

**STATE OF MISSOURI**  
**DEPARTMENT OF NATURAL RESOURCES**

MISSOURI CLEAN WATER COMMISSION



**CONSTRUCTION PERMIT**

The Missouri Department of Natural Resources hereby issues a permit to:

Missouri American Water Company Meramec Sewer WWTP 1022 Winter Lake Dr. Fenton, MO 63026
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for the construction of (described facilities):

See attached.
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Permit Conditions:

See attached.
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Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

November 8, 2016  
Effective Date

  
\_\_\_\_\_  
Harry D. Bozoian, Director, Department of Natural Resources

November 7, 2018  
Expiration Date

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

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

The installation of ultraviolet disinfection is for compliance with the *E. Coli* bacteria effluent limit in the operating permit, MO-0091162. The facility has chlorine disinfection and is converting to UV disinfection, as the renewal permit contained a total residual chlorine effluent limit. A Trojan unit, model UV3000 PTP Model 3600 is being installed. The UV disinfection system is designed to treat a peak flow rate of 0.73 MGD, which is 3.5 times the design flow of 0.209 MGD. The average flow over the previous five years of discharge monitoring data is 0.157 MGD. The system is designed to treat peak flows at a transmittance of 60%. The unit will contain 2 channels, 6 modules with each module containing 4 lamps for a total of 24 lamps.

With the installation of the UV disinfection system, a sump pump and a new sampler will be installed. Construction will include all necessary piping and appurtenance to make the facilities complete and useable to treat the wastewater.

### **II. COST ANALYSIS FOR COMPLIANCE**

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

The department is not required to complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

### **III. CONSTRUCTION PERMIT CONDITIONS**

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.
2. All construction shall be in accordance with the plans and specifications submitted by Donohue and Associates on October 21, 2016.
3. The department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(8).

4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's St. Louis Regional Office per 10 CSR 20-7.015(9)(E)2.
5. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"
6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."
7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.
  - A. Sewer mains shall be laid at least 10 feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10 foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.
  - B. Manholes should be located at least 10 feet horizontally from any existing or proposed water main.
  - C. Manholes shall be located with the top access at or above grade level.
  - D. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
    - a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
    - b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends 10 feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.

8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at [www.dnr.mo.gov/env/wpp/epermit/help.htm](http://www.dnr.mo.gov/env/wpp/epermit/help.htm). See [www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm](http://www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm) for more information.
9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the department's Water Protection Program at 573-751-1300 for more information. See [www.dnr.mo.gov/env/wpp/401/](http://www.dnr.mo.gov/env/wpp/401/) for more information.
10. Upon completion of construction;
  - A. Missouri American Water Company will become the continuing authority for operation, maintenance, and modernization of these facilities;
  - B. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D);
  - C. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications; and
  - D. When the facility applies for their next operating permit renewal, they will be expected to include an updated facility description on their application.

#### **IV. REVIEW SUMMARY**

##### **1. AMMONIA**

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at <http://dnr.mo.gov/pubs/pub2481.pdf>. The 2013 permit renewal/modification discusses EPA's new ammonia criteria.

## 2. FACILITY DESCRIPTION

The origin of the Meramec Sewer WWTP facility is somewhat unknown. It is thought that the facility was originally purchased by Duckett Creek Sanitary District, but then sold and relocated to its present site by Meramec Sewer Company in 1998. Missouri American Water Company bought the facility in 2013. This area is a well-defined residential area, which is estimated that at complete build out there will be 1,050 customers. Currently there are 998 customers, which is approximately 95% built-out. Below is a summary of discharge monitoring reports from January 2011-October 2016.

The facility is designed to treat an average flow of 209,000 gpd. The plant is an activated sludge treatment system with chlorine disinfection. The existing treatment system includes:

1. A grinder to reduce the size of trash and minimize maintenance problems;
2. A surge tank to reduce high flows on the treatment system;
3. Two extended aeration basins;
4. Two final clarifiers, each with a radius of 17 feet for a surface area of 907 sq ft with a surface overflow rate with both clarifiers in service of 115 gallons per day per sq ft;
5. A chlorine contact chamber, which is being replaced with UV disinfection; and
6. Aerated basin to hold waste activated sludge prior to being pumped and hauled by Absolute Best Rate Septic Service to St. Louis Disposal Solutions.

Parameter	Units	Effluent Limit	Average effluent concentration**
Flow	MGD	*	0.157
BOD <sub>5</sub>	mg/L	30	11.09
TSS	mg/L	30	8.88
Ammonia as N-summer	mg/L	1.4	4.45
Ammonia as N-winter	mg/L	2.8	6.95
pH	SU	6.5-9.0	7.32

\*Monitoring only \*\*DMRS from January 2011-October 2016

## 3. COMPLIANCE PARAMETERS

The installation of ultraviolet disinfection is for compliance with the *E. Coli* bacteria effluent limit in the operating permit, MO-0091162. The facility has chlorine disinfection and is converting to UV disinfection, as the renewal permit contained a total residual chlorine effluent limit.

