VIA EMAIL TRANSMITTAL TO JAMES.NELLESSON@STATE.NM.US

June 24, 2020

James E. Nellesson, PhD.
Air Permit Specialist, Major Source Permits Section
New Mexico Environnent Department Air Quality Bureau
525 Camino de los Marquez, Suite 1
Santa Fe, New Mexico, 87505-1816

Re: Response to Comments – June 10, 2020 Administrative Incompleteness Notification
Application to Modify Construction Permit 0339-M8 (Rev.0), May 2020,
Harvest Four Corners, LLC – La Jara Compressor Station, A.I. No. 1010

Dear Dr. Nellesson,

On behalf of **Harvest Four Corners, LLC (Harvest)**, Cirrus Consulting, LLC appreciates the opportunity to respond to the Department's letter of Administrative Incompleteness for the **La Jara Compressor Station** Application to Modify Construction Permit 0339-M8, dated May 2020 (Rev.0).

The comments are presented below along with responses. Revised (Rev.1) sections and pages to the application are attached at the end of the document. A Table of Contents to the Attachments is provided. In several instances the revisions to the document changed the pagination (sections 3, 6, 12, 15) and so the entire revised section is provided in PDF.

Unless otherwise instructed, this document is being provided only via electronic copy (emailed). Please let us know if any further information is needed regarding the application.

Thank you.

Sincerely,

Lisa Killion
Sr. Environmental Scientist

Attachments

cc: Kijun Hong, Harvest (electronic copy)
Bobby Myers, Cirrus (electronic copy)

RESPONSES TO APPLCIATION INCOMPLETENESS COMMENTS OF JUNE 10, 2020,
LA JARA COMPRESSOR STATION APPLICATION TO MODIFY NSR PERMIT 0339-M8

**COMMENT 1:**

*1. **Section 12 – PSD Applicability Determination**: This section has not been filled out correctly, with proper PSD emissions evaluation, for the proposed actions and operating scenarios contained within the application. The facility is currently a PSD source and although some of the proposed operation scenarios would reduce the facility to below PSD thresholds, Scenario 0 is presented as an option for retention, which would keep the facility a PSD size source. Public notice given in Section 9 also clearly indicates that no turbines may be replaced, retaining PSD status. Hence, at a minimum a Step I PSD evaluation is needed, comparing baseline actual emissions (BAE) for each turbine to be replaced to the potential emission rates of the new replacement turbine (see 20.2.74.7.G NMAC). This is to verify that a major modification (see 20.2.74.7.AE NMAC) is not occurring and that emissions changes from this proposed project will be below the significant emission rates in Table 2 (20.2.74.502 NMAC). And, such comparison is needed for each individual Scenario proposed in the application (Scenarios 0, 1, 2, and 3). Further, the Step I evaluation would not only need to look at the turbine emissions but include emissions from all of the other units proposed for modification, comparing baseline emissions to proposed emissions. Retaining PSD status would also mean that any future projects would have to determine relationship to this current proposed project (look-back period, again see 20.2.74.7.G NMAC).*

**RESPONSE:**

The PSD analysis is provided in the updated section 12 (Rev.1) of the permit application for each proposed scenario, as requested. Note that both a Step 1 and Step 2 (Netting) analysis are included and show that the project emissions under each of the scenarios (0, 1, 2, and 3) are *not* Significant under Table 2 of 20.2.74.502 NMAC. All supporting documentation used in the PSD analysis (emission inventories, CO2e calculations, etc.) is provided at the back of section 12 following the PSD analysis. Electronic Excel files are also provided.

**COMMENT 2:**

*2) **Unit 4 Emergency Generator**: Section 2 Tables and Section 3 Summary: The request to remove allowable emission limits for this unit cannot be done and simultaneously have the facility maintain PSD status. The unit may meet exemption criteria under 20.2.72 NMAC but the unit is not exempt under 20.2.74 NMAC.*

**RESPONSE:**

The individual unit 4 generator has been added to Table 2-E, 'Requested Allowable Emissions' (for Scenario 0 only), and to Table 2-I 'Stack Exit and Fugitive Emission Rates for HAPs and TAPs'. The emission totals at the bottom of the tables already included the emissions from unit 4, therefore no changes were made to the emission totals.

Changes were made to Table 2-A 'Regulated Emission Sources', which now identifies the unit 4 generator engine as "existing". (It had previously been indicated as being modified.)

Scenarios 1, 2 and 3 result in a PSD *minor* facility. Therefore, the requested permit changes in section 3 for removal of the permitted emissions for unit 4 are now addressed with regard only to Scenarios 1, 2, and 3. Scenario 0 is identified as remaining a PSD major facility with emission limits for unit 4.

The above updates have no bearing on the applicability and compliance discussion in application section 13 compliance with regard to unit 4.

**COMMENT 3:**

*3) **Section 15 Alternative Operating Scenarios**: The current application has proposed four different potential operating scenarios (Scenarios 0, 1, 2, and 3) and these have not been described here.*

**RESPONSE:**

A brief description of scenarios 0, 1, 2, and 3 has been added to revised section 15 (Rev.1). The description redirects the reader to the more detailed discussions of the scenarios throughout the permit application as they are not an alternative to a proposed permit change, but the overall objective of the requested permit changes.

**COMMENT 4:**

*4) **Section 16 Air Dispersion Modeling**: As PSD major source and retaining PSD major source status, the emergency generator emissions need to be included in dispersion modeling.*

**RESPONSE:**

NMED does not require the unit 4 emergency generator to be included the dispersion modeling submitted in support of this NSR application. The generator may be exempt from 20.2.72 NMAC NSR permitting requirements, while still being subject to other regulatory requirements, including those of 20.2.74 NMAC.

As regards 20.2.72 NMAC permitting, the existing unit 4 emergency generator meets the criteria of and therefore is exempt from 20.2.72 NMAC and need not be included in dispersion modeling required by 20.2.72 NMAC.

As regards 20.2.74 NMAC PSD requirements,

- As this application is not being submitted for a new major NSR source nor for a PSD major modification, modeling is not required as per 20.2.74 NMAC. Paragraph 200.B states:

  > "The requirements of Sections 300 through 306 [*including the modeling requirements of 303-305*], 400 and 403 of this part apply to the construction of any new major stationary source or the major modification of any existing major stationary source, except as this part otherwise provides."

- Further, as per the NMED modeling guidelines in Table 7 of Section 2.7.1, temporary emissions do not consume increment.

> "The Bureau interprets temporary emissions to mean emissions at the location that will occur for less than one year or emissions of standby or emergency equipment that operates less than 500 hours per year."

## TECHNICAL INFORMATION

### REQUEST 1:

*1) **Section 6 Calculations: Turbine Units 1 and 2 (old Solar Centaur T-4002)** – could not find the uncontrolled pph NOx, CO, and VOC emission rates (note says were taken from Solar Data Sheets, but I was unable to find the data).*

### RESPONSE:

Data sheets for the Solar Centaur T-4000 turbine (units 1 and 2) at the La Jara Compressor Station are attached to this letter. (Note the "2" in T-4002 simply indicates that the turbine drives a compressor.) The attached Solar Centaur T-4000 turbine data sheets from 1992 reflect lower $NO_X$, CO and VOC emissions, even taking into consideration the manufacturer-provided safety factors.

Due to the age of the units (1972), it is difficult to come by unit-specific data sheets. In the La Jara Compressor Station's January 2014 NSR permit application section 6 write-up, the requested allowable "NOx emissions from Units 1 & 2 are being corrected *so as to be consistent with emissions from similar units within the WFC fleet*". Then-WFC facilities with the same or similar model units would include:

- Chaco Compressor Station: The Centaur 40-4002 is permitted at 73.0 tpy.
- Dogie Compressor Station: The Centaur T-4002s are permitted at 78.9 tpy.
- Kutz Canyon Processing Plant: The Centaur 40s are permitted at 67.9 tpy.

The currently permitted La Jara T-4002 turbine $NO_X$ emissions (66.0 tpy) are somewhat aligned with the Centaur 40 unit at Kutz Canyon Processing Plant (Kutz). The La Jara allowable CO and VOC emission rates (63.1 tpy and 19.3 tpy, respectively) are also similar to Kutz. The Kutz 2018 (March) NSR application emission calculations for the Solar Centaur 40 cite "$NO_X$ emissions taken from previous applications (based on Kutz stack test data [10% safety factor added])"; and for CO and VOC, "emissions taken from previous applications (based on manufacturers data . . .)" with a 300% and 500% safety factor applied to the CO and VOC, respectively. (The safety factors are cited in the Solar data sheets, generally.)

### REQUEST 2:

*2) **Section 13 Regulatory Analysis: 40 CFR 63 MACT CCCCCC** (6-C) applies to a Gasoline Tank (Unit T9). What happened to this tank? Is it still located at the facility?*

### RESPONSE:

A 20.2.72.219.A NMAC admininstrative permit revision (admin) form requesting the removing the unit T9 gasoline tank was submitted to NMAQB in November 2019. A copy of the

completed admin form and delivery documentation is provided in revised section 20, 'Other Relevant Information' (Rev.1).

**REQUEST 3:**

*3) **Section 13 Regulatory Analysis: PSD rule 20.2.74 NMAC** – Since the permittee is requesting to maintain PSD status, an appropriate PSD Step 1 analysis is needed for each proposed Scenario (as described above for Section 12) and those results also summarized here.*

**RESPONSE:**

The requested PSD Step 1 analysis was provided as part of the section 12 PSD Determination in Revision 1 (Rev.1) of the application.

**ADDENDA**

**Table 2-A, Turbine Units 3, 6, and 7.** In addition to the above items, Table 2-A 'Regulated Emission Units' has been revised for units 3, 6 and 7 such that they no longer reflect "To be Modified" and are now identified as "Existing (unchanged)". This was done in order to avoid confusion. The previous "modified" designation was intended to flag the fuel/heat rate and stack parameter changes (discussed in section 3) that have no effect on the allowable emission rates of units 3, 6, and/or 7.

**Section 3, fuel sulfur limits and $SO_2$ emission calculations for the Backup Emergency Generator unit 4.** The section 3 discussion of the fuel sulfur limits and $SO_2$ emission calculations has been modified.

# ATTACHMENTS

Responses (Rev.1) to Administrative Incompleteness Comments for the
Application to Modify Construction Permit 0339-M8 for the La Jara Compressor Station, May 2020

Insert page(s) for:

| | | |
|---|---|---|
| Section 1 | Facility Information | First page only |
| Section 2 | | Tables 2-A, 2-E, 2-I |
| Section 3 | Application Summary | Entire section |
| Section 6 | All Calculations | Entire narrative section (except 6.a) |

Section 7 Information Used To Determine Emissions

Solar Turbines Summary of Engine Performance Data, Centaur T-4000 (April 1992)

La Jara Compressor Station construction permit modification application, January 2014; section 6, p.2, paragraph 2 discussion of NOX emissions from turbine units 1 and 2.

Section 12 PSD Applicability Determination for All Sources Entire section

PSD Project Determination Analysis – Step 1

Green House Gas Emissions Data and Calculations
(Current and previous CO2e emission calculations for individual turbines, storage tanks, fugitives)

PSD Project Determination Analysis – Step 2: Netting Analysis | Net Emission Increases and Decreases

PSD Project Determination, Step 2 (Netting Analysis) | Projected Future Annual Emissions

PSD Project Determination, Step 2 (Netting Analysis) | Past Actuals Analysis

| | |
|---|---|
| EU01 | Existing turbine unit 1 |
| EU 02 | Existing turbine unit 2 |
| EU 08 | Proposed replacement turbine 8 |
| EU 09 | Proposed replacement turbine 9 |
| T1-T3, L1, 18 | Condensate tanks, truck loading, separator |
| F1 | Fugitive emissions |

2018 Emission Inventory: Documentation for 'Past Actuals' 2-year averages analyses, including annual operating hours and emission calculations for turbines, storage tanks, truck loading & fugitive emissions.

2019 Emission Inventory: Documentation for 'Past Actuals' 2-year averages analyses, including annual operating hours and emission calculations for turbines, storage tanks, truck loading & fugitive emissions.

Section 15 Alternative Operating Scenarios Entire section

Section 20 Other Relevant Information

Permitting Administrative Multi-Form, Nov. 7, 2019 removal of gasoline storage tank T-9 from La Jara Compressor Station construction permit 0339-M8-R1 (including delivery verification)

| **Mail Application To:** | | **For Department use only:** |
|---|---|---|
| New Mexico Environment Department<br>Air Quality Bureau<br>Permits Section<br>525 Camino de los Marquez, Suite 1<br>Santa Fe, New Mexico, 87505<br><br>Phone: (505) 476-4300<br>Fax: (505) 476-4375<br>www.env.nm.gov/aqb | | AIRS No.: |

# Universal Air Quality Permit Application

**Use this application for NOI, NSR, or Title V sources.**

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well. See Section 1-I for submittal instructions for other permits.

**This application is submitted as** (check all that apply)**:** ☐ Request for a No Permit Required Determination (no fee)
☒ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☒ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ a NOI 20.2.73 NMAC ☐ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☒ TV significant mod. TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☒ minor modification to a PSD source ☐ a PSD major modification

**Acknowledgements:**

☒ I acknowledge that a pre-application meeting is available to me upon request. ☐ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.

☒ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

☐ Check No.: _____ in the amount of _____ **No application fee required for application update.**

☒ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance program (SBEAP) and qualifies for 50% of the normal application and permit fees. Enclosed is a check for 50% of the normal application fee which will be verified with the Small Business Certification Form for your company.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance Program (SBEAP) but does not qualify for 50% of the normal application and permit fees. To see if you qualify for SBEAP assistance and for the small business certification form go to https://www.env.nm.gov/aqb/sbap/small_business_criteria.html ).

