Engineering Evaluation Report - DRAFT

CalClean Inc, Plant #12568
6407 Telegraph Ave., Oakland, CA 94609
Application #31106

Background

CalClean Inc ("Applicant") has requested a Change of Condition to an existing Permit to Operate for a portable soil vapor extraction (SVE) unit to allow the equipment to be operated at 6407 Telegraph Ave., Oakland, CA 94609 (Plant #12568) which is within 1,000 feet of a K-12 school. The purpose of this project is to remediate residual concentrations of petroleum hydrocarbons in the gasoline range, such as benzene, toluene, ethylbenzene, xylenes, and ethanol compounds in the subsurface soil and groundwater at the site. The site is at existing ARCO branded gasoline service station No. 0374.

S-3 Portable Soil Vapor Extraction System: Vacuum Blower (Make: Solleco LLC; Model: 500; Max. Operating Rate: 500 scfm) including a Vapor/Oil Separator, Liquid Ring Pump, Vapor/Oil Separator; abated by A-1: Thermal/Catalytic Oxidizer (Make: Solleco, LLC, Model: 500, Max. Operating Rate: 400,000 BTU/hr); powered by CARB Statewide portable registered diesel engine, Isuzu, Model BU-4JJ1T, serial number 154286, rated at 68 bhp

A-1 Thermal/Catalytic Oxidizer

This portable soil vapor extraction unit consists of a vacuum blower (S-3) with a maximum capacity of 500 scfm. Multi-phase extraction (MPE) will utilize a CalClean-supplied mobile remediation trailer (MRT; BAAQMD Plant #12568) and existing onsite monitoring well MW-4. MPE removes groundwater using down-well tubing known as "stingers" to expose normally submerged soil in the vadose zone. A vacuum is applied to the extraction well to remove water via the stingers and extract volatile compounds from the exposed soil. The extracted groundwater and vapors are conveyed to the MRT where they are separated with a vapor/oil separator. Extracted soil vapors will be directed to a thermal/catalytic oxidizer (A-1) for treatment prior to discharge to the atmosphere. At this plant location, the abatement device will be used exclusively as a thermal oxidizer. Extracted groundwater will be pumped from the MPE system's water knockout through a groundwater treatment system with the cumulative flow measured by a flow meter. Treated groundwater is conveyed to the sanitary sewer under permit from East Bay Municipal Utility District. Thermal/Catalytic oxidation will be conducted by a Solleco LLC, Model 500 (certified by SCAQMD) and will be fueled by propane with a 400,000 BTU/hr maximum and 100% excess air capacity. The project is to be powered by CARB Statewide Portable Registered diesel fired Isuzu engine, model BU-4JJ1T, serial no. 154286, rated at 68 bhp.

The thermal/catalytic oxidizer will be equipped with continuous temperature monitoring to ensure that Best Available Control Technology (BACT) destruction efficiencies are met. Emissions monitoring for operation of the equipment will be conducted according to established Source Test methodology. Procedures are outlined in the conditions.

In accordance with Regulation 2-1-413, the Air District may issue "a single multiple-location permit that will allow the source to operate at more than one location in the Air District. The APCO shall issue the permit, upon payment of standard filing, initial, and permit to operate fees as set forth in Regulation 3" if the source satisfies the requirements set forth in Regulation 2 Rule 1 Sections 413.1 through 413.7.

Table 1 - Previous Applications for Plant #12568

Application Number	Project Title	Project Description
1138	New Facility/Portable SVE	Permit to Operate/Authority to Construct
4918	New Source/Vapor Extraction	New Source/Authority to Construct
13287	Portable Equipment	Permit to Operate/Authority to Construct
16470	Portable Equipment	Permit to Operate/Authority to Construct
16676	Change of Conditions	Modification to Authority to Construct/Public Notice
23777	Change of Conditions S-2	Change of Conditions
28010	Soil Vapor Extraction	Change of Conditions/Public Notice
29611	Thermal/Catalytic Oxidizer	Change of Conditions/Public Notice

Operating conditions will be worded to ensure that the requirements, and any expressed emission limits of that section are satisfied, through proper notification, source testing and recordkeeping practices. Regarding emission limits, those of primary concern are the 10 tons per year offsets trigger levels for criteria pollutants, as well as the emission rates corresponding to the acceptable health risk levels identified in Regulation 2-5.

For Operation of Equipment at Multiple Locations Within the District per Regulation 2-1-413.3: "The source will not be operated within 1000 feet of the outer boundary of any K-12 school site unless the applicable notice requirements of Health and Safety Code Section 42301.6 have been met."

