PERMIT # 1673

TECHNICAL SUPPORT AND POTENTIAL TO EMIT DOCUMENT

April 2005, Updated October 2009

I. GENERAL COMMENTS:

A. Company Information

1. SFPP, L.P. (Operating partner for Kinder Morgan Energy Partners, KMEP L.P.)

2. Physical Address:

SFPP – Silvercroft Wash SVEU-2
2905/ 2913 North Silver Island Way
Tucson, AZ 85745

Mailing Address:

1100 Town & Country Road
Orange, CA 92868

B. Background

This permit is for operation of a Soil Vapor Extraction Unit (SVEU) at the SFPP Silvercroft Wash Release Site which had a gasoline spill from a pipeline break. At the time of issuance, there was no background as this site was a new source. Levine-Fricke (LFR) is the consultant for this project and conducted testing at the site to determine the parameters to include in the application materials. In May 2009, LFR submitted a revision to eliminate the need for EPA Method 232 sampling and to eliminate triggers for more frequent monitoring. This revision was based on stack testing that demonstrated that the levels of dioxins and furans generated and emitted from the SVEU are inconsequential and the future possibility of forming significant dioxins and furans during the continued remediation of the site was highly unlikely.

C. Attainment Classification

The source is in an area that is in attainment for all pollutants.

II. SOURCE DESCRIPTION

A. Process Description

The process will consist of extracting soil vapor from extraction (SVE) wells. The process gas stream from the extraction wells enters the vapor extraction system through the moisture separation system. The process stream then passes through the particulate air filter into the blower housing. The process stream is discharged from the blower through a silencer to the inlet of the oxidizer shell (TO) where it is destroyed. The contaminants of concern are Benzene, Toluene, Ethyl benzene, Xylenes (BTEX), Methyl Tertiary Butyl Ether and Total Petroleum Hydrocarbons. There are effectively no pollutants emitted from the SVEU. One of the main purposes of an SVEU is to incinerate any extracted gases from the wells and as such there are hardly any emissions released into the atmosphere.

The original problem at the site is the gasoline spill but chlorinated solvents; tetrachloroethylene (PCE) & trichloroethylene (TCE) have been detected in samples collected from wells. The PCE & TCE vapors are from an unknown off-site source. It is possible that in the treatment of gases extracted from the wells PCE

& TCE could be present. In the process of cleaning up the spill, VOCs are passed through a thermal oxidizer, TO. The BTEX, PCE & TCE combination is heated/ oxidized in the process and polychlorinated dibenzo-*para*-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) may be formed, also known as dioxins and furans. In case dioxins and furans are formed as a result of the oxidation of CVOCs, the SVEU uses granular activated carbon (GAC) to treat and capture these contaminants. As explained in the background section of the technical support document, testing has shown inconsequential levels of dioxins and furans.

The SVEU has two safety controls that shut down the unit when it's not operating within specified parameters. First, there is a UV flame sensor that triggers a system that prevents process gas from the wellfield entering the oxidizer shell when the flame fails. Secondly, an independent high temperature shut down is provided to immediately shut down the vapor extraction system (VES) if the oxidizer temperature exceeds 1800 F or drops below 1300 F.

B. Air Pollution Control Devices

The SVEU incorporates a thermal oxidizer in series with chillers followed by vapor-phase carbon for air pollution control (APCD). The vapor phase granular activated carbon (GAC) will primarily be used to absorb any chlorinated solvents remaining in the vapor stream or any by-products of the oxidation of chlorinated solvents present after oxidation of the vapor stream. These byproducts are polychlorinated dibenzo-*para*-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF).

III. REGULATORY HISTORY

As this is a new source, there is no regulatory history associated with it. LFR on behalf of SFPP has stated in the application that the source will stay in compliance with all regulations and requirements during the operation of the SVEU.

A. Testing & Inspections

Various testing has been conducted and show that SFPP is in compliance with the permit.

