

**SECTION 31 43 00
HANDLING CONTAMINATED GROUNDWATER**

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Work specified in this Section includes designing, procuring, installing, operating, cleaning, and dismantling a temporary groundwater treatment system to manage contaminated groundwater that may be generated during dewatering operations associated with ANY EXCAVATION.
- B. This Specification is performance based; the Contractor shall be responsible for the complete design, procurement, and installation of all materials, equipment and appurtenances necessary to meet the specified service conditions for the duration of the dewatering operations.
- C. The discharge of all groundwater collected from construction dewatering activities within the project limits shall be directed to the sanitary sewer system existing within the construction corridor. Discharge and management of groundwater shall be accomplished in accordance with the Connecticut Department of Energy and Environmental Protection (DEEP) *General Permit for the Discharge of Groundwater Remediation Wastewater* (General Permit), and local regulations and ordinances. The Contractor shall be responsible for securing the General Permit and any other necessary state and local permits, including fees. The General Permit registration for discharge to the sanitary sewer must be submitted to the Engineer for review and approval prior to submittal to the DEEP.
- D. The Contractor shall be the General Permit applicant, the primary contact shall be the Owner, the site Owner shall be the Municipality where the Work is taking place.
- E. The Contractor is hereby notified that a minimum lead time of three to six weeks or more can be expected to prepare, process, and approve the General Permit application, including coordination with the Municipality where the Work is taking place. **No claim for delay will be considered based upon the Contractor's failure to accommodate the permitting process identified above.**
- F. This Item does not apply to the possible diversion of existing stormwater flow in existing pipes around the construction site during field activities. Diversion of existing flows remains the responsibility of the Contractor.
- G. The Engineer will sample the groundwater treatment system discharge as required by the General Permit. The Contractor shall be furnished with copies of the analytical results by the Engineer for submittal to the appropriate agencies and shall be responsible for any modifications to the system needed to meet performance requirements.

1.02 SUBMITTALS

- A. As required for the appropriate level of operation, the Contractor shall prepare and submit to the Engineer a groundwater pretreatment system design, stamped and signed by a licensed professional engineer registered in the State of Connecticut including a schematic of the equipment proposed for the groundwater treatment system for review. At a minimum, the diagram shall show flow rates, pipe material and diameter, valve locations, sampling ports, discharge locations, etc. The Contractor shall also submit for review manufacturers' data sheets, assembly details and performance data on the treatment equipment, which may include settling tanks or frac tanks, particulate filters, activated carbon units and/or air stripper units. The pretreatment system design shall be submitted two weeks before startup and include the estimated flow rate, start and completion dates, flow sample frequency and proposed sample analytical methods.

- B. The Contractor shall not be allowed to commence Work activities until such time as the temporary groundwater treatment system design, as applicable, has been reviewed by the Engineer, installed in accordance with the accepted design, and is completely operational. **No claim for delay in the progress of the Work will be considered for failure by the Contractor to design a system to meet this Performance Specification.** It is anticipated that this Work will involve specialty services and/or proprietary products.

1.03 HANDLING CONTAMINATED GROUNDWATER

- A. Groundwater treatment, consisting of a settling tank or frac tank, particulate filter, activated carbon units and/or air stripper units, as required shall be located between the groundwater collection and removal sump and the sanitary sewer, and shall be designed to prevent sediments and solids, as well as contaminants in excess of the General Permit allowable effluent concentrations, from entering the sanitary sewer system. Estimated allowable effluent concentrations are provided in the General Permit and will be provided in the authorization provided by DEEP.
- B. Equipment required for this Item shall be installed in a location and manner acceptable to the Engineer, and in accordance with the manufacturers' recommendations to prevent interference with Work and traffic.
- C. The Contractor shall make adjustments to the sanitary sewer tie-in, if necessary, to accommodate the treatment unit. The Contractor shall obtain approval from the Owner and MDC if modifications to the municipal sewer system are necessary.
- D. The Contractor shall be responsible for treatment of the groundwater to meet performance requirements established in the General Permit.
- E. Prior to initial effluent discharge into the sanitary sewer system, the Engineer will sample the treatment system discharge to verify conformance with requirements of the General Permit.
- F. The Engineer will notify the Contractor as soon as practicable upon knowledge of an exceedance of the pollutant levels established in the General Permit. The Contractor shall be responsible for ceasing the discharge immediately.
- G. Following recognition of an exceedance of the established pollutant levels, and in accordance with the conditions and requirements of the General Permit, the Contractor shall be responsible for all subsequent notifications to the Owner and DEEP, and procedural modifications necessary to reduce contaminant levels to acceptable criteria.
- H. If required, the Contractor shall (re)start the discharge in accordance with all necessary approvals from the DEEP and in full compliance with the General Permit and any amendments imposed thereto.
- I. Upon completion of operations involving the use of the settling tank or frac tank, particulate filters, carbon adsorption units and/or air stripper units, the Engineer will sample silt and sediment collected in the settling tank or frac tank for waste characterization determination. Disposal of the material shall be in accordance with Section 31 23 16.10, "Handling , Transportation and Disposal of Regulated Soil." The Contractor is hereby notified that laboratory turnaround time is expected to be 14 working days or longer. **No claim delay will be considered based upon the Contractor's failure to accommodate the laboratory turnaround time as identified above.**

1.04 OPERATIONAL REQUIREMENTS

- A. At a minimum the groundwater treatment system shall be designed to meet the following conditions:

Design Water Flow Rate: 40 gpm (or actual, whichever is greater) Min.
Operating Water Temp: 45° F
Settling Tank Detention Time: 4 hours

Note: The design flow rate is based on estimated flows. Actual flows may be higher.

