



OCT 05 2010

John Hess  
Bonanza Creek Energy Operating Company  
4900 California Ave, Suite 350B  
Bakersfield, CA 93309

**Re: Notice of Preliminary Decision - Authority to Construct**  
**Project Number: S-1103330**

Dear Mr. Hess:

Enclosed for your review and comment is the District's analysis of Bonanza Creek Energy Operating Company's application for an Authority to Construct for two new crude oil storage tanks, 250 bbl drain tank and 300 bbl clarifier tank and reduce throughput on existing tank '6 to net emissions, at Bonanza's Heavy Oil Western Stationary Source.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. Please submit your written comments on this project within the 30-day public comment period which begins on the date of publication of the public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Ms. Sudeshna Bakshi of Permit Services at (661) 392-5608.

Sincerely,



David Warner  
Director of Permit Services

DW:sb

Enclosures

**Seyed Sadredin**  
Executive Director/Air Pollution Control Officer

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**Northern Region**  
4800 Enterprise Way  
Modesto, CA 95356-8718  
Tel: (209) 557-6400 FAX: (209) 557-6475

**Central Region (Main Office)**  
1990 E. Gettysburg Avenue  
Fresno, CA 93726-0244  
Tel: (559) 230-6000 FAX: (559) 230-6061

**Southern Region**  
34946 Flyover Court  
Bakersfield, CA 93308-9725  
Tel: 661-392-5500 FAX: 661-392-5585



OCT 05 2010

Mike Tollstrup, Chief  
Project Assessment Branch  
Stationary Source Division  
California Air Resources Board  
PO Box 2815  
Sacramento, CA 95812-2815

**Re: Notice of Preliminary Decision - Authority to Construct**  
**Project Number: S-1103330**

Dear Mr. Tollstrup:

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OCT 05 2010

Gerardo C. Rios (AIR 3)  
Chief, Permits Office  
Air Division  
U.S. E.P.A. - Region IX  
75 Hawthorne Street  
San Francisco, CA 94105

**Re: Notice of Preliminary Decision - Authority to Construct**  
**Project Number: S-1103330**

Dear Mr. Rios:

Enclosed for your review and comment is the District's analysis of Bonanza Creek Energy Operating Company's application for an Authority to Construct for two new crude oil storage tanks, 250 bbl drain tank and 300 bbl clarifier tank and reduce throughput on existing tank '6 to net emissions, at Bonanza's Heavy Oil Western Stationary Source.

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Bakersfield Californian

**NOTICE OF PRELIMINARY DECISION  
FOR THE PROPOSED ISSUANCE OF  
AN AUTHORITY TO CONSTRUCT**

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Unified Air Pollution Control District solicits public comment on the proposed issuance of Authority to Construct to Bonanza Creek Energy Operating Company for two new crude oil storage tanks, 250 bbl drain tank and 300 bbl clarifier tank and reduce throughput on existing tank '6 to net emissions, at Bonanza's Heavy Oil Western Stationary Source.

The analysis of the regulatory basis for this proposed action, Project #S-1103330, is available for public inspection at [http://www.valleyair.org/notices/public\\_notices\\_idx.htm](http://www.valleyair.org/notices/public_notices_idx.htm) and the District office at the address below. Written comments on this project must be submitted within 30 days of the publication date of this notice to **DAVID WARNER, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT, 34946 FLYOVER COURT, BAKERSFIELD, CA 93308.**

**San Joaquin Valley Air Pollution Control District  
Authority to Construct Application Review  
New Oil Tank**

Facility Name:	Bonanza Creek Energy Operating Company	Date:	09/02/10
Mailing Address:	4900 California Avenue, Suite 350B Bakersfield, CA 93309	Engineer:	Sudeshna Bakshi
Contact Person:	Scott Faulkenburg for John Hess	Lead Engineer:	Steve Leonard
Telephone:	(661) 377-0073 x15 (Scott) (661) 638-2730 (John)		
Fax:	(661) 638-2733		
ATCs #:	S-3007-6-2, '19-0, and '20-0		
Project #:	1103330		
Deemed Complete:	8/16/10		

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## **I. Proposal**

The primary business of Bonanza Creek Energy Operating Company (Bonanza Creek) is crude oil production. Bonanza Creek has submitted an Authority to Construct (ATC) application for the installation of one 250 bbl fixed roof crude oil drain tank, and one 300 bbl fixed roof crude oil clarifier tank to the USL 23 tank battery and to limit the throughput of tank S-3007-6 to from 100 bbl/day to 80 bbl/day.

The reduction in throughput to tank S-3007-6 is proposed to mitigate the increase in emissions from installing tanks '-19 and '-20. Offsets will not be required as a result of this netting action.

Bonanza Creek is currently designated as exempt from the requirements of 40 CFR Part 70 under Rule 2530, *Federally Enforceable Potential to Emit*, and therefore does not maintain a Title V Operating Permit.

See the current Permit to Operate in Appendix A and facility diagram in Appendix B.

## **II. Applicable Rules**

Rule 2201	New and Modified Stationary Source Review Rule (12/18/08)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 2530	Federally Enforceable Potential to Emit (12/18/08)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4623	Storage of Organic Liquids (5/19/2005)

California Health & Safety Code 41700 Health Risk Assessment

CH&SC 42301.6 School Notice

Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)

CCR, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

### III. Project Location

This equipment is located at the USL 23 Tank Battery, in the Ripley-Tatum lease, in Section SE 23, Township 11N, Range 23W in Bonanza Creek's Western heavy crude oil production source. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

### IV. Process Description

Produced liquids from the lease oil wells, primary water and crude oil, is piped to an existing heater treater for initial separation. Separated crude oil is routed to one of three 1,000bbl stock tanks and effluent water is routed through the proposed clarifier tank where low velocities and skimmers allow oil still trapped in the oil to separate out and clarified water is routed to existing water disposal tanks. The proposed drain tank handles any upsets and overflows at the tank setting. A truck load out from the stock tank delivers crude oil to the buyer.

### V. Equipment Listing

Existing Unit:

Pre-Project Equipment Description:

S-3007-6-1: 21,000 GALLON FIXED ROOF CRUDE OIL STOCK TANK #2 (RIPLEY TATUM LEASE)

ATC Description:

S-3007-6-2: MODIFICATION OF 500 BBL FIXED ROOF CRUDE OIL STOCK TANK #2 WITH P/V VENT (RIPLEY TATUM LEASE): REDUCE THROUGHPUT FROM 100 BBL TO 80 BBL PER DAY

Post Project Equipment Description:

S-3007-6-2: 500 BBL FIXED ROOF CRUDE OIL STOCK TANK #2 WITH P/V VENT (RIPLEY TATUM LEASE)

New units:

S-3007-19-0: 250 BBL FIXED ROOF CRUDE OIL DRAIN TANK WITH P/V VENT (RIPLEY TATUM LEASE)

S-3007-20-0: 300 BBL FIXED ROOF CONSTANT LEVEL CRUDE OIL CLARIFIER TANK WITH P/V VENT (RIPLEY TATUM LEASE)

## VI. Emission Control Technology Evaluation

The new tanks will be equipped with a pressure-vacuum (P/V) relief vent valve set to within 10% of the maximum allowable working pressure of the tank. The P/V-valve will reduce VOC wind induced emissions from the tank vent.

## VII. General Calculations

### A. Assumptions

- Facility will operate 24 hours/day and 365 days/yr
- The tanks will emit only volatile organic compounds (VOC)
- The PE1 for tank S-3007-6-1 is based on a TVP of 0.5 psia and throughput of 100 bbl per day.
- The PE2 for tank S-3007-6-2 is based on a TVP of 0.5 psia and throughput of 80 bbl per day (per applicant).
- The PE for new tank S-3007-19-0 is based on a TVP of 0.5 psia and throughput of 5 bbl per day (per applicant).
- Tank S-3007-20-0 will be operated as a constant level tank and VOC emissions are based on a TVP of 0.5 psia (per applicant).

### B. Emission Factors

Both the daily and annual PE's for each permit unit will be based on the results from the District's Microsoft Excel spreadsheets for Tank Emissions - Fixed Roof Crude Oil less than 26° API. The spreadsheet for tanks was developed using the equations for fixed-roof tanks from EPA AP-42, Chapter 7.1. The emission factors are included in aforementioned spreadsheets.

### C. Calculations

Since emission units S-3007-19-0, and '20-0 are new emission units, PE1 = 0

#### 1. Pre-Project Potential to Emit (PE1)

Permit Unit	VOC - Daily PE1 (lb/day)	VOC - Annual PE1 (lb/Year)	Data Source
S-3007-6-1	5.9	2,170	Per applicant *
S-3007-19-0	0	0	New Unit
S-3007-20-0	0	0	New Unit
<b>Total PE1</b>	<b>5.9</b>	<b>2,170</b>	-

\* Note: Past project emission values have not been considered. The tank dimensions for Unit #6 proposed by the applicant for this project is close to the industry standards, resulting in new VOC emission values which will be considered for all calculations henceforth.

**2. Post Project Potential to Emit (PE2)**

Permit Unit	VOC - Daily PE2 (lb/day)	VOC - Annual PE2 (lb/Year)	Data Source
S-3007-6-2	4.9	1,805	Per applicant
S-3007-19-0	0.7	268	Per applicant
S-3007-20-0	0.2	71	Per applicant
<b>Total PE2</b>	<b>5.8</b>	<b>2,144</b>	-

See Appendix C for all emission calculations.

**Increase in Greenhouse Gas (as CO<sub>2</sub>e):**

VOC is assumed to be 85% of TOC (AP-42 Sec. 5.2); also assume 15% of TOC is CH<sub>4</sub> (methane) if site specific data is not available (2009 API Compendium, E-6); and GWP for CH<sub>4</sub> is 23 lb-CO<sub>2</sub>e/lb-CH<sub>4</sub> (District Policy APR 2015):

$$\text{Therefore: CH}_4 = (\text{VOC}/0.85) \times 0.15$$

$$\text{Total CH}_4 \text{ from Tanks '19 and '20} = (268 + 71 \text{ lb/yr})/0.85 \times 0.15 = 60 \text{ lb/yr}$$

$$\begin{aligned} \text{CO}_2\text{e (Mton/yr)} &= \text{CH}_4 \text{ (lb/yr)} \times 1\text{-Mton}/2,200 \text{ lb} \times 23 \\ &= 60 \times 1/2,200 \times 23 \\ &= 0.63 \text{ Mton/yr} \end{aligned}$$

$$0.63 \text{ M-ton/yr} < 230 \text{ M-ton CO}_2\text{e/yr}$$

Per District Policy 2015, project specific greenhouse gas emissions less than or equal to 230 M-tons of CO<sub>2</sub>e/yr are considered to be zero for District permitting purposes.

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

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

The SSPE1 is used to determine if:

- a. If the facility is becoming a new Major Source,
- b. An offset threshold will be surpassed, or
- c. A Stationary Source Increase in Permitted Emissions (SSIPE) public notice is triggered.

