DRAFT Engineering Evaluation
The Elms
18764 Cox Avenue, Saratoga, CA 95070
Plant No. 203190
Application No. 682340 and 684800

Project Description:
One Soil Vapor Extraction System
and Seventeen Sub-Slab Depressurization Systems

Background

The Elms has applied for an Authority to Construct for the following equipment:

S-1	**Soil-Vapor Extraction System** **Soil Vapor Extraction System, Roots Frame 718 Universal RAI Blower, Maximum 2000 acfm**

Abated by

A-1	**One 5,000 lbs. of Granular Activated Carbon System, and One Permanganate Vessel in Series**

And

S-2 through S-18	**Sub-Slab Depressurization System** **Sub-Slab Depressurization System, RadonAway EC6 Pro Series Fan, Maximum 60 acfm for Each Sub-Slab Depressurization System**

Abated by

A-2 through S-18	**One 7 lbs. Granular Activated Carbon System,** **and One Permanganate Vessel in Series** **for Each SSD System**

The facility is proposing to construct and operate one full-scale soil vapor extraction (SVE) and 17 sub-slab depressurization (SSD) systems in conjunction with the proposed redevelopment of The Elms (formally the Quito Village Center) located at 18764-18850 Cox Avenue in Saratoga, California (Site). The approximately 6.3-acre Site is currently developed with a commercial strip mall that included a dry-cleaner facility. Due to historical dry cleaner operations, chlorinated volatile organic compound (VOC) impacts are present in soil and soil vapor in the subsurface underlying the Site. Environmental remediation activities are being conducted under the oversight of Santa Clara County Department of Environmental Health (SCCDEH). Implementation of the SVE is required for the Site to be redeveloped into mixed residential and commercial use.

The main compound found in the soil was perchloroethylene (PCE). Emissions calculations were based on laboratory results from samples taken at the site. S-1 Soil Vapor Extraction (SVE) system

will be abated by a granular activated carbon (GAC) system with permanganate. Therefore, 96% abatement will be expected for S-1, per correspondence with the facility on 01/11/2024. S-2 through S-18 Sub-Slab Depressurization (SSD) systems will also be abated by GAC and permanganate. Since the emissions are so low, the minimum of 90% abatement will be required, per correspondence with the facility on 01/11/2024.

At 96% abatement for S-1, and 90% abatement for S-2 through S-18, no emissions are expected to trigger Health Risk Assessment per Regulation 2-5, Table 1.

Procedures are outlined in the conditions found below. The applicant will be required to provide written notification at the start of the operation. The applicant will be required to stay below the acute and chronic trigger levels of Regulation 2-5. Effluent volatile organic compound (VOC) concentrations will be monitored with a flame-ionization detector (FID).

The site is not located within the boundary of an overburdened community. However, this site is located within 1,000 feet of Challenger School (Preschool & Kindergarten). Therefore, public notification is required per Regulation 2-1-412.

Emission Calculations

Initial soil vapor data is used to estimate precursor organic compound (POC), non-precursor organic compound (NPOC), and toxic air contaminant (TAC) emissions. It is assumed that the equipment can operate 24 hours a day, 365 days a year. The following assumptions are used to estimate emissions.

S-1 SVE System

- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21^{o}C; 1 mole occupies 24.15 Liters (or 386.8 ft3/pound-mol).
- Toxic Air Contaminants (TAC) emissions will be based on soil vapor data submitted with this application.
- The organic influent flow rate of 2000 acfm, which converts to 914 dscfm at 120 degrees F,and 50% water content by volume.

dscfm = acfm x (459.67 R + 70 F)/(459.67 R + temp in F) x (actual P/ 14.7 psi) x (1- volumetric fraction of water vapor)

dscfm = dry cubic feet per minute at standard conditions (14.7 psi and 70 degrees F)
acfm = actual cubic feet per minute
R = temperature (degrees Rankine)
F = temperature (degrees Fahrenheit) = 70 F
P = pressure (psi) = 14.7 psi

- The system will be abated by one (1) 5,000 lbs. of Granulated Activated Carbon and one permanganate vessel pursuant to Regulation 8-47-301. 96% abatement efficiency is assumed.