**Citation:** Please provide the **low level citation** under which this application is being submitted: **20.2.72.219.D(1) NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

# Section 1 – Facility Information

## Section 1-A: Company Information

| | | AI # if known (see 1st 3 to 5 #s of permit IDEA ID No.): **1010** | Updating Permit/NOI #: **339-M8-R1** |
|---|---|---|---|
| 1 | Facility Name: La Jara Compressor Station | Plant primary SIC Code (4 digits): 1389 | |
| | | Plant NAIC code (6 digits): 213112 | |
| a | Facility Street Address (If no facility street address, provide directions from a prominent landmark): From Bloomfield, drive 37 miles east on Hwy 64. Turn left on Hwy 527 and drive 7.8 miles. Turn right on Rosa Road and drive 3.3 miles. Turn left and drive 1.3 miles to the station. | | |
| 2 | Plant Operator Company Name: Harvest Four Corners, LLC | Phone/Fax: 505-632-4600 / 505-632-4782 | |

# Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

| Unit Number[1] | Source Description | Make | Model # | Serial # | Manufacturer's Rated Capacity[3] (Specify Units) | Requested Permitted Capacity[3] (Specify Units) | Date of Manufacture[2] / Date of Construction/ Reconstruction[2] | Controlled by Unit # / Emissions vented to Stack # | Source Classification Code (SCC) | For Each Piece of Equipment, Check One | RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4] | Replacing Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1<br>Field Unit 3 | Natural Gas Fired Turbine | Solar | T-4002 | OHB16-C1819<br>(Pkg # 3020005) | 3961 hp | 3123 hp | 1/1/1972<br>1/1/1972 | N/A<br>1 | 20200201 | Existing (unchanged) / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / **X To be Replaced** | N/A | N/A |
| 2<br>Field Unit 4 | Natural Gas Fired Turbine | Solar | T-4002 | OHB16-C2641<br>(Pkg # 3020004) | 3961 hp | 3123 hp | 1/1/1972<br>1/1/1972 | N/A<br>2 | 20200201 | Existing (unchanged) / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / **X To be Replaced** | N/A | N/A |
| 3<br>Field Unit 2 | Natural Gas Fired Turbine | Solar | T-4702 | OHG17-C5915<br>(Pkg # CC81338) | 4680 hp | 3779 hp | 8/1/1981<br>8/1/1981 | N/A<br>3 | 20200201 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | N/A | N/A |
| 6<br>Field Unit 1 | Natural Gas Fired Turbine | Solar | T-4702S | OHB20-C0547<br>(Pkg # DCC0164) | 4680 hp | 3934 hp | 1/1/1999<br>1/1/1999 | N/A<br>6 | 20200201 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | N/A | N/A |
| 7<br>Field Unit 1A | Natural Gas Fired Turbine | Solar | T-4702S | OHC20-C4653<br>(Pkg # DCC0165) | 4680 hp | 3934 hp | 1/1/1999<br>1/1/1999 | N/A<br>7 | 20200201 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | N/A | N/A |
| 8<br>Field Unit 3 | Natural Gas Fired Turbine | Solar | T-4702S | TBD | 4680 hp | 3795 hp | TBD<br>TBD | N/A<br>1 | 20200201 | Existing (unchanged) / To be Removed<br>New/Additional / **X Replacement Unit**<br>To Be Modified / To be Replaced | N/A | **1** |
| 9<br>Field Unit 4 | Natural Gas Fired Turbine | Solar | T-4702S | TBD | 4680 hp | 3795 hp | TBD<br>TBD | N/A<br>2 | 20200201 | Existing (unchanged) / To be Removed<br>New/Additional / **X Replacement Unit**<br>To Be Modified / To be Replaced | N/A | **2** |
| 4 | Recip. Internal Combustion Engine | Waukesha | F3521G | RU18456<br>(Pkg # 361832) | 515 hp | 440 hp | 3/13/1981<br>3/13/1981 | N/A<br>4 | 20100202 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | 4SRB | N/A |
| 18[5] | 3-Phase Separator | Peerless | 14-248 | U-197 | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31000129 | Existing (unchanged) / To be Removed<br>New/Additional / Replacement Unit<br>**X To Be Modified** / To be Replaced | N/A | N/A |
| SSM [6] | Startup, Shutdown & Maintenance | N/A | N/A | N/A | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31000299 | Existing (unchanged) / To be Removed<br>New/Additional / Replacement Unit<br>**X To Be Modified** / To be Replaced | N/A | N/A |
| P1[7] | Trunk S Loop Pig Launcher | TDW | N/A | N/A | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31000299 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | N/A | N/A |
| P2[7] | Trunk S Loop Pig Receiver | TDW | N/A | N/A | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31000299 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | N/A | N/A |
| F1 | Equipment Leaks | N/A | N/A | N/A | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31088811 | **X Existing (unchanged)** / To be Removed<br>New/Additional / Replacement Unit<br>To Be Modified / To be Replaced | N/A | N/A |
| M1 | Malfunctions | N/A | N/A | N/A | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31000299 | Existing (unchanged) / To be Removed<br>New/Additional / Replacement Unit<br>**X To Be Modified** / To be Replaced | N/A | N/A |

| Unit Number[1] | Source Description | Make | Model # | Serial # | Manufacturer's Rated Capacity[3] (Specify Units) | Requested Permitted Capacity[3] (Specify Units) | Date of Manufacture[2] / Date of Construction/ Reconstruction[2] | Controlled by Unit # / Emissions vented to Stack # | Source Classification Code (SCC) | For Each Piece of Equipment, Check One | RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4] | Replacing Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1[5] | Condensate Storage Tank | Pesco | N/A | T-1987 | 400 bbl | 400 bbl | 1/1/1997<br>1/1/1997 | N/A<br>N/A | 40400311 | Existing (unchanged) To be Removed<br>New/Additional Replacement Unit<br>**X To Be Modified** To be Replaced | N/A | N/A |
| T2[5] | Condensate Storage Tank | Pesco | N/A | T-1986 | 400 bbl | 400 bbl | 1/1/1997<br>1/1/1997 | N/A<br>N/A | 40400311 | Existing (unchanged) To be Removed<br>New/Additional Replacement Unit<br>**X To Be Modified** To be Replaced | N/A | N/A |
| T3[5] | Condensate Storage Tank | Pesco | N/A | T-1985 | 400 bbl | 400 bbl | 1/1/1997<br>1/1/1997 | N/A<br>N/A | 40400311 | Existing (unchanged) To be Removed<br>New/Additional Replacement Unit<br>**X To Be Modified** To be Replaced | N/A | N/A |
| L1[5] | Truck Loading (condensate) | N/A | N/A | N/A | N/A | N/A | N/A<br>N/A | N/A<br>N/A | 31000299 | Existing (unchanged) To be Removed<br>New/Additional Replacement Unit<br>**X To Be Modified** To be Replaced | N/A | N/A |

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.

[2] Specify dates required to determine regulatory applicability.

[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

[5] The VOC emission limits (including flash + tank working/breathing losses) from the separator, condensate storage tanks, and condensate loading activities are aggregated under a single VOC emission source "T1 to T3, L1, 18" in Operating Permit P023-R3, Table A.106. No changes are sought.

[6] "SSM" is described as "1Compressor and Associated Piping Blowdowns during Routine and Predictable Startup, Shutdown, and/or Maintenance (SSM)" in Operating Permit P023-R3.

[7] The VOC emission limits from the pig launching and pig receiving activities are aggregated under a single emission source "P1 and P2" in Operating Permit P023-R3, Table A.107. No changes are sought.

# Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E$^{-4}$).

| Unit No. | NOx | | CO | | VOC | | SOx | | PM[1] | | PM10[1] | | PM2.5[1] | | $H_2S$ | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| 1[2] | 15.07 | 66.00 | 14.41 | 63.10 | 4.41 | 19.30 | 0.10 | 0.44 | 0.19 | 0.85 | 0.19 | 0.85 | 0.19 | 0.85 | - | - | - | - |
| 2[3] | 15.07 | 66.00 | 14.41 | 63.10 | 4.41 | 19.30 | 0.10 | 0.44 | 0.19 | 0.85 | 0.19 | 0.85 | 0.19 | 0.85 | - | - | - | - |
| 3 | 24.06 | 105.39 | 4.39 | 19.21 | 2.51 | 11.00 | 0.12 | 0.54 | 0.24 | 1.04 | 0.24 | 1.04 | 0.24 | 1.04 | - | - | - | - |
| 6 | 3.64 | 15.93 | 4.43 | 19.40 | 1.27 | 5.56 | 0.12 | 0.54 | 0.24 | 1.05 | 0.24 | 1.05 | 0.24 | 1.05 | - | - | - | - |
| 7 | 3.64 | 15.93 | 4.43 | 19.40 | 1.27 | 5.56 | 0.12 | 0.54 | 0.24 | 1.05 | 0.24 | 1.05 | 0.24 | 1.05 | - | - | - | - |
| 8[4] | 3.52 | 15.43 | 4.29 | 18.79 | 1.23 | 5.38 | 0.12 | 0.52 | 0.23 | 1.02 | 0.23 | 1.02 | 0.23 | 1.02 | - | - | - | - |
| 9[5] | 3.52 | 15.43 | 4.29 | 18.79 | 1.23 | 5.38 | 0.12 | 0.52 | 0.23 | 1.02 | 0.23 | 1.02 | 0.23 | 1.02 | - | - | - | - |
| SSM | - | - | - | - | Not specified | 32.39 | - | - | - | - | - | - | - | - | - | - | - | - |
| P1 & P2 | - | - | - | - | Not specified | 10.91 | - | - | - | - | - | - | - | - | - | - | - | - |
| T1 to T3, L1, 18[6] | - | - | - | - | Not specified | 48.54 | - | - | - | - | - | - | - | - | - | - | - | - |
| F1 | - | - | - | - | 1.4 | 5.92 | - | - | - | - | - | - | - | - | - | - | - | - |
| M1 | - | - | - | - | Not specified | 10.00 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | | | | | | | | | |
| **4*** | 12.62 | 3.16 | 8.74 | 2.18 | 0.29 | 7.28E-02 | 1.09E-02 | 2.73E-03 | 6.24E-02 | 1.56E-02 | 6.24E-02 | 1.56E-02 | 6.24E-02 | 1.56E-02 | - | - | - | - |
| | **** The inclusion of individual emission rates (pph & tpy) for unit 4 backup emergency generator pertains solely to Scenario 0; and is excluded from scenarios 1, 2, and 3.*** | | | | | | | | | | | | | | | | | |
| **Totals[7]** | **74.14** | **272.60** | **50.84** | **186.59** | **89.62** | **168.65** | 0.61 | 2.64 | 1.24 | 5.16 | 1.24 | 5.16 | 1.24 | 5.16 | - | - | - | - |
| **Totals[8]** | 62.61 | 222.08 | 40.73 | 142.29 | 86.43 | 154.64 | 0.59 | 2.58 | 1.21 | 5.04 | 1.21 | 5.04 | 1.21 | 5.04 | - | - | - | - |
| **Totals[9]** | 51.06 | 171.50 | 30.61 | 97.98 | 83.25 | 140.72 | **0.61** | **2.67** | **1.25** | **5.21** | **1.25** | **5.21** | **1.25** | **5.21** | - | - | - | - |

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

[2] Turbine unit 1 emissions if turbine unit 1 is not replaced by unit 8 (no change).

[3] Turbine unit 2 emissions if turbine unit 2 is not replaced by unit 9 (no change).

[4] Turbine emissions if turbine unit 8 replaces turbine unit 1.

[5] Turbine emissions if turbine unit 9 replaces turbine unit 2.

[6] The 'T1 to T3, L1, 18' (aggregated source) emissions include a 25% safety factor.

[7] **Scenario 0:** Emission totals if **no turbines are replaced = REQUESTED ALLOWABLE NOX, CO & VOC EMISSIONS**

[8] **Scenarios 1 & 2**: Emission totals if **only one turbine** (unit 1 or unit 2) **is replaced** with turbine unit 8 or 9, respectively.

[9] **Scenario 3**: Emission totals if **both turbines** (**units 1 and 2) are replaced = REQUESTED ALLOWABLE SO2 & PM EMISSIONS**

# Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

| Stack No. | Unit No.(s) | Total HAPs[1] | | Acetaldehyde X HAP or TAP | | Formaldehyde X HAP or TAP | | n-Hexane X HAP or TAP | | Provide Pollutant Name Here HAP or TAP | | Provide Pollutant Name Here HAP or TAP | | Provide Pollutant Name Here HAP or TAP | | Provide Pollutant Name Here HAP or TAP | | Provide Pollutant Name Here HAP or TAP | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| 1[1] | 1[1] | 0.3 | 1.3 | 0.1 | 0.5 | 0.1 | 0.5 | - | - | | | | | | | | | | |
| 2[2] | 2[2] | 0.3 | 1.3 | 0.1 | 0.5 | 0.1 | 0.5 | - | - | | | | | | | | | | |
| 3 | 3 | 0.3 | 1.5 | 0.1 | 0.6 | 0.1 | 0.6 | - | 0.1 | | | | | | | | | | |
| 6 | 6 | 0.4 | 1.6 | 0.2 | 0.7 | 0.1 | 0.6 | - | 0.1 | | | | | | | | | | |
| 7 | 7 | 0.4 | 1.6 | 0.2 | 0.7 | 0.1 | 0.6 | - | 0.1 | | | | | | | | | | |
| 8[3] | 8[3] | 0.3 | 1.5 | 0.1 | 0.6 | 0.1 | 0.6 | - | 0.1 | | | | | | | | | | |
| 9[4] | 9[4] | 0.3 | 1.5 | 0.1 | 0.6 | 0.1 | 0.6 | - | 0.1 | | | | | | | | | | |
| SSM | SSM | - | 0.8 | - | - | - | - | - | 0.6 | | | | | | | | | | |
| P1 & P2 | P1 & P2 | - | 0.3 | - | - | - | - | - | 0.2 | | | | | | | | | | |
| T1 to T3, L1, 18[5] | T1 to T3, L1, 18[5] | - | 6.5 | - | - | - | - | - | 6.0 | | | | | | | | | | |
| F1 | F1 | - | 0.1 | - | - | - | - | - | 0.1 | | | | | | | | | | |
| M1 | M1 | - | 0.2 | - | - | - | - | - | 0.2 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 4 | 4 | 0.1 | - | - | - | - | - | - | - | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Totals[6]** | | 16.6 | 15.1 | 0.7 | 3.0 | 0.7 | 2.9 | 14.2 | 7.3 | | | | | | | | | | |
| **Totals[7]** | | 16.7 | 15.4 | 0.7 | 3.1 | 0.8 | 3.1 | 14.2 | 7.3 | | | | | | | | | | |
| **Totals[8]** | | **16.8** | **15.6** | **0.7** | **3.2** | **0.8** | **3.2** | **14.2** | **7.3** | | | | | | | | | | |

[1] Turbine unit 1 emissions if turbine unit 1 is not replaced by unit 8 (no change).

