

San Joaquin Valley Air Pollution Control District
Authority to Construct
Application Review

Soil Remediation Project Served by [Thermal/Catalytic](#) Oxidizer

Facility Name: _____ Date: June 1, 2016
Mailing Address: _____ Engineer: _____
Lead Engineer: _____
Contact Person: _____
Telephone: _____
Application #(s): _____
Project #: _____
Deemed Complete: _____

I. Proposal

[Facility Name](#) is applying for an Authority to Construct (ATC) permit for a soil [\[and groundwater\]](#) remediation operation served by a [thermal/catalytic](#) oxidizer.

OR

[Facility Name](#) is applying for an Authority to Construct (ATC) permit to modify their soil [\[and groundwater\]](#) remediation operation to [\(state the type of modification\)](#).

II. Applicable Rules

- Rule 2201 New and Modified Stationary Source Review Rule (8/15/19)
- Rule 2410 Prevention of Significant Deterioration (6/16/11)
- Rule 2520 Federally Mandated Permits (8/15/19)
- Rule 4101 Visible Emissions (2/17/05)
- Rule 4102 Nuisance (12/17/92)
- Rule 4201 Particulate Matter Concentration (12/17/92)
- Rule 4651 Volatile Organic Compounds from Decontamination of Soil (9/20/07)
- Rule 4801 Sulfur Compounds (12/17/92)
- CH&SC 41700 California Health and Safety Code (Health Risk Assessment)
- CH&SC 42301.6 California Health and Safety Code (School Notice)
- Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
- California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at [location]. The District has verified that the facility is/is not located within 1,000 feet of the outer boundary of any K-12 school. Therefore, pursuant to CH&SC 42301.6, California Health and Safety Code (School Notice), public notification is/is not required.

If located at an existing stationary source

Although this operation is located at [Facility Name and #], it is considered a different stationary source with a different SIC code since the soil remediation operation is not considered a normal business activity of the existing facility.

IV. Process Description

The remediation system will consist of a vapor extraction blower and a thermal/catalytic oxidizer. The vapor extraction blower will remove gasoline vapors from the contaminated soil and convey a mixture of gasoline vapors and air to the thermal/catalytic oxidizer. The thermal/catalytic oxidizer will destroy at least 95% of the VOC in the process stream prior to discharge into the atmosphere.

Operating Schedule:

The operating schedule is [] hr/day, [] days/week, and [] weeks/year. The expected life of the project is [] years.

V. Equipment Listing

Thermal/Catalytic Oxidizer System:

Manufacturer: []
Model #: [] in
Burner Rating: [] MMBtu or KVA
Supplemental Fuel: Natural Gas, LPG or Electric
Destruction Efficiency: [] % (District BACT requirement: 95%)
Residence Time: [] sec (0.5 sec is a minimum District requirement)
Stack Flowrate: [] scfm

Extraction Blower/Motor:

Power Rating: [] hp

C-XXXX-X-X: SOIL REMEDIATION PROJECT SERVED BY A XX.X MMBTU/HR
[MANUFACTURER AND MODEL #] [NATURAL GAS/LPG]-FIRED
[THERMAL/CATALYTIC] OXIDIZER

Or

C-XXXX-X-X: SOIL REMEDIATION PROJECT SERVED BY A XX.X KVA [MANUFACTURER AND MODEL NUMBER] ELECTRIC [THERMAL/CATALYTIC]

VI. Emission Control Technology Evaluation

Thermal Oxidizer:

During thermal oxidation, the temperature of the process stream is increased from ambient to $\geq 1400^{\circ}\text{F}$ with the assistance of a natural gas/LPG fueled burner. The combustion chamber will be maintained at $\geq 1400^{\circ}\text{F}$. The heated gases are turbulently mixed with oxygen and retained for a minimum of 0.5 seconds in the combustion chamber to ensure maximum VOC incineration. The thermal oxidizer will operate with a destruction efficiency of at least 95%.

Catalytic Oxidizer:

The catalytic oxidizer utilizes a catalytic element installed downstream of the combustion chamber burners. The precious metals in the catalytic element will accelerate the oxidation process at a lower temperature than for thermal oxidation, normally $\geq 600^{\circ}\text{F}$.

(i) If a gaseous fuel burner is used to maintain the minimum temperature

Natural gas/LPG will be used as a supplemental fuel when needed to maintain a combustion chamber temperature of $\geq 600^{\circ}\text{F}$. The natural gas/LPG fueled burner will be used to heat the VOC contaminated process stream from ambient temperature to $\geq 600^{\circ}\text{F}$ before the process stream passes through the catalytic element. The catalytic oxidizer will operate with a destruction efficiency of at least 95%.

(ii) If an electric heating element is used to maintain the minimum temperature

An electric heating element will be used to maintain a catalyst bed temperature of $\geq 600^{\circ}\text{F}$. The catalytic oxidizer will operate with a destruction efficiency of at least 95%.

VII. Emissions Calculations

A. Assumptions

If ppmv value is not already referenced to methane, add the following conversion:

VOC concentrations are measured with reference to methane. This requires that the molecular weight be adjusted to methane. Since the applicant stated that the maximum influent concentration is [] ppmv as [gasoline @ 100 lb/lb-mole], the adjusted concentration can be determined as follows:

$(\text{mass emissions})_{\text{as methane}} = \text{mass emissions}_{\text{as gasoline}}$

$$(\text{concentration} \times \text{flowrate} \times \text{molar volume} \times \text{molecular weight})_{\text{methane}} = (\text{concentration} \times \text{flowrate} \times \text{molar volume} \times \text{molecular weight})_{\text{gasoline}}$$

$$(\text{concentration} \times \text{molecular weight})_{\text{methane}} = (\text{concentration} \times \text{molecular weight})_{\text{gasoline}}$$

$$\text{concentration}_{\text{methane}} = \text{concentration}_{\text{gasoline}} \times \text{molecular weight}_{\text{gasoline}} / \text{molecular weight}_{\text{methane}}$$

Maximum Influent Concentration (ppmv as methane)

$$= \text{concentration}_{\text{gasoline}} \times \text{molecular weight}_{\text{gasoline}} / \text{molecular weight}_{\text{methane}}$$

$$= [\quad] \text{ ppmv-gasoline} \times 100 \text{ lb-gasoline/lb-mole} / 16.043 \text{ lb-methane/lb-mole}$$

$$= [\quad] \text{ ppmv as methane}$$

Process Weight:

- Maximum influent concentration: [] ppmv as methane **OR** mg/m³ of VOC being removed from the soil (proposed by applicant)
- Maximum influent rate: [] scfm
- Control efficiency: []% (as proposed by the applicant) minimum BACT requirement
- Maximum effluent VOC concentration = [] ppmv as methane **OR** mg³/m³ x (1 – 0.95)

B. Emission Factors

Thermal/Catalytic Oxidizer

Maximum effluent VOC concentration
= [] ppmv as methane **OR** mg³/m³ x (1 – 0.95)

Natural Gas

The following emission factors for NO_x, CO, VOC, and PM₁₀ are from AP-42 (7/98), Table 1.4-1 & 1.4-2. The SO_x emission factor is from District Policy APR 1720.

Emission Factors	
Pollutant	EF _(Natural Gas) (lb/MMBtu)
NO _x	0.1
SO _x ¹	0.00285
PM ₁₀	0.0076
CO	0.084
VOC	0.0055

Liquid Petroleum Gas

¹ Based on a natural gas HHV of 1000 Btu/scf and a total sulfur content of 1.0 gr/100 scf of gas (District Policy APR 1720).