The SSPE1 is calculated in the following table.



SSPE1: (From Project 1095619)					
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
S-3007-1-2	0	0	0	0	16,675
S-3007-2-0	0	0	0	0	3,447
S-3007-3-1	2,577	79	196	2,164	142
S-3007-4-0	440	0	60	100	20
S-3007-5-0	0	0	0	0	3,447
<b>S-3007-6-1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,170 *</b>
S-3007-7-0	0	0	0	0	1,000
S-3007-8-6	3,974	11,038	971	16,336	1,214
S-3007-9-3	0	0	0	0	854
S-3007-10-0	0	0	0	0	2,080
S-3007-11-0	0	0	0	0	1,000
S-3007-12-0	0	0	0	0	2,080
S-3007-13-0	0	0	0	0	1,000
S-3007-14-2	4,380	8,979	4,161	20,258	3,011
S-3007-16-0	0	0	0	0	3,447
S-3007-17-0	0	0	0	0	3,447
S-3007-18-0	0	0	0	0	2,474
<b>SSPE1 (lb/yr):</b>	<b>11,371</b>	<b>20,096</b>	<b>5,388</b>	<b>38,858</b>	<b>47,508</b>

\* Refer to Section VII.C.1

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

Pursuant to Section 4.10 of District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

The SSPE2 is used to determine if:

- a. The facility is becoming a new Major Source,
- b. An offset threshold will be surpassed, or
- c. An SSIPE public notice is triggered

The SSPE2 is calculated in the following table.

SSPE2					
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
S-3007-1-2	0	0	0	0	16,675
S-3007-2-0	0	0	0	0	3,447
S-3007-3-1	2,577	79	196	2,164	142
S-3007-4-0	440	0	60	100	20
S-3007-5-0	0	0	0	0	3,447
<b>S-3007-6-2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,805</b>
S-3007-7-0	0	0	0	0	1,000
S-3007-8-6	3,974	11,038	971	16,336	1,214
S-3007-9-3	0	0	0	0	854
S-3007-10-0	0	0	0	0	2,080
S-3007-11-0	0	0	0	0	1,000
S-3007-12-0	0	0	0	0	2,080
S-3007-13-0	0	0	0	0	1,000
S-3007-14-2	4,380	8,979	4,161	20,258	3,011
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S-3007-17-0	0	0	0	0	3,447
S-3007-18-0	0	0	0	0	2,474
<b>S-3007-19-0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>268</b>
<b>S-3007-20-0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>71</b>
<b>SSPE2 (lb/yr):</b>	<b>11,371</b>	<b>20,096</b>	<b>5,388</b>	<b>38,858</b>	<b>47,482</b>

Note: The modified unit and the new units are in bold.

## 5. Major Source Determination

Pursuant to Section 3.23 of District Rule 2201, a major source is a stationary source with post-project emissions (SSPE2) equal to or exceeding one or more of the major source threshold values. However, Section 3.23.2 states, "for the purposes of determining major source status, the SSPE2 shall not include the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site."

The SSPE1 and SSPE2 are compared to the major source thresholds in the following table. This facility does not contain ERCs which have been banked at this source. Therefore, no adjustment to SSPE2 is necessary.

Major Source Determination					
Pollutant	SSPE1 (lb/yr)	SSPE2 (lb/yr)	Major Source Threshold (lb/yr)	Existing Major Source?	Post Project Major Source?
NO <sub>x</sub>	11,371	11,371	20,000	No	No
SO <sub>x</sub>	20,096	20,096	140,000	No	No
PM <sub>10</sub>	5,388	5,388	140,000	No	No
CO	38,858	38,858	200,000	No	No
VOC	47,531	47,482	20,000	Yes	Yes

As seen in the table above, this source is a Major Source for VOC emissions, and will remain a Major Source for VOC.

**6. Baseline Emissions (BE)**

The BE calculation (in lbs/year) is performed pollutant-by-pollutant for each unit within the project, to calculate the QNEC and if applicable, to determine the amount of offsets required.

Pursuant to Section 3.7 of District Rule 2201, BE = PE1 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 of District Rule 2201.

Unit S-3007-6-2:

Pursuant to Rule 2201, Section 3.12, a Clean Emissions Unit is defined as an emissions unit that is “equipped with an emissions control technology with a minimum control efficiency of at least 95% or is equipped with emission control technology that meets the requirements for achieved-in-practice BACT as accepted by the APCO during the five years immediately prior to the submission of the complete application.

Tank S-3007-6-2 is equipped with a PV-vent set to within 10% of the maximum allowable tank pressure and thus meets the requirements of BACT Guideline 7.3.1 (updated 10/1/2002). Therefore this emissions unit meets the definition of a Clean Emissions Unit, and BE is equal to PE1.

BE = PE1 = 2,170 lb-VOC/yr

Units S-3007-19-0, and -20-0:

Since these are new emissions units, BE = PE1 = 0 for all pollutants.

<b>Baseline Emissions (BE=PE1)</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
S-3007-6-2	5.9	2,170
S-3007-19-0	0.0	0
S-3007-20-0	0.0	0

## 7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 (as in effect on Dec. 19, 2002) 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."

For the purposes of this definition, the SB 288 major modification thresholds for existing major sources are listed as follows:

<b>SB 288 Major Modification Thresholds (lb/yr)</b>				
	<b>NOx</b>	<b>SOx</b>	<b>PM<sub>10</sub></b>	<b>VOC</b>
Net Project Increase	0	0	0	339*
Threshold	50,000	80,000	30,000	50,000
SB 288 Major Mod?	No	No	No	No

\* See Section VII.C.8

As shown above, the project is not a significant increase and therefore does not constitute a SB 288 Major Modification.

## 8. Federal Major Modification

A Federal Major Modification is defined in 40 CFR Part 51.165 (as in effect on Dec. 19, 2002) 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."

Rule 2201 Section 3.17 states that an SB 88 Major Modification is not a Federal Major Modification if the emission increase for the project or the net emission increase for the facility (calculated pursuant to 40 CFR 51.165(a)(2)(ii)(B) through (D) does not result in a significant emission increase as defined in Rule 2201 Table 3-1 (shown below).

### VOC Emissions Increase (EI) Calculations:

S-3007-6 (existing unit):

Per District Draft Policy (dated 7/8/10) for *Implementation of Rule 2201 (as amended on 12/18/08 and effective on 6/10/10) for SB288 Major Modifications and Federal Major Modifications*:

*If the proposed modification does not result in an increase in design capacity or potential to emit, and it does not impact the ability of the emission unit to operate at a higher utilization rate, then the unused baseline capacity emissions can also be excluded from the emission increase (EI). Therefore the emission increase is calculated as follows:*

Emission increase = PAE – BAE – unused baseline capacity emissions  
EI = PAE – BAE – unused baseline capacity emissions

where: PAE = projected actual emissions of the units (or post-project emissions=PE2)  
BAE = baseline actual emissions

$$PAE = 1,805 \text{ lb/yr}$$

BAE = 0 (per the emissions inventory for past four years, the tank has been idle for the last two consecutive years) (Appendix D)

Unused baseline emissions = 2,170 lb/yr (considering equipment operating at previous permitted capacity, assume value as equal to PE1)

$$EI = 1,805 - 0 - 2,170 = -365 \text{ lb/yr} = 0 \text{ lb/yr}$$

S-3007-19 and '- 20 (new units):

Per District Draft Policy (dated 7/8/10) for Implementation of Rule 2201 (as amended on 12/18/08 and effective on 6/10/10) for SB288 Major Modifications and Federal Major Modifications:

*EI for new units = Potential to emit for each emission unit*

$$PAE = \sum PE2 \text{ (for units '-19 and '-20)} = 268 \text{ lb/yr} + 71 \text{ lb/yr} = 339 \text{ lb/yr}$$

$$BAE = 0 \text{ (new units)}$$

$$EI = 339 \text{ lb/yr}$$

Therefore, total Emissions Increase = 0+339 = **339 lb/yr**

<b>Federal Major Modification Significance Thresholds (lb/yr)</b>				
	<b>NOx</b>	<b>SOx</b>	<b>PM<sub>10</sub></b>	<b>VOC</b>
Net Project Increase	0	0	0	339
Threshold	0	80,000	30,000	0
Federal Major Mod?	No	No	No	Yes

As shown in the above calculations, the project will result in an increase in VOC emissions greater than the Federal Major Modification threshold. Therefore, this project is a Federal Major Modification and the facility shall address alternative siting requirements pursuant to Section 4.15.1 of Rule 2201. Bonanza Creek provided an alternative siting analysis to comply with this requirement (Appendix E).

In addition, pursuant to Section 4.15.2, the owner of the proposed new major source or federal major modification shall demonstrate to the satisfaction of the APCO that all major stationary sources owned or operated by such person (or any entity controlling, controlled by, or under common control with such person) in California which are subject to emission limitations are in compliance or on a schedule for compliance with all applicable limitations and standards. Bonanza Creek provided verification that all major Stationary Sources owned or operated by Bonanza Creek in California are in compliance or on a schedule for compliance with all applicable emission limitations and standards (Appendix F).

**9. Quarterly Net Emissions Change (QNEC)**

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. The QNEC shall be calculated as follows:

Quarterly Net Emissions Change (QNEC)					
Permit Unit	PE2 (lb/yr)	Quarterly PE2 (lb/qtr)	BE (lb/yr)	Quarterly BE (lb/qtr)	QNEC (lb/qtr)
S-3007-6-2	1,805	451	2,170	543	-92
S-3007-19-0	268	67	0	0	67
S-3007-20-0	71	18	0	0	18

**VIII. Compliance**

**Rule 2201 New and Modified Stationary Source Review Rule**

**A. Best Available Control Technology (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 an SB 288 Major Modification or a Federal Major Modification, as directed in this rule.

\*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.

**a. New emissions units – PE > 2 lb/day**

As discussed in Section VII.C.2 of this evaluation, the applicant is proposing to install two new tanks with a PE of 0.7 lb/day (S-3007-19-0) and 0.2 lb/day (S-3007-20-0) for VOC. Since the PE for each unit is less than 2.0 lb/yr, BACT is not triggered for new emissions units.

**b. Relocation of emissions units – PE > 2 lb/day**

There are no emissions units being relocated from one stationary source to another. Therefore BACT is not triggered for relocation purposes.