This portable soil vapor extraction unit is to be operated at 6407 Telegraph Avenue in Oakland, CA 94609. This location is within 1,000 feet of the outer boundary of Peralta Elementary School, Sankofa United Elementary School, and Escuela Bilingüe Internacional (EBI) Preschool & 1st Grade School. Operation of S-3 and A-1 at 6407 Telegraph Avenue, Oakland, CA requires this permit application to amend the permit conditions and to conduct public notification per Regulation 2-1-412.

Regulation 2-1-412.2 requires that the public notice be distributed to all K-12 schools within a ¼ mile of this source. There are no other K-12 schools within ¼ mile of this source. A Public Notice will be prepared and sent out to the home address of each student at these schools and to each address within a radius of 1,000 feet of the source S-3.

Criteria Pollutant Emission Calculations

For a conservative estimate of annual emissions, the Air District staff assumed that the system will be operated for 24 hours a day and 8760 hours a 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
- Molecular weight of Total Petroleum Hydrocarbons gasoline (TPHg) = 100 g/mole (value for "weathered gasoline").
- Influent values based on operational parameters of equipment and applicant supplied soil vapor test results: Influent volumetric flowrate limit of 500 cf/minute for the fan; maximum influent concentrations of each detected VOC are listed in Table 1.

- During operation, CalClean obtained the Total Inlet and a Stack sample in Tedlar bags every 30 days and submitted these samples to a state certified lab for analyses by USEPA TO-3 for TPHg and USEPA TO-15 for BTEX and Oxygenates (including MTBE).
- Abatement efficiency of 99.99% was calculated for S-3.

The following is an example calculation of pollutant emissions [Total Petroleum Hydrocarbons gasoline (TPHg)] for S-3:

$$1.615 \times 10^7 \frac{\mu g}{m^3} \times 500 \frac{ft^3}{minute} \times 1440 \frac{minute}{day} \times \frac{1}{35.31} \frac{m^3}{ft^3} \times \frac{1}{4.54 \times 10^8} \frac{lb}{\mu g} \times (1 - 0.9999)$$
$$= \mathbf{0.0795} \frac{\boldsymbol{lbs}}{\boldsymbol{day}} \boldsymbol{TPHg} \ (abated)$$

$$0.0795 \frac{lbs}{day} \times \frac{365 \ days}{yr} \times \frac{ton}{2000 \ lb} = \mathbf{0.015} \frac{\boldsymbol{tons}}{\boldsymbol{yr}} \boldsymbol{TPHg} \ (abated)$$

Table 2 – Estimated Emissions from S-3

Pollutant	Influent Vapor Concentration (ppbv)	Influent Vapor Concentration (µg/m^3)	Abated Hourly Emissions (lb/hr)	Abated Daily Emissions (lb/day)	Abated Annual Emissions (lb/yr)
Benzene	13,000	4.20E+04	8.63E-06	2.07E-04	7.56E-02
Toluene	11,000	4.20E+04	8.61E-06	2.07E-04	7.54E-02
Ethylbenzene	2,000	8.79E+03	1.80E-06	4.33E-05	1.58E-02
m,p-Xylene	7,300	3.21E+04	6.59E-06	1.58E-04	5.77E-02
o-Xylene	1,500	6.59E+03	1.35E-06	3.25E-05	1.19E-02
Xylenes, Total	8,800	3.87E+04	7.94E-06	1.91E-04	6.95E-02
Ethanol	0.000	0.000	1.25E-07	3.01E-06	1.10E-03
TPH (as Gasoline)	3.90E+06	1.62E+07	3.31E-03	7.95-02	2.90E+01

Total Emissions from S-3:

Per Regulation 1-234, any organic compounds designated to have negligible photochemical reactivity by the USEPA are considered NPOCs. All the measured components emitted from source S-3 have been determined to have photochemical reactivity per 40 CFR 50.100(s)(1) and are not considered to be NPOCs.

Table 3 summarizes the criteria pollutant emissions that will result from the operation of S-3.