- Emissions are from a pilot test report completed in April of 2021 for The Elms by WSP USA Inc..

Table 1. S-1 SVE System Abated Emissions						
Pollutant	**CAS #**	**Abated Emissions**				
		Inlet Conc. (ug/m3)	**Hourly Emission Rate (lb/hr)**	**Daily Emission Rate (lb/day)**	**Annual Emission Rate (lb/yr)**	**Annual Emission Rate (ton/yr)**
Acetone	67-64-1	22	3.01E-06	7.22E-05	2.64E-02	1.32E-05
Benzene	71-43-2	2.5	3.42E-07	8.21E-06	3.00E-03	1.50E-06
Chloroform	67-66-3	13	1.78E-06	4.27E-05	1.56E-02	7.79E-06
Ethanol	64-17-5	1500	2.05E-04	4.93E-03	1.80E+00	8.99E-04
Trichlorofluoromethane	75-69-4	31	4.24E-06	1.02E-04	3.72E-02	1.86E-05
Dichlorodifluoromethane	75-71-8	140	1.92E-05	4.60E-04	1.68E-01	8.39E-05
Perchloroethylene (PCE)	127-18-4	8800	1.20E-03	2.89E-02	1.05E+01	5.27E-03
Cumene	98-82-8	15	2.05E-06	4.93E-05	1.80E-02	8.99E-06
d-Limonene	5989-27-5	6.7	9.17E-07	2.20E-05	8.03E-03	4.02E-06

Notes:

1. It is assumed that equipment will operate 24 hours a day, 365 days a year.
2. Non-Precursor Organic Compounds (NPOCs) have been determined based on Regulation 1-234 and 40 CFR 51.100(s)(1). NPOCs have negligible photochemical reactivity.

Table 2. Organic Emissions Review for S-1					
Pollutant	**Effluent Volumetric Concentration (ppmv)**	**Hourly Emission Rate (pound/hour)**	**Daily Emission Rate (pound/day)**	**Annual Emission Rate (pounds/year)**	**Annual Emission Rate (ton/year)**
POC	0.092	2.10E-04	0.005	1.842	0.001
NPOC	0.541	1.23E-03	0.03	10.778	0.005
Total	0.633	1.4E-03	0.035	12.621	0.006

Notes:

1. POC and NPOC emissions are based on the laboratory test results considering an abatement efficiency of 96%.
2. The effluent volumetric concentrations are measured as methane.
3. POC and NPOC Annual Emission Rates will be rounded up to 1.9 lbs./year and 10.8 lbs./year respectively to be used as condition limit.
4. The total effluent volumetric concentration will be used to set the GAC vessels breakthrough monitoring condition.

S-2 through S-18 SSD Systems

- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21^{O}C; 1 mole occupies 24.15 Liters (or 386.8 ft3/pound-mol).
- Toxic Air Contaminants (TAC) emissions will be based on soil vapor data submitted with this application.
- The organic influent flow rate of 60 acfm for each SSD system, which converts to 30 dscfm at 70 degrees F, and 50% water content by volume.

dscfm = acfm x (459.67 R + 70 F)/(459.67 R + temp in F) x (actual P/ 14.7 psi) x (1- volumetric fraction of water vapor)

dscfm = dry cubic feet per minute at standard conditions (14.7 psi and 70 degrees F)
acfm = actual cubic feet per minute
R = temperature (degrees Rankine)
F = temperature (degrees Fahrenheit) = 70 F
P = pressure (psi) = 14.7 psi

- The system will be abated by one (1) 7 lbs. of Granulated Activated Carbon and permanganate in series. 90% abatement efficiency is assumed.
- Emissions are from a pilot test report completed in January of 2021 for The Elms by WSP USA Inc..