**c. Modification of emissions units – AIPE > 2 lb/day**

$$\text{AIPE} = \text{PE2} - \text{HAPE}$$

Where,

AIPE = Adjusted Increase in Permitted Emissions, (lb/day)

PE2 = Post-Project Potential to Emit, (lb/day)

HAPE = Historically Adjusted Potential to Emit, (lb/day)

$$\text{HAPE} = \text{PE1} \times (\text{EF2}/\text{EF1})$$

Where,

PE1 = The emissions unit's Potential to Emit prior to modification or relocation, (lb/day)

EF2 = The emissions 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 emissions unit's permitted emission factor for the pollutant before the modification or relocation

$$\text{AIPE} = \text{PE2} - (\text{PE1} * (\text{EF2} / \text{EF1}))$$

Modified unit S-3007-6-2:

$$\text{EF1} = \text{EF2}; \text{ So, } \text{EF1}/\text{EF2} = 1.0$$

$$\text{PE1} = 5.9 \text{ lb/day and } \text{PE2} = 4.9 \text{ lb/day}$$

$$\text{HAPE} = 5.9 \times 1 = 5.9 \text{ lb/day}$$

$$\text{AIPE} = 4.9 - 5.9 = -1.0 \text{ lb/day} \leq 0.0 \text{ lb/day}$$

As demonstrated above, the AIPE is not greater than 2.0 lb/day for VOC emissions from existing unit '6.

#### **d. Major Modification**

As discussed in Section VII.C.7 above, this project does constitute a Major Modification for VOC emissions; therefore BACT is triggered for VOC for all emissions units associated with this stationary source project.

### **2. BACT Guideline**

BACT Guideline 7.3.1 *Petroleum and Petrochemical Production – Fixed Roof Organic Liquid Storage or Processing Tank, <5,000 bbl Tank capacity* applies to the modified tank S-3007-6-2, and two new tanks S-3007-19-0, and S-3007-20-0 and is presented in Appendix G.

### **3. Top-Down BACT Analysis**

Per Permit Services Policies and Procedures for BACT, 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.

Pursuant to the attached Top-Down BACT Analysis (see Appendix G), BACT has been satisfied with the following:

VOC: PV-vent set to within 10% of maximum allowable pressure.

**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 Threshold Levels (lb/year)			
Pollutant	SSPE2	Offset Threshold	Offsets Triggered?
NO <sub>x</sub>	11,371	20,000	No
SO <sub>x</sub>	20,096	54,750	No
PM <sub>10</sub>	5,388	29,200	No
CO	38,858	200,000	No
VOC	47,482	20,000	Yes

**2. Quantity of Offsets Required**

As demonstrated earlier in Section VII.C.5, the facility is becoming a Major Source for VOC as a result of this project and the SSPE2 is greater than the offset thresholds; therefore, offset calculations are required for this project.

Per District Rule 2201, Sections 4.7.1 and 4.7.3, and District APR 10-10, the quantity of offsets in pounds per year for VOC is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) =  $(\sum[PE2 - BE] + ICCE) \times DOR$ , for all new or modified emissions units in the project,

Where,

PE2 = Post Project Potential to Emit, (lb/year)

BE = Baseline Emissions, (lb/year)

ICCE = Increase in Cargo Carrier Emissions, (lb/year)

DOR = Distance Offset Ratio, determined pursuant to Section 4.8

As calculated in Section VII.C.6 above, the Baseline Emissions (BE) from the subject units are equal to the Pre-Project Potential to Emit (PE1).

$$\sum BE = 2,170 \text{ lb-VOC/yr}$$



As calculated in Section VII.C.2, the post-project Potential to Emit from the subject units are:

$$\sum PE2 = 2,144 \text{ lb-VOV/yr}$$

Distance offset ratio (DOR) = 1.5 (District Rule 2201, Section 4.8.1)

Offsets Required (lb/year) =  $([PE2 - BE] + ICCE) \times DOR$

$$\begin{aligned} \text{Offsets Required (lb/year)} &= ([2,144 - 2,170] + 0) \times 1.5 \\ &= 0 \text{ lb VOC/year (negative)} \end{aligned}$$

As demonstrated in the calculation above, the amount of offsets is zero; therefore, offsets will not be required for this project.

## C. Public Notification

### 1. Applicability

Public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,

As shown in Section VII.C.8, this project constitutes a Federal Major Modification; therefore, public noticing is required.

- b. Any new emissions unit with a Potential to Emit greater than 100 lb/day for any one affected pollutant

As calculated in Section VII.C.2, daily emissions for all pollutants are less than 100 lb/day.

- c. Any modifications that increase the SSPE1 above offset threshold levels

As shown in Section VII.C.3, SSPE1 is already greater than the offset threshold; therefore, an offset threshold will not be surpassed and public noticing is not required.

- d. Any new stationary source with SSPE2 exceeding the emissions offset threshold level

This is an existing facility; therefore, public noticing for new stationary source exceeding offset threshold purposes is not required.

- e. Any project with a Stationary Source Project Increase in Potential (SSIPE) Emissions greater than 20,000 lb/year for any 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:

<b>Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice</b>					
<b>Pollutant</b>	<b>SSPE2 (lb/year)</b>	<b>SSPE1 (lb/year)</b>	<b>SSIPE (lb/year)</b>	<b>SSIPE Public Notice Threshold</b>	<b>Public Notice Required?</b>
VOC	47,482	47,508	-26	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.

**2. Public Notice Action**

As discussed above, public noticing is required for this project as VOC emissions increases exceed the Federal Major Modification threshold. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this equipment.

**D. Daily Emission Limits (DELs)**

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.

Therefore, the following conditions will be listed on the permits to operate to ensure compliance.

S-3007-6-2:

- *Crude oil throughput shall not exceed 80 bbl per day based on a monthly average. [District Rule 2201]*
- *This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]*

S-3007-19-0:

- *Crude oil throughput shall not exceed 5.0 bbl per day based on a monthly average. [District Rule 2201]*
- *This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]*

S-3007-20-0:

- *This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]*
- *This tank shall be designed and operated at a constant level. [District Rule 2201]*

**E. Compliance Assurance**

**1. Source Testing**

The permittee will be required to perform periodic TVP testing on tanks S-3007-6-2, and '20-0 using the latest EPA and CARB approved version of the Lawrence Berkeley National Laboratory "Test Method for Vapor Pressure of Reactive Organic Compounds in Heavy Crude Oil Using Gas Chromatograph" to validate non-applicability of Rule 4623. The testing shall be conducted once every 24 month period or every time when the source of liquid stored is changed. The following conditions will be placed on the ATCs:

- *Permittee shall conduct true vapor pressure (TVP) testing of the organic liquid stored in this tank at least once every 24 months during summer (July - September), and/or whenever there is a change in the source or type of organic liquid stored in this tank in order to maintain exemption from the rule. . In lieu of testing each uncontrolled fixed roof tank, an operator may conduct a TVP testing of a representative tank provided the requirements of Sections 6.2.1.1.1 through 6.2.1.1.5 of Rule 4623 are met. [District Rule 4623]N*
- *The API gravity of crude oil or petroleum distillate shall be determined by using ASTM Method D 287 e1 "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method). Sampling for API gravity shall be performed in accordance with ASTM Method D 4057 "Standard Practices for Manual Sampling of Petroleum and Petroleum Products." [District Rule 4623] N*
- *For crude oil with an API gravity of 26 degrees or less, the TVP shall be determined using the latest version of the Lawrence Berkeley National Laboratory "test Method for Vapor pressure of Reactive Organic Compounds in Heavy Crude Oil Using Gas Chromatograph", as approved by ARB and EPA. [District Rule 4623] N*
- *The TVP testing shall be conducted at actual storage temperature of the organic liquid in the tank. The permittee shall also conduct an API gravity testing. [District Rule 4623] N*

**2. Monitoring**

Monitoring is not required for oil tanks to demonstrate compliance with Rule 2201.

**3. Recordkeeping**

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following condition(s) will appear on the ATCs:

For units S-3007-6-2, and '20-0:

- *The permittee shall keep accurate records of each organic liquid stored in the tank, including its storage temperature, TVP, and API gravity. [District Rule 4623]*

For units S-3007-6-2, '19-0, and '20-0:

- *Permittee shall maintain monthly records of average daily crude oil throughput and shall submit such information to the APCO 30 days prior to the expiration date indicated in the Permit to Operate. [District Rule 4623]*
- *All records required to be maintained by this permit shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rules 2201 and 4623]*

Other recordkeeping requirements are presented under Rule 4623 in the Compliance Section below.

#### **4. Reporting**

No reporting is required to demonstrate compliance with Rule 2201.

#### **F. Ambient Air Quality Analysis**

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.

However, for projects with VOC as the only criteria pollutant of concern, an AAQA is not conducted. Therefore, an AAQA was not performed for this project.

#### **Rule 2520 Federally Mandated Operating Permits**

Since this facility's emissions exceed the major source thresholds of District Rule 2201, this facility is a major source. Pursuant to Rule 2520 Section 5.1, and as required by permit condition, the facility will have up to 12 months from the date of ATC issuance to either submit a Title V Application or comply with District Rule 2530 *Federally Enforceable Potential to Emit*.

However, this facility has elected to comply with Rule 2530, which, per Section 4.6 of Rule 2520, exempts it from the requirements of Rule 2520.

#### **Rule 2530 Federally Enforceable Potential to Emit**

The purpose of this rule is to restrict the emissions of a stationary source so that the source may elect to be exempt from the requirements of Rule 2520. Per Section 6.1 of Rule 2530, this facility has elected exemption from the requirements of Rule 2520 by ensuring actual emissions from the stationary source in every 12-month periods to not exceed the following: ½ the major source thresholds for NO<sub>x</sub>, VOCs, CO, and PM<sub>10</sub>; 35 tons per year SO<sub>2</sub>; 5 tons per year of a single HAP; 12.5 tons per year of any combination of HAPs; 50 percent of any lesser threshold for a single HAP as the EPA may establish by rule; and 50 percent of the major source threshold for any other regulated air pollutant not listed in 6.1.1 and 6.1.6 of Rule 2530.

#### **Rule 4001**

40 CFR 60 Subparts K, Ka and Kb

The tanks have a storage capacity less than 420,000 gallons (10,000 bbl) and have been/will be used for petroleum or condensate with TVP less than 3.5 KPa (0.5 psia) that is stored, processed and/or treated at a drilling and production facility prior to custody transfer. Therefore, the requirements of 40 CFR 60 Subparts K, Ka and Kb are not applicable to these tanks.

#### **Rule 4101 Visible Emissions**

Per Section 5.0, no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity). As all units in this project consist of VOC emissions only, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity and continued compliance is expected.

#### **Rule 4102 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 equipments are well maintained. Therefore, compliance with this rule is expected.

#### **California Health & Safety Code 41700 – Health Risk Analysis**

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.

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 J), 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
S-3007-19-0	2.21E-08	No
S-3007-20-0	4.50E-09	No

### Discussion of T-BACT

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.

### California Health & Safety Code 42301.6 (School Notice)

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.

### Rule 4623 Storage of Organic Liquids

Rule 4623 limits volatile organic compound (VOC) emissions from the storage of organic liquids from tanks with a design capacity of 1,100 gallons or greater.

The facility is currently a small producer and will remain a producer. Pursuant to Section 4.4, tanks exclusively receiving and/or storing an organic liquid with a TVP less than 0.5 psia are exempt from all other requirements of the rule except for complying with the following provisions:

- 4.4.1 TVP and API Gravity Testing provisions pursuant to Section 6.2,
- 4.4.2 Recordkeeping provisions pursuant to Sections 6.3.4 & 6.3.6,
- 4.4.3 Test Methods provisions pursuant to Section 6.4, and
- 4.4.4 Compliance schedules pursuant to Section 7.2.

