

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Summer Set Utility Company  
43 Monte Rosa Dr.  
DeSoto, MO 63020

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

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.

April 12, 2016  
Effective Date

  
Sara Parker Pauley, Director, Department of Natural Resources

April 11, 2018  
Expiration Date

  
John Madras, Director, Water Protection Program

## **CONSTRUCTION PERMIT**

### **I. CONSTRUCTION DESCRIPTION**

This is a DEMONSTRATION project. Summer Set Utility Company's Wastewater Treatment Plant is an existing three- cell lagoon with UV disinfection installed. The facility is adding 24 BioDomes in the first cell of the lagoon. The second cell of the lagoon will have an additional 52 BioDomes installed for a total of 76 BioDomes. The facility is designed for ammonia removal of 0.18 lbs ammonia per unit per day to meet final ammonia effluent limits. The permitted design flow will remain the same at 117,300 gpd. The facility will continue using the existing ultraviolet disinfection system.

### **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 TWM, Inc. on June 22, 2015 and August 21, 2015.
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. Summer Set Utility 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); and
  - C. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications.

#### **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.htm>.

The facility was informed of the EPA 2013 ammonia criteria in the July 22, 2015 comment letter. In the facility's August 21, 2015 response to comments, the facility indicated that BioDome system was designed to meet an effluent limit of less than 0.6 mg/L and that the nutrient removal can be achieved through varying the aeration cycles of the equipment.

**2. CONSTRUCTION PURPOSE**

The purpose of the construction permit is for the installation of the 76 BioDomes for final compliance with ammonia effluent limits. The facility is required to be in compliance by June 1, 2016.

**3. FACILITY DESCRIPTION**

Summer Set Utility Company's Wastewater Treatment Plant is an existing three-cell lagoon with UV disinfection installed. To meet ammonia effluent limits, the facility is proposing to install BioDomes in the first two cells. Below is the existing performance of the three-cell lagoon.

Parameter	Units	AML	Average Concentration †
Flow	MGD	*	0.038
BOD <sub>5</sub>	mg/L	30	14
TSS	mg/L	30	11
Ammonia as N-summer	mg/L	*/1.4	8.14
Ammonia as N-winter	mg/L	*/2.8	12.4
pH	SU	6.0-9.0	7.8
Fecal Coliform	#colonies/100mL	400	134

\* monitoring only

† discharge monitoring reports October 1, 2010-July 2015

**4. COMPLIANCE PARAMETERS**

The installation of the BioDomes is to meet compliance with ammonia effluent limits. Since the design flow is over 100,000 gpd, the facility will be required to monitor total nitrogen and total phosphorus in the effluent. The facility is required to be in compliance by June 1, 2016.

Parameter	Units	MDL	AML
Flow	MGD	*	*
BOD <sub>5</sub>	mg/L	45	30
TSS	mg/L	45	30
Ammonia as N-summer	mg/L	2.8	1.4
Ammonia as N-winter	mg/L	4.0	2.0
Total Phosphorus	mg/L	*	*
Total Nitrogen	mg/L	*	*
pH	SU	>6.5	>6.5
E. Coli	#colonies/100mL	1030	206

\*monitoring only

**5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA**

This is a DEMONSTRATION project. Summer Set Utility Company's Wastewater Treatment Plant is an existing three-cell lagoon with UV disinfection installed. The second cell of the lagoon will have an additional 52 BioDomes installed for a total of 76 BioDomes installed.

The facility is adding 24 BioDomes in the first cell of the lagoon. Ten feet of depth of Cell 1 is required for the BioDomes in the manufacturer's specifications for the primary cell. Each BioDome has 2,840 square feet of aerated surface design to remove per dome per day: 0.18 lbs of ammonia as N, 5.6 lbs of BOD, and 2.16 lbs of TSS. The expected spacing is seven rows alternating with three or four domes per row. The distance between rows is 20 feet with the distance between domes per row is 30 feet.

The existing aeration system in Cell 1 is being replaced with variable frequency drive blowers to get sufficient aeration in Cells 1 and 2. The primary cell aeration system requires one CFM at 7 psig. Total aeration requirements are 76 CFM for both Cells 1 and 2. There will be two blower systems installed.

The connection from Cell 1 to Cell 2 is being relocated to maximize the treatment in each cell and to prevent short-circuiting. The facility will be installing 207 lf of 6 inch PVC pipe and removing the existing connection between the cells.

Cell 2 will have 52 BioDomes installed, in four rows with 13 domes per row. The distance between domes in each row is expected to be 7.5 feet and the distances between rows is 12 feet. The 7 foot depth of Cell 2 was considered in the design of the number and placement of the domes by the manufacturer.

As this is a DEMONSTRATION project, there were changes in the design of this facility from the design of the first full-scale demonstration at Archie. Changes include decreasing the ammonia loading from 0.33 lbs of ammonia per unit per day to 0.18 lbs ammonia per unit per day. Also, at Archie there was short-circuiting present due to the baffle curtain and the number of BioDomes installed; which is believed will not occur at Summer Set due to the number of BioDomes being installed.

The existing cell three will operate as a polishing cell following the treatment received in Cells 1 and 2 with the BioDomes. There are no changes proposed to Cell 3. The existing UV disinfection will be maintained and used with the upgrades. The UV disinfection system was installed under a previous construction permit.