Table 3. Abated Emissions for Each SSD System (S-2 through S-18)						
Pollutant	**CAS #**	**Abated Emissions**				
		Inlet Conc. (ug/m3)	**Hourly Emission Rate (lb/hr)**	**Daily Emission Rate (lb/day)**	**Annual Emission Rate (lb/yr)**	**Annual Emission Rate (ton/yr)**
Benzene	71-43-2	6.2E+01	7.0E-07	1.7E-05	6.1E-03	3.0E-06
Toluene	108-88-3	1.5E+02	1.7E-06	4.0E-05	1.5E-02	7.4E-06
Xylenes	1330-20-7	2.9E+01	3.3E-07	7.8E-06	2.9E-03	1.4E-06
Chloroform	67-66-3	5.3E+01	6.0E-07	1.4E-05	5.2E-03	2.6E-06
Trichlorofluoromethane	75-69-4	3.1E+01	3.5E-07	8.4E-06	3.0E-03	1.5E-06
Dichlorodifluoromethane	75-71-8	1.1E+01	1.2E-07	3.0E-06	1.1E-03	5.4E-07
Perchloroethylene (PCE)	127-18-4	1.3E+03	1.5E-05	3.5E-04	1.3E-01	6.4E-05
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	6.8E+00	7.6E-08	1.8E-06	6.7E-04	3.3E-07
Ethyl benzene	100-41-4	8.4E+00	9.4E-08	2.3E-06	8.3E-04	4.1E-07
1,1,1-Trichloroethane (Methyl Chloroform)	71-55-6	7.2E+00	8.1E-08	1.9E-06	7.1E-04	3.5E-07
1,2,4-Trimethylbenzene	95-63-6	7.2E+00	8.1E-08	1.9E-06	7.1E-04	3.5E-07
Carbon disulfide	75-15-0	8.2E+01	9.2E-07	2.2E-05	8.1E-03	4.0E-06
p-Isopropyltoluene	99-87-6	4.7E+01	5.3E-07	1.3E-05	4.6E-03	2.3E-06

Notes:

1. It is assumed that equipment will operate 24 hours a day, 365 days a year.
2. Non-Precursor Organic Compounds (NPOCs) have been determined based on Regulation 1-234 and 40 CFR 51.100(s)(1). NPOCs have negligible photochemical reactivity.

Table 4. Organic Emissions Review for for Each System (S-2 through S-18)					
Pollutant	**Effluent Volumetric Concentration (ppmv)**	**Hourly Emission Rate (pound/hour)**	**Daily Emission Rate (pound/day)**	**Annual Emission Rate (pounds/year)**	**Annual Emission Rate (ton/year)**
POC	0.068	5.08E-06	0.00E+00	0.045	0.00E+00
NPOC	0.202	1.51E-05	0.00E+00	0.132	0.00E+00
Total	0.270	2.01E-05	0.00E+00	0.177	0.00E+00

Notes:

1. POC and NPOC emissions are based on the laboratory test results considering an abatement efficiency of 90%.
2. The effluent volumetric concentrations are measured as methane.
3. POC and NPOC Annual Emission Rates will be rounded up to 0.1 lb./year and 0.2 lb./year respectively to be used as condition limit.
4. The total effluent volumetric concentration will be used to set the GAC vessels breakthrough monitoring condition.

Cumulative Increase

Table 5. Cumulative Increase				
Pollutant	**Source**	**Current Permitted Emissions, Post 4/5/1991**	**Application New Emissions Increase**	**New Cumulative Increase**
		(ton/yr)	**(ton/yr)**	**(ton/yr)**
POC	S-1	-	0.001	0.001
	S-2 thru S-18	-	0.00E+00	-
	Total	**0.00E+00**	**0.001**	**0.001**

This is a new facility. Therefore, there are no existing emissions at this facility.

Toxic Risk Screening

Project emissions include the emissions from S-1 SVE system and S-2 through S-18 SSD system.

No toxic air contaminant emissions exceed the Chronic Trigger Levels in Regulation 2-5, Table 2-5-1. Therefore, no Health Risk Assessment (HRA) was triggered for this project.

