

SECTION 15880
ODOR CONTROL SYSTEM

PART 1.0 GENERAL

1.1 DESCRIPTION

1.1.1 Description

These Specifications are intended to give a general description of what is required, but do not cover all details that will vary in accordance with the requirements of the equipment furnished. They are, however, intended to cover the furnishing, delivery and installation of all materials, equipment and appurtenances for the complete Odor Control System herein specified, whether specifically mentioned in these Specifications or not.

Contractor to furnish and install a pre-engineered Odor Control System as hereinafter specified.

1.2 WARRANTY

1.2.1 All equipment supplied under this Section of the Specifications shall be warranted for a period of one (1) year from date of shipment.

1.2.2 The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be repaired or replaced and the system restored to service at no expense to the Owner.

1.3 DESCRIPTION OF SYSTEM

1.3.1 The Manufacturer shall furnish a complete, pre-engineered Odor Control System. The Manufacturer of the Odor Control System shall be responsible for the design and fabrication of the complete system within the limits specified herein. Site preparation shall be the responsibility of the Owner as described and as specified.

1.3.2 The following minimum design parameters shall be incorporated into the Manufacturer's design:

1.3.2.1 Average Influent concentration: Less than 15 ppm Hydrogen sulfide (H₂S)

1.3.2.2 Airflow rate: **XX SCFM**

1.3.2.3 Removal rate: >99.0% H₂S

1.3.2.4 Design carbon life: >1 year

1.4 QUALITY ASSURANCE

1.4.1 To assure unity of responsibility, all equipment and material specified in this Section of the Specifications shall be furnished and coordinated by the Odor Control System Manufacturer.

- 1.4.2 All equipment furnished under this Specification shall be new and unused and shall be the standard product of manufacturers having a successful record of operation, manufacturing, and servicing similar equipment and systems.

1.5 SUBMITTALS

- 1.5.1 Copies of all materials required establishing compliance with the specifications shall be submitted to the Owner's Consulting Engineer in the form of a booklet or binder. Submittals shall include at least the following:
 - 1.5.1.1 Plan view drawing showing arrangement of the odor control unit.
 - 1.5.1.2 Product drawings and cut sheets on all furnished equipment.
 - 1.5.1.3 Detailed physical drawings of the odor control unit to include all external piping connections and associated sizes, and materials of construction.
 - 1.5.1.4 Product data sheets for the blower and drive motor including performance curve with operating point and data.
 - 1.5.1.5 Specification data for the activated carbon media.

1.4 PRODUCT HANDLING

- 1.4.1 All equipment items shall be properly protected so that no damage or deterioration will occur from the time of shipment until installation is completed and the units and equipment are ready for operation.
- 1.4.2 All exposed blower and equipment openings shall be protected.
- 1.4.3 Proper care shall be taken to protect mechanical parts from the entrance of water during shipment, storage, and handling.
- 1.4.4 Each box or package shall be properly marked to show its contents.

PART 2.0 PRODUCTS

2.1 GENERAL

- 2.1.1 All equipment furnished shall be new and suitable for the conditions of service to which they will be subject. Workmanship shall be of the highest quality and shall be carried out by competent and experienced workmen. All parts shall be protected so that no damage may occur during a long delay from time of shipment to time of completion of installation.
- 2.1.2 Operating Conditions - The odor control system shall be suitable for long-term operation under the following operating conditions.
 - 2.1.2.1 Duty: Continuous or cycle timed, per electrical design requirement.
 - 2.1.2.2 Ambient environment: Exterior

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|--|-------------------------|
| 2.1.2.3 Ambient Temp. (°F): | 50-105 |
| 2.1.2.4 Project site elevation (ft. MSL): | xxx |
| 2.1.2.5 Total air flow (SCFM): | xx |
| 2.1.2.6 Average influent H ₂ S conc. (ppm): | 15 |
| 2.1.2.7 Maximum influent H ₂ S conc. (ppm): | <50 ppm, intermittent |
| 2.1.2.8 Removal required (%): | >99.0% H ₂ S |

2.2 CARBON ADSORPTION VESSEL

2.2.1 The adsorber canister shall be constructed entirely of 304L stainless steel. The canister shall contain an internal carbon support structure fabricated of 304L stainless steel perforated screen. Drilled or slotted pipe shall not be acceptable as an air distribution means. An air distribution plenum shall be located at the beginning throughpoint of the canister. The canister shall have a bottom inlet and bottom fully screened outlet. The canister shall have an EPDM-gasketed, removable stainless steel roll formed full sized lid with adjustable tension lever-locking retaining ring for carbon replacement access. A 1/4" drain valve shall be located at the bottom of the piping header for the removal of condensate.

2.2.2 Design - The carbon adsorption vessel shall meet the following design criteria:

| | |
|---|---------------|
| 2.2.2.1 Number of vessels (minimum): | x (1-4) |
| 2.2.2.2 Minimum diameter (in): | xx (16/20/24) |
| 2.2.2.3 Maximum height (in): | 32 |
| 2.2.2.4 Depth of carbon (in): | 24 |
| 2.2.2.5 Inlet size (in): | 4 |
| 2.2.2.6 Airstream Carbon Contact time (max) | 1 Lf/Sec |

2.3 ACTIVATED CARBON

2.3.1 The carbon vessel shall be filled with (84,136,185) lbs of high H₂S capacity catalytic type carbon. The carbon shall be designed for low pressure drop.

