

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

MISSOURI CLEAN WATER COMMISSION



**MISSOURI STATE OPERATING PERMIT**

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92<sup>nd</sup> Congress) as amended,

Permit No. MO-0137707

Owner: 3G Processing, LLC  
Address: 7364 Newkirk Road, Mountain Grove, MO 65711

Continuing Authority: Same as above  
Address: Same as above

Facility Name: 3G Processing/Grisham Farms Wastewater  
Facility Address: 7364 Newkirk Road, Mountain Grove, MO 65711

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**

SIC Codes #2011, #2099, #5812, #0212  
See Pages 2 - 3

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.

February 1, 2015  
\_\_\_\_\_  
Effective Date

\_\_\_\_\_  
Sara Parker Pauley, Director, Department of Natural Resources

September 30, 2019  
\_\_\_\_\_  
Expiration Date

\_\_\_\_\_  
John Madras, Director, Water Protection Program

**FACILITY DESCRIPTION** (continued)

Industrial no-discharge/Land Application. Reclamation of off-spec and outdated human food products to produce animal food. Oil is recovered from process wastewater and tote washing.

Permitted Feature #001 – Storage lagoon/wastewater is land applied. Wastewater may also be hauled to Springfield WWTF.

Legal Description: SW ¼, NW ¼, Sec. 4, T28N, R13W, Wright County  
UTM Coordinates: X = 555653, Y = 4111052  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Design flow is 62,000 gallons per day (1-in-10 year design including net rainfall minus evaporation).

Average design flow is 17,500 gallons per day (dry weather flows).

Actual flow is 6,000 gallons per day.

Upper operating level: 2 feet below spillway or overflow

Permitted Feature #002 – Manure storage pits for beef cattle feeding area. Wastewater from lagoon is used to wash manure from feeding area to storage pits. Wastewater and comingled manure is land applied.

Legal Description: SE ¼, NW ¼, Sec. 4, T28N, R13W, Wright County  
UTM Coordinates: X = 555955, Y = 4111152  
Receiving Stream: Tributary to Whetstone Creek (U)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #003 – Land Application - Grisham Tract, 84 acres available

Legal Description: E ½, Sec. 4, T28N, R13W, Wright County  
UTM Coordinates: X = 555924, Y = 4110921  
Receiving Stream: Tributary to Whetstone Creek (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #004 – Land Application - Grisham Tract 2, 39.5 acres available

Legal Description: N ½, NE ¼, Sec. 5, T28N, R13W, Wright County  
UTM Coordinates: X = 555022, Y = 4111532  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #005 – Land Application – Grisham Tract 3, 31 acres available

Legal Description: NE ¼, Sec. 6, T28N, R13W, Wright County  
UTM Coordinates: X = 553471, Y = 4111269  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #006 – Land Application – Smith Tract, 87 acres available

Legal Description: SE ¼, Sec. 7, T28N, R13W, Wright County  
UTM Coordinates: X = 553359, Y = 4108774  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #007 – Land Application – McGilliard Tract, 46 acres available

Legal Description: S ½, N ½, Sec. 7, T28N, R13W, Wright County  
UTM Coordinates: X = 552725, Y = 4109445  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #008–Land Application –Grisham Tract 4, 159 acres available

Legal Description: SE ¼, Sec. 32, T29N, R13W, Wright County  
UTM Coordinates: X = 554813, Y = 4112262  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

Permitted Feature #009– Land Application –Grisham Tract 5, 158 acres available

Legal Description: S ½, Sec. 12, T29N, R15W, Wright County  
UTM Coordinates: X = 542209, Y = 4118447  
Receiving Stream: Gasconade River (P)  
First Classified Stream and ID: Gasconade River (P) (1496) (losing)  
USGS Basin & Sub-watershed No.: (10290201-0101)

Permitted Feature #010– Land Application –Grisham Tract 6, 261 acres available

Legal Description: E ½, Sec. 13, T29N, R15W, Wright County  
UTM Coordinates: X = 542446, Y = 4117453  
Receiving Stream: Wolfe Creek (C) (losing)  
First Classified Stream and ID: Wolfe Creek (C) (1500) (losing)  
USGS Basin & Sub-watershed No.: (10290201-0102)

Permitted Feature #011– Land Application – Nelson Tract, 86.5 acres available

Legal Description: E ½, Sec. 26, T29N, R13W, Wright County  
UTM Coordinates: X = 559756, Y = 4114052  
Receiving Stream: East Whetstone Creek (C)  
First Classified Stream and ID: East Whetstone Creek (C) (1505)  
USGS Basin & Sub-watershed No.: (10290201-0106)

Permitted Feature #012– Land Application – Nelson Tract 2, 18.5 acres available

Legal Description: S ½, NW ¼, Sec. 25, T29N, R13W, Wright County  
UTM Coordinates: X = 560756, Y = 4114295  
Receiving Stream: Tributary to Dake Creek (U)  
First Classified Stream and ID: East Whetstone Creek (C) (1505)  
USGS Basin & Sub-watershed No.: (10290201-0106)

Permitted Feature #013– Land Application – Grisham Tract 7, 35 acres available

Legal Description: W ½, Sec. 5, T28N, R13W, Wright County  
UTM Coordinates: X = 554458, Y = 4110787  
Receiving Stream: Tributary to Absher Prong (U) (losing)  
First Classified Stream and ID: Whetstone Creek (P) (1504) 303(d) List  
USGS Basin & Sub-watershed No.: (10290201-0107)

**Land Application:**

Irrigation Volume/year: 18,990,000 gallons at design loading (including 1-in-10 year flows)

Irrigation areas: 866 acres at design loading

Application rates: 0.2 inch/hour; 0.5 inch/day; 1.0 inches/week; 24.0 inches/year

Equipment type: Terragators

Vegetation: Hay and pasture land

Application rate is based on: Hydraulic loading rate

**TABLE A-1.  
IRRIGATION SYSTEM 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 upon issuance 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
<b>PERMITTED FEATURE #001</b> Storage Basin Operational Monitoring						
Storage Basin Freeboard (Note 1)	Feet	*			once/month	measured
Rainfall	Inches	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2016</u> .						
<b>PERMITTED FEATURE #001, #002</b> Wastewater Land Applied (Note 2)						
Total Kjeldahl Nitrogen as N (Note 3)	mg/L	*			once/quarter**	grab
Nitrate Nitrogen as N (Note 3)	mg/L	*			once/quarter**	grab
Total Phosphorus as P	mg/L	*			once/quarter**	grab
pH	SU	*			once/quarter**	grab
Oil & Grease	mg/L	*			once/quarter**	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2016</u> .						

**PERMITTED  
FEATURE  
#003 - #013**

**TABLE A-2.  
LAND APPLICATION 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 upon issuance 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
<b>Wastewater Land Application Operational Monitoring</b>						
Irrigation Period	Hours	*			daily	total
Volume Irrigated	Gallons	*			daily	total
Application Area	Acres	*			daily	total
Application Rate	Inches	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2016</u> .						

\* Monitoring requirement only.

\*\* See table below for quarterly sampling

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

Note 1 - Storage Basin freeboard shall be reported as Storage Basin water level in feet below the overflow level.

Note 2 - Wastewater that is applied shall be sampled at the irrigation pump, wet well, or application vehicle. If no land application occurred during the report period, report as "No Application."

Note 3 - Wastewater irrigation rates shall not exceed a nitrogen application rate of 150 pounds total nitrogen per acre per year, and the applied wastewater shall 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 #18 c for additional requirements.

## B. STANDARD CONDITIONS

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

## C. SPECIAL CONDITIONS

1. Emergency Discharge. Wastewater shall be stored and land applied during suitable conditions so that there is no discharge from the storage structure(s) or land application site. An emergency discharge from wastewater storage structure(s) may only occur if rainfall exceeds the 1 in 10 year (Data taken from the Missouri Climate Atlas) or the 24 hour, 25 year (Data taken from NRCS Urban Hydrology for Small Watersheds) rainfall events. **Discharge for any other reason including 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 28<sup>th</sup> 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 <sub>5</sub>	mg/L
Total Suspended Solids	mg/l
Ammonia as N	mg/L
pH – Units	SU
Oil & Grease	mg/L
E. coli	#/100mL

2. This permit may be reopened and modified, or alternatively revoked and reissued, to:
  - a. Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
    - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
    - (2) controls any pollutant not limited in the permit.
  - b. Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
  - c. Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.
  - d. Incorporate the requirement to develop a pretreatment program pursuant to 40 CFR 403.8(a) when the Director of the Water Protection Program determines that a pretreatment program is necessary due to any new introduction of pollutants into the Publically Owned Treatment Works or any substantial change in the volume or character of pollutants being introduced.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

3. All 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:

C. SPECIAL CONDITIONS cont'd

- (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. Reporting of Non-Detects:
    - a. An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
    - b. The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
    - c. The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
    - d. Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
    - e. See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
  7. 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.
  8. 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.
  9. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
  10. Hazardous waste regulated under the Missouri Hazardous Waste Law and regulations shall not be land applied under this permit.
  11. All paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) shall be stored so that these materials are not exposed to stormwater. Spill prevention, control, and/or management shall be provided sufficient to prevent any spills of these pollutants from entering a water 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.
  12. Good housekeeping practices shall be maintained on the site to keep solid waste from entry into waters of the state.
  13. 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.
  14. 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 O&M manual and made available to the department upon request.

C. SPECIAL CONDITIONS cont'd

15. 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.
  
16. 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 wastewater by the permittee to those sites listed in the "Facility Description" of this permit. Land application of wastewater by a contract hauler to sites owned, rented, or leased by the permittee must also be listed in the "Facility Description" unless, the contract hauler is permitted. Land applications by contract hauler to sites that are not owned, rented, or leased by the permittee are not required to be listed in 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 include all land application site(s) listed in this permit.
  - c. Storage Basin Operating Levels. The minimum and maximum operating water levels for the storage basin(s) shall be clearly marked. Each storage basin shall be operated so that the maximum water elevation does not exceed upper operating level. Storage basins shall be lowered to the minimum operating level prior to November 30 each year.
  - d. Public Access Restrictions. This permit does not authorize application of wastewater to areas to public use areas.
  
17. Land Application Requirements.
  - a. Wastewater land applications shall not exceed agronomic rates to ensure agricultural use of nutrients and prevent contamination of surface and groundwater. The agronomic rate is the amount of wastewater applied to a field to supply the amount of nutrients to meet the fertilizer recommendation.
  - b. No land application shall occur during frozen, snow covered, or saturated soil conditions. There shall be no application during a precipitation event or if a 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. Land application fields shall be checked daily during land application 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, wetland, 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. Wastewater application on slopes exceeding 10%, the hourly application rate shall not exceed one-half (1/2) the design sustained permeability and in no case shall exceed one-half (1/2) inch per hour.
  - g. Land application equipment shall be visually inspected daily during land application to check for equipment malfunctions and leaks. The application system shall be operated so as to provide uniform distribution of wastes over the entire land application site and shall be capable of applying the annual design flow during an application period of less than 100 days or 800 hours per year. Land application equipment shall be calibrated at least once annually.

C. SPECIAL CONDITIONS cont'd

18. Nutrient Management

- a. If land application sites listed in this permit are also included as land application sites in other permit(s), the wastewater and sludge applications from other sources shall be included in the application rates in paragraphs b and c of this section. Records of the amount and application rate of wastewater or sludge from other sources must be kept.
- b. Hydraulic Loading Rate. Wastewater application rates should not exceed a nitrogen application rate of 150 pounds total nitrogen per acre per year, and the applied wastewater should not exceed ten (10) mg/l of nitrate nitrogen as N. Hydraulic application rates exceeding 60 inches per acre per year shall calculate nitrogen loading rates and include results in the annual report. The calculation procedures are as follows: (Total N) x (0.226) x (inches per acre irrigated) = pounds total N per acre. Where Total N = [Total Kjeldahl Nitrogen (TKN) as N] + [Nitrate Nitrogen as N].
- c. If the applied wastewater is expected to provide more than 150 pounds total nitrogen per acre/year or if the applied wastewater exceeds 10 mg/l of nitrate nitrogen as N, the permittee must reduce the application rates or use the Plant Available Nitrogen (PAN) method. The calculations to show the amount of plant-available nitrogen provided and the wastewater and amount of nitrogen that will be utilized by the vegetation shall be submitted with the annual report.

$$\text{PAN} = [\text{Ammonia Nitrogen} \times \text{volatilization factor}^*] + [\text{Organic Nitrogen} \times 0.2] + [\text{Nitrate Nitrogen}]$$

\*Volatilization factor is 0.7 for surface application and 1 for subsurface application.

19. 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 land application field 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.

20. Annual Report on Land Application.

- a. 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:
- b. 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.
- c. The number of days the storage structure discharged during the year, the discharge flow, reason the discharge occurred and effluent analysis performed.
- d. 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 wastewater applied (gal. or tons/acre)
- e. For fields where the total nitrogen application exceeds 150 lbs./acre, submit PAN calculations to document that the applied nitrogen will be utilized.
- f. The report shall include any soil test results. If none were taken during the reporting year, report the date samples were taken.
- g. Narrative summary of any problems or deficiencies identified, corrective action taken and improvements planned.

**MISSOURI DEPARTMENT OF NATURAL RESOURCES  
FACT SHEET  
FOR THE PURPOSE OF NEW PERMIT  
OF  
MO-0137707  
3G PROCESSING/GRISHAM FARMS WASTEWATER**

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 storm water 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 wastewater land application

**Part I – Facility Information**

Facility Type: Industrial no-discharge/land application – SIC #2011, #2099, #5812. This facility was previously covered under MOG822195 permit.

Facility Description:

Reclamation of off-spec and outdated human food products to produce animal food. Oil and solids from commercial chicken frying operations and other feed stocks are separated and recovered, and used as feedstock in the production of animal food. The facility also uses wastewater from the lagoon to wash manure from a beef cattle feeding area into concrete storage pits. The manure and comingled wastewater is land applied.

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

- No.

Application Date: 07/21/14  
MOG822195 Expiration Date: 07/16/16

**PERMITTED FEATURE(S) TABLE:**

PERMITTED FEATURE	TREATMENT LEVEL	EFFLUENT TYPE
#001, #003-#013	Land Application	Industrial wastewater
#002	Land Application	Industrial wastewater and animal waste

Facility Performance History:

This facility was last inspected on January 8, 2013 and was found to be in non-compliance for failure to report a bypass within 24 hours, operating without required permit, and failure to meet standard conditions of the MOG822195 permit.

**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 1<sup>st</sup> classified receiving stream’s beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

**RECEIVING STREAM(S) TABLE:**

PERMITTED FEATURE	WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO CLASSIFIED SEGMENT	12-DIGIT HUC**
001	Tributary to Absher Creek	U	N/A	General Criteria	4.4 mi.	10290201-0107
	Whetstone Creek	P	1504	AQL, CLF, LWW, WBC-B		
002, 003	Tributary to Whetstone Creek	U	N/A	General Criteria	3.9 mi.	
	Whetstone Creek	P	1504	AQL, CLF, LWW, WBC-B		
004, 005, 006, 007, 008, 013	Tributary to Absher Creek	U	N/A	General Criteria	2.4 to 5.4 mi.	
	Whetstone Creek	P	1504	AQL, CLF, LWW, WBC-B		
009	Gasconade River	P	1496	AQL, LWW, WBC-B		10290201-0101
0010	Wolfe Creek	C	1500	AQL, SCR, LWW, WBC-B		10290201-0102
011	East Whetstone Creek	C	1505	AQL, LWW, WBC-B		10290201-0106
012	Tributary to Dake Creek	U	N/A	General Criteria	0.5 mi.	
	East Whetstone Creek	C	1505	AQL, LWW, WBC-B		

\* - 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.

- All limits in this operating permit are at least as protective as those established in the MOG822195 permit; therefore, backsliding does not apply.

**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 is not authorized to land apply biosolids. Sludge/biosolids are recovered and used in other processes.

**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.

**NUTRIENT MANAGEMENT AND LAND APPLICATION**

Land applications by a contract hauler on fields that the permittee has a spreading agreement on are not required to be in this permit. A spreading agreement does not constitute the field being rented or leased by the permittee as they do not have any control over management of the field.

The agronomic rate is the amount of wastewater applied to a field to supply the amount of nutrients to meet the fertilizer recommendation. For more information on nutrient management, PAN calculations, and land application best management practices, consult the following University of Missouri Extension Guides:

WQ430 Crop/Nutrient Considerations for Biosolids.

WQ426 Best Management Practices for Biosolids Land Application.

WQ429 Interpretation of Laboratory Analysis of Biosolids Samples.

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.

**SCHEDULE OF COMPLIANCE (SOC):**

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

**STORM WATER 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 storm water 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 Storm Water 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 storm water discharges.

Not Applicable ; At this time, the permittee is not required to develop and implement a SWPPP.

**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.

**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

– This facility is not considered to be a source of the above listed pollutant(s) or considered to contribute to the impairment of Whetstone Creek.

**Part IV – Permit Limits Determination**

**Permitted Feature #001 – STORAGE BASIN EMERGENCY DISCHARGE**

There are no effluent limits associated with Permitted Feature #001 for the no-discharge facility. However, the following 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
Flow	MGD	*		
Biochemical Oxygen Demand <sub>5</sub>	mg/L	*		
Total Suspended Solids	mg/L	*		
Ammonia as N	mg/L	*		
pH	SU	*		
Oil & Grease	mg/L	*		
E.coli	**	*		
Monitoring Frequency	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.			

\* - Monitoring requirement only  
 \*\* - # of colonies/100mL; the Monthly Average for E. coli is a geometric mean.  
 \*\*\* - Parameter not established in previous state operating permit.

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

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/day while discharging	Test results are due on the 28 <sup>th</sup> day of the month after the cessation of the discharge
Biochemical Oxygen Demand <sub>5</sub>	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	
E.coli	once/day while discharging	

**PERMITTED FEATURE #001 – STORAGE BASIN OPERATIONAL MONITORING**

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

**STORAGE BASIN OPERATIONAL MONITORING TABLE:**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE
Freeboard	feet	1	*		
Rainfall	inches	1	*		
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:**

- **Freeboard.** Monitoring requirement only.
- **Rainfall.** Monitoring requirement only.

**Minimum Sampling and Reporting Frequency Requirements.**

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Freeboard	once/month	once/year
Rainfall	once/day	once/year

**PERMITTED FEATURE #001, #002 – WASTEWATER LAND APPLIED**

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

**STORAGE BASIN OPERATIONAL MONITORING TABLE:**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE
Total Kjeldahl Nitrogen as N	mg/L	1	*		
Nitrate Nitrogen as N	mg/L	1	*		
Total Phosphorus as P	mg/L	1	*		
pH	SU	1	*		
Oil & Grease	mg/L	1	*		
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 #001, #002 – DERIVATION AND DISCUSSION OF LIMITS:**

- **Total Kjeldahl Nitrogen.** Monitoring requirement only. Monitoring for Total Kjeldahl Nitrogen 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.]
- **Total Phosphorus as P.** Monitoring requirement only. Monitoring for Total Phosphorus as P 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.]
- **Oil & Grease.** Monitoring requirement only. Monitoring for Oil & Grease is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]

**Minimum Sampling and Reporting Frequency Requirements.**

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Total Kjeldahl Nitrogen as N	once/quarter	once/year
Nitrate Nitrogen as N	once/quarter	once/year
Total Phosphorus as P	once/quarter	once/year
pH	once/quarter	once/year
Oil & Grease	once/quarter	once/year

**PERMITTED FEATURE #003 - #013 – LAND APPLICATION MONITORING**

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE
Irrigation Period	hours	1	*	
Volume Irrigated	gallons	1	*	
Application Area	acres	1	*	
Application Rate	inches	1	*	
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

\*\*\* - # of colonies/100mL; the Monthly Average for Fecal Coliform is a geometric mean.

**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                |                                    |

- **Irrigation Period.** Monitoring requirement only. Monitoring for the Irrigation Period is included to determine if proper application is occurring on the land application fields.
- **Volume Irrigated.** 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.

**Minimum Sampling and Reporting Frequency Requirements.**

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Irrigation Period	once/day	once/year
Volume Irrigated	once/day	once/year
Application Area	once/day	once/year
Application Rate	once/day	once/year

**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 will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than 4 years old, that data may be re-submitted to meet the requirements of the renewal application. 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 November 7, 2014 to December 8, 2014. No responses received.