Table 6. Total Project Toxics Emissions Review - Regulation 2-5

Pollutant	CAS #	Hourly Emission Rate (lb/hr)	Acute Trigger Level (lb/hr)	Exceeds Acute Trigger Level?	Annual Emission Rate (lb/yr)	Chronic Trigger Level (lb/yr)	Exceeds Chronic Trigger Level?
Acetone	67-64-1	3.01E-06	N/A	No	2.64E-02	N/A	No
Benzene	71-43-2	1.22E-05	1.20E-02	No	1.07E-01	2.90E+00	No
Toluene	108-88-3	2.86E-05	2.20E+00	No	2.51E-01	1.60E+04	No
Xylenes	1330-20-7	5.53E-06	9.70E+00	No	4.85E-02	2.70E+04	No
Chloroform	67-66-3	1.19E-05	6.60E-02	No	1.04E-01	1.50E+01	No
Ethanol	64-17-5	2.05E-04	N/A	No	1.80E+00	N/A	No
Trichlorofluoromethane	75-69-4	1.02E-05	N/A	No	8.90E-02	N/A	No
Dichlorodifluoromethane	75-71-8	2.13E-05	N/A	No	1.86E-01	N/A	No
Perchloroethylene (PCE)	127-18-4	1.45E-03	8.80E+00	No	1.27E+01	1.40E+01	No
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	1.30E-06	N/A	No	1.14E-02	4.10E+01	No
Ethyl benzene	100-41-4	1.60E-06	N/A	No	1.40E-02	3.30E+01	No
1,1,1-Trichloroethane (Methyl Chloroform)	71-55-6	1.37E-06	3.00E+01	No	1.20E-02	3.90E+04	No
1,2,4-Trimethylbenzene	95-63-6	1.37E-06	N/A	No	1.20E-02	N/A	No
Carbon disulfide	75-15-0	1.57E-05	2.70E+00	No	1.37E-01	3.10E+04	No
p-Isopropyltoluene	99-87-6	8.97E-06	N/A	No	7.86E-02	N/A	No
Cumene	98-82-8	2.05E-06	N/A	No	1.80E-02	N/A	No
d-Limonene	5989-27-5	9.17E-07	N/A	No	8.03E-03	N/A	No

Offsets

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a site 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 site with a cumulative increase that exceeds 1.0 ton per year of PM_{10}, $PM_{2.5}$, or sulfur dioxide (SO_2).

The site is not expected to have a PTE greater than 10 tons per year of POC or NO_X, nor is the site a major site of PM_{10}, $PM_{2.5}$, and SO_2. Therefore, the requirements of Regulations 2-2-302 and 2-2-303 do not apply.

Best Available Control Technology (BACT)

In accordance with Regulation 2-2-301, Best Available Control Technology (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 (SO_2), particulate matter less than 10 micrometer (PM_{10}) and particulate matter less than 2.5 micrometer ($PM_{2.5}$).

NPOC and POC emissions are expected to be below 10 pound per day for S-1 through S-18. Therefore, BACT is not required.

California Environmental Quality Act (CEQA)

This project is classified as ministerial under the District Regulation 2-1-311, because the engineering review for this project requires only the application of standard emission factors and established formulas as specified in Chapter 9.2 of the District's Permit Handbook. This project does not trigger BACT or TBACT and is not subject to the health risk assessment requirements of Regulation 2, Rule 5. This review follows objective procedures and applies standard permit conditions; and therefore, the review of this project is not discretionary as defined by CEQA. Since this project is ministerial, it is not subject to CEQA review requirement of Regulation 2-1-310, and no further CEQA analysis is required.

Compliance

This project is located within 1,000 feet of a K-12 school. Therefore, public notice is required.

School information for all schools located within ¼ mile of the facility is summarized below.

School Name	Street Address	City
Challenger School	18811 Cox Ave, Saratoga, CA 95070	Saratoga

Saratoga French Cultural Preschool, and Action Day School - El Quito are located within ¼ mile of the facility. However, they are both preschools.

Therefore, this project is subject to the school public noticing requirement of the California Health & Safety Code and Regulation 2-1-412.

This project is not located within the boundaries of an Overburdened Community (OBC) as defined in Regulation 2-1-243. Therefore, this project does not trigger OBC public notification.

Regulation 8-47-301 requires that any soil vapor extraction operation which emits benzene, vinyl chloride, tetrachloroethene, methylene chloride, and/or trichloroethene shall be vented to a control device which reduces emissions to the atmosphere by at least 90 percent by weight. The facility has proposed to install activated carbon vessels with permanganate with at least 90 percent abatement efficiency to reduce emissions.