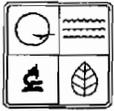
The facility requested and was granted a deviation from the back-up power requirements as the existing aeration and UV systems do not have back-up power.

## **6. OPERATING PERMIT MODIFICATION**

Operating permit MO-0036382 was public noticed March 4- April 4, 2016. No comments were received. The operating permit modification will be issued upon receipt of the Statement of Work Completed. The facility has already submitted their modification application and modification fee. The project is classified as a DEMONSTRATION project and will have additional monitoring requirements for the first year of operation.

MO-0036382  
 CP0001764  
 AP 21405

**RECEIVED**



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

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED \$150.00	CHECK NO. 1881
DATE RECEIVED 6/22/15	

**WATER PROTECTION PROGRAM**

**APPLICATION OVERVIEW**

The Application for Construction Permit – Wastewater Treatment Facility 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 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?  
 YES Date of Approval: \_\_\_\_\_  
 Attached is the No Degradation Evaluation Conclusion of Antidegradation Review form
- 1.3 Has the department approved the proposed project's facility plan\*?  
 YES Date of Approval: \_\_\_\_\_  NO  N/A (If Not Applicable, complete No. 1.4.)
- 1.4 [Complete only if answered Not Applicable on No. 1.3.] 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
- 1.5 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
- 1.6 Is a summary of design\* included with this application?  YES  NO
- 1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?  
 YES Date of submittal: Nov.  
 Enclosed is the appropriate operating permit application submittal. Denote which form:  A  B  B2  
 N/A Please explain: \_\_\_\_\_
- 1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency?  YES  NO
- 1.9 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

Summerset Subdivision WWTP

2.2 PROJECT DESCRIPTION

In an effort to facilitate ammonia nitrogen removal, 42 bio-domes will be installed in the second lagoon at the treatment plant. These domes have been documented to remove ammonia nitrogen in other lagoon facilities. The Summerset Lagoon system has been out of compliance with ammonia nitrogen limits due in part to several meth lab facilities located within homes tributary to the treatment plant. Local law enforcement officials have been alerted but the addition of the bio-dome system has been successfully used in other nutrient removal without the substantial cost of constructing a mechanical plant.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

N/A - Sludge retained in lagoon

2.4 DESIGN INFORMATION

- A. Current population: \_\_\_\_\_; Design population: 1,564
- B. Actual Flow: 40,000 gpd; Design Average Flow: 117,300 gpd;  
 Actual Peak Daily Flow: \_\_\_\_\_ gpd; Design Maximum Daily Flow: \_\_\_\_\_ gpd

2.5 ADDITIONAL INFORMATION

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

**3.0 WASTEWATER TREATMENT FACILITY**

NAME Summer Set Utility Co. Wastewater Treatment Facility		TELEPHONE NUMBER WITH AREA CODE (636) 586-8706	E-MAIL ADDRESS	
ADDRESS (PHYSICAL) 43 Monte Rosa Drive	CITY DeSoto	STATE MO	ZIP CODE 63020	COUNTY Jefferson
Wastewater Treatment Facility: Mo- 0036382 (Outfall 1 Of 1 )				
3.1 Legal Description: NE ¼, NE ¼, SW ¼, Sec. 15, T 39N, R 4E (Use additional pages if construction of more than one outfall is proposed.)				
3.2 UTM Coordinates Easting (X): 712969 Northing (Y): 4219555 For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)				
3.3 Name of receiving streams: <u>Falling Rock</u>				

**4.0 PROJECT OWNER**

NAME Same as Above		TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS	
ADDRESS	CITY	STATE	ZIP CODE	

**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	E-MAIL ADDRESS	
ADDRESS	CITY	STATE	ZIP CODE	

5.1 A letter from the continuing authority, if different than the owner, is included with this application.  YES  NO  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?  YES  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?  YES  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?  YES  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?  YES  NO
- D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application?  YES  NO

**6.0 ENGINEER**

ENGINEER NAME / COMPANY NAME Vicki L. Wade / TWM, Inc.		TELEPHONE NUMBER WITH AREA CODE (618) 624-4488	E-MAIL ADDRESS vwade@twm-inc.com	
ADDRESS 4940 Old Collinsville Road	CITY Swansea	STATE IL	ZIP CODE 62226	

**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 <i>Tony Georges</i>	DATE 12-11-2014
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TITLE OR CORPORATE POSITION <i>President</i>	TELEPHONE NUMBER WITH AREA CODE <i>636-586-8705</i>	E-MAIL ADDRESS
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Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
P.O. BOX 176  
JEFFERSON CITY, MO 65102-0176

**END OF PART A.  
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.**

**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.  
 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 three 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 _____	Berm Width _____	% Slope _____
Basin #2:	Length _____	Width _____	Depth _____	Freeboard _____	Berm Width _____	% Slope _____
Basin #3:	Length _____	Width _____	Depth _____	Freeboard _____	Berm Width _____	% 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  
Basin #3: 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 Basin #3: \_\_\_\_\_ ft

9.6 Existing sludge depth, if the basins are currently in operation.  
Basin #1: \_\_\_\_\_ ft Basin #2: \_\_\_\_\_ ft Basin #3: \_\_\_\_\_ ft

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

**10.0 LAND APPLICATION SYSTEM**

10.1 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.)

10.2 Type of vegetation:  Grass hay  Pasture  Timber  Row crops  
 Other (describe) \_\_\_\_\_

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

10.4 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

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

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

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