**DATE OF FACT SHEET:** DECEMBER 12, 2014

### **COMPLETED BY:**

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

## Section C – Bypass/Upset Requirements

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

## Section D – Administrative Requirements

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



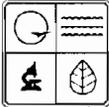
STANDARD CONDITIONS FOR NPDES PERMITS  
ISSUED BY  
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES  
MISSOURI CLEAN WATER COMMISSION  
REVISED  
AUGUST 1, 2014

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



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

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



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**

RECEIVED  
 APR 10

FOR AGENCY USE ONLY	
CHECK NUMBER	21277
DATE RECEIVED	7/24/14
FEE SUBMITTED	\$15000.00

**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 # MO- 03700 Expiration Date \_\_\_\_\_
- 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 3 G Processing / Grisham Farms Wastewater Land Application System		TELEPHONE WITH AREA CODE (417) 926-5444	
		FAX (417) 926-5442	
ADDRESS (PHYSICAL) 7364 Newkirk Road	CITY Mountain Grove	STATE MO	ZIP CODE 65711

**3. OWNER**

NAME Lexie Grisham		E-MAIL ADDRESS gfpinc@fidmail.com	TELEPHONE WITH AREA CODE (417) 926-5444
			FAX (417) 926-5442
ADDRESS (MAILING) Same	CITY	STATE	ZIP CODE

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

**4. CONTINUING AUTHORITY**

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

**5. OPERATOR**

NAME Same		CERTIFICATE NUMBER N/A	TELEPHONE WITH AREA CODE
			FAX
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

**6. FACILITY CONTACT**

NAME Same		TITLE	TELEPHONE WITH AREA CODE
			FAX

**7. ADDITIONAL FACILITY INFORMATION**

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

001 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 Sec \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County  
 UTM Coordinates Easting (X): \_\_\_\_\_ Northing (Y): \_\_\_\_\_  
*For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)*

002 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 Sec \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County  
 UTM Coordinates Easting (X): \_\_\_\_\_ Northing (Y): \_\_\_\_\_

003 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 Sec \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County  
 UTM Coordinates Easting (X): \_\_\_\_\_ Northing (Y): \_\_\_\_\_

004 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 Sec \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County  
 UTM Coordinates Easting (X): \_\_\_\_\_ Northing (Y): \_\_\_\_\_

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

001 – SIC 2001-2099 and NAICS \_\_\_\_\_ 002 – SIC 5812 and NAICS \_\_\_\_\_  
 003 – SIC \_\_\_\_\_ and NAICS \_\_\_\_\_ 004 – SIC \_\_\_\_\_ and NAICS \_\_\_\_\_

SW  
 2/19/14

## White River Valley Environmental Services, LLC

536 Roark Branch Drive  
Branson West, MO 65737  
417 294 0590

RECEIVED

July 11, 2014

Amanda Sappington  
Industrial Permits Unit Chief  
P.O. Box 176  
Jefferson City, MO 65102

WATER PROTECTION PROGRAM

Dear Ms. Sappington:

Enclosed is the application for a permit to land apply wastewater resulting from the operations of 3 G Processing and Grisham Farms, both of Mountain Grove, Missouri.

Please feel free to contact either Greg Whitlock or me with any questions or comments you might have regarding this application.

Thank you for your assistance in this matter.

Sincerely,



Rick Helms,  
Operations Manager

Grisham Farms / 3 G Processing  
Application for Site Specific Permit for Land Application of Wastewater

Contents

1. Form A
2. Form C
3. Form C flow diagram and water balance
4. Form I
5. Land Application Site Summary
6. Land Application Site Maps/Aerial Photos
7. Soil Evaluation Reports
8. Soil Test Reports
9. Soil Test Data
10. Loading Rate Data
11. O&M Manual
12. pH Record Form
13. Land Application Record Form
14. Hauled Waste Permit

# Form 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

ADDRESS	CITY	STATE	ZIP CODE
---------	------	-------	----------

**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)	TELEPHONE WITH AREA CODE
<i>Lexie Grisham Member</i>	<i>417-746-4834</i>
SIGNATURE	DATE SIGNED
<i>Lexie Grisham</i>	<i>7-16-14</i>

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?
- Map at 1" = 2000' scale?
- 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](http://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 moreA. 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](http://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/](http://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](http://www.osha.gov/pls/imis/sicsearch.html) and for the North American Industry Classification System at [www.census.gov/naics](http://www.census.gov/naics) or contact the appropriate Department of Natural Resources Regional Office.
- 7.3

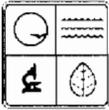
**INSTRUCTIONS FOR COMPLETING FORM A  
APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT  
(CONTINUED)**

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/](http://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](http://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.

## Form C

RECEIVED



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH  
**FORM C – APPLICATION FOR DISCHARGE PERMIT –**  
**MANUFACTURING, COMMERCIAL, MINING,**  
**SILVICULTURE OPERATIONS, PROCESS AND STORMWATER**

**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

3 G Processing / Grisham Farms Wastewater Land Application System

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

N/A

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)

Forms A and I attached

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

A. FIRST 2011-2099 B. SECOND 5812  
C. THIRD \_\_\_\_\_ D. FOURTH \_\_\_\_\_

2.10 FOR EACH OUTFALL GIVE THE LEGAL DESCRIPTION.

OUTFALL NUMBER (LIST) \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 SEC \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ COUNTY \_\_\_\_\_

2.20 FOR EACH OUTFALL LIST THE NAME OF THE RECEIVING WATER

OUTFALL NUMBER (LIST) RECEIVING WATER  
See Attached Maps See Attached Maps

2.30 BRIEFLY DESCRIBE THE NATURE OF YOUR BUSINESS

Reclamation of off-spec and outdated human food products to produce animal food.

Reclamation of process waste solids from commercial chicken frying operations and other feed stocks to separate/recover oil and solids. Oil and solid products are used as feedstock in the production of animal food.



**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 <i>(list)</i>	2. OPERATION(S) CONTRIBUTING FLOW <i>(list)</i>	3. FREQUENCY		4. FLOW				C. DURATION <i>(in days)</i>
		A. DAYS PER WEEK <i>(specify average)</i>	B. MONTHS PER YEAR <i>(specify average)</i>	A. FLOW RATE <i>(in mgd)</i>		B. TOTAL VOLUME <i>(specify with units)</i>		
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	4. LONG TERM DAILY	3. MAXIMUM AVERAGE	
All	Tote Washing	5	12	.002	.01	2000 GPD	10,000 GPD	5
All	Condensate	5	12	.015	.05	15,000 GPD	50,000 GPD	5
All	Oil Recovery	5	12	.0005	.002	500 GPD	2000 GPD	5

**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)**

B. ARE THE LIMITATIONS IN THE APPLICABLE EFFLUENT GUIDELINES EXPRESSED IN TERMS OF PRODUCTION (OF 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 <i>(list outfall numbers)</i>
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC. <i>(specify)</i>	

**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

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.**



3.10 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 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)

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)
Consulting Analytical Services	2804 E. Battlefield Springfield, MO 65804-4014	417 882 1017	BOD, COD, TOC, TSS, TKN NO2/NO3, Total Solids, Total P, Na, Cl-,K, O&G, NH3.

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) <i>Lexie Grisham Member</i>	TELEPHONE NUMBER WITH AREA CODE <i>417-746-4834</i>
SIGNATURE (SEE INSTRUCTIONS) <i>Lexie Grisham</i>	DATE SIGNED <i>7-16-14</i>

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet (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												OUTFALL NO.		
												All		
PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.														
1. POLLUTANT	2. EFFLUENT				3. UNITS (specify if blank)				4. INTAKE (optional)		B. NO. OF ANALYSES			
	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				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	8870	4586			6300	919	2	mg/l	lbs					
B. Chemical Oxygen Demand (COD)	15400	7963			13350	1948	2	mg/l	lbs					
C. Total organic Carbon (TOC)	4990	2580			4990	637.07175	2	mg/l	lbs					
D. Total Suspended Solids (TSS)	590	305			261	38.165925	2	mg/l	lbs					
E. Ammonia (as N)	57.9	28.9					1	mg/l	lbs					
F. Flow	VALUE 62000 GPD		VALUE		VALUE 17500 GPD					VALUE				
G. Temperature (winter)	VALUE 2		VALUE							VALUE				
H. Temperature (summer)	VALUE 20		VALUE							VALUE				
I. pH	MINIMUM 4.45	MAXIMUM 12.2												
PART B - Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for any pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for 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. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	B. MAXIMUM 30 DAY VALUE (1) CONCENTRATION	(2) MASS	C. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	(2) MASS	B. NO. OF ANALYSES
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
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 - Nitrate (as N)	X		0.28	144			.28	.040	1	mg/l	lbs			

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT						4. UNITS		5. INTAKE (optional)		B. NO. OF ANALYSES	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVRG. VALUE		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													
H. Oil and Grease	X		333	172			172.5	25.1763	4	mg/l	lbs			
I. Phosphorus (as P), Total (7723-14-0)	X		37	19			37	5.40015	1	mg/l	lbs			
J. Sulfate (as SO <sup>4-</sup> ) (14808-79-8)		X												
K. Sulfide (as S)		X												
L. Sulfite (as SO <sup>3-</sup> ) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)		X												
O. Barium, Total (7440-39-3)		X												
P. Boron, Total (7440-42-8)		X												
Q. Cobalt, Total (7440-48-4)		X												
R. Iron, Total (7439-89-6)		X												
S. Magnesium, Total (7439-95-4)		X												
T. Molybdenum, Total (7439-98-7)		X												
U. Manganese, Total (7439-96-5)		X												
V. Tin, Total (7440-31-5)		X												
W. Titanium, Total (7440-32-6)		X												

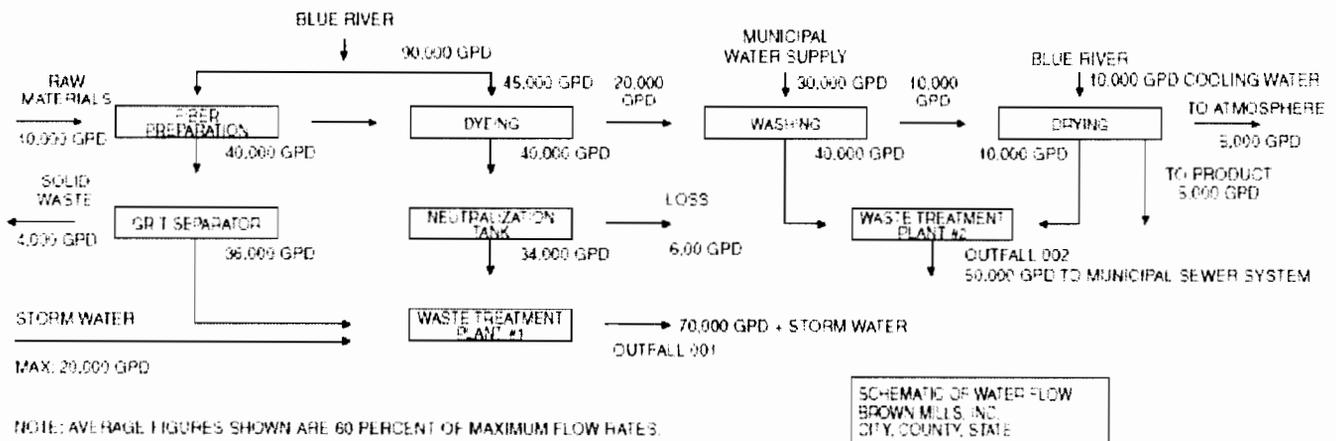
1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT						4. UNITS			5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVRG. VALUE		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS						
<b>METALS, AND TOTAL PHENOLS</b>														
1M. Antimony, Total (7440-36-9)		X												
2M. Arsenic, Total (7440-38-2)	X		.006	0.003		.006	0.0008	1	mg/l	lbs				
3M. Beryllium, Total (7440-41-7)		X												
4M. Cadmium, Total (7440-43-9)		X												
5M. Chromium III (16065-83-1)		X												
6M. Chromium VI (18540-29-9)		X												
7M. Copper, Total (7440-50-8)		X												
8M. Lead, Total (7439-92-1)		X												
9M. Mercury, Total (7439-97-6)		X												
10M. Nickel, Total (7440-02-0)		X												
11M. Selenium, Total (7782-49-2)		X												
12M. Silver, Total (7440-22-4)		X												
13M. Thallium, Total (7440-28-0)		X												
14M. Zinc, Total (7440-66-6)	X		.531	0.274		.531	0.077	1	mg/l	lbs				
15M. Cyanide, Amenable to Chlorination		X												
16M. Phenols, Total		X												
<b>RADIOACTIVITY</b>														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

**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 with possibility of discharge, 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.
- 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	.....Web 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 measures 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 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. Part B requires you to mark "X" in either the "Believe Present" column or the "Believe Absent" column (column 2A or 2B, Part B) based on 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 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
ug/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 complete 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 in part C. No analysis is required, but you have analytical, you must report it.

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

<b>TOXIC POLLUTANT</b>	<b>HAZARDOUS SUBSTANCES</b>	<b>HAZARDOUS SUBSTANCES</b>
Asbestos	Dichlorvos	Nalad
	Diethylamine	Napthenic acid
<b>HAZARDOUS SUBSTANCES</b>	Dimethylamine	Nitrotoluene
	Dinitrobenzene	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)**

<b>HAZARDOUS SUBSTANCES</b>	<b>HAZARDOUS SUBSTANCES</b>	<b>HAZARDOUS SUBSTANCES</b>
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	Uranium
2,4-D (2,4-Dichloro- Phenoxyacetic acid)	Methyl mercaptan	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 \$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.

## **Form C Flow Diagram and Water Balance**

3 G processing

Condensate water from oil recovery from off spec food

and food waste

15,000 GPD avg

50,000 GPD peak

pH adjustment with liquid sodium hydroxide and storage in two 10,000 gallon fiberglass tanks

Grisham Farms

Tote Washing

2,000 GPD avg

10,000 GPD peak

Existing Earthen Storage Basin

Basin

17,500 GPD avg

62,000 GPD peak

Grisham Farms Land Application

Sites

All Outfalls

17,500 GPD avg

62,000 GPD peak

Thomason Processing

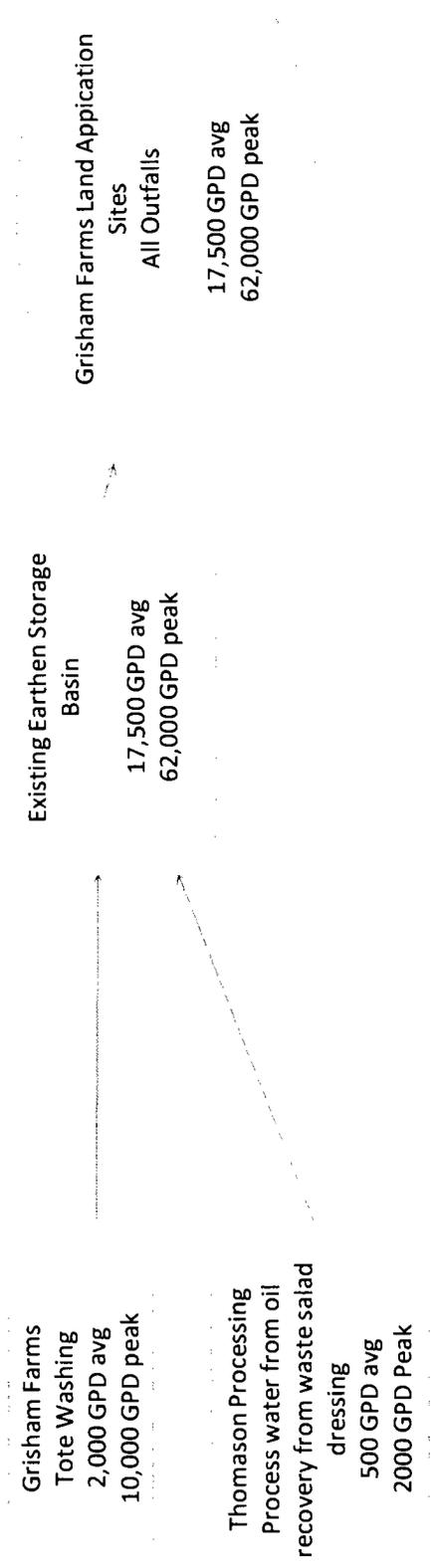
Process water from oil

recovery from waste salad

dressing

500 GPD avg

2000 GPD Peak



# Form I



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

**FORM I – PERMIT APPLICATION FOR CONSTRUCTION AND  
 OPERATION OF WASTEWATER IRRIGATION SYSTEMS**

**FOR AGENCY USE ONLY**

PERMIT NUMBER

MO -

DATE RECEIVED

**INSTRUCTIONS:** The following forms must be submitted with Form I: **FORM B** for domestic wastewater. **Submit FORMS E and G** for land disturbance permit if construction areas total one acre or more.

**1.00 FACILITY INFORMATION**

1.10 Facility Name

3G Processing LLC / Grisham Farm Products

1.20 Application for:  Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8)  
 Operating Permit (if no construction permit, attach engineering documents)  
 Date Irrigation System Began Operation: \_\_\_\_\_  
 Operating Permit Renewal

1.30 Type of wastewater to be irrigated:  Domestic  Municipal  State/National Park  Seasonal business  
 Municipal with Pretreatment Program or Significant Industrial Users  Other (explain) Ind.  
 SIC Codes (list all that apply, in order of importance) 2011 - 2099 & 5812

1.40 Months when the business or enterprise will operate or generate wastewater:  
 12 months per year  Part of year (list Months): \_\_\_\_\_

1.50 This system is designed for:  
 No-discharge  Partial irrigation when feasible and discharge rest of time.  
 Irrigation during recreation season (April – October) and discharge during November – March.  
 Other (explain) \_\_\_\_\_

1.60 List the Facility outfalls which will be applicable to the irrigation system from outfalls listed on Form B.  
 Outfall Nos. N/A \_ \_ \_ \_ \_

**2.00 STORAGE BASINS**

2.10 Number of storage basins: 1 Type of basin:  Steel  Concrete  Fiberglass  Earthen  
 Earthen with membrane liner

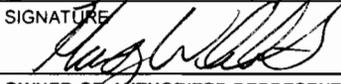
2.20 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.  
 (Complete Attachment A: Profile Sketch)  
 Basin #1: Length 195 Width 65 Depth 10 Freeboard 2 Berm Width 20 % Slope 2.9-1  
 Basin #2: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Berm Width \_\_\_\_\_ % Slope \_\_\_\_\_

2.30 Storage Basin operating levels (report as feet below emergency overflow level)  
 Basin #1: Maximum water level 2 ft. Minimum operating water level 12 ft.  
 Basin #2: Maximum water level \_\_\_\_\_ ft. Minimum operating water level \_\_\_\_\_ ft.