The facility is required to keep the pertinent records per Condition #100223 and #100224 pursuant to Regulation 8-47-501.

Prevention of Significant Deterioration (PSD), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPS) are not triggered.

Permit Conditions

Permit Condition # 100223 for S-1 and A-1

1. The influent vapor flow rate shall not exceed 2,000 acfm from the blower of S-1. [Basis: Cumulative Increase, Regulation 2-5].

2. The owner/operator shall abate the precursor organic compound (POC)/non-precursor organic compound (NPOC) emissions from the soil vapor extraction systems with the Activated Carbon Vessels and Permanganate vessel in series (A-1) during all periods of operation as follows:

   S-1 shall be abated by A-1, consisting of a minimum of one (1) 5,000 lbs. activated carbon vessel and permanganate vessel in series.

   [Basis: Regulations 8-47-301 and 8-47-302 and Regulation 2-5].

3. In no event shall perchloroethylene (PCE) emissions to the atmosphere from S-1 exceed 11 pounds per 12-month consecutive period. [Basis: Regulations 8-47-301, 8-47-302 and Toxics].

4. In no event shall the toxic air contaminant (TAC) emissions to the atmosphere from S-1 exceed the trigger levels listed in District Regulation 2-5, Table 2-5-1. [Basis: Regulation 2-5].

5. The owner/operator shall not emit from S-1 more than 1.9 pounds of precursor organic compounds (POC) and 10.8 pounds of non-precursor organic compounds (NPOC) per 12-month consecutive period. [Basis: Cumulative Increase]

6. Upon initial start-up, the owner/operator shall take air samples from S-1 for laboratory analysis using EPA Method TO-15. The air samples shall be taken at the following locations:
   a. At the inlet to the first carbon vessel in series.
   b. At the outlet of the last vessel in series prior to venting to the atmosphere.
   [Basis: Regulation 2-1-403, Regulation 8-47-301].

7. The owner/operator shall use the results from the laboratory report to calculate the following:

   a. The abatement efficiency of the S-1 system. The precursor organic compounds (POC) abatement efficiency of A-1 shall be maintained at a minimum of 96% by weight.
   b. If the POC is detected at its outlet in a lesser quantity than 2 ppmv, the abatement efficiency does not need to be calculated.
   c. TAC emissions emitted to the atmosphere, using the maximum permitted flowrate of S-1.

The owner/operator shall submit the laboratory report, abatement efficiency, and calculated TAC emissions within 21 days of the initial startup, to demonstrate compliance with Parts 1 through 5 of this condition. [Basis: Regulation 2-1-403, Regulation 2-5].

8. During operation of A-1, the owner/operator shall monitor with a 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 last vessel in series.
   b. At the inlet to the last vessel in series.
   c. At the outlet of the last vessel in series, prior to venting to the atmosphere.
   [Basis: Regulations 1-523 and 2-1-403]

9. During the operation of A-1, the second to last carbon vessel shall be immediately changed out with unspent carbon upon breakthrough, defined as the detection at its outlet in excess of the higher of the following limits:

   a. 10 % of the inlet stream concentration to the carbon bed.
   b. 10 ppmv (measured as methane).[Basis: Cumulative Increase and Regulations 1-523 and 2-1-403]

10. The last carbon vessel shall be immediately changed out with unspent carbon upon detection at its outlet of 10 ppmv or greater (measured as methane). [Basis: Cumulative Increase and Regulations 1-523 and 2-1-403]

11. 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 1 through 5 of this condition and shall be conducted on a daily basis.

    a. If the owner/operator can demonstrate one (1) month of consecutive daily monitoring readings where the sum of monitoring results of S-1 is lower than 2 ppmv, measured as methane, the monitoring frequency may be reduced to weekly.

    b. After the monitoring frequency has been reduced to weekly, if the owner/operator can demonstrate one (1) month of consecutive weekly monitoring readings of S-1 is lower than 2 ppmv, measured as methane, the monitoring frequency may be reduced to once every two (2) weeks.

    c. After the monitoring frequency has been reduced to once every two (2) weeks, if the owner/operator can demonstrate one (1) month of consecutive bi-weekly readings where the monitoring results of S-1 is lower than 2 ppmv, measured as methane, the monitoring frequency may be reduced to monthly.