The following emission factors for NO_x, CO, VOC, and PM₁₀ are from AP-42 (7/98), Table 1.5-1 for LPG combustion.

Emission Factors	
Pollutant	EF _(LPG) ² (lb/MMBtu)
NO _x	0.15
SO _x	0.0164 ³
PM ₁₀	0.0044
CO	0.021
VOC _(non-methane)	0.0055

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since this is a new emissions unit, the PE1 = 0

Or, For Modifications (Otherwise Delete);

The daily, annual, and quarterly pre-project emissions are shown below:

Pre-Project Potential to Emit (PE1)			
	Daily PE	Annual PE	Quarterly PE
NO _x	[]	[]	[]
SO _x	[]	[]	[]
PM ₁₀	[]	[]	[]
CO	[]	[]	[]
VOC	[]	[]	[]

2. Post Project Potential to Emit PE (PE2)

Emissions from Thermal/Catalytic Oxidizer:

² Based on a heating value of 91,500 Btu/gal for propane (AP-42, Section 1.5, 10/96).

³ SO_x = 0.1(S), where S = sulfur content in gr/100 scf = 0.1 (15) = 1.5 lb/1000 gal => (1.5 lb/1000 gal ÷ 0.0915 MMBtu/gal) = 0.0164 lb/MMBtu where, maximum sulfur content of LPG is 15 gr/100 scf (CRC Handbook of Tables for Applied Engineering Science, 2nd Edition, page 390).

<p>Control Efficiency: [] % (Per applicant, District BACT requirement: 95%) Max. Influent Conc.: [] ppmv as methane Max. Effluent Conc. Max Influent Conc. × (1 - Control Efficiency) = [] ppmv × (1 - 0.95) = [] ppmv as methane Influent Flow Rate: [] ft³/min (as proposed by the applicant) Molecular Wt. of Contaminant: 16.043 lb/lb-mole (converted M_w obtained from the applicant to methane) Molar Volume of Gas: 379.5 ft³/lb-mole</p>
<p>PE_{Uncontrolled} = Concentration (ppmv) × Influent Flow Rate (ft³/min) × 1 lb-mole/379.5 ft³ × Mol. Wt. (lb/lb-mole) × 1440 min/day</p> <p>= ([] × 10⁻⁶) × ([] ft³/min) × (1 lb-mole/379.5 ft³) × (16.043 lb/lb-mole) × 1440 min/day</p> <p>= [] lb-VOC/day</p>
<p><i>If Concentration given in mg/m³ use the following equation, otherwise delete it</i></p>
<p>PE_{Uncontrolled} = Concentration (mg/m³) × Influent Flow Rate (ft³/min) × (m³/35.31 ft³) × (g/1000 mg) × (lb/453.6 g) × 1440 min/day</p> <p>= ([] mg/m³) × ([] ft³/min) × m³/35.31 ft³ × (g/1000 mg) × (lb/453.6 g) × 1440 min/day</p> <p>= [X] lb-VOC/day</p>
<p>PE_{Controlled} = PE_{Uncontrolled} (lb/day) × (1 - Control Efficiency)</p> <p>= ([X] lb/day) × (1 - 0.95)</p> <p>= [Y] lb-VOC/day</p>

If the daily PE ([Y] above) is below 2 pounds per day, add the following section; otherwise delete it.

Once effluent VOC emissions drop below 2 pounds per day, the emissions unit is no longer subject to BACT and may operate at a lower control efficiency or without any controls at all. However, since the VOC emissions calculated above are below 2.0 lb-VOC/day, the calculated VOC emission will be adjusted to 2.0 lb-VOC/day in order to show no increase in emissions from this operation once the control device is reduced or taken off-line. The effluent concentration will be recalculated as follows:

$$\text{Concentration (ppmv)} = (2.0 \text{ lbs/day}) \div [\text{Influent Flow Rate (ft}^3\text{/min)} \times 1 \text{ lb-mole/379.5 ft}^3 \times \text{Mol. Wt. (lb/lb-mole)} \times 1440 \text{ min/day}]$$

$$\begin{aligned} \text{Concentration (ppmv)} &= (2.0 \text{ lbs/day}) \div [([] \text{ ft}^3\text{/min}) \times (1 \text{ lb-mole/379.5 ft}^3) \times ([] \text{ lb/lb-mole}) \\ &\quad \times 1440 \text{ min/day} \times 10^{-6}] \\ &= [] \text{ ppmv} \end{aligned}$$

Post-Project Potential to Emit (PE2)

Pollutant	PE _{Controlled} (lb/day)	PE _{annual} (lb/yr)	PE _{quarterly} (lb/qtr)
NO _x	[]	[]	[]
SO _x	[]	[]	[]
PM ₁₀	[]	[]	[]
CO	[]	[]	[]
VOC	[]	[]	[]

Note: PE_{annual} (lb/yr) = PE_{Controlled} (lb/day) x 365 (days/yr)

Note: PE_{Quarterly} (lb/qtr) = (PE_{Annual}) (lb/yr) ÷ 4 (qtr/yr)

Emissions from Combustion of Supplemental Fuel:

(Note: Delete this section if the emission unit is exclusively an electrically heated catalytic oxidizer)

Max Burner Rating =	[] MMBtu/hr
Operating hours =	24 hr/day
PE _{Natural Gas/LPG} (lb/day) =	Max Natural Gas/LPG (MMBtu/hr) x EF (lb/MMBtu) x 24 hr/day
PE _{NOx} (lb/day) =	[] MMBtu/hr x [] lb-NOx/MMBtu x 24 hr/day
	= [] lb-NOx/day
PE _{SOx} (lb/day) =	[] MMBtu/hr x [] lb-SOx/MMBtu x 24 hr/day
	= [] lb-SOx/day
PE _{PM10} (lb/day) =	[] MMBtu/hr x [] lb-PM ₁₀ /MMBtu x 24 hr/day
	= [] lb-PM10/day
PE _{CO} (lb/day) =	[] MMBtu/hr x [] lb-CO/MMBtu x 24 hr/day
	= [] lb-CO/day
PE _{VOC} (lb/day) =	[] MMBtu/hr x 0.0055 lb-VOC/MMBtu x 24 hr/day
	= [] lb-VOC/day

Emissions Solely from Combustion	
Pollutant	PE _(Natural Gas or LPG) only (lb/day)
NO _x	[]
SO _x	[]
PM ₁₀	[]
CO	[]
VOC _(non-methane)	[]

Total Emissions from Soil Remediation System:

$$PE_{Total} = PE_{Thermal \text{ or } Catalytic/Controlled} + PE_{Natural \text{ Gas or } LPG}$$

Total Post-Project Potential to Emit (PE2)					
Pollutant	PE_{Controlled voc} (lb/day)	PE_{Natural Gas or LPG} (lb/day)	PE_{2Daily} (lb/day)	PE_{2Annual} (lb/yr)	PE_{2Quarterly} (lb/qtr)
NO _x	---	[]	[]	[]	[]
SO _x	---	[]	[]	[]	[]
PM ₁₀	---	[]	[]	[]	[]
CO	---	[]	[]	[]	[]
VOC	[]	[]	[]	[]	[]

Note: $PE_{Annual} \text{ (lb/yr)} = PE_{Daily} \text{ (lb/day)} \times 365 \text{ (days/yr)}$

Note: $PE_{Quarterly} \text{ (lb/qtr)} = (PE_{Annual} \text{ (lb/yr)}) \div 4 \text{ qtr/yr}$

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

[For New Facilities]

Since this is a new facility, SSPE1 is equal to zero.