In addition, drain tank S-3007-19 carries a small producer throughput limit <50 bbls oil/per day and, therefore, is only required to keep records pursuant to Section 6.3.4.

Conditions on small producer requirements, TVP testing, and recordkeeping will be placed on the ATCs to ensure compliance with this rule.

Since the API Gravity and TVP of the oil has already been established, initial TVP and API testing of the oil in the new tanks will not be necessary.

### 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.

### **Greenhouse Gas (GHG) Significance Determination**

It is determined that no other agency has or will prepare an environmental review document for the project. Thus the District is the Lead Agency for this project.

The District's engineering evaluation (this document) demonstrates that the project would not result in an increase in project specific greenhouse gas emissions. The District therefore concludes that the project would have a less than cumulatively significant impact on global climate change.

Per District Policy, project specific greenhouse gas emissions less than or equal to 230 metric tons-CO<sub>2</sub>e/year are considered to be zero for District permitting purposes and are exempt from further environmental review.

### **District CEQA Findings**

The District is the Lead Agency for this project because there is no other agency with broader statutory authority over this project. The District performed an Engineering Evaluation (this document) for the proposed project and determined that the activity will occur at an existing facility and the project involves negligible expansion of the existing use. Furthermore, the District determined that the activity will not have a significant effect on the environment. The District finds that the activity is categorically exempt from the provisions of CEQA pursuant to CEQA Guideline § 15031 (Existing Facilities), and finds that the project is exempt per the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment (CEQA Guidelines §15061(b)(3)).

## **IX. Recommendation**

Compliance with all applicable rules and regulations is expected. Issue ATCs S-3007-6-2, '19-0, and '20-0 subject to permit conditions listed on the attached draft Authority to Construct in Appendix I.

**X. Billing Information**

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
S-3007-6-2	3020-05S C	21,000 gallons	\$63
S-3007-19-0	3020-05S B	10,500 gallons	\$44
S-3007-20-0	3020-05S B	12,600 gallons	\$44

**Appendices**

- A: Existing Permit to Operate for Unit S-3007-6-1
- B: Facility Diagram
- C: Emission Calculations
- D: BAE Data for Unit S-3007-6
- E: Alternate Siting Analysis
- F: Compliance Certification
- G: BACT Guideline 7.1.3 and BACT Analysis
- H: Vendor Quote for Vapor Control System
- I: HRA Summary
- J: Draft Authorities to Construct and Emissions Profiles



**Appendix A**  
**Existing Permit to Operate for Unit S-3007-6**

# San Joaquin Valley Air Pollution Control District

**PERMIT UNIT:** S-3007-6-1

**EXPIRATION DATE:** 09/30/2011

**SECTION:** SE23 **TOWNSHIP:** 11N **RANGE:** 23W

**EQUIPMENT DESCRIPTION:**

21,000 GALLON FIXED ROOF CRUDE OIL STOCK TANK #2 (RIPLEY TATUM LEASE)

## PERMIT UNIT REQUIREMENTS

---

1. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. To maintain status as small producer permittee's crude oil production shall average less than 6,000 bbl/day from all operations within Kern County and permittee shall not engage in refining, transporting or marketing of refined petroleum products. [District Rule 1020]
3. The permittee shall not emit more than one half of the major source threshold based on a rolling 12-month summary of actual emissions. [District Rule 2530, 6.1]
4. The permittee shall maintain a record of the rolling 12-month summary of actual emissions from permitted operations. This record shall be kept on site and made available to the District upon request. [District Rule 2530, 6.1]
5. This tank shall be equipped with a pressure-vacuum (PV) relief valve set to within 10% of the maximum allowable working pressure of the tank, permanently labeled with the operating pressure settings, properly maintained in good operating order in accordance with the manufacturer's instructions, and shall remain in gas-tight condition except when the operating pressure exceeds the valve's set pressure. [District Rule 4623]
6. Crude oil throughput shall not exceed 100 barrels per day based on a monthly average. [District Rule 2201]
7. This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]
8. Permittee shall conduct true vapor pressure (TVP) testing of the organic liquid stored in this tank at least once every 24 months during summer (July - September), and/or whenever there is a change in the source or type of organic liquid stored in this tank in order to maintain exemption from the rule. [District Rule 4623]
9. The TVP testing shall be conducted at actual storage temperature of the organic liquid in the tank. The permittee shall also conduct an API gravity testing. [District Rule 4623]
10. Permittee shall submit the records of TVP and API gravity testing to the APCO within 45 days after the date of testing. The records shall include the tank identification number, Permit to Operate number, type of stored organic liquid, TVP and API gravity of the organic liquid, test methods used, and a copy of the test results. [District Rule 4623]
11. The API gravity of crude oil or petroleum distillate shall be determined by using ASTM Method D 287 e1 "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method). Sampling for API gravity shall be performed in accordance with ASTM Method D 4057 "Standard Practices for Manual Sampling of Petroleum and Petroleum Products." [District Rule 4623]
12. For crude oil with an API gravity of 26 degrees or less, the TVP shall be determined using the latest version of the Lawrence Berkeley National Laboratory "test Method for Vapor pressure of Reactive Organic Compounds in Heavy Crude Oil Using Gas Chromatograph", as approved by ARB and EPA. [District Rule 4623]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

These terms and conditions are part of the Facility-wide Permit to Operate.

13. Permittee shall maintain monthly records of average daily crude oil throughput and shall submit such information to the APCO 30 days prior to the expiration date indicated in the Permit to Operate. [District Rule 2201]
14. The permittee shall keep accurate records of each organic liquid stored in the tank, including its storage temperature, TVP, and API gravity. [District Rule 4623]
15. All records required to be maintained by this permit shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rule 4623]

These terms and conditions are part of the Facility-wide Permit to Operate.

# **Appendix B**

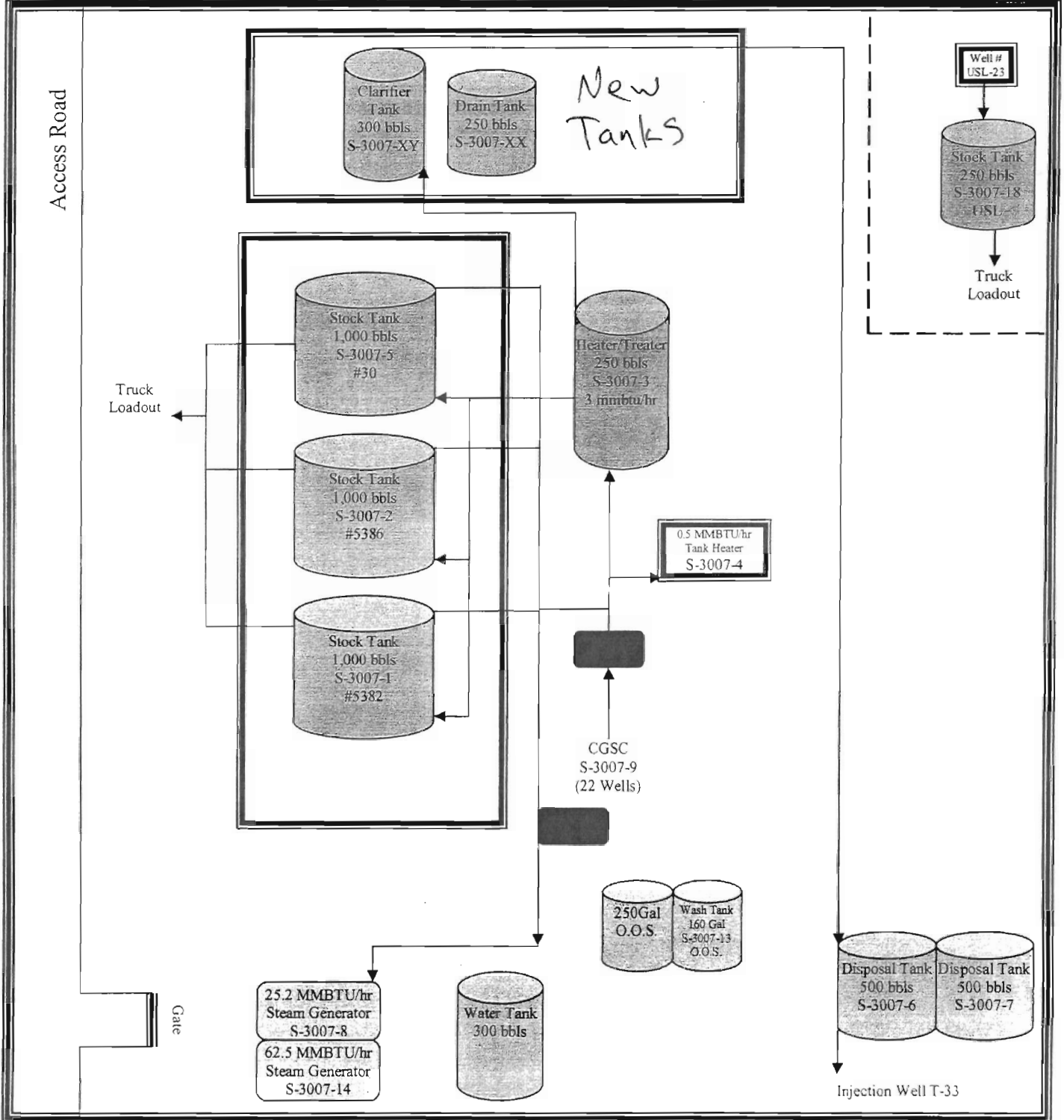
## **Facility Diagram**

Bonanza Creek Energy Operating Co., LLC.

