The University of North Carolina at Chapel Hill  
Bingham Facility, Orange County, NC  

General Operation and Maintenance Plan for Wastewater Irrigation System

Description

The University of North Carolina at Chapel Hill (University) owns and operates the wastewater collection, treatment, and disposal system for the UNC-CH Bingham Facility in Orange County, NC. The system is designed to treat and dispose of an average of 3,556 GPD of domestic strength wastewater in accordance with NCDER wastewater irrigation rules and regulations (15A NCAC 02T .0500).

The collection system consists of an 8 inch PVC gravity sewer system for the domestic wastewater generated on site. Wastewater is conveyed from the existing three (3) buildings on site to an existing 8,000 gallon septic tank. The effluent from the septic tank is pumped via the existing duplex submersible pump station to an existing AdvanTex wastewater treatment system.

The AdvanTex system provides treatment of the septic tank effluent providing the equivalent of secondary effluent quality. The effluent from the AdvanTex system flows through a new chlorine contact tank for disinfection of the wastewater. A new sodium hypochlorite chemical feed system consisting duplex metering pumps and a 50 gallon chemical storage tank is provided for wastewater disinfection.

From the chlorine contact tank the wastewater flows through an existing 60 degree trapezoidal flume with an ultrasonic level sensor, transmitter, and flow totalizer system. The flow monitoring system provides a 4 - 20 milliamp output signal in proportion to flow to modulate the chlorine metering pumps. From the flow metering flume, the wastewater flows to a new secondary effluent pump station.

The secondary effluent pump station pumps effluent to the wet weather storage basin. The wet weather storage basin provides storage for the effluent during periods of wet weather or other conditions that prevent surface irrigation of the wastewater. The refurbished basin is provided with an inlet structure, screened outlet structure to the spray irrigation pump station, and an 18 inch compacted clay liner with a 12 inch cement stabilized surface liner.

The refurbished spray irrigation pump station at the wet weather storage basin consists of two (2) new well type submersible pumps installed in the existing wetwell, with VFDs, piping, valves, and electrical controls for spray irrigation of the effluent.

A new 5.7 acre spray irrigation system on-site consists buried PVC transmission mains and laterals with multiple risers with adjustable impact sprinklers for surface irrigation of the effluent.
Operation and Maintenance Manual

A comprehensive Operation and Maintenance Manual will be prepared during construction of the wastewater treatment system improvements. The O&M Manual will include the following sections:

1. Introduction and General Process Description
2. Unit Treatment Process Descriptions
3. Operational Control and Alarm Systems
4. Systematic Process Startup, Shutdown, and Normal Operation
5. Maintenance Requirements
6. Sampling, Monitoring, and Testing
7. Record Keeping
8. Emergency Operating Procedures and Contacts

Operation

The University maintains certified wastewater treatment system operators on staff to operate, monitor, and maintain the wastewater treatment facilities. General operational responsibilities of the University include the following:

1. Comply with NCDENR rules and regulations.
3. Maintain records of water usage and irrigation.
4. Perform required compliance testing in accordance with permit requirements.
5. Submit monitoring and other reports as required by NCDENR.
6. Implement operational procedures for dealing with emergency situations.
7. Comply with all safety rules and regulations.
8. Report any line breaks or spills to the proper authorities.

Maintenance

Maintenance of the wastewater treatment and disposal system generally includes the following:

1. Provide preventive maintenance of equipment as required per manufacturer’s instructions.
2. Prepare a preventive maintenance schedule.
3. Maintain necessary tools and supplies on-site for proper maintenance work.
4. Pump the solids from the septic tank as required based on solids accumulation.
5. Perform field sampling, testing, and observations
6. Repair any broken equipment or piping leaks as required.
7. Keep spare parts, piping repair equipment, etc. in inventory for emergency repairs.
Provisions for Safety Measures

Access to the wastewater treatment system, emergency effluent storage basin, wet weather storage basin, and spray irrigation system is restricted by perimeter fencing.

The 125,000 gallon emergency effluent storage basin is interconnected with the secondary effluent pump station and can be used for emergency containment of wastewater.

Additional safety measures and concerns will be addressed in the Operation and Maintenance Manual.

Emergency Contacts

UNC Energy Services
Water, Wastewater, and Stormwater
919-843-0364

NCDENR Environmental Emergency
1-800-858-0368

DWQ Raleigh Regional Office
919-791-4200

UNC Dept. of Environment, Health, and Safety
Report any emergencies or accidents (919- 962-5507)

Other emergency contacts and information will be included in the Operation and Maintenance Manual.