[2] Turbine unit 2 emissions if turbine unit 2 is not replaced by unit 9 (no change).

[3] Turbine emissions if turbine unit 8 replaces turbine unit 1.

[4] Turbine emissions if turbine unit 9 replaces turbine unit 2.

[5] The 'T1 to T3, L1, 18' (aggregated source) emissions include a 25% safety factor.

[6] **Scenario 0: Emission totals if no turbine is replaced (maximum worst-case emissions).**

[7] **Scenarios 1 & 2**: Emission totals if **only one turbine** (unit 1 or unit 2) **is replaced** with turbine unit 8 or 9, respectively.

[8] **Scenario 3**: Emission totals if **both turbines** (**units 1 and 2) are replaced** with units 8 and 9, respectively.

# Section 3

## Application Summary

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The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **Process Summary** shall include a brief description of the facility and its processes.

**Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions:** Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

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Harvest Four Corners, LLC (Harvest) is submitting this air quality permit application to the New Mexico Air Quality Bureau (NMAQB) for a Significant Permit Revision to its air quality permit for the La Jara Compressor Station, construction permit No. 339-M8, issued November 6, 2018, as administratively revised in 339-M8-R1. The facility is also authorized under Title V Operating Permit P023-R3, issued January 10, 2017, as administratively revised in P023-R3-M1. (Title V Operating Permit modification application No. P023-R3-M2 is also currently under review by NMAQB.) The facility is a production gathering field compressor station that pressurizes and dehydrates natural gas for transport through natural gas pipelines.

The current facility permit includes the following emission sources:

- Two Solar Centaur T-4002 natural gas-fired turbines, units 1 and 2;
- One Solar Centaur T-4702 natural gas-fired turbine, unit 3;
- Two Solar Centaur 40-4702S natural gas-fired turbines, units 6 and 7;
- One Waukesha F3512G natural gas-fired standby generator, unit 4;
- One 3-phase separator, unit 18;
- Routine startups, shutdowns and maintenance (SSM) emissions of volatile organic compounds (VOC) from the turbines, compressors and piping associated with the station;
- A pig launcher and receiver, unit P1 and P2;
- Fugitive emissions of VOC from process piping leaks (valves, flanges, seals, etc.), unit F1;
- Three 400-barrel condensate storage tanks, units T1, T2 and T3;
- Condensate liquid truck loading, unit L1; and
- Malfunction emissions of VOC (unit M1).

Unregulated/exempt emission sources at the facility include one produced water storage tank (unit T4) and produced water truck loading (unit L2); one natural gas-fired fuel gas heater (unit 5); and miscellaneous other liquid storage tanks and gas transmission equipment. The regulatory justification for exemption is noted in Table 2-B of the application. Emission calculations for equipment with exemption based on emissions less than 0.5 ton per year are included in section 6.

VOC emissions from the unit 18 separator, condensate storage tanks (T1, T2 and T3) and condensate truck loading ( L1) are aggregated under a single combined emission limit for "T1 to T3, L1, 18" within construction permit Table 106.A, and are treated within Table 2-E (Requested Allowable Emissions) as a single emission unit. Similarly, Table 107.A of the permit combines VOC emissions from pig launching (P1) and pig receiving (P2) under a single combined emission limit "P1 and P2", and is treated in the same manner in application Table 2-E. Harvest is not seeking any changes regarding source aggregation for these emission units.

## *Proposed Permit Revisions*

**Proposed Replacement of Combustion Turbine Units 1 and/or 2 with Turbine Units 8 and/or 9**

In order to improve the performance of the station's compression capabilities, Harvest wishes to have the discretion to replace either or both of its unit 1 and/or unit 2 Solar Centaur T-4002 gas turbine compressor engines with a Solar Centaur 40-4702S upgrade (proposed unit 8 and/or 9, respectively). The replacement of the turbine(s) would take place during a normally scheduled maintenance operation. If implemented, the turbine upgrade(s) result in a ***reduction*** in the Potential To Emit (PTE) for nitrogen oxides ($NO_X$), carbon monoxide (CO and volatile organic compounds (VOC) emissions from the turbine(s) and a net air quality benefit. The emission estimates in this permit application take into account four turbine replacement scenarios:

- Scenario 0: Continued operation of turbine units 1 and 2 at the facility (i.e., no turbines replaced);
- Scenario 1: Replacement of the unit 1 turbine with unit 8, and no replacement of unit 2;
- Scenario 2: Replacement of the unit 2 turbine with unit 9, and no replacement of unit 1; and
- Scenario 3 Replacement of both turbine units 1 and 2 with turbine units 8 and 9, respectively.

The ambient air quality dispersion modeling study included in this application incorporates a comparison of all of the above turbine scenarios and updates, and demonstrates that all of the proposed potential turbine changes will comply with the ambient air quality standards and PSD increment levels.

If implemented, the above proposed permit changes result in an overall lowering of facility emissions of $NO_X$, CO and VOC, and negligible emission increases in $SO_2$ and particulate matter. The negligible emission increases in PTE are based on the use of the updated worst-case fuel heat rate and exhaust

parameters for turbine units 3, 6 and 7 as used in the dispersion modeling for the sake of conservatism. The proposed changes do not result in any de-bottlenecking of operations.

**Proposed Removal of Scenario 1, 2, and 3 Emission Limits for the Unit 4 Exempt Emergency Generator**

The Unit 4 Waukesha F3521G generator engine is a standby generator that is only operated during the unavoidable loss of commercial utility power; is operated less than 500 hours per year; and is accompanied by sufficient recordkeeping to verify it is operated less than 500 hours per year. Therefore, under the New Source Review permitting program the unit is an exempt emission source under 20.2.72.202.B(3) NMAC. However, under the facility's current PSD permit, the unit 4 backup emergency generator has emission limits in Table 106.A. As identified in Section 13, the engine is subject to the provisions of *National Emission Standards for Hazardous Air Pollutants* (NESHAP), Title 40 of the Code of Regulations, part 63 (40 CFR 63), subpart ZZZZ for *Stationary Reciprocating Internal Combustion Engines* and therefore, the unit is considered a regulated emission source (with or without emission limits. The engine included in Table 2-A, "Regulated Emission Sources". Note that subpart ZZZZ contains no emission limits applicable to the unit 4 generator engine, only operational and maintenance standards.

If and when Harvest implements Scenarios 1, 2, or 3, a PSD minor source facility will be the result at which time Harvest requests that the emission limits for the unit 4 emergency generator engine be removed from the permit Table 106.A, Allowable Emissions. The facility will continue to be a PSD major source as long as it operates with neither turbine unit 1 or 2 replaced by turbine unit(s) 8 and/or 9, respectively (i.e., Scenario 0), and the emission limits in Table 106.A Allowable Emissions will remain in force under Scenario 0, or until either of the unit 1 or 2 turbines is removed from the permit.

**Fuel Sulfur Limits**

The following current fuel sulfur requirement applies to sulfur dioxide ($SO_2$) emissions from the combustion equipment:

- Permit condition A106 Facility: *Allowable Emissions*, subsection B: ". . . the fuel burned in [turbine] units 3, 6 and 7 shall not contain total sulfur in excess 0.8 percent by weight (8000 ppmw) . . . (40 CFR 60, Subpart GG)".

- Permit condition A110 *Facility: Fuel and Fuel Sulfur Requirements,* subsection A. "Fuel and Fuel Sulfur Requirements (Units 1, 2, 3, 4, 6, and 7)" requires that "All combustion emission units shall combust only natural gas containing no more than **0.2 grains of total sulfur per 100 dry standard cubic feet**."

- Permit condition A205, Turbines, subsection C, 40 CFR 60, Subpart GG (units 3, 6, and 7) provides that the units are subject to 60 CFR 60, Subpart GG [*Standards of Performance for Stationary Gas Turbines*]. Subpart GG, subsection §60.333(b), requires that stationary gas turbines subject to the rule may not burn any fuel which contains total sulfur in excess of 0.8 percent by weight (8000 ppmw).

The calculation of combustion turbine $SO_2$ Potential To Emit (PTE) is based on use of the AP-42 Table 3.1-2a default emission factor of 3.40E-03 pounds of $SO_2$ per million British thermal units (lb $SO_2$/MMBtu). AP-42 also provides an equation for the calculation of an emission factor (lb/MMBtu) when percentage of fuel sulfur ("S") is known: SO2 lb/MMBtu = 0.94 x S.

Back-calculation of the fuel sulfur % (S) corresponding with the default AP-42 emission factor (lb/MMBtu/0.94 = S) yields S = 3.62E-03 %. As shown in section 6 of this application, using the facility's natural gas density (based on the extended natural gas analysis), the fuel sulfur content that corresponds with the default turbine emission factor is 1.35 gr/100 scf, well above the 0.2 gr/100 scf fuel sulfur content limitation of condition A110. The back-calculated fuel sulfur content is compliant with NSPS subpart GG fuel sulfur requirements. Therefore, Harvest requests that the current 0.2 gr/100 scf fuel sulfur limit be increased to 1.35 gr/100 scf. $SO_2$ emission calculations based on the default AP-42 emission factor are used in the dispersion modeling of included in this application. The dispersion modeling demonstrates compliance with all applicable ambient air quality standards and PSD increment requirements, including for $SO_2$.

In comparison to the default emission factor for a natural gas fired turbine, the AP-42 emission factor for $SO_2$ from a 4-Stroke Rich Burn (4SRB) engine reciprocating internal combustion engine (RICE) is based on a 5.88 E-04 lb $SO_2$/MMBtu factor (Table 3.2-3), lower than the turbine emission factor. No equation for a known fuel sulfur content is available, however footnote 'e' to Table 3.2-3 indicates that the emission factor is based on an assumed fuel sulfur content of 0.2 gr/100 scf.

As discussed above, the unit 4 emergency generator is an exempt standby generator under 20.2.72.202.B(3) NMAC, but is also subject to operational requirements under 40 CFR 63 subpart ZZZZ and is therefore a regulated emissions unit. $SO_2$ emission calculations are provided in section 6 including the use of the more-conservative turbine emission factor of 3.40E-03 lb $SO_2$/MMBtu for all of the combustion emission units. The resulting $SO_2$ emissions are well below 0.5 tpy. The requested 1.35 gr S/100 scf fuel sulfur content applies to all of the facility combustion units, including the unit 4 generator engine.

**Condensate Storage Tanks**

The current permit contains the following requirements on the aggregated emission source that includes the condensate tanks, 3-phase separator and [condensate] truck loading:

- Permit condition A203, Tanks, subsection A, limits the monthly rolling 12-month total condensate throughput/truck loading to/from the combined units to 6,425 barrels per year (bpy); and the monthly rolling 12-month average 3-phase separator (unit 18) inlet pressure to 91.9 psia.

- Permit condition A106, Facility Allowable Emissions: subsection A, Table 106.A: Allowable Emissions, limits the aggregated emission source unit 'T1 to T3, L1, 18' to 188.0 tpy of VOC.

Harvest is submitting updated emission calculations in this application support of the following requested permit changes:

Revise condition A203 to allow a monthly rolling 12-month total condensate throughput/truck loading to/from the combined units to 6,500 bpy; and the monthly rolling 12-month average 3-phase separator (unit 18) inlet pressure to 205.0 psia.

Revise permit condition A106, Table 106.A: Allowable Emissions, to limit aggregated emission source unit 'T1 to T3, L1, 18' to 48.6 tpy of VOC.

As currently permitted, the facility $NO_X$ and VOC emissions are greater than 250 tpy, making it a major source under the 20.2.74 NMAC '*Permits - Prevention of Significant Deterioration*' (PSD) permitting program. Although major for PSD, the facility is not currently subject to PSD requirements, including BACT, and the proposed modification is a PSD minor modification. If the proposed changes are implemented, the facility emissions will be reduced to below the 250 tpy PSD thresholds and it will become a PSD minor source. The facility will remain a Title V major source subject to the 20.2.70 NMAC [Title V] Operating Permits program.

The emissions of Hazardous Air Pollutants (HAP) from both the current permitted and proposed facility are below 10 tpy per individual HAP and 25 tpy for total HAP. Therefore, the facility remains an area source of HAP.

## *Additional Note*

**Update of Fuel Flow and Stack Parameters for Combustion Turbine Units 3, 6 and 7**. This application contains updated fuel flow rate and exhaust stack parameters for the unit 3 Solar Centaur 40-4702 turbine, and the units 6 and 7 Solar Centaur 40-4702S turbines. The updated parameters are based on manufacturer's data referenced to the worst-case ambient temperature that gives the most conservative fuel flow rates and stack emission dispersion characteristics for dispersion modeling purposes. The emission rates of the units are unchanged.

# Section 6

## All Calculations

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**Show all calculations** used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

**Tank Flashing Calculations**: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

**SSM Calculations**: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

**Glycol Dehydrator Calculations**: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

**Road Calculations:** Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

**Significant Figures:**

**A.** All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.

**B.** At least 5 significant figures shall be retained in all intermediate calculations.

**C.** In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

**(1)** If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;

**(2)** If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**

**(3)** If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.

**(4)** The final result of the calculation shall be expressed in the units of the standard.

**Control Devices:** In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device

regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

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## *Turbines*

The Potential To Emit (PTE) for nitrogen oxides ($NO_X$), carbon monoxide (CO) and volatile organic compounds (VOC) from the current combustion turbine units 1 and 2 are carried forward from the most current permit. The PTE for $NO_X$, CO and VOC from their respective turbine upgrade replacements, units 8 and 9, are calculated based the proposed Solar Centaur 40-4702S turbine manufacturer performance data.