2.40 Depth of sludge in lagoons and storage basins 0 ft.  
 Total sludge stored 0 dry tons 0 cu. ft.

**3.00 LAND APPLICATION SYSTEM**

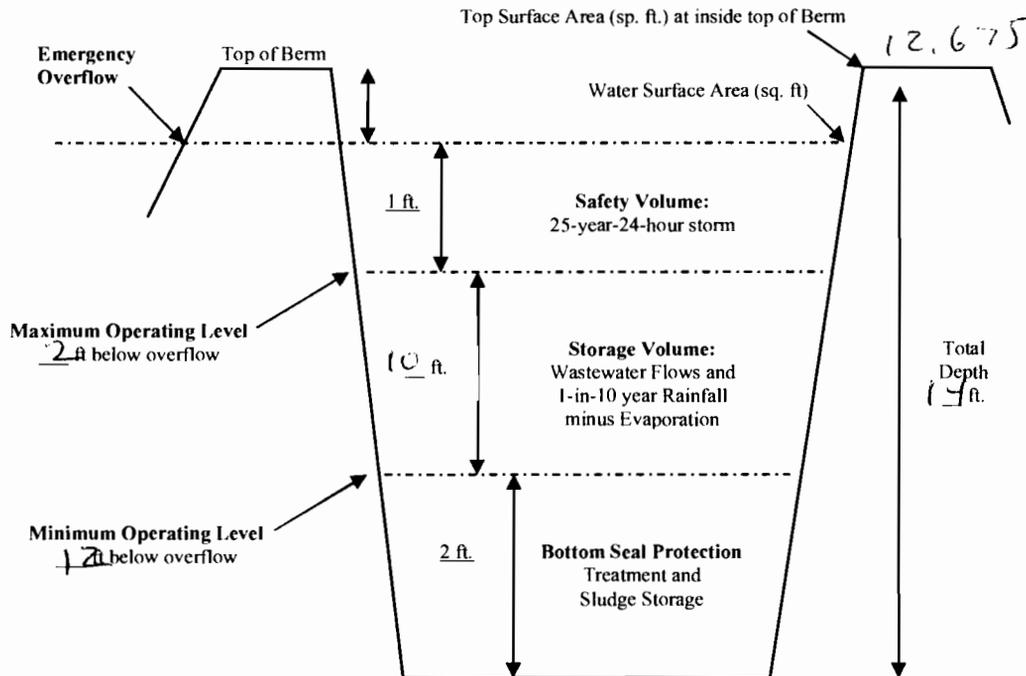
3.10 Number of irrigation sites 8 Total Acres 866 Maximum % field slopes varies  
 Location: \_\_\_ ¼, \_\_\_ ¼, \_\_\_ ¼, \_\_\_ Sec. \_\_\_ T \_\_\_ R \_\_\_ County \_\_\_ Acres  
 Location: \_\_\_ ¼, \_\_\_ ¼, \_\_\_ ¼, \_\_\_ Sec. \_\_\_ T \_\_\_ R \_\_\_ County \_\_\_ Acres

3.11	Type of vegetation: <input checked="" type="checkbox"/> Grass hay <input checked="" type="checkbox"/> Pasture <input type="checkbox"/> Timber <input type="checkbox"/> Row crops <input type="checkbox"/> Other (describe) _____
3.20	Wastewater flow (dry weather) gallons/day: Average annual: <u>17.5</u> Seasonal _____    Off-season _____ Months of seasonal flow: <u>12</u> Human Population Equivalent: <u>4000</u>
3.21	Land Application rate per acre (design flow including 1 in 10 year storm water flows): Design: <u>14</u> inches/year    _____ inches/hour    _____ inches/day    _____ inches/week Actual: _____ inches/year    _____ inches/hour    _____ inches/day    _____ inches/week Total Irrigation per year (gallons): _____ Design    _____ Actual Actual months used for Irrigation (check): <input checked="" type="checkbox"/> Jan <input checked="" type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input checked="" type="checkbox"/> Apr <input checked="" type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
3.22	Land Application Rate is based on: <input type="checkbox"/> Nutrient Management Plan (N&P) <input type="checkbox"/> Hydraulic Loading <input checked="" type="checkbox"/> Other (describe) <u>Conservative Nitrogen Loading Rate of 150 lbs/acre/yr at design flow</u>
3.30	Equipment type: <input type="checkbox"/> Sprinklers <input type="checkbox"/> Gated pipe <input type="checkbox"/> Center pivot <input type="checkbox"/> Traveling gun <input checked="" type="checkbox"/> Other (describe) _____ Equipment Flow Capacity: _____ Gallons per hour    _____ Total hours of operation per year
3.40	Public Access Restrictions for irrigation sites: <input checked="" type="checkbox"/> Site is Fenced <input type="checkbox"/> Wastewater disinfection prior to irrigation <input type="checkbox"/> Other (describe): _____
3.50	Separation distance (in feet) from the outside edge of the wetted irrigation area to down gradient features: <u>150</u> Permanent flowing stream <u>300</u> Losing Stream <u>150</u> Intermittent (wet weather) stream <u>50</u> Lake or pond <u>50</u> Property boundary <u>150</u> Dwellings <u>NA</u> Water supply well    _____ Other (describe) _____
3.60	SOILS INFORMATION:    Use information from the County Soil Survey, NRCS, or professional soil scientist. Soil Series Name _____    Depth of bedrock _____ Feet    Depth of water table _____ Feet Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges: _____ In/hr for 0-12 in soil depth    _____ In/hr for 12-24 inch soil depth    _____ In/hr for 24-60 inch soil depth
3.70	Include a recent Geologic Report by the Department's Geological Survey and Resource Assessment Division with your construction permit.
3.80	Attach a current copy of the Operation and Maintenance (O&M) Plan for the irrigation system.    Date of O&M Plan: <u>07/14</u>
3.81	Attach a site map showing topography, storage basins, irrigation sites, property boundary, streams, wells, roads, dwellings and other pertinent features.
3.82	Attach a facility sketch showing treatment units, storage basins, pipelines, irrigation equipment, application sites and other features.
<b>4.00 CERTIFICATION</b>	
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 this 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 or imprisonment.	
<b>CONSULTING ENGINEER</b> – Name, Official Title and Engineering Firm    (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
<u>Greg Whitlock, Principal, Whitlock Engineering</u>	<u>417-379-0640</u>
SIGNATURE	DATE SIGNED
	<u>July 11, 2014</u>
<b>OWNER OR AUTHORIZED REPRESENTATIVE</b> – Name and Official Title    (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
<u>Lexie Grisham    Member</u>	<u>417-746-4534</u>
SIGNATURE	DATE SIGNED
	<u>7-16-14</u>

**ATTACHMENT A**

(To be included with Form I)

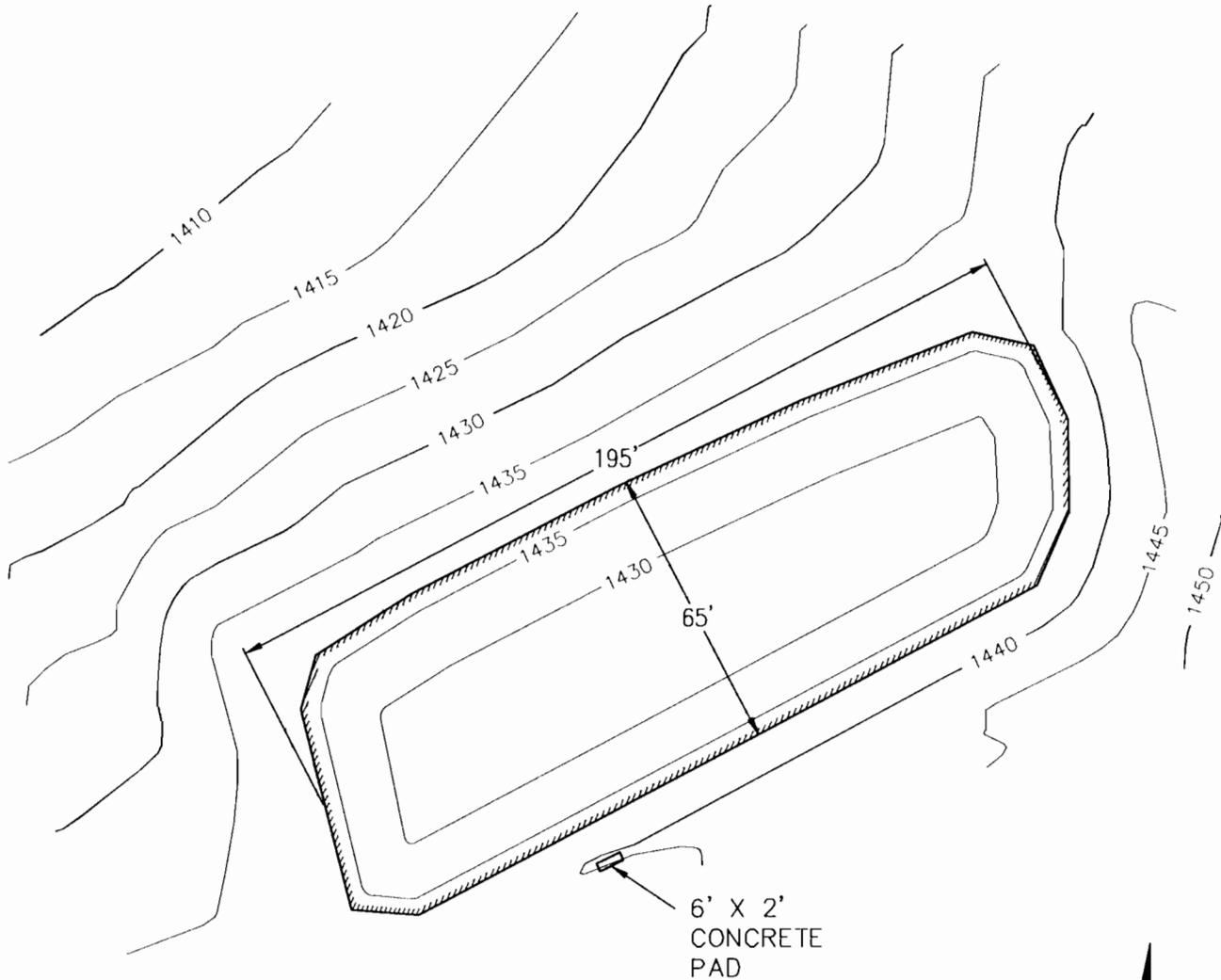
**Lagoon or Storage Basin  
PROFILE SKETCH**



**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.

CONTROL POINT #1  
1/2" IRON PIN  
N=477359.7004  
E=1677496.293  
ELV=1458'



CONTROL POINT #2  
1/2" IRON PIN  
N=477088.4693  
E=1677262.5808  
ELV=1441.43'

## Whitlock Engineering

9648 E. NORTH VIEW ROAD  
STRAFFORD, MISSOURI 65757  
PHONE: (417) 582-4003  
email: gregwhitlock@gmail.com

GRISHAM FARM PRODUCTS, INC.

SITE PLAN

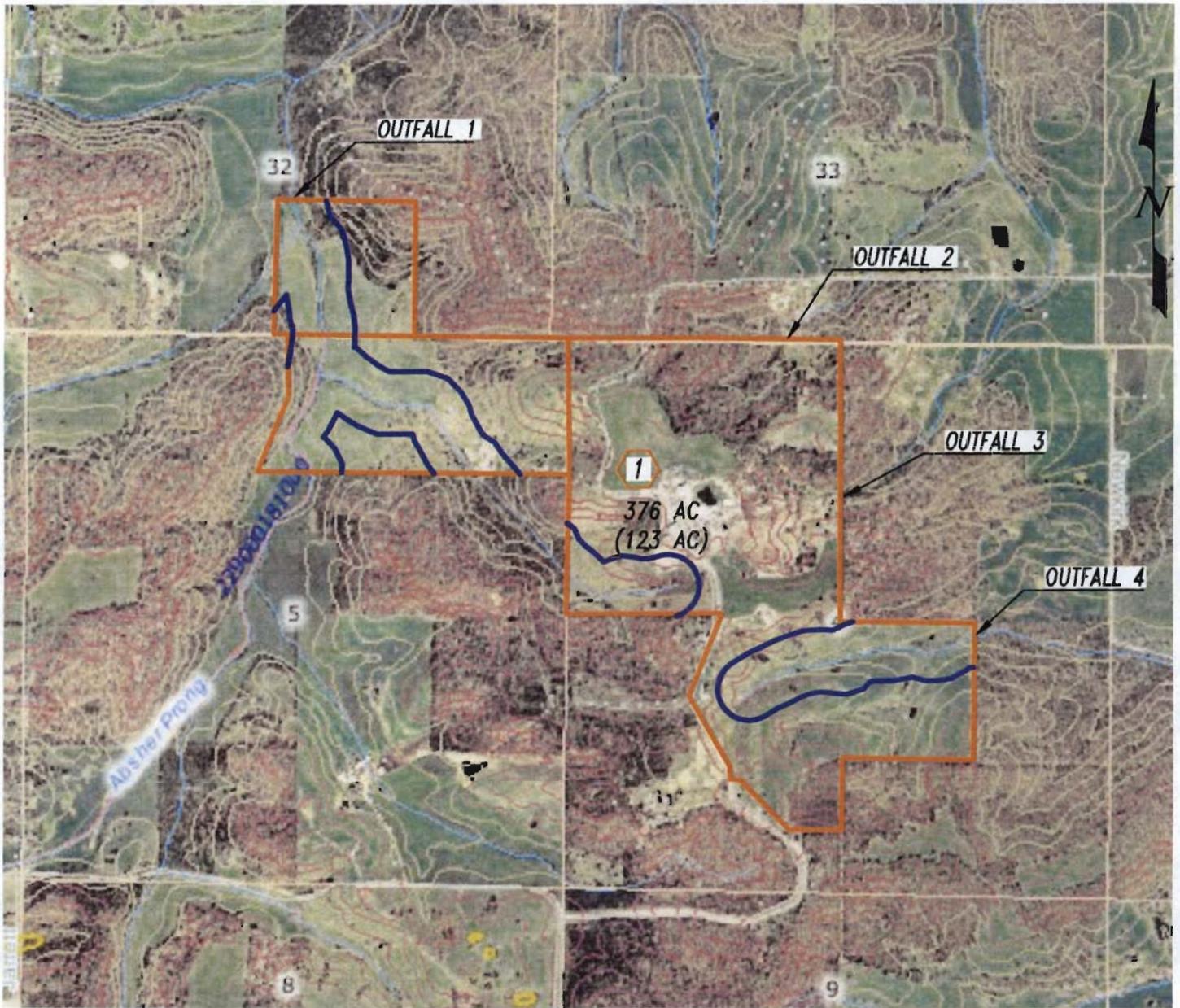
## **Land Application Site Summary**

Grisham Farm Products / 3 G Processing Site Specific Permit

Application Sites Summary

Exhibit	Total Acreage	Suitable Acreage	Outfalls
1	376	123	1,2,3,4
2	137	31	5
3	199	87	6
4	120	46	7,8
5	159	20 (estimate)	9,10,11
6	871	419	12,13,14
7	290	105	15,16
8	305	35	1,2
Totals	2457	866	

## **Land Application Site Maps / Aerial Photos**



**LEGEND**

-  LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
-  PARCEL LINES
-  300' STREAM BUFFER
-  SINKHOLE OUTLINE

**NOTES:**

1. AVAILABLE PASTURE CONSERVATIVELY ASSUMES 300 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

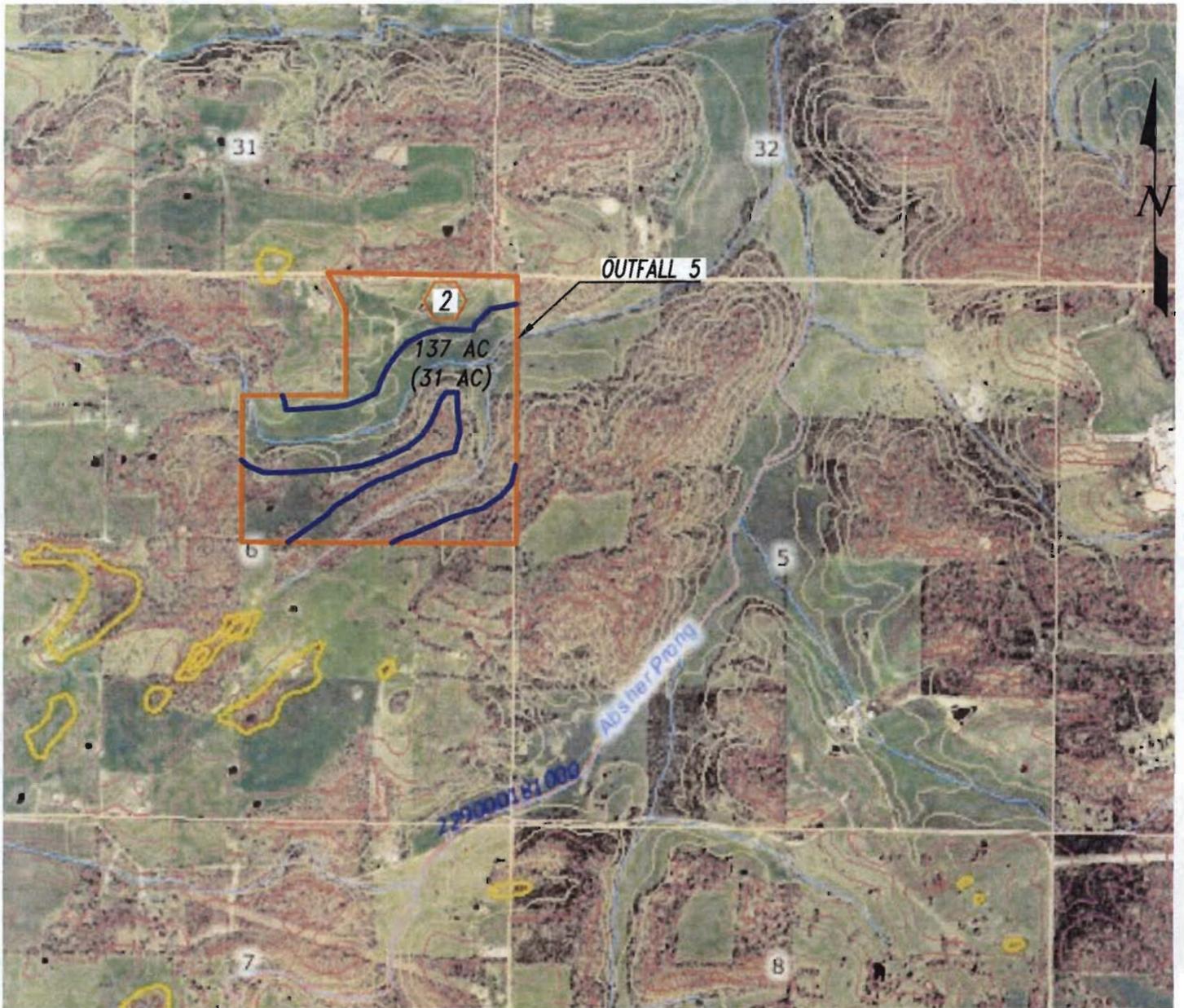
SECTIONS 4 & 5, TOWNSHIP 28N, RANGE 13W  
 SECTION 32, TOWNSHIP 29N, RANGE 13W  
 SCALE: 1"=1,500'

**EXHIBIT 1**

**Whitlock Engineering, LLC**

9648 E North View Road  
 Strafford, Missouri 65757  
 Phone: 417-582-4003

GRISHAM FARM PRODUCTS  
 SITE SPECIFIC PERMIT  
 LAND APPLICATION SITE PLAN  
 SITE 1-GRISHAM TRACTS



**LEGEND**

- 1 LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
- PARCEL LINES
- 300' STREAM BUFFER
- SINKHOLE OUTLINE

**NOTES:**

1. AVAILABLE PASTURE CONSERVATIVELY ASSUMES 300 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

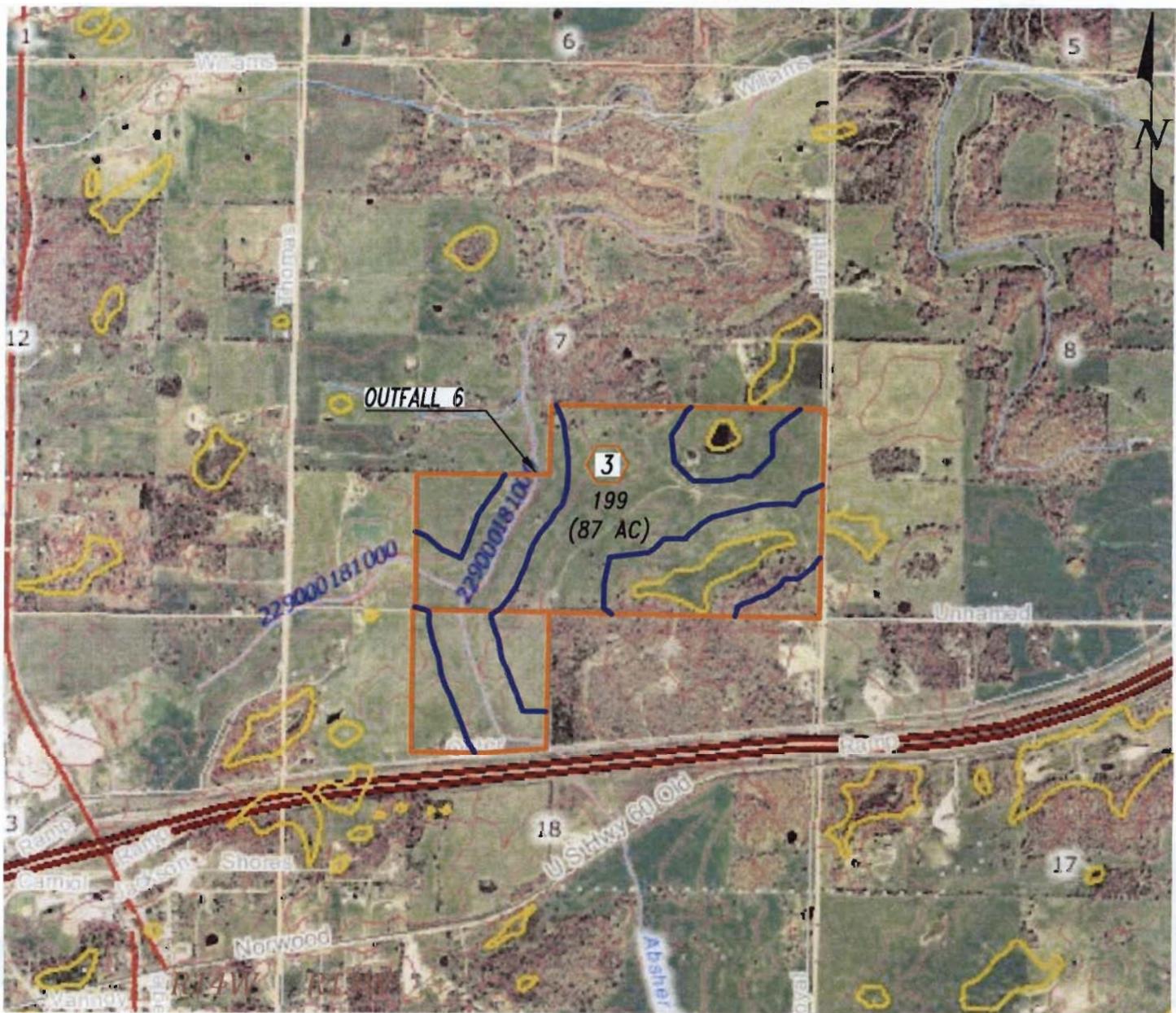
SECTION 6, TOWNSHIP 28N, RANGE 13W  
SCALE: 1"=1,500'