[For existing facilities]

Pursuant to Section 4.9 of District Rule 2201, the Pre-project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Since this is an existing facility, SSPE1 is equal to the PE_{Total} Pre-Project for all criteria pollutants.

The Pre-project Stationary Source Potential to Emit (SSPE1) is presented in the following table:

Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)					
Permit #	NO_x	SO_x	PM₁₀	CO	VOC
C-xxxx-x-x	0	0	0	0	0
Total	0	0	0	0	0

4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to Section 4.10 of District Rule 2201, the Post-project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site. The Post-project Stationary Source Potential to Emit (SSPE2) is presented in the following table:

Post Project Stationary Source Potential to Emit [SSPE2] (lb/year)					
Permit #	NO _x	SO _x	PM ₁₀	CO	VOC
C-xxxx-x-x	0	0	0	0	0
Total	0	0	0	0	0

5. Major Source Determination

Pursuant to Section 3.24 of District Rule 2201, a Major Source is a stationary source with post-project emissions or a Post Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the following threshold values. However, Section 3.24.2 states, “for the purposes of determining major source status, the SSPE2 shall not include the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.”

Major Source Determination (lb/year)					
Pollutant	NO _x	SO _x	PM ₁₀	CO	VOC
SSPE2 (lb/yr)	[]	[]	[]	[]	[]
Major Source Threshold	20,000	140,000	140,000	200,000	20,000
Major Source?	[Yes or No]	[Yes or No]	[Yes or No]	[Yes or No]	[Yes or No]

Since **none** of the threshold values in the above table are exceeded, this facility **is not** a Major Source.

Or

Since **the annual VOC emissions are above the major source** threshold values in the above table, this facility **is now** a Major Source for VOC. *(If this is true, this project is NO LONGER A GEAR. Check with your supervisor before further processing.)*

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable.

PSD Major Source Determination (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
Estimated Facility PE before Project Increase	0	0	0	0	0	0	0
PSD Major Source Thresholds	250	250	250	250	250	250	100,000
PSD Major Source ? (Y/N)	N	N	N	N	N	N	N

As shown above, the facility **is not** an existing major source for PSD for at least one pollutant. Therefore the facility **is not** an existing major source for PSD.

6. Baseline Emissions (BE)

a) Annual BE

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to Section 3.22

Since this is a new facility, the annual BE is equal to zero.

OR

Since this unit is not located at a major source, BE = Pre-project Potential to Emit.

Annual BE (lb/year)					
Permit Number	NO _x	SO _x	PM ₁₀	CO	VOC
C-xxxx-xx	0	0	0	0	[]

b) Quarterly BE (QBE)

The QBE is required, unit by unit, pollutant by pollutant, to determine the Quarterly Net Emissions Change below.

[For New Facilities]

Since this is a new facility, the quarterly BE is equal to zero.

[For Existing Facilities]

$$QBE = PE_{1\text{quarterly}}$$

QBE (lb/qtr)					
Permit Number	NO _x	SO _x	PM ₁₀	CO	VOC
C-xxxx-xx	0	0	0	0	[]

7. Quarterly Net Emissions Change (QNEC)

The QNEC is entered into PAS database and subsequently reported to CARB. The QNEC is calculated for each pollutant, for each unit, as the difference between the post-project quarterly permitted emissions and the quarterly baseline emissions.

$$QNEC = PE_2 \text{ (lb-VOC/qtr)} - BE \text{ (lb-VOC/qtr)}$$

Quarterly Net Emissions Change (QNEC) (lb/qtr)					
Permit Number	NO _x	SO _x	PM ₁₀	CO	VOC
C-xxxx-xx	0	0	0	0	0

8. Major Modification

Major Modification is defined in 40 CFR Part 51.165 as *"any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."*

As discussed in Section VII.C.5 above, the facility is not a Major Source for any criteria pollutant; therefore, the project does not constitute a Major Modification.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to pollutants for which the District is in attainment or for unclassified, pollutants. The pollutants addressed in the PSD applicability determination are listed as follows:

- NO₂ (as a primary pollutant)
- SO₂ (as a primary pollutant)

- CO
- PM
- PM10
- Greenhouse gases (GHG): CO₂, N₂O, CH₄, HFCs, PFCs, and SF₆

The first step of this PSD evaluation consists of determining whether the facility is an existing PSD Major Source or not (See Section VII.C.5 of this document).

In the case the facility is an existing PSD Major Source, the second step of the PSD evaluation is to determine if the project results in a PSD significant increase.

In the case the facility is NOT an existing PSD Major Source but is an existing source, the second step of the PSD evaluation is to determine if the project, by itself, would be a PSD major source.

In the case the facility is new source, the second step of the PSD evaluation is to determine if this new facility will become a new PSD major Source as a result of the project and if so, to determine which pollutant will result in a PSD significant increase.

A. Potential to Emit for New or Modified Emission Units vs PSD Major Source Thresholds

As a screening tool, the project potential to emit from all new and modified units is compared to the PSD major source threshold, and if total project potential to emit from all new and modified units is below this threshold, no further analysis will be needed.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable.

(Enter VOC emissions)

PSD Major Source Determination: Potential to Emit (tons/year)							
	NO ₂	VOC	SO ₂	CO	PM	PM ₁₀	CO _{2e}
Total PE from New and Modified Units	0	0	0	0	0	0	0
PSD Major Source threshold	250	250	250	250	250	250	100,000
New PSD Major Source?	N	N	N	N	N	N	N

As shown in the table above, the project potential to emit, by itself, does not exceed any of the PSD major source thresholds. Therefore, Rule 2410 is not applicable and no further discussion is required.

10. Federal Major Modification

As shown above, this project does not constitute a Major Modification. Therefore, in accordance with District Rule 2201, Section 3.17, this project does not constitute a Federal Major Modification and no further discussion is required.

VIII. Compliance

Rule 2201 - New and Modified Stationary Source Review Rule

A. BACT

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in a Major Modification.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

The applicant is proposing to install a new emissions unit with a PE of [] lb/day for VOC as calculated in section VII.C.2. Since the daily VOC emissions are [greater or not greater] than 2.0 lbs/day, BACT [will or will not] be triggered. The daily emissions for [NOx, SOx, PM₁₀, and CO] are also above 2.0 lb/day. Therefore, BACT will be triggered for [NOx, SOx, PM₁₀, CO, and VOC].

OR

The applicant is proposing to modify its existing emissions unit with an AIPE of [] lb/day for VOC as calculated in the following section. Since the daily VOC emissions are [greater or less] than 2.0 lbs/day, BACT [will or will not] be triggered. The daily AIPE for [NOx, SOx, PM₁₀, and CO] are also above 2.0 lb/day. Therefore, BACT will be triggered for [NOx, SOx, PM₁₀, CO, and VOC].

Adjusted Increase in Permitted Emissions (AIPE)

AIPE = PE2 – HAPE where,

- AIPE = Adjusted Increase in Permitted Emissions, lb/day.
- PE2 = the emission unit’s post project Potential to Emit, lb/day.
- HAPE = the emission unit’s Historically Adjusted Potential to Emit, lb/day.

Historically Adjusted Potential to Emit (HAPE) Calculations:

HAPE = PE1 x (EF2 / EF1) where,

- PE1 = The emission unit’s Potential to Emit prior to modification or relocation.
- EF2 = The emission unit’s permitted emission factor for the pollutant after modification or relocation. If EF2 is greater than EF1 then EF2/EF1 shall be set to 1.
- EF1 = The emission unit’s permitted emission factor for the pollutant before the modification or relocation.