Table 3 – Total Criteria Pollutant Emissions from S-3

Pollutant	Emissions		
	(lb/day)	(lb/yr)	(TPY)
POC	3.34E-04	29.3	0.015
NPOC	0	0	0

Table 4 – Toxic Pollutant Emissions
Chronic Emissions

Pollutant	Abated Project Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	Emissions Exceed Chronic Trigger Levels (Yes/No)
Benzene	7.56E-02	2.90E+00	No
Toluene	7.54E-02	1.20E+04	No
Ethylbenzene	1.58E-02	3.30E+01	No
m,p-Xylene	5.77E-02	2.70E+04	No
o-Xylene	1.19E-02	2.70E+04	No
TPH (as Gasoline)	2.90E+01	2.70E+05	No

Acute Emissions

Pollutant	Abated Project Emissions (lb/hr)	Acute Trigger Level (lb/hr)	Emissions Exceed Acute Trigger Levels (Yes/No)
Benzene	8.63E-06	6.00E-02	No
Toluene	8.61E-06	8.20E+01	No
Ethylbenzene	1.80E-06	-	No
m,p-Xylene	6.59E-06	4.90E+01	No
o-Xylene	1.35E-06	4.90E+01	No
TPH (as Gasoline)	3.31E-03	-	No

Note: TPH-g = total petroleum hydrocarbons (reported as hexane for trigger levels)

Based on calculations presented in Table 4, emissions of TACs for S-3 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.

Cumulative Increase

The Air District tracks increases in emissions from each facility. These cumulative emissions were reset on April 5, 1991 for all facilities. For portable equipment, the cumulative emission increases are charged to the plant pursuant to the initial permit application for the portable equipment. Table 5 below summarizes the emissions calculations from the original permit Application #13287.

Table 5 – Criteria Pollutant Emissions for Originally Permitted Soil Vapor Extraction System, S-3

Source	POC
S-3 (lbs/day)	16.7
S-3 (lbs/year)	6,109
S-3 (tons/year)	3.055

In this case, the emissions summarized below were added to the cumulative emission increases for this facility pursuant to Application #13287. These cumulative emission increases will not change for subsequent applications at new locations unless the operation requires a higher permitted emissions limit.

For Application #31106, the applicant has not requested any increases in emission limits. Therefore, this current application does not result in any cumulative emission increases.

Table 6 - Cumulative Emission Increases, Plant #12568 (tons per year)

Pollutant	Existing	Proposed Project	Post-Project
PM	0.000	0	0.000
POC	3.055	0	3.055
NO_x	0.000	0	0.000
SO_2	0.000	0	0.000
CO	0.000	0	0.000

Statement of Compliance

Regulation 1: General Provisions and Definitions
All sources are subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The proposed soil vapor extraction operation is not expected to be a source of public nuisance.

Regulation 2, Rule 1: California Environmental Quality Act (CEQA) Requirements
District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with the California Environmental Quality Act (CEQA) requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 9.2, Soil Vapor Extraction. Therefore, this application is considered to be ministerial and is exempt from CEQA review.

Regulation 2, Rule 1: School Public Notice Requirements
The public notification requirements of Regulation 2-1-412 apply to modifications which result in any increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school. This project is within 1,000 feet of the boundary of a K-12 school and therefore is subject to the public notification requirements of Reg. 2-1-412. Notifications will be distributed to parents or guardians of students enrolled at Peralta Elementary School, Sankofa United Elementary School, and Escuela Bilingüe Internacional (EBI) Preschool & 1st Grade School, and all residential and business neighbors within 1,000 feet of the proposed new location.

Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements
Under Regulation 2, Rule 2, any new or modified source which results in an increase of 10 lbs/highest day or more of any criteria pollutant must be evaluated for adherence to BACT. As shown in Table 3, the emissions from S-3 abated by A-1 will not exceed 10 pounds/day for precursor organic compounds. Therefore, BACT is not triggered by this application.

Regulation 2, Rule 2: Offsets
The cumulative emission increases for this site and this application are summarized below.

Table 8 – Offsets

Pollutant	Current Balance (tons/year)	Application Increases (tons/year)	New Balance (tons/year)	Offsets Required (tons/year)

PM_{10}	0.000	0.000	0.000	0
POC	3.050	0.000	3.050	0
NPOC	0.000	0.000	0.000	0
NO_X	0.000	0.000	0.000	0
SO_2	0.000	0.000	0.000	0
CO	0.000	0.000	0.000	0

The offset requirements for precursor organic compounds (POC) and nitrogen oxides (NOx) are found in Regulation 2-2-302. Under Regulation 2-2-302, POC and NOx emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more on a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC or NOx per year, the emission offsets may be provided by the District's Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC or NOx, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

Since the criteria pollutant emissions from this site are less than the offset threshold for each pollutant, offsets are not required.

