

Draft Engineering Evaluation
Pangea Environmental Services Inc
8410 Amelia Street, Oakland, CA 94621
Application No. 30383; Plant No. 24648

Background

Pangea Environmental Services Inc has applied for an Authority to Construct for soil remediation at the site located at 8410 Amelia Street, Oakland, CA 94621. The project location is at a new facility.

S-1 Sub-Slab Depressurization system consisting of one 340 max scfm Pentair SST70 Blower abated by;

A-1 Two 1,000lb capacity Activated Carbon Vessels in Series

This soil vapor extraction unit consists of a 340 scfm blower. Soil vapor will be extracted with vapor abatement achieved by two 1,000 lb carbon beds in series. The proposed system will be designed to extract vapor from five industrial buildings with sub slabs and crawl spaces with only one blower. Soil vapor samples were extracted for laboratory analysis at the proposed site. The results show presence of petroleum hydrocarbons at the site. The results for benzene and ethyl benzene were 2.3 and 323 ug/m³ respectively. However, both pollutants will be assumed to be near toxic trigger level for conservative estimate. Emission monitoring for operation of the equipment will be conducted according to established Source Test methodology. Procedures are outlined in the conditions

The applicant will be conditioned to provide written notification at the start of the operation. Procedures are outlined in the conditions found below. The Carbon unit influent and effluent volatile organic carbon concentrations will be monitored with a photoionization detector (PID) on a schedule reflecting current loading rates and predicted Carbon capacity. Monitoring schedule changes will be allowed only after District review of concentration measurements and subsequent receipt of District approval.

Emission Calculations

For a conservative estimate of yearly emissions, we shall assume that the system is operated for an entire year within an inlet concentration corresponding to the initial soil concentration level. Generalized assumptions follow:

- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21°C; 1 mole occupies 24.15L
- Influent rate based off maximum blower capacity of 340 scfm and laboratory results submitted with this application. Benzene and ethylbenzene are assumed to be near toxic trigger level.
- Overall abatement efficiency of 90 % was assumed for A-1.
- Example Calculations can be seen below:

$$2500 \frac{\mu g}{m^3} (\text{Benzene}) \times 340 \frac{ft^3}{min} \times 1440 \frac{min}{day} \times \frac{1}{35.31} \frac{m^3}{ft^3} \times \frac{1}{4.54 \times 10^8} \frac{lb}{\mu g} = 0.076 \frac{lb}{day} (\text{unabated})$$

$$0.076 \frac{lb}{day} (\text{Benzene}) \times (1 - 90.0\%) \times 365 \frac{day}{year} = 2.78 \frac{lb}{year} (\text{abated})$$

$$11.67 \text{ ppmv (total influent)} \times (1 - 90\%) = 1.17 \text{ ppmv (total effluent)}$$

Table 1 – S-1 SVE System

Pollutant	Max Influent vapor concentration [µg/m ³]	Max Influent vapor concentration [ppmv]	Effluent vapor concentration [ppmv]	Unabated Emission [lb/day]	Abated Emission [lb/day]	Abated Emission [lb/yr]
Benzene	2500	0.77	0.077	0.076	0.008	2.78
Ethyl Benzene	29000	6.57	0.657	0.884	0.088	32.28
Toluene	198	0.05	0.005	0.006	0.001	0.22
Xylenes	2937	0.67	0.067	0.090	0.009	3.27
TPH	13300	3.61	0.361	0.406	0.041	14.80
Total	47,935	11.67	1.17	1.46	0.15	53.35

Table 2 – S-1 Criteria Organic Emissions (TPY)

Pollutant	lb/day	lb/yr	TPY
POCs	0.15	53.35	0.027

All compounds in Table 1 are considered to be precursor organic compounds (POC).

Cumulative Increase

Table 3- Plant Cumulative Emissions

Pollutant	Current Permitted Emissions, Post 4/5/91 (TPY)	New Emission Increase with A/N 30370 (TPY)	Cumulative Emissions (TPY)
POCs	0	0.027	0.027

Toxic Risk Screening

Table 4 – S-1 Toxic Review

Toxic Pollutant	Abated Emission (lb/hr)	Abated Emission (lb/yr)	Acute Trigger lb/hr	Chronic Trigger lb/yr	HRA required
Benzene	3.18E-04	2.8	0.06	2.9	N
Ethyl Benzene	3.68E-03	32.28	-	33	N
Toluene	2.52E-05	0.2	82	1.20E+04	N
Xylenes	3.73E-04	3.27	49	2.70E+04	N
TPH	1.69E-03	14.80	-	-	N

Toxic emissions are not expected to exceed the toxic trigger level per reg 2-5 Table 2-5-1.

Offsets

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of precursor organic compounds (POCs) or nitrogen oxides (NO_x). Furthermore, pursuant to Regulation 2-2-303 offsets must be provided for any new or modified source at a major facility with a cumulative increase that exceeds 1.0 ton per year of PM₁₀, PM_{2.5}, or sulfur dioxide (SO₂).