## 4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The installation of ultraviolet disinfection is for compliance with the *E. Coli* bacteria effluent limit in the operating permit, MO-0091162. A Trojan unit, model UV3000 PTP Model 3600 is being installed. The unit will contain 2 channels, 6 modules with each module containing 4 lamps for a total of 24 lamps.

The UV disinfection system is designed to treat a peak flow rate of 0.73 MGD, which is 3.5 times the design flow of 0.209 MGD. The system is designed to treat peak flows at a transmittance of 60%. The control system will be provided by the manufacturer and include UV intensity, lamp elapsed run time, and intensity alarm indication.

Flow from the treatment plant to the UV system will occur by gravity. The UV system will be placed in the existing chlorination basin. Missouri American Water received a variance from Jefferson County's requirements for new or modified structures to be at the 500 year flood elevation of 421 feet for the reconstruction of the clarifier tank and the addition of UV system.

The project also includes the installation of a sump pump capable of pumping a minimum of 15 gallons per minute at minimum total dynamic head of 6 feet, with submersible cable.

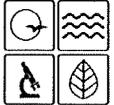
The sampler to be installed after the disinfection basin is a model 4700 refrigerated ISCO sampler.

## **5. OPERATING PERMIT MODIFICATION**

Operating permit MO-0091162 will require a modification to reflect the construction activities. It is Missouri American's plan to include the updated facility description in their next operating permit renewal application to reflect the installation of the ultraviolet disinfection system and removal of the chlorine effluent limits. The existing operating permit expires December 2017.

Leasue J. Meyers, EI  
Engineering Section  
[leasue.meyers@dnr.mo.gov](mailto:leasue.meyers@dnr.mo.gov)

MO-0091162 CP0001879  
 AP 25532 C.17241



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM  
**APPLICATION FOR CONSTRUCTION PERMIT –  
 WASTEWATER FACILITY**

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
\$\$\$ RECEIVED 91000.00	CHECK NO. 1700037840
DATE RECEIVED 10-21-16	SR

**APPLICATION OVERVIEW**

The Application for Construction Permit – Wastewater Facility form is for construction pertaining to domestic wastewater treatment facilities, agrichemical facilities, and components thereof. This form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

**PART A – BASIC INFORMATION**

**1.0 APPLICATION INFORMATION** (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 1.1 Is this a Federal/State funded project?  YES  N/A Funding Agency: \_\_\_\_\_ Project #: \_\_\_\_\_
- 1.2 Is this an application for an agrichemical?  YES (See instructions.)  N/A
- 1.3 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?  
 YES Date of Approval: N/A
- 1.4 Has the department approved the proposed project's facility plan\*?  
 YES Date of Approval: \_\_\_\_\_  NO  N/A (If Not Applicable, complete No. 1.5.)
- 1.5 [Complete only if answered Not Applicable on No. 1.4] Is a copy of the engineering report\* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?  
 YES  NO
- 1.6 Is a copy of the appropriate plans\* and specifications\* included with this application?  
 YES Denote which form is submitted:  Hard copy  Electronic copy (See instructions.)  NO
- 1.7 Is a summary of design\* included with this application?  YES  NO
- 1.8 Is a general operating permit applicable?  
 YES Submit the appropriate operating permit application to the Regional Office at least 60 days prior to operation.  
 NO Enclose the appropriate operating permit application and fee submittal. Denote which form:  B  B2
- 1.9 Is the facility currently under enforcement with the department or the Environmental Protection Agency?  YES  NO
- 1.10 Is the appropriate fee included with this application?  YES  NO (See instructions for appropriate fee.)

\* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

**2.0 PROJECT INFORMATION**

2.1 NAME OF PROJECT  
 Meramec WWTF Ultraviolet Disinfection System

2.2 PROJECT DESCRIPTION  
 Installation of a UV Disinfection system to replace chlorination basin. UV system is being placed inside of the chlorination basin.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge disposal by contract hauler

2.4 DESIGN INFORMATION

A. Current population: 2,290; Design population: 2,450  
 B. Actual Flow: 192,000 gpd; Design Average Flow: 209,000 gpd;  
 Actual Peak Daily Flow: 201,800 gpd; Design Maximum Daily Flow: 219,450 gpd;  
 Design Wet Weather Event: 0.80 MGD

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2.5 ADDITIONAL INFORMATION

- A. Is a topographic map attached?  YES  NO
- B. Is a process flow diagram attached?  YES  NO

