

**DRAFT**  
**Engineering Evaluation Report**  
**1501 VERMONT LLC**  
**Plant Number 22847**  
**Application Number 26862**

**1501 Vermont Street**  
**San Francisco, CA 94107**

## **Background**

On behalf of 1501 Vermont LLC, Erler & Kalinowski, Inc. (EKI) has applied for an Authority to Construct and Permits to operate a Sub-slab vapor mitigation systems at a property located in San Francisco, Ca. The sub-slab vapor mitigation system will mitigate any migration of VOCs to indoor air resulting from any accumulation of VOCs below the commercial building slab. Extracted vapors will be abated by two parallel sets of two vessels of granulated activated carbon arranged in series before discharge to the atmosphere through an exhaust vent approximately 3' above the roof of the building. Emissions of toxic compounds are expected to be below the respective triggers levels in Regulation 2-5 (Table 2-5-1).

Operation of the source will be conditioned to collect bag samples for subsequent laboratory analysis on each of the first two days of operation. Thereafter, effluent concentrations will be determined by laboratory analysis on a quarterly schedule. The applicant may propose after 6 months of operation that the sampling frequency be reduced to an annual basis. Sampling frequency schedule changes will be allowed only after District review of concentration measurements and subsequent receipt of District approval.

The application covers the following source:

- S-1 Sub-slab Vapor Mitigation System (1 regenerative blower & piping), All Star Model RBH6-305-2, 230 scfm (or equivalent), abated by A-1 and A-2.**
- A-1 Carbon Adsorption Vessels (2 in series, 200 lb each) – EnviroSupply, Model V-200 (or equivalent).**
- A-2 Carbon Adsorption Vessels (2 in series, 200 lb each) – EnviroSupply, Model V-200 (or equivalent).**

## **Emission Calculations**

For a conservative estimate of emissions, it is assumed that the system will be operated for 24 hours a day and 8760 hours a year with maximum inlet concentration level of each compound while the actual inlet concentration will be an average from all the wells. Generalized operating conditions are as follows:

- \* Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21°C
- \* Influent values based on operational parameters of equipment and applicant's supplied soil vapor test results:
  - influent rate: 230 scfm;
  - Tetrachloroethylene (PCE): 5,700 ug/m<sup>3</sup> (= 5.7 ug/L)
  - 1,2,4 - Trichlorobenzene (1,2,4-TMB): 121 ug/m<sup>3</sup> (= 0.121 ug/L)
  - abatement efficiency: 90%

**Emission of each compound is calculated using the following equations:**

$$\text{Emissions, lb/hr} = \text{ug/L} * \text{scfm} * 60 \text{ min/hr} * 28.32 \text{ L/cf} * 10^{-6} \text{ g/ug} * 1 \text{ lb/454 g} * (1-0.9)$$

$$\text{Emissions, lb/yr} = (\text{emissions, lb/hr}) * (8760 \text{ hrs/yr})$$

Emissions, as calculated, are given below:

Compound	Acute trigger level, lb/hr	Chronic trigger level, lb/yr	S-1		
			ug/L	lb/hr	lb/yr
PCE	44	18	5.7	0.0005	4.3
1,2,4-Trichlorobenzene			0.121	0.00001	0.093
Total POC			5.821	0.00051	4.393

**Total POC emissions = 0.0122 lb/day @24 hrs/day**  
**= 4.393 lb/yr @365 days/yr**  
**= 0.0022 tpy**

**Plant Cumulative Increase**

POC = 0.0022 tpy

**Toxics Emissions and Health Risk Screening Analysis**

As can be seen in the table above, toxic compound (PCE) emissions are below the toxic trigger levels and therefore a health risk screening analysis is not required per Regulation 2-5.

**BACT**

POC emissions from the proposed project will be < 10 lbs per highest day and therefore are not subject to the BACT requirements of Regulation 2-2-301.

**Offsets**

Offsets requirements of Regulation 2-2-302 are not triggered for facility wide or permitted POC emissions < 10 tpy.

**CEQA**

The project is considered to be ministerial under the Districts 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 evaluated as per the guidance in Chapter 9.2 of the permit handbook.

## Statement of Compliance

Based on the information submitted, this operation will be expected to comply with the requirements of Regulation 8-47-301, Emission Control Requirements.

**8-47-301 Emission Control Requirement, Specific Compounds:** Any air stripping and soil vapor extraction operations which emit benzene, vinyl chloride, perchloroethylene, methylene chloride and/or trichloroethylene shall be vented to a control device which reduces emissions to the atmosphere by at least 90 percent by weight.

There are two schools (Meadow-Livingston and Bryant Elementary) located within 1000 feet of the project and therefore the project is subject to the public notice requirements of Regulation 2-1-412.

A public notice was distributed on ----- to the parents and guardians of the students of the schools within ¼ mile of the project and to all addresses within 1000 feet of the project. The comment period ended on -----.

*(Discuss comments received)*

PSD, NSPS, and NESHAPS are not triggered.

## Permit Conditions

- S-1 Sub-slab Vapor Mitigation System (1 regenerative blower & piping), All Star Model RBH6-305-2, 230 scfm (or equivalent), abated by A-1 and A-2.**
- A-1 Carbon Adsorption Vessels (2 in series, 200 lb each) – EnviroSupply, Model V-200 (or equivalent).**
- A-2 Carbon Adsorption Vessels (2 in series, 200 lb each) – EnviroSupply, Model V-200 (or equivalent).**

1. The owner/operator shall abate the Precursor Organic Compound (POC) emissions from Source S-1 by A-1 & A-2 SVE Abatement System, two parallel sets of two (200 lb minimum capacity) Activated Carbon Vessels arranged in series, during all periods of operation. Influent vapor flow shall not exceed 230 cfm. In no event shall POC emissions to the atmosphere exceed 0.0122 pound per day and any toxic emissions above the trigger levels listed in the Table 2-5-1 of Regulation 2-5 for S-1.  
[Basis: Cumulative increase, Regulation 2-5, Regulation 8-47-301]
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 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 of the higher of the following:
  - a. 10 % of the inlet stream concentration to the Carbon vessel.
  - b. 10 ppmv or greater (measured as hexane).[Basis: Cumulative Increase, Regulation 2-5, TBACT]
5. The owner/operator shall immediately change out the last carbon vessel with unspent Carbon upon detection at its outlet of 10 ppmv (measured as hexane).  
[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.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 8-47-501, Regulation 1-523]
7. The owner/operate shall report any non-compliance of these conditions to Compliance & Enforcement Division at the time that it is discovered. The owner/operator 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, TBACT]
8. 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]

### Recommendations

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 the District, State, and federal air-quality related regulations. The preliminary recommendation is to issue an Authority to Construct for the source listed below. However, the source will be located within 1000 feet of K-12 schools, which triggers the public notification requirements of the District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

The public notification commenced on ----- and expired on-----. ----- comments were received and after reviewing it is my recommendation that the District issue an Authority to Construct for the following source:

- S-1 Sub-slab Vapor Mitigation System (1 regenerative blower & piping), All Star Model RBH6-305-2, 230 scfm (or equivalent), abated by A-1 and A-2.**
- A-1 Carbon Adsorption Vessels (2 in series, 200 lb each) – EnviroSupply, Model V-200 (or equivalent).**
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By: \_\_\_\_\_  
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Air Quality Engineer II