Based on emissions in Table 1, the facility is not expected to have a PTE greater than 10 tons per year of POC or NO_x, nor is the facility a major facility of PM₁₀, PM_{2.5}, and SO₂. Therefore, the requirements of Regulations 2-2-302 and 2-2-303 do not apply.

CEQA

The project is considered to be ministerial under the Districts proposed CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA. This project is in compliance with Chapter 9.2 of the permit handbook.

Compliance

Based on the information submitted, this operation is expected to be in compliance with Regulation 8-47-301, Emission Control Requirements, Specific compounds, and 8-47-302, Organic compounds. The POC emissions will be vented through a Carbon adsorption system at all times of operation.

The TPH influent concentration used in this evaluation is a conservative estimation. GAC Adsorbers would breakthrough in less than a day if this estimation is near actual TPH levels. The applicant was made aware of this and understands that the carbon must be changed upon breakthrough. The applicant has stated that they expect the concentrations to be significantly lower than the conservative estimation.

This project is within 1,000 ft St. of Encompass Academy and Acorn Woodland Elementary. Therefore, this project is subject to the public notification requirements of Regulation 2-1-412. PSD, NSPS, and NESHAPS are not triggered.

Permit Conditions

Permit Condition # 27340

1. The owner/operator shall abate the Precursor Organic Compound (POC) emissions from Source S-1 by A-1 SVE Abatement System, consisting of two 1,000-pound Activated Carbon Vessels arranged in series, during all periods of operation. Influent vapor flow shall not exceed 340 scfm. In no event shall the Toxic Air Contaminants (TACs) emissions to the atmosphere from S-1 exceed the respective chronic trigger levels in District's Regulation 2-5, Table 2-5-1. [Basis: Cumulative Increase, Regulation 2-5].
2. The owner/operator of this source shall monitor with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the District's Source Test Manager at the following locations:

- a. At the inlet to the second to the last carbon vessel in series.
- b. At the inlet to the last carbon vessel in series.
- c. At the outlet of the carbon vessel that is last in series prior to venting to the atmosphere.

When using an FID to monitor breakthrough, readings may be taken with and without a carbon filter tip fitted on the FID probe. Concentrations measured with the carbon filter tip in place shall be considered methane for the purposes of these permit conditions. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

3. The owner/operator shall record these monitor readings in a monitoring log at the time they are taken. The owner/operator shall use the monitoring results to estimate the frequency of carbon change-out necessary to maintain compliance with parts number 4 and 5 and shall be conducted on a daily basis. The owner/operator of this source may propose for District review, based on actual measurements taken at the site during operation of the source, that the monitoring schedule be changed based on the decline in organic emissions and/or the demonstrated breakthrough rates of the carbon vessels. Written approval by the District's Engineering Division must be received by the owner/operator prior to a change to the monitoring schedule. [Basis: Cumulative Increase, Regulation 2-5, TBACT]
4. The owner/operator shall immediately change out the second to last Carbon vessel with unspent carbon upon breakthrough, defined as the detection at its outlet or the higher of the following:
 - a. 10 % of the inlet stream concentration to the Carbon vessel.
 - b. 5 ppmv or greater (measured as isobutylene).[Basis: Cumulative Increase, Regulation 2-5, TBACT]
5. The owner/operator shall immediately change out the last vessel in series with unspent carbon upon detection at the outlet of 1.17 ppmv (measured as isobutylene). [Basis: Cumulative Increase, Regulation 2-5, TBACT]
6. The owner/operator of this source shall maintain the following records for each month of operation of the source:
 - a. The hours and times of operation.
 - b. Each monitor reading or analysis result for the day of operation they are taken.
 - c. The number of carbon beds removed from service.
 - d. Total throughput of soil vapor from source S-1 in Standard Cubic Feet.

All measurements, records and data required to be maintained by the owner/operator shall be retained and made available for inspection by the District for at least two years following the date the data is recorded. [Basis: Regulation 1-523]

7. The owner/operator of S-1 shall report any non-compliance with these conditions to the Compliance and Enforcement Division at the time that it is first discovered. The owner/operator of S-1 shall detail the corrective action taken and include the data showing the exceedance as well as the time of occurrence in the submittal. [Basis: Cumulative Increase, Regulation 2-5]
8. The owner/operator if S-1 shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the various provisions of this conditional Authority to

Construct/Permit to Operate. All measurements, records and data required to be maintained by the owner/operator shall be retained for at least two years following the date the data is recorded. [Basis: Regulation 1-523]

9. Upon final completion of the remediation project, the operator of Source S-1 shall notify the Engineering Division within two weeks of decommissioning the operation. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source is located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412.6. After the comments are received from the public and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance an Authority to Construct for the following source

S-1 Sub-Slab Depressurization system consisting of one 340 max scfm Pentair SST70 Blower abated by;

A-1 (2) 1,000lb capacity Activated Carbon Vessels in Series

by _____
Ali Roohani

December 15, 2020