Regulation 2, Rule 5: Health Risk Assessment Requirements
A Health Risk Assessment Toxic Risk Screen need not be prepared as the applicant has agreed to monitor emissions of benzene and determine the cumulative annual emissions. Annual emissions are conditioned to the toxic trigger level. Highest annual emissions are limited to 3.8 pounds per year. The equipment will most likely be operated at one location for only a short duration so this annual limit should not be difficult to meet. In accordance with District Regulation 2-5, the impact is then insignificant as emissions do not trigger a risk screen. Therefore, based on the emissions limits set forth by Reg. 2-5, the Air District has recommended the issuing of this Authority to Construct permit with a benzene emission limit of 0.060 pounds per hour and 2.9 pounds per year. This annual benzene emission limit is equivalent to a daily average emission rate of 0.0079 pounds per day.

Major Facility Review, Regulation 2, Rule 6
40 CFR Part 70, State Operating Permit Programs (Title V)
The Title V federal permitting requirements of 40 Code of Federal Regulations (CFR) Part 70 have been codified and are enforced through District Regulation 2, Rule 6. This regulation applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and other designated facilities. This facility is a not a Phase II acid rain facility, subject solid waste incinerator, or other designated source category. It is not a major facility since the potential emissions are less than the major source thresholds for regulated air pollutants and hazardous air pollutants. This facility is not subject to Regulation 2, Rule 6 or 40 CFR, Part 70.

Regulation 8, Rule 47: Air Stripping and Soil Vapor Extraction Operations
Regulation 8-47-301 requires any air stripping and soil vapor extraction operations which emit benzene, vinyl chloride, perchloroethylene, methylene chloride and/or trichloroethylene to be vented to a control device which reduces emissions to the atmosphere by at least 90 percent by weight. The proposed thermal/catalytic oxidizer will reduce emissions by at least 90 percent by weight.

Regulation 8-47-501 requires that any person subject to the requirements of this Rule shall keep records of any vapor monitoring results that have been collected to monitor the performance of a control device. Such records shall be retained for a minimum of two years from the date of entry and be made available to District staff upon request. Recordkeeping requirements will be placed on the permit to ensure compliance.

Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

Regulation 9-8-301 requires that no person shall operate a stationary internal combustion engine fired exclusively on fossil derived fuels unless the emission limits stated in Regulation 9-8-301.1 through 9-8-301.3 are met. Diesel engines are additionally subject to CARB stationary internal combustion emissions standards. The system is equipped with a diesel fired Isuzu, model BU-4JJ1T, serial no. 154286, rated at 68 bhp to power the CalClean Portable System. In accordance with Regulation 9-8-112, the requirements of this section do not apply as the internal combustion engine is registered as portable pursuant to the Statewide Portable Engine and Equipment Registration Program under Registration No. 162532.

Permit Condition #22646
Condition #22646 setting out the operating and recordkeeping requirements for the operation at source S-3 shall be made a part of the source's Permit to Operate.

OLD CONDITION #22646

1. The operator of this source 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. Application Number (13287, 16470, & 28010) and Plant Number (12568).
   b. Street address, including zip code, for the location where the equipment will be operated.
   c. The name and telephone number of a contact person where the equipment 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 operator may provide telephone notice of said change to the assigned Plant Engineer in the Engineering Division. If the start-up is delayed more than 5 days, written notification must be resubmitted. [basis: Reg. 1-523]

2. This equipment 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 this portable equipment remains 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: Reg. 2-1-220.2]

3. This portable equipment, S-3, shall operate at all times in conformance with the eligibility requirements set forth in Regulation 2-1-220 for portable equipment. [basis: Reg. 2-1-220.2]

4. This equipment is not to 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 an application for a revised permit to operate. These notification requirements have been satisfied for operation at 2500 Laurel Street in Napa, CA (94558) and 793 South Van Ness Avenue in San Francisco, CA (94110). [basis: Reg. 2-1-220.4]

5. This equipment shall be used exclusively for the removal of non-chlorinated volatile organic compounds associated with petroleum products from extracted soil vapor. This shall be demonstrated by onsite sampling required in condition 10 below. [basis: Reg. 2-5]

6. Precursor Organic Compound (POC) emissions from S-3 shall be abated by abatement device A-3, thermal/catalytic oxidizer during all periods of operation. Soil vapor flow rate shall not exceed 500 scfm. [basis: Reg. 8-47-301.1,2 and Cumulative Increase]