**EXHIBIT 2**

**Whitlock Engineering, LLC**

9648 E North View Road  
Strafford, Missouri 65757  
Phone: 417-582-4003

GRISHAM FARM PRODUCTS  
SITE SPECIFIC PERMIT  
LAND APPLICATION SITE PLAN  
SITE 2-GRISHAM & GRISHAM TRACT



**LEGEND**

- 1 LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
- PARCEL LINES
- 300' STREAM BUFFER
- SINKHOLE OUTLINE

**NOTES:**

1. AVAILABLE PASTURE CONSERVATIVELY ASSUMES 300 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

SECTIONS 7 & 18, TOWNSHIP 28N, RANGE 13W

SCALE: 1"=1,500'

**EXHIBIT 3**

**Whitlock Engineering, LLC**

9648 E North View Road  
 Strafford, Missouri 65757  
 Phone: 417-582-4003

**GRISHAM FARM PRODUCTS  
 SITE SPECIFIC PERMIT  
 LAND APPLICATION SITE PLAN  
 SITE 3-SMITH TRACTS**



**LEGEND**

- 1 LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
- PARCEL LINES
- 300' STREAM BUFFER
- SINKHOLE OUTLINE

**NOTES:**

1. AVAILABLE PASTURE CONSERVATIVELY ASSUMES 300 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

SECTION 7, TOWNSHIP 28N, RANGE 13W  
SCALE: 1"=1,500'

**EXHIBIT 4**

**Whitlock Engineering, LLC**

9648 E North View Road  
Strafford, Missouri 65757  
Phone: 417-582-4003

GRISHAM FARM PRODUCTS  
SITE SPECIFIC PERMIT  
LAND APPLICATION SITE PLAN  
SITE 4-MCGILLIARD TRACT



**LEGEND**

- 1 LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
- PARCEL LINES
- 300' STREAM BUFFER
- SINKHOLE OUTLINE

**NOTES:**

1. 300 FT STREAM BUFFERS SHOWN MAY BE REDUCED SUBJECT TO GEOHYDROLOGIC EVALUATION. USABLE PASTURE IS SUBJECT TO FUTURE AREA CLEARED FOR PASTURE.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

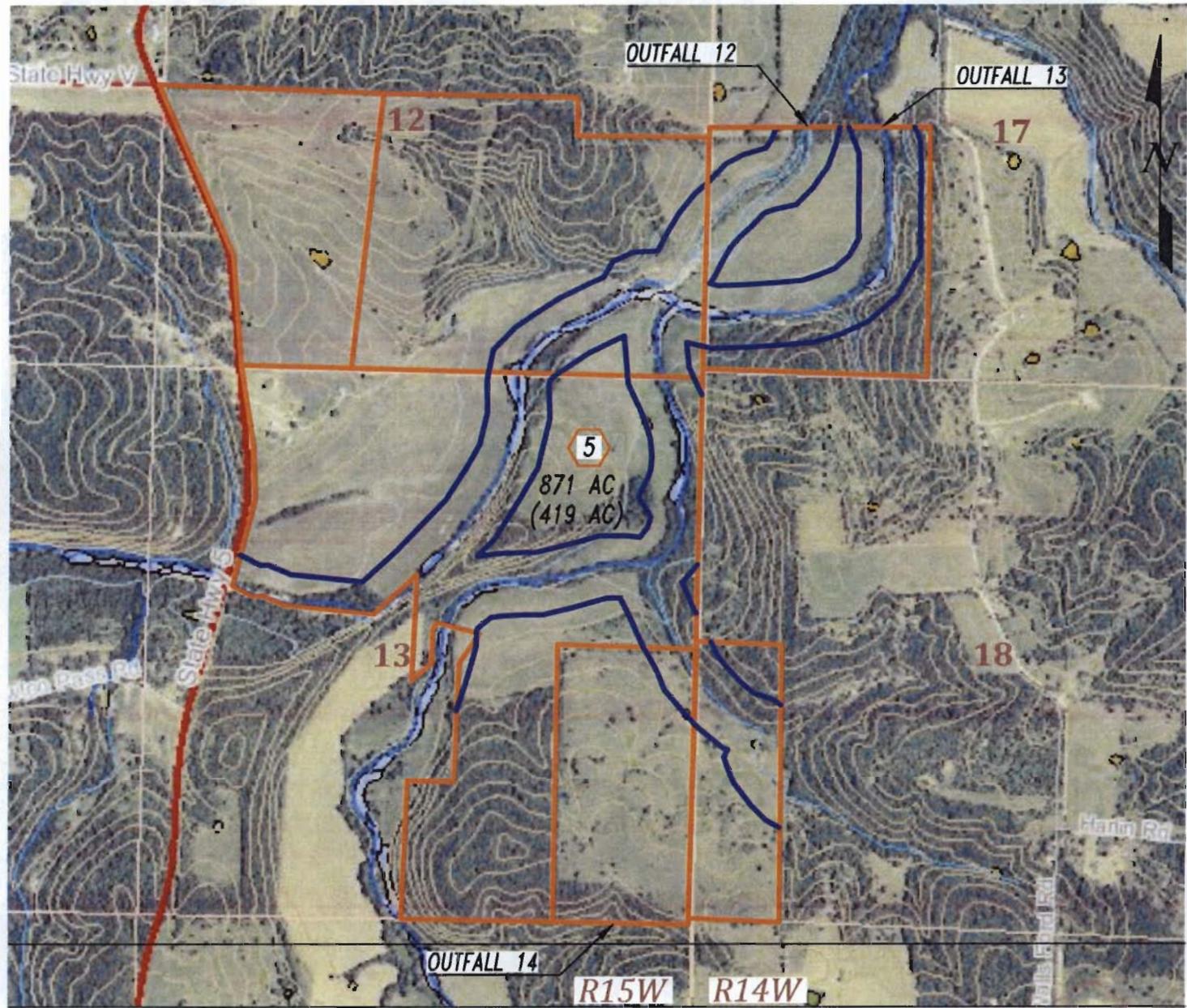
SECTIONs 32 & 33, TOWNSHIP 29N, RANGE 13W  
 SCALE: 1"=1,500'

**EXHIBIT 5**

**Whitlock Engineering, LLC**

9648 E North View Road  
 Strafford, Missouri 65757  
 Phone: 417-582-4003

**GRISHAM FARM PRODUCTS  
 SITE SPECIFIC PERMIT  
 LAND APPLICATION SITE PLAN  
 SITE 5-GRISHAM & GRISHAM TRACTS**



**LEGEND**

- 1 LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
- PARCEL LINES
- 300' STREAM BUFFER

**NOTES:**

1. AVAILABLE PASTURE CONSERVATIVELY ASSUMES 300 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

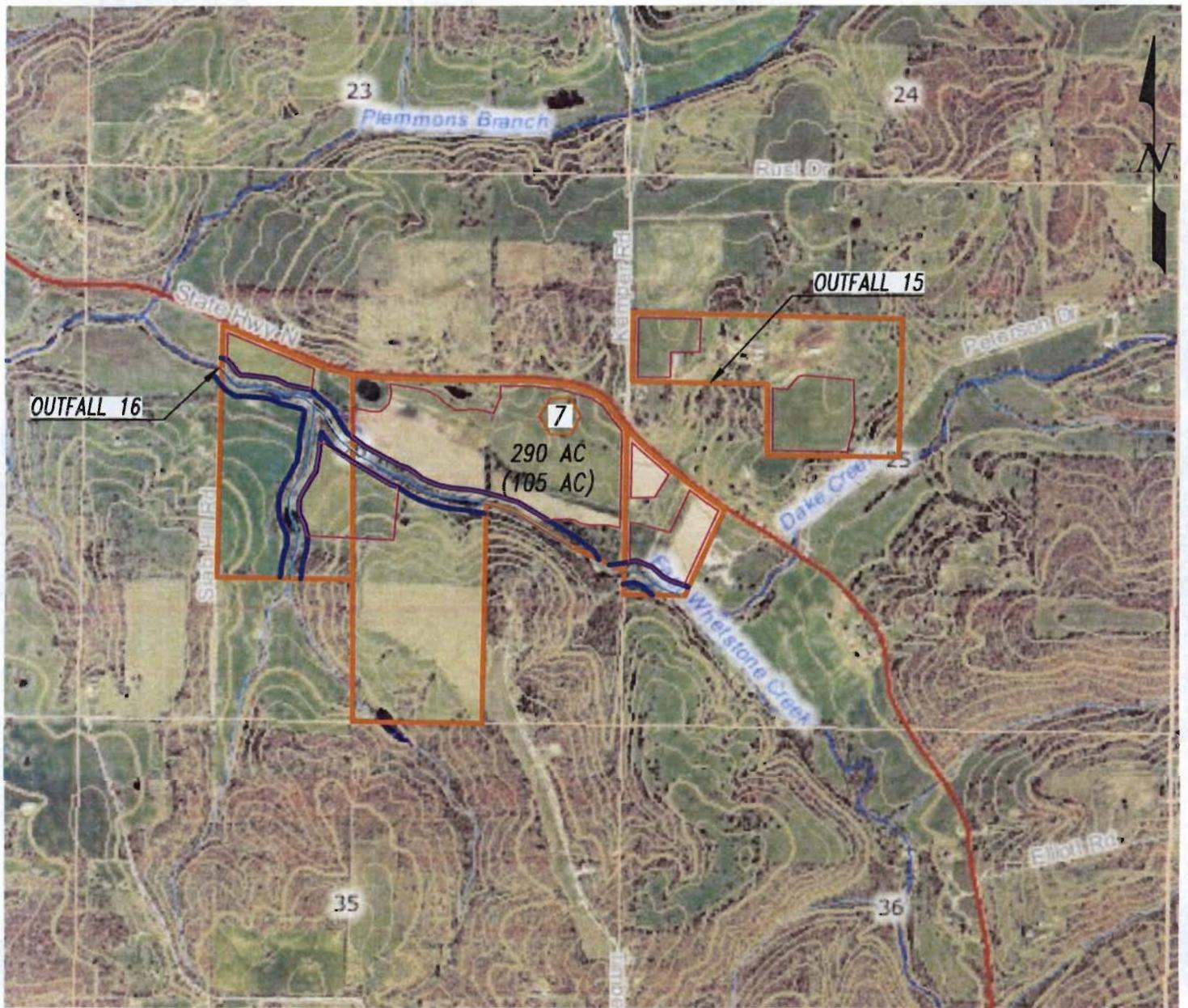
SECTIONS 12 & 13, TOWNSHIP 29N, RANGE 15W  
 SECTIONS 17 & 18, TOWNSHIP 29N, RANGE 14W  
 SCALE: 1"=1,500'

**EXHIBIT 6**

**Whitlock Engineering, LLC**

9648 E North View Road  
 Strafford, Missouri 65757  
 Phone: 417-582-4003

**GRISHAM FARM PRODUCTS  
 SITE SPECIFIC PERMIT  
 LAND APPLICATION SITE PLAN  
 SITE 6-GRISHAM & GRISHAM TRACTS**



**LEGEND**

- 1 LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
- PARCEL LINES
- 100' STREAM BUFFER
- LAND APPLICATION AREA

**NOTES:**

1. AVAILABLE PASTURE ASSUMES 100 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

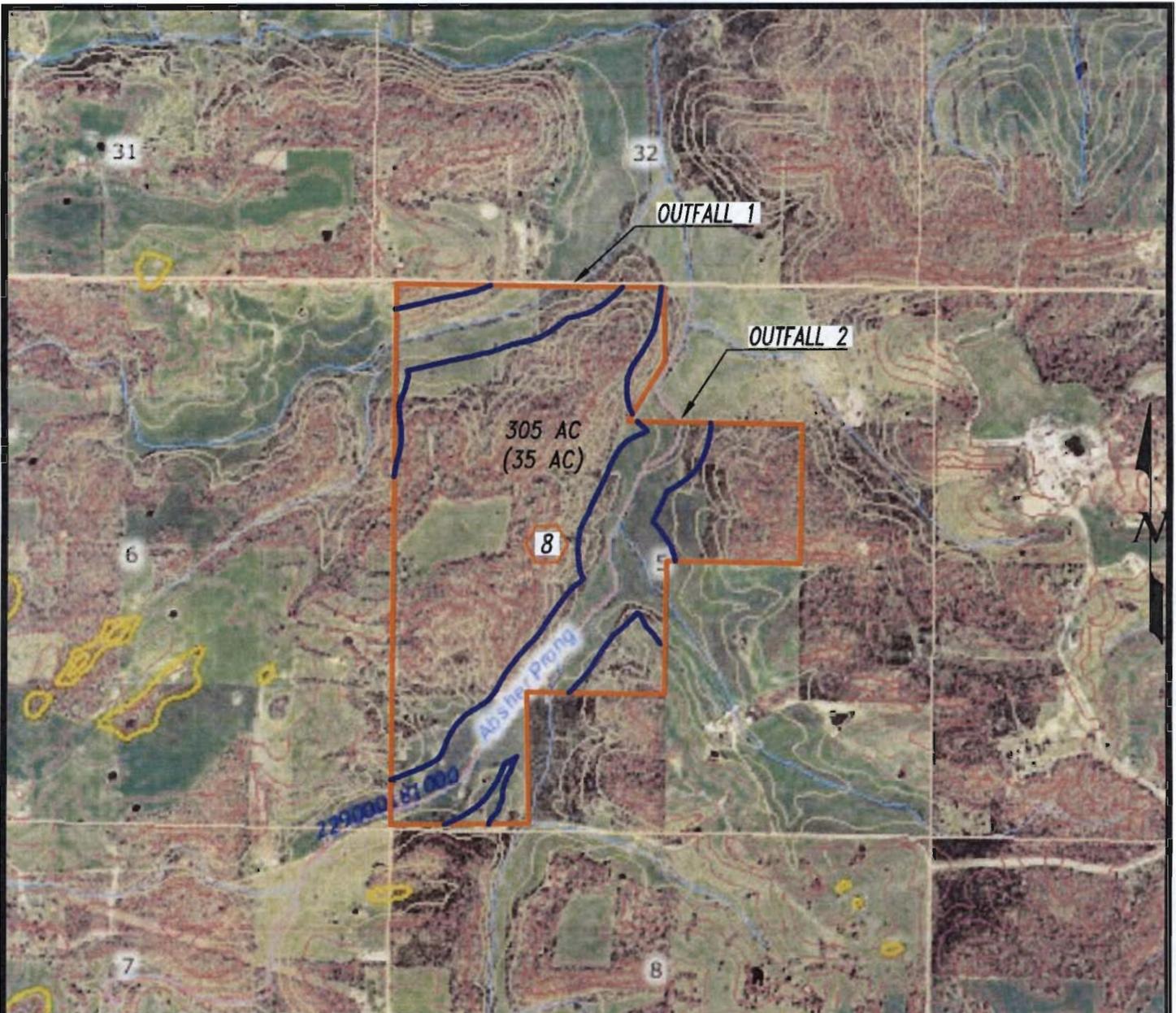
SECTIONS 25 & 26, TOWNSHIP 29N, RANGE 13W  
 SCALE: 1"=1,500'

**EXHIBIT 7**

**Whitlock Engineering, LLC**

9648 E North View Road  
 Strafford, Missouri 65757  
 Phone: 417-582-4003

**GRISHAM FARM PRODUCTS  
 SITE SPECIFIC PERMIT  
 LAND APPLICATION SITE PLAN  
 SITE 7-NELSON TRACTS**



**LEGEND**

-  LAND APPLICATION SITE NUMBER
- XX AC TOTAL ACERAGE
- (XX AC) AREA AVAILABLE FOR LAND APPLICATION
-  PARCEL LINES
-  300' STREAM BUFFER
-  SINKHOLE OUTLINE

**NOTES:**

1. AVAILABLE PASTURE ASSUMES 300 FT STREAM BUFFERS SUBJECT TO GEOHYDROLOGIC EVALUATION.
2. LAND APPLICATION SHALL NOT OCCUR WITHIN 150 FEET FROM A DWELLING AND WITHIN 50 FEET OF A PROPERTY LINE OR DITCH.

**LOCATION MAP**

SECTIONS 5 TOWNSHIP 28N, RANGE 13W

SCALE: 1"=1,500'

**EXHIBIT 8**



**WHITLOCK**  
ENGINEERING, LLC

9648 E North View Road  
Strafford, Missouri 65757  
Phone: 417-582-4003

GRISHAM FARM PRODUCTS  
SITE SPECIFIC PERMIT  
LAND APPLICATION SITE PLAN  
SITE 8-GRISHAM & GRISHAM

DATE: 04/04/13

SHEET: 1 OF 1

# Soil Evaluation Reports

New Kirk

SOIL PROFILE DESCRIPTION

Owner: Grisham Farms Date: 8/28/13 Excavation Depth: 48 Pit (required for new installation) or Core #:

Suitability (S, PS, U)	Horizon		Munsell Color (moist)	Redoximorphic Features <sup>(e)</sup>	Texture		% Coarse Fragments by volume <3" >3"	Consistence <sup>(e)</sup>	Structure <sup>(e)</sup>	Roots/Pores <sup>(e)</sup>	Shrink/Swell	Application Rate	
	Designation	Depth/Boundary <sup>(b)</sup>			USDA <sup>(b)</sup>	% Clay						Conv. (Table 13)	LPP (Table 14)
S	AP	0-8	10YR 3/3		GRUS.L 20	35	-	M&F	2MGR	M&E	L	.5	.5
S	Bt1	8-12	10YR 4/4	FD 4/4	GRUS.L 20	35	-	M&F	2F&BIC	E&E	L	.5	.5
S	Bt2	12-17	5YR 5/6	CIP 5/6	GRUS.L 30	15	20	M&F	2F&BIC	E&E	M	.5	.3
S	2Bt3	17-23	10YR 5/6	CIP MN	GRUS.L 44	15	45	M&F	1F&R/1F&S&BIC	-	W	.5	.25
U	3Bt4	23-27	10YR 5/6	CIP MN	CB C 55	tr	15	MV&I	2MPR/1VF&S&BIC	-	W	4b	-
U	R	27											
PS	AP	0-5	10YR 2/2		GRS.L 20	15	-	M&F	2M&L	M&E	L	.5	.5
PS	Bt1	5-10	10YR 5/4	FD 4/4	GRS.L 22	15	-	M&F	1VF&S&BIC	E&E	L	.5	.5
PS	Bt2	10-28	5YR 5/6	CIP 5/6	SIL 38	tr	-	M&F	1F&R/1VF&S&BIC	E&E	M	.3	.3
PS	2Bt3	28-36	2.5YR 4/6	CIP 5/6	C 50	tr	-	M&F	1F&R/1VF&S&BIC	USE	M	4a	.2
PS	2Bt3	36-48	2.5YR 4/6	CIP 5/6	C 55	tr	-	M&F	2MPR/1VF&S&BIC	-	M	4a	.2

Notes: P. # 1 37.13895°, 92.36371° Backslope 15-18% R @ 27"

P. # 2 37.13786°, 92.36893° Summit 0-3%  
 C-Now Tree Area 37.13299°, 92.3693° Ridge top 0-3% 14" to C 20" 4b

Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual, topology: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, scl-sandy clay loam, cl-clay loam, sc-sandy clay, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vfi-very firm, wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong, size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-play, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

New Kirk

SOIL PROFILE DESCRIPTION

Owner: Grissham Farms

Date: 8/28/13

Pit (required for new installation) or Core #:

Excavation Depth:

Suitability (S, PS, U)	Horizon		Munsell Color (moist)	Redoximorphic Features <sup>(7)</sup>	Texture		% Coarse Fragments by volume <3" >3"	Consistence <sup>(6)</sup>	Structure <sup>(5)</sup>	Roots/Pores <sup>(6)</sup>	Shrink/Swell	Soil Group	Application Rate	
	Designation <sup>(1)</sup>	Depth/Boundary <sup>(1)</sup>			USDA <sup>(2)</sup>	% Clay							Conv. (Table 13)	LPP (Table 14)
PS	RP	0-3	10YR 3/3		GRS:L 18	15	-	Mf	2MGR	m	L	3	.4	
PS	BE	3-9	10YR 5/4	FD 3/3	GRS:L 20	15	-	Mf	1VFSB	CLF	L	3	.4	
PS	Bt <sub>1</sub>	9-20	5YR 5/6	CIP 5/6	SIL 34	6F	-	Mf	1VFSBK	SLC	L	3	.35	
PS	Bt <sub>2</sub>	20-29	5YR 5/6	CIP 5/6	SIL 40	6C	-	Mf	2FPR/1VFSBK	DFSL	M	3	.3	
PS	Bt <sub>3</sub>	29-35	2.5YR 5/6	10YR 5/6 CDNV	GR C 50	15	15	Mf	2FPR/1VFSBK	DFSL	M	4a	.2	
W	Bt <sub>4</sub>	35-48	2.5YR 5/6	10YR 5/6 CIP 5/6	GR C 55	15	15	Mf	2FPR/1VFSBK	-	M	4b	-	
S	Ap	0-6	10YR 4/4		GRUS:L 20	35	-	Mf	2MAR	-	L	5	.5	
S	Bt <sub>1</sub>	6-14	10YR 5/6	CIP 5/4	GRUS:L 28	35	-	Mf	1VFSBK	-	L	5	.5	
S	Bt <sub>2</sub>	14-25	10YR 5/6	CIP 5/4	GRUS:L 30	35	-	Mf	1VFSBK	-	L	5	.4	
S	Bt <sub>3</sub>	25-44	2.5YR 5/6	CIP 5/6	GRUS:L 38	55	-	Mf	2F3BK	-	L	5	.4	
S	Bt <sub>4</sub>	44-60	7.5YR 5/6	CIP 5/6	GRUS:L 48	55	-	Mf	2F3BK	-	M	5	.3	

limestone  
nodules  
@ 35"

