client Service Representative

heather@midwestlabs.com (402)829-9891

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j. Soil, Movatia Labs, 03-16-12.



120 East Davis Street
P.O. Box 30
Fayette, MO 65248-0030

Phone: (660) 248-1911
Fax: (660) 248-1921
http://www.inovatia.com

ANALYSIS REPORT

Client Information:
Golden Triangle Energy
15053 Highway 59
Craig, MO 64437
Attn: Steve Doughty

Date Received: March 16, 2012
Time Received: 11:15
Relinquished by: UPS
Sampler: Steve Doughty
Sample Matrix: Soil
Sample Type: N/A

Chain of Custody Number: 12-0236
Project Name: NPDES / 2012
Project Number: N/A
Sample Number: Soil Samples
Lab Number: 121335
Page: 2 of 2

Analysis	Result	Units	Reporting Limit	Analysis Method	Date - Analyst
Nitrogen, Ammoniacal	9.0	mg/Kg	0.1	SM 4500-NH3 C	4/9/2012 - MWL
Nitrogen, Nitrate	4	ppm	N/A	FIA	4/9/2012 - MWL
Nitrogen, Organic	1481	mg/Kg	N/A	Calculation	4/9/2012 - MWL
Phosphorus (P1 Weak Bray)	6	ppm	N/A	Colorimetric Bray	4/9/2012 - MWL
Phosphorus (P2 Strong Bray)	45.0	ppm	N/A	Colorimetric Bray	4/9/2012 - MWL
Exchangeable Sodium Percent	0.5	%	N/A	Calculation	4/9/2012 - MWL
% Organic Matter	2.1	%	N/A	L.O.I	4/9/2012 - MWL
Cation Exchange Capacity (CEC)	22.5	meq/100g	N/A	EPA 9081	4/9/2012 - MWL
pH (Solid)	6.9	SU	N/A	ASA #1	4/9/2012 - MWL
Sulfur, Total	9	mg/Kg	N/A	ICP	4/9/2012 - MWL
Potassium, Total	268	mg/Kg	N/A	ICP	4/9/2012 - MWL
Manganese, Total	8	mg/Kg	N/A	DTPA - ICP	4/9/2012 - MWL
Bromide	< 5	mg/Kg	5	EPA 300.0 Modified	4/12/2012 - MWL

Notes:

04/13/12
Date

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k. Soil, Midwest Labs, 10-07-11.

REPORT NUMBER
11-280-0959
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STEVE DOUGHTY
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 10/14/11



SOIL ANALYSIS REPORT

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.L. percent RATE	PHOSPHORUS		POTASSIUM		MAGNESIUM		CALCIUM		SODIUM		SOIL pH 1:1	pH BUFFER INDEX	CATION EXCHANGE CAPACITY CEC meq/100g	PERCENT BASE SATURATION (COMPUTED)		
			P (WEAK BRAY) 1:7 ppm RATE	P (STRONG BRAY) 1:7 ppm RATE	OLSEN BICARBONATE P ppm RATE	K ppm RATE	Mg ppm RATE	Ca ppm RATE	Na ppm RATE	% K	% Mg	% Ca				% H	% Na	
* 228		3.1 M	36 VH	75 VH	250 M	799 VH	4359 H	53	6.9	29.3	2.2	22.7	74.3	0.0	0.8			

LAB NUMBER	NITRATE-N (FIA)				SULFUR S I.C.A.P. ppm RATE	ZINC Zn DTPA ppm RATE	MANGANESE Mn DTPA ppm RATE	IRON Fe DTPA ppm RATE	COPPER Cu DTPA ppm RATE	BORON B SORB. DTPA ppm RATE	EXCESS LIME RATE	SOLUBLE SALTS mmhos/cm RATE
	SURFACE	SUBSOIL 1	SUBSOIL 2	Total lbs/A								
* 228	depth (in)	depth (in)	depth (in)	depth (in)	ppm	ppm	ppm	ppm	ppm	ppm		
87776	9	16	0-6	16	16			137 VH			L	0.7 L

The above analytical results apply only to the sample(s) submitted. Samples are retained a maximum of 30 days.

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REPORT NUMBER

11-280-0959

REPORT DATE

Oct 12, 2011

RECEIVED DATE

Oct 7, 2011

ACCOUNT

11804



13611 "B" Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121

www.midwestlabs.com

IDENTIFICATION

STEVE DOUGHTY

NPDES

GOLDEN TRIANGLE ENERGY

SHAUN O RILEY

15053 HWY 111

CRAIG MO 64437-

ADDITIONAL SOIL ANALYSIS

LAB NUMBER	SAMPLE IDENTIFICATION	CHLORIDE ppm	TKN_PPM ppm
22887776	1	8	1370

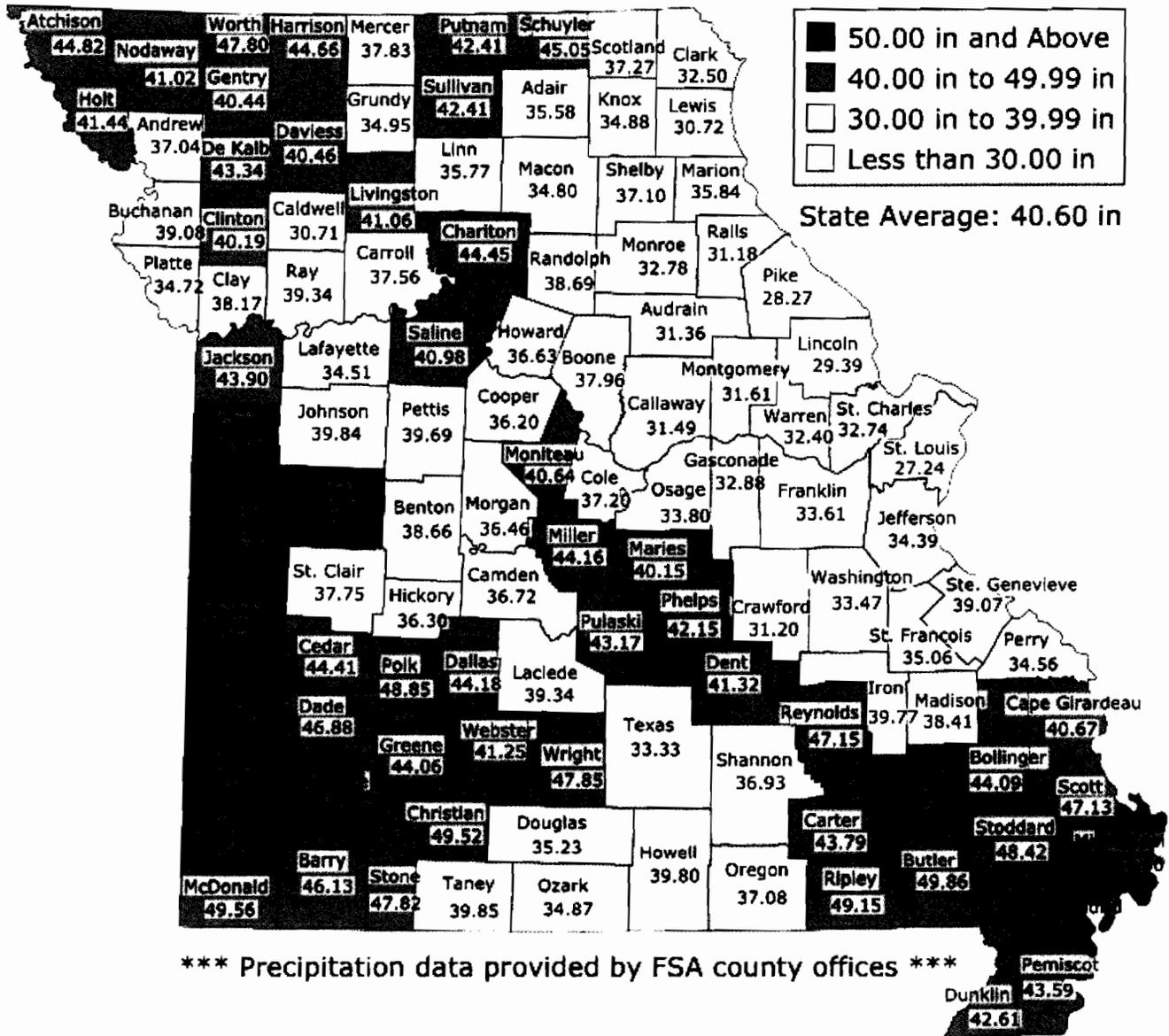
The above analytical results apply only to the sample(s) submitted. Samples are retained a maximum of 30 days.

Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

I. Rainfall totals for Holt county Missouri, 2007 thru 2011.

Weather Data

2007 Annual Precipitation

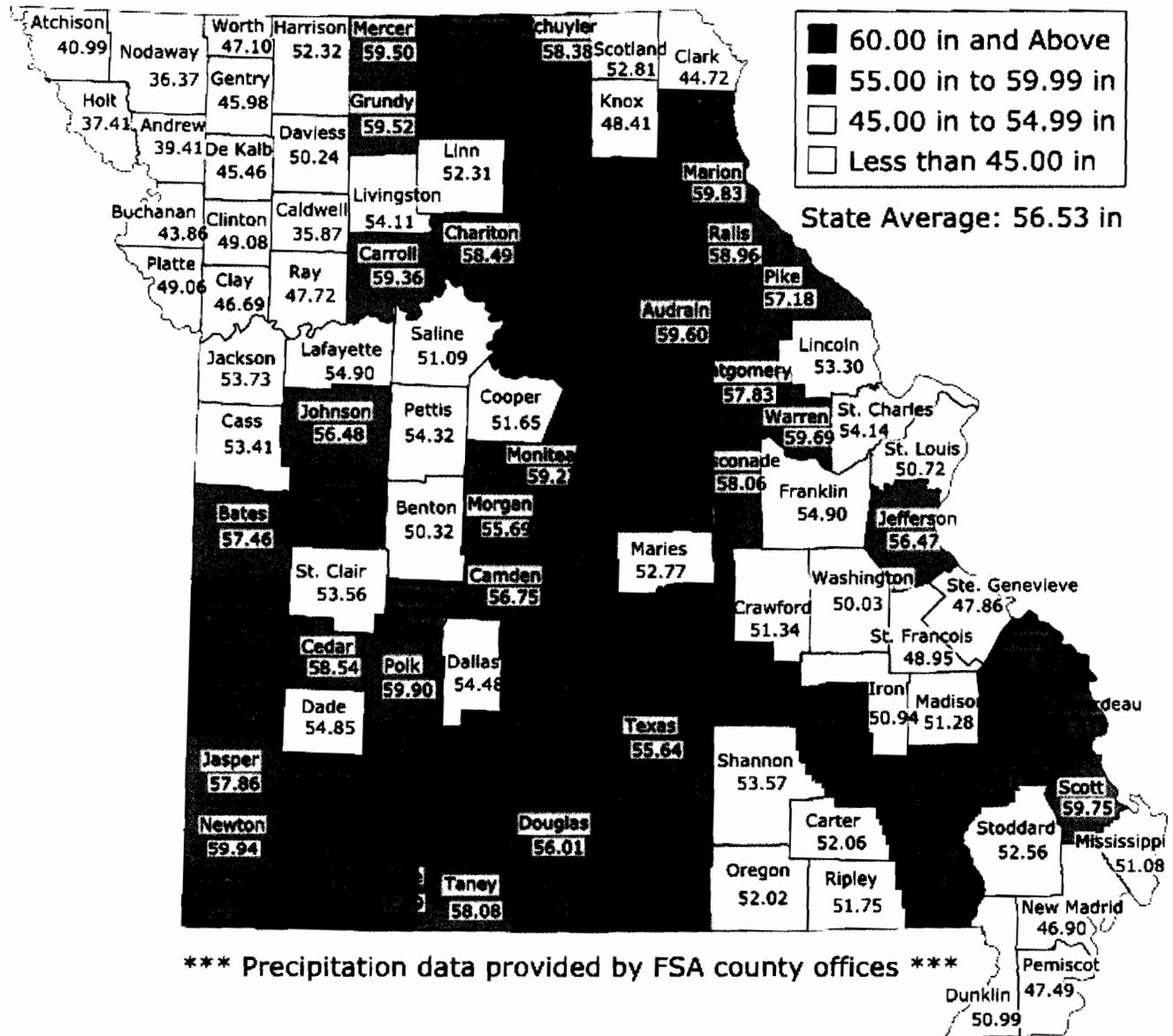


*** Precipitation data provided by FSA county offices ***

Source: USDA/NASS - Missouri Field Office

Weather Data

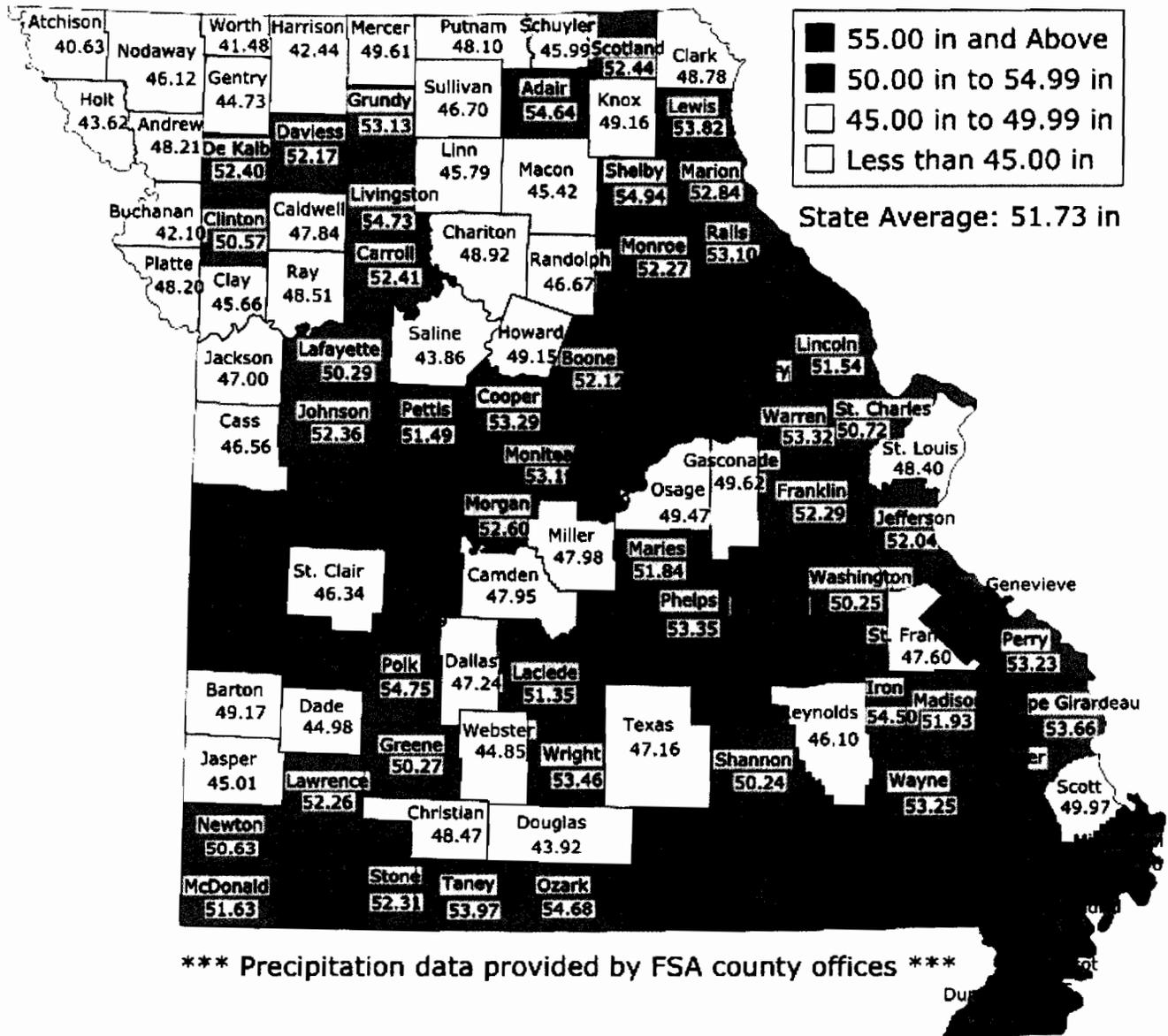
2008 Annual Precipitation



Source: USDA/NASS - Missouri Field Office

Weather Data

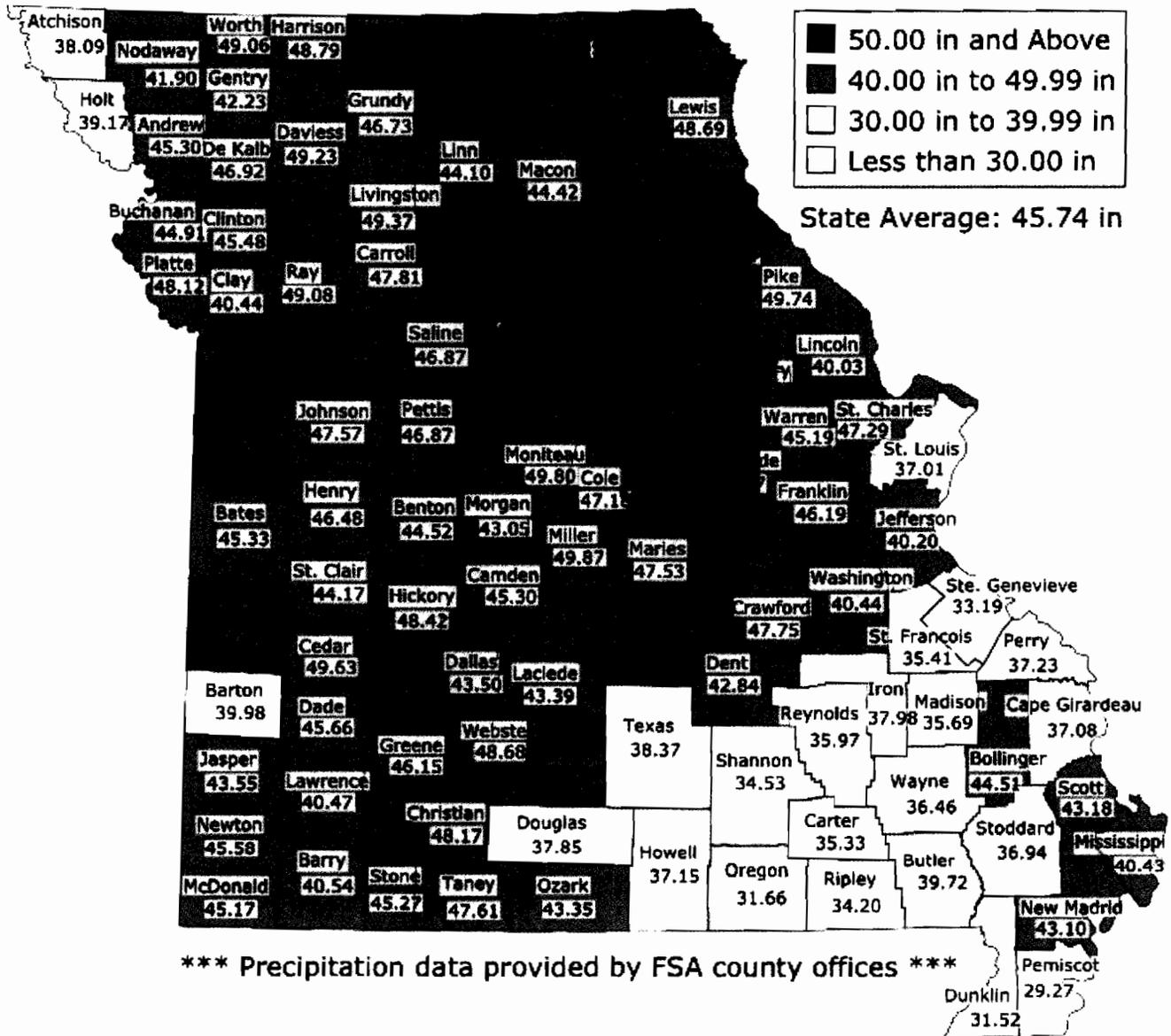
2009 Annual Precipitation



Source: USDA/NASS - Missouri Field Office

Weather Data

2010 Annual Precipitation

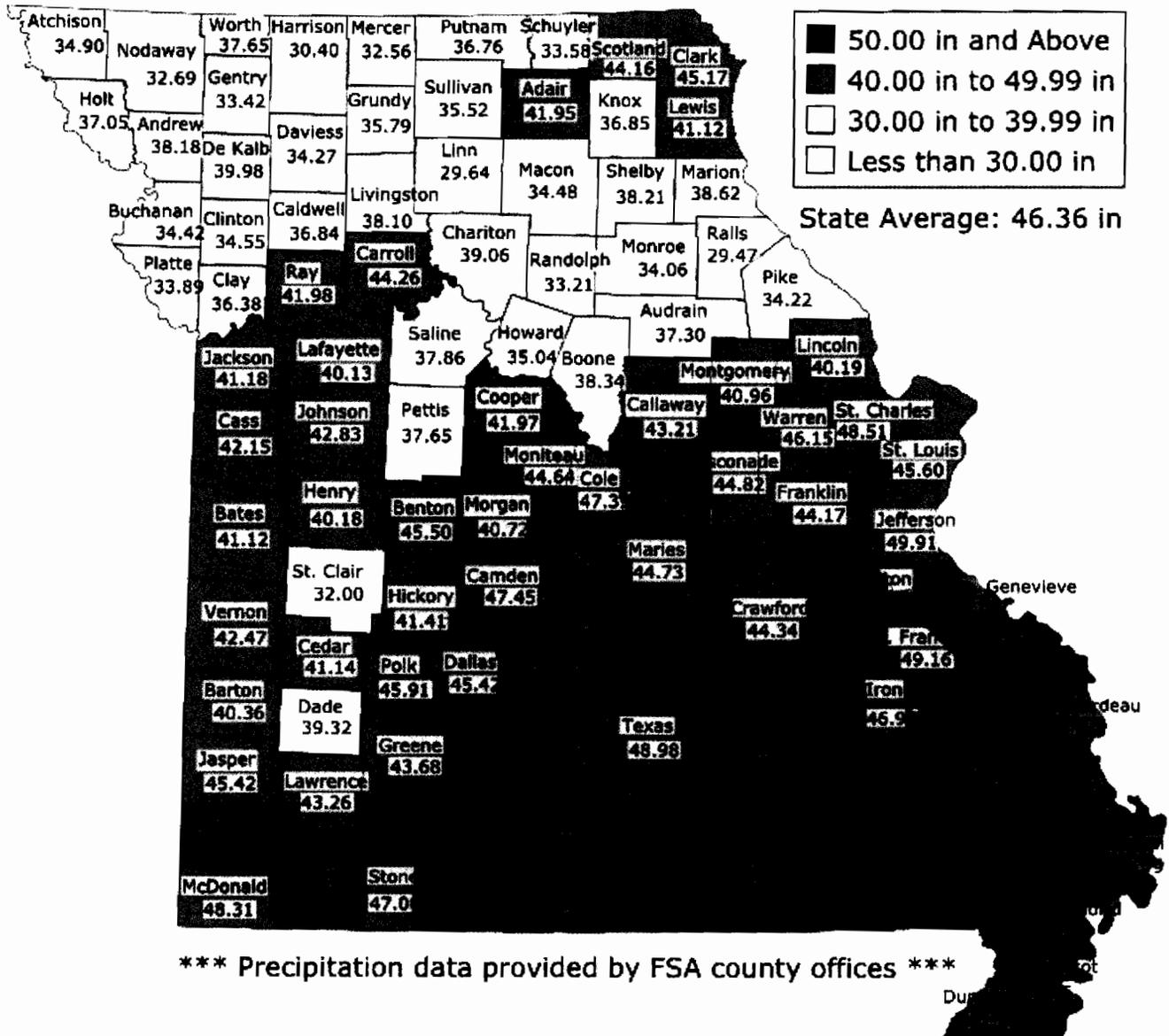


*** Precipitation data provided by FSA county offices ***

Source: USDA/NASS - Missouri Field Office

Weather Data

2011 Annual Precipitation



Source: USDA/NASS - Missouri Field Office

m. MSDS sheets for input chemicals & industrial denaturants.



Natural Gasoline

Safety Data Sheet

Section 1: Identification of the substance or mixture and of the supplier

Product Name: Natural Gasoline
SDS Number: 039420
Synonyms/Other Means of Identification: 12#, 13#, 14#, 15#, 16# Gasoline
NGL Pentanes Plus
Natural Gasoline .C5-8
MARPOL Annex I Category: Gasoline Blending Stocks
Intended Use: Gasoline Blending
Manufacturer: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175
Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)
SDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
www.conocophillips.com

Section 2: Hazard(s) Identification

DANGER

Extremely flammable liquid and vapor. (H224)*
Causes skin irritation. (H315)*
May be fatal if swallowed and enters airways. (H304)*
May contain or release poisonous hydrogen sulfide gas.
May cause drowsiness or dizziness. (H336)*
May cause cancer. (H350)*
Toxic to aquatic life with long lasting effects. (H411)*



Precautionary Statement(s):

Obtain special instructions before use. (P201)*
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. (P210)*
Wear protective gloves / protective clothing / eye protection / face protection. (P280)*
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. (P301+P310)*
Store in a well-ventilated place. Keep container tightly closed. (P403+P233)*
Dispose of contents/container to approved disposal facility. (P501)*

* (Applicable GHS hazard/precautionary code.)

