

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 5	PAGE 1
	APPL NO 519422 REV	DATE 03/08/2012
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PERMIT TO CONSTRUCT

APPLICANT'S NAME: ORANGE COUNTY SANITATION DISTRICT (OCS D)

MAILING ADDRESS: 10844 ELLIS AVENUE
 FOUNTAIN VALLEY, CA 92708-7018
 ATTN.: TERRY AHN, REGULATORY SPECIALIST

EQUIPMENT ADDRESS: 22212 BROOKHURST STREET (PLANT NO. 2)
 HUNTINGTON BEACH, CA 92646

FACILITY ID NO.: 029110

EQUIPMENT DESCRIPTION:

ODOR CONTROL SYSTEM FOR THE BIOSOLIDS TRUCK LOADING STATION, CONSISTING OF;

1. EXHAUST BLOWER, MAXIMUM 3000 CFM, 15 H. P., VENTING TWO (2) BIOSOLIDS STORAGE SILOS (PART OF THE SLUDGE PROCESSING STATION, PC 453240).
2. ADSORBER, BAY PRODUCTS, SPARROW 3000, 8' DIA. X 7'- 3" H. OVERALL, CONTAINING MINIMUM OF 3800 LBS OF ACTIVATED CARBON (BOTTOM LAYER) AND 1500 LBS OF POTASSIUM PERMANGANATE (KMNO4) IMPREGNATED MEDIA (TOP LAYER). EQUIPPED WITH DIFFERENTIAL PRESSURE GAUGE AND A DEMISTER.
3. EXHAUST STACK, 1' - 6" DIA. X 13' - 6" HIGH ABOVE GROUND.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATIONS UNDER WHICH THIS PERMIT IS ISSUED.
 [RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITIONS AT ALL TIMES.
 [RULE 204]
3. THE OPERATOR MAY USE ALTERNATE MEDIA AND AMOUNTS IN ORDER TO OPTIMIZE THE ODOR CONTROL SYSTEM, PROVIDED SUCH ALTERNATE MEDIA AND AMOUNTS ARE GUARANTEED BY THE VENDOR TO MEET THE EMISSION LIMITS IN THIS PERMIT.
 [RULE 204]

