

**ENGINEERING EVALUATION
WELL TEST, INC
1319 HOWARD AVENUE, BURLINGAME, CA 94010
PLANT NO. 19967; APPLICATION NO. 30093**

BACKGROUND

On behalf of Well Test, Inc., RRM, Inc. has applied for a modification to an existing Permit to Operate (Application No. 27919, PO issued on 01/31/2017) for the following equipment:

**S-2: Portable Soil Vapor Extraction (SVE) System; Make: Rietschle; Model: VLR 300; Maximum flow rate: 212 scfm; abated by
A-2: (2) – 300 lbs Granular Activated Carbon (GAC) Adsorbers arranged in series; Make: BakerCorp; Model: Kleen.Air 55R**

The above equipment will be located at 1319 Howard Avenue, Burlingame, CA 94010 (the site). Portable SVE system will be accomplished by means of a regenerative vacuum blower (S-2) with a maximum flow rate of 212 scfm. The extracted vapors will be abated by A-2, two 300-pound capacity GAC Adsorbers connected in series. The portable SVE system will be operated to remove volatile organic compounds (VOCs) in subsurface vapors at the site.

S-2 will be located within 1,000 feet of the outer boundary of St. Catherine of Siena School at 1300 Bayswater Avenue, Burlingame, CA 94010, and therefore requires public notification per District Regulation 2-1-412. There are no other K-12 schools within ¼ mile of this source. A public notice was prepared and will be sent to the parents or guardians of children enrolled in the above referenced school and to each address within a radius of 1,000 feet of the source.

The source will comply with the updated permit condition #26331 as shown below in the strikeout/underlined format. The system is expected to operate for up to 12 consecutive months.

EMISSIONS CALCULATION

POC and NPOC Emissions from S-2 Portable Soil Vapor Extraction System:

S-2 has an existing Permit to Operate (Application No. 27919). Emissions were calculated and accounted for when the source was issued an Authority to Construct and a Permit to Operate. The calculations have been revised using the highest concentrations of chemical compounds detected from SVE pilot test conducted at the site from January 21 to 28, 2019.

For a conservative estimate of annual emissions, the District staff assumed that the system is operated for the entire year with 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 24.15 L
- Influent values based on operational parameters of equipment: Influent volumetric flowrate limit of 212 scfm
- Maximum effluent concentrations based on soil vapor test results: cis-1,2-Dichloroethene 8.7 µg/m³, tetrachloroethylene (PCE) 7.5 µg/m³, trichloroethylene (TCE) 15 µg/m³

Emissions of Toxic Air Contaminants [PCE]:

$$7.5 \frac{\mu\text{g}}{\text{m}^3} \times 212 \frac{\text{ft}^3}{\text{min}} \times 1440 \frac{\text{min}}{\text{day}} \times \frac{1}{35.31} \frac{\text{m}^3}{\text{ft}^3} \times \frac{1}{4.54 \times 10^8} \frac{\text{lb}}{\mu\text{g}} = 0.000143 \frac{\text{lb}}{\text{day}} \text{ (abated)}$$

Table 1 – Estimated Emissions from S-2

Pollutant	Effluent Vapor Concentration ($\mu\text{g}/\text{m}^3$)	Abated Daily Emissions (lb/day)	Abated Hourly Emissions (lb/hr)	Abated Annual Emissions (lb/yr)
PCE	7.5	1.43E-04	5.96E-06	0.052
cis-1,2-Dichloroethylene	8.7	1.66E-04	6.91E-06	0.061
TCE	15	2.86E-04	1.19E-05	0.104

Total Emissions from S-2:

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from the operation of S-2.

Table 2 – Total Criteria Pollutant Emissions from S-2

Pollutant	Emissions		
	(lb/day)	(lb/yr)	(TPY)
POC	4.52E-04	0.165	0.000
NPOC	1.43E-04	0.052	0.000

PLANT CUMULATIVE INCREASE

Table 3 summarizes the cumulative increase in criteria pollutant emissions that will result at Plant No. 19967 from operation of S-2.

Table 3 - Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions, Post 4/5/91 (TPY)	New Increase with This Application (TPY)	Cumulative Emissions (TPY)
POC	0.001	0.000	0.001
NPOC	0.000	0.000	0.000

HEALTH RISK ANALYSIS**Table 4 - Toxic Air Contaminant Emissions**

Pollutant	Abated Hourly Emissions (lb/h)	Acute Trigger Level (lb/h)	Abated Annual Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	HRA Required? (Y/N)
PCE	5.96E-06	4.40E+01	0.052	1.40E+01	N
cis-1,2-Dichloroethylene	6.91E-06	-	0.061	-	N
TCE	1.19E-05	-	0.104	4.10E+01	N

Based on calculations presented in Table 4, emissions of TACs for S-2 do not exceed acute or chronic trigger levels set forth in Table 1 of Regulation 2-5; therefore, a toxic risk screen is not required.