    If any subsequent results from monitoring where the sum of monitoring results of S-1 exceed 2 ppmv, measured as methane, the owner/operator shall revert to daily monitoring. If monitoring reverts back to daily, the owner/operator may reduce the monitoring frequency in accordance with Parts 11(a) through (c) of this condition.

[Basis: Cumulative Increase, Toxics, and Regulations 1-523 and 2-1-403]

12. The owner/operator shall maintain the following information for each month of operation:

    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. Total throughput of soil vapor from source S-1 in standard cubic feet.

    Such records shall be retained and made available for inspection by the District for two (2) years following the date the data is recorded. [Basis: Recordkeeping]

13. The owner/operator shall report any noncompliance 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: Regulation 2-1-403]

14. 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 condition. All measurements, records and data required to be maintained by the operator shall be retained for at least two (2) years following the date the data is recorded. [Basis: Regulation 1-523]

15. Upon final completion of the remediation project, the operator shall notify the Engineering Division within two weeks of decommissioning the operation. [Basis: Regulation 2-1-403]

End of Conditions

Permit Condition # 100224 for S-2 through S-18 and A-2 through A-18

1. The influent vapor flow rate shall not exceed 60 acfm from the blower of each sub-slab depressurization system (S-2 through S-18).
   [Basis: Cumulative Increase, Regulation 2-5].

2. The owner/operator shall abate the precursor organic compound (POC)/non-precursor organic compound (NPOC) emissions from the soil vapor extraction systems with the Activated Carbon Vessels and Permanganate vessel in series (A-2 through A-18) during all periods of operation as follows:

   S-2 through S-18 shall each be abated by each abatement device (A-2 through A-18) respectively, and each abatement device (A-2 through A-18) shall consist of a minimum of one (1) 7- lb. activated carbon vessel and permanganate vessel in series.

[Basis: Regulations 8-47-301 and 8-47-302 and Regulation 2-5].

3. In no event shall perchloroethylene (PCE) emissions to the atmosphere from each sub-slab depressurization system (S-2 through S-18) exceed 0.13 pound per 12-month consecutive period.
   [Basis: Regulations 8-47-301, 8-47-302 and Toxics].

4. In no event shall the toxic air contaminant (TAC) emissions to the atmosphere from each sub-slab depressurization system (S-2 through S-18) exceed the trigger levels listed in District Regulation 2-5, Table 2-5-1. [Basis: Regulation 2-5].

5. The owner/operator shall not emit from each sub-slab depressurization system (S-2 through S-18) more than 0.1 pound of precursor organic compounds (POC) and 0.2 pound of non-precursor organic compounds (NPOC) per 12-month consecutive period. [Basis: Cumulative Increase]

6. Upon initial start-up, the owner/operator shall take air samples from each sub-slab depressurization system (S-2 through S-18) for laboratory analysis using EPA Method TO-15. The air samples shall be taken at the following locations:
   a. At the inlet to the first carbon vessel in series.
   b. At the outlet of the last vessel in series prior to venting to the atmosphere.
   [Basis: Regulation 2-1-403, Regulation 8-47-301].

7. The owner/operator shall use the results from the laboratory report to calculate the following:

   a. The abatement efficiency of each sub-slab depressurization system (S-2 through S-18). The precursor organic compounds (POC) abatement efficiency of each system shall be maintained at a minimum of 90% by weight.
   b. If the POC is detected at its outlet in a lesser quantity than 2 ppmv, the abatement efficiency does not need to be calculated.
   c. TAC emissions emitted to the atmosphere, using the maximum permitted flowrate of each sub-slab depressurization system (S-2 through S-18).
   The owner/operator shall submit the laboratory report, abatement efficiency, and calculated TAC emissions within 21 days of the initial startup, to demonstrate compliance with Parts 1 through 5 of this condition. [Basis: Regulation 2-1-403, Regulation 2-5].