- EF1 = [] % (Taken from project # [])
- EF2 = [] % (As proposed by the applicant, 95% District BACT requirement)

$$\begin{aligned}
 \text{AIPE (lb/day)} &= \text{PE2 (lb/day)} - [\text{PE1 (lb/day)} \times (\text{EF2} / \text{EF1})] \\
 &= \text{PE2 (lb/day)} - [\text{PE1 (lb/day)} \times (0.95 / 0.95)] \\
 &= \text{PE2 (lb/day)} - [\text{PE1 (lb/day)} \times 1] \\
 &= \text{PE2 (lb/day)} - \text{PE1 (lb/day)}
 \end{aligned}$$

Adjusted Increase in Permitted Emissions (AIPE)			
Pollutant	PE₂ Daily Post Project (lb/day)	PE₁ Daily Pre Project (lb/day)	AIPE (lb/day)
NO _x	--	--	--
SO _x	--	--	--
PM ₁₀	--	--	--
CO	--	--	--
VOC	[]	[]	[]

2. BACT Guidance

Per District Policy APR 1305, Section IX, “A top-down BACT analysis shall be performed as a part of the Application Review for each application subject to the BACT requirements pursuant to the District’s NSR Rule for source categories or classes covered in the BACT Clearinghouse, relevant information under each of the following steps may be simply cited from the Clearinghouse without further analysis.”

SJVUAPCD BACT Clearinghouse Guideline 2.1.1 specifies the achieved in practice or contained in SIP BACT and technologically feasible BACT for soil remediation operations utilizing a thermal/catalytic oxidation system. Therefore, relevant information will be cited without further analysis.

See Appendix I: BACT Clearinghouse Guideline 2.1.1

3. Top-Down BACT Analysis

VOC:

The applicant is proposing to use a [thermal/catalytic oxidizer at 95% or greater control efficiency](#). Per the Top-Down analysis in [Appendix I](#) of this evaluation, the proposed equipment satisfies the BACT requirement.

(Add the following section if BACT for NO_x is triggered; otherwise, delete.)

NO_x:

The applicant is proposing to use a [thermal/catalytic oxidizer at 95% or greater control efficiency](#). Per the Top-Down analysis in [Appendix I](#) of this evaluation, the proposed equipment satisfies the BACT requirement.

B. Offsets

1. Offset Applicability

Pursuant to Section 4.5.3, offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the Post Project Stationary Source Potential to Emit (SSPE2) equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The following table compares the post-project facility-wide annual emissions in order to determine if offsets will be required for this project.

Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
Post Project SSPE (SSPE2)	--	--	--	--	--
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	No

2. Quantity of Offsets Required

As shown in the table above, the SSPE2 is not greater than or equal to the offset threshold levels for any criteria pollutant. Therefore, offsets will not be required.

OR

As shown in the table above, the SSPE2 meets or exceeds the offset threshold levels. Therefore, offsets will be required. *(If this is true, this project is NO LONGER A GEAR. Check with your supervisor before further processing.)*

C. Public Notification

1. Applicability

Public noticing is required for:

- a. Any new Major Source, which is a new facility that is also a Major Source,
- b. Major Modifications,
- c. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- d. Any project which results in the offset thresholds being surpassed, and/or
- e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a) New Major Source

Example (a): (For a new facility – non Major Source.)

New Major Sources are new facilities, which are also Major Sources. As shown in Section VII.C.5 above, the SSPE2 is not greater than the Major Source threshold for any criteria pollutant. Therefore, public noticing is not required for this project for new Major Source purposes.

Example (c): (For an existing facility.)

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

b) Major Modification

As demonstrated in VII.C.7, this project does not constitute a Major Modification; therefore, public noticing for Major Modification purposes is not required.

c) PE > 100 lb/day

Example (a): (For a project not including a new emissions unit.)

Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. There are no new emissions units associated with this project; therefore public noticing is not required for this project for Potential to Emit Purposes.

Example (b): (For a project including a new emissions unit – PE ≤ 100 lb/day.)

Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. As seen in Section VII.C.2 above, this project does not include a new emissions unit which has daily emissions greater than 100 lb/day for any pollutant, therefore public noticing for PE > 100 lb/day purposes is not required.

Example (c): (For a project including a new emissions unit – PE > 100 lb/day.)

The PE2 for this new unit is compared to the daily PE Public Notice thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds				
Pollutant	PE2 (lb/day)	Public Threshold	Notice	Public Notice Triggered?
NO _x	100.5	100 lb/day		Yes
SO _x	21.2	100 lb/day		No
PM ₁₀	25.6	100 lb/day		No
CO	124.7	100 lb/day		Yes
VOC	48.9	100 lb/day		No

Therefore, public noticing for PE > 100 lb/day purposes is required.

d) Offset Threshold

Example (a): (For a project not surpassing the offset threshold.)

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	0	0	20,000 lb/year	No
SO _x	0	0	54,750 lb/year	No
PM ₁₀	17,471	24,399	29,200 lb/year	No
CO	0	0	200,000 lb/year	No
VOC	0	0	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

Example (b): (For a project surpassing the offset threshold.)

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	18,361	21,698	20,000 lb/year	Yes
SO _x	3,274	3,963	54,750 lb/year	No
PM ₁₀	5,450	6,785	29,200 lb/year	No
CO	25,680	27,318	200,000 lb/year	No
VOC	17,552	19,035	20,000 lb/year	No

As detailed above, offset thresholds were surpassed for NO_x with this project; therefore public noticing is required for offset purposes. *(As stated earlier, if this is true, this project is NO LONGER A GEAR. Check with your supervisor before further processing.)*

(Note: Public notification is independent of whether or not Offsets are required. For example, if this project involves the installation of emergency (offset-exempt) equipment and the offset threshold is surpassed, then public notification would still be triggered. And conversely, if this project involves the installation of new equipment which required offsets; however, the SSPE1 was already greater than the offset threshold, public notification would not be triggered.)

e) SSIPE > 20,000 lb/year

An SSIPE exceeding 20,000 pounds per year for any one pollutant triggers public notice.

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE is calculated as the Post Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. $SSIPE = SSPE2 - SSPE1$. The values for SSPE2 and SSPE1 are calculated according to Rule 2201, Sections 4.9 and 4.10, respectively. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

Example (a): (For a project where the SSIPE ≤ 20,000 lb/year.)

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	876	0	876	20,000 lb/year	No
SO _x	37	0	37	20,000 lb/year	No
PM ₁₀	8,438	3,776	4,662	20,000 lb/year	No

CO	730	0	730	20,000 lb/year	No
VOC	19,966	0	19,966	20,000 lb/year	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore public noticing for SSIPE purposes is not required.

Example (b): (For a project where the SSIPE > 20,000 lb/year.)

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	35,453	11,267	24,186	20,000 lb/year	Yes
SO _x	6,482	4,533	1,949	20,000 lb/year	No
PM ₁₀	8,438	5,971	2,467	20,000 lb/year	No
CO	42,080	21,956	20,124	20,000 lb/year	Yes
VOC	29,008	25,942	3,066	20,000 lb/year	No

As demonstrated above, the SSIPEs for NO_x and CO were greater than 20,000 lb/year; therefore public noticing for SSIPE purposes is required.

2. Public Notice Action

Example (a): (For a project not requiring public notification.)

As discussed above, this project will not result in emissions, for any criteria pollutant, which would subject the project to any of the noticing requirements listed above. Therefore, public notice will not be required for this project.