Notes: P. #3/37.13334°, 92.37459° Topsoil 4-7% slope Tree Clearing  
P. #4/37.13382°, 92.3733° Bottomland 0-3% Stream Terrace Tree Clearing

Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, set-sandy clay loam, el-clay loam, sc-sandy clay, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

New Kirk

# SOIL PROFILE DESCRIPTION

Owner: Grisham Farms

Date: 8/28/13

Excavation Depth: 48 Pit (required for new installation) or Core #:

Vegetation: Grass Parent Material: Colluvium Residual

Suitability (S, PS, U)	Horizon Designation <sup>(1)</sup>	Depth/ Boundary <sup>(1)</sup>	Munsell Color (moist)	Redoximorphic Features <sup>(2)</sup>	Texture		% Coarse Fragments by volume <3" >3"	Consistence <sup>(4)</sup>	Structure <sup>(5)</sup>	Roots/Pores <sup>(6)</sup>	Shrink/Swell	Soil Group	Application Rate	
					USDA <sup>(3)</sup>	% Clay							Conv. (Table 13)	LPP (Table 14)
PS	Ap	0-5	10YR 3/3		GRS/L 18		25	MFC	2MGR	MC	L	3	.15	
PS	Bt	5-12	10YR 5/4		GRS/L 20		15	MFC	1VFSBK	CC	L	3	.14	
S	2Bt	12-20	10YR 5/4		GRS/L 20		45	MFC	2FSBK	CC	L	5	.14	
S	2Bt	20-25	2.5YR 5/10	20% brittle	GRS/L 33		55	MFC	2FPR/1VFSBK	CC	M	5	.2	
PS	3Bt	25-40	2.5YR 9/10	CIP 5/10	GRS/L 48		20	MFC	1FPR/1VFSBK	-	M	3	.25	
PS	4Bt	40-48	2.5YR 4/10	CIP 5/10	GR/L 55		15	MFC	1FPR/1VFSBK	-	M/N	4a	.2	
S	Ap	0-10	10YR 2/2		GRS/L 18		45	MFC	2MGR	MC	L	5	.15	
S	Bt	10-18	10YR 5/4	FD 2/a	GRS/L 20		45	MFC	1VFSBK	CC	L	5	.15	
PS	Bt	18-26	5YR 5/10	LIP 5/10	GRS/L 20		15	MFC	1FSBK	CC	L	3	.14	
PS	2Bt	26-40	2.5YR 5/10	CIP 5/10	C 50		20	MFC	2FSBK	-	M	4a	.2	
PS	2Bt	40-50	2.5YR 5/10	CIP 5/10	C 55		20	MFC	2FSBK	-	M/N	4a	.2	

Notes: P. # 5 37.14282°, 92.36859° Backslope 4-6% Slope

P. # 6 37.14239°, 92.37257° Backslope 22-28% Slope Grass

### Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, st-sandy sand, sl-silty loam, si-silt loam, sil-silt loam, sl-clay loam, scl-silty clay loam, sc-sandy clay, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistency) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sl-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR-prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

P. # 5  
F - New Kirk  
P. # 6  
G - New Kirk

New Kink

# SOIL PROFILE DESCRIPTION

Owner: Grisham Farms Date: 5/28/13  
 Excavation Depth: 48 Pit (required for new installation) or Core #:  
 Vegetation: Grass Parent Material: Caliche / Residual

Suitability (S, PS, U)	Horizon	Munsell Color (moist)	Redoximorphic Features <sup>(b)</sup>	Texture		% Coarse Fragments by volume	Consistence <sup>(4)</sup>	Structure <sup>(5)</sup>	Roots/Pores <sup>(6)</sup>	Shrink/Swell	Soil Group	Application Rate	
				USDA <sup>(3)</sup>	% Clay							Conv. (Table 13)	LPP (Table 14)
S	AP D-6	10YR 4/4		GRUSL	18	35	MSr	1M GR	ME	L	S	.15	
S	BE 6-12	10YR 5/4	FD4/4	GRUSL	20	35	MSi	1FSBIC	CE	L	S	.15	
S	Bt 12-24	7.5YR 5/4	CIP5/4	GRUSL	26	45	MSi	2FSBIC	CE	L	S	.15	
S	Bt 24-36	7.5YR 5/4	CIP5/4	GRUSL	30	55	MSi	2FSBIC	CE	L	S	.14	
S	Bt 36-49	5YR 5/4	CIP5/4	GRUSL	38	50	MSi	2FSBIC	UFC	M	S	.14	
S	Bt 49-55	5YR 5/4	CIP5/4	GRUSL	42	45	MSi	1FSBIC	-	M	S	.13	
S	AP O-5	10YR 2/2		GRUSL	20	35	MSr	2M GR	ME	L	S	.15	
S	BE 5-11	10YR 5/4	CD2/2	GRUSL	20	35	MSi	1VFSBIC	CE	L	S	.15	
S	Bt 11-21	10YR 5/4	CIP5/4	GRUSL	26	55	MSi	2FSBIC	CE	L	S	.15	
S	Bt 21-28	10YR 5/4	CIP5/4	GRUSL	32	55	MSi	2FSBIC	CE	L	S	.14	
PS	Bt 28-39	5YR 5/4	CIP5/4	SIC	30	tr	MSi	2FSBIC	UFC	M	S	.35	
PPS	Bt 39-48	7.5YR 5/4	CIP5/4	C	50	tr	MSi	1FPR/1VFSBIC	-	M	4u	.25	

Notes H-Newkirk 8 CARES Finding 37.15301°, 92.38051°  
 P. # 7 37.14617°, 92.38263° Top slope 4-6% Grass Cla-Residual

P. # 8 37.4588° 92.38299° Back slope 6-8% Tree Area

### Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, scl-sandy clay loam, cl-clay loam, sic-silty clay loam, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fl-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

New Kirk

# SOIL PROFILE DESCRIPTION

Owner: Grisham Farms Date: 8/28/13  
 SOIL CHARACTERISTICS Excavation Depth: 48 Pit (required for new installation) or Core #:  
 Vegetation: Grass Parent Material: Alluvium - Residuum

Soil Suitability (S, PS, U)	Horizon Designation	Depth / Boundary	Munsell Color (moist)	Redoximorphic Features	Texture		% Coarse Fragments by volume	Consistence	Structure	Roots / Pores	Shrink / Swell	Application Rate	
					USDA % Clay	<3" >3"						Conv. (Table 13)	LPP (Table 14)
S	A <sub>1</sub>	0-8	10YR 8/4		GRSCL 18	-	35	MS	2M GR	MR	L	3	.5
S	A <sub>2</sub>	8-14	10YR 5/4	CD 4/4	GRSCL 20	-	35	MCI	2ESBIS	CR	L	5	.5
S	B <sub>1</sub>	14-27	10YR 5/4	CIP 5/4	GRSCL 20	15	50	MCI	2FSBC	RR	L	5	.4
S	B <sub>2</sub>	27-35	7.5YR 5/6	CIP 5R 5/6	GRSCL 30	15	35	MS	1ESBK	RC	M	5	.3
PS	2B <sub>1</sub>	35-48	10YR 5/8	CIP 5R 5/6	SIC 40	5	5	MS	1FPR/1VESBK	USS	M	3	.2
				Sandstone									
PS	A <sub>1</sub>	0-10	10YR 4/4		GRSCL 18	15	15	MCI	2EGR	MR	L	3	.4
PS	A <sub>2</sub>	10-13	10YR 4/4		SIL 22	5	5	MCI	1VESBK	RC	L	3	.4
PS	B <sub>1</sub>	13-21	7.5YR 5/6		SIL 32	5	5	MCI	1ESBK	FL	M	3	.4
S	2B <sub>2</sub>	21-30	7.5YR 5/4	CIP 5/2	CIP 5/2	45	45	MCI	1ESBK	USS	M	5	.4
S	2B <sub>3</sub>	30-48	7.5YR 5/6	CIP 5/2	CIP 5/2	46	45	MS	1ESBK	-	M	5	.2

Notes: Pit # 9 Ridge top - 0-4% 37.1473° 92.40156° Between Mapped Sinkholes  
 No Pit Sample M - New Kirk 37.14403° 92.38743°  
 Pit # 10 Bottom land 37.14692° 92.39793° Alluvium / Colluvium

### Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, sc-sandy clay loam, cl-clay loam, sic-silty clay loam, sc-sandy clay, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

Mt. Grove

SOIL PROFILE DESCRIPTION

OWNER: Grissham Farms 31.20253, 92.52881 Date: 8/20/13 4% Slope

SOIL CHARACTERISTICS Parent Material: ~~loam~~ Residuum Excavation Depth: 60' Pit (required for new installation) or Core #:

Suitability (S, PS, U)	Horizon Designation	Munsell Color (moist)	Redoximorphic Features <sup>(2)</sup>	Texture		% Coarse Fragments by volume		Consistence <sup>(4)</sup>	Structure <sup>(5)</sup>	Roots/Pores <sup>(6)</sup>	Shrink/Swell	Soil Group	Application Rate	
				USDA <sup>(1)</sup>	% Clay	<3"	>3"						Conv. (Table 13)	LPP (Table 14)
PS	Ap D-7 C/W 7-18	10YR 4/4		SIL 18	-	-	-		2FGR	MC CF	L 3	3	.5	.5
PS	Bt1 C/W 18-36	2.5YR 5/4		SIL 26	-	-	-		2FSDK	CC CF	1 3	3	.5	.5
PS	Bt2 C/W 36-48	7.5YR 5/6	C1P5/4	SICL 28	-	-	-		2ESDK	CF CF	1 3	3	.4	.4
PS	Bt3 C/W 48-64	7.5YR 5/6	C1P5/4	SICL 32	-	-	-		1ESBK	CF CF	1 3	3	.35	.35
PS	Bt4 C/W	5YR 5/6	C1P5/4	SIC 48	-	-	-		1ESBK	CF CF	1 3	3	.25	.25

Notes: Lagoon 3.6 million gallons Approx. 300' x 600' x 8' depth.  
31.20845, 92.5289°  
Some wilderness weight county.  
0% Slope SE

Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, scl-sandy clay loam, cl-clay loam, sic-silty clay loam, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistency) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SDBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

mt. Grove

SOIL PROFILE DESCRIPTION

OWNER: Grisham Farms 31.21523, 92.51844, P#3 Date: 7/28 Pit (required for new installation) or Core #: 78

SOIL CHARACTERISTICS		Excavation Depth: <u>78</u>		Parent Material: <u>Colluvium / Residuals</u>		Pit (required for new installation) or Core #:				
Suitability (S, PS, U)	Horizon	Munsell Color (moist)	Redoximorphic Features <sup>(b)</sup>	Texture		Consistence <sup>(c)</sup>	Structure <sup>(b)</sup>			
				USDA <sup>(a)</sup>	% Clay			% Coarse Fragments by volume	Roots/Pores <sup>(e)</sup>	
	Designation <sup>(d)</sup>	Depth / Boundary <sup>(d)</sup>					Shrink / Swell			
S	AP	D-3		GRUSL18	35	M.C.	2FGR	L	5	1.5
S	BE	3-B		GRUSL18	45	M.C.	2F5BK	L	5	1.5
S	Bt1	B-25	CIP5/4	GRUSL27	50	M.C.	2F5BK	L	5	1.4
S	Bt2	25-44	CIP5/4	GRUSL28	55	M.C.	1F5BK	L	5	1.4
S	Bt3	44-52	CIP5/6	GRUSL30	50	M.C.	1F5BK	M	5	1.3
S	2B1	52-70	CIP5/6	GRUSL30	35	M.C.	2FPR/1F5BK	M	5	1.2
S	A	2-5		GRUSL19	35	M.C.	2FGR	L	5	1.4
S	BE	5-12	CIP4/4	GRUSL20	35	M.C.	2F5BK	L	5	1.4
S	Bt	12-24	CIP5/4	GRUSL26	45	M.C.	1F5BK	L	5	1.4
S	Bt2	24-34	CIP5/4	GRUSL30	45	M.C.	1F5BK	L	5	1.4
S	Bt3	34-45	CIP5/4	GRUSL30	45	M.C.	2F5BK	M	5	1.3
S	Bt4	45-65	CIP5/4	GRUSL48	35	M.C.	2FPR/1F5BK	M	5	1.2

Notes: Wilderness / Ridge, 25-4% Slope, Tree Area #3 Pit on Tree Line  
#4 Pit in Swampy Slope of Tree Line Area, Tree Clearing 25 to 30 Acres  
31.216, 92.5209, P#4

Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, scl-sandy clay loam, cl-clay loam, c-clay loam, sc-sandy clay, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR-prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

Mt. Grove

**SOIL PROFILE DESCRIPTION**

Pit # 5  
 OWNER: Grisham Farm - Toe slope 4-16% 37.2145° 92.51704° Date: 92.51704°  
 Excavation Depth: 48 Pit (required for new installation) or Core #: 48

Vegetation: <u>Grass</u>		Parent Material: <u>Colluvium / Residual</u>		Excavation Depth: <u>48</u>		Pit (required for new installation) or Core #: <u>48</u>								
Soil (S, PS, U)	Horizon Designation	Depth/ Boundary <sup>(1)</sup>	Munsell Color (moist)	Redoximorphic Features <sup>(2)</sup>	Texture		% Coarse Fragments by volume	Consis- tence <sup>(4)</sup>	Structure <sup>(5)</sup>	Roots /Pores <sup>(6)</sup>	Shrink /Swell	Soil Group	Application Rate	
					USDA <sup>(3)</sup>	% Clay							Conv. (Table 13)	LPP (Table 14)
S	AP	0-3	10YR 4/4		GRUSL 18	-	35	ME	2FGR	MS	L	S	.5	
S	AB	3-9	10YR 4/4	E10 Y3	GRUSL 20	-	35	MS	1ESBK	CC	L	S	.5	
S	BE-1	9-18	7.5YR 5/4	C1P5/4	GRUSL 26	-	45	ME	2FSBK	CC	L	S	.4	
S	BE-2	18-23	7.5YR 5/10	C1P5/4	GRUSL 30	-	55	ME	2FSBK	USK	L	S	.4	
PS	BE-3	23-40	5YR 5/4	C1P5/4	GRUSL 35	10	55	ME	1FSBK	USK	M	S	.3	
PS	2Bt4	40-52	2.5YR 5/10	C1P5/4	GRUSL 48	5	35	MS	1ESBK	-	M	S	.2	
PS	2Bt5	52-60	2.5YR 5/10	C1P5/4	GRUSL 52	5	25	ME	1FPR/1VFSBK	-	M/N	4A	.1	
PS	AP	0-10	10YR 4/4		L 18	-	-	ME	2FGR	CC	L	S	.5	
PS	BH	10-24	7.5YR 5/4		L 22	-	-	MS	1ESBK	CC	L	S	.5	
PS	Bt2	24-38	7.5YR 5/10	C1P5/4	S1L 26	-	-	ME	2FSBK	CC	L	S	.5	
PS	Bt3	38-48	7.5YR 5/10	C1P5/4	S1L 32	-	-	ME	2FSBK	-	L	S	.4	
PS	2Bt4	48-65	5YR 5/10	C1P5/4	S1C 40	-	-	ME	1FPR/1VFSBK	-	M	S	.35	

Notes Pit # 5 37.2145°, 92.51704° Toeslope 4-6%

Pit # 6 37.21305°, 92.51471° 2-4% Terrace James fin

**Notations used on Soil Profile Description**

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, sil-silt loam, st-silt, sc-sandy clay loam, cl-clay loam, sic-silty clay loam, sc-sandy clay, c-clay, Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

Mt. Grove

SOIL PROFILE DESCRIPTION

Owner: Grisham Farms

Date: 8/27/13

Pit (required for new installation) or Core #:

Excavation Depth: 1.0

Parent Material: Residuals

Suitability (S, PS, U)	Horizon Designation	Depth / Boundary (ft)	Munsell Color (moist)	Redoximorphic Features (b)	Texture (c)		% Coarse Fragments by volume <3" >3"	Consistence (e)	Structure (f)	Roots / Pores (g)	Shrink / Swell	Soil Group	Application Rate	
					USDA (h)	% Clay							Conv. (Table 13)	LPP (Table 14)
S	AP	0-9	10YR 4/4		GRUSL 18	35	fr	nc	2MGR	ME	L	S	.4	
PS	BE	9-20	10YR 5/4	FD 4/4	GRUSL 20	35	5	nc	2FSBK	CC	L	S	.4	
PS	Bt1	20-27	7.5YR 5/0	1P5/4	GRUSL 20	15	15	nc	1FSBK	CC	L	S	.4	
PS	Bt2	27-39	7.5YR 5/0	1P5/4	GRUSL 20	15	15	nc	1FSBK	CC	L	S	.3	
PS	Bt3	39-48	5YR 5/0	1P5/4	5:1C	44	fr	nc	1FSBK	MS	M	S	.25	
PS	2Bt4	48-60	2.5YR 5/1	5/4	C	55	fr	nc	1FPR/1VFSBK	-	M/10	4u	.2	
S	AP	0-4	10YR 4/4		GRUSL 18	35	-	nc	2MGR	MS	L	S	.4	
PS	BE	4-10	10YR 5/4	FC 4/4	GRUSL 20	35	-	nc	1VF2BR	CC	L	S	.4	
PS	Bt1	10-24	7.5YR 5/0	1P5/4	GRUSL 20	45	5	nc	1FSBK	CC	L	S	.4	
S	Bt2	24-39	7.5YR 5/0	1P5/4	5:1C	32	45	nc	2FSBK	MS	M	S	.3	
PS	Bt3	39-48	5YR 5/0	1P5/4	5:1C	44	fr	nc	1FPR/1VFSBK	-	M	S	.35	

Notes: \* F-Grisham 37.20732°, 92.52069° Map from CARES no pit.  
 P.#7 37.19953°, 92.51995° 6-8% Slope Backslope.  
 P.#8 37.19186°, 92.52125° 16-18% Slope Backslope - Grass  
 G-Grisham 37.20732°, 92.52012°

Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, scl-sandy clay loam, cl-clay loam, scl-silty clay loam, sc-sandy clay, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vf-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

Mt. Grove

SOIL PROFILE DESCRIPTION

Owner: Grissman Farms 37.21238° 92.52751° Date: 8/27/13 12-15% Slope  
 SOIL CHARACTERISTICS Excavation Depth: 48" Pit (required for new installation) or Core #:  
 Vegetation: Grass Parent Material: loess

Suitability (S, PS, U)	Horizon Designation	Depth/Boundary	Munsell Color (moist)	Redoximorphic Features	Texture		% Coarse Fragments by volume <3" >3"	Consistence	Structure	Roots/Pores	Shrink/Swell	Soil Group	Application Rate	
					USDA % Clay	% >3"							Conv. (Table 13)	LPP (Table 14)
B	H	D-2	10YR 3/3		GRUSL 18	-	15	MS	2MGR	MC	L	3	.5	
S	E	2-5	10YR 5/4	FD 3/3	GRUSL 18	-	35	MS	1FSBK	CC	L	5	.5	
S	BE	5-17	10YR 5/4	10YR 5/6	GRUSL 20	-	50	MS	1FSBK	CC	L	5	.4	
S	Bt1	17-28	7.5YR 5/6	CIP 5/6, 5/4	GRUSL 28	15	50	MS	2FSBK	VEE	L	5	.4	
S	Bt2	28-41	5YR 5/6	CIP 5/4	GRUSL 32	15	40	MS	2FSBK	VEE	M	5	.4	
S	Bt3	41-48	5YR 5/6	CIP 5/4	GRUSL 44	10	35	MS	1EPR/1VFSBK	-	M	5	.25	

Notes

Notations used on Soil Profile Description

- (1) Boundary distinctness: A-abrupt, C-clear, G-gradual; topography: S-smooth, W-wavy, I-irregular;
- (2) Redox Features Report low chroma Munsell colors and iron and manganese concentrations indicative of soil drainage limitations;
- (3) Texture s-sand, ls-loamy sand, sl-sandy loam, l-loam, sil-silt loam, si-silt, scl-sandy clay loam, ci-clay loam, sic-silty clay, c-clay; Designate estimated clay content for all horizons;
- (4) Consistence (report moist consistence) moist: fr-friable, fi-firm, vfi-very firm; wet: ss-slightly sticky, s-sticky, vs-very sticky and sp-slightly plastic, p-plastic, vp-very plastic; dry: sh-slightly hard, h-hard, vh-very hard;
- (5) Structure grade: 1-weak, 2-moderate, 3-strong; size: f-fine (thin if platy), m-medium, c-coarse (thick if platy); shape: ABK-angular blocky, SBK-subangular blocky, GR-granular, PL-platy, PR prismatic, MA-massive;
- (6) Roots/Pores abundance: f-few, c-common, m-many; size: vf-very fine, f-fine, m-medium, c-coarse.