The choice to replace the turbine(s) is to be implemented at Harvest's discretion. If implemented, the proposed unit 8 and/or 9 [replacement] turbines result in significant decreases in the PTE for $NO_X$, CO and VOC emissions compared to the current unit(s) 1 and/or 2. The PTE data shown in section 2, Table 2-E *Requested Allowable Emissions* reflects the maximum emission rates according to the following turbine scenarios 0, 1, 2 or 3, with the worst-case emissions occurring if the turbine replacements are not implemented (i.e., Scenario 0), equivalent to the current permitted emissions.

- Scenario 0: Continued operation of turbine units 1 and 2 at the facility (i.e., no turbines replaced);
- Scenario 1: Replacement of the unit 1 turbine with unit 8, and no replacement of unit 2;
- Scenario 2: Replacement of the unit 2 turbine with unit 9, and no replacement of unit 1; and
- Scenario 3 Replacement of both turbine units 1 and 2 with turbine units 8 and 9, respectively.

The PTE for $NO_X$, CO and VOC from combustion turbine unit 3 is based on manufacturer performance data for the Solar Centaur 40-4702 turbine. The PTE for $NO_X$, CO and VOC for units 6 and 7 are based on manufacturer performance data for the Solar Centaur 40-4702S turbine. The turbine heat rate and exhaust flow parameters used in all of the turbine calculations and dispersion modeling corresponds with the manufacturer's published fuel rate and exhaust parameters at 32 ° F ambient temperature, which corresponds with the most conservative pollutant dispersion modeling results.

Sulfur dioxide ($SO_2$) and particulate emissions are calculated for the turbines using the default AP-42 emission factor from Table 3.1-2a in pounds of pollutant per million British thermal units (lb/MMBtu), multiplied by the maximum hourly turbine fuel heat rate (MMBtu/hr). Hazardous air pollutant (HAP) emissions are calculated using GRI-HAPCalc 3.0 emissions estimation software. All emission calculations assume operation at full site capacity for 8,760 hours per year.

The turbines start up with no load and a rich fuel mixture. As a result, the emissions during startups are minimized. Because the turbines take only minutes to reach operating temperature, emissions during

startup are not expected to exceed the steady-state allowable limits. Similarly, emissions during shutdown do not exceed the steady-state allowable limits, because fuel and air flow cease within seconds of shutdown. Emissions due to scheduled maintenance are negligible as the turbines are not in operation during maintenance.

### *Backup Emergency Generator Reciprocating Engine*

Emissions of nitrogen oxides ($NO_X$), carbon monoxide (CO) and volatile organic compound (VOC) emissions from the 4-stroke, rich burn (4SRB) natural gas fired Waukesha F3521G (unit 4) are calculated from engine manufacturer's data and the site-rated horsepower (hp) rating of the engine. As discussed in section 3, emissions of sulfur dioxide ($SO_2$) are calculated from a default turbine AP-42 emission factor from Table 3.1-2a in lb/MMBtu, multiplied by the maximum hourly turbine fuel heat rate (MMBtu/hr). Particulate emissions are calculated from the appropriate AP-42, Table 3.2-2 emission factors for 4SRB engines, multiplied by the maximum hourly engine fuel heat rate (MMBtu/hr). Uncontrolled hazardous air pollutants (HAPs) from the RICE are calculated with the GRI-HAPCalc 3.01 emissions estimation software. The emission calculations assume operation at full site capacity for 500 hours per year as the generator and its associated engine are limited to less than 500 hours of operation per year only during the loss of commercial utility power. The unit is a regulated source under the Operating Permit.

The engine starts up with no load and a rich fuel mixture. As a result, emissions are minimized. Because the engine takes only minutes to reach the operating temperature of the engine, emissions during startup are not expected to exceed the steady-state allowable emission rate limits. There are no Environmental Protection Agency (EPA)-approved test methods available to measure emissions during startup.

Similarly, emissions during shut down do not exceed the steady-state allowable limits because the fuel and air flow to the engine cease within seconds of shutdown. Emissions due to scheduled maintenance are negligible, as the engine is not in operation during maintenance.

As identified in section 3 of this application, Harvest requests that if and when Harvest implements Scenarios 1, 2, or 3, a PSD minor source facility will result and that the unit 4 emergency generator will then be an exempt unit under 20.2.72.202.B(3) NMAC. The unit will still be subject to the applicable equipment maintenance and operating standards of 40 CFR subpart ZZZZ.

### *Fuel Gas Heater (Exempt)*

$NO_X$, CO, VOC, $SO_2$ and particulate emissions from the fuel gas heater (unit 5) are calculated using AP-42 emission factors and the maximum fuel use. Hazardous air pollutant (HAP) emissions are calculated using GRI-HAPCalc 3.0 emissions es. All emission calculations assume operation at full site capacity for 8,760 hours per year. The emission calculations are provided in this section. Based on a PTE of less

than 0.5 tpy for any regulated air pollutant, the heater is an exempt emission source under 20.2.72.202.B(5) NMAC.

### *Startup, Shutdown & Routine Maintenance (SSM) Emissions of VOC from Turbines, Compressors, and Piping*

During routine and predictable startup, shutdown and/or maintenance activities (SSM) of the turbines, compressors and piping blowdowns, emissions of VOC are released to the atmosphere. SSM emissions from the turbines result from the blowdown of motive gas used to drive turbine components during startups and shutdowns. SSM emissions from the compressors occur when high pressure gas is used to purge air from the compressors and associated piping prior to startups. Also, after a shutdown, high pressure gas in the compressor and associated piping is released to atmosphere as a safety precaution.

One common reason for compressor startups and shutdowns is a change in the amount of compression required from the station due to fluctuations in the pipeline. To prolong the life of equipment and reduce engine emissions, the compressors are shutdown when not needed. It is “routine or predictable” that the compressors at the station will come on-line and drop off-line many times during the course of operation. It is also standard industry practice.

A compressor is also shut down for maintenance of the turbine engine, the compressor, or other equipment at the station. The maintenance is scheduled based the unit time in service and/or monitoring of equipment (visual and automated), in accordance with company and standard industry practice. This maintenance is also “routine or predictable”.

SSM venting emissions of VOC and HAP from facility turbines, compressors and piping blowdowns are calculated from the composition of the natural gas, the quantity of gas vented during each event, and the estimated number of annual events. The composition of the natural gas is based on an extended gas analysis of the facility inlet gas line sampled on May 25, 2018. The quantity of gas vented during each event is determined by Harvest engineering. The annual number of blowdown events for the compressors are estimated based on historical data. A safety factor is added because VOC and HAP emissions from each blowdown event are dependent on the composition of the gas in the pipeline, and because the annual number of blowdowns may vary. Experience indicates the composition of the gas is also likely to vary. The use of the safety factor is designed to ensure an adequate emissions limit, which includes emissions from other non-blowdown miscellaneous startup, shutdown and maintenance activities.

The SSM emissions identified in this application are routine or predictable startup, shutdown and/or scheduled maintenance, and do not include malfunctions or upsets. Emission calculations are provided in this section.

### *Pig Launcher and Receiver*

The facility includes a pipeline pig launcher (unit P1) and pig receiver (unit P2) for the removal of hydrocarbons and water from the natural gas pipeline ("pigging" operations). A "pig" is a device that is periodically inserted into a pipeline for the purpose of cleaning and/or internal inspection. The pig is inserted into the pipeline at an upstream location, and through the pressure of the natural gas behind it is propelled downstream, pushing along with it residual material through the pipeline. The pig is then "caught" into a receptacle (pig receiver) at a downstream compressor station facility. Gas, hydrocarbon liquids and pressurized water "slugs" are pushed into the catcher (or into the inlet scrubber) where the gas is separated from the liquids and routed into the gathering pipeline. The depressurized hydrocarbon liquid and/or water mixture is drained and diverted to a storage tank for separation and storage.

A small amount of natural gas is released when the pig receiver is opened to insert or retrieve the pig, including VOC and HAP constituents in the natural gas. The pig launcher and receiver /slug catcher VOC emissions are fugitive emissions that result from opening valves at the pig receiving compartment along the line.

Emissions of VOC and HAP are calculated from the composition of the natural gas, and the aggregated sum volumes of gas released per year during pigging operations. The composition of the natural gas is based on the inlet extended gas analysis identified above. The annual quantity of gas released is determined by Harvest engineering based on historical data with safety factor is incorporated.

Harvest does not seek any changes to the current aggregated permitted pigging (unit P1 and P2) emissions. The requested allowable emissions in Table 2-E and 2-F are carried forward from the existing permit.

### *Fugitive Emissions*

Fugitive emissions of VOC and HAP from equipment leaks (unit F1) are calculated using emission factors from Table 2.4 of the 1995 Protocol for Equipment Leak Emission Estimates published by the Environmental Protection Agency (EPA), equipment counts from Harvest, and the gas stream composition obtained from the extended gas analysis. The HAP components of the natural gas are derived from the species molar percentages in the natural gas. Due to the nature of the source, it is estimated that SSM emissions from valves, connectors, seals, etc. are accounted for in the calculations. Emission calculations are provided in this section.

## *Condensate Storage Tanks*

Flash emissions

The ProMax 3.2 emissions modeling program is used to calculate the facility-wide emissions of flashed VOC and HAP associated with the aggregated source that includes the inlet separator (unit 18), three 400-barrel condensate liquid storage tanks (units T1, T2 and T3) and condensate truck loading (unit L1), collectively permitted as unit "T1 to T3, L1, 18". The ProMax flash emissions model provides the facility-wide aggregated flash emissions of VOC in the "La Jara Condensate Tank Flash Model" main flowsheet, which also provides a graphical representation of the individual material streams. Input data to the model includes a representative condensate liquid analysis (La Jara Liquid Spot analysis, sampled on July 19, 2019) along with operating parameters representative of the La Jara Compressor Station facility.

The total flashed gas lb/hr including (VOC and non-VOC) mass flow is provided in the '/Tank_Flash_Emissions (Material Stream)' (9.62 lb/hr). The VOC mass flow (lb/hr) is calculated by taking the sum of the vapor stream (Vap) non-methane, non-ethane (NMNE) speciated hydrocarbon mass fractions under multiplied by the total gas mass flow (lb/hr). Tons per year VOC tpy = VOC lb/hr x 8760 hr/yr x 1 ton/2000 lbs.

Similarly, the facility-wide flashed gas HAP emissions are calculated from the individual speciated vapor mass flow fractions in the '/Tank_Flash_Emissions (Material Stream)' and the total gas mass flow (lb/hr). Tons per year are calculated from HAP lb/hr x 8760 hr/yr x 1 ton/2000 lbs.

Tank Working & Breathing Emissions

Condensate storage tank working and breathing losses of VOC and HAP are calculated using TANKS 4.0.9d emission estimation software and an assumed annual facility throughput of 6,500 barrels per year (bpy) (273,000 gallons per year, gpy) of condensate divided equally among the three condensate storage tanks (91,000 gpy each). The condensate liquid composition (including HAP constituents) is estimated from the the ProMax emissions model '/Condensate_Truck_Loading (Material Stream)' 'Fraction [Fraction]' (speciated mole fractions) data for the liquid stream. The mole fractions are added to the "TANKS 4.09d Condensate Liquid Input" spreadsheet where they are "normalized" to balance the liquid composition of the light molecular weight gases that are flashed during depressurization upon entry of the liquid to the storage tank. The normalizing removes the weight percentages of the flashed gases, and reassigns them to the weight percentage of the lightest hydrocarbon that exists at in a liquid state at atmospheric pressure (i.e., the butanes), resulting in a more conservative estimate of tank working and breathing losses.

An overall 25% safety factor is applied the calculated flashing, working and breathing losses and truck loading tpy emissions prior to their aggregation in unit 'T1 to T3, L1, 18' of the Table 2-E (Requested Allowable Emissions) in order to allow for fluctuation in the composition of the condensate liquid. The

calculated PTE (less than 61 tpy VOC) is significantly lower than the currently permitted 188.0 tpy VOC for the 'T1 to T3, L1, 18' aggregated emission unit.

### *Exempt Storage Tanks*

Except for the condensate storage tanks, all of the storage tanks at the La Jara Compressor Station are either exempt under 20.2.72.202.B(2) or 20.2.72.202.B(5) NMAC, or are not a source of VOC/HAP. Emission calculations are provided for exemption based on emissions of 0.5 tpy or less of any regulated air pollutant (20.2.72.202.B(5) NMAC).

- VOC and HAP emissions for the produced water storage tank (unit T4) are calculated by selecting the most conservative emission factors from the Colorado Department of Public Health and Environment (CDPHE) February 8, 2010 PS Memo 09-02 "Oil and Gas Produced Water Tank Batteries Regulatory Definitions and Guidance" and the Texas Commission on Environmental Quality (TCEQ) August 2010 project "Emission Factor Determination for Produced Water Storage Tanks", and the maximum annual facility-wide produced water throughput. Based on a PTE of less than 1 tpy for any regulated air pollutant, the unit T4 produced water storage tank is an exempt source under 20.2.72.202.B(5) NMAC.

- Residual oil #6 is used to represent lubrication oil and used oil. Based on a vapor pressure of residual oil #6 of less than less than 0.2 PSI, the lube oil storage tanks (units T5, T6, and T7) and used oil tank (unit T8) are exempt under 20.2.72.202.B(2) NMAC.

- Emissions for the methanol storage tank (unit T10) are calculated using TANKS 4.09d emission calculation software. The calculated PTE is 661.7 pounds per year of VOC (methanol) is below 0.5 tpy. Based on a PTE of less than 0.5 tpy for any regulated air pollutant, the unit T10 methanol storage tank is an exempt source under 20.2.72.202.B(5) NMAC.

- Emissions for the corrosion inhibitor storage tank (unit T11) are calculated using TANKS 4.09d emission calculation software. The calculated PTE is 38.77 pounds per year of VOC, well below 0.5 tpy. Based on a PTE of less than 0.5 tpy for any regulated air pollutant, the unit T11 corrosion inhibitor storage tank is an exempt source under 20.2.72.202.B(5) NMAC.

- Based on a vapor pressure of diesel fuel stored in the unit T12 diesel storage tank of less than less than 0.2 PSI, the unit T12 diesel tank is exempt under 20.2.72.202.B(2) NMAC.

- The MSDS for the BACTRON K-87 biocide in storage tank T13 shows it does not contain VOC or HAP. Therefore, it is not a regulated emission source.

