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EQUIPMENT LOCATION:

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BLOOMINGTON, CA 92316

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EQUIPMENT DESCRIPTION

Application No.	*Equipment*	*Action*
461448	TV Revision	De Minimus Revision
512090	Soil Vapor Extraction, Thermal/Catalytic Oxidizer, 0.4 mmbtu/hr, 250 scfm	New Construction

516458 (prev A/N 451879)	Saturator Sump	Modification to correct thruput (typo), correct dimensions
516459 (prev A/N 451878	Station Sump	Modification to increase thruput, correct dimensions

INTRODUCTION/BACKGROUND:

This is an existing facility applying for a Title V revision. Initial TV was issued 4/16/01 under A/N 332609 with subsequent revisions.

Calnev Pipe Line, LLC operates a tank farm and a pipeline terminal in Bloomington, CA. The facility is called a pipeline breakout station that receives petroleum products, such as gasoline, diesel, and jet / turbine fuel, via pipelines from the KinderMorgan Carson facility, then transfers the products to pipelines serving the Southern California Mojave Desert region and Southern Nevada. This facility is operating fixed roof storage tanks, internal floating roof storage tanks, external floating roof storage tanks, underground storage tanks, domed external floating roof tanks, and a thermal oxidizer to control emissions from the operation of the storage tanks.

This revision will add a new soil vapor extraction system (A/N 512090) and modify two existing sumps (A/N 519458-9) by increasing thruput and correcting dimensions.

A/N 512090 – Soil Vapor Extraction (New Construction)

INTRODUCTION:

This application was submitted 6-24-10 as Class I for a soil vapor extraction system consisting of a thermal oxidizer with catalytic oxidizer. The unit was brought on site July 1, 2010 but has not been operated.

HISTORY/PROJECT DESCRIPTION:

Hours of operation are 24 hr/day, 7 days/week, 12 months/yr

Equipment is a Mako thermal oxidizer with catalytic oxidizer. Per email dated July 30, 2010, the unit DOES NOT have a heat exchanger. The thermal oxidizer uses propane as a fuel. The maximum flow rate is 250 scfm, rated at 400,000 btu/hr with a greater than 99% hydrocarbon destruction efficiency in both modes (per Technical Specifications included with the application information. Max VOC influent to the thermal oxidizer is 15,000 ppm and max VOC influent to the catalytic oxidizer is 3500 ppm.

Per information submitted with this application, nearest residential receptor is 280 meters. . Nearest commercial receptor is 117 meters. There is no school within 1000 feet of the equipment.

CALCULATIONS:

Emissions from the treatment of contaminated waste stream

Total inlet flow system = well gas + propane gas + combustion air

Well Gas = 250 scfm

Propane = 400 scfh = 6.7 scfm (from Mako Specs)

Products of combustion air = (6.7 scfm)(13.5) where 13.5 is combustion factor @20% excess air (AP42)

= 90.5 scfm

Total inlet = 250 + 90.5 = 340.5 scfm

Assume exhaust temperatures are 1200 degrees in thermal mode and 500 degrees in catalytic mode

Total thermal exhaust flow = (340.5 scfm)((1200+460)/60+460)) = 1087 acfm
Total catalytic exhaust flow = (340.5 scfm)((500+460)/60+460)) = 629 acfm

Thermal Mode (15,000 > VOC>3500 ppm)

Assume **50 ppm** HC at the outlet (per SCAQMD in thermal/catalytic mode)
MaxR2(HC) = (50 ppm)(86 lb/lbm)(lbm/379 cf)(340.5 scf/min)(60 min/hr)(1E-6)
= 0.23 lb/hr
*24 = 5.5 lb/day
*365 = 2014.8 lb/yr

DRE% = (51.06 lb/hr – 0.23 lb/hr)/51.06 = 99.5 %

Catalytic Mode (3500 > VOC)
If inlet VOC is 3500 ppm or below, then system is in catalytic mode :

R1(HC) = (3500 ppm)(86 lb/lbm)(lbm/379 scf)(250 scfm)(60)(1E-6)
= 11.9 lb/hr

R2(HC@99%) = (11.9 lb/hr) *(1-0.99)
= 0.12 lb/hr

Emissions:

Inlet	15000>VOC>3500	3500>VOC
Mode	Thermal	Catalytic
Emission limit	50 ppm or 99%	50 ppm or 99%
R1 lb/hr	51.1	11.9
R2 lb/hr	0.23 or 0.51	0.23 or 0.12
R2 lb/day	5.5 or 12.3	5.5 or 2.86
R2 lb/yr	2014.8 or 4489.5	2014.8 or 1042.4