Example (b): (For a project requiring public notification – PE > 100 lb/day.)

As discussed above, public noticing is required for this project for NO_x emissions in excess of 100 lb/day. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District's website prior to the issuance of the ATC for this equipment.

(Note: When public notification is required an additional section in the EE gets added, Section VIII-Rule 2201-F, see below)

D. Daily Emissions Limits (DEL)

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.15 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.15.1 and 3.15.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

- a) The total VOC emissions from the soil remediation system served by the thermal oxidizer shall not exceed [] pounds in any one day.
- b) VOC concentration of the exhaust gas from the soil remediation system served by the thermal/catalytic oxidizer shall not exceed [] ppmv, as methane. [District Rule 2201]
- c) The soil ventilation rate and the exhaust gas flow rate shall not exceed [] scfm.

E. Compliance Assurance

The following measures shall be taken to ensure continued compliance with District Rules:

1. Source Testing

VOC Source testing upon initial startup is required.

2. Monitoring

Monitoring of influent and exhaust VOC concentrations will be required weekly. If the uncontrolled VOC emission rate is below 2.0 lb/day as demonstrated by five consecutive weekly samples, the control device may be taken off-line and sampling shall be performed monthly for ongoing demonstration to show that the uncontrolled VOC emissions are below 2.0 lb/day.

3. Record Keeping

The permittee shall maintain records for all monitored data for a period of five years.

4. Reporting

The permittee shall submit initial startup test report and maintain all other monitoring records on site. Such records shall be made available for District inspection upon request.

F. Ambient Air Quality Analysis

(Note: Applicable only when public notice is triggered, otherwise delete this section.)

An AAQA is conducted by the Technical Services group, for any project which has an increase in emissions and triggers public notification requirements. Discuss the AAQA results as follows.

For example:

Section 4.14.1 of this Rule requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The Technical Services Division of the SJVAPCD conducted the required analysis. Refer to Appendix X of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO_x, CO, and SO_x. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO_x, CO, or SO_x.

The proposed location is in a non-attainment area for PM₁₀. The increase in the ambient PM₁₀ concentration due to the proposed equipment is shown on the table titled Calculated Contribution. The levels of significance, from 40 CFR Part 51.165 (b)(2), are shown on the table titled Significance Levels.

Significance Levels					
Pollutant	Significance Levels (µg/m ³) - 40 CFR Part 51.165 (b)(2)				
	Annual Avg.	24 hr Avg.	8 hr Avg.	3 hr Avg.	1 hr Avg.
PM ₁₀	1.0	5	N/A	N/A	N/A

Calculated Contribution					
Pollutant	Calculated Contributions (µg/m ³)				
	Annual Avg.	24 hr Avg.	8 hr Avg.	3 hr Avg.	1 hr Avg.
PM ₁₀	0.XX	X.XX	N/A	N/A	N/A

As shown, the calculated contribution of PM₁₀ will not exceed the EPA significance level. This project is not expected to cause or make worse a violation of an air quality standard.

(Note: Special permit conditions may be required as a result of the AAQA.)

Rule 2410 Prevention of Significant Deterioration

As shown in Section C.9.A above, this is a new facility and the project potential to emit, by itself, does not exceed any of the PSD major source thresholds. Therefore, this facility is not a PSD source and Rule 2410 does not apply.

Rule 2520 Federally Mandated Operating Permits

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

Rule 4101 Visible Emissions

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity.

As long as the equipment is properly maintained and operated, compliance with visible emissions limits is expected under normal operating conditions.

Rule 4102 Public Nuisance

Section 4.0 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected.

California Health & Safety Code 41700 (Health Risk Assessment)

Discuss whether a Health Risk Assessment is required and/or the results of the HRA, including any special conditions to consider when issuing the ATC(s).

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

Example (a): (For a project with no increase in emissions.)

As demonstrated above, there are no increases in emissions associated with this project, therefore a health risk assessment is not necessary and no further risk analysis is required.

(Note 1: An HRA is necessary if there is a change in any HRA parameter, i.e. exhaust flow rate changes, stack changes, fuel use and type changes, receptor distances, etc.)

(Note 2: If example (a) is used, delete the following sections, since they don't apply if an HRA was not performed.)

Example (b): (For a project with a Prioritization score ≤ 1.)

An HRA is not required for a project with a total facility prioritization score of less than or equal to one. According to the Technical Services Memo for this project (Appendix X), the total facility prioritization score including this project was less than or equal to one. Therefore, no future analysis is required to determine the impact from this project and compliance with the District's Risk Management Policy is expected.

Example (c): (For a project with a Prioritization score > 1.)

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix X), the total facility prioritization score including this project was greater than one. Therefore, a health risk assessment was required to determine the short-term acute and long-term chronic exposure from this project.

The cancer risk for this project is shown below:

HRA Summary		
Unit	Cancer Risk	T-BACT Required

X-XXXX-X-X	XX per million	Yes/No
------------	----------------	--------

Discussion of T-BACT

Discuss whether a T-BACT is or is not triggered and the requirements which satisfy T-BACT (if any).

Example (a): (For a project where T-BACT not triggered.)

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is not required for this project because the HRA indicates that the risk is not above the District's thresholds for triggering T-BACT requirements; therefore, compliance with the District's Risk Management Policy is expected.

Example (b): (For a project where T-BACT is triggered)

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is required for this project because the HRA indicates that the risk is above the District's thresholds for triggering T-BACT requirements.

For this project T-BACT is triggered for VOC. T-BACT is satisfied with BACT for VOC (see [Appendix X](#)), which is the use of a [thermal/catalytic oxidation system with a 95% or greater control efficiency](#); therefore, compliance with the District's Risk Management Policy is expected.

(Note: List all conditions necessary to ensure that the equipment is operated in the manner assumed when the RMR was performed.)

See Appendix II: Health Risk Assessment Summary

Rule 4651 – Volatile Organic Compounds From Decontamination of Soil

The applicant is not proposing to excavate, transport, handle, ex-situ decontaminate, or dispose contaminated soil. Therefore, per section 2.0, this rule is not applicable.

California Health & Safety Code 42301.6 (School Notice)

Reference project location and its proximity to a school and state whether or not school notice is required for this project.

Example (a): (For a Non-School Notice project - > 1,000 feet.)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

Example (b): (For a Non-School Notice project – no increase in emissions)

The District has verified that this site is located within 1,000 feet of a school. However, pursuant to California Health and Safety Code 42301.6, since this project will not result in an increase in emissions, a school notice is not required.

Example (c): (For a School Notice project.)

The District has verified that this site is located within 1,000 feet of the following school:

School Name: [Name]
Address: [Address]

Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is required. Prior to the issuance of the ATC for this equipment, notices will be provided to the parents/guardians of all students of the affected school, and will be sent to all residents within 1,000 ft. of the site.

[If there is no school w/in ¼ mile of the emissions increase, include the following discussion, otherwise delete]:

The District has verified that there are no additional schools within ¼ mile of the emission source.

[If there is a school w/in ¼ mile of the emissions increase, include the following discussion, otherwise delete]:

Since a school notice has been triggered (due to the above-listed school within 1,000 of the emission source), notices will also be provided to the parents/guardians of all students from all school sites within ¼ mile of the emission source. The following schools(s) are within ¼ mile of the emission source:

School Name: [Name]
Address: [Address]
(add additional schools if necessary)

(Note: Refer to [FYI - 71](#) for guidance on how to process a School Notice project.)

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001.

The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant

environmental effects of proposed activities.

- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The District performed an Engineering Evaluation (this document) for the proposed project and determined that the project qualifies for ministerial approval under the District's Guideline for Expedited Application Review (GEAR). Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which a public agency exercises only ministerial approval. Therefore, the District finds that this project is exempt from the provisions of CEQA.

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit are based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

As described above, the project requires only ministerial approval, and is exempt from the provisions of CEQA. As such, an Indemnification Agreement or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendations

Issue Authority to Construct [C-xxxx-x-x](#) subject to the permit conditions on the attached draft Authority to Construct.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
C-XXXX-X-X	3020-01-[] *use fuel burning fee schedule if it results in higher fees (when applicable)	[] Electric HP	\$882.00

Appendices

- I: BACT Guideline 2.1.1 & Top-Down BACT Analysis
- li: HRA Summary
- lii: Draft Authority to Construct
- lv: Emissions Profile

APPENDIX I

BACT Guideline 2.1.2 & Top-Down BACT Analysis

**San Joaquin Valley
 Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline 2.1.1*

Last Update: March 17, 1997

Emissions Unit: Soil Remediation Operation - Thermal Oxidizer

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Thermal Oxidizer @ 1400°F and 0.5 sec OR Catalytic Oxidizer @ 600°F and 0.5 sec both at 95% or greater control efficiency		
NO _x		1. Natural gas with low NO _x burner 2. Water injection (valid only for vapor generation units)	Carbon adsorption - as an alternative for VOC control (not valid for vapor generation units)

*This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Page(s)

Top-Down BACT Analysis for VOC

a. Step 1 - Identify All Possible VOC Control Technologies

The SJVUAPCD BACT Clearinghouse Guideline 2.1.1 identifies for this soil remediation operation:

- Achieved-in-practice BACT: Thermal Oxidizer @ 1400°F and 0.5 sec, @ 95% or greater control efficiency.
- Achieved-in-practice BACT: Catalytic Oxidizer @ 600°F and 0.5 sec, @ 95% or greater control efficiency.
- No technologically feasible alternatives are listed.

b. Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options listed.

c. Step 3 - Rank Remaining Control Technologies by Control Effectiveness

- Achieved-in-practice BACT: Thermal Oxidizer @ 1400°F and 0.5 sec, @ 95% or greater control efficiency.
- Achieved-in-practice BACT: Catalytic Oxidizer @ 600°F and 0.5 sec, @ 95% or greater control efficiency.

d. Step 4 - Cost Effectiveness Analysis

The only control technology alternative in the ranking list from Step 3 has been achieved in practice. Therefore, per SJVUAPCD BACT policy, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

The applicant is proposing BACT by the use of a **thermal and/or catalytic** oxidizer @ 1400°F and 600°F respectively and 0.5 sec, with a control efficiency of 95% or greater.

OR

The applicant is proposing a **thermal** oxidizer @ 1400°F and 0.5 sec, with a control efficiency of 95% or greater.

OR

The applicant is proposing a catalytic oxidizer @ 600°F and 0.5 sec, with a control efficiency of 95% or greater.

(delete this section if BACT for NO_x is not triggered)

Top-Down BACT Analysis for NO_x

a. Step 1 - Identify All Possible VOC Control Technologies

Achieved-in-Practice

- None

(If this facility is a small emitter, include the following Technologically Feasible discussion. Otherwise, discuss with supervisor. A small emitter is defined as a facility with emissions less than a) 2 ton/yr of each pollutant or b) 40 lb-NO_x/day, 30 lb-SO_x/day, 30 lb-PM₁₀/day, 220 lb-CO/day, 30 lb-VOC/day)

Technologically Feasible

A small emitter is not required to use technologically feasible options. Therefore, the following will not be included in this assessment.

- Natural gas with low NO_x burner
- Water injection (valid only for vapor generation units)

Alternate Basic Equipment

- Carbon adsorption - as an alternative for VOC control (not valid for vapor generation units)

b. Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options listed.

c. Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Carbon adsorption (No NO_x emissions; 100% control)

d. Step 4 - Cost Effectiveness Analysis

A small emitter is only required to consider the cost effectiveness of achieved-in-practice alternate basic equipment as follows:

$$CE_{alt} = (COST_{alt} - COST_{basic}) / (EMISSION_{basic} - EMISSION_{alt})$$

where,

CE_{alt} = the cost effectiveness of alternate basic equipment expressed as dollars per ton of emissions reduced

$COST_{alt}$ = the equivalent annual capital cost of the alternate basic equipment plus its annual operating cost

$COST_{basic}$ = the equivalent annual capital cost of the proposed basic equipment, without BACT, plus its annual operating cost

$EMISSION_{basic}$ = the emissions from the proposed basic equipment, without BACT.

$EMISSION_{alt}$ = the emissions from the alternate basic equipment

Carbon adsorption is most likely to cost out with the cost of carbon alone. Since there is no NO_x emissions from carbon adsorption, $EMISSION_{alt} = 0$. As a worst case, it will be assumed that there is no cost for the basic equipment. This will result in the following equation:

$$CE_{alt} = (COST_{alt}) / (EMISSION_{basic})$$

In this project, to control the same amount of VOC, it would take [] lb of carbon per day as shown below:

$$\begin{aligned} & \text{Amount of carbon (lb/day)} \\ & = \text{amount of VOC controlled} \times \text{lb-carbon/lb-VOC} \\ & = [] \text{ lb-VOC/day} \times 5 \text{ lb-carbon/lb-VOC} \\ & = [] \text{ lb-carbon/day} \end{aligned}$$

The cost of carbon is approximately \$3/lb⁴, resulting in the following daily cost:

$$\begin{aligned} COST_{alt} & = \$3/\text{lb} \times [] \text{ lb-carbon/day} \\ & = \end{aligned}$$

$EMISSION_{basic}$ is equal to the daily NO_x emissions generated as shown in Section VII.C.2 of this evaluation. The resulting CE_{alt} is as follows:

$$\begin{aligned} CE_{alt} & = (COST_{alt}) / (EMISSION_{basic}) \times (\text{lb to ton conversion}) \\ & = [] (\$/\text{day}) / [] (\text{lb-NO}_x/\text{day}) * (2000 \text{ lb}/1 \text{ ton}) \\ & = [] \$/\text{ton-NO}_x \end{aligned}$$

The cost effectiveness for NO_x is \$24,500/ton, which is less than the CE_{alt} calculated above. Therefore, the use of carbon adsorption is not cost-effective and is not required.

⁴ Data from Timothy Souther of Geomatrix – May 8, 2007.

e. Step 5 - Select BACT

No NO_x control technology is required as shown by this top down BACT analysis.