- The MSDS for the Chevron ATF DEXTRON III/MERCON automatic transmission fluid in storage tank T14 shows it does not contain VOC or HAP. Therefore, it is not a regulated emission source.

Due to the nature of operations, startup and shutdown emissions from the storage tanks are assumed to be accounted for in the TANKS 4.0.9d program used to calculate emissions. Emissions due to maintenance are negligible.

### *Condensate Truck Loading Emissions*

VOC and HAP emissions from condensate truck loading activites (unit L1) are calculated using emission factors from AP-42 Section 5.2, *Truck Loading*, and the estimated maximum throughput of condensate loaded annually. The emission calculations assume submerged loading during transfer operations. The composition of the liquid (including HAP) is based on the vapor mass fractions of VOC in the TANKS 4.09d output.

The requested allowable emissions from the condensate truck loading emissions are included in Table 2-E under the aggregated emission source unit ‘T1 to T3, L1, 18’.

### *Produced Water Truck Loading Emissions (Exempt)*

Emissions of VOC and HAP from produced water truck loading activities (unit L2) are estimated using emission factors from AP-42 Section 5.2, *Truck Loading* and the estimated maximum annual facility throughput of produced water. The emission calculations assume submerged loading during transfer operations. The HAPs are calculated from the weight ratios of the CDPHE/TCEQ produced water emission factors of HAP to VOC (lb/bbl HAP / lb/bbl VOC), and applied to the truck loading pph and tpy VOC emission rates. Based on a PTE of less than 0.5 tpy for any regulated air pollutant, the produced water truck loading emissions is an exempt source under 20.2.72.202.B(5) NMAC.

### *Malfunctions*

Malfunction (unit M1) emissions are set at 10 tons of VOC per year. Based on the gas release rate associated with the set emission rate, HAP emissions are estimated using the natural gas extended analysis described above. The HAP calculations are provided in this section.

# Section 7

## Information Used To Determine Emissions

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**Information Used to Determine Emissions shall include the following**:

- [X] If manufacturer data are used, include specifications for emissions units and control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- [ ] If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- [X] If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- [ ] If an older version of AP-42 is used, include a complete copy of the section.
- [X] If an EPA document or other material is referenced, include a complete copy.
- [X] Fuel specifications sheet.
- [X] If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

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Please see the following pages.

SOLAR TURBINES INCORPORATED  DATE RUN: -APR-92
ENGINE PERFORMANCE DATA  REV. 5.5
EXHAUST GAS AND EMISSION DATA  REV. 5.9
TEXT CHANGES  REV. 5.4
PCB ID : 0

--- SUMMARY OF ENGINE PERFORMANCE DATA ---  2 ITERATIONS

ENGINE : CENTAUR
MODEL : T-4000
TYPE : CS/MD
RATING : STANDARD
FUEL : GAS FUEL

DATA FOR NOMINAL PERFORMANCE

GENERAL INPUT SPECIFICATIONS

| | | |
|---|---|---|
| SD NATURAL GAS | | FUEL USE |
| 6325.0 | FEET | ALTITUDE |
| 59.00 | DEG. F | AMBIENT TEMPERATURE |
| 60.0 | PERCENT | RELATIVE HUMIDITY |
| 0.00 | INCH. H2O | INLET PRESSURE LOSS |
| 3.00 | INCH. H2O | EXHAUST PRESSURE LOSS |
| 0.0 | HP | ACCESSORY HORSEPOWER AT GP SHAFT |
| 0.0000 | LB/MIN | COMPRESSOR DISCHARGE BLEED |

MECHANICAL INPUT SPECIFICATIONS

| | | |
|---|---|---|
| 1.0000 | --- | GEARBOX RATIO,(N EQUIPMENT/N POWER TURBINE) |
| 1.0000 | --- | GEARBOX EFFICIENCY |
| 14977. | R.P.M. | OPTIMUM POWER TURBINE SPEED |
| 14901. | R.P.M. | SPEED OF GAS PRODUCER TURBINE |

DYNAMIC AND THERMODYNAMIC PERFORMANCE DATA

| | | |
|---|---|---|
| 3025.4 | HP | OUTPUT POWER AFTER GEARBOX |
| 1060.9 | LBS-FT | OUTPUT TORQUE AFTER GEARBOX |
| 28.5752 | MMBTU/HR | FUEL FLOW |
| 9.445 | KBTU/HP-HR | SPECIFIC FUEL CONSUMPTION |
| 1774.7 | LB/MIN | INLET AIR FLOW |
| 1797.8 | LB/MIN | ENGINE EXHAUST FLOW |
| 93.36 | P.S.I.G. | CMP. DIFFUSER EXIT STATIC PRESSURE |
| 595.1 | DEG. F | CMP. DIFFUSER EXIT TEMPERATURE |
| 1550.0 | DEG. F | GAS PRODUCER TURBINE INLET TMP. |
| 1085.4 | DEG. F | POWER TURBINE INLET TEMPERATURE |
| 788.2 | DEG. F | ENGINE EXHAUST TEMPERATURE |

FUEL GAS COMPOSITION (VOLUME PERCENT)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| = | 0.0000 | CH4 | = 92.7900 | C2H4 | = 0.0000 | C2H6 | = | 4.1600 |
| C3H6 | = 0.0000 | C3H8 | = 0.8400 | C4 | = 0.1800 | C5 | = | 0.0400 |
| C6 | = 0.0400 | C7 | = 0.0000 | C8 | = 0.0000 | CO | = | 0.0000 |
| CO2 | = 0.4400 | H2 | = 0.0000 | H2O | = 0.0000 | H2S | = | 0.0001 |
| N | = 1.5100 | O2 | = 0.0000 | SO2 | = 0.0000 | | | |

SOLAR TURBINES INCORPORATED  DATE RUN: -APR-92
ENGINE PERFORMANCE DATA REV. 5.5
EXHAUST GAS AND EMISSION DATA REV. 5.9
TEXT CHANGES REV. 5.4
JOB ID : 0

--- Summary of Emissions for point number 0
ORIGINAL STANDARD COMBUSTOR

NOX (EXPRESSED AS EQUIVALENT NO2) EMISSIONS AT ISO,
SEA LEVEL, FULL LOAD, NO LOSS CONDITION
BURNING SD NATURAL GAS = 95. PPMV AT 15 PERCENT O2, DRY BASIS

ALLOWABLE THERMAL NOX EMISSIONS FOR THIS ENGINE PER
40CFR60 SUBPART GG = 164. PPMV AT 15 PERCENT O2, DRY BASIS

ESTIMATED ENGINE EMISSION AT 0.01302 SDNG FUEL/AIR RATIO, DRY

2.00 PERCENT OPACITY SMOKE EMISSION

| NOX | (+/-) | CO | (+/-) | UHC | (+/-) | SO2 | |
|---|---|---|---|---|---|---|---|
| 6.70 | 20% | 2.58 | 300% | 0.52 | 500% | 0.00 | g/(kg -FUEL) |
| 81.09 | 20% | 51.25 | 300% | 18.08 | 500% | 0.03 | PPMvd at 15% O2 |
| 9.29 | 20% | 3.57 | 300% | 0.72 | 500% | 0.01 | LBm/Hr |
| 40.67 | 20% | 15.65 | 300% | 3.15 | 500% | 0.02 | TON/YR |
| 0.52 | 20% | 0.20 | 300% | 0.04 | 500% | 0.00 | micro-gram/Joule (GAS TURBINE SHAFT POWER) |
| 1.39 | 20% | 0.54 | 300% | 0.11 | 500% | 0.00 | g/(HP-Hr) (GAS TURBINE SHAFT POWER) |
| 168.50 | 20% | 64.84 | 300% | 13.10 | 500% | 0.09 | mg/Nm3 at 15% O2, DRY BASIS(1 ATM, 0 DEG C) |
| 0.32 | 20% | 0.13 | 300% | 0.03 | 500% | 0.00 | LBm/MMBTU -(FUEL LHV) |
| 19.69 | 20% | 53.75 | 300% | 10.86 | 500% | 0.08 | g/GJ -(FUEL LHV) |
| 67.38 | 20% | 42.59 | 300% | 15.02 | 500% | 0.03 | PPMv at 16% O2 DRY |
| 0.29 | 20% | 0.11 | 300% | 0.02 | 500% | 0.00 | LBm/(MMBTU -FUEL HHV) |

SO2 EMISSION DEPENDS ON SULFUR CONTENT IN FUEL. THE CURRENT ESTIMATE IS
BASED ON THE ASSUMPTION OF 100 PERCENT CONVERSION OF FUEL SULFUR TO SO2.
SULFUR CONTENT = 1.9 PPMW

EMISSION DATA HAS BEEN MEASURED FROM THE LISTED NUMBER OF ENGINES AT SEA LEVEL BURNING SAN DIEGO NATURAL GAS OR LIQUID DISTILLATE. SIGNIFICANT VARIATIONS IN EMISSIONS FROM ENGINE TO ENGINE HAVE BEEN OBSERVED. FROM THIS DATA NOMINAL EMISSIONS IN GRAMS OF EACH CONSTITUENT PER KG OF FUEL AS A FUNCTION OF FUEL/AIR RATIO HAVE BEEN ESTABLISHED. EMISSIONS AT SITE CONDITIONS HAVE BEEN CALCULATED ON EPA RECOMMENDED METHOD, EMISSIONS BURNING CHOICE FUEL ARE ESTIMATED ON FLAME TEMPERATURE CONSIDERATION. ZERO ZERO FUEL BOUND NITROGEN IS ASSUMED. ANY EMISSION GUARANTEE IS THE NOMINAL VALUE PLUS THE PERCENT MARGIN, AND IS RESTRICTED TO:

AMBIENT TEMPERATURE 50 F to 90 F
LOAD 80% to 100%
GAS FUEL FLAME TEMPERATURE +/- 50 F OF STANDARD GAS FUEL

EMISSION DATA BASE STATISTICS

| NOX | CO | UHC | SMOKE | |
|---|---|---|---|---|
| 4 | 2 | 3 | 1 | ENGINE TESTS |
| 39 | 19 | 23 | 8 | NUMBER OF DATA POINTS |
| 9.36 | 15.48 | 61.07 | 50.00 | PERCENT ERROR MARGIN |
| 10.47 | 19.01 | 70.62 | 71.76 | STD. ERR OF FORECAST PERCENT |

[illegible] TURBINES INCORPORATED DATE RUN: 28-APR-92

ENGINE PERFORMANCE DATA REV. 5.5
EXHAUST GAS AND EMISSION DATA REV. 5.9
TEXT CHANGES REV. 5.4
JOB ID : 0

--- SUMMARY OF ENGINE PERFORMANCE DATA --- 2 ITERATIONS

ENGINE : CENTAUR
MODEL : T-4000
TYPE : CS/MD
RATING : STANDARD
FUEL : GAS FUEL

DATA FOR NOMINAL PERFORMANCE

GENERAL INPUT SPECIFICATIONS

| | | |
|---|---|---|
| SD NATURAL GAS | | FUEL USE |
| 6325.0 | FEET | ALTITUDE |
| 59.00 | DEG. F | AMBIENT TEMPERATURE |
| 60.0 | PERCENT | RELATIVE HUMIDITY |
| 3.00 | INCH. H2O | INLET PRESSURE LOSS |
| 3.00 | INCH. H2O | EXHAUST PRESSURE LOSS |
| 0.0 | HP | ACCESSORY HORSEPOWER AT GP SHAFT |
| 0.0000 | LB/MIN | COMPRESSOR DISCHARGE BLEED |

MECHANICAL INPUT SPECIFICATIONS

| | | |
|---|---|---|
| 1.0000 | --- | GEARBOX RATIO,(N EQUIPMENT/N POWER TURBINE) |
| 1.0000 | --- | GEARBOX EFFICIENCY |
| 14552. | R.P.M. | OPTIMUM POWER TURBINE SPEED |
| 14587. | R.P.M. | SPEED OF GAS PRODUCER TURBINE |

DYNAMIC AND THERMODYNAMIC PERFORMANCE DATA

| | | |
|---|---|---|
| 2763.8 | HP | OUTPUT POWER AFTER GEARBOX |
| 997.5 | LBS-FT | OUTPUT TORQUE AFTER GEARBOX |
| 26.8425 | MMBTU/HR | FUEL FLOW |
| 9.712 | KBTU/HP-HR | SPECIFIC FUEL CONSUMPTION |
| 1723.6 | LB/MIN | INLET AIR FLOW |
| 1745.3 | LB/MIN | ENGINE EXHAUST FLOW |
| 89.12 | P.S.I.G. | CMP. DIFFUSER EXIT STATIC PRESSURE |
| 579.4 | DEG. F | CMP. DIFFUSER EXIT TEMPERATURE |
| 1500.0 | DEG. F | GAS PRODUCER TURBINE INLET TMP. |
| 1047.0 | DEG. F | POWER TURBINE INLET TEMPERATURE |
| 769.1 | DEG. F | ENGINE EXHAUST TEMPERATURE |

FUEL GAS COMPOSITION (VOLUME PERCENT)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| = | 0.0000 | CH4 = | 92.7900 | C2H4 = | 0.0000 | C2H6 = | 4.1600 |
| C3H6 = | 0.0000 | C3H8 = | 0.8400 | C4 = | 0.1800 | C5 = | 0.0400 |
| 6 = | 0.0400 | C7 = | 0.0000 | C8 = | 0.0000 | CO = | 0.0000 |
| CO2 = | 0.4400 | H2 = | 0.0000 | H2O = | 0.0000 | H2S = | 0.0001 |
| 2 = | 1.5100 | O2 = | 0.0000 | SO2 = | 0.0000 | | |

DATE RUN: 13-APR-92

ENGINE PERFORMANCE DATA REV. 5.5
EXHAUST GAS AND EMISSIC DATA REV. 5.9
TEXT CHANGES REV. 5.4
PCB ID : 0

--- Summary of Emissions for point number 0
ORIGINAL STANDARD COMBUSTOR

NOX (EXPRESSED AS EQUIVALENT NO2) EMISSIONS AT ISO,
SEA LEVEL, FULL LOAD, NO LOSS CONDITION
BURNING SD NATURAL GAS = 95. PPMV AT 15 PERCENT O2, DRY BASIS