Emissions from burning of propane in the thermal oxidizer

HHV propane = 91500 btu/gal
Burner rating = 0.4 mmbtu/hr
Fuel usage = 0.4 mmbtu/hr* gal/91500 btu = 4.4 gal/hr

Emission factors from Form B-1:
ROG = 0.26 lb/1000 gal
NOx = 12.8 lb/1000 gal

SOx = 4.6 lb/1000 gal
CO = 3.2 lb/1000 gal
PM/PM10 = 0.28 lb/mmcf

ROG = (0.26 lb/1000 gal)(4.4 gal/hr)
= 0.00114 lb/hr
*24 = 0.027 lb/day
*365 = 10.02 lb/yr

NOx = (12.8 lb/1000 gal)(4.4 gal/hr)

= 0.056 lb/hr
*24 = 1.35 lb/day
*365 = 493.4 lb/yr

SOX = (4.6 lb/1000 gal)(4.4 gal/hr)
= 0.02 lb/hr
*24 = 0.49 lb/day
*365 = 177.3 lb/yr

CO = (3.2 lb/1000 gal)(4.4 gal/hr)
= 0.014 lb/hr
*24 = 0.34 lb/day
*365 = 123.3 lb/yr

PM/PM10 = (0.28 lb/1000 gal)(4.4 gal/hr)
= 0.001 lb/hr
*24 = 0.03 lb/day
*365 = 10.8 lb/yr

Total ROG = ROG(well/thox) + ROG(propane)
= 0.51 lb/hr + 0.00114 lb/hr
= 0.511 lb/hr
= 12.3 lb/day

Total NOx 45 ppm @3% O2 (per Mako guarantee)
Assume O2 in exhaust = 9.177% (spreadsheet from R. Onufer attached to email 3/17/11)
NOx actual = 45 ppm ((20.9-9.177)/20.9-3)
= 29.5 ppm

NOx mass = (29.5 ppm)(340.5 scfm)(lbm/379 scf)(46 lb/lbm)(60 min/hr)(1E-6)
= 0.074 lb/hr
= 1.8 lb/day

Toxics Emissions

Toxic air contaminants are quantified by multiplying the VOC emissions calculated above by the representative weight fractions of toxics present in gasoline. The representative weight fractions are from Table 11.3-2 of Volume 3 of the USEPA's Emissions Inventory Improvement Program Document Series (January 2001) and are as follows:

Highest annual VOC emissions at 4489.5 lb/yr (worse case)

TAC Emissions

TAC	Wt.% in Vapor	Emissions, lbs/yr	Emissions, lb/hr	HRA input values, lb/hr*
Benzene	0.9	40.4	0.0046	0.007
Ethyl benzene	0.10	4.49	0.00051	0.00051
n-Hexane	1.6	71.83	0.0082	0.0082
Toluene	1.3	58.36	0.0067	0.0067
Xylenes	0.50	22.45	0.0026	0.0026
Naphthalene	0.05	2.24	0.00026	0.00026
MTBE	11.9	534.25	0.061	0.061

* These values were backcalculated from a less than one in a million risk.

Health Risk Assessment using SCREEN 3:

Assume exhaust flow rate = 340.5 scfm = 629 acfm
Assume point source operating >12 hr/day
Assume stack height = 13 ft
Assume nearest residential = 280 meters
Assume nearest commercial = 117 meters
Stack diameter = 13.5 in. (equivalent diameter of a 12 in. square stack)

Mass emissions (lb/hr) – see TAC Emissions Table above for HRA input values

Max 1-hr concentration of 49.3 ug/m3 at 250 meters

1-hr concentration of 100.3 ug/m3 at 100 meters

Allow. Benzene emission rate = 0.007 lb/hr = 0.168 lb/day
Allow. MTBE emission rate = 0.04 lb/hr = 0.96 lb/day

MICR (residential) is 0.965 in a million (based on Tier 3) and MICR (commercial) is 0.383 in a million which is less than the allowable 1 in a million.

HIA for residential and commercial are both less than 1. See Excel spreadsheet.

RULES and EVALUATION:

Rules:

212: Public notice is not required.
401: Visible emissions are not expected.
402: Nuisance is not expected with proper operational procedures and mitigation measures.

1147: This unit was manufactured November 2009 and brought on site July 2010. It is supplemented by propane and is exempt from the emission limits in Table I per 1147(g)(7), since it does not fire on natural gas. It is still subject to the combustion system maintenance requirements per 1147(c)(7).