STATEMENT OF COMPLIANCE

The owner/operator of S-2 is expected to comply with Regulation 8-47-301, "Emission Control Requirements, Specific compounds", and Regulation 8-47-302, "Organic compounds", since S-2 will be abated by A-2. The emissions from S-2 will be required to be vented to A-2 at all times of operation.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxides (SO₂), particulate matter less than 10 micrometer (PM₁₀) and particulate matter less than 2.5 micrometer (PM_{2.5}). Based on the emission calculations presented in POC emissions calculation section, S-2 is subject to BACT, since the potential to emit for all criteria pollutants, if unabated, is greater than 10 pounds per day for S-2. BACT requirements will be achieved in practice and so will be reflected in the permit conditions below

Offsets

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NO_x per Regulation 2-2-302. Table 3 above summarizes increases in criteria pollutant emissions at the plant. Offsets are not applicable to this application, since the emissions do not exceed 10 tons/yr. Thus, this facility is not subject to Regulation 2-2-302.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

This project is considered to be ministerial under the District's 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 as described in the District's Permit Handbook Chapter 9.2 (Soil Vapor Extraction) and therefore is not discretionary as defined by CEQA.

PERMIT CONDITION

Permit Condition #26331

Revised Permit Condition #26331 for S-2 and S-3 for Application #30093

1. The owner/operator of S-2 and S-3 shall provide written notification to the Engineering Division at least 3 days prior to start-up of operation at any new location. The notification shall include:
 - a. Source Number (S-2/S-3) and Plant Number (19967).
 - b. Street address, including zip code, for the location where the source will be operated.
 - c. The name and telephone number of a contact person where the source will be operated.
 - d. The date of initial start-up and estimated duration of operations at that location.
 - e. The distance from the source to the outer boundary of the nearest K-12 school, or indication that the distance is greater than 1500 feet.

In the event that the start-up is delayed less than 5 days, the owner/operator may provide telephone notice of said change to the assigned Engineer in the Engineering Division. If the start-up is delayed more than 5 days, written notification must be resubmitted. [Basis: Regulation 1-441]

2. S-2 and S-3 shall not remain at any single location for a period in excess of 12 consecutive months, following the date of initial operation except as allowed under Section 2-1-220.10. If these portable sources remain at any fixed location for more than 12 months, the portable permit will automatically revert to a conventional permanent location permit and will lose its portability. [Basis: Regulation 2-1-220.2]
3. These portable sources, S-2 and S-3, shall operate at all times in conformance with the eligibility requirements set forth in Regulation 2-1-220 for portable equipment. If any toxic air contaminant emissions are expected to exceed the Table 2-5-1 Trigger Levels, then the health risk assessment requirements of Regulation 2, Rule 5, shall be met before commencement of operation at that site. This will require submittal of a permit application for a Change of Conditions and payment of health risk assessment fees to evaluate operation of these sources at the new location. [Basis: Regulations 2-1-220 and 2-5-401]
4. S-2 and S-3 shall not be operated within 1000 feet of the outer boundary of any K-12 school, unless the applicable requirements of the California Health and Safety Code Section 42301.6 have been met. This will require the submittal of a permit application for a Change of Conditions and payment of ~~public school notification fees~~ public notice fee for the new location.
 - a. ~~The applicable public school notification requirements have been met for operation at: 357 East Taylor Street, San Jose, CA 95112. [Basis: Regulation 2-1-220.4]~~
 - a. The applicable requirements have been met for operation at 1319 Howard Avenue, Burlingame, CA 94010.
5. The owner/operator shall abate the Precursor Organic Compound (POC) emissions from Source S-2, Soil Vapor Extraction (SVE) System, by A-2, Carbon Adsorption System, including two (300 lbs minimum capacity each) activated carbon vessels operated in series, during all periods of operation. Start-up and subsequent operation of each abatement device shall take place only after written notification of same has been received by the District's Engineering Division. The owner/operator shall operate the source such that the soil vapor flow rate from S-2 shall not exceed 212 scfm. [Basis: Cumulative Increase, Regulations 8-47-301 and 302, TBACT]
6. The owner/operator shall abate the Precursor Organic Compound (POC) emissions from Source S-3, Soil Vapor Extraction (SVE) System, by A-3, Carbon Adsorption System, including two (300 lbs minimum capacity each) activated carbon vessels operated in series, during all periods of operation. Start-up and subsequent operation of each abatement device shall take place only after written notification of same has been received by the District's Engineering Division. The owner/operator shall operate the source such that the soil vapor flow rate from S-3 shall not exceed 300 scfm. [Basis: Cumulative Increase, Regulations 8-47-301 and 302, TBACT]
7. The owner/operator shall operate A-2 or A-3, Carbon Adsorption System such that the POC abatement efficiency shall be maintained at a minimum of 99% by weight for inlet POC concentrations greater than or equal to 2000 ppmv (measured as hexane). For inlet concentrations below 2000 ppmv and greater than or equal to 200 ppmv, a minimum abatement efficiency of 97% shall be maintained by the owner/operator. For inlet concentrations below 200 ppmv, a minimum abatement efficiency of 90% shall be maintained by the owner/operator. The minimum abatement efficiency shall be waived if outlet POC concentrations are shown to be less than 10 ppmv (measured as hexane). In no event shall the owner/operator emit more than ~~0.15~~ 0.11 lbs/day of Trichloroethylene (TCE), 84.9 lb/day of Carbon Disulfide, ~~0.05~~ 0.038 lb/day of Tetrachloroethene, 0.0079 lbs/day of Benzene, 0.041 lbs/day of Chloroform, 0.003 lbs/day of Vinyl Chloride. [Basis: Cumulative Increase, Regulation 2-5, Table 2-5-1, TBACT].
8. To determine compliance with Part 7, within 24 hours after start-up of the Activated Carbon Vessels at any new location, the owner/operator of this source ~~these sources~~ shall:
 - a. Analyze the inlet gas stream to determine the vapor flow rate and concentrations of total POC and individual toxic air contaminants present.
 - b. Analyze exhaust gas to determine the flow rate, and the concentrations of total POC and individual toxic air contaminants present.