# Soil Test Reports

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID NEWKIRK		Sample no 1	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81255-1	Lab no. D1306297
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING							
		Very Low	Low	Medium	High	Very High	Excess		
pH <sub>s</sub> (salt pH)	5.8	*****							
Phosphorus (P)	29 lbs/A	*****							
Potassium (K)	258 lbs/A	*****							
Calcium (Ca)	1920 lbs/A	*****							
Magnesium (Mg)	417 lbs/A	*****							
Sulfur (SO <sub>4</sub> -S)	ppm								
Zinc (Zn)	ppm								
Manganese (Mn)	ppm								
Iron (Fe)	ppm								
Copper (Cu)	ppm								
Organic matter 3.2 %	Neutralizable acidity 1.5 meq/100g	Cation Exch. Capacity 8.4 meq/100g							
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A					
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches			
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS			
Cropping options		Yield goal	Pounds per acre				Effective Neutralizing Material (ENM)	0	
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn			S
19 COOL SEASON GR PAST		100 CD/A	60	20	20				
19 COOL SEASON GR PAST		150 CD/A	90	20	20				
19 COOL SEASON GR PAST		200 CD/A	120	25	20				
19 COOL SEASON GR PAST		250 CD/A	150	25	20				
						Effective magnesium (EMg)	0		

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.3 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

Regional Agronomy Specialist Tim Schnakenberg

Phone 417-357-6812

White-Farmer, Yellow-FSA, Blue-Firm, Pink-Extension

MP 189 Revised 1/96

Signature

University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating  
Equal opportunity institutions

Portageville

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID B NEWKIRK		Sample no 2	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81255-2	Lab no. D1306298
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION			RATING						
			Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	6.5		*****						
Phosphorus (P)	83 lbs/A		*****						
Potassium (K)	833 lbs/A		*****						
Calcium (Ca)	2500 lbs/A		*****						
Magnesium (Mg)	647 lbs/A		*****						
Sulfur (SO <sub>4</sub> -S)	ppm								
Zinc (Zn)	ppm								
Manganese (Mn)	ppm								
Iron (Fe)	ppm								
Copper (Cu)	ppm								
Organic matter 5.4 %	Neutralizable acidity 0.0 meq/100g	Cation Exch. Capacity 10.0 meq/100g							
PH in water	Electrical Conductivity	Mmho/cm	Sodium (Na) lbs/A						
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth Top	Inches			Subsoil Inches			
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS		
Cropping options		Yield goal	Pounds per acre						
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S		
19 COOL SEASON GR PAST		100 CD/A	60	0	0			Effective Neutralizing Material (ENM)	0
19 COOL SEASON GR PAST		150 CD/A	90	0	0			Effective magnesium (EMg)	0
19 COOL SEASON GR PAST		200 CD/A	120	0	0				
19 COOL SEASON GR PAST		250 CD/A	150	0	0				

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.0 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

---If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID C NEWKIRK		Sample no 3	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81255-3	Lab no. D1306299
County Christian Region 6	
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING						
		Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	4.7	*****						
Phosphorus (P)	8 lbs/A	*****						
Potassium (K)	112 lbs/A	*****						
Calcium (Ca)	660 lbs/A	*****						
Magnesium (Mg)	118 lbs/A	*****						
Sulfur (SO <sub>4</sub> -S)	ppm							
Zinc (Zn)	ppm							
Manganese (Mn)	ppm							
Iron (Fe)	ppm							
Copper (Cu)	ppm							
Organic matter 2.4 %	Neutralizable acidity 4.0 meq/100g	Cation Exch. Capacity 6.3 meq/100g						
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A				
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS		
Cropping options		Yield goal	Pounds per acre					
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST		100 CD/A	60	55	50			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST		150 CD/A	90	55	55			1085
19 COOL SEASON GR PAST		200 CD/A	120	60	65			Effective magnesium (EMg)
19 COOL SEASON GR PAST		250 CD/A	150	60	75			***

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.2 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.
- \*\*\*Suggest using dolomitic limestone if readily available, but yield response to magnesium is not likely.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID D NEWKIRK		Sample no 4	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81255-4	Lab no. D1306300
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.4	*****					
Phosphorus (P)	33 lbs/A	*****					
Potassium (K)	172 lbs/A	*****					
Calcium (Ca)	1480 lbs/A	*****					
Magnesium (Mg)	328 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 4.0 %	Neutralizable acidity 3.0 meq/100g	Cation Exch. Capacity 8.3 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A			
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches	
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS	
Cropping options		Yield goal	Pounds per acre				Effective Neutralizing Material (ENM) 545 Effective magnesium (EMg) 0
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	
19 COOL SEASON GR PAST		100 CD/A	60	20	25		
19 COOL SEASON GR PAST		150 CD/A	90	20	35		
19 COOL SEASON GR PAST		200 CD/A	120	20	45		
19 COOL SEASON GR PAST		250 CD/A	150	20	55		

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.9 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID E NEWKIRK		Sample no 5	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

<b>Serial no. S81255-5</b>	<b>Lab no. D1306301</b>
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING						
		Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	7.4	*****						
Phosphorus (P)	113 lbs/A	*****						
Potassium (K)	753 lbs/A	*****						
Calcium (Ca)	6780 lbs/A	*****						
Magnesium (Mg)	758 lbs/A	*****						
Sulfur (SO <sub>4</sub> -S)	ppm							
Zinc (Zn)	ppm							
Manganese (Mn)	ppm							
Iron (Fe)	ppm							
Copper (Cu)	ppm							
Organic matter 4.5 %	Neutralizable acidity 0.0 meq/100g	Cation Exch. Capacity 21.1 meq/100g						
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A				
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS		
Cropping options	Yield goal	Pounds per acre						
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S		
19 COOL SEASON GR PAST	100 CD/A	60	0	0			Effective Neutralizing Material (ENM)	0
19 COOL SEASON GR PAST	150 CD/A	90	0	0				
19 COOL SEASON GR PAST	200 CD/A	120	0	0			Effective magnesium (EMg)	0
19 COOL SEASON GR PAST	250 CD/A	150	0	0				

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.9 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

---If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.

<http://www.soiltest.psu.missouri.edu/>

<b>Serial no. S81255-6</b>	<b>Lab no. D1306302</b>
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

FIELD INFORMATION	
Field ID F NEWKIRK	Sample no 6
Acres 40	Last Limed unknown
	Irrigated No
Last crop	FSA Copy N

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	7.0	*****					
Phosphorus (P)	206 lbs/A	*****					
Potassium (K)	65 lbs/A	*****					
Calcium (Ca)	2900 lbs/A	*****					
Magnesium (Mg)	639 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 3.7 %	Neutralizable acidity 0.0 meq/100g	Cation Exch. Capacity 10.0 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A			
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches	
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS	
Cropping options		Yield goal	Pounds per acre				
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S
19 COOL SEASON GR PAST		100 CD/A	60	0	80		
19 COOL SEASON GR PAST		150 CD/A	90	0	85		
19 COOL SEASON GR PAST		200 CD/A	120	0	95		
19 COOL SEASON GR PAST		250 CD/A	150	0	105		
						Effective Neutralizing Material (ENM)	0
						Effective magnesium (EMg)	0

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.5 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID G NEWKIRK		Sample no 7	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81255-7	Lab no. D1306303
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING							
		Very Low	Low	Medium	High	Very High	Excess		
pH <sub>s</sub> (salt pH)	6.7	*****							
Phosphorus (P)	314 lbs/A	*****							
Potassium (K)	514 lbs/A	*****							
Calcium (Ca)	5820 lbs/A	*****							
Magnesium (Mg)	1319 lbs/A	*****							
Sulfur (SO <sub>4</sub> -S)	ppm								
Zinc (Zn)	ppm								
Manganese (Mn)	ppm								
Iron (Fe)	ppm								
Copper (Cu)	ppm								
Organic matter 14.5 %	Neutralizable acidity 0.0 meq/100g	Cation Exch. Capacity 20.7 meq/100g							
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A					
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches			
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS			
Cropping options		Yield goal	Pounds per acre						
19 COOL SEASON GR PAST		100 CD/A	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	Effective Neutralizing Material (ENM)	0
19 COOL SEASON GR PAST		150 CD/A	60	0	0				
19 COOL SEASON GR PAST		200 CD/A	90	0	0			Effective magnesium (EMg)	0
19 COOL SEASON GR PAST		250 CD/A	120	0	0				
19 COOL SEASON GR PAST		250 CD/A	150	0	0				

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.2 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID H NEWKIRK		Sample no 8	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81255-8	Lab no. D1306304
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	4.2	*****					
Phosphorus (P)	18 lbs/A	*****					
Potassium (K)	85 lbs/A	*****					
Calcium (Ca)	640 lbs/A	*****					
Magnesium (Mg)	141 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 3.8 %	Neutralizable acidity 6.0 meq/100g	Cation Exch. Capacity 8.3 meq/100g					
PH in water	Electrical Conductivity Mmho/cm	Sodium (Na) lbs/A					
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	35	65			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	35	70			1825
19 COOL SEASON GR PAST	200 CD/A	120	40	80			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	40	90			***

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 4.7 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

---To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

\*\*\*Suggest using dolomitic limestone if readily available, but yield response to magnesium is not likely.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID GRISHAM		Sample no 1	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

<b>Serial no. S81253-1</b>	<b>Lab no. D1306305</b>
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.6	*****					
Phosphorus (P)	9 lbs/A	*****					
Potassium (K)	36 lbs/A	*****					
Calcium (Ca)	1810 lbs/A	*****					
Magnesium (Mg)	122 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 1.6 %	Neutralizable acidity 2.0 meq/100g	Cation Exch. Capacity 7.1 meq/100g					
PH in water	Electrical Conductivity Mmho/cm	Sodium (Na) lbs/A					
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS
Cropping options		Yield goal	Pounds per acre				
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S
19 COOL SEASON GR PAST	100 CD/A	60	50	90			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	55	100			0
19 COOL SEASON GR PAST	200 CD/A	120	55	110			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	60	120			***

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.1 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

\*\*\*Limestone is not currently recommended. For a future limestone application, suggest using dolomitic limestone if readily available, but yield response to magnesium is not likely.

Regional Agronomy Specialist Tim Schnakenberg

Phone 417-357-6812

White-Farmer, Yellow-FSA, Blue-Firm, Pink-Extension

MP 189 Revised 1/96

Signature

University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating

Portageville

Equal opportunity institutions

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID B GRISHAM		Sample no 2	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

<b>Serial no. S81253-2</b>	<b>Lab no. D1306306</b>
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING						
		Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	5.0	*****						
Phosphorus (P)	14 lbs/A	*****						
Potassium (K)	197 lbs/A	*****						
Calcium (Ca)	950 lbs/A	*****						
Magnesium (Mg)	161 lbs/A	*****						
Sulfur (SO <sub>4</sub> -S)	ppm							
Zinc (Zn)	ppm							
Manganese (Mn)	ppm							
Iron (Fe)	ppm							
Copper (Cu)	ppm							
Organic matter 3.0 %	Neutralizable acidity 2.5 meq/100g	Cation Exch. Capacity 5.8 meq/100g						
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A				
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS		
Cropping options		Yield goal	Pounds per acre					
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST		100 CD/A	60	40	20			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST		150 CD/A	90	45	25			605
19 COOL SEASON GR PAST		200 CD/A	120	45	30			Effective magnesium (EMg)
19 COOL SEASON GR PAST		250 CD/A	150	50	40			0

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.5 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

Regional Agronomy Specialist Tim Schnakenberg

Phone 417-357-6812

White-Farmer, Yellow-FSA, Blue-Firm, Pink-Extension

MP 189 Revised 1/96

Signature

University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating  
Equal opportunity institutions

Portageville

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID C GRISHAM		Sample no 3	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

<b>Serial no. S81253-3</b>	<b>Lab no. D1306307</b>
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.9	*****					
Phosphorus (P)	11 lbs/A	*****					
Potassium (K)	268 lbs/A	*****					
Calcium (Ca)	3060 lbs/A	*****					
Magnesium (Mg)	204 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 4.6 %	Neutralizable acidity 1.5 meq/100g	Cation Exch. Capacity 10.3 meq/100g					
PH in water	Electrical Conductivity Mmho/cm	Sodium (Na) lbs/A					
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS
Cropping options		Yield goal	Pounds per acre				
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S
19 COOL SEASON GR PAST	100 CD/A	60	45	20			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	50	20			0
19 COOL SEASON GR PAST	200 CD/A	120	50	20			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	55	20			***

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.4 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

\*\*\*Limestone is not currently recommended. For a future limestone application, suggest using dolomitic limestone if readily available, but yield response to magnesium is not likely.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID D GRISHAM		Sample no 4	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

Serial no. S81253-4		Lab no. D1306308	
County Christian		Region 6	
Submitted 8/30/2013		Processed 9/6/2013	

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.4	*****					
Phosphorus (P)	23 lbs/A	*****					
Potassium (K)	614 lbs/A	*****					
Calcium (Ca)	1190 lbs/A	*****					
Magnesium (Mg)	255 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter	3.2 %	Neutralizable acidity	2.5 meq/100g	Cation Exch. Capacity	7.3 meq/100g		
PH in water		Electrical Conductivity	Mmho/cm	Sodium (Na)	lbs/A		
Nitrate (NO <sub>3</sub> -N) Topsoil	ppm	Subsoil	ppm	Sampling Depth	Top Inches	Subsoil	Inches
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	25	0			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	30	0			455
19 COOL SEASON GR PAST	200 CD/A	120	30	0			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	35	0			0

**Comments**

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.9 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID E GRISHAM		Sample no 5	
Acres 40	Last Limed unknown	Irrigated	No
Last crop		FSA Copy N	

Serial no. S81253-5	Lab no. D1306309
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING						
		Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	6.4	*****						
Phosphorus (P)	10 lbs/A	*****						
Potassium (K)	143 lbs/A	*****						
Calcium (Ca)	2960 lbs/A	*****						
Magnesium (Mg)	709 lbs/A	*****						
Sulfur (SO <sub>4</sub> -S)	ppm							
Zinc (Zn)	ppm							
Manganese (Mn)	ppm							
Iron (Fe)	ppm							
Copper (Cu)	ppm							
Organic matter 3.5 %	Neutralizable acidity 0.0 meq/100g	Cation Exch. Capacity 10.5 meq/100g						
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A				
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS		
Cropping options	Yield goal	Pounds per acre						
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S		
19 COOL SEASON GR PAST	100 CD/A	60	50	40			Effective Neutralizing Material (ENM)	0
19 COOL SEASON GR PAST	150 CD/A	90	50	50				
19 COOL SEASON GR PAST	200 CD/A	120	55	60			Effective magnesium (EMg)	0
19 COOL SEASON GR PAST	250 CD/A	150	55	65				

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.  
---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.9 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID F GRISHAM		Sample no 6	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Serial no. S81253-6	Lab no. D1306310
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	6.0	*****					
Phosphorus (P)	10 lbs/A	*****					
Potassium (K)	146 lbs/A	*****					
Calcium (Ca)	3140 lbs/A	*****					
Magnesium (Mg)	714 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter	3.1 %	Neutralizable acidity	1.0 meq/100g	Cation Exch. Capacity	12.0 meq/100g		
PH in water		Electrical Conductivity	Mmho/cm	Sodium (Na)	lbs/A		
Nitrate (NO <sub>3</sub> -N) Topsoil	ppm	Subsoil	ppm	Sampling Depth	Top	Inches	Subsoil
<b>NUTRIENT REQUIREMENTS</b>							<b>LIMESTONE SUGGESTIONS</b>
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	50	45			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	50	50			0
19 COOL SEASON GR PAST	200 CD/A	120	55	60			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	55	70			0

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.5 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID G GRISHAM		Sample no 7	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

Serial no. S81253-7	Lab no. D1306311
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING						
		Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	5.7	*****						
Phosphorus (P)	24 lbs/A	*****						
Potassium (K)	88 lbs/A	*****						
Calcium (Ca)	1650 lbs/A	*****						
Magnesium (Mg)	326 lbs/A	*****						
Sulfur (SO <sub>4</sub> -S)	ppm							
Zinc (Zn)	ppm							
Manganese (Mn)	ppm							
Iron (Fe)	ppm							
Copper (Cu)	ppm							
Organic matter 2.8 %	Neutralizable acidity 1.5 meq/100g	Cation Exch. Capacity 7.1 meq/100g						
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A				
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches		
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS		
Cropping options	Yield goal	Pounds per acre						
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S		
19 COOL SEASON GR PAST	100 CD/A	60	25	60			Effective Neutralizing Material (ENM)	0
19 COOL SEASON GR PAST	150 CD/A	90	25	70				
19 COOL SEASON GR PAST	200 CD/A	120	30	75			Effective magnesium (EMg)	0
19 COOL SEASON GR PAST	250 CD/A	150	30	85				

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.2 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID H GRISHAM		Sample no 8	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

<b>Serial no. S81253-8</b>	<b>Lab no. D1306312</b>
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING							
		Very Low	Low	Medium	High	Very High	Excess		
pH <sub>s</sub> (salt pH)	6.2	*****							
Phosphorus (P)	10 lbs/A	*****							
Potassium (K)	127 lbs/A	*****							
Calcium (Ca)	2060 lbs/A	*****							
Magnesium (Mg)	420 lbs/A	*****							
Sulfur (SO <sub>4</sub> -S)	ppm								
Zinc (Zn)	ppm								
Manganese (Mn)	ppm								
Iron (Fe)	ppm								
Copper (Cu)	ppm								
Organic matter 3.0 %	Neutralizable acidity 0.5 meq/100g	Cation Exch. Capacity 7.6 meq/100g							
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A					
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches			
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS			
Cropping options		Yield goal	Pounds per acre				Effective Neutralizing Material (ENM)	0	
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn			S
19 COOL SEASON GR PAST		100 CD/A	60	50	45				
19 COOL SEASON GR PAST		150 CD/A	90	50	50				
19 COOL SEASON GR PAST		200 CD/A	120	55	60				
19 COOL SEASON GR PAST		250 CD/A	150	55	70				
						Effective magnesium (EMg)	0		

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.  
---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.7 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID I GRISHAM		Sample no 1	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Serial no. S81254-1	Lab no. D1306313
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.4	*****					
Phosphorus (P)	11 lbs/A	*****					
Potassium (K)	248 lbs/A	*****					
Calcium (Ca)	1600 lbs/A	*****					
Magnesium (Mg)	254 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 2.6 %	Neutralizable acidity 2.0 meq/100g	Cation Exch. Capacity 7.4 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A			
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches	
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS	
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	45	20			Effective Neutralizing Material (ENM) 365
19 COOL SEASON GR PAST	150 CD/A	90	50	20			
19 COOL SEASON GR PAST	200 CD/A	120	50	20			Effective magnesium (EMg) 0
19 COOL SEASON GR PAST	250 CD/A	150	55	20			

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.9 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

---To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID J GRISHAM		Sample no 2	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81254-2	Lab no. D1306314
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.4	*****					
Phosphorus (P)	12 lbs/A	*****					
Potassium (K)	438 lbs/A	*****					
Calcium (Ca)	1230 lbs/A	*****					
Magnesium (Mg)	201 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 2.1 %	Neutralizable acidity 1.5 meq/100g	Cation Exch. Capacity 6.0 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm	Sodium (Na) lbs/A				
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches	
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS	
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	45	0			Effective Neutralizing Material (ENM) 275
19 COOL SEASON GR PAST	150 CD/A	90	45	0			
19 COOL SEASON GR PAST	200 CD/A	120	50	0			Effective magnesium (EMg) 0
19 COOL SEASON GR PAST	250 CD/A	150	50	0			

**Comments**

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.9 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID I NEWKIRK		Sample no 1	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

Serial no. S81256-1	Lab no. D1306315
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.8	*****					
Phosphorus (P)	89 lbs/A	*****					
Potassium (K)	24 lbs/A	****					
Calcium (Ca)	1840 lbs/A	*****					
Magnesium (Mg)	344 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 2.6 %	Neutralizable acidity 1.5 meq/100g	Cation Exch. Capacity 7.6 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A			
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth Top		Inches		Subsoil Inches	
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	0	105			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	0	110			0
19 COOL SEASON GR PAST	200 CD/A	120	0	120			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	0	130			0

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.3 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

---If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID J NEWKIRK		Sample no 2	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

Serial no. S81256-2	Lab no. D1306316
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	6.0	*****					
Phosphorus (P)	17 lbs/A	*****					
Potassium (K)	152 lbs/A	*****					
Calcium (Ca)	2700 lbs/A	*****					
Magnesium (Mg)	318 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 4.3 %	Neutralizable acidity 1.0 meq/100g	Cation Exch. Capacity 9.3 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A			
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches	
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS	
Cropping options		Yield goal	Pounds per acre				
19 COOL SEASON GR PAST		100 CD/A	N 60	P <sub>2</sub> O <sub>5</sub> 35	K <sub>2</sub> O 35	Zn	S
19 COOL SEASON GR PAST		150 CD/A	90	40	45		
19 COOL SEASON GR PAST		200 CD/A	120	40	55		
19 COOL SEASON GR PAST		250 CD/A	150	45	60		
						Effective Neutralizing Material (ENM)	0
						Effective magnesium (EMg)	0

Comments

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.5 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.