1166: This equipment will be installed and operated to comply with requirements of this rule.

Reg 13: BACT/LAER:
VOC: BACT/LAER for thermal oxidizers is 1400 degrees minimum operating temperature. Additionally, manufacturer has guaranteed VOC DRE of >99%
NOx: This equipment will have a low-NOx burner that has a guaranteed emission of 45 ppm@3% O2, which is considered BACT/LAER for this equipment.

Offsets: Max VOC emissions from this equipment due to the treatment of contaminated soil are 12.3 lb/day. Offsets in the form of ERCs are required. See Project Emissions Summary. NOx at 1.8 lb/day is a product of combustion from an air pollution control device and is exempt from modeling and offsets per 1304(a)(5).

Modeling for ROG is not required. Modeling for NOx is exempt since this equipment is an APC device (R1304(a)(5))

Sensitive Zone: KMLT will provide VOC ERCs from their own CalNev facility.

Statewide Compliance – Per Kinder Morgan Energy Partners facilities in California are in compliance (see letter April 26, 2010)

1401: Based on Tier 3, the risk (residential and commercial) is less than the one in a million. Hazard Indices (based on Tier 3) are less than one.

Title V: This is a de minimus revision to the facility's existing TV permit.

40CFR 63 Subpart GGGGG: Not applicable, since this facility is not a major HAP source

CONCLUSION:

This project will meet all District Rules and Regulations. It is recommended that a Permit to Construct/Operate be granted subject to the attached conditions after completion of the 45 day EPAc Notice.

A/N 516458 – Saturator Sump
A/N 516459 – Station Sump
(Alternation/Modification)

INTRODUCTION:

These two applications were submitted 12/02/10 as alterations/modifications to existing equipment to increase thruput and correct equipment dimensions.

EMISSIONS CALCULATION

In the previous applications, the VOC emissions were calculated using AP-42, 5.2, 1995 per engineering evaluation.

$$L = 12.46SPM/T\ (1 - eff/100)$$

Where:

L = VOC loss, lbs/1000gal
S = saturator factor, Table 5.2-1, AP-42, using 0.2 for constant temp at 60 deg F
P = true v.p, Table 7.1-2, 5.2 psia for station sump; 0.009 for saturator
M = molecular wt., 66 for station sump liquid; 130 for saturator, Table 7.1-2
T = temp, 520 deg R
Eff = control efficiency, 95% for station sump and zero for saturator

Saturator Sump: No Control (previous A/N 451879)
The saturator sump, 790 gallon in capacity, collects spent gasoline which must be drained periodically from the Saturator Tank. This tank is used to enrich the vapors collected in the facility's vapor collection system to a level above the upper explosive limit to ensure a safe operation in the vapor holder. The spent gasoline collected in the sump is then pumped to the station sump, which also serves as an indirect vapor control for the saturator sump. In addition, the spent gasoline, with most of its volatile components stripped out in the saturator, has very little vapor left and the sump is vented to atmosphere.

$$L = [(12.46)(0.2)(0.009)(130)/520]$$

$$= 0.006 \text{ lb/1000 gal}$$

Max flow = 840 gal/day = 25200 gal/month

Therefore, VOC emissions = 0.006 lb/1000 gal * 840 gal/day
= 0.005 lb/day, R1 = R2
= 1.83 lb/yr

Note that calculations were done using 840 gal/day = 20 bbl/day = 7300 bbl/yr and NSR entries in previous application reflect this. When the permit was issued, a thruput condition limiting equipment to 200 bbl/yr was erroneously imposed. This typo will be corrected to 840 gal/day * 30 = 25,200 gal/month or 600 bbl/month. There are no changes in emissions.

Station Sump: 95% control (previous A/N 451878)
The station sump, 1086 gallon capacity, collects fluids drained from product sampling activities, pump repairs, drains from meter proving works, and fluids pumped in from the saturator sump. All fluids collected in the station sump are pumped to Tank 100, a storage tank used for storage of Transmix. Displaced vapors in the sump are directed via a closed vent system to the facility's vapor collection and disposal system, which is a thermal oxidizer (permitted under A/N 461447:P/O G8424).

Total fluid throughput for the station sump ranges from 800 to 1500 bbls/month and is a mixture of gasoline, diesel, and jet / turbine fuel. Applicant is asking for a thruput increase up to 5917 bbl/month.