2.6 ESTIMATED PROJECT CONSTRUCTION COST

\$ 200,000.00

3.0 WASTEWATER TREATMENT FACILITY				
NAME Missouri-American Water - Meramec Sewer WWTP		TELEPHONE NUMBER WITH AREA CODE		EMAIL ADDRESS
ADDRESS (PHYSICAL) 1022 Winter Lake Dr.		CITY Fenton	STATE MO	ZIP CODE 63026
COUNTY Jefferson				
Wastewater Treatment Facility: Mo-0091162 (Outfall one Of one )				
3.1 Legal Description: NE ¼, NE ¼, SE ¼, Sec. 2 , T 43n , R 5e (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): 725,005 Northing (Y): 4,263,572 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: Unnamed tributary to Meramec River (U) Meramec River (P) (2183) USGS (07140102-1003)				
4.0 PROJECT OWNER				
NAME Missouri-American Water Company (Todd Embrey)		TELEPHONE NUMBER WITH AREA CODE (314) 996-2217		EMAIL ADDRESS Todd.Embrey@amwater.com
ADDRESS 727 Craig Road		CITY Creve Coeur	STATE MO	ZIP CODE 63141
5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.				
NAME Same as above		TELEPHONE NUMBER WITH AREA CODE		EMAIL ADDRESS
ADDRESS		CITY	STATE	ZIP CODE
5.1 A letter from the continuing authority, if different than the owner, is included with this application. <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A				
5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.				
A. Is a copy of the certificate of convenience and necessity included with this application? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				
5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.				
A. Is a copy of the as-filed restrictions and covenants included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? <input type="checkbox"/> YES <input type="checkbox"/> NO				
6.0 ENGINEER				
ENGINEER NAME / COMPANY NAME Christopher M. Safford / Donohue & Associates, Inc.		TELEPHONE NUMBER WITH AREA CODE (636) 400-7046		EMAIL ADDRESS csafford@donohue-associates.com
ADDRESS 1415 Elbridge Payne Road, Suite 165		CITY Chesterfield	STATE MO	ZIP CODE 63017
7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and 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 Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.				
PROJECT OWNER SIGNATURE				
PRINTED NAME TODD EMBREY				DATE 10/17/2016
TITLE OR CORPORATE POSITION PROJECT MANAGER		TELEPHONE NUMBER WITH AREA CODE 314 996 2217		EMAIL ADDRESS todd.embrey@
Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM P.O. BOX 176 JEFFERSON CITY, MO 65102-0176 amwater.com				
<b>END OF PART A.</b>				
<b>REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.</b>				

**PART B – LAND APPLICATION ONLY**

**(Submit only if the proposed construction project includes land application of wastewater.)**

**8.0 FACILITY INFORMATION**

8.1 Type of wastewater to be irrigated:  Domestic  State/National Park  Seasonal business  
 Municipal  Municipal with a pretreatment program or significant industrial users  
 Other (explain)

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

8.3 This system is designed for:  
 No-discharge  Subsurface  
 Partial irrigation when feasible and discharge rest of time  
 Irrigation during recreational season, April – October, and discharge during November – March  
 Other (explain)

**9.0 STORAGE BASINS**

9.1 Number of storage basins: \_\_\_\_\_ (Use additional pages if greater than two basins.)

9.2 Type of basins:  Steel  Concrete  Fiberglass  Earthen  Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.  
Basin #1: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Depth \_\_\_\_\_ Safety \_\_\_\_\_ % Slope \_\_\_\_\_  
Basin #2: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Freeboard \_\_\_\_\_ Depth \_\_\_\_\_ Safety \_\_\_\_\_ % Slope \_\_\_\_\_

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

9.5 Design depth of sludge in storage basins.  
Basin #1: \_\_\_\_\_ ft Basin #2: \_\_\_\_\_ ft

9.6 Existing sludge depth, if the basins are currently in operation.  
Basin #1: \_\_\_\_\_ ft Basin #2: \_\_\_\_\_ ft

9.7 Total design sludge storage: \_\_\_\_\_ dry tons and \_\_\_\_\_ cubic feet

**10.0 LAND APPLICATION SYSTEM**

10.1 Type of land application:  Fixed Head Sprinklers  Center Pivot  Traveling Gun  Drip Dispersal  
 Subsurface Low Pressure Pipe  Other (describe) \_\_\_\_\_

10.2 Number of irrigation sites \_\_\_\_\_ Total Acres \_\_\_\_\_ Maximum % field slopes \_\_\_\_\_  
Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres  
(Use additional pages if greater than three irrigation sites.)

10.3 Type of vegetation:  Grass hay  Pasture  Timber  Row crops  
 Other (describe)

10.4 Wastewater flow (dry weather) gallons per day: Average annual \_\_\_\_\_  
Seasonal \_\_\_\_\_ Off-season \_\_\_\_\_

10.5 Land application rate (design flow including 1-in-10 year storm water flows):  
Design: \_\_\_\_\_ inches/year \_\_\_\_\_ inches/hour \_\_\_\_\_ inches/day \_\_\_\_\_ inches/week  
Actual: \_\_\_\_\_ inches/year \_\_\_\_\_ inches/hour \_\_\_\_\_ inches/day \_\_\_\_\_ inches/week

10.6 Total irrigation per year (gallons): Design: \_\_\_\_\_ gal Actual: \_\_\_\_\_ gal

10.7 Actual months used for irrigation (check all that apply):  
 Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

10.8 Land application rate is based on:  
 Hydraulic Loading  Other (describe) \_\_\_\_\_  
 Nutrient Management Plan (N and P) If N and P is selected, is the plan included?  YES  NO