B. Excess Emissions None.

IV. EMISSIONS ESTIMATES

<u>Emissions without APCD</u>

The potential maximum VOC emissions are based on the maximum TPH, PCE, and TCE concentrations measured from each well. The equation below was used to estimate the potential maximum instantaneous VOC emission from each well based on these maximum concentrations and a maximum extraction flow rate of 50 cubic feet per minute (cfm) from each well.

$$ER = \left(Q \times C_{\text{Soil Vapor}} \times \text{MW} \times \frac{1}{10^6\ \text{ppmV}} \times \frac{60\,\text{min}}{1\,\text{hr}} \times \frac{1\,\text{lb mol}}{379\,\text{ft}^3} \right) \quad \text{Equation \#1}$$

Where:

ER = Emission Rate [lb/hr]
Q = Pumping Rate [cfm]
C = Soil Vapor Concentration [ppmV]
MW = Molecular Weight of Contaminant [lb/lb-mol]

USEPA. 1989. Estimating Air Emissions from Petroleum UST Cleanups. EPA #510 – K –92 – 901

As mentioned in the process description, the emissions from the SVEU will effectively be zero due to the APCs. To determine permit applicability pursuant to PCC 17.12.140.B.2.a.iii, maximum emissions without controls were calculated. This means looking at the emissions from the blower before controls. LFR has calculated this to be 806 lbs/hr or 3529 tons of VOC per year and so the SVEU will need a permit. Since the oxidizer is an inherent part of the design, it will be taken as a synthetic minor limitation and the emissions to consider are those emissions after oxidation but before the GAC treatment is applied.

Emissions from Oxidizer without GAC treatment

Pursuant to PCC 17.16.430.G, installation of APCD is required. Based upon this requirement, the PTE with controls, of VOC emissions after oxidation are approx. 4.15 tpy with a destruction efficiency of at least 99%. This includes any dioxins and furans that may be in the gas stream. Dioxins and furans would be from the oxidation of any chlorinated VOCs that would be present. For effective oxidation of the influent vapor at the maximum VOC concentration, the vapor from the extraction wells will initially be mixed with approximately 95% atmospheric air via a manual dilution-air inlet valve as necessary. The dilution is needed to maintain a total maximum influent vapor concentration of less than 14,000 ppmv as TPH to keep the thermal oxidizer from reaching an "over-temperature" condition. Additionally, as the soil gases from the wells diminish in concentration over time the dilution-air will be reduced as required to maintain influent concentrations at maximum allowable levels without exceeding 14,000 ppmv as TPH to optimize remediation and the oxidizer's supplemental fuel use. The table below is of estimated maximum potential emission rates for each of the contaminants of concern.

Contaminant of Concern	Maximum Concentration with 95% Dilution (ppbv)	Maximum Concentration with 99% Oxidizer Destruction (ppbv)	Maximum Emission Rate from Oxidizer (lbs/hr)
Benzene	140,000	1,400	8.655 E-03
Toluene	130,000	1,300	9.477 E-03
Ethyl Benzene	8,500	85	7.145 E-04
Xylene (m, p)	21,500	215	1.807 E-03
Xylene (o)	7,000	70	5.884 E-04
MTBE	700,000	7,000	4.876 E-02
TPHg	8,500,000	85,000	5.786 E-01
1,3,5-Trimethylbenzene	175	1.75	1.665 E-05
1,2,4-Trimethylbenzene	2,050	20.50	1.950 E-04
PCE	25	0.25	3.044 E-06
TCE	0	0.00	0.000 E-00

LFR used extremely conservative modeling to estimate emissions for the contaminants of concern. With the exception of Benzene, all the pollutants meet the Arizona Ambient Air Quality Guidelines (AAAQGs) for 1-hour, 24-hr, and annual exposure. Benzene does not meet the annual exposure guideline using the worst-case scenario but since LFR will be applying dilution-air to the influent vapor before oxidation, this ensures that Benzene will meet the AAAQGs.

