SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

SOIL VAPOR EXTRACTION – INITIAL SOURCE TEST REPORT

PERMIT NUMBER (S): _____

SOIL VAPOR EXTRACTION INITIAL EMISSIONS RESULTS

Initial Sample Event	Sample Date	Hours of Operation	Influent							Effluent							Calculated VOC Control Efficiency (C)
			Flow Rate	Sample Start & End Times	Hour Meter Reading	Summa Canister Serial No.	Pollutant	Lab Results – Maximum Influent Concentration	Calculated Maximum Influent Mass Emission Rate (A) (B)	Flow Rate	Sample Start & End Times	Hour Meter Reading	Summa Canister Serial No.	Pollutant	Lab Results – Maximum Effluent Concentration	Calculated Maximum Effluent Mass Emission Rate (A) (B)	
		Hours	SCFM		Hours		(specify)	(specify units)	lb/day	SCFM		Hours		(specify)	(specify units)	lb/day	%
1st Test																	
2nd Test																	

(A) For effluent samples that have pollutant concentrations below the laboratory detection limit, the laboratory detection limit must be used as the pollutant concentration when calculating the system mass emission rate.

(B) Effluent mass emission rate calculations shall use the applicable EMISSION RATE CALCULATION EQUATION listed below.

(C) VOC control efficiency shall be calculated as follows:

$$\text{VOC Control Efficiency} = \left[\frac{\left(\text{Influent Mass Emission Rate } \left(\frac{\text{lb}}{\text{day}}\right) - \text{Effluent Mass Emission Rate } \left(\frac{\text{lb}}{\text{day}}\right)\right)}{\text{Influent Mass Emission Rate } \left(\frac{\text{lb}}{\text{day}}\right)}\right] \times 100$$

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INCLUDE THE FOLLOWING AS ATTACHMENTS:

☐ Applicable Field Data Sheets
☐ As-built process flow diagram, including all sampling and flow measurement port locations
☐ Laboratory analysis reports with laboratory detection limits listed for each pollutant sampled
☐ Applicable Chain of Custody (COC) documents
☐ Any additional information that describes any modifications or revisions to the system design, including adjustments of process parameters (i.e., temperature, flow rates, etc.)
☐ SOIL VAPOR EXTRACTION – CARBON BREAKTHROUGH MONITORING FORM ***(applicable only for carbon adsorption systems)***

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EMISSION RATE CALCULATION EQUATION (to convert from PPM to lb/day):

$$Q_c = \frac{(C_c) * (F) * (MW_c) * (60 \text{ minutes/hour}) * (24 \text{ hours/day})}{(10^6) * (V)}$$

where:

Q_c = Mass Emission Rate of Contaminant c, lbs/day
C_c = Concentration of Contaminant c, ppm
1×10^6 = Conversion from parts per million to parts per unit volume
F = Vapor Volume Flow Rate, scfm
V = Molar Volume = 385.3 ft^3/lb-mole (based on Ideal Gas Law for a gas at standard conditions of 68 °F and 1 atm)
MW_c = Molecular Weight of Contaminant c
= 100 lb/lb-mol for TPHg (weathered gasoline)
= 78.11 lb/lb-mol for Benzene
= 88.15 lb/lb-mol for MtBE
= 131.4 lb/lb-mol for Trichloroethylene (TCE)
= 98.96 lb/lb-mol for Ethylene Dichloride (1,2 Dichloroethane)
= 165.8 lb/lb-mol for Tetrachloroethylene (Perchloroethylene, PCE)
= 119.4 lb/lb-mol for Chloroform
= 62.5 lb/lb-mol for Vinyl Chloride
= 84.93 lb/lb-mol for Methylene Chloride

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EMISSION RATE CALCULATION EQUATION (to convert from mg/m^3 to lb/day):

$Q_c = (C_c) * (F) * (0.02832\ m^3/ft^3) * (0.000002205\ lb/mg) * (60\ minutes/hour) * (24\ hours/day)$

where:

Q_c	= Mass Emission Rate of Contaminant c, lbs/day
C_c	= Concentration of Contaminant c, mg/m^3
F	= Vapor Volume Flow Rate, scfm
0.02832	= Conversion from ft^3 to m^3
0.00000220	= Conversion from mg to lb

EMISSION RATE CALCULATION EQUATION (to convert from μg/L to lb/day):

$$Q_c = \frac{(C_c) * (F) * (0.02832\ m^3/ft^3) * (60\ minutes/hour) * (24\ hours/day) * (2.2\ lb/kg)}{(1{,}000{,}000\ \mu g\text{-}m^3/L\text{-}kg)}$$

where:

Q_c	= Mass Emission Rate of Contaminant c, lbs/day
C_c	= Concentration of Contaminant c, μg/L
F	= Vapor Volume Flow Rate, scfm
0.02832	= Conversion from ft^3 to m^3
1,000,000	= Conversion from L-kg to μg-m^3