Section 3: Composition / Information on Ingredients

Component	CASRN	Concentration*
Natural Gasoline .C5-8	68425-31-0	100
Toluene	108-88-3	1-10
Benzene	71-43-2	0.1-5
Hydrogen Sulfide	7783-06-4	<0.1

Total Sulfur: > 0.5 wt%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume

Conditions for safe storage: This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H₂S, and flammability prior to entry. Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Section 8: Exposure Controls / Personal Protection

Component	ACGIH	OSHA	Other
Natural Gasoline ..C5-8	300 ppm TWA 500 ppm STEL as Gasoline	---	---
Toluene	TWA: 20 ppm	Ceiling: 300 ppm TWA: 200 ppm	---
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 1 ppm TWA: 10 ppm	---
Hydrogen Sulfide	STEL: 5 ppm TWA: 1 ppm	Ceiling: 20 ppm	TWA: 5 ppm 8hr TWA: 2.5 ppm 12hr STEL: 15 ppm (CanocoPhillips Guidelines)

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure to hydrogen sulfide (H₂S) above exposure limits, a NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used. Under conditions where hydrogen sulfide (H₂S) is NOT detected, a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Colorless
Physical Form:	Liquid
Odor:	Gasoline
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	350 - 850 mm Hg @ 100°F / 37.8°C
Vapor Density (air=1):	>1
Initial Boiling Point/Range:	84-376°F / 29-191°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	0.75 @ 68°F / 20°C
Bulk Density:	6.25 lbs/gal
Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	No data
Flash Point:	-70 to -50°F / -57 to -46°C
Test Method:	(estimate)
Lower Explosive Limits (vol % in air):	1.4-1.5
Upper Explosive Limits (vol % in air):	7.4-7.6
Auto-ignition Temperature:	568-853°F / 280-456°C

Section 10: Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	May be harmful if inhaled	May contain or release poisonous hydrogen sulfide gas - see Other Comments.	> 5.2 mg/L
Skin Absorption	Unlikely to be harmful		> 2 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: Not expected to be a respiratory sensitizer.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: May cause cancer. Based on component information.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

Information on Toxicological Effects of Components

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Toluene

Carcinogenicity: Exposure of rats and mice to toluene at concentrations ranging from 120-1200 ppm for two years did not demonstrate evidence of carcinogenicity. Toluene has not been listed as a carcinogen by IARC.

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Reproductive Toxicity: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. Decreased fetal body weight and increased skeletal variations in both inhalation and oral studies, but only at doses that were maternally toxic. No fetal toxicity was seen at doses that were not maternally toxic. Decreased sperm counts have been observed in male rats in the absence of a reduction in fertility. Toluene has been reported to cause mental or growth retardation in the children of solvent abusers who directly inhale toluene during pregnancy.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

Cyclohexane

Reproductive Toxicity: Two-generation reproduction and developmental toxicity studies using rats and rabbits exposed (whole-body) to atmospheric concentrations up to 7000 ppm cyclohexane did not detect evidence of developmental toxicity in either species.

Section 12: Ecological Information

Section 12: Ecological Information

Toxicity: Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

Other Adverse Effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping Description: UN1203, Gasoline, 3, II
Non-Bulk Package Marking: Gasoline, UN1203
Non-Bulk Package Labeling: Flammable liquid
Bulk Package/Placard Marking: Flammable / 1203
Packaging - References: 49 CFR 173.150; 173.202, 173.242

Hazardous Substance: See Section 15 for RQ's
Emergency Response Guide: 128
Note:

(Exceptions; Non-bulk; Bulk)

See Section 15 for RQ's
128

*The following alternate shipping description order may be used until January 1, 2013: Proper Shipping name, Hazard Class or Division, (Subsidiary Hazard if any), UN or NA number, Packing Group
Other shipping description elements may be required for DOT compliance.*

International Maritime Dangerous Goods (IMDG)

Shipping Description: UN1203, Gasoline, 3, II, (FP° C cc), [where FP is the material's flash point in degrees Celsius closed cup]
Non-Bulk Package Marking: Gasoline, UN 1203
Labels: Flammable liquid
Placards/Marking (Bulk): Flammable / 1203
Packaging - Non-Bulk: P001
EMS: F-E, S-E

Section 14: Transport Information

Note: *If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.*

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: UN1203
 Proper Shipping Name: Gasoline
 Hazard Class/Division: 3
 Packing Group: II
 Non-Bulk Package Marking: Gasoline, UN1203
 Labels: Flammable liquid
 ERG Code: 3H

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y305	305	307
Max. Net Qty. Per Package:	1 L	5 L	60 L
Packaging Instruction # after 12/31/2010:	Y341	353	364

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes
 Chronic Health: Yes
 Fire Hazard: Yes
 Pressure Hazard: No
 Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration ^a	de minimis
n-Hexane	2-13	1.0%
Toluene	1-10	1.0%
Cyclohexane	1-5	1.0%
Benzene	0.1-5	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Toluene	Developmental Toxicant

International Hazard Classification

GHS Classification:

H224 – Flammable liquids – Category 1
H315 – Skin corrosion/irritation – Category 2
H304 – Aspiration Hazard – Category 1
H336 – Specific target organ toxicity (single exposure) – Category 3
H350 – Carcinogenicity – Category 1B
H411 – Hazardous to the aquatic environment, chronic toxicity – Category 2

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class

B2 - Flammable Liquids
D2A
D2B

National Chemical Inventories:

All components are either listed on the US TSCA inventory, or are not regulated under TSCA.

All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

Section 16: Other Information

Date of Issue:	20-Dec-2010
Status:	FINAL
Previous Issue Date:	13-Aug-2010
Revised Sections or Basis for Revision:	Format change MARPOL information (Sections 1, 3 and 12)
SDS Number:	039420

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and Implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

EASTMAN

MATERIAL SAFETY DATA SHEET

Revision Date: 09/10/2007
MSDSUSA/ANS/EN/15000015788/Version 4.1
0032347972/0000821108

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	Eastman(TM) Ethyl Acetate, Urethane Grade
Product Identification Number(s)	P0005407
Manufacturer/Supplier	Eastman Chemical Company 200 South Wilcox Drive Kingsport, TN 37660-5280 US +14232292000
MSDS Prepared by	Eastman Product Safety and Health
Chemical Name	acetic acid ethyl ester
Synonym(s)	00054-UG 900300
Molecular Formula	C4H8O2
Molecular Weight	88.11
Product Use	solvent
OSHA Status	hazardous

For emergency health, safety, and environmental information, call 1-423-229-4511 or 1-423-229-2000.

For emergency transportation information, in the United States: call CHEMTREC at 800-424-9300 or call 423-229-2000.

2. COMPOSITION INFORMATION ON INGREDIENTS

(Typical composition is given, and it may vary. A certificate of analysis can be provided, if available.)

<u>Weight %</u>	<u>Component</u>	<u>CAS Registry No.</u>
100%	ethyl acetate	141-78-6

3. HAZARDS IDENTIFICATION

WARNING!
FLAMMABLE LIQUID AND VAPOR
HIGH VAPOR CONCENTRATIONS MAY CAUSE DROWSINESS AND IRRITATION OF THE EYES
OR RESPIRATORY TRACT
PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DRYING, CRACKING, OR IRRITATION

HMIS® Hazard Ratings: Health - 1, Flammability -3, Chemical Reactivity - 0

HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

4. FIRST-AID MEASURES

Inhalation: Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.
Eyes: Any material that contacts the eye should be washed out immediately with water. If easy to do,

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EASTMAN

MATERIAL SAFETY DATA SHEET

Revision Date: 09/10/2007
MSDSUSA/ANSVEN/150000015788/Version 4.1
0032347972/0000821108

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

Eye Protection: Wear safety glasses with side shields (or goggles). Wear a full-face respirator, if needed.

Skin Protection: For operations where prolonged or repeated skin contact may occur, chemical-resistant gloves should be worn. Contact health and safety professional or manufacturer for specific information.

Recommended Decontamination Facilities: eye bath, washing facilities, safety shower

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: liquid

Color: colorless

Odor: sweet, ester

Odor Threshold: 3.9 ppm

Specific Gravity: 0.902 (20 °C)

Vapor Pressure: 20 °C; 99 mbar

Vapor Density: 3

Freezing Point: -83 °C

Boiling Point: 78 °C

Evaporation Rate: 4.1 (n-butyl acetate = 1) **Solubility in Water:** moderate

Octanol/Water Partition Coefficient: P: 5.4; log P: 0.73

Flash Point: -4 °C (Tag closed cup)

Autoignition Temperature: 485 °C (ASTM D2155)

Thermal Decomposition Temperature: (DTA) No exotherm to 500°C

10. STABILITY AND REACTIVITY

Stability: Stable.

Incompatibility: Material reacts with strong oxidizing agents.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

Oral LD-50:(rat)	5,600 mg/kg
Inhalation LC-50: (rat)	6 h: 16000 ppm

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Revision Date: 09/10/2007
MSDSUSA/ANSI/EN/150000015788/Version 4.1
0032347972/0000821108

Dermal LD-50: (rabbit)	>20 mL/kg (highest dose tested)
Skin Irritation (rabbit)	slight
Eye Irritation (rabbit)	slight
Skin Sensitization: (human)	none

12. ECOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

Oxygen Demand Data:

BOD-5: 1,240 mg/g
BOD-20: 1,240 mg/g
BOD-20: 1,430 mg/g

COD (Chemical Oxygen Demand):: 1,540 mg/g
ThBOD: 1,820 mg/g

Acute Aquatic Effects Data:

48 h LC-50 (golden orfe): 270 mg/l
48 h LC-50 (golden orfe): 333 mg/l
24 h LC-50 (daphnid): 3090 mg/l
24 h EC-50 (daphnid): 3090 mg/l

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Mix with compatible chemical which is less flammable and incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container.

14. TRANSPORT INFORMATION

Important Note: *Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.*

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DOT (USA)

Reportable Quantity: 2,270 kg (Ethyl Acetate)

Possible Shipping Description(s):

Ethyl acetate
3 UN 1173 II

Sea - IMDG (International Maritime Dangerous Goods)

Possible Shipping Description(s):

ETHYL ACETATE
3 UN 1173 II

Air - ICAO (International Civil Aviation Organization)

Possible Shipping Description(s):

Ethyl acetate
3 UN 1173 II

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS (Canada) Status: controlled

WHMIS (Canada) Hazard Classification: B/2

SARA 311-312 Hazard Classification(s):
fire hazard

SARA 313: none, unless listed below

Carcinogenicity Classification (components present at 0.1% or more): none, unless listed below

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TSCA (US Toxic Substances Control Act): This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act): This product is listed on the DSL. Any impurities present in this product are exempt from listing.

EINECS (European Inventory of Existing Commercial Chemical Substances): This product is listed on EINECS or otherwise complies with EINECS requirements. **EINECS Number:** 205-500-4

AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme): This product is listed on AICS or otherwise complies with NICNAS.

MITI (Japanese Handbook of Existing and New Chemical Substances): This product is listed in the Handbook or has been approved in Japan by new substance notification.

16. OTHER INFORMATION

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The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information. Users should make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials, the safety and health of employees and customers, and the protection of the environment.

Product hazard information is provided as a supplement to other information.



Hexane

Material Safety Data Sheet

CITGO Petroleum Corporation
1701 Golf Road, Suite 1-1101
Rolling Meadows, IL 60008-4295

MSDS No. 19041
Revision Date 12/18/2008

IMPORTANT: This MSDS is prepared in accordance with 29 CFR 1910.1200. Read this MSDS before transporting, handling, storing or disposing of this product and forward this information to employees, customers and users of this product.

Hazard Rankings		
	HMIS	NFPA
Health Hazard	* 2	2
Fire Hazard	3	3
Reactivity	0	0

* = Chronic Health Hazard

Emergency Overview			
Physical State	Liquid.		
Color	Transparent, colorless.	Odor	Characteristic hydrocarbon solvent odor.
DANGER: EXTREMELY FLAMMABLE LIQUID AND VAPOR, VAPOR MAY CAUSE FLASH FIRE. Vapor may travel considerable distance to source of ignition and flash back. Harmful or fatal if swallowed - can enter lungs and cause damage. Breathing high concentrations can cause irregular heartbeats which may be fatal. May be harmful if inhaled or absorbed through the skin. Can cause eye, skin or respiratory tract irritation. Overexposure can cause central nervous system (CNS) depression and/or other target organ effects. Harmful to aquatic organisms.			

Protective Equipment
Minimum Recommended See Section 8 for Details

SECTION 1. PRODUCT IDENTIFICATION

Trade Name	Hexane	Technical Contact	(847) 734-7699 (8am - 4pm CT M-F)
Product Number	19041	Medical Emergency	(832) 486-4700
CAS Number	64742-49-0	CHEMTREC Emergency (United States Only)	(800) 424-9300
Product Family	Petroleum hydrocarbon solvent		
Synonyms	Commercial Hexane; C6-rich Solvent; CITGO® Material Code: 19041		

SECTION 2. COMPOSITION

This product may be composed, in whole or in part, of any of the following refinery streams:

Naphtha, petroleum, hydrotreated light [CAS No.: 64742-49-0]

This product contains the following components:

Component Name(s)	CAS Registry No.	Concentration (%)
-------------------	------------------	-------------------

Hexane

n-Hexane	110-54-3	40 - 60
Hexane, other isomers	Mixture	40 - 60
Methylcyclopentane	96-37-7	5 - 20
Heptane, all isomers	Mixture.	<3
Cyclohexane	110-82-7	<2

SECTION 3. HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact. Eye contact. Inhalation. Ingestion.

Signs and Symptoms of Acute Exposure

Inhalation	Breathing high concentrations may be harmful. Mist or vapor can irritate the throat and lungs. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness. Breathing high concentrations of this material, for example, in an enclosed space or by intentional abuse, can cause irregular heartbeats which can cause death.
Eye Contact	This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists. Symptoms include stinging, watering, redness, and swelling.
Skin Contact	This material can cause skin irritation. The severity of irritation will depend on the amount of material that is applied to the skin and the speed and thoroughness that it is removed. Symptoms include redness, itching, and burning of the skin. Repeated or prolonged skin contact can produce moderate irritation (dermatitis).
Ingestion	If swallowed, this material may irritate the mucous membranes of the mouth, throat, and esophagus. It can be readily absorbed by the stomach and intestinal tract. Symptoms include a burning sensation of the mouth and esophagus, nausea, vomiting, dizziness, staggered gait, drowsiness, loss of consciousness and delirium, as well as additional central nervous system (CNS) effects.

