Engineering Evaluation
West Environmental
for
Former Mee Rae Malette/Payless Cleaners
4212-4220 Piedmont Avenue,
Oakland, CA 94611
Plant # 23472; Application Number 27828

1. Background:

West Environmental for Former Mee Rae Malette/Payless Cleaners has applied for an Authority to Construct/Permit to Operate the following Sub-Slab Depressurization System (SSD) located at former Payless Cleaners, 4212-4220 Piedmont Avenue, CA 94611. The system will remove volatile organic compounds (VOC) vapors from vapor extraction points through pipes installed just below the interior building slab. The extracted vapors are passed through a heat exchanger that is located in series with two 200 pound activated carbon units. The reason for the heat exchanger A-1 is to cool the air-vapor mixture entering the carbon system A-2. The activated carbon abatement is more efficient in removing organics at a lower temperature.

S-1: Sub-slab Depressurization Vapor Extraction System Consisting of a Regenerative Blower, Airtech Model 3BA7420-OAT56, 5.09 HP, 100 SCFM Capacity abated by A-1 and A-2

A-1 Compressed Air Heat Exchanger Made By Air UPA-100, 12 HP Motor 100 SCFM Capacity in Series with A-2

A-2: (2)-200 Pound Activated Carbon Vessels in Series, 100 SCFM Capacity, VDF-55 GAC
The SSD system will be operated within 1000 feet of the following two Schools and thus a Public Notice is required.

St. Leo The Great Catholic School
4238 Howe Street
Oakland, CA 94611

Piedmont Avenue Elementary School
4314 Piedmont Avenue
Oakland, CA 94611

The SSD system will be operated within quarter mile of the following School and thus a Public Notice is required for this school as well.

Pacific Boychoir Academy
215 Ridgeway Avenue
Oakland, CA
94611

2. Emission Calculations

Table 1 shows calculated precursor organic compound (POC), Non-precursor organic compound (NPOC) and Toxic Air Contaminant (TAC) emissions. The TAC emissions are based on the highest pilot test results submitted by the applicant. Thus the maximum amount that can potentially be emitted is calculated in Table 1. With the two 200 pound activated carbon abatement system in series a 98.5% abatement efficiency is expected. Calculations demonstrate that the TAC emissions do not exceed the annual trigger limit thus a risk screen is not required.

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

TAC emission, lb/y = ($\mu g/m^3$ of the TAC) X (6.243 E-11 lb/ft^3/ $\mu g/m^3$) (100 ft^3/m) (60 m/h)(24h/d)(365 d/y)

Thus, TAC **e**mission per year before abatement = (0.003274) X ($\mu g/m^3$ of the TAC)

With 98.5% abatement annual TAC emission to the atmosphere, lb/y = (0.015) X (0.003274) X ($\mu g/m^3$ of the TAC)

= (4.9 E-5) X (µg/m^3 of the TAC)

Table 1 TAC Emission Calculation

Emission Calculations spreadsheet for SSD System

AAQMD Plant	23472.00			
Application #	27828.00			
Facility Name	West Environmental & Technology			
Soil Vapor Extraction System		**Abatement Device**		
Data Form G		Data Form A		
Total Flow Rat	100.00 scfm	*Select the abatement devices for the proposed project:*	Enter the destruction efficiency:	
	100.00 ft^3/min	2-100 lb Carbon System	Efficiency	0.99
			Reduction	0.02

	Toxic Air Contaminants (TACs)	Chronic Trigger Level [lb/y]	Acute Trigger Level [lb/hr]	Molecular Weight (MW) [g/mol]
Former Dry Cleaning Sites	PCE	18.00	44.00	165.83
	TCE	54.00	1000.00	131.40
	1,2 DCE	10000.00	1000.00	96.94
B	Vynyl Chloride	1.40	400.00	62.50
	Chloroform	20.00	0.33	119.37
	1,1 DCE	66.00	1000.00	96.94
	1,1,1 TCA	39000.00	150.00	133.40

For unit conversion:		
	365.00	*days/year*
	8760.00	*hours/year*
	1440.00	*mins/day*
1 lb/mole	*386.00*	*ft^3*
1lb	*0.00*	*ton*
1 day	*86400.00*	*s*
1lb	*453.60*	*g*

1.Chronic Trigger level per District's Regulation 2-5, Table 2-5-1, amended 1/6/2010

	Influent vapor concentration [µg/m^3]	Influent vapor concentration [2] [ppmv]		Unabated Emission [lb/day]	Abated Emission [lb/day]	Abated Emission [lb/yr]	Chronic Trigger Level [1] [lb/year]	Emission exceeds Chronic Trigger Levels [3] (Yes/No)	Hourly Abated Emission [lb/hour]	Acute Trigger Level [1] [lb/hour]	Emission exceeds Acute Trigger Levels [3] (Yes/No)	Unabated Emission Factors [4] [lb/cubic feet]
PCE	28000.00		0.00	0.25	0.00	1.38	18.00	No	0.00	44.00	No	0.00
TCE	7000.00		0.00	0.06	0.00	0.34	54.00	No	0.00	1000.00	No	0.00
1,2 DCE	790.00		0.00	0.00	0.00	0.00	10000.00	No	0.00	1000.00	No	0.00
Vinyl Chloride	560.00		0.00	0.00	0.00	0.00	1.40	No	0.00	400.00	No	0.00
Chloroform	250.00		0.00	0.00	0.00	0.00	20.00	No	0.00	0.33	No	0.00
1,1 DCE	200.00		0.00	0.00	0.00	0.00	66.00	No	0.00	1000.00	No	0.00
1,1,1 TCA	280.00		0.00	0.15	0.00	0.83	39000.00	No	0.00	150.00	No	0.00
			0.00	0.00	0.00	0.00		No	0.00	0.00	No	0.00
			Total	0.47	0.01	2.55						