Emissions using Vapor-phase GAC

It is possible that dioxins and furans could be in the gas stream after oxidation. As a precaution, LFR has proposed to always operate the vapor-phase GAC just in case there are any dioxins and furans in the gas stream. Emission rates using this process are dictated by the frequency of GAC change-outs (i.e. how frequently used GAC is replaced with unused GAC). Assuming maximum emission rates from the oxidizer as shown in the table above, the GAC usage rates are calculated to be approximately 80 pounds of GAC per day. At this rate it would take 125 days to reach 100% saturation of the 10,000 lbs of GAC in the APCD. Emission rates from the GAC can be determined based on the change-out frequency of the GAC. SFPP has proposed a change-out frequency that will maintain emissions at or near zero.

Based on the potential to emit the source's class is a Class II true minor stationary source for all pollutants.

V. APPLICABLE REQUIREMENTS

NSPS No NSPS rules apply to the source.

NESHAP No NESHAP rules apply.

SIP The following SIP rules apply: SIP rules 321, 343 & 344.

PCC The following PCC rules apply: 17.12.185, 17.16.010, 17.16.030, 17.16.040, 17.16.050, & 17.16.430

VI. PERMIT CONTENTS

A. Emission Limits/ Standards:

Soil Vapor Extraction Unit (SVEU)

PCC 17.16.430.A.1	PM Standard
PCC 17.16.040.A, 17.16.130.B.3 & SIP Rule 321	Opacity Standard
PCC 17.16.050.D & SIP Rule 343	Visibility Limiting Standard
PCC 17.16.430.D & SIP Rule 344	Odor Limiting Standard
PCC 17.16.430.G	Processing of VOCs
PCC 17.16.430.G	Use of abatement equipment
PCC 17.16.430.G	Destruction efficiency
PCC 17.12.185.A.2	No direct discharge into the atmosphere

Fuel Limitation

Change of fuels with appropriate revision.

Operational Limitation

PCC 17.12.185.A.2 & 17.16.430.G	Thermal Oxidizer use
PCC 17.12.185.A.2 & 17.16.430.G	Granular Activated Carbon use

B. Monitoring:

Soil Vapor Extraction Unit (SVEU)

Monitoring for VOC & Benzene	PCC 17.12.185.A.3
Observe exhaust stack for evidence of abnormal emission	PCC 17.12.185.A.3
Weekly performance checks of equipment	PCC 17.12.185.A.3

C. Recordkeeping Requirements

Soil Vapor Extraction Unit (SVEU)

Recordkeeping of CVOC monitoring	PCC 17.12.185.A.4
Record results of opacity observations	PCC 17.12.185.A.4
Record results of equipment performance observations	PCC 17.12.185.A.4
Demonstrate that only commercially available pipeline quality gas was fired	PCC 17.12.190.B & 17.12.185.A.4
Location of Records	PCC 17.12.185.A.4

D. Reporting Requirements:

All Operations

Reports of 5 consecutive CVOC detections	PCC 17.12.185.A.5.b
Reports of Method 5 & 23 sampling	PCC 17.12.185.A.5.b
Reports of all required testing	PCC 17.12.185.A.5.b
Excess emissions and permit deviation reporting	PCC 17.12.185.A.5 & 17.12.185.D.3.d
Semiannual summary reports of required monitoring	PCC 17.12.185.A.5
Emissions Inventory reporting	PCC 17.12.320

E. Testing Requirements:

Testing upon Control Officer's request	PCC 17.20.010.B
Compliance with Particulate Matter Standard	PCC 17.20.010.B
Compliance with Opacity Standard	PCC 17.12.185.A.3
Testing before startup	PCC 17.12.185.A.3

F. Alternate Operating Scenarios: The applicant has not requested any alternate operating scenarios

G. Miscellaneous Comments: None

VII. IMPACTS TO AMBIENT AIR QUALITY

Not a major source and so no studies are required.

VIII. CONTROL TECHNOLOGY DETERMINATION

No control technologies needed to be determined. This is simply an SVEU used for soil vapor extraction.

IX. PREVIOUS PERMIT CONDITIONS

A. Previous permit conditions that required monitoring and recordkeeping for dioxins and furans have been removed from the permit.

B. Old citations were updated to reflect current Pima County Code citations.