Due to its light viscosity, there is a danger of aspiration into the lungs during swallowing and subsequent vomiting. Aspiration can result in severe lung damage or death. Cardiovascular effects include shallow rapid pulse with pallor (loss of color in the face) followed by flushing (redness of the face). Also, progressive CNS depression, respiratory insufficiency and ventricular fibrillation leads to death.

Chronic Health Effects Summary Prolonged and/or repeated contact may cause skin irritation and inflammation. Symptoms include defatting, redness, blistering, lesions, and scaly dermatitis.

Chronic effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction.

Reports have associated repeated and prolonged occupational overexposure to light petroleum products with irreversible brain and nervous system damage (sometimes referred to as "Solvent or Painter's Syndrome"). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Repeated and prolonged overexposure to n-hexane has been associated with peripheral nerve tissue damage. Adverse effects include numbness, tingling, pain, and loss of muscle control in the extremities, disorientation, impaired vision and reflexes, decline in motor function and paralysis.

Conditions Aggravated by Exposure Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin, Respiratory System, Liver, Kidneys, Peripheral Nervous System, Central Nervous System (CNS)

Target Organs May cause damage to the following organs: liver, mucous membranes, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea

Carcinogenic Potential This product is not known to contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

Hexane

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

- Engineering Controls** Provide ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits indicated below. All electrical equipment should comply with the National Electrical Code. An emergency eye wash station and safety shower should be located near the work-station.
- Personal Protective Equipment** Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



- Eye Protection** Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing, or spraying of this material. A suitable emergency eye wash water and safety shower should be located near the work station.
- Hand Protection** Avoid skin contact. Use heavy duty gloves constructed of chemical resistant materials such as Viton® or heavy nitrile rubber. Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.
- Body Protection** Avoid skin contact. Wear long-sleeved fire-retardant garments (e.g., Nomex®) while working with flammable and combustible liquids. Additional chemical-resistant protective gear may be required if splashing or spraying conditions exist. This may include an apron, boots and additional facial protection. If product comes in contact with clothing, immediately remove soaked clothing and shower. Promptly remove and discard contaminated leather goods.
- Respiratory Protection** For known vapor concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator if adequate protection is provided. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134). For airborne vapor concentrations that exceed the recommended protection factors for organic vapor respirators, use a full-face, positive-pressure, supplied air respirator. Due to fire and explosion hazards, do not enter atmospheres containing concentrations greater than 10% of the lower flammable limit of this product.
- General Comments** Warning! Use of this material in spaces without adequate ventilation may result in generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels
n-Hexane	ACGIH (United States). Skin TWA: 50 ppm 8 hour(s). OSHA (United States). TWA: 500 ppm 8 hour(s).
Hexane, other isomers	ACGIH (United States). TWA: 500 ppm 8 hour(s). STEL: 1000 ppm 15 minute(s).
Heptane, all isomers	ACGIH (United States). TWA: 400 ppm 8 hour(s). STEL: 500 ppm 15 minute(s). OSHA (United States). TWA: 500 ppm 8 hour(s).

Hexane

Cyclohexane

ACGIH (United States).
TWA: 100 ppm 8 hour(s).
OSHA (United States).
TWA: 300 ppm 8 hour(s).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

Physical State	Liquid.	Color	Transparent, colorless.	Odor	Characteristic hydrocarbon solvent odor.
Specific Gravity	0.68 (Water = 1)	pH	Not Applicable.	Vapor Density	AP 3 (Air = 1)
Boiling Range	66 to 70°C (151 to 158°F)		Melting/Freezing Point	Not available.	
Vapor Pressure	18.7 kPa (140 mm Hg) (at 20°C)		Volatility	675 g/l VOC (w/v)	
Solubility in Water	Very slightly soluble in cold water. (<0.1 % w/w)		Viscosity (cSt @ 40°C)	AP 0.5	
Flash Point	Closed cup: -18°C (0°F). (Tagliabue (ASTM D-56))				
Additional Properties	Conductivity = <5 picosiemens/meter (unadditized)				

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability	Stable.	Hazardous Polymerization	Not expected to occur.
Conditions to Avoid	Keep away from heat, flame and other potential ignition sources. Keep away from strong oxidizing conditions and agents.		
Materials Incompatibility	Strong acids, alkalis, and oxidizers such as liquid chlorine and oxygen.		
Hazardous Decomposition Products	No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.		

SECTION 11. TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data	n-Hexane This material contains n-hexane. Long-term or repeated exposure to n-hexane can cause permanent peripheral nerve damage. Initial symptoms are numbness of the fingers and toes. Also, motor weakness can occur in the digits, but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. Co-exposure to methylethyl ketone or methyl isobutyl ketone increases the neurotoxic properties of n-hexane. In laboratory studies, prolonged exposure to elevated concentrations of n-hexane was associated with decreased sperm count and degenerative changes in the testicles of rats.
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Heptane, all isomers

n-Heptane was not mutagenic in the Salmonella/microsome (Ames) assay and is not considered to be carcinogenic.

Cyclohexane

ORAL (LD50): Acute: 12705 mg/kg [Rat]. 813 mg/kg [Mouse].

Hexane

Cyclohexane can cause eye, skin and mucous membrane irritation, CNS depressant and narcosis at elevated concentrations. In experimental animals exposed to lethal concentrations by inhalation or oral route, generalized vascular damage and degenerative changes in the heart, lungs, liver, kidneys and brain were identified.

Cyclohexane has been the focus of substantial testing in laboratory animals. Cyclohexane was not found to be genotoxic in several tests including unscheduled DNA synthesis, bacterial and mammalian cell mutation assays, and in vivo chromosomal aberration. An increase in chromosomal aberrations in bone marrow cells of rats exposed to cyclohexane was reported in the 1980's. However, a careful re-evaluation of slides from this study by the laboratory which conducted the study indicates these findings were in error, and that no significant chromosomal effects were observed in animals exposed to cyclohexane. Findings indicate long-term exposure to cyclohexane does not promote dermal tumorigenesis.

SECTION 12. ECOLOGICAL INFORMATION

- Ecotoxicity** Ecotoxicity data are not available for this product. Aquatic toxicity values are expected to be in the range of 1 - 10 mg/l based upon data from components and similar products. This mixture contains components that are potentially toxic to freshwater and saltwater ecosystems.
- Environmental Fate** This product will normally float on water. Components will evaporate rapidly. This material may be harmful to aquatic organisms and may cause long term adverse effects in the aquatic environment. The octanol-water partition coefficient (log Kow) for this product is expected to be in the range of 2.1 to 5.

SECTION 13. DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Maximize material recovery for reuse or recycling. Recovered non-usable material may be regulated by US EPA as a hazardous waste due to its ignitibility (D001) and/or its toxic (D018) characteristics. Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a RCRA "hazardous waste" at the time of disposal. Transportation, treatment, storage and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues.

SECTION 14. TRANSPORT INFORMATION

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.

- US DOT Status** A U.S. Department of Transportation regulated material.
- Proper Shipping Name** RQ, Hexanes, 3, UN 1208, PGII, ERG: 128
- Hazard Class** 3 **Packing Group** II
UN/NA Number UN 1208
- Reportable Quantity** RQ 5000 lbs. [Based upon maximum Hexane concentration of 100% and an RQ of 5000 lbs.]
- Placard(s)**

Hexane



Emergency Response
Guide No.

128

MARPOL III Status

Not a DOT "Marine
Pollutant" per 49 CFR
171.8.

SECTION 15. REGULATORY INFORMATION

TSCA Inventory	This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.
SARA 302/304 Emergency Planning and Notification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312 Hazard Identification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: Fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard
SARA 313 Toxic Chemical Notification and Release Reporting	This product contains the following components in concentrations above <i>de minimis</i> levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: n-Hexane [CAS No.: 110-54-3] Concentration: <60% Cyclohexane [CAS No.: 110-82-7] Concentration: <2%
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are: n-Hexane [CAS No.: 110-54-3] RQ = 5000 lbs. (2268 kg) Concentration: 60% Cyclohexane [CAS No.: 110-82-7] RQ = 1000 lbs. (453.6 kg) Concentration: <2% Benzene [CAS No.: 71-43-2] RQ = 10 lbs. (4.536 kg) Concentration: <0.05%
Clean Water Act (CWA)	This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
California Proposition 65	This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): Toluene: <0.01% Benzene: <0.001% Ethylbenzene: <0.001% Naphthalene: <0.001%
New Jersey Right-to-Know Label	For New Jersey R-T-K labeling requirements, refer to components listed in Section 2.

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet complies with the Canadian Controlled Product Regulations and the United States Occupational Safety and Health Administration (OSHA) hazard communication standard.

1. Product and Supplier Identification

Product: Methanol (CH₃OH) **Non-Emergency Tel. #:** (604) 661-2600

Synonyms: Methyl alcohol, methyl hydrate, wood spirit, methyl hydroxide **Emergency Tel. #:** 1-800-424-9300 (CHEMTREC) (Canada and US)

Product Use: Solvent, fuel, feedstock

Company Identification: Methanex Corporation,
1800 Waterfront Centre,
200 Burrard Street,
Vancouver, B.C.
V6C 3M1

Note: CHEMTREC number to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

Importer: Methanex Methanol Company
Suite 1150 – 15301 Dallas Parkway
Addison, Texas 75001
Telephone: (972) 702-0909

2. Composition

Component	% (w/w)	Exposure Limits*	LD ₅₀	LC ₅₀
Methanol (CAS 67-56-1)	99-100	ACGIH TLV-TWA: 200 ppm, skin STEL: 250 ppm, skin notation OSHA PEL: 200 ppm TLV Basis, critical effects: neuropathy, vision, central nervous system	5628 mg/kg (oral/rat) 20 ml/kg (dermal/ rabbit)	64000 ppm (inhalation/rat)

* Exposure limits may vary from time to time and from one jurisdiction to another. Check with local regulatory agency for the exposure limits in your area.

available, do not induce vomiting. In actual or suspected cases of ingestion, transport to medical facility immediately.

NOTE TO PHYSICIAN: Acute exposure to methanol, either through ingestion or breathing high airborne concentrations can result in symptoms appearing between 40 minutes and 72 hours after exposure. Symptoms and signs are usually limited to CNS, eyes and gastrointestinal tract. Because of the initial CNS's effects of headache, vertigo, lethargy and confusion, there may be an impression of ethanol intoxication. Blurred vision, decreased acuity and photophobia are common complaints. Treatment with ipecac or lavage is indicated in any patient presenting within two hours of ingestion. A profound metabolic acidosis occurs in severe poisoning and serum bicarbonate levels are a more accurate measure of severity than serum methanol levels. Treatment protocols are available from most major hospitals and early collaboration with appropriate hospitals is recommended.

5. Fire Fighting Measures

Flash point:	11°C (TCC)
Autoignition temperature:	385 °C (NFPA 1978), 470 °C (Kirk-Othmer 1981; Ullmann 1975)
Lower Explosive Limit:	6% (NFPA, 1978)
Upper Explosion Limit:	36% (NFPA, 1978), 36.5% (Ullmann, 1975)
Sensitivity to Impact:	Low
Sensitivity to Static Discharge:	Low
Hazardous Combustion Products:	Toxic gases and vapours; oxides of carbon and formaldehyde.
Extinguishing Media:	Small fires: Dry chemical, CO ₂ , water spray Large fires: Water spray, AFFF(R) (Aqueous Film Forming Foam (alcohol resistant)) type with either a 3% or 6% foam proportioning system.

Fire Fighting Instructions: Methanol burns with a clean clear flame that is almost invisible in daylight. Stay upwind! Isolate and restrict area access. Concentrations of greater than 25% methanol in water can be ignited. Use fine water spray or fog to control fire spread and cool adjacent structures or containers. Contain fire control water for later disposal. Fire fighters must wear full face, positive pressure, self-contained breathing apparatus or airline and appropriate protective clothing. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD INDEX:

HEALTH: 1

FLAMMABILITY: 3

REACTIVITY: 0

6. Accidental Release Measures

Overview: Flammable liquid which can burn without a visible flame. Release can cause an immediate risk of fire and explosion. Eliminate all ignition sources, stop leak and use absorbent materials. If necessary, contain spill by diking. Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapour and fire hazard. Maximize methanol recovery for recycling or re-use. Restrict access to area until completion of cleanup. Ensure cleanup is conducted by

Respiratory Protection: NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

Skin protection: Butyl and nitrile rubbers are recommended for gloves. Check with manufacturer. Wear chemical resistant pants and jackets, preferably of butyl or nitrile rubber. Check with manufacturer.

Eye and Face Protection: Face shield and chemical splash goggles when transferring is taking place.

Footwear: Chemical resistant, and as specified by the workplace.