BUSINESS NAME: Ripley Tatum Tank Battery  
SCALE: NONE



Facility Diagram S-3007



## **Appendix C**

### **Emissions Calculations**

Ripley Tatum - 250 bbl Drain Tank

Tank Input Data	
permit number (S-xxx-xx-xx)	S-3007-xx
facility tank I.D.	Drain
nearest city (1: Bakersfield, 2: Fresno, 3: Stockton)	1
tank ROC vapor pressure (psia)	0.5
liquid bulk storage temperature, T <sub>b</sub> (°F)	100
is this a constant-level tank? (yes, no)	no
will flashing losses occur in this tank (only if first-line tank)? (yes, no)	no
breather vent pressure setting range (psi)	0.06
diameter of tank (feet)	15
capacity of tank (bbl)	250
conical or dome roof? (c, d)	c
shell height of tank (feet)	8
average liquid height (feet)	5
are the roof and shell the same color? (yes,no)	yes
For roof:	
color (1:Spec Al, 2:Diff Al, 3:Light, 4:Med, 5:Red, 6:White)	4
condition (1: Good, 2: Poor)	1
-----This row only used if shell is different color from roof-----	
-----This row only used if shell is different color from roof-----	

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Liquid Input Data	A	B
maximum daily fluid throughput (bbl)		5
maximum annual fluid throughput (bbl)		1,825
-----This row only used if flashing losses occur in this tank-----		50
-----This row only used if flashing losses occur in this tank-----		18,250
molecular weight, M <sub>w</sub> (lb/lb-mol)		100

Calculated Values	A	B
daily maximum ambient temperature, T <sub>ax</sub> (°F)		77.65
daily minimum ambient temperature, T <sub>an</sub> (°F)		53.15
daily total solar insolation factor, I (Btu/ft <sup>2</sup> -day)		1648.9
atmospheric pressure, P <sub>a</sub> (psia)		14.47
(psia)	99.0	0.9259
(psia)	88.2	0.6653
water vapor pressure at average liquid surface temperature ( f <sub>la</sub> ), P <sub>va</sub> (psia)	93.6	0.7903
roof outage, H <sub>ro</sub> (feet)		0.1563
vapor space volume, V <sub>v</sub> (cubic feet)		557.76
paint factor, alpha		0.68
vapor density, W <sub>v</sub> (lb/cubic foot)		0.0084
daily vapor temperature range, delta T <sub>v</sub> (degrees Rankine)		49.04
vapor space expansion factor, K <sub>e</sub>		0.1032

Results	lb/year	lb/day
Standing Storage Loss	177	0.48
Working Loss	91	0.25
Flashing Loss	N/A	N/A
Total Uncontrolled Tank VOC Emissions	268	0.7

Summary Table	
Permit Number	S-3007-xx
Facility Tank I.D.	Drain
Tank capacity (bbl)	250
Tank diameter (ft)	15
Tank shell height (ft)	8
Conical or Dome Roof	Conical
Maximum Daily Fluid Throughput (bbl/day)	5
Maximum Annual Fluid Throughput (bbl/year)	1,825
Maximum Daily Oil Throughput (bbl/day)	50
Maximum Annual Oil Throughput (bbl/year)	---
Total Uncontrolled Daily Tank VOC Emissions (lb/day)	0.7
Total Uncontrolled Annual Tank VOC Emissions (lb/year)	268

Ripley Tatum - 300 bbl Clarifier

Tank Input Data	
permit number (S-xxx-xx-xx)	S-3007-xx
facility tank I.D.	
nearest city (1: Bakersfield, 2: Fresno, 3: Stockton)	1
tank ROC vapor pressure (psia)	0.5
liquid bulk storage temperature, T <sub>b</sub> (°F)	100
is this a constant-level tank? (yes, no)	yes
will flashing losses occur in this tank (only if first-line tank)? (yes, no)	no
breather vent pressure setting range (psi)	0.06
diameter of tank (feet)	11.6
capacity of tank (bbl)	300
conical or dome roof? (c, d)	c
shell height of tank (feet)	16
average liquid height (feet)	14
are the roof and shell the same color? (yes,no)	yes
For roof:	
color (1:Spec Al, 2:Diff Al, 3:Light, 4:Med, 5:Red, 6:White)	4
condition (1: Good, 2: Poor)	1
-----This row only used if shell is different color from roof-----	
-----This row only used if shell is different color from roof-----	

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Liquid Input Data	A	B
maximum daily fluid throughput (bbl)		300
maximum annual fluid throughput (bbl)		109,500
-----This row only used if flashing losses occur in this tank-----		50
-----This row only used if flashing losses occur in this tank-----		18,250
molecular weight, M <sub>w</sub> (lb/lb-mol)		100

Calculated Values	A	B
daily maximum ambient temperature, T <sub>ax</sub> (°F)		77.65
daily minimum ambient temperature, T <sub>an</sub> (°F)		53.15
daily total solar insolation factor, I (Btu/ft <sup>2</sup> -day)		1648.9
atmospheric pressure, P <sub>a</sub> (psia)		14.47
(psia)	99.0	0.9259
(psia)	88.2	0.6653
water vapor pressure at average liquid surface temperature (T <sub>la</sub> ), P <sub>va</sub> (psia)	93.6	0.7903
roof outage, H <sub>ro</sub> (feet)		0.1208
vapor space volume, V <sub>v</sub> (cubic feet)		224.14
paint factor, alpha		0.68
vapor density, W <sub>v</sub> (lb/cubic foot)		0.0084
daily vapor temperature range, delta T <sub>v</sub> (degrees Rankine)		49.04
vapor space expansion factor, K <sub>e</sub>		0.1032

Results	lb/year	lb/day
Standing Storage Loss	71	0.19
Working Loss	N/A	N/A
Flashing Loss	N/A	N/A
Total Uncontrolled Tank VOC Emissions	71	0.2

Summary Table	
Permit Number	S-3007-xx
Facility Tank I.D.	---
Tank capacity (bbl)	300
Tank diameter (ft)	11.6
Tank shell height (ft)	16
Conical or Dome Roof	Conical
Maximum Daily Fluid Throughput (bbl/day)	300
Maximum Annual Fluid Throughput (bbl/year)	109,500
Maximum Daily Oil Throughput (bbl/day)	50
Maximum Annual Oil Throughput (bbl/year)	---
Total Uncontrolled Daily Tank VOC Emissions (lb/day)	0.2
Total Uncontrolled Annual Tank VOC Emissions (lb/year)	71



Pre-project

505

Tank Input Data	
permit number (S-xxxx-xx-xx)	S-3007-6
facility tank I.D.	
nearest city (1: Bakersfield, 2: Fresno, 3: Stockton)	1
tank ROC vapor pressure (psia)	0.5
liquid bulk storage temperature, Tb (°F)	100
is this a constant-level tank? (yes, no)	No
will flashing losses occur in this tank (only if first-line tank)? (yes, no)	No
breather vent pressure setting range (psi)	0.06
diameter of tank (feet)	15
capacity of tank (bbl)	500
conical or dome roof? (c, d)	c
shell height of tank (feet)	16
average liquid height (feet)	10
are the roof and shell the same color? (yes,no)	yes
For roof:	
color (1:Spec Al, 2:Diff Al, 3:Light, 4:Med, 5:Red, 6:White)	4
condition (1: Good, 2: Poor)	1
-----This row only used if shell is different color from roof-----	4
-----This row only used if shell is different color from roof-----	1

Liquid Input Data	A	B
maximum daily fluid throughput (bbl)		100
maximum annual fluid throughput (bbl)		36,500
-----This row only used if flashing losses occur in this tank-----		100
-----This row only used if flashing losses occur in this tank-----		36,500
molecular weight, Mw (lb/lb-mol)		100

Calculated Values	A	B
daily maximum ambient temperature, T <sub>ax</sub> (°F)		77.65
daily minimum ambient temperature, T <sub>an</sub> (°F)		53.15
daily total solar insolation factor, I (Btu/ft <sup>2</sup> -day)		1648.9
atmospheric pressure, P <sub>a</sub> (psia)		14.47
(psia)	99.0	0.9259
(psia)	88.2	0.6653
water vapor pressure at average liquid surface temperature (T <sub>la</sub> ), P <sub>va</sub> (psia)	93.6	0.7903
roof outage, H <sub>ro</sub> (feet)		0.1563
vapor space volume, V <sub>v</sub> (cubic feet)		1087.90
paint factor, alpha		0.68
vapor density, W <sub>v</sub> (lb/cubic foot)		0.0084
daily vapor temperature range, delta T <sub>v</sub> (degrees Rankine)		49.04
vapor space expansion factor, K <sub>e</sub>		0.1032

Results	lb/year	lb/day
Standing Storage Loss	345	0.95
Working Loss	1,825	5.00
Flashing Loss	N/A	N/A
Total Uncontrolled Tank VOC Emissions	2,170	5.9

Summary Table			
Permit Number	S-3007-6		
Facility Tank I.D.	---		
Tank capacity (bbl)	500		
Tank diameter (ft)	15		
Tank shell height (ft)	16		
Conical or Dome Roof	Conical		
Maximum Daily Fluid Throughput (bbl/day)	100		
Maximum Annual Fluid Throughput (bbl/year)	36,500		
Maximum Daily Oil Throughput (bbl/day)	100		
Maximum Annual Oil Throughput (bbl/year)	---		
Total Uncontrolled Daily Tank VOC Emissions (lb/day)	5.9		
Total Uncontrolled Annual Tank VOC Emissions (lb/year)	2,170	108.50	95% Control
		21.70	99% Control

Post-project

505

Tank Input Data	
permit number (S-xxxx-xx-xx)	S-3007-6
facility tank I.D.	
nearest city (1: Bakersfield, 2: Fresno, 3: Stockton)	1
tank ROC vapor pressure (psia)	0.5
liquid bulk storage temperature, Tb (°F)	100
is this a constant-level tank? (yes, no)	No
will flashing losses occur in this tank (only if first-line tank)? (yes, no)	No
breather vent pressure setting range (psi)	0.06
diameter of tank (feet)	15
capacity of tank (bbl)	500
conical or dome roof? (c, d)	c
shell height of tank (feet)	16
average liquid height (feet)	10
are the roof and shell the same color? (yes,no)	yes
For roof:	
color (1:Spec Al, 2:Diff Al, 3:Light, 4:Med, 5:Red, 6:White)	4
condition (1: Good, 2: Poor)	1
-----This row only used if shell is different color from roof-----	4
-----This row only used if shell is different color from roof-----	1

Liquid Input Data	A	B
maximum daily fluid throughput (bbl)		80
maximum annual fluid throughput (bbl)		29,200
-----This row only used if flashing losses occur in this tank-----		80
-----This row only used if flashing losses occur in this tank-----		29,200
molecular weight, Mw (lb/lb-mol)		100

Calculated Values	A	B
daily maximum ambient temperature, T <sub>ax</sub> (°F)		77.65
daily minimum ambient temperature, T <sub>an</sub> (°F)		53.15
daily total solar insulation factor, I (Btu/ft <sup>2</sup> -day)		1648.9
atmospheric pressure, P <sub>a</sub> (psia)		14.47
(psia)	99.0	0.9259
(psia)	88.2	0.6653
water vapor pressure at average liquid surface temperature (T <sub>la</sub> ), P <sub>va</sub> (psia)	93.6	0.7903
roof outage, H <sub>ro</sub> (feet)		0.1563
vapor space volume, V <sub>v</sub> (cubic feet)		1087.90
paint factor, alpha		0.68
vapor density, W <sub>v</sub> (lb/cubic foot)		0.0084
daily vapor temperature range, delta T <sub>v</sub> (degrees Rankine)		49.04
vapor space expansion factor, K <sub>e</sub>		0.1032

Results	lb/year	lb/day
Standing Storage Loss	345	0.95
Working Loss	1,460	4.00
Flashing Loss	N/A	N/A
Total Uncontrolled Tank VOC Emissions	1,805	4.9