Regional Agronomy Specialist Tim Schnakenberg

Phone 417-357-6812

White-Farmer, Yellow-FSA, Blue-Firm, Pink-Extension

MP 189 Revised 1/96

Signature

University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating  
Equal opportunity institutions

Portageville

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID K NEWKIRK		Sample no 3	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

Serial no. S81256-3	Lab no. D1306317
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:

MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION			RATING						
			Very Low	Low	Medium	High	Very High	Excess	
pH <sub>s</sub> (salt pH)	5.5		*****						
Phosphorus (P)	45 lbs/A		*****						
Potassium (K)	265 lbs/A		*****						
Calcium (Ca)	1390 lbs/A		*****						
Magnesium (Mg)	257 lbs/A		*****						
Sulfur (SO <sub>4</sub> -S)	ppm								
Zinc (Zn)	ppm								
Manganese (Mn)	ppm								
Iron (Fe)	ppm								
Copper (Cu)	ppm								
Organic matter 3.1 %	Neutralizable acidity 3.0 meq/100g	Cation Exch. Capacity 7.9 meq/100g							
PH in water	Electrical Conductivity	Mmho/cm	Sodium (Na)				lbs/A		
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches		Subsoil	Inches		
NUTRIENT REQUIREMENTS							LIMESTONE SUGGESTIONS		
Cropping options		Yield goal	Pounds per acre						
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S		
19 COOL SEASON GR PAST		100 CD/A	60	20	20			Effective Neutralizing Material (ENM)	485
19 COOL SEASON GR PAST		150 CD/A	90	20	20			Effective magnesium (EMg)	0
19 COOL SEASON GR PAST		200 CD/A	120	20	20				
19 COOL SEASON GR PAST		250 CD/A	150	20	20				

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.0 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID L NEWKIRK		Sample no 4	
Acres 40	Last Limed unknown	Irrigated No	
Last crop		FSA Copy N	

Serial no. S81256-4	Lab no. D1306318
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.0	*****					
Phosphorus (P)	72 lbs/A	*****					
Potassium (K)	340 lbs/A	*****					
Calcium (Ca)	1430 lbs/A	*****					
Magnesium (Mg)	340 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter 2.7 %	Neutralizable acidity 5.0 meq/100g	Cation Exch. Capacity 10.4 meq/100g					
PH in water	Electrical Conductivity	Mmho/cm		Sodium (Na) lbs/A			
Nitrate (NO <sub>3</sub> -N) Topsoil ppm	Subsoil ppm	Sampling Depth	Top	Inches	Subsoil	Inches	
NUTRIENT REQUIREMENTS						LIMESTONE SUGGESTIONS	
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	0	0			Effective Neutralizing Material (ENM) 1210
19 COOL SEASON GR PAST	150 CD/A	90	0	0			
19 COOL SEASON GR PAST	200 CD/A	120	0	0			Effective magnesium (EMg) 0
19 COOL SEASON GR PAST	250 CD/A	150	0	0			

Comments

- For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.
- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.5 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- If no P2O5 or no K2O is recommended retest annually to determine when maintenance fertilizer should be applied.
- To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

<http://www.soiltest.psu.missouri.edu/>

FIELD INFORMATION			
Field ID M NEWKIRK		Sample no 5	
Acres 40	Last Limed unknown	Irrigated	No
Last crop			FSA Copy N

This report is for:  
MELISSA BETTES  
153 MARTHA STREET  
OZARK MO 65721

Serial no. S81256-5	Lab no. D1306319
County Christian	Region 6
Submitted 8/30/2013	Processed 9/6/2013

Soil sample submitted by: Firm Number: 80 Outlet: 800  
DELTA SOIL TEST LAB  
P O BOX 160  
147 STATE HWY T  
PORTAGEVILLE, MO 63873

SOIL TEST INFORMATION		RATING					
		Very Low	Low	Medium	High	Very High	Excess
pH <sub>s</sub> (salt pH)	5.3	*****					
Phosphorus (P)	17 lbs/A	*****					
Potassium (K)	301 lbs/A	*****					
Calcium (Ca)	1760 lbs/A	*****					
Magnesium (Mg)	282 lbs/A	*****					
Sulfur (SO <sub>4</sub> -S)	ppm						
Zinc (Zn)	ppm						
Manganese (Mn)	ppm						
Iron (Fe)	ppm						
Copper (Cu)	ppm						
Organic matter	4.6 %	Neutralizable acidity	4.0 meq/100g	Cation Exch. Capacity	10.0 meq/100g		
PH in water		Electrical Conductivity	Mmho/cm	Sodium (Na)	lbs/A		
Nitrate (NO <sub>3</sub> -N) Topsoil	ppm	Subsoil	ppm	Sampling Depth	Top	Inches	Subsoil
<b>NUTRIENT REQUIREMENTS</b>							<b>LIMESTONE SUGGESTIONS</b>
Cropping options	Yield goal	Pounds per acre					
		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Zn	S	
19 COOL SEASON GR PAST	100 CD/A	60	35	20			Effective Neutralizing Material (ENM)
19 COOL SEASON GR PAST	150 CD/A	90	40	20			800
19 COOL SEASON GR PAST	200 CD/A	120	40	20			Effective magnesium (EMg)
19 COOL SEASON GR PAST	250 CD/A	150	45	20			0

**Comments**

---For cool season grass pasture and bluegrass pasture split nitrogen applications between late Spring after first grazing and mid August, applying 60% before the season of greatest need.  
---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 5.8 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.  
---To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

## Soil Test Data

# Grisham Farm Products 2013

Pit #	Sample #	Lat	Long	Location	Description	Depth to Bedrock
1	Newkirk	37.13895	92.36371	Newkirk	15 - 18% Upland Backslope	27"
2	B-Newkirk	37.13786	92.36893	Newkirk	0 -3% Summit	> 48"
Tree Area	C-Newkirk	37.13299	92.2693	Newkirk	0 - 3 % Ridgetop	> 36"
3	D-Newkirk	37.13334	92.37459	Newkirk	4 - 7 % Toeslope	>48"
4	E-Newkirk	37.13382	92.3733	Newkirk	0 - 3 % Bottom Land	>60"
5	F-Newkirk	37.14282	92.14282	Newkirk	4 - 6 % Uplank Backslope	> 48"
6	G-Newkirk	37.14739	92.3757	Newkirk	22 - 28 % Upland Backslope	>48"
7	I-Newkirk	37.14667	92.38263	Newkirk	4 - 6 % Toeslope	>55"
Sample	H-Newkirk	37.15301	92.38051	Newkirk		
8	J-Newkirk	37.4588	92.38279	Newkirk	6 - 8 % Upland Backslope	> 48"
9	K-Newkirk	37.1473	92.40156	Newkirk	0 - 4 % Ridgetop	> 48"
10	L-Newkirk	37.14692	92.39793	Newkirk	0 - 2 % Bottomland	>48"
Sample	M-Newkirk	37.14403	92.38743	Newkirk		
1	Grisham	37.20753	92.52881	Mt. Grove	4% Upland Backslope	>64"
Lagoon 2		37.20845	92.5289	Mt. Grove	4 to 6 %	
3	B-Grisham	37.21523	92.51864	Mt. Grove	2 to 4 % Ridgetop	>70"
4	C-Grisham	37.216	92.5209	Mt. Grove	0 to 2 % Summit	> 65"
5	D-Grisham	37.2145	92.51704	Mt. Grove	4 to 6 % Toeslope	>60"
6	E-Grisham	37.21305	92.51471	Mt. Grove	2 to 4 % Terrace	>65"
7	H-Grisham	37.19953	92.51995	Mt. Grove	6 to 8 % Upland Backslope	> 60"
Sample	F-Grisham	37.20732	92.52069	Mt. Grove		
8	I-Grisham	37.19786	92.52125	Mt. Grove	16 to 18 % Upland Backslope	> 48"
Sample	G-Grisham	37.20732	92.52072	Mt. Grove		
9	J-Grisham	37.21238	92.52751	Mt. Grove	12 to 15 % Upland Backslope	> 48"

\*\*\* Limestone is not currently recommended. For a future limestone application, suggest using dolomitic limestone if readily available, but yield response to magnesium is not likely.

Pit #	Sample #	Permeability Application Rate (gpd/sq. ft.)	4b Clay	Soil Test (P/K) lbs/A - Rating	N--250 CD/A lbs/A	P205--250 CD/A lbs/A
1	Newkirk	.5 to 12" > .25 to 23	Yes 27"	29 M/258 H	150	25
2	B-Newkirk	.5 to 10" > .2 to 48"	No	83 VH/833 E	150	0
Tree Area	C-Newkirk	.4 to 14"	Yes 28"	8 VL/112 M	150	60
3	D-Newkirk	> .3 to 29	Yes 35"	33 H/172 H	150	20
4	E-Newkirk	> .3 to 60"	No	113 E/753 E	150	0
5	F-Newkirk	> .2 op 48"	No	206 E/65 L	150	0
6	G-Newkirk	> .2 to 50"	No	314 E/514 VH	150	0
7	I-Newkirk	> .3 to 55"	No	89 VH/24 VL	150	0
Sample	H-Newkirk			18 L/85 L	150	40
8	J-Newkirk	> .25 to 48"	No	17 L/152 M	150	45
9	K-Newkirk	> .2 to 48"	No	45 H/265 H	150	20
10	L-Newkirk	> .2 to 48"	No	72 VH/340 VH	150	0
Sample	M-Newkirk			17 L/301 VH	150	45
1	Grisham	> .25 to 64"	No	9 VL/36 VL	150	60
Lagoon 2						
3	B-Grisham	> .2 to 70"	No	14 L/197 H	150	50
4	C-Grisham	> .2 to 65"	No	11 VL/268 H	150	55
5	D-Grisham	> .2 to 60"	No	23 M/614 E	150	35
6	E-Grisham	> .35 to 65"	No	10 VL/143 M	150	55
7	H-Grisham	> .2 to 60"	No	10 VL/127 M	150	55
Sample	F-Grisham			10 VL/146 M	150	55
8	I-Grisham	> .25 to 48"	No	11 VL/248 H	150	55
Sample	G-Grisham			24 M/88 L	150	30
9	J-Grisham	> .25 to 48"	No	12 L/438 VH	150	50

VL - Very Low Rating      M - Medium Rating      VH - Very High Rating

L - Low Rating

H - High Rating

E - Excess

Pit #	Sample #	K2O--250 CD/A lbs/A	Lime--ENM tons/acre	Lime--Emg tons/acre	Salt pH Rating	Ca--lbs/A Rating
	1 Newkirk	20	0	0	5.8 M	1920 H
	2 B-Newkirk	0	0	0	6.5 H	2500 H
Tree Area	C-Newkirk	75	1085	***	4.7 L	660 M
	3 D-Newkirk	55	545	0	5.4 M	1480 H
	4 E-Newkirk	0	0	0	7.4 VH	6780 VH
	5 F-Newkirk	105	0	0	7.0 VH	2900 H
	6 G-Newkirk	0	0	0	6.7 H	5820 H
	7 I-Newkirk	130	0	0	5.8 M	1840 H
Sample	H-Newkirk	90	1825	***	4.2 VL	640 M
	8 J-Newkirk	60	0	0	6.0 H	2700 H
	9 K-Newkirk	20	485	0	5.5 M	1390 H
	10 L-Newkirk	0	1210	0	5.0 L	1430 M
Sample	M-Newkirk	20	800	0	5.3 M	1760 H
	1 Grisham	120	0	***	5.6 M	1810 H
Lagoon 2						
	3 B-Grisham	40	605	0	5.0 L	950 M
	4 C-Grisham	20	0	***	5.9 M	3060 H
	5 D-Grisham	0	455	0	5.4 M	1190 H
	6 E-Grisham	65	0	0	6.4 H	2960 H
	7 H-Grisham	70	0	0	6.2 H	2060 H
Sample	F-Grisham	70	0	0	6.0 H	3140 H
	8 I-Grisham	20	365	0	5.4 M	1600 H
Sample	G-Grisham	85	0	0	5.7 M	1650 H
	9 J-Grisham	0	275	0	5.4 M	1230 H

VL - Very Low Rating      M - Medium Rating      VH - Very High Rating  
 L - Low Rating              H - High Rating              E - Excess

Pit #	Sample #	Mg--lbs/A Rating	Organic Matter %	Loading rate based on OM %	Neutralizable Acidity meq/100g	CEC meq/100g
	1 Newkirk	417 H	3.2	0.4	1.5	8.4
	2 B-Newkirk	647 H	5.4	0.5	0.0	10.0
Tree Area	C-Newkirk	118 L	2.4	0.3	4.0	6.3
	3 D-Newkirk	328 H	4.0	0.5	3.0	8.3
	4 E-Newkirk	758 H	4.5	0.5	0.0	21.1
	5 F-Newkirk	639 H	3.7	0.4	0.0	10.0
	6 G-Newkirk	1319 H	14.5	0.8	0.0	20.7
	7 I-Newkirk	344 H	2.6	0.3	1.5	7.6
Sample	H-Newkirk	141 L	3.8	0.4	6.0	8.3
	8 J-Newkirk	318 H	4.3	0.5	1.0	9.3
	9 K-Newkirk	257 M	3.1	0.4	3.0	7.9
	10 L-Newkirk	340 M	2.7	0.3	5.0	10.4
Sample	M-Newkirk	282 M	4.6	0.5	4.0	10.0
	1 Grisham	122 L	1.6	0.3	2.0	7.1
Lagoon 2						
	3 B-Grisham	161 M	3.0	0.4	2.5	5.8
	4 C-Grisham	204 L	4.6	0.5	1.5	10.3
	5 D-Grisham	255 H	3.2	0.4	2.5	7.3
	6 E-Grisham	709 H	3.5	0.4	0.0	10.5
	7 H-Grisham	420 H	3.0	0.4	0.5	7.6
Sample	F-Grisham	714 H	3.1	0.4	1.0	12.0
	8 I-Grisham	254 M	2.6	0.3	2.0	7.4
Sample	G-Grisham	326 H	2.8	0.4	1.5	7.1
	9 J-Grisham	201 M	2.1	0.3	1.5	6.0

VL - Very Low Rating      M - Medium Rating      VH - Very High Rating

L - Low Rating

H - High Rating

E - Excess

## **Loading Rate Data**

MB Soil Consulting  
 Melissa Bettes  
 153 Martha Street, Ozark, MO 65721  
 417 434-2287

**Reference Page to Maps**

October 23, 2013  
 Grisham Farm Products  
 7364 Newkirk Rd, Mountain Grove, MO 65711  
 Phone: 417 746-4834, Fax: 417 746-4486  
 gfpinc@fidmail.com  
 Wright County

**Map Grisham Property-Newkirk**

Measuring Units Pounds Per Acre unless indicated									
Map Unit	Soil Sample Name(s)	Permeability Loading Rate	Total Soil Sample Suitable Area (Acres)	Total Liquid Capacity	N / P <sub>2</sub> O <sub>5</sub> / K <sub>2</sub> O Average	Lime ENM Average	Ca / Mg Average		
Sample	Newkirk	17,424 gpd per acre at .4	212.7	3,706,084.8 gpd	150/60/75	1085	660/118		
1 and 2	B and C	21,780 gpd per acre at .5	156.68	3,412,490.4 gpd	150/12.5/10	0	2210/532		
3 and 4	D and E	17,424 gpd per acre at .4	66	1,149,984 gpd	150/10/27.5	272.5	4130/543		
6 and 7	F, G and I	17,424 gpd per acre at .4	76.38	1330845.1 gpd	150/0/78.3	0	3520/767.3		
9	H, J and K	19,602 gpd per acre at .45	7	137,214 gpd	150/35/57	770	1577/239		
10	L and M	17,424 gpd per acre at .4	72.9	1,270,209.6 gpd	150/22.5/10	1005	1595/299		

MB Soil Consulting  
 Melissa Bettes  
 153 Martha Street, Ozark, MO 65721  
 417 434-2287

**Reference Page to Maps**

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 Grisham Farm Products  
 7364 Newkirk Rd, Mountain Grove, MO 65711  
 Phone: 417 746-4834, Fax: 417 746-4486  
 gfpinc@fidmail.com  
 Wright County

**Map Williams Property - Grisham Property**

Measuring Units Pounds Per Acre unless indicated

Map Unit	Soil Sample Name(s)	Permeability Loading Rate	Total Soil Sample Suitable Area (Acres)	Total Liquid Capacity	N / P <sub>2</sub> O <sub>5</sub> / K <sub>2</sub> O Average	Lime ENM Average	Ca / Mg Average
1 and Lagoon 2	Grisham	13,068 gpd per acre at .3	70.31	918,811.08	150/60/120	0	1810/122
Sample	F and G	17,424 gpd per acre at .4	34.44	600,082.56 gpd	150/43/78	0	2395/520
3, 4, 5 and 9	B, C, D and J	17,424 gpd per acre at .4	232.44	4,050,034.5 gpd	150/48/15	334	1608/205
6	E	16,335 gpd per acre at 3.75	35.87	585,936.45	150/55/65	0	2960/709
7 and 8	H and I	16,335 gpd per acre at 3.75	111.91	1,828,049.80	150/55/45	183	1830/337

# O&M Manual

Grisham Farms / 3G Processing Land Application System  
Operation and Maintenance Manual

## System Description and General

The Grisham Farms / 3G Processing land application system consists of the following major components.

1. There are two primary and one minor waste streams. The waste stream at 3G processing is condensate water resulting from steam heating the feedstock to facilitate separation of oil from food solids. The waste stream at Grisham Farms is wastewater generated from washing out totes that are used to ship in the waste food products. The minor waste stream is process wastewater resulting from recovering oil from out of spec food products at the Thomas and Sons facility.
2. Bulk storage and pH adjustment tanks. Condensate water collected at the 3G Processing Facility in Mountain Grove is collected and pH adjusted to within the range of 6 to 9 in two fiberglass tanks that are 8,000 gallon capacity each. pH adjustment is accomplished by the addition of liquid sodium hydroxide or lime slurry.
3. Transport Trucks. pH adjusted condensate water is transported from the 3G Processing Facility to the land application system wastewater storage system using two dedicated 6,000 gallon tank trucks.
4. Storage Facility 1. Tote washing water and wastewater hauled in from Thomas and Sons Facility is stored in a 300,000 gallon earthen basin. A floating oil recovery device is utilized at this location.
5. Application Vehicles. Two 3,000 gallon all terrain land application vehicles (terrigators) are used to land apply liquid waste and manure.
6. Loading pumps. A pit hog manure handling pump is used to load terrigators at Storage Facility 1.
7. Application sites. There are eight separate land application areas totaling 2,457 acres, with 866 acres available for land application (not affected by various setback requirements for losing streams, sinkholes, surface streams, property lines, residences etc.).

## Operating Goals

The overall goal to keep in mind regarding the operation of the various aspects of the system is to avoid adverse environmental impacts. In general that means storage tanks are consistently monitored and kept from overflowing and wastewater and manure are not land applied in setback and buffer areas. You will be able to accomplish that by following the guidance presented in this manual.

In today's regulated world, it is not sufficient to do the job without documenting the work. So another primary goal to bear in mind is to keep accurate and up to date records. All necessary record keeping forms are included in this manual.

### 3 G Bulk Storage and pH adjustment tanks

Two 10,000 gallon fiberglass tanks are provided to receive, treat and store condensate wastewater at the 3G processing facility. The tanks are equipped with aeration for mixing. Liquid sodium hydroxide is fed via chemical metering pump to adjust pH. The flow rate to the tanks varies based on the processing rate and feedstock. pH of wastewater also varies based on the same considerations.