PART 2 - PRODUCTS

2.01 GROUNDWATER TREATMENT SYSTEM EQUIPMENT

The following paragraphs recommend groundwater treatment system equipment. This should not be construed as a definitive list of Items but only an example of suggested technologies and of the level of detail expected for the submittals.

- A. Settling tanks or frac tanks should be sized to contain the total discharge from the groundwater collection and removal sump for a period of four hours, and shall be fitted with an opening capable of accepting pumped flows from dewatering operations. The settling tank shall be constructed to prevent silts and solids from entering the sanitary sewer system.
- B. Particulate filters should be a bag-type filter and be sized appropriately for the removal of particulates (silts and other solids) as needed.
- C. Activated carbon units shall be properly sized for the flows under given operating conditions. Each container shall contain virgin activated carbon at start-up. The units shall be supplied with a removable, gasketed cover with bolt-type closing ring. The vessels shall have inlet and outlet couplings adequately sized for the flow and pressure rating. A drain connection shall also be provided at the bottom of the vessel. Pressure gauges shall be provided with the units so that the backpressure of each vessel may be monitored for potential failure.
- D. Air stripper units shall be either a low-profile or packed tower type of system sized to meet the conditions of service described herein. The stripper shall be impact resistant, suitable for the contaminants to be treated and suitable for outdoor operation. The air stripping system shall have an integral effluent stilling well. The air stripper shall be equipped with an air pressure gauge as supplied by the stripper manufacturer. The air blower and motor shall be compatible with the air stripping system provided and shall be explosion-proof. The Contractor shall supply his own power source for the equipment. The exhaust from the stripper shall be configured to discharge the air stream a minimum of ten feet above grade. The Contractor shall also be responsible for providing any air emissions treatment that may be required pursuant to DEEP regulations, and securing applicable discharge permits.
- E. The Contractor shall be responsible for providing, installing, operating and maintaining equipment capable of metering the flow into the sanitary sewer system, such that the total daily flow can be recorded for each day of the discharge. The meter should be capable of measuring, indicating, and recording instantaneous and cumulative flow. The meter shall be used continuously during discharge.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall ensure that all personnel involved with the groundwater treatment operations understand the terms of the General Permit issued for the project by DEEP. In the event of a conflict between the requirements of this Item and the General Permit, then the terms of the General Permit shall govern.
- B. It is intended that the dewatering equipment operates at a rate that removes groundwater that naturally infiltrates the excavation. Care shall be taken not to cause a hydraulic gradient that draws groundwater into the excavation at an excessive rate.
- C. Freeze protection methods and equipment shall be approved by the Engineer.

3.02 HANDLING CONTAMINATED GROUNDWATER

- A. The Contractor shall furnish all labor, equipment, tools and materials and performing all operations in connection with the dewatering, control and diversion of water to maintain "in the dry" conditions of all excavations such that placement of various piping, manholes and appurtenances can be installed in accordance with the Contract Documents.
- B. The Contractor shall provide settling tanks, particulate filters, carbon adsorption units and/or air stripper units, as required, at each dewatering operation to be located between the groundwater collection and removal sump and the sanitary sewer. The tanks shall have a minimum capacity equal to four hours of discharge from the sump, assuming a minimum flow rate of 40 gallons per minute. If additional flow is realized, then additional tank and system capacities shall be employed. The Contractor shall furnish and install a meter to measure and record flows.

PART 4 – MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

The Contractor shall furnish all labor, equipment, tools and materials and performing all operations in connection with the dewatering of contaminated groundwater, control and diversion of contaminated water to maintain "in the dry" conditions of all excavations. The Contractor shall provide settling tanks, particulate filters, carbon adsorption units and/or air stripper units, as required, at each dewatering operation. The treatment of contaminated groundwater as confirmed by the Engineer shall be measured for payment by the gallon treated.

4.02 BASIS OF PAYMENT

The Contractor shall be paid for treatment of contaminated groundwater by the gallon treated. That price shall include furnishing all labor, equipment, tools and materials and performing all operations in connection with the dewatering, control and diversion of water to maintain "in the dry" conditions of all excavations. The Contractor shall provide settling tanks, particulate filters, carbon adsorption units and/or air stripper units, as required, at each dewatering operation.

END OF SECTION