

TECHNICAL SPECIFICATIONS FOR DIGESTER CLEANING

1. SCOPE

- 1.1 This section covers the cleaning and sludge dewatering for digesters, containing sludge anaerobically digested to Class B Levels.
- 1.2 These areas are classified as a Class I, Division 1, Group D hazardous areas, inside and a distance of 10 feet beyond all exterior wall and roof, and to a distance 10 feet beyond all gas handling equipment. All work within the digester shall be classified as confined space work. Flammable materials shall not be stored or located in or near the digesters. All hazardous digester gases shall be safely removed prior to ventilation. Digesters shall be continuously ventilated, and the atmosphere in the digester monitored using approved detection devices, at all times. The CONTRACTOR shall treat the tank as a confined, hazardous space at all times. The CONTRACTOR shall be aware that the digester contents may be in a stage of active decomposition and producing hazardous gases such as carbon dioxide, carbon monoxide, hydrogen sulfide and other deleterious and/or harmful gases.
- 1.3 The CONTRACTOR shall provide all equipment, pumps, hoses, lights, electrical extension cords, all temporary power, tools, and labor required to remove digester contents.
- 1.4 Where access doors have caulking, gaskets: new gaskets of the same thickness, size, and material shall be provided and installed.
- 1.5 The CITY/AGENCY/Plant will provide a fire hydrant available for the CONTRACTOR's use during the project. Usage shall not exceed 200 gallons per minute.
- 1.6 All hauling and handling equipment and labor shall be provided by CONTRACTOR. Hauling equipment shall not permit sludge to leak or splash onto roads during loading or transportation. CONTRACTOR shall be responsible for cleaning up any spilled, leaked, or splashed sludge or digester contents on roads or other areas at or away from the site of Work. The landfill or permitted disposal site shall be identified and manifests and testing shall be submitted to the City/Agency for record purposes.
- 1.7 Material removed from the digesters shall be dewatered and treated as required to be transported to a licensed/permitted landfill or permitted disposal site. Dewatering shall not produce excessive odors, require excess operating area or otherwise be completed in a manner which would impede plant operations.
- 1.8 Contractor shall dispose of all digester contents on a land disposal site permitted by the State. CONTRACTOR shall locate the disposal site, arrange for disposal, and acquire permission to dispose of digester contents. The disposal site shall be permitted to handle the grade of material removed from the digester or CONTRACTOR shall be permitted to dispose of the grade of material on a designated site. CONTRACTOR shall comply with all state, local, and federal regulations concerning removal, hauling, and disposal of sludge contents. Weight

of hauled sludge will be determined by the amounts listed on off-site scales at highway check points. Weigh-master tickets shall be provided by the CONTRACTOR to the CITY/AGENCY for proof of total weight of material disposed.

- 1.9 Dewatering processes, such as belt press or centrifuge, may be used. The filtrate or centrate may be transferred to the plant headworks at a rate not to exceed 250 gallons per minute with a suspended solids concentration in the liquid stream less than 200 mg/l. The CONTRACTOR shall be required to provide all laboratory measurement and testing equipment for quantity and quality of centrate/filtrate to be returned to the plant. CONTRACTOR shall submit test results to the CITY/AGENCY for acceptance. CITY/AGENCY may test this flow stream and will deny permission to use dewatering processes if filtrate or centrate characteristics are not acceptable.
- 1.10 Location of the tie-in point to the headworks to be determined by the City/Agency/Agency. The CONTRACTOR shall coordinate with the CITY/AGENCY to determine the times when the centrate can be returned to the headworks. All associated centrate/filtrate return piping shall be provided by the CONTRACTOR. The returned water shall be monitored and screened (1/4" max opening or 6MM). No trash is to be re-introduced into the system. The CONTRACTOR will be required to protect this piping from damage caused by truck traffic crossing the pipes.

2. EXECUTION

2.1 Work Order Procedure

- 2.1.1 The Contractor shall respond in writing to the District Representative or Contracting Officer within twenty four (24) hours of receipt of a Work Order Package.
- 2.1.2 A Work Order Package will include detailed description of pipe diameter, material of pipe, location of work, and expected work duration.
- 2.1.3 The Contractor's written response shall include a detailed a schedule showing the start dates specified in the Work Order and the progress the Contractor will follow to complete each individual task location within the time limit specified in the Work Order.
- 2.1.4 In addition to a submitted schedule, Contractor shall submit an extension of quantities per the unit prices established in the attached Schedule of Quantities so as to establish a Not To Exceed price for work to be completed as described by the Work Order Package.
- 2.1.5 The Contractor shall start work on the locations within seven (7) calendar days, once an acknowledgement by the Contractor of receipt of Work Order Package is executed.
- 2.1.6 The Contractor shall complete all such work on a Work Order Package without interruption or delay within the time limit as specified in the Work Order