Because of the variability in the wastewater flow rate and pH, it is advisable to operate the tanks independently and adjust pH to within the range of 6 to 9 on a batch basis.

Measure pH of the wastewater with a properly calibrated pH meter. Calibrate the meter with pH 4 buffer and pH 10 buffer once each operating day. Operate the mixing device in the tank continuously during the neutralization process. Feed the approximate amount of sodium hydroxide needed, allow fifteen minutes for mixing and sample the contents of the basin. Continue to feed sodium hydroxide in small amounts as needed until neutralization is completed. Do not overfeed sodium hydroxide.

Only transport properly treated/pH adjusted wastewater.

Complete the 3G processing pH Control record each day for each batch of wastewater treated and hauled. Keep copies of the records available for DNR inspections. Retain the records for five years.

## Storage Facility Number 1

Storage facility 1 is an earthen lagoon equipped with an oil recovery device. Check and record the operating depth of the lagoon daily. Check the operation of the oil recovery device daily and remove collected oil as needed.

Do not allow the lagoon to overflow. In case of any discharge from the lagoon, inform the Missouri Department of Natural Resources at 417 891 4300 as soon as possible.

In case of lagoon level nearing the point of overflow and inclement weather prevents land application, haul wastewater to the City of Springfield. Required forms and contact information is included separately in this manual.

## Land Application Equipment

Land application equipment consists of two 3,000 Gallon Terragators. Perform manufacturer recommended maintenance as required.

## Land Application Operations

Based on soil sampling and evaluation results, the most restricted site is Site 1 at 13,068 GPD/Acre, or 0.307 GPD/ sq. ft. Terragator applies 3,000 Gallons on an approximately 30' x 1000' area for an application rate of 0.1 gallons / sq. ft. Do not exceed three passes per day on the same application area.

Do not apply on saturated soils or in frozen conditions that will result in runoff of applied liquid.

Review land application site maps and only land apply in areas that are suitable. Respect setbacks shown on site maps.

Record amounts hauled and zones applied on the included forms.

There is a total of 866 acres that has been identified as suitable for land application of wastewater. Assuming 50 % of the available area is utilized each year, and the average daily flow of 17,500 GPD is land applied, the annual application rate in inches is 0.24.

# **pH Record Form**

### 3G Processing pH control

Month \_\_\_\_\_ Year \_\_\_\_\_

Date	pH 4 buffer reading	pH 10 buffer reading	Tank 1 pH	Tank 2 pH	Tank 1 pH	Tank 2 pH
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
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24						
25						
26						
27						
28						
29						
30						
31						

Instrument type: \_\_\_\_\_

Any repairs or replacements to pH measuring device? \_\_\_\_\_

Operator Signature \_\_\_\_\_

# Land Application Record Form

### 3G Processing LLC Waste Land Application Program

Month \_\_\_\_\_ Year \_\_\_\_\_

Date	Precipitation	Field #	Gallons Spread	Field #	Gallons Spread
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

Lagoon Level: \_\_\_\_\_ Dates of any discharges \_\_\_\_\_

Crops harvested during month: Type, field # and amount \_\_\_\_\_

Operator Signature \_\_\_\_\_

# Hauled Waste Permit



*Protecting Water For Future Generations*

March 5, 2012

Mr. Rick Helms  
White River Environmental Service LLC  
536 Roark Branch Drive  
Branson West, MO 65737

**RE: HAULED WASTEWATER PERMIT #107  
GRISHAM FARM TRANSPORTATION LLC**

Dear Mr. Helms:

Please find the enclosed City of Springfield hauled wastewater permit #107 issued to Grisham Farm Transportation LLC. The original copy is to be kept in the Grisham Farm Transport LLC office for reference, and one copy is to be kept in each of the permitted vehicles at all times for driver reference. This permit has an effective date of March 5, 2012 and shall expire on March 5, 2015.

This permit and future invoicing is based exclusively upon the permit application information you have provided during the permit application process. The City may suspend or revoke this permit at any time if any of the information is found to be incorrect, or if the conditions of this permit are violated. In addition, if any hauled wastewater discharge causes any operation or maintenance problem with the City wastewater collection or treatment system and/or results in violation of any conditions stated within the NPDES permits issued to the City of Springfield, Grisham Farm Transport LLC will be considered responsible for damages.

If you should have any questions concerning your hauled wastewater permit, please contact me at (417) 864-1490 or Wastewater Operations at (417) 864-1923.

Sincerely,

**CITY OF SPRINGFIELD  
ENVIRONMENTAL SERVICES**

A handwritten signature in black ink, appearing to read "John D. Waldman".

**JOHN D WALDMAN  
PRETREATMENT INSPECTOR**

Enclosures

*Department of Environmental Services, Clean Water Services Division - 1216 W. Nichols, Bldg G, Springfield, MO 65802  
Phone (417) 864-1923 - Fax (417) 864-1918 - homepage: [www.springfieldmo.gov](http://www.springfieldmo.gov) - email: [city@springfieldmo.gov](mailto:city@springfieldmo.gov)*

# HAULED WASTEWATER DISCHARGE PERMIT

CITY OF SPRINGFIELD, MISSOURI

**Permit ID Number: 107**

In accordance with all the terms and conditions of the current Chapter 120 of the Springfield City Code, Wastewater Regulations, any special conditions accompanying this Permit, and all applicable Federal, State, or local laws, rules, or regulations, permission is hereby granted to:

NAME OF PERMITTEE: **GRISHAM FARM TRANSPORTATION, LLC**

ADDRESS: **1301 INDUSTRIAL PARK ROAD  
MOUNTAIN GROVE, MISSOURI 65711**

For the disposal of domestic septic tank, holding tank, or other normally acceptable wastewater at the Southwest Wastewater Treatment Plant located at 3301 S. Highway FF Springfield, Missouri.

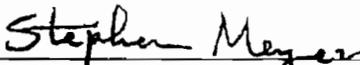
This Permit is based on information provided in the Hauled Wastewater Discharge Permit application which together with the conditions and requirements contained in Attachments A and B constitute the Hauled Wastewater Discharge Permit. A valid City Business License is also required. This Permit is effective for the period set forth below, may be suspended or revoked for Permit condition noncompliance, and is not transferable. This Permit does not authorize the discharge of conditionally acceptable wastewater. Conditionally acceptable wastewater is considered on a case-by-case basis.

**The original Permit shall be kept on file in the Permittee's office. A copy of this Permit shall be carried in every registered vehicle used by the Permittee.**

EFFECTIVE DATE: **MARCH 5, 2012**

EXPIRATION DATE: **MARCH 5, 2015**

Number of permit copies required: 1 OFFICE COPY, 2 TRUCK COPIES

  
\_\_\_\_\_  
CITY OF SPRINGFIELD  
ENVIRONMENTAL SERVICES

# ATTACHMENT A

## HAULED WASTEWATER DISCHARGE PERMIT PROGRAM GUIDANCE AND GENERAL PERMIT CONDITIONS

### VIOLATION OF ANY OF THESE PERMIT CONDITIONS CAN RESULT IN THE SUSPENSION OR REVOCATION OF PERMITTEE DISPOSAL PRIVILEGES

**I. INTRODUCTION:** The City of Springfield has established a program to provide for the environmentally safe, cost effective, and convenient disposal of septic and holding tank wastewaters. Recognizing that the acceptance of hauled wastewaters presents certain risks including plant upsets and sludge contamination, the City has developed these guidelines to minimize those risks and protect its facilities.

- 2. TYPES OF WASTEWATERS ACCEPTED:** In general, any wastewater that is:
- a) Nontoxic to the biological processes and has no adverse impact on any physical and/or chemical treatment processes at the wastewater treatment plant, and
  - b) biodegradable and determined to have no adverse impacts on the wastewater treatment plant operation or discharge effluent or sludge, will be considered for acceptance. Hauled wastewater can be categorized into three categories:

**I.) Normally acceptable wastewater:**

- Residential septic tank wastewater
- Residential holding tanks wastewater
- Commercial holding/septic tanks used for domestic type sanitary wastewater (non-process wastewater)
- Grease trap wastewater from food establishments (accepted at **Southwest Plant only!**)

**II.) Conditionally acceptable wastewater:** Prior approval is required for this type of wastewater and approval is considered on a case-by-case individual basis. The location of the generator or of the discharge site is to be identified on each approval. This type wastewater includes:

- Industrial and commercial process wastewaters
- Municipal sludge if they are from biological processes and meet all State and Federal Guidelines for treatment, handling, and land application
- Petroleum-contaminated water from underground storage tanks and site remediation

- Mud or sand trap wastes from car washes and automotive service bays
- High organic strength liquids such as milk byproducts, food processing residuals, etc.
- Special wastewater such as landfill leachate, condensates, washes waters, and others.

**III.) Restricted Wastewaters: (Not acceptable for discharge to any Springfield POTW)**

- Any wastewater as defined in Section 120-112 and 120-113 of Chapter 120, Wastewater Regulations, including any flammable, explosive, or corrosive wastes and any wastewater or sludge with unacceptable levels of metals.

In all cases, the City reserves the unconditional right to accept or reject any hauled wastewater as it deems necessary to protect its employees, facilities, or treatment processes. Any wastewater employee may unconditionally refuse to accept a load or stop an unloading in progress.

**3. ADMINISTRATIVE PROCEDURES:** All haulers are required to obtain a hauled wastewater discharge permit before discharging wastewater at any City wastewater treatment plant. Permits will be issued to haulers that meet the following conditions:

- Submit a completed permit application with proof of vehicle insurance in amounts required by State law, as well as a copy of valid City of Springfield business license.
- For permit renewals, haulers must have a record of satisfactory compliance with all conditions and requirements of the expiring hauled wastewater discharge permit.
- Haulers must understand and agree that no discharge of hauled wastewater may be introduced into the sanitary sewer collection system via manholes, cleanouts, building sewers, or any appurtenance tributary to the City wastewater collection and treatment system, unless approved by the Director of Environmental Services or his representative in accordance with Section 120-75 of the Springfield City Code.

Permits will be issued for a period of three years. Haulers who have satisfactorily operated within all the conditions of their hauled wastewater discharge permit shall submit an application for permit renewal ninety (90) days before the expiration date of their current permit.

**4. MANIFESTS:** Haulers must complete and provide to the City a hauled wastewater discharge manifest for each source of wastewater on a truck load including:

- Section 1: Wastewater stream identification - Indicating volume (gallons), type(s), and source(s) of hauled wastewater.
- Section 2: Generator of wastewater - Indicating company name, complete address, and telephone number for all pumping activities. Any wastewater that does not originate from a single family residence must also include the generator's signature.

- Section 3: Hauler of Wastewater - Indicating company name, hauled wastewater discharge permit number, vehicle license number, vehicle tank capacity, pump out date and time, and signature.
- Section 4: Acceptance by City - **A City representative must sign the Hauled Wastewater Manifest for any conditionally acceptable loads.** The white (top) copy of all manifests shall be submitted to the treatment plant at time of unloading. The pink copy shall be returned to the generator of the wastewater.

5. **FEES:** The following fees are utilized in the hauled wastewater acceptance program. The actual fee shall be in accordance with and as authorized by Section 120-76 of the Springfield City Code.

- Hauled Wastewater Discharge Fee
- High Strength Charges
- Laboratory Analysis

The hauled wastewater discharge fee is a rate per 1,000 gallons of hauled wastewater. Charges for disposal will be based on this rate, multiplied by the usable capacity of a vehicle. Regardless of the volume of hauled wastewater accepted, charges will be based on full tank load capacity only. Partial loads will be considered as full loads. A hauled wastewater discharge manifest shall be completed for each source of hauled wastewater. Collection of fees will be by monthly invoicing to the hauler and are due within thirty (30) days. Fees for the laboratory analysis or high strength of any wastewater, if necessary, will be made in accordance with Chapter 120 and included in the monthly invoicing to the hauler.

6. **COMPLIANCE:** A hauled wastewater discharge permit and the associated disposal privileges may be suspended or revoked immediately for any violation of the permit conditions and/or failure to submit invoice payment to the City in a timely manner.

## **ATTACHMENT B**

### **HAULED WASTEWATER DISCHARGE PERMIT SPECIFIC PERMIT CONDITIONS**

#### **VIOLATION OF ANY OF THESE PERMIT CONDITIONS CAN RESULT IN THE SUSPENSION OR REVOCATION OF PERMITTEE DISPOSAL PRIVILEGES**

1. Hauled wastewater will normally be accepted from 7:30 a.m. until 5:00 p.m., 7 days per week. Conditionally acceptable wastewater requires proper written documentation granting approval for acceptance by the City which may restrict time, place, and conditions for acceptance. **An authorized City representative shall be contacted at the Southwest Treatment Plant before the unloading of any conditionally acceptable wastewater and may commence after reviewing all written information accompanying the load.**
2. The City wastewater acceptance structure at the treatment plants will normally allow unloading directly from the outlet device on the haulers vehicle. Any additional hose(s) or special equipment will be the responsibility of the Permittee.
3. Care shall be taken when connecting, disconnecting, or unloading to prevent the spillage of any materials around the hauled wastewater acceptance structure. It is the responsibility of the Permittee and their employees to leave the hauled wastewater structure in satisfactory condition. If necessary, the Permittee, or their employees, shall wash down the area before departing the site, including the cleaning of any City water hose or other equipment used during cleanup.
4. The original hauled wastewater discharge permit shall be kept in the office of the Permittee. Each registered hauling vehicle shall carry a copy of the permit at all times. A City representative may request to see a copy of the permit at any time, which shall be provided.
5. All permittees shall use and complete a City hauled wastewater discharge manifest for each individual generator of hauled wastewater. All loads will require a fully completed hauled wastewater discharge manifest fully identifying:
  - Section 1: Wastewater Stream Identification - Information indicating volume (gallons), type, and source of hauled wastewater.
  - Section 2: Generator of Wastewater - Information indicating name, complete address, and telephone number for all pump outs. Any wastewater that does not originate from a single-family residence must also include the generator's signature.
  - Section 3: Hauler of Wastewater - Indicating company name, hauled wastewater permit number, vehicle license number, vehicle tank capacity, pump out date and time, and driver identification and/or signature.

- Section 4: Acceptance by the City - A City authorized representative must sign the hauled wastewater discharge manifest for any conditionally acceptable load. The white (top) copy of the hauled wastewater discharge manifest is to be retained by the City treatment plant.

6. A City representative may request additional information concerning the origin and nature of the contents of any registered vehicle. In addition, the Permittee shall allow the City to immediately obtain a sample of the wastewater from any vehicle. The permittee shall comply with all information requests concerning the load. This may include, but is not limited to, the following information: pickup points, volumes, and wastewater characteristics.

7. This permit shall be valid only when all other Federal, State, or local permits required by the Permittee for transporting wastewater are valid and current. In addition, permittee vehicle insurance in amounts as required by State law shall be kept current. Expired vehicle insurance coverage may result in the suspension of disposal privileges. A valid City business license is also required.

8. The permittee shall immediately report in writing to the City any changes in business name, ownership, address/telephone number, and registered vehicles. Changes to vehicles include but are not limited to: the modification of previously registered vehicles, the addition of vehicles, or the deletion of vehicles.

9. In the case of multiple pump outs included as one vehicle load, if any part of the load that is prohibited or restricted, it shall cause the entire load to be unacceptable for discharge.

10. The City reserves the unconditional right to refuse acceptance of any load or stop an unloading operation in progress at any time. Any City employee may unconditionally refuse to accept a load or stop an unloading in progress.

11. All vehicles used by the permittee to haul wastewater shall be registered with the City. Any vehicle additions, deletions, or modifications shall immediately be reported in writing to the City. The written notification shall include vehicle license number, make, and model of vehicle, tank capacity and the nature of the modifications. **The use of a registered hauled wastewater vehicle for the transportation or storage of hazardous materials, liquid petroleum fuels, waste oil, petroleum derivative wastes, or corrosives is specifically prohibited.**

12. The discharge of any materials defined as restricted wastewaters in Chapter 120 of the Springfield City Code is specifically prohibited. These wastes include but are not limited to; flammables, explosives, corrosives, or wastes with unacceptable elevated levels of metals. Any violation on the part of the Permittee or their representatives with the conditions of this permit, or any portion of Chapter 120, shall be cause for immediate suspension or revocation of the hauled wastewater permit and associated discharge privileges. In addition, such violations shall be cause for legal prosecution by the City under prevailing law.

13. The disposal fee will be based on the current rate multiplied by the registered usable capacity of a vehicle. Charges will be based on vehicle full load capacity only. A hauled wastewater discharge manifest will be required for each source of wastewater. Partial loads will be considered as full loads. Fees for laboratory analysis or high strength wastes, if applicable, will be made in accordance with Chapter 120 of the Springfield City Code. Haulers will be invoiced monthly for disposal fees and any laboratory fees or high strength charges. **Payment of monthly hauled wastewater invoices is due to the City within thirty (30) days.**

14. Portable toilet wastewaters are considered as a conditionally acceptable hauled wastewater. Under no circumstances will these wastewaters be accepted if they contain any chemical deodorizers that cause upset, interference, or pass through of the treatment processes or facilities. Current Material Safety Data Sheets for all deodorizers used by the Permittee must be kept on file with the City.

CITY OF SPRINGFIELD, MO.  
PUBLIC WORKS DEPT.  
DIVISION OF SANITARY SERVICES  
1216 WEST NICHOLS STREET  
SPRINGFIELD, MO. 65802-4170

MANIFEST NUMBER

123900

DATE / TIME OF DISCHARGE

\_\_\_\_/\_\_\_\_/\_\_\_\_  
\_\_\_\_:\_\_\_\_ AM  PM

### HAULED WASTEWATER DISCHARGE MANIFEST

1. WASTEWATER STREAM IDENTIFICATION (Sections 1A, 1B, 1C, & 1D must be completed by generator or hauler)

A. Volume: 6000 gallons

B. Normally Acceptable: Holding Tank  Septic Tank  Grease Trap  Other  Describe other \_\_\_\_\_

\*\*\*Note: Conditionally acceptable wastewater requires a completed application form and approval letter to be attached\*\*\*

C. Conditionally Acceptable: Industrial/Commercial process  Municipal Sludge  Petroleum Contaminated  Mud/Sand trap   
High Strength Organic Liquid  Landfill Leachate  Special Wastewater Other  Describe other \_\_\_\_\_

D. Source: Home/Apt.  Office/Commercial  Restaurant  Portable Toilet  Industrial  Other

Description of Other and special handling instructions, if any: \_\_\_\_\_

2. GENERATOR OF WASTEWATER (Sections 2A, 2B, & 2C must be completed by generator or hauler)

A. Complete Name (print or type): 3G PROCESSING, LLC B: Phone No. 417-926-5444

C. Complete Pickup Address: 1301 INDUSTRIAL PARK ROAD, MTN. GROVE, MO

ALL WASTEWATERS ARE SUBJECT TO THE RULES AND REGULATIONS AND TERMS AND CONDITIONS OF THE CITY OF SPRINGFIELD, MO. GENERATOR SIGNATURE REQUIRED FOR ALL NON-DOMESTIC LOADS  
The undersigned being duly authorized does hereby certify to the accuracy of the source and type of hauled wastewater identified above and subject to this manifest.

Date: \_\_\_\_\_ D. Signature: JOE ADOLF Title or position: PLANT MANAGER

3. HAULER OF WASTEWATER (Sections 3A, 3B, 3C, 3D, & 3E must be completed by hauler)

A. Company Name (print or type): GRISHAM FARM TRANSPORTATION, LLC

B. HW Permit Number: 107 C. Vehicle License Number: \_\_\_\_\_ Truck Capacity: 6000 ?

D. Pumpout Date: Day Pumpout Time: Time

The above described wastewater was picked up and hauled by me to the City of Springfield disposal facility and was discharged. I certify that the information listed on this manifest is true, accurate, and complete to the best of my knowledge. I am aware of the conditions and requirements of my hauled waste discharge permit and understand that failure to comply with those conditions and requirements may result in the immediate suspension or revocation of my permit and its disposal privileges as well as the enforcement of possible penalties as may be allowed by law. I agree to pay all applicable charges imposed by the City.

E. Driver Name (print or type): \_\_\_\_\_ F. Driver Signature: \_\_\_\_\_

4. ACCEPTANCE BY THE CITY OF SPRINGFIELD, MO. (must be completed by authorized City employee)

\*\*\*Note: Conditionally acceptable wastewater requires a completed application form and approval letter to be attached\*\*\*

The above hauler delivered the described wastewater to this disposal facility and it was conditionally accepted.

Discharge Date: \_\_\_\_\_ Sample I.D. Number: \_\_\_\_\_ (if required)

Signature of City employee and title if waste accepted: \_\_\_\_\_

NOT ACCEPTED, EXPLAIN: \_\_\_\_\_ Name: \_\_\_\_\_

Northwest Plant

Southwest Plant

White Sheet : City

Yellow Sheet : Hauler

Pink Sheet : Generator