APPENDIX II

HRA Summary

APPENDIX III

Draft Authority to Construct

APPENDIX IV

Emissions Profile

Conditions
(DON'T INCLUDE WITH APPLICATION REVIEW)

If Using Electric Heater Only

Only an electrical coil shall be used as an auxiliary method of supplying power for the combustion of VOC. [District Rule 2201] N

Thermal Oxidizer (Natural Gas)

{1420} The soil remediation system shall be maintained in proper operating condition at all times. [District Rule 2201] N

{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N

{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

{2857} Only natural gas shall be used as auxiliary fuel for the combustion of VOC. [District Rule 2201] N

{1423} Either the VOC control efficiency shall not be less than 95%, or the total VOC emission rate shall not exceed 2 pounds in any one day. [District Rule 2201] N

The effluent gas flowrate after the control device shall not exceed xxx scfm. [District Rule 2201] N

The effluent VOC concentration level after the control device shall not exceed xxx ppmv, as methane. [District Rule 2201]

{1463} The total VOC emissions from the soil remediation system served by the thermal oxidizer shall not exceed XX pounds in any one day. [District Rule 2201] N

The emissions from the combustion of natural gas shall not exceed any of the following limits: 0.1 lb-NO_x/MMBtu, 0.084 lb-CO/MMBtu, 0.0076 lb-PM₁₀/MMBtu, 0.0055 lb-VOC/MMBtu, or 0.00285 lb-SO_x/MMBtu. [District Rule 2201] N

{1462} The minimum operating temperature for the combustion chamber of the thermal oxidizer shall be maintained at or above 1400 degrees F. [District Rule 2201] N

{2775} The thermal oxidizer shall be equipped with an operational temperature gauge to indicate the temperature of the combustion chamber. A continuously recording device

shall be utilized to indicate the combustion chamber temperature during operation. [District Rule 2201] N

{1470} The soil remediation system shall not be operated unless the combustion chamber is at or above minimum operating temperature. The system shall automatically terminate operation if the temperature drops below the minimum operating temperature. [District Rule 2201] N

{1413} Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams. [District Rule 1081] N

{1414} Laboratory samples shall be taken at the initial inspection, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] N

{1416} Measurements to determine the influent and the effluent gas flow rates shall be taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] N

{1417} Initial compliance with VOC emission rate and control efficiency requirements shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] N

{403 modified} Ongoing compliance with VOC emission rate and control efficiency requirements shall be demonstrated at least once per month by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

{1425} Records of the cumulative running time and the measured influent and effluent VOC concentrations shall be maintained. [District Rule 2201] N

{2780} All records shall be retained for a minimum of five years, and shall be made available for District inspection upon request. [District Rule 2201] N

Thermal Oxidizer (LPG)

{1420} The soil remediation system shall be maintained in proper operating condition at all times. [District Rule 2201] N

{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N

{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

{2859} Only liquefied petroleum gas shall be used as auxiliary fuel for the combustion of VOC. [District Rule 2201] N

{1423} Either the VOC control efficiency shall not be less than 95%, or the total VOC emission rate shall not exceed 2 pounds in any one day. [District Rule 2201] N

The effluent gas flowrate after the control device shall not exceed xxx scfm. [District Rule 2201] N

The effluent VOC concentration level after the control device shall not exceed xxx ppmv, as methane. [District Rule 2201]

{1463} The total VOC emissions from the soil remediation system served by the thermal oxidizer shall not exceed XX pounds in any one day. [District Rule 2201] N

The emissions from the combustion of LPG shall not exceed either of the following limits: 0.15 lb-NO_x/MMBtu, 0.021 lb-CO/MMBtu, 0.0044 lb-PM₁₀/MMBtu, 0.0055 lb-VOC/MMBtu, or 0.0164 lb-SO_x/MMBtu. [District Rule 2201]

{1462} The minimum operating temperature for the combustion chamber of the thermal oxidizer shall be maintained at or above 1400 degrees F. [District Rule 2201] N

{2775} The thermal oxidizer shall be equipped with an operational temperature gauge to indicate the temperature of the combustion chamber. A continuously recording device shall be utilized to indicate the combustion chamber temperature during operation. [District Rule 2201] N

{1470} The soil remediation system shall not be operated unless the combustion chamber is at or above minimum operating temperature. The system shall automatically terminate operation if the temperature drops below the minimum operating temperature. [District Rule 2201] N

{1413} Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams. [District Rule 1081] N

{1414} Laboratory samples shall be taken at the initial inspection, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] N

Laboratory samples shall be analyzed for VOC. [District Rule 2201] N

{1416} Measurements to determine the influent and the effluent gas flow rates shall be

taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] N

{1417} Initial compliance with VOC emission rate and control efficiency requirements shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] N

{403 modified} Ongoing compliance with VOC emission rate and control efficiency requirements shall be demonstrated at least once per month by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

{1425} Records of the cumulative running time and the measured influent and effluent VOC concentrations shall be maintained. [District Rule 2201] N

{2780} All records shall be retained for a minimum of five years, and shall be made available for District inspection upon request. [District Rule 2201] N

Catalytic Oxidizer (Natural Gas)

{1420} The soil remediation system shall be maintained in proper operating condition at all times. [District Rule 2201] N

{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N

{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

{2857} Only natural gas shall be used as auxiliary fuel for the combustion of VOC. [District Rule 2201] N

{1423} Either the VOC control efficiency shall not be less than 95%, or the total VOC emission rate shall not exceed 2 pounds in any one day. [District Rule 2201] N

The effluent gas flowrate after the control device shall not exceed xxx scfm. [District Rule 2201] N

The effluent VOC concentration level after the control device shall not exceed xxx ppmv, as methane. [District Rule 2201]

{1465} The total VOC emissions from the soil remediation system served by the catalytic oxidizer shall not exceed xxx pounds in any one day. [District Rule 2201] N

The emissions from the **combustion of natural gas** shall not exceed any of the following limits: 0.1 lb-NO_x/MMBtu, 0.084 lb-CO/MMBtu, 0.0076 lb-PM₁₀/MMBtu, 0.0055 lb-VOC/MMBtu, or 0.00285 lb-SO_x/MMBtu. [District Rule 2201] N

{1464} The minimum operating temperature for the combustion chamber of the catalytic oxidizer shall be maintained at or above 600 degrees F. [District Rule 2201] N

{2861} The catalytic oxidizer shall be equipped with an operational temperature gauge to indicate the temperature of the combustion chamber. A continuously recording device shall be utilized to indicate the combustion chamber temperature during operation. [District Rule 2201] N

{1470} The soil remediation system shall not be operated unless the combustion chamber is at or above minimum operating temperature. The system shall automatically terminate operation if the temperature drops below the minimum operating temperature. [District Rule 2201] N

{1413} Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams. [District Rule 1081] N

{1414} Laboratory samples shall be taken at the initial inspection, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] N

{1416} Measurements to determine the influent and the effluent gas flow rates shall be taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] N

{1417} Initial compliance with VOC emission rate and control efficiency requirements shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] N

{403 modified} Ongoing compliance with VOC emission rate and control efficiency requirements shall be demonstrated at least once per month by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

{1425} Records of the cumulative running time and the measured influent and effluent VOC concentrations shall be maintained. [District Rule 2201] N

{2780} All records shall be retained for a minimum of five years, and shall be made available for District inspection upon request. [District Rule 2201] N

Catalytic Oxidizer (LPG)

{1420} The soil remediation system shall be maintained in proper operating condition at all times. [District Rule 2201] N

{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N

{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

{2859} Only liquefied petroleum gas shall be used as auxiliary fuel for the combustion of VOC. [District Rule 2201] N

{1423} Either the VOC control efficiency shall not be less than 95%, or the total VOC emission rate shall not exceed 2 pounds in any one day. [District Rule 2201] N

The effluent gas flowrate after the control device shall not exceed xxx scfm. [District Rule 2201] N

The effluent VOC concentration level after the control device shall not exceed xxx ppmv, methane. [District Rule 2201]

{1465} The total VOC emissions from the soil remediation system served by the catalytic oxidizer shall not exceed xxx pounds in any one day. [District Rule 2201] N

The emissions from the combustion of LPG shall not exceed either of the following limits: 0.15 lb-NO_x/MMBtu, 0.021 lb-CO/MMBtu, 0.0044 lb-PM₁₀/MMBtu, 0.0055 lb-VOC/MMBtu, or 0.0164 lb-SO_x/MMBtu. [District Rule 2201]