Summary Table	
Permit Number	S-3007-6
Facility Tank I.D.	---
Tank capacity (bbl)	500
Tank diameter (ft)	15
Tank shell height (ft)	16
Conical or Dome Roof	Conical
Maximum Daily Fluid Throughput (bbl/day)	80
Maximum Annual Fluid Throughput (bbl/year)	29,200
Maximum Daily Oil Throughput (bbl/day)	80
Maximum Annual Oil Throughput (bbl/year)	---
Total Uncontrolled Daily Tank VOC Emissions (lb/day)	4.9
Total Uncontrolled Annual Tank VOC Emissions (lb/year)	1,805

90.25	95% Control
18.05	99% Control

**Appendix D**  
**BAE Data for Unit S-3007-6-0**

**Bonanza Creek Energy Operating Co., Inc.**  
**2008 Emission Inventory**  
**Facility S-3007**

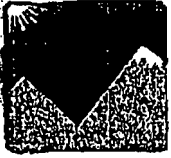
Tank Permit #	Tank #	Lease	Description	Tank Type	Contents	Capacity (bbl)	Annual Throughput (bbl)	Oil Recovered (bbl)	Oil/H2O Ratio	Distance to Residence	Distance to Business	Notes
S-3007-1-0	5382	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	32,465			>3000	>3000	
S-3007-2-0	5386	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	32,465			>3000	>3000	
S-3007-5-0	30	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	32,465			>3000	>3000	
<del>S-3007-6-0</del>	2	Ripley-Tatum	Stock	Fixed Roof	Oil	500	-			>3000	>3000	<del>Out of Service</del>
S-3007-7-0	3	Ripley-Tatum	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-10-0		Ripley Trust	Wash	Fixed Roof	Oil/Water	750	4,789			>3000	>3000	
S-3007-11-0		Ripley Trust	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-12-0		Ripley Trust	Stock	Fixed Roof	Oil	500	4,789			>3000	>3000	
S-3007-13-0		Ripley-Tatum	Wash	Fixed Roof	Oil/Water	160	-			>3000	>3000	Out of Service

6-7 11.13  
 out of service  
 2007

**Bonanza Creek Energy Operating Co., Inc.**  
**2007 Emission Inventory**  
**Facility S-3007**

Tank Permit No.	Tank No.	Lease	Description	Tank Type	Contents	Capacity (bb)	Annual Throughput (bb)	Oil Recovered (bb)	Oil/H <sub>2</sub> O Ratio	Distance to Residence	Distance to Business	Notes
S-3007-1-0	5382	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	16,907			>3000	>3000	
S-3007-2-0	5386	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	16,907			>3000	>3000	
S-3007-5-0	30	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	16,907			>3000	>3000	
S-3007-6-0	2	Ripley-Tatum	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-7-0	3	Ripley-Tatum	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-10-0		Ripley Trust	Wash	Fixed Roof	Oil/Water	750	1,000			>3000	>3000	
S-3007-11-0		Ripley Trust	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-12-0		Ripley Trust	Stock	Fixed Roof	Oil	500	1,000			>3000	>3000	
S-3007-13-0		Ripley-Tatum	Wash	Fixed Roof	Oil/Water	160	-			>3000	>3000	Out of Service

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Southeastern Region  
Southern Region



**SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT**

1990 E. Gettysburg Ave., Fresno, CA 93728

(559) 230 - 6000

RECEIVED

**WORKSHEET FOR THE ANNUAL EMISSION INVENTORY : 2006**

RECEIVED APR 13 2007

APR 23 2007 SJVAPCD Southern Region

**FORTY MILE CREEK COMPANY LLC**  
4900 CALIFORNIA AVE, SUITE 350B  
BAKERSFIELD CA, 93309

Permits SVC  
SJVAPCD  
Is this information considered:

- CONFIDENTIAL
- NOT CONFIDENTIAL

SITE ADDRESS : HEAVY OIL WESTERN,

*5-1072165*

**Note: All requests for confidentiality must be supported by a written justification ( Title 17, section 91010, California Administrative Code)**

WorkSheet for Permit # : S-3007

Units (1, 2, 5, 6, 7, 10, 11, 12, 13)

**OIL FIELD TANKS**

Annual Process Data for Storage Tanks:

Tank Type: ( ) Fixed Roof ( ) Floating Roof

Materials Stored: \_\_\_\_\_

Total Annual Throughput: \_\_\_\_\_ Units \_\_\_\_\_

Total Capacity: \_\_\_\_\_ Units \_\_\_\_\_

What is the Oil/Water Ratio?: \_\_\_\_\_

What is Gas/Oil Ratio?: \_\_\_\_\_

Distance to Nearest Business from Equipment \_\_\_\_\_ (feet)

Distance to Nearest Residence from Equipment \_\_\_\_\_ (feet)

Comments: \_\_\_\_\_

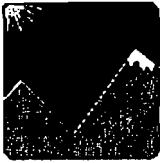
*See attached spreadsheet*

1

Bonanza Creek Energy Operating Co., Inc.  
 2007 Emission Inventory  
 Facility S-3007

Tank Permit #	Tank #	Lease	Description	Tank Type	Contents	Capacity (bbl)	Annual Throughput (bbl)	Oil Recovered (bbl)	Oil/H2O Ratio	Distance to Residence	Distance to Business	Notes
S-3007-1-0	5382	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	16,907			>3000	>3000	
S-3007-2-0	5386	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	16,907			>3000	>3000	
S-3007-5-0	30	Ripley-Tatum	Stock	Fixed Roof	Oil	1000	16,907			>3000	>3000	
S-3007-6-0	2	Ripley-Tatum	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-7-0	3	Ripley-Tatum	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-10-0		Ripley Trust	Wash	Fixed Roof	Oil/Water	750	1,000			>3000	>3000	
S-3007-11-0		Ripley Trust	Stock	Fixed Roof	Oil	500	-			>3000	>3000	Out of Service
S-3007-12-0		Ripley Trust	Stock	Fixed Roof	Oil	500	1,000			>3000	>3000	
S-3007-13-0		Ripley-Tatum	Wash	Fixed Roof	Oil/Water	160	-			>3000	>3000	Out of Service

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 MAY 21 2008  
 SLYAPCD  
 Southern Region



**SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT**

1990 E. Gettysburg Ave., Fresno, CA 93726

**OIL FIELD**

(559) 230 - 6000

**WORKSHEET FOR THE ANNUAL EMISSION INVENTORY : 2005**

**VIRSAL OIL COMPANY**  
1601 H ST, SUITE 200  
BAKERSFIELD CA, 93301

FACILITY ID# : **S-3007**  
TAD #: 15-3007  
SIC #: 1311  
PHONE #: (661) 872-5574  
TOXID:  
US Form Required: No

SITE ADDRESS : HEAVY OIL WESTERN,

Is this information considered:

CONFIDENTIAL  
 NOT CONFIDENTIAL

Note: All requests for confidentiality must be supported by a written justification ( Title 17, section 91010, California Administrative Code)

WorkSheet for Permit # S-3007-6-0

500 BBL FIXED ROOF CRUDE OIL STOCK TANK #2 (RIPLEY TATUM LEASE)

**OIL FIELD FUGITIVES**

Fugitive Sources Data:

Product:  Heavy Oil ( ) Light Oil ( ) Gas Vapor

Indicate Number of:

Valves/Flanges: \_\_\_\_\_

Pump Seals: \_\_\_\_\_

Compressor Seals: \_\_\_\_\_

Gas Safety Relief Valves: \_\_\_\_\_

Wells: \_\_\_\_\_

Well Heads: \_\_\_\_\_

Well Cellars: \_\_\_\_\_ (sq.ft. of Cellar Area)

Gas/Oil Ratio: \_\_\_\_\_

Distance to Nearest Residence from Equipment \_\_\_\_\_ (feet)

Distance to Nearest Business from Equipment \_\_\_\_\_ (feet)

Comments: \_\_\_\_\_

**OIL FIELD TANKS**

Annual Process Data for Storage Tanks:

Tank Type:  Fixed Roof ( ) Floating Roof

Materials Stored: CRUDE OIL

Annual Throughput: 339 Units 880

Total Capacity: 500 Units 880

What is the Oil/Water Ratio? 0.03 ?

What is Gas/Oil Ratio : 0 ?

Distance to Nearest Residence from Equipment 3,000 (feet)

Distance to Nearest Business from Equipment 3,000 (feet)

Comments: \_\_\_\_\_



**Appendix E**  
**Alternate Siting Analysis**

**Bonanza Creek Energy Operating Co., Inc.**

---

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**JUL 13 2010**

SJVAPCD  
Southern Region

July 12, 2010

Ms. Robert Rinaldi  
San Joaquin Valley Unified APCD  
34946 Flyover Court  
Bakersfield, CA 93308

**Subject: NOI Response - Project S-1103330 – 250 Drain/300 Clarifier (Tatum)**

Dear Mr. Rinaldi:

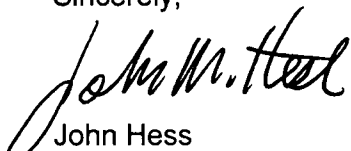
Please find enclosed the following supplemental information for the ATC for a new 250 bbl tank and a new 300 bbl clarifier tank at the Tatum Lease:

- **Distance to nearest receptor** - The equipment is greater than 1,000 feet to the nearest business, residence, or school.
- **Alternate Siting** – Bonanza Creek is an oil producer. Based on the location of the limited natural resource, Bonanza Creek is utilizing an existing facility for the processing of extracted fluid.

Alternative sites would involve either pumping the produced fluid directly from the wells into trucks or piping the fluid to another tank battery. Trucking of the produced fluid, which includes the oil, water, and any associated gas would not be a feasible option due to the 24 hour per day production and volume of produced water. Piping changes would include additional stationary pumps to pipe the fluid to the nearest existing Bonanza Creek facility. Land use rights, stream/river crossings, and other logistical issues make this an impractical solution. Both of these alternate scenarios and the associated relocation and/or construction of various support structures would result in a much greater impact on air emissions.

If you have any questions or need further information, please feel free to call me at (661) 638-2730 or Scott Faulkenburg at (661) 377-0073.

Sincerely,



John Hess  
VP – Western Region

cc: Scott Faulkenburg, EnviroTech

**Appendix F**  
**Compliance Certification**

**Bonanza Creek Energy Operating Co., Inc.**

RECEIVED

AUG 10 2010

SJVAPCD  
Southern Region

August 10, 2010

Mr. Robert Rinaldi  
San Joaquin Valley Unified APCD  
34946 Flyover Court  
Bakersfield, CA 93308

**Subject: NOI Response - Project S-1103330 – 250 Drain/300 Clarifier (Tatum)**

Dear Mr. Rinaldi:

Please find enclosed the following supplemental information for the ATC for a new 250 bbl tank and a new 300 bbl clarifier tank at the Tatum Lease:

- **Distance to nearest receptor** - The equipment is greater than 1,000 feet to the nearest business, residence, or school.
- **Alternate Siting** – Bonanza Creek is an oil producer. Based on the location of the limited natural resource, Bonanza Creek is utilizing an existing facility for the processing of extracted fluid.