L = [(12.46)(0.2)(5.2)(66)/520] * (1-0.95)

= 0.08 lb/1000 gal

PreModMax flow = 1500 bbl/mo * 42 gal/bbl * mo/30 days = 2100 gal/day = 18,000 bbl/yr

Therefore, PreModVOC emissions = 0.08 lb/1000 gal * 2100 gal/day
= 0.17 lb/day, R2
*1/24 = 0.01 lb/hr

PreMod R1 = 3.44 lb/day
= 0.14 lb/hr

PostModMax flow = 5917 bbl/month = 248,514 gal/mo = 8284 gal/day = 71,000 bbl/yr

Therefore, PostModVOC emissions = 0.08 lb/1000 gal * 8284 gal/day
= 0.66 lb/day, R2
*1/24 = 0.028 lb/hr

= 240.9 lb/yr

PostMod R1 = 13.3 lb/day
= 0.55 lb/hr

Increase = 0.66 – 0.17 = 0.49 lb/day

Toxics Emissions

Toxic air contaminants are quantified by multiplying the VOC emissions calculated above by the representative weight fractions of toxics present in gasoline (worse case). The representative weight fractions are from Table 11.3-2 of Volume 3 of the USEPA's Emissions Inventory Improvement Program Document Series (January 2001) and are as follows:

Annual VOC emissions for the station sump is 240.9 lb/yr.

Station TAC Emissions

TAC	Wt.% in Vapor	Emissions, lbs/yr	Emissions, lb/hr
Benzene	0.9	2.17	0.00025
Ethyl benzene	0.10	0.24	0.00003
n-Hexane	1.6	3.85	0.0004
Toluene	1.3	3.13	0.00036
Xylenes	0.50	1.2	0.00014
Naphthalene	0.05	0.12	0.00001
MTBE	11.9	28.67	0.0033

Health Risk Assessment using SCREEN 3:

Assume point source operating >12 hr/day
Assume stack height = 27 ft (VRU height)
Assume nearest residential = 217 meters (from info in A/N 451878)
Assume nearest commercial = 278 meters (from info in A/N 451878)

Mass emissions (lb/hr) – see TAC Emissions Table above for HRA input values

MICR (residential) is 0.0859 in a million (based on Tier 2) and MICR (commercial) is 0.0112 in a million which is less than the allowable 1 in a million.

HIA for residential and commercial are both less than 1. See Excel spreadsheet.

CONCLUSION:

Rules:

212: Public notice is not required.
401: Visible emissions are not expected.
402: Nuisance is not expected with proper operational procedures and mitigation measures.

463 Organic Liquid Storage

Not applicable because the permit units are not above-ground storage tanks.

40 CFR 63 Subpart R

The facility is not subject to Subpart R (Major Source) and is only subject to recordkeeping requirements.

Rule 1149 - Storage Tank Cleaning and Degassing

The 1000 gal station sump is subject to the requirements of R-1149(c)(2). Since it is connected to a vapor control unit with at least 95% efficiency, it complies with the rule.

Rule 1176 - VOC Emissions from Wastewater Systems

This rule is not applicable to facilities with an SIC code of 4226.

Reg XIII New Source Review (NSR)

Rule 1303: Requirements (Amended Dec. 6, 2002)

1303(a) Best Available Control Technology (BACT)

The saturator sump results in NO emission increase, so BACT does not apply. However, the station sump has increase of 0.49 lb/day but is already vented to a thermal oxidizer which is considered BACT.

1303(b)(1) Modeling - modeling for VOC is not required.

1303(b)(2) Emission Offsets

Station sump: There is no change in emissions so offsets are not required.

Saturator sump: The increase in emissions is less than 0.5 lbs/day. However, since the previous permit (@0.17 lb/day) was less than two years ago, the entire amount of 0.66 lb/day will need to be offset.

Reg XIV Toxics and Other Non-Criteria Pollutants

Rule 1401, New Source Review for Air Toxics

Since there is no increase in emissions from the saturator sump, there is no increase in toxics.
For the station sump, MICR is less than one in one million, and the chronic and acute indices are also less than 1.0. Compliance

Reg XXX Title V Permits

In addition to the three permit unit applications, Calnev also submitted an application A/N 451883 for its Title V revision.

CONCLUSION AND RECOMMENDATION

The operations of the two existing underground sumps are expected to comply with all applicable District Rules and Regulations. Therefore, Permits to Operate are recommended subject to the attached conditions:

PROJECT EMISSIONS SUMMARY

	PreMod <lb/day>	PostMod	Increase
SVE	0 (new construction)	12.3	12.3
Saturator Sump	0.005	0.005	0
Station Sump	0.17	0.66	0.49
Total			12.79

ERCs needed: (12.3 + 0.66) * 1.2 = 15.6 = **16 pounds ERCs**