8. During operation of A-2 through A-18, the owner/operator shall monitor with a 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 last vessel in series.
   b. At the inlet to the last vessel in series.
   c. At the outlet of the last vessel in series, prior to venting to the atmosphere.
   [Basis: Regulations 1-523 and 2-1-403]

9. During the operation of A-2 through A-18, the second to last carbon vessel shall be immediately changed out with unspent carbon upon breakthrough, defined as the detection at its outlet in excess of the higher of the following limits:

   a. 10 % of the inlet stream concentration to the carbon bed.
   b. 10 ppmv (measured as methane).
   [Basis: Cumulative Increase and Regulations 1-523 and 2-1-403]

10. The last carbon vessel shall be immediately changed out with unspent carbon upon detection at its outlet of 10 ppmv or greater (measured as methane). [Basis: Cumulative Increase and Regulations 1-523 and 2-1-403]

11. 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 1 through 5 of this condition and shall be conducted on a daily basis.

    a. If the owner/operator can demonstrate one (1) month of consecutive daily monitoring readings where the sum of monitoring results of each sub-slab depressurization system (S-2 through S-18) is lower than 2 ppmv, measured as methane, the monitoring frequency may be reduced to weekly.

    b. After the monitoring frequency has been reduced to weekly, if the owner/operator can demonstrate one (1) month of consecutive weekly monitoring readings of each sub-slab depressurization system (S-2 through S-18) is lower than 2 ppmv, measured as methane, the monitoring frequency may be reduced to once every two (2) weeks.

    c. After the monitoring frequency has been reduced to once every two (2) weeks, if the owner/operator can demonstrate one (1) month of consecutive bi-weekly readings where the monitoring results of each sub-slab depressurization system (S-2 through S-18) is lower than 2 ppmv, measured as methane, the monitoring frequency may be reduced to monthly.

    If any subsequent results from monitoring where the sum of monitoring results of each sub-slab depressurization system (S-2 through S-18) exceed 2 ppmv, measured as methane, the owner/operator shall revert to daily monitoring. If monitoring reverts back to daily, the owner/operator may reduce the monitoring frequency in accordance with Parts 11(a) through (c) of this condition.

    [Basis: Cumulative Increase, Toxics, and Regulations 1-523 and 2-1-403]

12. The owner/operator shall maintain the following information for each month of operation:

    b. Hours and time of operation.

d. Each emission test, analysis, or monitoring results logged in for the day of operation they were taken.
e. Total throughput of soil vapor from source each sub-slab depressurization system (S-2 through S-18) in standard cubic feet.

Such records shall be retained and made available for inspection by the District for two (2) years following the date the data is recorded. [Basis: Recordkeeping]

13. The owner/operator shall report any noncompliance 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: Regulation 2-1-403]

14. 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 condition. All measurements, records and data required to be maintained by the operator shall be retained for at least two (2) years following the date the data is recorded. [Basis: Regulation 1-523]

15. Upon final completion of the remediation project, the operator shall notify the Engineering Division within two weeks of decommissioning the operation. [Basis: Regulation 2-1-403]

End of Conditions

Recommendation

The Air 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 triggers public notification requirements per Regulation 2-1-412. After the comments are received from the public and reviewed, the Air District will make a final determination on the permit.

I recommend that the District initiates a public notice and considers any comments received prior to taking any final action on issuance of an Authority to Construct and/or a Permit to Operate for the following equipment:

S-1	**Soil-Vapor Extraction System** **Soil Vapor Extraction System, Roots Frame 718 Universal RAI Blower, Maximum 2000 acfm**

Abated by

A-1	**One 5,000 lbs. of Granular Activated Carbon System, and One Permanganate Vessel in Series**

And

S-2 through S-18	**Sub-Slab Depressurization System** **Sub-Slab Depressurization System, RadonAway EC6 Pro Series Fan, Maximum 60 acfm for Each Sub-Slab Depressurization System**

Abated by

A-2 through S-18	**One 7 lbs. Granular Activated Carbon System, and One Permanganate Vessel in Series for Each SSD System**

Youjin Kim, Air Quality Engineer
January 1, 2024