Alternative sites would involve either pumping the produced fluid directly from the wells into trucks or piping the fluid to another tank battery. Trucking of the produced fluid, which includes the oil, water, and any associated gas would not be a feasible option due to the 24 hour per day production and volume of produced water. Piping changes would include additional stationary pumps to pipe the fluid to the nearest existing Bonanza Creek facility. Land use rights, stream/river crossings, and other logistical issues make this an impractical solution. Both of these alternate scenarios and the associated relocation and/or construction of various support structures would result in a much greater impact on air emissions.

- **BACT Analysis** – Attached
- **Major Source Compliance Demonstration** – Bonanza Creek is verifying that all major Stationary Sources owned or operated by Bonanza Creek in California are in compliance with all applicable emission limitations and standards, to the best of our knowledge.

**Appendix G**  
**BACT Guideline 7.3.1 and**  
**BACT Analysis**

**Best Available Control Technology (BACT) Guideline 7.3.1 Last Update: 10/1/2002**

**Petroleum and Petrochemical Production - Fixed Roof Organic Liquid Storage or Processing Tank, < 5,000 bbl Tank capacity \*\***

Pollutant	Achieved in Practice or in the SIP	Technologically Feasible	Alternate Equipment	Basic
VOC	PV-vent set to within 10% of maximum allowable pressure	99% control ( Waste gas incinerated in steam generator, heater treater, or other fired equipment and inspection and maintenance program; transfer of noncondensable vapors to gas pipeline; reinjection to formation (if appropriate wells are available); or equal).		

*\*\* Converted from Determinations 7.1.11 (10/01/02).*

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**Top Down BACT Analysis**

VOC emissions may occur when the produced fluids from the crude oil production wells enter the oil storage tanks.

**Step 1 - Identify All Possible Control Technologies**

BACT Guideline 7.3.1 lists the controls applicable to fixed-roof organic liquid storage or processing tanks of <5,000 bbl tank capacity. The VOC control measures are summarized below.

**Technologically feasible:**

99% control (waste gas incinerated in steam generator, heater treater, or other fired equipment and inspection and maintenance program; transfer of uncondensed vapors to gas pipeline or reinjection to formation (if appropriate wells are available)).

### **Achieved in Practice:**

PV relief valve set to within 10% of maximum allowable pressure.

### **Step 2 - Eliminate Technologically Infeasible Options**

All of the above identified control options are technologically feasible.

### **Step 3 - Rank Remaining Control Technologies by Control Effectiveness**

1. 99% control (waste gas incinerated in steam generator, heater treater, or other fired equipment and inspection and maintenance program; transfer of uncondensed vapors to gas pipeline or reinjection to formation (if appropriate wells are available).
2. PV relief valve set to within 10% of maximum allowable pressure.

### **Step 4 - Cost Effectiveness Analysis**

The annualized cost is determined by adding the annualized capital cost to the annual operating costs as shown below.

$$A = \frac{P \cdot i \cdot (i + 1)^n}{(i + 1)^n - 1} + \text{Annual operating cost}$$

Where:

A = Annual Cost

P = Present Value

i = Interest Rate (10%)

n = Equipment (10 years)

The capital cost of the equipment and installing the equipment is \$72,425.35

The annual maintenance cost = \$12,000

The annual seal replacement = \$4,000

Therefore, the annualized cost of the purchase and installation is:

$$A = \frac{\$72,425.35 \cdot 0.1 \cdot (0.1 + 1)^{10}}{(0.1 + 1)^{10} - 1} + \$12,000 + \$4,000$$

$$A = \$27,786$$

To compare the price-per-ton-of-emissions-reduced, the annualized cost figure is divided by the number of tons of year reduced.

Tons reduced = PE2 x 0.99

Tons Reduced = (268+71+1,805) lb/year x 0.99 ÷ 2,000 lb/ton

Tons Reduced = 1.06 tons

Cost per ton reduced =  $\$27,786 \div 1.06 \text{ tons} = \$26,213.21 \text{ per ton}$

Since this figure is above the cost-effectiveness threshold of \$17,500/ton, the vapor control system is not required for this project.

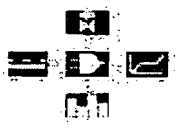
### **Step 5 - Select BACT**

The remaining option is achieved-in-practice BACT and will be required for the two new tanks and the existing tank.

-PV relief valve set to within 10% of maximum allowable pressure of the tank



**Appendix H**  
**Vendor Quote for Vapor Control System**



A.M.P.S., INC.  
 PO Box 81975  
 Bakersfield, CA 93380

# Estimate

Date	Estimate #
11/2/2009	10250
LIC, 897656	

Name / Address
Bonanza Creek Energy Operating Co., LLC 4900 California Ave. Bakersfield, Ca 93309

P.O. No.	Terms	Account #	Project	Other
VRU-COMP,				

Description	Qty	Rate	Total
QUINCY QTS3 RANGE 50- 125 mcf @ 55 DISCHARGE PRESSURE, 4x8 inlet scrubber, skid 4'5 x 10' with relief, controls on unit will be one control panel 12x12x8, one smart relay outs 4, inputs 5. one dp- wc transmitter, one temp switch inlet, two level switches for high-control, two psig switches for outlet an inlet, lube oil switches- low , psig. this unit will be ready to put in service after install, we will test run unit in shop before delivery. the only service that we will need to do is the initial start-up tuning / safety in field. note: the unit has 2.5 hp motor on unit, with this 2.5 hp flow will be 45-50 (mcf) at 50.0 psig. 5.0 hp = 83.0 - 85.0 mcf. 10.0 hp = 120.0 - 125.0 mcf. we can install a controller that will control at a set rate (i.e.) 60.0 mcf, this will control dis. psig back in to the suc,	1	66,757.83	66,757.83T
THE INLET PIPING IS 2.0 " OUTLET 2.0 "			
Delivery	1	160.00	160.00

<b>Subtotal</b>	\$66,917.83
<b>Sales Tax (8.25%)</b>	\$5,507.52
<b>Total</b>	\$72,425.35

**Appendix I**  
**HRA Summary**

# San Joaquin Valley Air Pollution Control District Risk Management Review

To: Sudeshna Bakshi – Permit Services  
 From: Cheryl Lawler – Technical Services  
 Date: September 21, 2010  
 Facility Name: Bonanza Creek Energy Operating Company  
 Location: SE 23/Township 11N/Range 23W – Ripley Tatum  
 Application #(s): S-3007-6-2, 19-0, 20-0  
 Project #: S-1103330

---

## A. RMR SUMMARY

RMR Summary				
Categories	Drain Tank (Unit 19-0)	Clarifier Tank (Unit 20-0)	Project Totals	Facility Totals
Prioritization Score	0.00	0.00	0.00	>1
Acute Hazard Index	0.00	0.00	0.00	0.09
Chronic Hazard Index	0.00	0.00	0.00	0.00
Maximum Individual Cancer Risk	2.21E-08	4.50E-09	2.66E-08	5.28E-06
T-BACT Required?	No	No		
Special Permit Conditions?	No	No		

### I. Project Description

Technical Services received a request on September 2, 2010, to perform a Risk Management Review for a new drain tank, a new clarifier tank, and to reduce the throughput of an existing tank at the facility (Unit 6-2).

### II. Analysis

For Unit 6-2 (existing tank), no further analysis was required since the throughput for this tank is decreasing.

For Units 19-0 and 20-0 (drain and clarifier tanks), toxic emissions were calculated using emission factors for toxic fugitive emissions from oilfield equipment, along with VOC fugitive emission rates supplied by the processing engineer. In accordance with the District's *Risk Management Policy for Permitting New and Modified Sources* (APR 1905-1, March 2, 2001), risks from the units were prioritized using the procedures in the 1990 CAPCOA Facility Prioritization Guidelines and incorporated in the District's HEART's database. The prioritization scores for the units were less than 1.0 (see RMR Summary Table); however, the facility's combined prioritization scores totaled to greater than one. Therefore, a refined Health Risk Assessment was required and performed for both units. AERMOD was used with area source parameters outlined below and concatenated 5-year meteorological data

from Bakersfield to determine maximum dispersion factors at the nearest residential and business receptors. The dispersion factors were input into the HARP model to calculate the Chronic and Acute Hazard Indices and the Carcinogenic Risk.

The following parameters were used for the review:

<b>Analysis Parameters</b>			
<b>Source Types</b>	<b>Area</b>	<b>Closest Receptor (m)</b>	304.8
<b>Unit 19-0 VOC Emission Rate (lb/yr)</b>	268	<b>Type of Receptor</b>	Residence & Business
<b>Unit 20-0 VOC Emission Rate (lb/yr)</b>	71	<b>Location Type</b>	Rural
<b>Release Heights (m)</b>	2.44 & 4.88	<b>Length of Sides (m)</b>	4.57 & 3.54

### III. Conclusions

#### Unit 19-0

The acute and chronic indices are below 1.0; and the maximum individual cancer risk associated with the unit is **2.21E-08**, which is less than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the unit is approved **without** Toxic Best Available Control Technology (T-BACT).

#### Unit 20-0

The acute and chronic indices are below 1.0; and the maximum individual cancer risk associated with the unit is **4.50E-09**, which is less than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the unit is approved **without** Toxic Best Available Control Technology (T-BACT).

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

**Appendix J**  
**Draft ATCs and Emissions Profiles**

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT  
**DRAFT**

**PERMIT NO:** S-3007-6-2

**LEGAL OWNER OR OPERATOR:** BONANZA CREEK ENERGY OPERATING COMPANY  
**MAILING ADDRESS:** P O BOX 21974  
BAKERSFIELD, CA 93390

**LOCATION:** HEAVY OIL WESTERN  
MIDWAY SUNSET OIL FIELD S SE23, T11N, R23W

**SECTION:** SE23 **TOWNSHIP:** 11N **RANGE:** 23W

**EQUIPMENT DESCRIPTION:**

MODIFICATION OF 500 BBL FIXED ROOF CRUDE OIL STOCK TANK #2 (RIPLEY TATUM LEASE): REDUCE THROUGHPUT FROM 100 BBL TO 80 BBL PER DAY

**CONDITIONS**

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. To maintain status as small producer permittee's crude oil production shall average less than 6,000 bbl/day from all operations within Kern County and permittee shall not engage in refining, transporting or marketing of refined petroleum products. [District Rule 1020]
3. The permittee shall not emit more than one half of the major source threshold based on a rolling 12-month summary of actual emissions. [District Rule 2530, 6.1]
4. The permittee shall maintain a record of the rolling 12-month summary of actual emissions from permitted operations. This record shall be kept on site and made available to the District upon request. [District Rule 2530, 6.1]
5. {2486} This tank shall be equipped with a pressure-vacuum (PV) relief valve set to within 10% of the maximum allowable working pressure of the tank, permanently labeled with the operating pressure settings, properly maintained in good operating order in accordance with the manufacturer's instructions, and shall remain in gas-tight condition except when the operating pressure exceeds the valve's set pressure. [District Rule 4623]
6. Crude oil throughput shall not exceed 80 barrels per day based on a monthly average. [District Rule 2201]
7. This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]