- c. Calculate the total POC and individual toxic air contaminant emission rates in pounds per ~~hour~~ day and per year based on the exhaust gas analysis and the operating exhaust flow rate. The soil vapor flow rate shall be decreased, if necessary, to demonstrate compliance with Part 7.
 - d. Calculate the POC abatement efficiency based on the inlet and exhaust gas sampling analysis. For the purpose of determining compliance with Part 7, the POC concentration shall be reported as hexane.
 - e. Submit to the District's Engineering Division the test results and emission calculations within one month from the testing date. Samples shall be analyzed according to modified EPA test methods 8015 and 8021 or their equivalent to determine the concentrations of POC and individual toxic air contaminants. [Basis: Regulation 1-441]
 - f. During operation of A-2 or A-3, Activated Carbon Vessels, the owner/operator shall monitor emissions 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:
 - 1) At the inlet to the second to last carbon vessel in series.
 - 2) At the inlet to the last carbon vessel in series.
 - 3) At the outlet of the carbon vessel that is last in series prior to venting to the atmosphere.
 - 4) Such monitoring shall be done on a daily basis.
 - 5) 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 purpose of these permit conditions.[Basis: Cumulative Increase, Regulation 2-5, TBACT]
9. The owner/operator shall record the emissions measured in part 8 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 7. Based on actual measurements taken at the site during source operations, the owner/operator of S-2 and S-3 may propose for District review, 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 any change to the monitoring schedule. [Basis: Cumulative Increase, Regulation 2-5, TBACT]
10. 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 bed.
 - b. 10 ppmv (measured as hexane).[Basis: Cumulative Increase, Regulation 2-5, TBACT]
11. 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]
12. The owner/operator shall maintain the following information for each month of operation of the Activated Carbon Vessels:
 - a. Hours and time of operation.
 - b. Each emission test, analysis or monitoring results logged in for the day of operation they were taken.
 - c. The number of carbon vessels replaced or removed from service and the location of the vessels in A-2/A-3, the date the vessel was removed, the weight of carbon in any new vessels, the date the new vessel was placed in service, and the location of the new vessel in A-2/A-3.
 - d. Total throughput of soil vapor from source S-2/S-3 in Standard Cubic Feet.
 - e. Total throughput of groundwater through Source S-2/S-3 in thousands of gallons.
- The owner/operator shall retain and make available for inspection by the District such records for two years following the date the data is recorded. [Basis: Regulation 1-523]
13. Within 30 days from the completion of each treatment operation at a given location, the owner/operator of these sources shall provide the assigned Engineer in the Engineering Division with a summary showing the following information:

- a. The dates and total number of days that each source was at that location and the dates, and total number of days that each source was operated at that location.
- b. A summary of the abatement efficiency and toxic air contaminant emission rates as determined and reported in the start-up sampling report required by Part 8e above.
- c. The results of any additional emission test, analysis, or monitoring performed on these sources or abatement devices, logged in for the day of operation they were taken.
- d. The total throughput of contaminated soil vapor processed by S-2/S-3 at that location (indicated in cubic feet).
- e. The total emissions of each toxic air contaminant detected at a location, based on the sampling results required by Part 8 above (indicated in pounds).

[Basis: Regulation 1-523]

14. Within 30 days after the end of every calendar year, the operator of these sources shall provide the assigned Engineer in the Engineering Division a year-end summary showing the following information:
 - a. The location(s) at which the sources were operated including the dates operated at each location.
 - b. The total throughput of contaminated soil vapor for the previous four quarters (indicated in standard cubic feet).
 - c. The total emissions of each toxic air contaminant for the previous four quarters (indicated in pounds).

[Basis: Regulation 1-523]

15. The owner/operator 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 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]

16. The owner/operator 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]

RECOMMENDATION

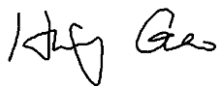
The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue a Permit to Operate 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 of a Permit to Operate for the following source:

S-2: Portable Soil Vapor Extraction (SVE) System; Make: Rietschle; Model: VLR 300; Maximum flow rate: 212 scfm; abated by

A-2: (2) – 300 lbs Granular Activated Carbon (GAC) Adsorbers arranged in series; Make: BakerCorp; Model: Kleen.Air 55R

Prepared by:



Date: 9/16/19

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