7. The POC abatement efficiency of abatement device A-3 shall be maintained at a minimum of 98.5% by weight for inlet POC concentrations greater than or equal to 2000 ppmv (measured as C6). For

inlet concentrations below 2000 ppmv and greater than or equal to 200 ppmv, a minimum abatement efficiency of 97% shall be maintained. For inlet concentrations below 200 ppmv, a minimum abatement efficiency of 90% shall be maintained. The minimum abatement efficiency shall be waived if outlet POC concentrations are shown to be less than 10 ppmv (measured as C6). In no event shall benzene emissions to the atmosphere exceed 2.9 pounds per hour or 0.010 pounds per day. Annual emissions of benzene shall not exceed 3.8 pounds per year. [basis: BACT; Reg. 2-5-110]

8. While operating as a thermal oxidizer, the minimum operating temperature of A-3 shall not be less than 1400 degrees Fahrenheit. While operating as a catalytic oxidizer, the minimum operating temperature of A-3 shall not be less than 600 degrees Fahrenheit. [basis: BACT]

9. To determine compliance with Condition Number 8, the thermal/catalytic oxidizer shall be equipped with continuous measuring and temperature recording instrumentation. The temperature data collected from the temperature recorder shall be maintained in a file which shall be available for District inspection for a period of at least 2 years following the date on which such data are recorded. [basis Reg. 1-523]

10. To determine compliance with Condition 7, within 24 hours after start-up of the thermal/catalytic oxidizer at any new location, the operator of this source shall:
    a. Analyze the inlet gas stream to determine the vapor flow rate and concentration of POC present.
    b. Analyze exhaust gas to determine the flow rate, and the concentration of benzene and POC present.
    c. Calculate the benzene emission rate in pounds per day 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 Condition 7.
    d. Calculate the POC abatement efficiency based on the inlet and exhaust gas sampling analysis. For the purpose of determining compliance with condition 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 benzene.

    [basis: Reg. 1-523]

11. Within 30 days from the completion of each treatment operation at a given location, the operator of this source shall provide the assigned Plant Engineer in the Engineering Division with a summary showing the following information:
    a. The dates and total number of days that the equipment was at that location and the dates, and total number of days that the equipment was operated at that location.
    b. A summary of the abatement efficiency and benzene emission rate as determined and reported in the start-up sampling report required by condition 10e above.
    c. The results of any additionally performed emission test, analysis, or monitoring result logged in for the day of operation they were taken.
    d. The total throughput of contaminated soil vapor processed by S-3 at that location (indicated in cubic feet).
    e. The total emissions of benzene at that location based on the sampling results required by condition 10 above.

    [basis: Reg. 1-523]

12. Within 30 days after the end of every calendar year, the operator of this source shall provide the assigned Plant Engineer in the Engineering Division a year-end summary showing the following information:
    a. The location(s) at which the equipment was operated including the dates operated at each location.
    b. The total throughput of contaminated soil vapor for the previous four quarters (indicated in cubic feet).
    c. The total benzene emissions for the previous four quarters (indicated in pounds).
    [basis: Reg. 1-523]

13. The 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 Permit to Operate. All measurements, records and data required to be maintained by the operator shall be retained for at least two years following the date the data is recorded. [basis: Reg. 1-523]

14. Any non-compliance with these conditions shall be reported to the Compliance and Enforcement Division at the time that it is first discovered. The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well as the time of occurrence. [basis: Reg. 1-523]

NEW CONDITION #22646

1. The operator of this source 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. Application Number (1138, 4918, 13287, 16470, 16676, 23777, 28010, 29611, & 31106) and Plant Number (12568).
    b. Street address, including zip code, for the location where the equipment will be operated.
    c. The name and telephone number of a contact person where the equipment 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 operator may provide telephone notice of said change to the assigned Plant Engineer in the Engineering Division. If the start-up is delayed more than 5 days, written notification must be resubmitted. [basis: Reg. 1-523]

2. This equipment 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 this portable equipment remains 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: Reg. 2-1-220.2]

3. This portable equipment, S-3, shall operate at all times in conformance with the eligibility requirements set forth in Regulation 2-1-220 for portable equipment. [basis: Reg. 2-1-220.2]

4. This equipment is not to 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 an application for a revised permit to operate. These notification requirements have been satisfied for operation at 2500 Laurel Street in Napa, CA (94558), 793 South Van Ness Avenue in San Francisco, CA (94110), and 6407 Telegraph Avenue in Oakland, CA (94609). [basis: Reg. 2-1-220.4]

5. This equipment shall be used exclusively for the removal of non-chlorinated volatile organic compounds associated with petroleum products from extracted soil vapor. This shall be demonstrated by onsite sampling required in condition 10 below. [basis: Reg. 2-5]