2. Unit conversions on the influent vapor concentrations:
[µg/m3] to [ppmv] : Influent vapor concentration [ppmv] = Influent vapor concentration [µg/m3] * 0.02404 / MW
3. If the emission exceeds Chronic Trigger Levels, please consult with the owner/operator if they would accept the trigger level limit in the permit conditions.
Otherwise, Health Risk Screening Analysis will be conducted to deteremine the maximum emission limits for the proposed project.
4. Enter the Unabated Emission Factors [lb/ cubic feet] on the Data Form G
5. Please verify if there is an appropriate abatement efficiency for Vinyl Chloride -
Using Permangangate will have 99 % destruction efficiency. Using Carbon Vessels will have 0% destruction efficiency.

3. Cumulative Increase- tons/year

Table 2 presents the plant cumulative increase. Perchloroethylene is a non-precursor organic (NPOC) compound and trichloroethylene, 1,2 dichloroethane and chloroform are precursor organic compounds (POC). Thus NPOC and POC emissions are 1.38 pounds and 1.17 pounds per year respectively.

Table 2 Cumulative Increase (ton/y)

Pollutant	Current	This Application (t/y)	Plant Total (t/y)
NPOC	0	0.001	0.001
POC	0	0.001	0.001

4. Compliance Statements:

Toxics

Perchloroethylene, trichloroethylene, 1,2 DCE and chloroform are emitted at the source. Other TACs are emitted in trace amounts and are insignificant. After abatement TAC emissions do not exceed the toxic trigger level listed in Regulation 2-5, Table 2-5-1. Therefore, the TAC emissions do not warrant a Risk Screen Analysis. However, the

following schools are within 1000 feet of the source S-1. Thus in accordance with Regulation 2-1-412 a Public Notification is required.

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New Source Review
Best Available Control Technology (BACT)
In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per day of precursor organic compound (POC), Non-precursor organic compound (NPOC), Nitrogen oxides (NO_X), carbon monoxide (CO), sulfur-di-oxide (SO_2) or particulate matter (PM_{10}). This proposed project will not emit over 10 pounds per day of POC, NPOC, NOx, CO, SO_2. Thus BACT is not triggered.

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

District Regulations
Based on the information submitted, this operation is expected to be in compliance with Regulation 8-47-301, Emission Control Requirements, Specific compounds, and 8-47-302, Organic compounds. POC and NPOC emissions will be vented through the activated carbon system A-1 at all times of operation.

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

5. Condition

Condition # 26255 applies to the following source:

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A-1 Compressed Air Heat Exchanger Made By Air UPA-100, 12 HP Motor 100 SCFM Capacity in Series with A-2

A-2: (2)-200 Pound Activated Carbon Vessels in Series, 100 SCFM Capacity, VDF-55 GAC

1. The owner/operator of S-1 shall abate the Precursor Organic Compound (POC) and non-precursor organic compound (NPOC) emissions from Source S-1 by A-1 and A-2 Abatement Systems, consisting of compressed air heater and two 200 pound Activated Carbon Vessels, all 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 of S-1

shall operate the sources such that the soil vapor flow rate from S-1 shall not exceed 100 scfm. [Basis: Cumulative Increase, Regulation 8-47-301 and 302, TBACT]

2. During operation of the Activated Carbon Vessels, the owner/operator of S-1 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 of the first carbon vessel
    b. At the inlet of the second carbon vessel.
    c. At the outlet of the second carbon vessel 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 purpose of these permit conditions. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

3. The owner/operator of S-1 shall record these monitor readings in a monitoring log at the time they are taken. The owner/operator of S-1 shall use the monitoring results to estimate the frequency of Carbon change-out necessary to maintain compliance with parts 2, 4 and 5, and shall be conducted on a daily basis. The owner/operator of this source may propose for District's 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 of S-1 shall immediately change out the first 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]

5. The owner/operator of S-1 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 S-1 of this source shall maintain the following information for each month of operation of A-2 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 removed from service.
    d. Total throughput of soil vapor from source S-1 in Standard Cubic Feet.

    All records shall be retained for two years following the date the data is recorded and made available for inspection by the District upon request. [Basis: Regulation 1-523]

7. The owner/operator of S-1 shall report any non-compliance with these conditions to the Compliance and Enforcement Division at the time that it is first discovered. The owner/operator of S-1 shall detail the corrective action taken and include the data showing the exceedance as well as the time of occurrence in the submittal. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

8. The owner/operator of S-1 shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the various provisions of this conditional Authority to Construct/Permit

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

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

6. Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source is located within 1000 feet of two schools, which triggers the public notification requirements of District Regulation 2-1-412. 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 an Authority to Construct the following source:

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by_____ September 28, 2016
By: Hari Doss