2.3.2 The catalytic carbon shall meet the following design criteria

| | | |
|----|--|----------|
| 1. | Iodine No., mg/g | 800 min |
| 2. | Butane Activity, weight % | 15.6 min |
| 3. | Ash, weight % | max |
| 4. | Moisture, weight % as packed | 4 max |
| 5. | Hardness No. 97 | min |
| 6. | Apparent Density, g/ml | 0.56 min |
| 7. | Mean Particle Diameter, mm | 3.7 min |
| 8. | Initial H ₂ S Breakthrough Capacity, g H ₂ S removed/cc Carbon | 0.09 min |

9. Ultimate H2S Breakthrough Capacity, g H2S removed/cc Carbon 0.69 min

The determination of H2S breakthrough capacity will be made by passing a moist (85% R.H.) air stream containing 1% H2S at a rate of 1,450 cc/min. through a 1 inch diameter by 9 inch deep bed of uniformly packed activated carbon and monitored to 50 ppm breakthrough. Results are expressed in grams H2S removed per cc of carbon. Test shall be performed per ASTM Test method D-6646, without modification or addition.

The determination of ultimate H2S breakthrough capacity based upon ability to be regenerated 10 times.

The carbon supplied shall be of a type that does not require chemicals to be regenerated in-place. Carbons which require hydroxide, permanganate, chlorine, organic, or other solutions, except clean water (see Table I), to regenerate the material, will not be accepted.

TABLE I - WATER QUALITY SPECIFICATIONS

Potable water with the following additional restrictions:

Iron Spec <.3 mg/l Manganese Spec < 1 mg/l

Langlier index < 0.3 units on the scaling side or alternatively pH between 6.5 and 8.5 with a TDS < 500 (recommended maximum) to 1000 (permissible maximum) mg/l.

Turbidity <.5 NTU Non-biofouling Less than 5 microns of particulate Less than 5 ppm TOC

Less than 1 ppm free chlorine

2.4 CENTRIFUGAL BLOWER

2.4.1 The blower shall have a radial, non sparking wheel design with an aluminum housing, and be coated interior and exterior with Devran epoxy. The blower shall be rated for outdoor operation. The blower shall be directly coupled to the drive and mounted in a common housing.

2.4.2 Drive - The drive shall be a continuous duty, 115/208-230/460 V, .xx HP, x phase, 60 Hz, TEFC or XP electric motor. The motor shall be manufactured by WEG, or equal, and shall be rated for IP66 or better.

2.4.3 Design - The fan shall be designed to meet the following criteria:

- 2.4.3.1 Number of fans: 1
- 2.4.3.2 Capacity at design conditions (SCFM): xx
- 2.4.3.3 Discharge pressure (in. of water): x.xx" esp
- 2.4.3.4 Maximum inlet temperature (°F): 105
- 2.4.3.5 Blower Speed, max. (RPM): 3500
- 2.4.3.6 Inlet size (in.): 4 or 6 inch
- 2.4.3.7 Outlet size (in.): 4

2.5 PROCESS STREAM PIPING

- 2.5.1 Process stream piping contained within the odor control unit shall be schedule 10 stainless steel. Sizes shall be as shown on the drawings.

2.6 SYSTEM WIRING

- 2.6.1 The blower shall be equipped with a standard electrical motor connection junction box. Field connection of a 120/208-230/460 volt, 1 or 3 phase, 60 Hz power supply to the cycle time controller or direct to the motor shall be made in accordance with the National Electrical Code (NEC), and all other related local electrical and fire codes requirements.

2.7 ACCEPTABLE PRODUCTS

Odor Control System shall be Model 4xx(insert canister diameter)SMSS-xxx(canister max cfm capacities)-xx(design cfm) as manufactured by EZ Vent Odor Control, Conowingo, MD, (410 658 2000). Items to be furnished by manufacturer shall also include one EZ Vent cycle timer controller, four vibration isolators, eight ss stud anchors, and one full charge of carbon.

2.8 OTHER MATERIALS

All other materials, not specifically described but required for a complete and proper installation of the work of this Section, shall be new; first quality of their respective kinds; and subject to approval of the Engineer.

PART 3.0 EXECUTION

3.1 INSTALLATION

Installation by the Contractor of each equipment item shall be in strict accordance with the Engineer's instructions and recommendations in the locations shown on the drawings. All cost for the installation shall be borne by the contractor. Unit shall be located outside of the pump station class 1, div 1 or div 2 two envelope.

3.2 INSPECTION, START-UP, AND OPERATOR TRAINING

A Manufacturer representative shall be present to perform the required inspection, start-up, and operator training services for the system. The Owner shall schedule this service with the manufacturer's representative and his intended system operators.

3.3 TESTING

After all equipment has been completely installed according to the direction of the Manufacturer and conducted in the presence of the Owner, tests shall be performed to indicate that the System operates satisfactorily and will meet the

design criteria set in this Specifications Section. Visual inspection will be made at this time for any discrepancies, which shall be corrected. The field test shall demonstrate correct mechanical operation after system start-up. Field tests shall include all equipment included under this section.

END OF SECTION