{1464} The minimum operating temperature for the combustion chamber of the catalytic oxidizer shall be maintained at or above 600 degrees F. [District Rule 2201] N

{2861} The catalytic oxidizer shall be equipped with an operational temperature gauge to indicate the temperature of the combustion chamber. A continuously recording device shall be utilized to indicate the combustion chamber temperature during operation. [District Rule 2201] N

{1470} The soil remediation system shall not be operated unless the combustion chamber is at or above minimum operating temperature. The system shall automatically terminate operation if the temperature drops below the minimum operating temperature. [District Rule 2201] N

{1413} Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams. [District Rule 1081] N

{1414} Laboratory samples shall be taken at the initial inspection, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] N

{1416} Measurements to determine the influent and the effluent gas flow rates shall be taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] N

{1417} Initial compliance with VOC emission rate and control efficiency requirements shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] N

{403 modified} Ongoing compliance with VOC emission rate and control efficiency requirements shall be demonstrated at least once per month by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

{1425} Records of the cumulative running time and the measured influent and effluent VOC concentrations shall be maintained. [District Rule 2201] N

{2780} All records shall be retained for a minimum of five years, and shall be made available for District inspection upon request. [District Rule 2201] N

Thermal and Catalytic Oxidizer (Natural Gas)

{1420} The soil remediation system shall be maintained in proper operating condition at all times. [District Rule 2201] N

{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N

{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

{2857} Only natural gas shall be used as auxiliary fuel for the combustion of VOC. [District Rule 2201] N

{1423} Either the VOC control efficiency shall not be less than 95%, or the total VOC emission rate shall not exceed 2 pounds in any one day. [District Rule 2201] N

{modified 1463} The total VOC emissions from the soil remediation system served by the thermal or catalytic oxidizer shall not exceed XX pounds in any one day. [District Rule 2201] N

The emissions from the **combustion of natural gas** shall not exceed any of the following limits: 0.1 lb-NO_x/MMBtu, 0.084 lb-CO/MMBtu, 0.0076 lb-PM₁₀/MMBtu, 0.0055 lb-VOC/MMBtu, or 0.00285 lb-SO_x/MMBtu. [District Rule 2201] N

{1462} The minimum operating temperature for the combustion chamber of the thermal oxidizer shall be maintained at or above 1400 degrees F. [District Rule 2201] N

{1464} The minimum operating temperature for the combustion chamber of the catalytic oxidizer shall be maintained at or above 600 degrees F. [District Rule 2201] N

{1469} The thermal/catalytic oxidizer shall be equipped with an operational temperature gauge to indicate the temperature of the combustion chamber. A continuously recording device shall be utilized to indicate the combustion chamber temperature during operation. [District Rule 2201] N

{1470} The soil remediation system shall not be operated unless the combustion chamber is at or above minimum operating temperature. The system shall automatically terminate operation if the temperature drops below the minimum operating temperature. [District Rule 2201] N

{1413} Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams. [District Rule 1081] N

{1414} Laboratory samples shall be taken at the initial inspection, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] N

{1416} Measurements to determine the influent and the effluent gas flow rates shall be taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] N

{1417} Initial compliance with VOC emission rate and control efficiency requirements shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] N

{403} Ongoing compliance with VOC emission rate and control efficiency requirements shall be demonstrated by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

{1356} Sampling to demonstrate ongoing compliance shall be performed at least once per month. [District Rule 1081] N

{1425} Records of the cumulative running time and the measured influent and effluent VOC concentrations shall be maintained. [District Rule 2201] N

{1471} The Air Pollution Control Inspector shall be notified in writing when the thermal

incinerator will be modified to operate in the catalytic oxidizer mode prior to the modification. [District Rule 2201] N

{2780} All records shall be retained for a minimum of five years, and shall be made available for District inspection upon request. [District Rule 2201] N

Thermal and Catalytic (LPG)

{1420} The soil remediation system shall be maintained in proper operating condition at all times. [District Rule 2201] N

{15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N

{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102] N

{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

{2859} Only liquefied petroleum gas shall be used as auxiliary fuel for the combustion of VOC. [District Rule 2201] N

{1423} Either the VOC control efficiency shall not be less than 95%, or the total VOC emission rate shall not exceed 2 pounds in any one day. [District Rule 2201] N

The effluent gas flowrate after the control device shall not exceed xxx scfm. [District Rule 2201] N

The effluent VOC concentration level after the control device shall not exceed xxx ppmv, as methane. [District Rule 2201]

{modified 1463} The total VOC emissions from the soil remediation system served by the thermal or catalytic oxidizer shall not exceed XX pounds in any one day. [District Rule 2201] N

{1465} The total VOC emissions from the soil remediation system served by the catalytic oxidizer shall not exceed xxx pounds in any one day. [District Rule 2201] N

The emissions from the combustion of LPG shall not exceed either of the following limits: 0.15 lb-NO_x/MMBtu, 0.021 lb-CO/MMBtu, 0.0044 lb-PM₁₀/MMBtu, 0.0055 lb-VOC/MMBtu, or 0.0164 lb-SO_x/MMBtu. [District Rule 2201]

{1462} The minimum operating temperature for the combustion chamber of the thermal oxidizer shall be maintained at or above 1400 degrees F. [District Rule 2201] N

{1464} The minimum operating temperature for the combustion chamber of the catalytic oxidizer shall be maintained at or above 600 degrees F. [District Rule 2201] N

{1469} The thermal/catalytic oxidizer shall be equipped with an operational temperature gauge to indicate the temperature of the combustion chamber. A continuously recording device shall be utilized to indicate the combustion chamber temperature during operation. [District Rule 2201] N

{1470} The soil remediation system shall not be operated unless the combustion chamber is at or above minimum operating temperature. The system shall automatically terminate operation if the temperature drops below the minimum operating temperature. [District Rule 2201] N

{1413} Sampling ports adequate for extraction of grab samples, measurement of gas flow rate, and use of an FID, PID, or other District-approved VOC detection device shall be provided for both the influent and the effluent gas streams. [District Rule 1081] N

{1414} Laboratory samples shall be taken at the initial inspection, under the supervision of the APCD Inspector. Samples shall be taken from both the influent and the effluent gas stream sampling ports. [District Rule 1081] N

{1416} Measurements to determine the influent and the effluent gas flow rates shall be taken at the initial inspection. Flow rate calculations shall be submitted to the District along with the laboratory sample analysis results. [District Rule 1081] N

{1417} Initial compliance with VOC emission rate and control efficiency requirements shall be demonstrated by the results of the laboratory sample analysis. The results shall be submitted to the District within 60 days of the test. [District Rule 1081] N

{403 modified} Ongoing compliance with VOC emission rate and control efficiency requirements shall be demonstrated at least once per month by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

After the thermal incinerator is modified to operate in catalytic oxidizer mode, compliance with VOC emission rate and control efficiency requirements shall be demonstrated by sampling both the influent and the effluent gas streams with an FID, PID, or other District-approved VOC detection device. [District Rule 1081] N

{1425} Records of the cumulative running time and the measured influent and effluent VOC concentrations shall be maintained. [District Rule 2201] N

{1471} The Air Pollution Control Inspector shall be notified in writing when the thermal incinerator will be modified to operate in the catalytic oxidizer mode prior to the modification. [District Rule 2201] N

{2780} All records shall be retained for a minimum of five years, and shall be made available for District inspection upon request. [District Rule 2201] N