- 2.2 The CITY/AGENCY plant staff will draw down the level of the digester to their desired elevation.
- 2.3 The first digester will be isolated by CITY/AGENCY staff. Digester gas will be burned at the CITY/AGENCY flare until the gas production does not create sufficient pressure. At this point the CONTRACTOR will then be responsible for evacuation and opening of the hatch(s).
- 2.4 The scope of this contract includes the cleaning and removal of all digester contents, high pressure cleaning of the interior digester walls, floor, ceiling, covers, etc with a high pressure hose nozzle and broom, cleaning of all associated piping and valves, hauling of all contents removed from digesters.
- 2.5 CONTRACTOR work includes cleaning out any materials impacted inside the tank. Digester contents means all material including sludge, solids, liquids, leakage through valves in pipelines connected to other digesters, and leakage or water from other sources.
- 2.6 Once the Digesters are cleaned to the satisfaction of the CITY/AGENCY. The CITY/AGENCY's representative will assess the condition of the digester and determine if any valves or pipes will need to be repaired by the CONTRACTOR. Payment for these repairs will be based on AGREED UPON LUMP SUM.
- 2.7 Upon completion of the general cleaning of the Interiors and Exteriors, the Contractor shall proceed to inspect, test, and clean, as needed, the gas diffusers and associated piping system (i.e. Flex Lines, Pipes, etc.) located inside each of the digesters. The scope of this work includes, but is not limited to the following:
 - 2.7.1 Close the gas inlet valve to the gas diffuser manifold and lock it out.
 - 2.7.2 Lock out the gas compressor pump.
 - 2.7.3 Disconnect each pipe/spear at the union at the top of the digester.
 - 2.7.4 Install the water connection to each pipe/spear one at a time and pressurize within 20-30 psi.
 - 2.7.5 While in the digester, verify that water is flowing through the pipe/spears and check all couplings and flex hoses for leaks.
 - 2.7.6 Upon observing restricted or no flow through the pipe proceed to discounted at the joints and remove to clear the blockage.
 - 2.7.7 Check to insure the pipes/spears are mounted to the digester wall properly and securely.
 - 2.7.8 Refer to Exhibit 3 for additional details pertinent to the gas diffuser system and associated parts.
- 2.8 CONTRACTOR shall maintain a clean work environment on a daily basis. Anything attracting vectors shall be cleaned up immediately. CONTRACTOR shall clean up any sludge or digester contents spilled on the ground or splashed on the walls after each digester is emptied. Clean-up is required of any stains or digester contents from the work area.
- 2.9 The CONTRACTOR is required to provide documentation photos of the interior condition of the digester.

3. CONSTRAINTS

- 3.1 Time Limit. CONTRACTOR shall schedule with CITY/AGENCY each digester to be taken out of service or returned to service at least two weeks in advance. Only one digester may be out of service at any given time.
- 3.2 No digester shall be out of service for longer than 30 calendar days. A digester is out of service when the access manholes in the cover are opened. During the time each digester is out of service, it shall be cleaned and all work inside the digester required by the Contract Documents shall be performed.
- 3.3 CONTRACTOR shall ensure that the digester tank has been purged and is free from all explosive gas before performing any work in the digester tank.
- 3.4 All provisions of confined space entry for CONTRACTOR and inspectors and also necessary lighting for inspection purposes shall be provided by the CONTRACTOR.
- 3.5 Compliance with local, state, and federal regulations concerning emissions or disposal of solid, particulate, liquid, or gaseous matter as a result of the cleaning, coating or other operations shall be the responsibility of the CONTRACTOR. All shielding, abrasive retrieval or other methods of using precautions required by the regulating agencies shall be accomplished at no additional cost to the CITY/AGENCY unless otherwise provided herein. Any fines imposed on the CITY/AGENCY or ENGINEER by any regulatory agency as a result of the CONTRACTOR's noncompliance with environmental regulations shall be paid or reimbursed by the CONTRACTOR.
- 3.6 Odor control will be a significant mutual concern of the City/Agency and the CONTRACTOR. In the event an odor problem arises as a result of the digester cleaning, the Contractor shall take all action necessary to abate nuisance odors.
- 3.7 CONTRACTOR is advised that there may be limited room available, and that chemical delivery and solids hauling trucks need to maintain access. Any hoses and piping installed by the CONTRACTOR shall be ramped and protected to maintain access.

4. MEASUREMENT AND PAYMENT

- 4.1 Contractor shall track daily job progress using a daily work log. This daily log will track all quantities of work performed to include but not limited to the following:
 - 4.1.1 Date/Time
 - 4.1.2 Weather
 - 4.1.3 Job Progress
 - 4.1.4 Labor
 - 4.1.5 Equipment
 - 4.1.6 Materials
 - 4.1.7 Impacts
 - 4.1.8 Meetings
 - 4.1.9 Change Order Progress

- 4.2 Daily work logs will be used to justify quantity of work performed on a specific Work Order Package. On the 25th of each month, Contractor shall submit its billing only for actual work performed. Actual quantities of work performed will be extended using the unit rates established in the Schedule of Quantities (attachment 1). In addition to submitting a Schedule of Quantities of work performed, Contractor shall also provide all daily work tags associated with completed job progress for the specific month in the billing cycle.
- 4.3 Payments are due Net 30 days after approved invoice.

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