Other: Eyewash and showers should be located near work areas. NOTE: PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean, fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

9. Physical and Chemical Properties

Appearance: Liquid, clear, colourless
Odour: Mild characteristic alcohol odour
Odour Threshold: detection: 4.2 - 5960 ppm
(geometric mean) 160 ppm
recognition: 53 - 8940 ppm
(geometric mean) 690 ppm

pH: Not applicable

Vapour Pressure: 12.8 kPa @ 20°C

Solubility: Completely soluble

Vapour Density: 1.105 @ 15°C

Freezing Point: -97.8°C

Boiling Point: 64.7 °C @ 101.3 kPa

Critical Temperature: 239.4 °C

Relative Density: 0.791

Evaporation Rate: 4.1 (n-butyl acetate =1)

Partition Coefficient: Log P (oct) = -0.82

Solubility in other Liquids: Soluble in all proportions in other alcohols, esters, ketones, ethers and most other organic solvents

10. Stability and Reactivity

Chemical Stability: Yes

Incompatibility: Yes. Avoid contact with strong oxidizers, strong mineral or organic acids, and strong bases. Contact with these materials may cause a violent or explosive reaction. May be corrosive to lead, aluminum, magnesium, and platinum.

Conditions of Reactivity: Presence of incompatible materials and ignition sources.

Hazardous Decomposition Products: Formaldehyde, carbon dioxide, and carbon monoxide.

Hazardous Polymerization: Will not occur.

11. Toxicological Information

LD₅₀:	5628 mg/kg (oral/rat), 20 ml/kg (dermal/rabbit)
LC₅₀:	64000 ppm (rat)
Acute Exposure:	See Section 3
Chronic Exposure:	See Section 3.
Exposure Limits:	See Section 2.
Irritancy:	See Section 3.
Sensitization:	No
Carcinogenicity:	Not listed by IARC, NTP, ACGIH, or OSHA as a carcinogen.
Teratogenicity:	No
Reproductive toxicity:	Reported to cause birth defects in rats exposed to 20,000 ppm
Mutagenicity:	Insufficient data
Synergistic products:	None Known

12. Ecological Information

Environmental toxicity: Methanol in fresh or salt water may have serious effects on aquatic life. A study on methanol's toxic effects on sewage sludge bacteria reported little effect on digestion at 0.1% while 0.5% methanol retarded digestion. Methanol will be broken down into carbon dioxide and water.

Biodegradability: Biodegrades easily in water.

13. Disposal Considerations

Review federal, provincial or state, and local government requirements prior to disposal. Store material for disposal as indicated in Section #7, *Handling and Storage*. Disposal by controlled incineration or by secure land fill may be acceptable.

14. Transport Information

Transport of Dangerous Goods (TDG and CLR):	Methanol, Class 3(6.1), UN1230, P.G. II Limited Quantity: ≤ 1 litres
United States Department of Transport (49CFR): (Domestic Only)	Methanol, Class 3, UN 1230, P.G. II, (RQ 5000 lbs/2270 kg) Limited Quantity: ≤ 1 litres
International Air Transport Association (IATA):	Methanol, Class 3(6.1), UN1230, P.G. II Packaging Instruction: 305, 1 litre maximum per package,
International Maritime Organization (IMO):	Methanol, Class 3(6.1), UN1230, P.G. II, Flash Point = 12 °C EmS No. F-E, S-D Stowage Category "B", Clear of living quarters

15. Regulatory Information

CANADIAN FEDERAL REGULATIONS:

CEPA, DOMESTIC SUBSTANCES LIST: Listed

WHMIS CLASSIFICATION: B2, D1A

UNITED STATES REGULATIONS:

29CFR 1910.1200 (OSHA): Hazardous

40CFR 116-117 (EPA): Hazardous

40CFR 355, Appendices A and B: Subject to Emergency Planning and Notification

40CFR 372 (SARA Title III): Listed

40CFR 302 (CERCLA): Listed

16. Other Information

Preparation Date: October 13, 2005

Prepared by: Kel-Ex Agencies Ltd., P.O. Box 52201, Lynnmour RPO, North Vancouver, B.C., V7J 3V5

Disclaimer: The information above is believed to be accurate and represents the best information currently available to us. Users should make their own investigations to determine the suitability of the information for their particular purposes. This document is intended as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.

Methanex Corporation and its subsidiaries make no representations or warranties, either express or implied, including without limitation any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Methanex Corp. will not be responsible for damages resulting from use of or reliance upon this information.

Revisions: None



**MATHESON
TRI-GAS**

ask. . .The Gas Professionals™

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MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: TERT-BUTANOL

TRADE NAMES/SYNONYMS:

T-BUTANOL; 1,1-DIMETHYLETHANOL; TRIMETHYLCARBINOL; TRIMETHYLMETHANOL;
TRIMETHYL METHANOL; BUTYL ALCOHOL; 2-METHYL-2-PROPANOL; TERT-BUTYL
ALCOHOL; TRIMETHYL CARBINOL; UN 1120; C4H10O; 00230215; RTECS EO1925000

CHEMICAL FAMILY: aliphatic, alcohols

CREATION DATE: Dec 01 2003

REVISION DATE: Jun 14 2007

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TERT-BUTANOL
CAS NUMBER: 75-65-0
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=0

EMERGENCY OVERVIEW:

CHANGE IN APPEARANCE: hygroscopic

COLOR: colorless

PHYSICAL FORM: crystals, liquid

ODOR: pungent odor

MAJOR HEALTH HAZARDS: respiratory tract irritation, eye irritation, central nervous system depression

PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire.

POTENTIAL HEALTH EFFECTS:





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EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

1600 ppm

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with organic vapor cartridge(s).

Any air-purifying respirator with a full facepiece and an organic vapor canister.

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.

Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

COLOR: colorless

CHANGE IN APPEARANCE: hygroscopic

PHYSICAL FORM: crystals, liquid

ODOR: pungent odor

MOLECULAR WEIGHT: 74.12

MOLECULAR FORMULA: (C-H₃)₃-C-O-H

BOILING POINT: 180 F (82 C)

MELTING POINT: 79 F (26 C)

VAPOR PRESSURE: 31 mmHg @ 20 C

VAPOR DENSITY (air=1): 2.6

SPECIFIC GRAVITY (water=1): 0.7887

WATER SOLUBILITY: soluble

PH: Not available

VOLATILITY: Not available

ODOR THRESHOLD: 73 ppm



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EVAPORATION RATE: 1.05 (butyl acetate=1)

VISCOSITY: 3.3 cP @ 30 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: alcohol, ether, acetone, benzene

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES: metals, acids, oxidizing materials, combustible materials, metal salts

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of carbon

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TERT-BUTANOL:

IRRITATION DATA: 500 ul/24 hour(s) skin-rabbit mild; 100 ul/24 hour(s) eyes-rabbit severe

TOXICITY DATA: >10000 ppm/4 hour(s) inhalation-rat LC50; >2 gm/kg skin-rabbit LD50; 2743 mg/kg oral-rat LD50

CARCINOGEN STATUS: ACGIH: A4 -Not Classifiable as a Human Carcinogen

LOCAL EFFECTS:

Irritant: inhalation, eye

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

TARGET ORGANS: central nervous system

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: kidney disorders, liver disorders, respiratory disorders, skin disorders and allergies

TUMORIGENIC DATA: Available.

MUTAGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

ADDITIONAL DATA: Alcohol may enhance the toxic effects.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 6410000 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (*Pimephales promelas*)



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INVERTEBRATE TOXICITY: 5504000 ug/L 48 hour(s) EC50 (Immobilization) Water flea (*Daphnia magna*)

OTHER TOXICITY: 2450000 ug/L 48 hour(s) LC50 (Mortality) Clawed toad (*Xenopus laevis*)

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Butanols
ID NUMBER: UN1120
HAZARD CLASS OR DIVISION: 3
PACKING GROUP: II
LABELING REQUIREMENTS: 3



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Butanols
UN NUMBER: UN1120
CLASS: 3
PACKING GROUP/RISK GROUP: II

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: No
SUDDEN RELEASE: No



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**SARA TITLE III SECTION 313 (40 CFR 372.65):
TERT-BUTYL ALCOHOL**

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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Health	2
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet Denatonium benzoate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Denatonium benzoate

Catalog Codes: SLD3193

CAS#: 3734-33-6

RTECS: BO6650000

TSCA: TSCA 8(b) inventory: Denatonium benzoate

CI#: Not available.

Synonym: Bitrex; N-[2-[(2,6-Dimethylphenyl)amino]-2-oxoethyl]-N,N-diethylbenzenemethanaminium benzoate

Chemical Formula: C₂₈H₃₄N₂O₃

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Denatonium benzoate	3734-33-6	100

Toxicological Data on Ingredients: Denatonium benzoate: ORAL (LD50): Acute: 584 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant).

Potential Chronic Health Effects:

Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant). **CARCINOGENIC EFFECTS:** Not available. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label.

Storage:

Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 446.59 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: Decomposes.

Melting Point: 168°C (334.4°F)

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Partially soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 584 mg/kg [Rat].

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans:

Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Denatonium benzoate

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

R22- Harmful if swallowed. R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 05:05 PM

Last Updated: 11/01/2010 12:00 PM

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Toluene

Material Safety Data Sheet

CITGO Petroleum Corporation
1701 Golf Road, Suite 1-1101
Rolling Meadows, IL 60008-4295

MSDS No. 07307
Revision Date 4/17/2008

IMPORTANT: This MSDS is prepared in accordance with 29 CFR 1910.1200. Read this MSDS before transporting, handling, storing or disposing of this product and forward this information to employees, customers and users of this product.

Hazard Rankings		
	HMIS	NFPA
Health Hazard	* 2	2
Fire Hazard	3	3
Reactivity	0	0

* = Chronic Health Hazard

Emergency Overview			
Physical State	Liquid.		
Color	Transparent, colorless.	Odor	Sweet, pungent aromatic hydrocarbon.

WARNING:
Flammable liquid; vapor may cause flash fire.
Harmful or fatal if swallowed - Can enter lungs and cause damage.
Mist or vapor can irritate the respiratory tract.
Liquid contact can cause eye or skin irritation.
Overexposure can cause central nervous system (CNS) depression and/or other target organ effects.
Breathing high concentrations can cause irregular heartbeats which may be fatal.

Protective Equipment
Minimum Recommended See Section 8 for Details


SECTION 1. PRODUCT IDENTIFICATION

Trade Name	Toluene	Technical Contact	(847) 734-7699 (8am - 4pm CT M-F)
Product Number	07307	Medical Emergency	(832) 486-4700
CAS Number	108-88-3	CHEMTREC Emergency (United States Only)	(800) 424-9300
Product Family	Petroleum hydrocarbon solvent		
Synonyms	Toluol; C7 Alkylbenzene; C7 Aromatic Hydrocarbon Solvent; High-purity Toluene; Methylbenzene; Reagent-grade Toluene (meets ASTM D-841 "Nitration Grade" Specifications); TDI-grade Toluene; Petroleum hydrocarbon solvent; Former product code(s): 2170 and 19170; CITGO® Material Code: 07307		

SECTION 2. COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
Toluene	108-88-3	>99

SECTION 3. HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact. Inhalation.

Signs and Symptoms of Acute Exposure

Toluene

Respiratory Protection For known vapor concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator if adequate protection is provided. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134). For airborne vapor concentrations that exceed the recommended protection factors for organic vapor respirators, use a full-face, positive-pressure, supplied air respirator. Due to fire and explosion hazards, do not enter atmospheres containing concentrations greater than 10% of the lower flammable limit of this product.

General Comments Warning! Use of this material in spaces without adequate ventilation may result in generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels
Toluene	ACGIH (United States).
	TWA: 20 ppm 8 hour(s).
	OSHA (United States).
	TWA: 200 ppm 8 hour(s).
	CEIL: 300 ppm
	PEAK: 500 ppm 1 times per shift, 10 minute(s).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

Physical State	Liquid.	Color	Transparent, colorless.	Odor	Sweet, pungent aromatic hydrocarbon.
Specific Gravity	0.87 (Water = 1)	pH	Not Applicable.	Vapor Density	AP 3 (Air = 1)
Boiling Range	109 - 111° C (228 - 231° F)			Melting/Freezing Point	AP -95°C (AP -139°F)
Vapor Pressure	3.2 kPa (24 mm Hg) (at 20°C)			Volatility	872 g/l VOC (w/v)
Solubility in Water	Very slightly soluble in cold water. (<0.1 % w/w)			Viscosity (cSt @ 40°C)	<3
Flash Point	Closed cup: 4°C (40°F). (Tagliabue.)				
Additional Properties	Paraffin, Isoparaffin and Cycloparaffin Hydrocarbons Content = <1 Wt.% (ASTM D-1319); Aromatic Hydrocarbon Content = >99 Wt. % (ASTM D-1319); Average Density at 60°F = 7.26 lbs./gal. (Calculated via ASTM D-287); Aniline Cloud Point Temperature = 48°F (8.9°C) (ASTM D-611); Kauri-Butanol (KB) Value = 105 (ASTM D-1133); Dry Point Temperature = 231°F (111°C) (ASTM D-86, D-850 or D-1078); Evaporation Rate = 1.9 (n-Butyl acetate = 1.0); Heat Value = 18,314 Btu per pound Odor threshold = 2 to 5 ppm in air				

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability	Stable.	Hazardous Polymerization	Not expected to occur.
Conditions to Avoid	Keep away from heat, flame and other potential ignition sources. Keep away from strong oxidizing conditions and agents.		
Materials Incompatibility	Strong acids, alkalis, and oxidizers such as liquid chlorine, other halogens, hydrogen peroxide and oxygen.		
Hazardous Decomposition Products	No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.		