CONDITIONS CONTINUE ON NEXT PAGE

YOU **MUST** NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

**DAVID WARNER**, Director of Permit Services

S-3007-6-2: Sep 27 2010 8:44AM - BAKSHIS : Joint Inspection NOT Required

8. {2910} Permittee shall conduct true vapor pressure (TVP) testing of the organic liquid stored in this tank at least once every 24 months during summer (July - September), and/or whenever there is a change in the source or type of organic liquid stored in this tank in order to maintain exemption from the rule. [District Rule 4623]
9. {2911} The TVP testing shall be conducted at actual storage temperature of the organic liquid in the tank. The permittee shall also conduct an API gravity testing. [District Rule 4623]
10. {2912} Permittee shall submit the records of TVP and API gravity testing to the APCO within 45 days after the date of testing. The records shall include the tank identification number, Permit to Operate number, type of stored organic liquid, TVP and API gravity of the organic liquid, test methods used, and a copy of the test results. [District Rule 4623]
11. {2482} The API gravity of crude oil or petroleum distillate shall be determined by using ASTM Method D 287 e1 "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method). Sampling for API gravity shall be performed in accordance with ASTM Method D 4057 "Standard Practices for Manual Sampling of Petroleum and Petroleum Products." [District Rule 4623]
12. {2483} For crude oil with an API gravity of 26 degrees or less, the TVP shall be determined using the latest version of the Lawrence Berkeley National Laboratory "test Method for Vapor pressure of Reactive Organic Compounds in Heavy Crude Oil Using Gas Chromatograph", as approved by ARB and EPA. [District Rule 4623]
13. Permittee shall maintain monthly records of average daily crude oil throughput and shall submit such information to the APCO 30 days prior to the expiration date indicated in the Permit to Operate. [District Rule 2201]
14. {2913} The permittee shall keep accurate records of each organic liquid stored in the tank, including its storage temperature, TVP, and API gravity. [District Rule 4623]
15. {2490} All records required to be maintained by this permit shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rule 4623]
16. This Authority to Construct (ATC) shall be implemented prior to or concurrently with ATCs S-3007-19-0 & '20-0 [District Rule 2201]

DRAFT



San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

**ISSUANCE DATE:** DRAFT

**PERMIT NO:** S-3007-19-0

**LEGAL OWNER OR OPERATOR:** BONANZA CREEK ENERGY OPERATING COMPANY  
**MAILING ADDRESS:** P O BOX 21974  
BAKERSFIELD, CA 93390

**LOCATION:** HEAVY OIL WESTERN  
MIDWAY SUNSET OIL FIELD S SE23, T11N, R23W

**SECTION:** SE23 **TOWNSHIP:** 11N **RANGE:** 23W

**EQUIPMENT DESCRIPTION:**  
250 BBL FIXED ROOF CRUDE OIL DRAIN TANK WITH P/V VENT (RIPLEY TATUM LEASE)

**CONDITIONS**

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. To maintain status as small producer permittee's crude oil production shall average less than 6,000 bbl/day from all operations within Kern County and permittee shall not engage in refining, transporting or marketing of refined petroleum products. [District Rule 1020]
3. The permittee shall not emit more than one half of the major source threshold based on a rolling 12-month summary of actual emissions. [District Rule 2530, 6.1]
4. The permittee shall maintain a record of the rolling 12-month summary of actual emissions from permitted operations. This record shall be kept on site and made available to the District upon request. [District Rule 2530, 6.1]
5. {2486} This tank shall be equipped with a pressure-vacuum (PV) relief valve set to within 10% of the maximum allowable working pressure of the tank, permanently labeled with the operating pressure settings, properly maintained in good operating order in accordance with the manufacturer's instructions, and shall remain in gas-tight condition except when the operating pressure exceeds the valve's set pressure. [District Rule 4623]
6. Crude oil throughput shall not exceed 5 barrels per day based on a monthly average. [District Rule 2201]
7. This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]

CONDITIONS CONTINUE ON NEXT PAGE

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Seyed Sadredin, Executive Director, APCO

**DAVID WARNER, Director of Permit Services**

S-3007-19-0 : Sep 27 2010 8:44AM - BAKSHIS : Joint Inspection NOT Required

8. Permittee shall maintain monthly records of average daily crude oil throughput and shall submit such information to the APCO 30 days prior to the expiration date indicated in the Permit to Operate. [District Rule 2201]
9. {2490} All records required to be maintained by this permit shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rule 4623]
10. This Authority to Construct (ATC) shall be implemented subsequently or concurrently with ATC S-3007-6-2. [District Rule 2201]

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San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

**ISSUANCE DATE: DRAFT**

**PERMIT NO:** S-3007-20-0

**LEGAL OWNER OR OPERATOR:** BONANZA CREEK ENERGY OPERATING COMPANY  
**MAILING ADDRESS:** P O BOX 21974  
BAKERSFIELD, CA 93390

**LOCATION:** HEAVY OIL WESTERN  
MIDWAY SUNSET OIL FIELD S SE23, T11N, R23W

**SECTION:** SE23 **TOWNSHIP:** 11N **RANGE:** 23W

**EQUIPMENT DESCRIPTION:**  
300 BBL FIXED ROOF CONSTANT LEVEL CRUDE OIL CLARIFIER TANK WITH P/V VENT (RIPLEY TATUM LEASE)

**CONDITIONS**

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. To maintain status as small producer permittee's crude oil production shall average less than 6,000 bbl/day from all operations within Kern County and permittee shall not engage in refining, transporting or marketing of refined petroleum products. [District Rule 1020]
3. The permittee shall not emit more than one half of the major source threshold based on a rolling 12-month summary of actual emissions. [District Rule 2530, 6.1]
4. The permittee shall maintain a record of the rolling 12-month summary of actual emissions from permitted operations. This record shall be kept on site and made available to the District upon request. [District Rule 2530, 6.1]
5. {2486} This tank shall be equipped with a pressure-vacuum (PV) relief valve set to within 10% of the maximum allowable working pressure of the tank, permanently labeled with the operating pressure settings, properly maintained in good operating order in accordance with the manufacturer's instructions, and shall remain in gas-tight condition except when the operating pressure exceeds the valve's set pressure. [District Rule 4623]
6. Tank shall be designed and operated at a constant level. [District Rule 2201]
7. This tank shall only store, place, or hold organic liquid with a true vapor pressure (TVP) of less than 0.5 psia under all storage conditions. [District Rules 2201 and 4623]

CONDITIONS CONTINUE ON NEXT PAGE

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Seyed Sadredin, Executive Director, APCO

**DAVID WARNER, Director of Permit Services**

S-3007-20-0 : Sep 27 2010 8:44AM - BAKSHIS : Joint Inspection NOT Required

8. {2910} Permittee shall conduct true vapor pressure (TVP) testing of the organic liquid stored in this tank at least once every 24 months during summer (July - September), and/or whenever there is a change in the source or type of organic liquid stored in this tank in order to maintain exemption from the rule. [District Rule 4623]
9. {2911} The TVP testing shall be conducted at actual storage temperature of the organic liquid in the tank. The permittee shall also conduct an API gravity testing. [District Rule 4623]
10. {2912} Permittee shall submit the records of TVP and API gravity testing to the APCO within 45 days after the date of testing. The records shall include the tank identification number, Permit to Operate number, type of stored organic liquid, TVP and API gravity of the organic liquid, test methods used, and a copy of the test results. [District Rule 4623]
11. {2482} The API gravity of crude oil or petroleum distillate shall be determined by using ASTM Method D 287 e1 "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method). Sampling for API gravity shall be performed in accordance with ASTM Method D 4057 "Standard Practices for Manual Sampling of Petroleum and Petroleum Products." [District Rule 4623]
12. {2483} For crude oil with an API gravity of 26 degrees or less, the TVP shall be determined using the latest version of the Lawrence Berkeley National Laboratory "test Method for Vapor pressure of Reactive Organic Compounds in Heavy Crude Oil Using Gas Chromatograph", as approved by ARB and EPA. [District Rule 4623]
13. Permittee shall maintain monthly records of average daily crude oil throughput and shall submit such information to the APCO 30 days prior to the expiration date indicated in the Permit to Operate. [District Rule 2201]
14. {2913} The permittee shall keep accurate records of each organic liquid stored in the tank, including its storage temperature, TVP, and API gravity. [District Rule 4623]
15. {2490} All records required to be maintained by this permit shall be maintained for a period of at least five years and shall be made readily available for District inspection upon request. [District Rule 4623]
16. This Authority to Construct (ATC) shall be implemented subsequently or concurrently with ATC S-3007-6-2. [District Rule 2201]

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Permit #: S-3007-6-2	Last Updated
Facility: BONANZA CREEK ENERGY OPERATING	08/30/2010 BAKSHIS

Equipment Pre-Baselined: NO

	<u>NOX</u>	<u>SOX</u>	<u>PM10</u>	<u>CO</u>	<u>VOC</u>
Potential to Emit (lb/Yr):	0.0	0.0	0.0	0.0	1805.0
Daily Emis. Limit (lb/Day)	0.0	0.0	0.0	0.0	4.9
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	0.0	0.0	0.0	0.0	-92.0
Q2:	0.0	0.0	0.0	0.0	-92.0
Q3:	0.0	0.0	0.0	0.0	-92.0
Q4:	0.0	0.0	0.0	0.0	-92.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Permit #: S-3007-19-0	<b>Last Updated</b>
Facility: BONANZA CREEK ENERGY OPERATING	09/01/2010 BAKSHIS

Equipment Pre-Baselined: NO

	<u>NOX</u>	<u>SOX</u>	<u>PM10</u>	<u>CO</u>	<u>VOC</u>
Potential to Emit (lb/Yr):	0.0	0.0	0.0	0.0	268.0
Daily Emis. Limit (lb/Day)	0.0	0.0	0.0	0.0	0.7
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	0.0	0.0	0.0	0.0	67.0
Q2:	0.0	0.0	0.0	0.0	67.0
Q3:	0.0	0.0	0.0	0.0	67.0
Q4:	0.0	0.0	0.0	0.0	67.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Permit #: S-3007-20-0	<b>Last Updated</b>
Facility: BONANZA CREEK ENERGY OPERATING	08/30/2010 BAKSHIS

Equipment Pre-Baselined: NO

	<u>NOX</u>	<u>SOX</u>	<u>PM10</u>	<u>CO</u>	<u>VOC</u>
Potential to Emit (lb/Yr):	0.0	0.0	0.0	0.0	71.0
Daily Emis. Limit (lb/Day)	0.0	0.0	0.0	0.0	0.2
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	0.0	0.0	0.0	0.0	18.0
Q2:	0.0	0.0	0.0	0.0	18.0
Q3:	0.0	0.0	0.0	0.0	18.0
Q4:	0.0	0.0	0.0	0.0	18.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					