6. Precursor Organic Compound (POC) emissions from S-3 shall be abated by abatement device A-1, thermal/catalytic oxidizer during all periods of operation. Soil vapor flow rate shall not exceed 500 scfm. [basis: Reg. 8-47-301.1.2 and Cumulative Increase]

7. The POC abatement efficiency of abatement device A-1 shall be maintained at a minimum of 98.5% by weight for inlet POC concentrations greater than or equal to 2000 ppmv (measured as C6). For inlet concentrations below 2000 ppmv and greater than or equal to 200 ppmv, a minimum abatement efficiency of 97% shall be maintained. For inlet concentrations below 200 ppmv, a minimum abatement efficiency of 90% shall be maintained. The minimum abatement efficiency shall be waived if outlet POC concentrations are shown to be less than 10 ppmv (measured as C6). In no event shall benzene emissions to the atmosphere exceed 0.060 pounds per hour or 0.0079 pounds per day. Annual emissions of benzene shall not exceed 2.9 pounds per year. [basis: BACT; Reg. 2-5-110]

8. While operating as a thermal oxidizer, the minimum operating temperature of A-1 shall not be less than 1400 degrees Fahrenheit. While operating as a catalytic oxidizer, the minimum operating temperature of A-1 shall not be less than 600 degrees Fahrenheit. [basis: BACT]

9. To determine compliance with Condition Number 8, the thermal/catalytic oxidizer shall be equipped with continuous measuring and temperature recording instrumentation. The temperature data collected from the temperature recorder shall be maintained in a file which shall be available for District inspection for a period of at least 2 years following the date on which such data are recorded. [basis Reg. 1-523]

10. To determine compliance with Condition 7, within 24 hours after start-up of the thermal/catalytic oxidizer at any new location, the operator of this source shall:
    a. Analyze the inlet gas stream to determine the vapor flow rate and concentration of POC present.
    b. Analyze exhaust gas to determine the flow rate, and the concentration of benzene and POC present.
    c. Calculate the benzene emission rate in pounds per day 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 Condition 7.
    d. Calculate the POC abatement efficiency based on the inlet and exhaust gas sampling analysis. For the purpose of determining compliance with condition 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 benzene.

    [basis: Reg. 1-523]

11. Within 30 days from the completion of each treatment operation at a given location, the operator of this source shall provide the assigned Plant Engineer in the Engineering Division with a summary showing the following information:
    a. The dates and total number of days that the equipment was at that location and the dates, and total number of days that the equipment was operated at that location.

b. A summary of the abatement efficiency and benzene emission rate as determined and reported in the start-up sampling report required by condition 10e above.
c. The results of any additionally performed emission test, analysis, or monitoring result logged in for the day of operation they were taken.
d. The total throughput of contaminated soil vapor processed by S-3 at that location (indicated in cubic feet).
e. The total emissions of benzene at that location based on the sampling results required by condition 10 above.

[basis: Reg. 1-523]

12. Within 30 days after the end of every calendar year, the operator of this source shall provide the assigned Plant Engineer in the Engineering Division a year-end summary showing the following information:
a. The location(s) at which the equipment was operated including the dates operated at each location.
b. The total throughput of contaminated soil vapor for the previous four quarters (indicated in cubic feet).
c. The total benzene emissions for the previous four quarters (indicated in pounds).

[basis: Reg. 1-523]

13. The 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 Permit to Operate. All measurements, records and data required to be maintained by the operator shall be retained for at least two years following the date the data is recorded. [basis: Reg. 1-523]

14. Any non-compliance with these conditions shall be reported to the Compliance and Enforcement Division at the time that it is first discovered. The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well as the time of occurrence. [basis: Reg. 1-523]

Recommendations

The Air District has evaluated the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable District, state, and federal air quality-related regulations, including the health risks resulting from toxic air contaminant emissions. The preliminary recommendation is to issue a permit for the equipment listed below. After considering all comments received during the Public Comment Period, the Air District will make a final determination.

I recommend that the Air 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-3 Portable Soil Vapor Extraction System (Make: Solleco LLC; Model: 500; Max. Operating Rate: 400,000 BTU/hr)

A-1 Thermal/Catalytic Oxidizer

Prepared by:

_____ 9/17/21

Melissa Tanaka Date
Engineering Intern

Reviewed/Approved by:

_____ 9/17/21

Barry G. Young Date
Senior Advanced Projects Advisor