Toluene

SECTION 11. TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Toluene

Effects from Acute Exposure:

Deliberate inhalation of toluene at high concentrations (e.g., glue sniffing and solvent abuse) has been associated with adverse effects on the liver, kidney and nervous system and can cause CNS depression, cardiac arrhythmias and death. Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects.

Effects from Repeated or Prolonged Exposure:

Studies of workers indicate long-term exposure may be related to impaired color vision and hearing. Some studies of workers suggest long-term exposure may be related to neurobehavioral and cognitive changes. Some of these effects have been observed in laboratory animals following repeated exposure to high levels of toluene. Several studies of workers suggest long-term exposure may be related to small increases in spontaneous abortions and changes in some gonadotropic hormones. However, the weight of evidence does not indicate toluene is a reproductive hazard to humans. Studies in laboratory animals indicate some changes in reproductive organs following high levels of exposure, but no significant effects on mating performance or reproduction were observed. Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Findings in laboratory animals were largely negative. Positive findings include small increases in minor skeletal and visceral malformations and developmental delays following very high levels of maternal exposure. Studies of workers indicate long-term exposure may be related to effects on the liver, kidney and blood, but these appear to be limited to changes in serum enzymes and decreased leukocyte counts. Studies in laboratory animals indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland following very high levels of exposure. The relevance of these findings to humans is not clear at this time.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Environmental Fate

Biodegradability: Rapidly biodegradable in aerobic conditions.

Partition Coefficient (log Kow): 2.7

Photodegradation: Based on similar materials, this product will have a significant tendency to partition to air. Hydrocarbons from this product which do partition to air are expected to rapidly photodegrade.

Stability in Water: Degradation of this product in water occurs primarily by microbial action.

Distribution: Principally to air.

SECTION 13. DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Toluene

Maximize material recovery for reuse or recycling. If discarded, Toluene is regulated by US EPA as a listed hazardous waste (U220). It is the responsibility of the user to determine if the material is a RCRA "hazardous waste" at the time of disposal. Transportation, treatment, storage and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues.

SECTION 14. TRANSPORT INFORMATION

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.

US DOT Status	A U.S. Department of Transportation (DOT) regulated material.		
Proper Shipping Name	UN1294, Toluene, 3, PG II RQ (Toluene)		
Hazard Class	3	Packing Group	II
		UN/NA Number	UN1294
Reportable Quantity	RQ 1000 lbs. [Based upon maximum Toluene concentration of 100% and an RQ of 1000 lbs.]		
Placard(s)		Emergency Response Guide No.	130
		MARPOL III Status	Not a DOT "Marine Pollutant" per 49 CFR 171.8.

SECTION 15. REGULATORY INFORMATION

TSCA Inventory	This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.
SARA 302/304 Emergency Planning and Notification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312 Hazard Identification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard
SARA 313 Toxic Chemical Notification and Release Reporting	This product contains the following components in concentrations above <i>de minimis</i> levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: Toluene [CAS No.: 108-88-3] Concentration: >99%
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are: Toluene [CAS No.: 108-88-3] RQ = 1000 lbs. (453.6 kg) Concentration: >99% Benzene [CAS No.: 71-43-2] RQ = 10 lbs. (4.536 kg) Concentration: <0.1%

Toluene

Xylene, all isomers [CAS No.: 1330-20-7] RQ = 100 lbs. (45.36 kg) Concentration: <0.1%

Clean Water Act (CWA)

This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

California Proposition 65

This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Toluene: >99%

Benzene: <0.1%

Ethylbenzene: <0.1%

New Jersey Right-to-Know Label

For New Jersey R-T-K labeling requirements, refer to components listed in Section 2.

Additional Remarks

Federal Hazardous Substances Act, related statutes, and Consumer Product Safety Commission regulations, as defined by 16 CFR 1500.14(b)(3) and 1500.83(a)(13): This product contains Toluene which may require special labeling if distributed in a manner intended or packaged in a form suitable for use in the household or by children. Precautionary label dialogue should display the following: **DANGER: Contains Toluene! Harmful or fatal if swallowed! Call Physician Immediately. Vapor Harmful! KEEP OUT OF REACH OF CHILDREN!**

SECTION 16. OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number 5.3
Revision Date 4/17/2008

ABBREVIATIONS

AP: Approximately	EQ: Equal	>: Greater Than	<: Less Than	NA: Not Applicable	ND: No Data	NE: Not Established
ACGIH: American Conference of Governmental Industrial Hygienists				AIHA: American Industrial Hygiene Association		
IARC: International Agency for Research on Cancer				NTP: National Toxicology Program		
NIOSH: National Institute of Occupational Safety and Health				OSHA: Occupational Safety and Health Administration		
NPCA: National Paint and Coating Manufacturers Association				HMIS: Hazardous Materials Information System		
NFPA: National Fire Protection Association				EPA: US Environmental Protection Agency		

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***** END OF MSDS *****

MSDS Number: M3588 * * * * * Effective Date: 07/06/06 * * * * * Supersedes: 08/17/05

MSDS**Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



Mallinckrodt
CHEMICALS



24 Hour Emergency Telephone: 908-659-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-496-6666

Outside U.S. and Canada
Chemtree: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

METHYL ISOBUTYL KETONE

1. Product Identification

Synonyms: 2-Pentanone,4-methyl-; Hexone; MIBK; Isopropylacetone

CAS No.: 108-10-1

Molecular Weight: 100.16

Chemical Formula: CH₃COCH₂CH(CH₃)₂

Product Codes:

J.T. Baker: 4855, 5384, 9212, 9320, 9322, 9405

Mallinckrodt: 5923, 6247, 6264

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Methyl Isobutyl Ketone	108-10-1	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! HARMFUL OR FATAL IF SWALLOWED. FLAMMABLE LIQUID AND

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Before using bulk quantities of this material, test for presence of explosive peroxides. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):
50 ppm (TWA), 75 ppm (STEL)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Polyvinyl alcohol (PVA) is a recommended material for personal protective equipment.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Slight camphor odor

Solubility:

Moderately soluble in water (1-10%).

Specific Gravity:

0.80 @ 20C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

117C (243F)

Melting Point:

-85C (-121F)

Vapor Density (Air=1):

3.5

Vapor Pressure (mm Hg):

16 @ 20C (68F)

Evaporation Rate (BuAc=1):

1.6

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. May form explosive peroxides in air.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Aldehydes, Nitric Acid, Perchloric Acid, Strong Oxidizers. Violent reaction with Potassium-tert-butoxide.

Conditions to Avoid:

Heat, flame, ignition sources, air, incompatibles

11. Toxicological Information

Oral rat LD50: 2080 mg/kg; Skin rabbit > 20 mL/kg; irritation eye rabbit, Standard Draize, 40 mg severe; investigated as a reproductive effector.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Methyl Isobutyl Ketone (108-10-1)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may evaporate to a moderate extent. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to be readily degraded by photolysis. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:

This material is not expected to be toxic to terrestrial life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: METHYL ISOBUTYL KETONE
Hazard Class: 3
UN/NA: UN1245
Packing Group: II
Information reported for product/size: 20L

International (Water, I.M.O.)

Proper Shipping Name: METHYL ISOBUTYL KETONE
Hazard Class: 3
UN/NA: UN1245
Packing Group: II
Information reported for product/size: 20L

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Methyl Isobutyl Ketone (108-10-1)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	--Canada--		
		DSL	NDSL	Phil.
Methyl Isobutyl Ketone (108-10-1)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-		-SARA 313-	
	RQ	TPQ	List	Chemical Catg.
Methyl Isobutyl Ketone (108-10-1)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8 (d)
Methyl Isobutyl Ketone (108-10-1)	5000	U161	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
 SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
 Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 3[Y]E

Poison Schedule: S5

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 3 Reactivity: 1

Label Hazard Warning:

DANGER! HARMFUL OR FATAL IF SWALLOWED. FLAMMABLE LIQUID AND VAPOR. MAY FORM EXPLOSIVE PEROXIDES IN AIR. HARMFUL IF INHALED. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

Label Precautions:

- Keep away from heat, sparks and flame.
- Avoid contact with eyes, skin and clothing.
- Avoid breathing vapor.
- Keep container tightly closed.
- Use only with adequate ventilation.
- Wash thoroughly after handling.

Label First Aid:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. In case of contact, immediately flush eyes or skin with plenty of water for at



Material Safety Data Sheet

The Dow Chemical Company

Product Name: UCAR(TM) Ester EEP

Issue Date: 01/26/2010

Print Date: 03 Mar 2010

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

UCAR(TM) Ester EEP

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number:

800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

989-636-4400

Local Emergency Contact:

989-636-4400

2. Hazards Identification

Emergency Overview

Color: Colorless

Physical State: Liquid.

Odor: Mild

Hazards of product:

WARNING! Combustible liquid and vapor. Prolonged exposure may cause skin burns. Vapor explosion hazard. Vapors may travel a long distance; ignition and/or flash back may occur. Isolate area. Stay out of low areas. Aspiration hazard. Can enter lungs and cause damage.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause slight temporary eye irritation. Corneal injury is unlikely. Vapor or mist may cause eye irritation.

Skin Contact: Brief contact may cause slight skin irritation with local redness. Prolonged contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. May cause drying and flaking of the skin.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation: Prolonged exposure is not expected to cause adverse effects.

Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

Aspiration hazard: Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

Birth Defects/Developmental Effects: Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

3. Composition Information

Component	CAS #	Amount
3-Ethoxypropionic acid ethyl ester	763-69-9	> 99.0 %

4. First-aid measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Notes to Physician: If burn is present, treat as any thermal burn, after decontamination. The decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Medical Conditions Aggravated by Exposure: Skin contact may aggravate preexisting dermatitis.

Emergency Personnel Protection: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Do not use direct water stream. May spread fire. Eliminate ignition sources. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Neoprene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl alcohol ("PVA"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Colorless
Odor	Mild
Odor Threshold	No test data available
Flash Point - Closed Cup	59 °C (138 °F) <i>Tag Closed Cup ASTM D56</i>
Flash Point - Open Cup	152 °F (152 °F) <i>Tag Open Cup ASTM D1310</i>
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits in Air	Lower: 1.05 % (V) <i>Literature</i> Upper: No test data available
Autoignition Temperature	377 °C (711 °F) <i>Literature</i>
Vapor Pressure	0.09 kPa @ 20 °C <i>Literature</i> 0.7 mmHg @ 20 °C <i>Literature</i>
Boiling Point (760 mmHg)	169.7 °C (337.5 °F) <i>Literature</i>
Vapor Density (air = 1)	5 <i>Literature</i>
Specific Gravity (H ₂ O = 1)	0.951 20 °C/20 °C <i>Literature</i>
Freezing Point	-100 °C (-148 °F) <i>Literature</i> Sets to glass
Melting Point	No test data available
Solubility in water (by weight)	5.2 % @ 20 °C <i>Literature</i>
pH	No test data available
Molecular Weight	146.2 g/mol <i>Literature</i>
Molecular Formula	CH ₃ CH ₂ OCH ₂ CH ₂ COOCH ₂ CH ₃
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	1.35 <i>Measured</i>
Evaporation Rate (Butyl Acetate = 1)	0.1 <i>Literature</i>
Dynamic Viscosity	1.3 cps @ 20 °C <i>Literature</i>
Kinematic Viscosity	No test data available

Volatile Organic Compounds 949 g/l

10. Stability and Reactivity

Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, Rat, male > 5,000 mg/kg

LD50, Rat, female > 4,300 mg/kg

Skin Absorption

LD50, Rabbit, male 4,080 mg/kg

LD50, Rabbit, female 4,679 mg/kg

Inhalation

LC50, 6 h, Rat > 1,000 ppm

Sensitization

Skin

Did not cause allergic skin reactions when tested in guinea pigs.

Repeated Dose Toxicity

Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Developmental Toxicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

No relevant information found.

Genetic Toxicology

In vitro genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry's Law Constant (H): 4.77E-07 atm*m3/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): 1.35 Measured

Partition coefficient, soil organic carbon/water (Koc): 10 Estimated.

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
100 %		OECD 301B Test

Chemical Oxygen Demand: 2.0 mg/mg

Theoretical Oxygen Demand: 1.97 mg/mg

ECOTOXICITY

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (*Pimephales promelas*), 96 h: 88 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, 48 h, immobilization: > 95 mg/l

Toxicity to Micro-organisms

IC50; bacteria, Growth inhibition (cell density reduction), 16 h: > 5,000 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk

NOT REGULATED

DOT Bulk

Proper Shipping Name: FLAMMABLE LIQUID, NOS

Technical Name: ETHYL 3-ETHOXYPROPIONATE

Hazard Class: 3 ID Number: UN1993 Packing Group: PG III

IMDG

Proper Shipping Name: FLAMMABLE LIQUID, NOS

Technical Name: ETHYL 3-ETHOXYPROPIONATE

Hazard Class: 3 ID Number: UN1993 Packing Group: PG III

EMS Number: F-E,S-E

Marine pollutant.: No

ICAO/IATA

Proper Shipping Name: FLAMMABLE LIQUID, NOS

Technical Name: ETHYL 3-ETHOXYPROPIONATE

Hazard Class: 3 ID Number: UN1993 Packing Group: PG III

Cargo Packing Instruction: 310

Passenger Packing Instruction: 309

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
Ethyl acrylate	140-88-5	< 15.0 PPM

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	2	2	0

Recommended Uses and Restrictions



1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : IPA
Uses : Use only in industrial processes.
Product Code : S1111
Company : Shell Chemical LP
 PO Box 2463
 HOUSTON TX 77252-2463
 USA
MSDS Request : 1-800-240-6737
Customer Service : 1-866-897-4355

Emergency Telephone Number
Chemtrec Domestic (24 hr) : 1-800-424-9300
Chemtrec International (24 hr) : 1-703-527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Concentration
Isopropyl Alcohol	67-63-0	100.00%

3. HAZARDS IDENTIFICATION

Emergency Overview	
Appearance and Odour	Clear, White Liquid. Characteristic
Health Hazards	: Vapours may cause drowsiness and dizziness. Irritating to eyes.
Safety Hazards	: Flammable liquid and vapour. Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.