ALLOWABLE THERMAL NOX EMISSIONS FOR THIS ENGINE PER
40CFR60 SUBPART GG = 164. PPMV AT 15 PERCENT O2, DRY BASIS

ESTIMATED ENGINE EMISSION AT 0.01259 SDNG FUEL/AIR RATIO, DRY

2.00 PERCENT OPACITY SMOKE EMISSION

| NOX | (+/-) | CO | (+/-) | UHC | (+/-) | SO2 | |
|---|---|---|---|---|---|---|---|
| 6.60 | 20% | 2.57 | 300% | 0.57 | 500% | 0.00 | g/(kg -FUEL) |
| 79.96 | 20% | 51.20 | 300% | 19.75 | 500% | 0.03 | PPMvd at 15% O2 |
| 8.60 | 20% | 3.35 | 300% | 0.74 | 500% | 0.00 | Lbm/Hr |
| 37.66 | 20% | 14.68 | 300% | 3.24 | 500% | 0.02 | TON/YR |
| 0.53 | 20% | 0.20 | 300% | 0.05 | 500% | 0.00 | micro-gram/Joule (GAS TURBINE SHAFT POWER) |
| 1.41 | 20% | 0.55 | 300% | 0.12 | 500% | 0.00 | g/(HP-Hr) (GAS TURBINE SHAFT POWER) |
| 166.11 | 20% | 64.75 | 300% | 14.31 | 500% | 0.09 | mg/Nm3 at 15% O2, DRY BASIS(1 ATM, 0 DEG C) |
| 0.32 | 20% | 0.12 | 300% | 0.03 | 500% | 0.00 | Lbm/MMBTU -(FUEL LHV) |
| 137.69 | 20% | 53.67 | 300% | 11.86 | 500% | 0.08 | g/GJ -(FUEL LHV) |
| 66.45 | 20% | 42.55 | 300% | 16.41 | 500% | 0.03 | PPMv at 16% O2 DRY |
| 0.29 | 20% | 0.11 | 300% | 0.02 | 500% | 0.00 | Lbm/(MMBTU -FUEL HHV) |

SO2 EMISSION DEPENDS ON SULFUR CONTENT IN FUEL. THE CURRENT ESTIMATE IS
BASED ON THE ASSUMPTION OF 100 PERCENT CONVERSION OF FUEL SULFUR TO SO2.
SULFUR CONTENT = 1.9 PPMW

EMISSION DATA HAS BEEN MEASURED FROM THE LISTED NUMBER OF ENGINES AT SEA
LEVEL BURNING SAN DIEGO NATURAL GAS OR LIQUID DISTILLATE. SIGNIFICANT
VARIATIONS IN EMISSIONS FROM ENGINE TO ENGINE HAVE BEEN OBSERVED. FROM THIS
DATA NOMINAL EMISSIONS IN GRAMS OF EACH CONSTITUENT PER KG OF FUEL AS A
FUNCTION OF FUEL/AIR RATIO HAVE BEEN ESTABLISHED. EMISSIONS AT SITE
CONDITIONS HAVE BEEN CALCULATED ON EPA RECOMMENDED METHOD, EMISSIONS
BURNING CHOICE FUEL ARE ESTIMATED ON FLAME TEMPERATURE CONSIDERATION. ZERO
ZERO FUEL BOUND NITROGEN IS ASSUMED. ANY EMISSION GUARANTEE IS THE
NOMINAL VALUE PLUS THE PERCENT MARGIN, AND IS RESTRICTED TO:
AMBIENT TEMPERATURE 50 F to 90 F
LOAD 80% to 100%
GAS FUEL FLAME TEMPERATURE +/- 50 F OF STANDARD GAS FUEL

EMISSION DATA BASE STATISTICS

| NOX | CO | UHC | SMOKE | |
|---|---|---|---|---|
| 4 | 2 | 3 | 1 | ENGINE TESTS |
| 39 | 19 | 23 | 8 | NUMBER OF DATA POINTS |
| 9.50 | 15.50 | 55.93 | 50.00 | PERCENT ERROR MARGIN |
| 10.63 | 19.00 | 64.59 | 71.27 | STD. ERR OF FORECAST PERCENT |

regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

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Note that the hydrogen sulfide ($H_2S$) content of the natural gas at the station is non-detect. Therefore, it is assumed there are no $H_2S$ emissions associated with any of the equipment. Also note that even if $H_2S$ is present, $H_2S$ emissions from the combustion of natural gas are negligible. $H_2S$ is converted to $SO_2$ during combustion.

***Turbines***

$NO_X$ emissions from Units 1 & 2 are being corrected so as to be consistent with emissions from similar units within the WFC fleet. CO and VOC emissions from Unit 2 are being corrected so as to be consistent with emissions from Unit 1. $NO_X$, CO, and VOC emissions from the turbines (Units 1, 2, 3, 6 & 7) are calculated from manufacturer's data. The $SO_2$ and particulate emissions are calculated using AP-42 emission factors from Table 3.1-2a. Lead emissions are calculated using the AP-42 emission factor from Table 1.4-2 (even though the turbines are combustion sources, the emission factor for external combustion is acceptable as lead is not a produced pollutant; rather, emissions are directly related to the lead content of the natural gas). Hazardous air pollutant (HAP) emissions are calculated using GRI-HAPCalc 3.0. Emissions are calculated assuming the turbines all operate at full site capacity for 8,760 hours per year.

Carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$) exhaust emissions are calculated using emission factors from the 40 Code of Federal Regulations (CFR), Part C, Tables C-1 & C-2 and the turbine higher heating value (HHV) design heat rates.

The turbines at the station startup with no load and a rich fuel mixture. As a result, emissions are minimized. Because the turbines take only minutes to reach operating temperature, emissions during startup are not expected to exceed the steady-state allowable limits. Similarly, emissions during shutdown do not exceed the steady-state allowable limits, because fuel and air flow cease within seconds of shutdown. Emissions due to scheduled maintenance are negligible as the turbines are not in operation during maintenance.

Except for $NO_X$ emissions from Units 1 & 2 and except for CO and VOC emissions from Unit 2, the $NO_X$, CO and VOC emissions listed in Table 2-E are unchanged from the current permit.

***Compressor SSM and Venting***

SSM emissions from the turbines, compressors and piping associated with the station (Units 1a-3a, 6a & 7a) are vented to the atmosphere. SSM emissions from the turbines result from the blowdown of motive gas used to drive turbine components during startups and shutdowns. SSM emissions from the compressors occur when high pressure gas is used to purge air from the compressors and associated piping prior to startups. This gas is then vented to atmosphere. Also, after shutdowns, high pressure gas in the compressors and associated piping is released to atmosphere as a safety precaution.

The VOC, HAP, and greenhouse gas (GHG) emissions from blowdown of the turbines, compressors and piping associated with the plant are calculated from the quantity of gas vented during each event, the composition of the gas, and the number of events. The quantity of gas vented during each event is determined by WFC engineering. The composition of the gas is determined from an extended gas analysis. For each unit, the annual number of blowdown events is estimated based on historical operations. A safety factor is added because emissions from each blowdown event are dependent on the composition of the gas in the pipeline and because the number of blowdowns in a year may vary. Experience indicates the composition of the gas is likely to vary. Use of the safety factor is also designed to ensure an adequate emissions limit, which includes emissions from other miscellaneous startup, shutdown and maintenance activities.

# Section 12

## Section 12.A
## PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

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**A PSD applicability determination for all sources**. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ☐ **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☒ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for this modification are **significant under Step 1 and are not significant after Step 2 (Netting), as they are below the significant emission rates in Table 2 of 20.2.74.502 NMAC. The "project" emissions listed below result only from changes described in this permit application, and do not result from any other permit revisions or modifications, past or future, to this facility. The proposed project does not result in "de-bottlenecking", or other associated emissions resulting in higher emissions. The project emissions (before netting) for this project are as follows [see Table 2 in 20.2.74.502 NMAC for a complete list of significance levels]:**

| | | Scenario 0 | Scenario 1 | Scenario 2 | Scenario 3 |
|---|---|---|---|---|---|
| a. | NOx: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| b. | CO: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| c. | VOC: | 54.46 TPY | 59.84 TPY | 59.84 TPY | 65.23 TPY |
| d. | SOx: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| e. | PM: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| f. | PM10: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| g. | PM2.5: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| h. | Fluorides: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| i. | Lead: | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| j. | Sulfur compounds (listed in Table 2): | 0 TPY | 0 TPY | 0 TPY | 0 TPY |
| k. | GHG: | 377 TPY | 20,400 TPY | 20,400 TPY | 40,424 TPY |

C. **Netting analysis is provided in the following pages, and shows that the project is not significant.**

D. **BACT** is **not required for this modification, as this application is a minor modification.**

E. If this is an existing PSD major source, or any facility with emissions greater than 250 TPY (or 100 TPY for 20.2.74.501 Table 1 – PSD Source Categories), determine whether any permit modifications are related, or could be considered a single project with this action, and provide an explanation for your determination whether a PSD modification is triggered.

**No permit modifications have occurred during the contemporaneous period that should be combined with this project to be considered as permitting action.**

## PSD APPLICABILITY DETERMINATION ANALYSES
## (Step 1 and Step 2 Netting Analyses)

**Scenario 0** consists of the continued operation of turbine units 1 and 2 at the facility (i.e., no turbines replaced). Because this emission scenario results in no change from the facility's current PSD major source status, NMED has requested a Project Determination analysis.

In the Scenario 0 Project emissions, the proposed changes to the NSR permit include

- No changes in PTE for the gas turbines (*no corresponding emission increases or decreases)*;
- A revision to the allowable facility-wide fuel sulfur limitation *with no direct corresponding emission increases or decreases*;
- An increase in facility-wide condensate throughput (from 6,424 barrels per year (bpy) and 91.9 pounds of pressure per square inch, actual (psia) to 6,500 bpy and 205.0 psia (*with a corresponding emissions decrease*); and
- Because of changes in the natural gas composition, an increase in VOC fugitive emissions occurs, from 5.05 tpy VOC (Title V application for P023-R3) to 5.92 tpy VOC.

Therefore, the emission units included for which emission increases and decreases must be taken into account in the Project Determination ("Step 1") are the condensate storage tanks and associated emissions (units T1 to T3, L1, 18), and fugitive emissions:

**Scenario 0 - Project Emissions Changes**

| **Scenario 0** | *No additional turbines; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
| -- | No additional turbines | - | - | - | - | - | - | - | - | - | - |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissic | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | - | - | 54.46 | - | - | - | - | - | - | 377.02 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

Based on the foregoing analysis for Scenario 0, the only regulated pollutant that exceeds the Significant Emission Rate listed in 20.2.74.502 NMAC, *Significant Emission Rates*, Table 2, is **VOC**. Project emissions of all other regulated PSD pollutants (criteria and CO2e) are below the Table 2 significant emission rates.

For any project pollutant emitted in an amount greater than its 20.2.74.502 NMAC Table 2 Significant Emission Rate in the Step 1 analysis, a "Netting Analysis" (Step 2) is required. The calculations of 'Past Actual Emissions' and 'Projected Future Actuals' inputs to the 'Net Emissions Increase – Scenario 0' are in Attachment 2. Because Scenario 0 is defined as no changes to turbine units 1 or 2, units 1 and 2 are not included in the calculated net emission increases or decreases. The summarized results of the Scenario 0 VOC emissions netting analysis are provided below. The netting analysis demonstrates the VOC emissions from the proposed Scenario 0 are below the PSD VOC major modification threshold of 40 tpy:

**Net Emissions Increase - Scenario 0**

| Projected Future Annual Emissions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy | |
| VOC tpy | N/A | N/A | 0.0 | 0.0 | 48.5 | 5.9 | 54.5 | |
| Based on 'Projected Actuals' for each individual emission source | | | | | | | | |

| 2-yr Avg Annual Actual Emissions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Total | |
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | tpy | |
| VOC tpy | N/A | N/A | 0.0 | 0.0 | 28.4 | 5.9 | 34.3 | |
| Based on 'Past Actuals' calculations for each individual emission source. | | | | | | | | |

| Project Net Emissions Change | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy | |
|---|---|---|---|---|---|---|---|---|
| VOC tpy | N/A | N/A | 0.0 | 0.0 | 20.1 | 0.0 | 20.1 | < PSD VOC major mod threshold of 40 tpy |
| Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions | | | | | | | | |

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**Scenario 1**. For the purpose of the Step 1 Project Emissions analysis, Scenario 1 consists of the addition of turbine unit 8 to the Scenario 0 Project Emissions .

In the Scenario 1 Project emissions, the proposed changes to the NSR permit include

- Removal of turbine unit 1 (however, no corresponding emission change is taken into account in the Step 1 analysis);
- No changes in PTE for gas turbines units 2, 3, 6, and 7 (*no corresponding emission increases or decreases*);
- The addition of turbine unit 8;
- A revision to the allowable facility-wide fuel sulfur limitation *with no direct corresponding emission increases or decreases*;
- An increase in facility-wide condensate throughput from 6,424 bpy and 91.9 psia to 6,500 bpy and 205.0 psia (*with a corresponding emissions decrease*); and
- Because of changes in the natural gas composition, an increase in VOC fugitive emissions occurs, from 5.05 tpy VOC (Title V application for P023-R3) to 5.92 tpy VOC.

Therefore, the emission units included in this project for which emission increases and decreases must be taken into account in the Project Determination ("Step 1") are the proposed turbine unit 8, the condensate storage tanks and associated emissions (units T1 to T3, L1, 18), and fugitive emissions:

**Scenario 1 - Project Emissions Changes**

| Scenario 1 | *Add turbine 8; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Number | Description | $NO_x$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
| 8 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissic | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | 15.43 | 18.79 | 59.84 | 0.52 | 1.02 | 1.02 | 1.02 | - | - | 20400.33 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | No | Yes | Yes | Yes | Yes | - | Yes | Yes |

Based on the foregoing analysis for Scenario 1, the only regulated pollutant that exceeds the Significant Emission Rate listed in 20.2.74.502 NMAC, *Significant Emission Rates*, Table 2, is **VOC**. Project emissions of all other regulated PSD pollutants (criteria and CO2e) are below the Table 2 significant emission rates.