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4. THIS PERMIT SHALL EXPIRE IF CONSTRUCTION OF THE EQUIPMENT IS NOT COMPLETED WITHIN ONE YEAR FROM THE DATE OF ISSUANCE OF THIS PERMIT UNLESS AN EXTENSION IS GRANTED BY THE EXECUTIVE OFFICER.
[RULE 205]
5. SAMPLING PORTS SHALL BE PROVIDED AT THE INLET AND OUTLET OF THE ODOR CONTROL SYSTEM TO ALLOW COLLECTION/ANALYSIS OF THE INLET FOUL AIR AND TREATED EXHAUST STREAM.
[RULE 204]
6. THE OPERATOR SHALL INSTALL AND MAINTAIN A DIFFERENTIAL PRESSURE GAUGE TO ACCURATELY INDICATE THE DIFFERENTIAL PRESSURE, IN INCHES OF WATER COLUMN, ACROSS THE MEDIA BED.
[RULE 204]
7. THE OPERATOR SHALL, ON A WEEKLY BASIS, MEASURE AND RECORD THE DIFFERENTIAL PRESSURE DROP, IN INCHES OF WATER COLUMN, ACROSS THE MEDIA BED.
[RULE 204]
8. IN OPERATION, THE PRESSURE DROP MEASURED ACROSS THE MEDIA BED SHALL BE MAINTAINED BETWEEN 4.8 AND 8.4 INCHES OF WATER COLUMN, OR ANOTHER RANGE SPECIFIED BY THE MANUFACTURER. MANUFACTURER'S PRESSURE DROP RANGE SPECIFICATIONS FOR THIS EQUIPMENT SHALL BE KEPT ON FILE AND SHALL BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 204]
9. THE HYDROGEN SULFIDE (H₂S) CONCENTRATION (PPMV) AT THE INLET TO ODOR CONTROL SYSTEM SHALL BE MONITORED AND RECORDED ON A WEEKLY BASIS FOR THE FIRST MONTH OF OPERATION, AND MONTHLY THEREAFTER USING COLORIMETRIC H₂S TUBES OR ANY OTHER DISTRICT APPROVED METHOD.
[RULE 204]
10. THE HYDROGEN SULFIDE (H₂S) CONCENTRATION (PPMV) IN THE EXHAUST OF THE ODOR CONTROL SYSTEM SHALL BE MEASURED AND RECORDED AT LEAST ONCE A WEEK USING COLORIMETRIC H₂S TUBES, HANDHELD H₂S ANALYZER, OR ANY OTHER DISTRICT APPROVED METHOD.
[RULE 204]
11. IN OPERATION, THE HYDROGEN SULFIDE (H₂S) CONCENTRATION IN THE EXHAUST OF THE ODOR CONTROL SYSTEM SHALL NOT EXCEED 1.0 PPMV.
[RULE 402, 1401]
12. THE MEDIA IN THE ADSORBER SHALL BE REPLACED WITH MINIMUM AMOUNT (LBS) OF FRESH CARBON MEDIA, AS DESCRIBED UNDER EQUIPMENT DESCRIPTION OR CONDITION NO. 3, WHENEVER NECESSARY TO COMPLY WITH THE CONDITIONS OF THIS PERMIT.
[RULE 204]
13. SPENT MEDIA REMOVED FROM THIS SYSTEM SHALL BE MAINTAINED OR STORED IN CLOSED CONTAINERS PRIOR TO REMOVAL FROM SITE.

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[RULE 402]

14. RECORDS SHALL BE MAINTAINED AS REQUIRED BY THIS PERMIT INCLUDING MEDIA CHANGE OVER DATE(S), QUANTITY, AND VENDOR GUARANTEES FOR COMPLIANCE. THE RECORDS SHALL BE KEPT FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.

[RULE 204]

BACKGROUND:

The above application, No. 519422, was submitted on 3/03/2011 for the existing equipment on site, but no longer in operation. Previously this equipment was issued a permit to construct under A/N 471696; however, the equipment was shutdown as applicant believed that equipment may not comply with odor control inlet ammonia (ppmv) condition. This new application, for the same equipment, is evaluated as a permit to construct/operate (PO evaluation, Class III, will trigger higher fees) and with respect to only H2S odors (this is a temporary unit). The odor control system for treating the foul-air exhaust from existing two (2) silos, containing dewatered sewage sludge (these storage vessels are a part of the Sludge Processing Station described under basic equipment description under current PC 453240, item # 18) at the truck loading bays. This is a Title V facility.

PROCESS DESCRIPTION:

Proposed odor control system, Bay Products, Sparrow 3000, will be located at the existing truck loading bays. The system is designed to treat maximum of 3000 cfm of foul-air exhaust containing sulfur based odorous compounds, mainly H2S, from two silos containing dewatered sewage solids. The carbon vessel will contain two layers of media, (1) top layer containing minimum of 1,500 lbs of potassium permanganate (KMNO4) impregnated media and (2) minimum 3,800 lbs of granular activated carbon Total media height is 3'. Adsorber vessel is equipped with one Dwyer model 2015 Magnehelic pressure gauge to measure pressure drop across the bed. At 70 ft/min, maximum pressure drop is 2.8" water column / ft of bed or a total pressure drop across the bed = 2.8" x 3' = 8.4" water column. There is a 6" thick demister pad following adsorbent media. Inlet and outlet foul air will be monitored for H2S concentrations. H2S control efficiency is assumed to be 95%. Design typical face velocity = 50 fpm, with residence time of 3 seconds.