Health Hazards
Inhalation : Vapours may cause drowsiness and dizziness.
Skin Contact : Repeated exposure may cause skin dryness or cracking.
Eye Contact : Irritating to eyes.
Signs and Symptoms : Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance. Other signs and symptoms of central nervous system (CNS) depression may include headache, nausea, and lack of coordination. Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty



Aggravated Medical Condition : breathing.
: Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Eyes. Skin.

4. FIRST AID MEASURES

Inhalation : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

Skin Contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.

Eye Contact : Immediately flush eyes with large amounts of water for at least 15 minutes while holding eyelids open. Transport to the nearest medical facility for additional treatment.

Ingestion : If swallowed, do not induce vomiting; transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Advice to Physician : Causes central nervous system depression. Call a doctor or poison control center for guidance. Potential for chemical pneumonitis. Consider: gastric lavage with protected airway, administration of activated charcoal.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : 12 °C / 54 °F (Abel)

Explosion / Flammability limits in air : 2 - 12 %(V)

Auto Ignition temperature : 425 °C / 797 °F (ASTM D-2155)

Specific Hazards : Carbon monoxide may be evolved if incomplete combustion occurs. The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Extinguishing Media : Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. Do not discharge extinguishing waters into the aquatic environment.

Unsuitable Extinguishing Media : Do not use water in a jet.

Protective Equipment for Firefighters : Wear full protective clothing and self-contained breathing apparatus.

Additional Advice : Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations.

Protective measures : Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet. Shut off



- Eye Protection** : hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Protective Clothing** : Chemical splash goggles (chemical monogoggles).
- Monitoring Methods** : Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.
- Monitoring Methods** : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Examples of sources of recommended air monitoring methods are given below or contact supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods, <http://www.cdc.gov/niosh/nmam/nmammenu.html>. Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods, <http://www.osha-slc.gov/dts/sltc/methods/toc.html>. Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances, <http://www.hsl.gov.uk/search.htm>.
- Environmental Exposure Controls** : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** : Clear White Liquid
- Odour** : Characteristic.
- Boiling point** : 82 - 83 °C / 180 - 181 °F
- Melting / freezing point** : -88 °C / -126 °F
- Flash point** : 12 °C / 54 °F (Abel)
- Explosion / Flammability limits in air** : 2 - 12 %(V)
- Auto-ignition temperature** : 425 °C / 797 °F (ASTM D-2155)
- Vapour pressure** : 4,100 Pa at 20 °C / 68 °F
- Specific gravity** : 0.78 - 0.79 at 20 °C / 68 °F
- Water solubility** : Completely miscible.
- Vapour density (air=1)** : 2 at 20 °C / 68 °F
- Volatile organic carbon content** : 100 %
- Evaporation rate (nBuAc=1)** : 1.5 (ASTM D 3539, nBuAc=1)

10. STABILITY AND REACTIVITY

- Stability** : Stable under normal conditions of use. Reacts with strong oxidising agents. Reacts with strong acids.
- Conditions to Avoid** : Avoid heat, sparks, open flames and other ignition sources.
- Materials to Avoid** : Strong oxidising agents. Strong acids.
- Hazardous Decomposition Products** : Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds



Hazardous Reactions : will be evolved when this material undergoes combustion or thermal or oxidative degradation.
: Data not available.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment : Information given is based on product testing.
Acute Oral Toxicity : Low toxicity: LD50 >2000 mg/kg , Rat
Acute Dermal Toxicity : Low toxicity: LD50 >2000 mg/kg , Rabbit
Acute Inhalation Toxicity : Low toxicity: LC50>5000 ppm / 1 hours, Rat
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin Irritation : Not irritating to skin.
Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.
Eye Irritation : Irritating to eyes.
Respiratory Irritation : Inhalation of vapours or mists may cause irritation to the respiratory system.
Sensitisation : Not a skin sensitizer.
Repeated Dose Toxicity : Kidney: caused kidney effects in male rats which are not considered relevant to humans

Material	: Carcinogenicity Classification
Isopropyl Alcohol	: IARC 3: Not classifiable as to carcinogenicity to humans.

Reproductive and Developmental Toxicity : Causes foetotoxicity in animals at doses which are maternally toxic.
Additional Information : Exposure may enhance the toxicity of other materials.

12. ECOLOGICAL INFORMATION

Ecotoxicological data are based on product testing.

Acute Toxicity
Fish : Low toxicity: LC/EC/IC50 > 100 mg/l
Aquatic Invertebrates : Low toxicity: LC/EC/IC50 > 1000 mg/l
Algae : Expected to have low toxicity: LC/EC/IC50 > 1000 mg/l
Microorganisms : Low toxicity: LC/EC/IC50 > 1000 mg/l
Mobility : Dissolves in water.
If product enters soil, it will be highly mobile and may contaminate groundwater.
Persistence/degradability : Readily biodegradable meeting the 10 day window criterion.
Oxidises rapidly by photo-chemical reactions in air.
Bioaccumulation : Not expected to bioaccumulate significantly.

13. DISPOSAL CONSIDERATIONS

Material Disposal : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical



Page 1 of _
Procter & Gamble Company
Household Care R&D
Ivorydale Technical Center
5299 Spring Grove Avenue
Cincinnati, OH 45217

MATERIAL SAFETY DATA SHEET

MSDS #:
Supersedes:

Issue Date:
Issue Date:

SECTION 1 - PRODUCT IDENTIFICATION

Name: 93% Sulfuric Acid

Emergency Telephone Number: (CHEMTREC-needed for transportation of shipments classified as hazardous only)
or call Local Poison Control Center(?)

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient: Sulfuric Acid 93% (H₂SO₄) CAS#: 7664-93-9 93 % by Wt. (or range)

SECTION 3 - HAZARDS IDENTIFICATION

Emergency Overview: A strong mineral acid present as a colorless and odorless oily liquid when pure but may appear yellow to dark brown when impure. Extremely corrosive to all body tissues, causing rapid tissue destruction and serious chemical burns. Skin or eye contact requires immediate first aid. Can decompose at high temperatures forming toxic gases such as sulfur oxides. Non-flammable but reacts violently with water generating large amounts of heat with potential for spattering of the acid. Can react with combustible materials to generate heat and ignition. Reacts with most metals, particularly when diluted with water, to form flammable hydrogen gas which may create an explosion hazard. It is highly toxic to aquatic organisms and plant life.

OSHA Regulatory Status:

Occupational Exposure Limits (OELs)

OSHA PEL 1 mg/m₃
ACGIH TLV 1 mg/m₃
NIOSH REL 1 mg/m₃

LD₅₀ / LC₅₀

Species and Route

LD₅₀ orl-rat 2140 mg/kg
LC₅₀ ihl-rat 510 mg/m³/2H
LC₅₀ ihl-mouse 320 mg/m³/2H

Potential Acute Health Effects/Signs and Symptoms: (See Section 11 for more information)

Sulfuric acid is not very volatile and workplace exposures are therefore primarily due to accidental splashes or to processes or actions that generate an acid mist. It is extremely corrosive to all body tissues, causing rapid tissue destruction and serious chemical burns on contact with the skin or eyes. Skin or eye contact requires immediate first aid. Inhalation of sulfuric acid mist or fumes may produce irritation of the nose, throat and respiratory tract. High levels of acid mist are also irritating to the skin and eyes. Chronic inhalation of acid mist may cause pitting and erosion of tooth enamel. Sulfuric acid is not listed as a carcinogen by OSHA, NTP, IARC, ACGIH or the EU. IARC, the ACGIH and the NTP have concluded there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic or potentially carcinogenic to humans. (see Toxicological Information, Section 11)

Potential Environmental Effects: (See Section 12 for more information)

It is highly toxic to aquatic organisms and plant life but does not bioaccumulate or concentrate in the food chain. (see Ecological Information, Section 12)

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions: Acid resistant protective clothing and gloves. Sleeves and pant legs should be worn outside, not tucked into gloves and rubber boots. Use close-fitting safety goggles or a combination of safety goggles and a face shield where splashing is a possibility. Respiratory protection equipment should be worn where exposure to hazardous levels of mist or fume is possible.

Environmental Precautions: This product can pose a threat to the environment. Contamination of soil and water should be prevented. Keep spillage from entering ground, streams or sewers.

Methods for Cleanup: Control source of release if possible to do safely. Contain spill, isolate hazard area, and deny entry to unauthorized personnel. Dike area around spill and pump uncontaminated acid back to process if possible. Neutralize spilled material with alkali such as sodium carbonate or sodium bicarbonate, soda ash, lime or limestone granules. If neutralized with lime rock or soda ash, good ventilation is required during neutralization because of the release of carbon dioxide gas. Allow to stand for 1-2 hours to complete neutralization, then absorb any liquid in solid absorbent such as vermiculite or clay absorbents. Place spilled material in suitable labeled containers for final disposal. Treat or dispose of waste spilled material and/or contaminated absorbent material in accordance with all local, regional and national regulations.

SECTION 7 - HANDLING AND STORAGE

Handling/Storage: Store in a dry, cool, well-ventilated area away from incompatible substances. Keep in tightly closed containers which are appropriately labeled. Do not allow contact with water. Do not store near alkaline substances. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal Protective Equipment (PPE): Protective clothing and gloves as well as glasses, goggles or face shield. Appropriate protective clothing should be worn where any possibility exists that skin contact can occur. Use close-fitting safety goggles or a combination of safety goggles and a face shield where any possibility exists that eye contact can occur. An eyewash and quick drench should be provided. Workers should wash immediately when skin becomes contaminated and at the end of each work shift.

Respiratory Protection: Where sulfuric acid mists are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (a combination of a 42CFR84 Class N, R or P-100 particulate filter and an acid gas cartridge). Note: sulfuric acid mist also causes eye irritation at high concentrations and a full face respirator or supplied air respirator may be necessary in some cases.

Ventilation: Use adequate local or general ventilation to maintain the concentration of sulfuric acid aerosol mists below recommended occupational exposure limits.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES**Appearance (color, physical form, shape):**

Clear, Colorless, Oily Liquid

Odor: Odorless when cold

Odor Threshold: > 1 mg/m³

Physical State: Liquid

Vapor Pressure (mm Hg): <0.04 kPa (<0.3 mm Hg) @ 25°C

Vapor Density (Air=1): 3.4 (air = 1)

Boiling Point: 280°C

Partition Coefficient (n-octanol/water):

Solubility in Water: Completely soluble with generation of heat

Flash Point (Method Used): Not Applicable.

Explosive Limits: Not Applicable.

Auto-Ignition Temperature: Not Applicable.

Decomposition Temperature:

Evaporation Rate (nBuOAc=1): Not Applicable

Specific Gravity/Density: 1.843183

Melting/Freezing Point: -35°C

pH (1% solution): Concentration dependant <0.1 (93% Sol'n), 0.3 (5% or 1N Sol'n)

Reserve Alkalinity:

SECTION 15 - REGULATORY INFORMATION**U.S.**

Listed on TSCA Inventory.....Yes
 Hazardous Under Hazard Communication Standard.....Yes
 CERCLA Section 103 Hazardous Substances.....Sulfuric Acid Yes RQ: 1000 lbs. (454 kg.)
 EPCRA Section 302 Extremely Hazardous SubstanceYes RQ: 1000 lbs. (454 kg.)
 Threshold Planning Quantity: 1000 lbs.
 EPCRA Section 311/312 Hazard CategoriesImmediate (Acute) Health Hazard -
 Corrosive
 Immediate (Acute) Health Hazard - Highly Toxic
 EPCRA Section 313 Toxic Release Inventory.....Sulfuric Acid CAS NO. 7664-93-9
 Percent by Weight: 93

SECTION 16 - OTHER INFORMATION

*N/A. - Not Applicable

*N/K. - Not Known

P&G Hazard Rating:

Health: 3

4=EXTREME

Flammability: 0

3=HIGH

Reactivity: 2

2= MODERATE

1=SLIGHT

0=NOT SIGNIFICANT

Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumes no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

Product: 655-422 Prentox® Prenfish™ Toxicant

Material Safety Data Sheet
U.S. Department of Labor (OSHA 29 CFR 1910.1200)

Manufacturer's Name: Prentiss Incorporated
 C. B. 2000
 Floral Park, NY 11001
Telephone Number: (516) 326-1919

Section 1: Chemical Identification

Product: 655-422 Prentox® Prenfish™ Toxicant
EPA Signal Word: DANGER

Active Ingredient (%): Rotenone (5%) (CAS # 83-79-4)
 Other Cube Resins (10%) N/A
Chemical Names: Rotenone – N/A
Chemical Class: Mixture

Section 2: Composition/ Information on Ingredients

Material:	OSHA PEL	ACGIH TLV	NTP/IARC/OSHA Other Carcinogen
Rotenone	(TWA) 5 mg/ M ³	(STEL) 10 mg/M ³ (TWA) 5 mg/M ³	No/No/No
Other associated cube resins	Not Est.	Not Est.	
Aromatic Petroleum Solvent (Supplier recommendation 100 ppm) (CAS # 64742-94-5) (Not to exceed 80%)			
Contains the following ingredients, by weight (typical):			
Naphthalene (CAS # 91-20-3)		9.9%	(TWA) 10 ppm
1,2,4-trimethylbenzene (CAS # 95-63-6)		1.7%	(TWA) 25 ppm
Acetone (CAS # 67-64-1) (not to exceed 7.5%)			(TWA) 250 ppm
Emulsifier #1 (CAS # N/A)		1.5%	N/D
Emulsifier #2 (CAS # N/A)		4.5%	N/D

Section 3: Hazards Identification

Clear liquid with mild odor. Fatal if inhaled. May be fatal if swallowed. Harmful if absorbed through skin. Causes substantial but temporary eye injury. Causes skin irritation. This pesticide is extremely toxic to fish.