Estimated Carbon Breakthrough (H2S)

Inlet H2S con. in foul air = 5 ppmv
 Total minimum GAC = 5300 lbs (2 layers of media).

H2S loading from silos exhaust = (3000) (5E-06) (1/379) (34) (60) = **0.08 lbs/hr (R1)** = 1.9 lbs/day.

Controlled H2S emission = 0.08 (1.0 - 0.95) = 0.004 lbs/hr (R2) = 0.1 lb/day

H2S adsorption capacity = 0.45 lbs H2S/lb of C (FORM 400-E-2b).

Total H2S adsorption capacity = 5300 lbs C x 0.45 lbs H2S/lb of C = 2385 lbs H2S

Estimated Breakthrough for H2S = 2385 lbs H2S / 1.9 lbs H2S loading per day = 1255 days (3.4 yrs).

However, as per current practice, H2S con. limit in exhaust is kept at 1 ppmv (permit condition).

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$$H_2S (R_2) = (3000) (1.0E-06) (34) (60) / 379 = \underline{0.016 \text{ lbs/hr } (R_2)}$$

Note: Potential ammonia emission from the upstream sewage handling processes (trunklines, headworks, primary treatment) were controlled by the respective odor control equipment (Ref. A/N 428642). For previously permitted dewatered solids, truckloading facility and respective control equipment please refer to the information provided by OCSD E-mail, April 01, 2011. This also includes correspondence from OCSD to AQMD.

RULES EVALUATION:

Rule 212: This is not a significant project. There are no schools within 1000' of emission source. H₂S emission is the main pollutant expected and is not a carcinogen, and not subject to MICR analysis. No public notice is required. Compliance is expected.

Rule 401: The equipment is not expected to emit visible emissions with proper operation and maintenance.

Rule 402: With proper operation, monitoring and maintenance of the equipment no odor complaints are anticipated. The equipment is the same for which PC was granted on 3/05/2008, under A/N 471696, for 1.0 ppmv H₂S limit in exhaust. Compliance with odor threshold limits is expected under CSAAQS (< 30 ppbv) and OEHHA (8 ppbv), see reference below.

H₂S ODOR CONTROL ANALYSIS: (Ref. A/N 471696)

SCREEN 3 model analysis indicated 1-hr maximum ground level con. = 168.5 mcg/m³ @ 1 lb/hr emission rate.

$$\begin{aligned}
 @ 0.016 \text{ lbs } H_2S / \text{hr} \times 168.5 \text{ mcg/m}^3 / 1 \text{ lb/hr} &= 2.696 \text{ mcg/m}^3 \\
 &= 2.696 \times 0.02445 / 34 \\
 &= 0.0019 \text{ ppmv } H_2S \\
 &= \underline{1.9 \text{ ppbv}} < 30 \text{ ppbv } H_2S \text{ limit under CSAAQS.} \\
 &\quad < 8 \text{ ppbv } H_2S \text{ odor threshold under OEHHA.}
 \end{aligned}$$

California State Ambient Air Quality Standard (CSAAQS)
California Office of Environmental Health Hazard Assessment Office (OEHHA).

Reg. 13: This regulation is not applicable to the installation of odor control equipment on an existing facility (no emission increase).

Rule 1401: H₂S is not a carcinogen and therefore not subject to MICR. HIC and HIA indices are less than 1, each under Tier 1 and Tier 2 analysis. Compliance is expected.

Rule 1401.1: Exempt. This is an existing facility.

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Reg. XXX: Compliance is expected. Title V revision A/N 519421 is submitted.

CONCLUSIONS / RECOMMENDATIONS:

Compliance with AQMD's applicable Rules and Regulations is expected.
 Issue a P/C, upon completion of EPA 45-day review, subject to the conditions listed on Pgs. 1 through 3.

Note: Upon approval of this permit, PC 471696 shall be inactivated (TV Section H, Rev 01, Pg. 20-21).