Potential Health Effects:

Primary Routes of Entry: Inhalation, ingestion, skin and eye contact.

Section 7: Handling and Storage

Do not contaminate water, food or feed by storage or disposal. Store in a dry place away from temperature extremes. Avoid inhalation of vapors. Harmful if swallowed, inhaled or absorbed through skin. Avoid contact with skin. Wear clean protective clothing.

Other precautions: Periodically inspect stored materials.

Section 8: Exposure Controls/Personal Protection

Respiratory protection: Mixers and handlers: Do not inhale. Use NIOSH certified respirator for organic vapor protection.

Ventilation:

Local Exhaust: As required to meet TLV.

Special: Not applicable.

Mechanical: As required to meet TLV.

Other: Not applicable.

Protective Gloves: Chemical resistant.

Eye Protection: Safety glasses, face shield or goggles.

Other protective clothing or equipment: Wear long pants, long sleeved shirt or other body covering clothes. Avoid skin or eye contact.

Work/Hygienic practices: Wash thoroughly after handling and before eating or smoking. Remove contaminated clothing and wash thoroughly before reuse.

Section 9: Physical and Chemical Properties

Appearance:	Amber Liquid
Odor:	Aromatic Solvent Odor
Boiling Point:	N/D
Specific Gravity (H₂O = 1):	0.9226
Vapor Pressure (mmHg):	N/D
Melting Point:	N/D
Vapor Density (Air = 1):	N/D
Evaporation Rate (Butyl Acetate = 1):	N/D
Solubility in Water:	Emulsifies.

Section 10: Stability and Reactivity

Stability:	Stable.
Conditions to avoid for stability:	None.
Incompatibility:	Strong acids and oxidizers.
Hazardous Decomposition or Byproducts:	CO, CO ₂
Hazardous Polymerization:	Will not occur.
Conditions to avoid for Hazardous Polymerization:	None.

Section 11: Toxicological Information

Acute Toxicity/Irritation Studies:

(The following data were developed with Prenfish)

Ingestion:	Oral LD ₅₀	55.3 mg/Kg (Rat – female) 264 mg/Kg (Rat – male) 178 mg/Kg (Rat – overall)
Dermal:		>2020 mg/Kg (Rabbit) (Slightly toxic)
Inhalation:		4-hour LC ₅₀ 0.048 mg/l. (Rat) (Highly toxic)
Eye Contact:		Moderately irritating (Rabbit)
Skin Contact:		Moderately irritating (Rabbit)
Skin Sensitization:		Non-sensitizing (Guinea Pig)

(The following data were developed with rotenone technical)

Mutagenic Potential:	Rotenone was not mutagenic when tested.
Reproductive Hazard Potential:	Rotenone had no reproductive effects when tested

Chronic/Subchronic Toxicity Studies:

Cancer Information: Rotenone was not carcinogenic when tested in rats and mice.

Toxicity of Other Components:

Petroleum solvent: The supplier reports that inhalation of high vapor concentrations (over 1,000 ppm) may cause nervous system effects such as headaches, dizziness, anesthesia and respiratory tract irritation

Surfactant: Causes severe eye irritation, which could lead to permanent eye damage. Prolonged or repeated skin contact may cause discomfort and local redness. Mist can irritate the respiratory tract, experienced as nasal discomfort and discharge with chest pain and coughing.

Target Organs: Eyes, skin, respiratory tract.

Section 12: Ecological Information

Summary of Effects: This product is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

Section 13: Disposal Considerations

Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities.

Product: 655-422 Prentox® Prenfish™ Toxicant

Section 14: Transport Information

DOT Classification: Pesticide liquid, flammable, toxic, n.o.s. (Acetone, Rotenone)

Hazard Class: 3, PG I

Subsidiary hazard class: 6.1

DOT Shipping Label: Poison and/or Toxic

Note: For transport purposes (49FR Part 173.132), the calculated 1-hour LC50 (Rat) is: 0.192 mg/L

Section 15: Regulatory Information

SARA Title III Classification:

Section 311/312:

Acute health hazard

Fire hazard

Section 313 Chemicals:

Aromatic Petroleum Solvent (Supplier recommendation 100 ppm) (CAS # 64742-94-5)

(Not to exceed 80%)

Contains the following ingredients, by weight (typical):

Naphthalene (CAS # 91-20-3)	9.9%	(TWA) 10 ppm
1,2,4-trimethylbenzene (CAS # 95-63-6)	1.7%	(TWA) 25 ppm

This product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372. Any copies or redistribution of this MSDS must include this notice.

Proposition 65: This product does not contain any chemical which is known to the State of California to cause cancer or birth defects or other reproductive harm.

CERCLA Reportable Quantity (RQ): None.

RCRA Classification: Ignitable.

TSCA Status: Registered pesticide, exempt from TSCA regulation. All ingredients are on the TSCA inventory.

Other: Rotenone

Illinois toxic substance

Massachusetts Hazardous Substance

New Jersey Special Health Hazardous Substance

Pennsylvania Workplace Hazardous Substance

Acetone

Massachusetts Hazardous Substance

New Jersey Environmental Hazardous Substance

New Jersey Special Health Hazardous Substance

New Jersey Workplace Hazardous Substance

Pennsylvania Workplace Hazardous Substance

Section 11: Toxicological Information

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Petroleum solvent: The supplier reports that inhalation of high vapor concentrations (over 1,000 ppm) may cause nervous system effects such as headaches, dizziness, anesthesia and respiratory tract irritation

Surfactant: Causes severe eye irritation, which could lead to permanent eye damage. Prolonged or repeated skin contact may cause discomfort and local redness. Mist can irritate the respiratory tract, experienced as nasal discomfort and discharge with chest pain and coughing.

Target Organs: Eyes, skin, respiratory tract.

Section 12: Ecological Information

Summary of Effects: This product is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

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Product: 655-422 Prentox® Prenfish™ Toxicant

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Note: For transport purposes (49FR Part 173.132), the calculated 1-hour LC50 (Rat) is: 0.192 mg/L

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This product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372. Any copies or redistribution of this MSDS must include this notice.

Proposition 65: This product does not contain any chemical which is known to the State of California to cause cancer or birth defects or other reproductive harm.

CERCLA Reportable Quantity (RQ): None.

RCRA Classification: Ignitable.

TSCA Status: Registered pesticide, exempt from TSCA regulation. All ingredients are on the TSCA inventory.

Other: Rotenone

Illinois toxic substance

Massachusetts Hazardous Substance

New Jersey Special Health Hazardous Substance

Pennsylvania Workplace Hazardous Substance

Acetone

Massachusetts Hazardous Substance

New Jersey Environmental Hazardous Substance

New Jersey Special Health Hazardous Substance

New Jersey Workplace Hazardous Substance

Pennsylvania Workplace Hazardous Substance



MATERIAL SAFETY DATA SHEET

PRODUCT

73551

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME :

73551

APPLICATION :

DEPOSIT PENETRANT

COMPANY IDENTIFICATION :

Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) :

(800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH: 0/1 FLAMMABILITY: 1/1 INSTABILITY: 0/0 OTHER:

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Based on our hazard evaluation, none of the substances in this product are hazardous.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause irritation with prolonged contact.

Do not get in eyes, on skin, on clothing. Do not take internally. Wear suitable protective clothing. Keep container tightly closed. Flush affected area with water.

May evolve oxides of carbon (COx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

May cause irritation with prolonged contact.

SKIN CONTACT :

May cause irritation with prolonged contact.

INGESTION :

Not a likely route of exposure. No adverse effects expected.

INHALATION :

Not a likely route of exposure. No adverse effects expected.

Nalco Company 1601 W. Diehl Road • Naperville, Illinois 60563-1198

(630)305-1000

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MATERIAL SAFETY DATA SHEET

PRODUCT

73551

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

APPEARANCE Clear Colorless

ODOR None

SPECIFIC GRAVITY 0.99 - 1.03 @ 77 °F / 25 °C

SOLUBILITY IN WATER Complete

pH (100 %) 6.6 - 7.0

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
None known

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon

11. TOXICOLOGICAL INFORMATION

The following results are for the polymer.

ACUTE ORAL TOXICITY :
Species LD50 Test Descriptor
Rat 2,300 - 16,000 mg/kg The following results are for the polymer.
Rating : Non-Hazardous

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

**MATERIAL SAFETY DATA SHEET**

PRODUCT

73551

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	> 1,000 mg/l	Product
Bluegill Sunfish	96 hrs	> 1,000 mg/l	Product
Fathead Minnow	96 hrs	996 mg/l	Product

Rating : Essentially non-toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs		> 1,000 mg/l	Product
Ceriodaphnia dubia	48 hrs	1,320 mg/l		Product

Rating : Essentially non-toxic

CHRONIC FISH RESULTS :

Species	Exposure	IC25	LOEC	Test Descriptor
Fathead Minnow	7 Days	527 mg/l	500 mg/l	Product

CHRONIC INVERTEBRATE RESULTS :

Species	Test Type	IC25	End Point	Test Descriptor
Ceriodaphnia dubia	3 Brood	141 mg/l	Reproduction	Product

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 85,000 mg/l

Chemical Oxygen Demand (COD) : 250,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	4 mg/l	Product

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.



MATERIAL SAFETY DATA SHEET

PRODUCT

73551

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.340 Defoaming Agents, 21 CFR 175.105 - Adhesives, 21 CFR 176.200 Defoaming Agents used in coatings, 21 CFR 176.210 Defoaming agents used in the manufacture of paper and paperboard, 21 CFR 176.300 - Slimicides, 21 CFR 177.1200 - Cellophane, 21 CFR 177.1400 - Hydroxyethyl cellulose film, water-insoluble, 21 CFR 178.1010 - Sanitizing solutions, 21 CFR 178.3120 - Animal glue

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :

This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :

None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

Water	7732-18-5
Polyalkylene glycol	Proprietary

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :

Not considered a WHMIS controlled product.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substances in this preparation are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

16. OTHER INFORMATION

**SAFETY DATA SHEET**

PRODUCT

S0940-3D TRASAR®

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATIONPRODUCT NAME : **S0940-3D TRASAR®**

APPLICATION : REAGENT STANDARD

COMPANY IDENTIFICATION :
Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 1/1 FLAMMABILITY : 0/0 INSTABILITY : 0/0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Based on our hazard evaluation, none of the substances in this product are hazardous.

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******CAUTION**

May cause irritation with prolonged contact.

Do not get in eyes, on skin, on clothing. Do not take internally. Wear suitable protective clothing. Keep container tightly closed. Flush affected area with water.

May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

May cause irritation with prolonged contact.

SKIN CONTACT :

May cause irritation with prolonged contact.

INGESTION :

Not a likely route of exposure. No adverse effects expected.

INHALATION :

Not a likely route of exposure. No adverse effects expected.

Nalco Company 1601 W. Diehl Road • Naperville, Illinois 60563-1198 • (630)305-1000

For additional copies of an MSDS visit www.nalco.com and request access

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**SAFETY DATA SHEET**

PRODUCT

S0940-3D TRASAR®EMERGENCY TELEPHONE NUMBER(S)
(800) 424-9300 (24 Hours) CHEMTREC**9. PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE	Liquid
APPEARANCE	Clear Pink
ODOR	None
SPECIFIC GRAVITY	1.0 @ 77 °F / 25 °C
DENSITY	8.33 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	8.0
VAPOR PRESSURE	Same as water
VOC CONTENT	0.0 % Calculated

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Freezing temperatures.

MATERIALS TO AVOID :

None known

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of nitrogen, Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

No toxicity studies have been conducted on this product.

Nalco Company 1601 W. Diehl Road • Naperville, Illinois 60563-1198 • (630)305-1000
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S0940-3D TRASAR®

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC**MOBILITY :**

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING

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TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, none of the substances in this product are hazardous.

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation:

Substance(s)	Citations
• Disodium Phosphate	Sec. 311

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

7. Map and Drawings

- a. Craig Quadrangle map.
- b. Legal description, Golden Triangle Energy, LLC.
- c. County property map, Golden Triangle Energy, LLC.
- d. Bartlett and West, Site Survey dated March 2010.