For any project pollutant emitted in an amount greater than its 20.2.74.502 NMAC Table 2 Significant Emission Rate in the Step 1 analysis, a "Netting Analysis" (Step 2) is required. The calculations of 'Past Actual Emissions' and 'Projected Future

Actuals' inputs to the 'Net Emissions Increase – Scenario 1' are in Attachment 2. The summarized results of the Scenario 1 VOC emissions netting analysis are provided below. The netting analysis demonstrates the VOC emissions from the proposed Scenario 1 are below the PSD VOC major modification threshold of 40 tpy:

**Net Emissions Increase - Scenario 1**

| **Projected Future Annual Emissions** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Unit No. | **EU 01** | **EU 02** | **EU 08** | **EU 09** | **EU T-1-T3, L1,18** | **EU F1** | **Total tpy** | |
| **VOC tpy** | 0.0 | 19.3 | 5.4 | 0.0 | 48.5 | 5.9 | 79.1 | |
| Based on 'Projected Actuals' for each individual emission source | | | | | | | | |
| | | | | | | | | |
| **2-yr Avg Annual Actual Emissions** | | | | | | | | |
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | **Total** | |
| Unit No. | **EU 01** | **EU 02** | **EU 08** | **EU 09** | **EU T-1-T3, L1,18** | **EU F1** | **tpy** | |
| **VOC tpy** | 17.05 | 18.27 | 0.0 | 0.0 | 28.4 | 5.9 | 69.7 | |
| Based on 'Past Actuals' calculations for each individual emission source. | | | | | | | | |
| | | | | | | | | |
| **Project Net Emissions Change** | **EU 01** | **EU 02** | **EU 08** | **EU 09** | **EU T-1-T3, L1,18** | **EU F1** | **Total tpy** | |
| **VOC tpy** | -17.0 | 1.0 | 5.4 | 0.0 | 20.1 | 0.0 | 9.5 | < PSD VOC major mod threshold of 40 tpy |
| Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions | | | | | | | | |

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**Scenario 2**. For the purpose of the Step 1 Project Emissions analysis, Scenario 2 consists of the addition of turbine unit 9 to the Scenario 0 Project Emissions .

In the Scenario 2 Project emissions, the proposed changes to the NSR permit include

- Removal of turbine unit 2 only (however, no corresponding emission change is taken into account in the Step 1 analysis);
- No changes in PTE for gas turbines units 1, 3, 6, and 7 (*no corresponding emission increases or decreases*);
- The addition of turbine unit 9;
- A revision to the allowable facility-wide fuel sulfur limitation *with no direct corresponding emission increases or decreases*;
- An increase in facility-wide condensate throughput from 6,424 bpy and 91.9 psia to 6,500 bpy and 205.0 psia (*with a corresponding emissions decrease*); and
- Because of changes in the natural gas composition, an increase in VOC fugitive emissions occurs, from 5.05 tpy VOC (Title V application for P023-R3) to 5.92 tpy VOC.

Therefore, the emission units included in this project for which emission increases and decreases must be taken into account in the Project Determination ("Step 1") are the proposed turbine unit 9, the condensate storage tanks and associated emissions (units T1 to T3, L1, 18), and fugitive emissions:

**Scenario 2 - Project Emissions Changes**

| **Scenario 2** | *Add turbine 9; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
| 9 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissic | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | 15.43 | 18.79 | 59.84 | 0.52 | 1.02 | 1.02 | 1.02 | - | - | 20400.33 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

Based on the foregoing analysis for Scenario 2, the only regulated pollutant that exceeds the Significant Emission Rate listed in 20.2.74.502 NMAC, *Significant Emission Rates*, Table 2, is **VOC**. Project emissions of all other regulated PSD pollutants (criteria and CO2e) are below the Table 2 significant emission rates.

For any project pollutant emitted in an amount greater than its 20.2.74.502 NMAC Table 2 Significant Emission Rate in the Step 1 analysis, a "Netting Analysis" (Step 2) is required. The calculations of 'Past Actual Emissions' and 'Projected Future Actuals' inputs to the 'Net Emissions Increase – Scenario 2' are in Attachment 2. The summarized results of the Scenario 2 VOC emissions netting analysis are provided below. The netting analysis demonstrates the VOC emissions from the proposed Scenario 2 are below the PSD VOC major modification threshold of 40 tpy:

**Net Emissions Increase - Scenario 2**

| Projected Future Annual Emissions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy | |
| VOC tpy | 19.3 | 0.0 | 0.0 | 5.4 | 48.5 | 5.9 | 79.1 | |
| Based on 'Projected Actuals' for each individual emission source | | | | | | | | |

| 2-yr Avg Annual Actual Emissions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Total | |
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | tpy | |
| VOC tpy | 17.05 | 18.27 | 0.0 | 0.0 | 28.4 | 5.9 | 69.7 | |
| Based on 'Past Actuals' calculations for each individual emission source. | | | | | | | | |

| Project Net Emissions Change | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy | |
|---|---|---|---|---|---|---|---|---|
| VOC tpy | 2.3 | -18.3 | 0.0 | 5.4 | 20.1 | 0.0 | 9.5 | < PSD VOC major mod threshold of 40 tpy |
| Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions | | | | | | | | |

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**Scenario 3**. For the purpose of the Step 1 Project Emissions analysis, Scenario 3 consists of the addition of turbine units 8 and 9 to the Scenario 0 Project Emissions.

In the Scenario 3 Project emissions, the proposed changes to the NSR permit include

- Removal of turbine units 1 and 2 (however, no corresponding emission changes are taken into account in the Step 1 analysis);
- No changes in PTE for gas turbines units 3, 6, and 7 (*no corresponding emission increases or decreases*);
- The addition of turbine units 8 and 9;
- A revision to the allowable facility-wide fuel sulfur limitation *with no direct corresponding emission increases or decreases*;
- An increase in facility-wide condensate throughput from 6,424 bpy and 91.9 psia to 6,500 bpy and 205.0 psia (*with a corresponding emissions decrease*); and
- Because of changes in the natural gas composition, an increase in VOC fugitive emissions occurs, from 5.05 tpy VOC (Title V application for P023-R3) to 5.92 tpy VOC.

Therefore, the emission units included in this project for which emission increases and decreases must be taken into account in the Project Determination ("Step 1") are the proposed turbine units 8 and 9, the condensate storage tanks and associated emissions (units T1 to T3, L1, 18), and fugitive emissions:

**Scenario 3 - Project Emissions Changes**

| **Scenario 3** | *Add turbines 8 and 9; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
| 8 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| 9 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissic | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | 30.85 | 37.58 | 65.23 | 1.05 | 2.04 | 2.04 | 2.04 | - | - | 40,423.6 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

Based on the foregoing analysis for Scenario 3, the only regulated pollutant that exceeds the Significant Emission Rate listed in 20.2.74.502 NMAC, *Significant Emission Rates*, Table 2, is **VOC**. Project emissions of all other regulated PSD pollutants (criteria and CO2e) are below the Table 2 significant emission rates.

For any project pollutant emitted in an amount greater than its 20.2.74.502 NMAC Table 2 Significant Emission Rate in the Step 1 analysis, a "Netting Analysis" (Step 2) is required. The calculations of 'Past Actual Emissions' and 'Projected Future Actuals' inputs to the 'Net Emissions Increase – Scenario 3' are in Attachment 2. The summarized results of the Scenario 3 VOC emissions netting analysis are provided below. The netting analysis demonstrates the VOC emissions from the proposed Scenario 3 are below the PSD VOC major modification threshold of 40 tpy:

**Net Emissions Increase - Scenario 3**

| **Projected Future Annual Emissions** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Unit No. | **EU 01** | **EU 02** | **EU 08** | **EU 09** | **EU T-1-T3, L1,18** | **EU F1** | **Total tpy** | |
| **VOC tpy** | 0.0 | 0.0 | 5.4 | 5.4 | 48.5 | 5.9 | 65.2 | |
| Based on 'Projected Actuals' for each individual emission source | | | | | | | | |

| **2-yr Avg Annual Actual Emissions** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | **Total** | |
| Unit No. | **EU 01** | **EU 02** | **EU 08** | **EU 09** | **EU T-1-T3, L1,18** | **EU F1** | **tpy** | |
| **VOC tpy** | 17.05 | 18.27 | 0.0 | 0.0 | 28.4 | 5.9 | 69.7 | |
| Based on 'Past Actuals' calculations for each individual emission source. | | | | | | | | |

| **Project Net Emissions Change** | **EU 01** | **EU 02** | **EU 08** | **EU 09** | **EU T-1-T3, L1,18** | **EU F1** | **Total tpy** | |
|---|---|---|---|---|---|---|---|---|
| **VOC tpy** | -17.0 | -18.3 | 5.4 | 5.4 | 20.1 | 0.0 | -4.4 | < PSD VOC major mod threshold of 40 tpy |
| Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions | | | | | | | | |

# PSD Project Determination Analysis - Step 1:

**Scenario 0** *No additional turbines; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)*

| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -- | No additional turbines | - | - | - | - | - | - | - | - | - | - |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissions | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | - | - | 54.46 | - | - | - | - | - | - | 377.02 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

**Scenario 1** *Add turbine 8; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)*

| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissions | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | 15.43 | 18.79 | 59.84 | 0.52 | 1.02 | 1.02 | 1.02 | - | - | 20400.33 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

**Scenario 2** *Add turbine 9; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)*

| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissions | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | 15.43 | 18.79 | 59.84 | 0.52 | 1.02 | 1.02 | 1.02 | - | - | 20400.33 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

**Scenario 3** *Add turbines 8 and 9; add new requested VOC emission rate for condensate tanks, loading & separator (T1-T3, L1, 18)*

| Unit Number | Description | $NO_X$, tpy | CO, tpy | VOC, tpy | $SO_2$, tpy | PM/TSP, tpy | $PM_{10}$, tpy | $PM_{2.5}$, tpy | $H_2S$, tpy | Lead, tpy | $CO_2e$ tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| 9 (NEW) | Solar Centaur 40-4702S Turbine | 15.43 | 18.79 | 5.38 | 0.524 | 1.018 | 1.018 | 1.018 | - | - | 20,023.3 |
| T1 - T3, L1 18 | Condensate tank, loading & separator emissions | - | - | 48.5 | - | - | - | - | - | - | 67.65 |
| F1 | Fugitive Emissions | - | - | 5.9 | - | - | - | - | - | - | 309.37 |
| | Project Total Emissions | 30.85 | 37.58 | 65.23 | 1.05 | 2.04 | 2.04 | 2.04 | - | - | 40,423.6 |
| | Project Significant Emission Rates | 40 | 100 | 40 | 40 | 25 | 15 | 10 | 10 | 0.6 | 75,000 |
| | Below Project Significant Emission Rate? | Yes | Yes | **No** | Yes | Yes | Yes | Yes | - | Yes | Yes |

# Green House Gas Emissions Data and Calculations

| Sources | Facility Total Emissions CO2, tpy | CH4, tpy | N2O, tpy | GHG, tpy | Pmt 0339-M8 (incl. EU 1&2) CO2e, tpy | Proposed (EU 8 & 9, etc.) CO2e, tpy |
|---|---|---|---|---|---|---|
| Engine & Turbine Exhaust | 101,782.18 | 1.92 | 0.19 | 101,784.29 | 95,392.95 | 101,887.30 |
| SSM Blowdowns | 6.6813 | 121.4778 | -- | 128.16 | 3,582.33 | 3,043.63 |
| Centrifugal Compressor Venting | 38.43 | 699.85 | -- | 738.29 | 18,031.38 | 17,534.76 |
| Heater & Boiler Exhaust | 284.05 | 5.35E-03 | 5.35E-04 | 284.05 | 284.34 | 284.34 |
| Pig Launchers & Receivers | 2.2578 | 41.0504 | -- | 43.31 | 1,057.65 | 1,028.52 |
| Equipment Leaks | 0.68 | 12.35 | -- | 13.03 | 318.13 | 309.37 |
| Natural Gas Pneumatic Device Venting | 1.23 | 22.43 | -- | 23.66 | 577.83 | 561.92 |
| Natural Gas Driven Pneumatic Pump Venting | 0.11 | 2.03 | -- | 2.15 | 52.39 | 50.95 |
| Malfunctions | 2.07 | 37.64 | -- | 39.71 | 1,156.43 | 943.00 |
| Separators & Storage Tanks (Flash Emissions) | 0.65 | 2.68 | -- | 3.33 | 476.94 | 67.65 |
| Total | 102,118.35 | 941.43 | 1.92E-01 | 103,059.97 | 120,930.38 | 125,711.43 |

*CO2e tpy = CO2 tpy + (CH4 tpy x 25) + (N2O tpy x 298)*

## Engine & Turbine Exhaust Emissions

| Unit Numbers | Description | Emission Factors CO2, kg/MMBtu | CH4, kg/MMBtu | N2O, kg/MMBtu | Emission Rates CO2, tpy | CH4, tpy | N2O, tpy | Old turbines (EU 1 & 2) Current CO2e, tpy | New turbines (EU 8 & 9) New CO2e, tpy |
|---|---|---|---|---|---|---|---|---|---|
| 1 or 8 (worst case) | Solar Centaur T4002 Turbine | 53.06 | 1.00E-03 | 1.00E-04 | 20,002.65 | 3.77E-01 | 3.77E-02 | 16,776.13 | 20,023.31 |
| 2 or 9 (worst case) | Solar Centaur T4002 Turbine | 53.06 | 1.00E-03 | 1.00E-04 | 20,002.65 | 3.77E-01 | 3.77E-02 | 16,776.13 | 20,023.31 |
| 3 | Solar Centaur 40-4702 Turbine | 53.06 | 1.00E-03 | 1.00E-04 | 20,417.36 | 3.85E-01 | 3.85E-02 | 20,438.45 | 20,438.45 |
| 6 | Solar Centaur 40-4702S Turbine | 53.06 | 1.00E-03 | 1.00E-04 | 20,627.56 | 3.89E-01 | 3.89E-02 | 20,648.86 | 20,648.86 |
| 7 | Solar Centaur 40-4702S Turbine | 53.06 | 1.00E-03 | 1.00E-04 | 20,627.56 | 3.89E-01 | 3.89E-02 | 20,648.86 | 20,648.86 |
| 4 | Waukesha F3521G RICE | 53.06 | 1.00E-03 | 1.00E-04 | 104.41 | 1.97E-03 | 1.97E-04 | 104.52 | 104.52 |
| | Total | | | | 101,782.18 | 1.92 | 0.19 | 95,392.95 | 101,887.30 |

The emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2

Emission Rates (tpy) = kg/MMBtu x 2.2 lb/kg x MMBtu/yr / 2,000 lb/ton

| Unit Numbers | Description | Fuel Types | Operating Times, hr/yr | Current (Turbines 1 & 2) LHV Design Heat Rates, MMBtu/hr | HHV Design Heat Rates, MMBtu/hr | HHV Fuel Usages, MMBtu/yr | New (Turbines 8 & 9) LHV Design Heat Rates, MMBtu/hr | HHV Design Heat Rates, MMBtu/hr | HHV Fuel Usages, MMBtu/yr |
|---|---|---|---|---|---|---|---|---|---|
| 1 or 8 (worst case) | Solar Centaur T4002 Turbine | Nat. Gas | 8,760 | 29.50 | 32.78 | 287,133 | 35.21 | 39.12 | 342,711 |
| 2 or 9 (worst case) | Solar Centaur T4002 Turbine | Nat. Gas | 8,760 | 29.50 | 32.78 | 287,133 | 35.21 | 39.12 | 342,711 |
| 3 | Solar Centaur 40-4702 Turbine | Nat. Gas | 8,760 | 35.94 | 39.93 | 349,816 | 35.94 | 39.93 | 349,816 |
| 6 | Solar Centaur 40-4702S Turbine | Nat. Gas | 8,760 | 36.31 | 40.34 | 353,417 | 36.31 | 40.34 | 353,417 |
| 7 | Solar Centaur 40-4702S Turbine | Nat. Gas | 8,760 | 36.31 | 40.34 | 353,417 | 36.31 | 40.34 | 353,417 |
| 4 | Waukesha F3521G RICE | Nat. Gas | 500 | 3.22 | 3.58 | 1,789 | 3.22 | 3.58 | 1,789 |

The fuel types and operating times are provided by Harvest

The LHV design heat rates are taken from manufacturers data

HHV Design Heat Rates (MMBtu/hr) = LHV Design Heat Rates (MMBtu/hr) / 0.9 LHV/HHV

HHV Fuel Usages (MMBtu/yr) = HHV Design Heat Rates (MMBtu/hr) x hr/yr

## SSM Blowdown Emissions

| Unit Numbers | Description | Total Gas Losses, scf/yr | CO2 Emission Factors, lb/scf | CH4 Emission Factors, lb/scf | Emission Rates CO2, tpy | CH4, tpy | CO2e, tpy |
|---|---|---|---|---|---|---|---|
| SSM | SSM Blowdowns | 6,954,155 | 0.0019 | 0.0349 | 6.68 | 121.48 | 3,043.63 |

The annual blowdown volumes are calculated from data provided by Harvest

The CO2 and CH4 emission factors are calculated from the facility extended gas analysis

Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

# Green House Gas Emissions Data and Calculations

## Centrifugal Compressor Venting Emissions

| Unit Numbers | Description | Emission Rates | | |
|---|---|---|---|---|
| | | CO2, tpy | CH4, tpy | CO2e, tpy |
| NA | Blowdown Valve Leakage | 7.04 | 128.23 | 3,212.91 |
| NA | Oil Degassing Vents | 31.39 | 571.62 | 14,321.84 |
| NA | Isolation Valve Leakage | 0.00 | 0.00 | - |
| | Total | 38.43 | 699.85 | 17,534.76 |

Operating mode - includes blowdown valve leakage (wet and dry seal) and the oil degassing vents (wet seal)
Non-operating depressurized mode - includes isolation valve leakage (wet & dry seal) through open blowdown vents (without blind flanges)
A combination of equations W-22 & W-36 (Subpart W) is used to calculate centrifugal compressor emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rates (tpy) = # x scf/hr x hr/yr x (CO2 Mole Percent (%) / 100) x CO2 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rates (tpy) = # x scf/hr x hr/yr x (CH4 Mole Percent (%) / 100) x CH4 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

| Unit Numbers | Description | Number of Compressors # | Gas Emissions, scf/hr | Operating Times, hr/yr | CO2 Mole Percents, % | CH4 Mole Percents, % | CO2 Density, kg/scf | CH4 Density, kg/scf |
|---|---|---|---|---|---|---|---|---|
| NA | Blowdown Valve Leakage | 5 | 167.4 | 8,760 | 1.66 | 82.64 | 0.0526 | 0.0192 |
| NA | Oil Degassing Vents | 5 | 746.2 | 8,760 | 1.66 | 82.64 | 0.0526 | 0.0192 |
| NA | Isolation Valve Leakage | 5 | 10.8 | 0 | 1.66 | 82.64 | 0.0526 | 0.0192 |

The number of compressors is provided by Harvest
Emission factors are the three year rolling average (2012-2014) of all measurements in the Williams Field Services, LLC compressor fleet located at natural gas processing plants
The operating times (the average operating times for all station compressors combined) are provided by Harvest
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The CO2 & CH4 densities (kg/scf) are taken from Subpart W, Paragraph 98.233(v)

## Heater & Boiler Exhaust Emissions

| Unit Numbers | Description | Emission Factors | | | Emission Rates | | | |
|---|---|---|---|---|---|---|---|---|
| | | CO2, kg/MMBtu | CH4, kg/MMBtu | N2O, kg/MMBtu | CO2, tpy | CH4, tpy | N2O, tpy | CO2e, tpy |
| 5 | Heater (insignificant) | 53.06 | 1.00E-03 | 1.00E-04 | 284.05 | 5.35E-03 | 5.35E-04 | 284.34 |
| | Total | | | | 284.05 | 5.35E-03 | 5.35E-04 | 284.34 |

The emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2
Emission Rates (tpy) = kg/MMBtu x 2.2 lb/kg x MMBtu/yr / 2,000 lb/ton

| Unit Numbers | Description | Fuel Types | Operating Times, hr/yr | LHV Design Heat Rates, MMBtu/hr | HHV | |
|---|---|---|---|---|---|---|
| | | | | | Design Heat Rates, MMBtu/hr | Fuel Usages, MMBtu/yr |
| 5 | Heater (insignificant) | Nat. Gas | 8,760 | 0.50 | 0.556 | 4,867 |

The fuel type and operating time are provided by Harvest
The LHV design heat rates are taken from manufacturers data
HHV Design Heat Rates (MMBtu/hr) = LHV Design Heat Rate (MMBtu/hr) / 0.9 LHV/HHV
HHV Fuel Usages (MMBtu/yr) = HHV Design Heat Rate (MMBtu/hr) x hr/yr

# Green House Gas Emissions Data and Calculations

## Pig Launcher & Receiver Emissions

| Unit Numbers | Description | Total Gas Losses, scf/yr | CO2 Emission Factors, lb/scf | CH4 Emission Factors, lb/scf | Emission Rates CO2, tpy | Emission Rates CH4, tpy | CO2e, tpy |
|---|---|---|---|---|---|---|---|
| PL | Pig Launcher | 2,159,245 | 0.0019 | 0.0349 | 2.07 | 37.72 | 945.04 |
| PR | Pig Receiver | 190,740 | 0.0019 | 0.0349 | 0.18 | 3.33 | 83.48 |
| | Total | | | | 2.2578 | 41.0504 | 1028.52 |

The annual blowdown volumes are calculated from data provided by Harvest
The CO2 and CH4 emission factors are calculated from the facility extended gas analysis
Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

## Equipment Leaks Emissions

| Unit Numbers | Description | Emission Rates CO2, tpy | Emission Rates CH4, tpy | CO2e, tpy |
|---|---|---|---|---|
| NA | Valves | 0.5 | 9.3 | 234.09 |
| NA | Connectors | 0.1 | 1.3 | 32.04 |
| NA | Open-Ended Lines | 0.0 | 0.6 | 15.83 |
| NA | Pressure Relief Valves | 0.1 | 1.1 | 27.41 |
| | Total | 0.68 | 12.35 | **309.37** |

| **Previously Permitted Fugitive Emissions** | | |
|---|---|---|
| CO2 tpy` | CH4 tpy | CO2e tpy |
| 3.49 | 22.46 | 564.87 |

A combination of equations W-31 & W-36 (Subpart W) is used to calculate uncombusted CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rate (tpy) = # x scf/hr/component x (CO2 Content (mole %) / 100) x hr/yr x CO2 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rate (tpy) = # x scf/hr/component x (CH4 Content (mole %) / 100) x hr/yr x CH4 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

| Unit Numbers | Description | Number of Components, # | Emission Factors, scf/hr /component | CO2 Contents, mole % | CH4 Contents, mole % | Operating Times, hr/yr | CO2 Density, kg/scf | CH4 Density, kg/scf |
|---|---|---|---|---|---|---|---|---|
| NA | Valves | 504 | 0.121 | 1.66 | 82.64 | 8,760 | 0.0526 | 0.0192 |
| NA | Connectors | 491 | 0.017 | 1.66 | 82.64 | 8,760 | 0.0526 | 0.0192 |
| NA | Open-Ended Lines | 133 | 0.031 | 1.66 | 82.64 | 8,760 | 0.0526 | 0.0192 |
| NA | Pressure Relief Valves | 37 | 0.193 | 1.66 | 82.64 | 8,760 | 0.0526 | 0.0192 |

The number of sources are calculated based on the number of compressors and dehydrators at the station (see criteria pollutant and HAP equipment leaks calculations)
The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The operating times are provided by Harvest (default is the entire year)
The CO2 & CH4 densities are taken from Subpart W, Paragraph 98.233(v)

# Green House Gas Emissions Data and Calculations

## Natural Gas Pneumatic Device Venting Emissions

| Unit Numbers | Description | Number of Devices, # | Emission Factors, scf/hr/device | Operating Times, hr/yr | Emission Rates | | |
|---|---|---|---|---|---|---|---|
| | | | | | CO2, tpy | CH4, tpy | CO2e, tpy |
| NA | Continuous High Bleed Pneumatic Devices | 1 | 37.3 | 8,760 | 0.31 | 5.70 | 142.88 |
| NA | Intermittent Bleed Pneumatic Devices | 8 | 13.5 | 8,760 | 0.91 | 16.51 | 413.71 |
| NA | Continuous Low Bleed Pneumatic Devices | 1 | 1.39 | 8,760 | 0.01 | 0.21 | 5.32 |
| | Total | | | | 1.23 | 22.43 | 561.92 |

The number of devices and operating times are provided by Harvest
The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
Equation W-1 (Subpart W) is used to calculate CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions in addition to CO2e emissions, it is necessary to divide by the global warming potentials
CO2 Emission Rates (tpy) = # x scf/hr/device x (CO2 Content (mole %) / 100) x CO2 Conversion Factors (tonne CO2e/scf) x hr/yr
x (2,204.6 lb/tonne / 2,000 lb/ton) / CO2 Global Warming Potentials (tonne CO2e/tonne CO2)
CH4 Emission Rates (tpy) = # x scf/hr/device x (CH4 Contents (mole %) / 100) x CH4 Conversion Factors (tonne CO2e/scf) x hr/yr
x (2,204.6 lb/tonne / 2,000 lb/ton) / CH4 Global Warming Potentials (tonne CO2e/tonne CH4)

| Unit Numbers | Description | CO2 Contents, mole % | CH4 Contents, mole % | CO2 Conversion Factors, tonne CO2e /scf | CH4 Conversion Factors, tonne CO2e /scf | CO2 Global Warming Potentials, tonne CO2e /tonne CO2 | CH4 Global Warming Potentials, tonne CO2e /tonne CH4 |
|---|---|---|---|---|---|---|---|
| NA | Continuous High Bleed Pneumatic Devices | 1.66 | 82.64 | 5.262E-05 | 4.790E-04 | 1 | 25 |
| NA | Continuous Low Bleed Pneumatic Devices | 1.66 | 82.64 | 5.262E-05 | 4.790E-04 | 1 | 25 |
| NA | Intermittent Bleed Pneumatic Devices | 1.66 | 82.64 | 5.262E-05 | 4.790E-04 | 1 | 25 |

The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The conversion factors are taken from Subpart W, Paragraph 98.233(a)
The global warming potentials are taken from 40 CFR Part 98, Table A-1

## Natural Gas Driven Pneumatic Pump Venting Emissions

**Emission Rates**

| Unit Number | Description | Number of Pumps, # | Emission Factor, scf/hr/pump | Operating Time, hr/yr | Emission Rates | | |
|---|---|---|---|---|---|---|---|
| | | | | | CO2, tpy | CH4, tpy | CO2e, tpy |
| NA | Pneumatic Pump Venting | 1 | 13.3 | 8,760 | 0.11 | 2.03 | 50.95 |

The number of pumps is provided by Harvest
The emission factor is taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
The operating time is provided by Harvest (default is the entire year)
Equation W-2 (Subpart W) is used to calculate CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions in addition to CO2e emissions, it is necessary to divide by the global warming potentials
CO2 Emission Rate (tpy) = # x scf/hr/pump x (CO2 Content (mole %) / 100) x CO2 Conversion Factor (tonne CO2e/scf) x hr/yr
x (2,204.6 lb/tonne / 2,000 lb/ton) / CO2 Global Warming Potentials (tonne CO2e/tonne CO2)
CH4 Emission Rate (tpy) = # x scf/hr/pump x (CH4 Content (mole %) / 100) x CH4 Conversion Factor (tonne CO2e/scf) x hr/yr
x (2,204.6 lb/tonne / 2,000 lb/ton) / CH4 Global Warming Potentials (tonne CO2e/tonne CH4)

| Unit Number | Description | CO2 Content, mole % | CH4 Content, mole % | CO2 Conversion Factor, tonne CO2e /scf | CH4 Conversion Factor, tonne CO2e /scf | CO2 Global Warming Potential, tonne CO2e /tonne CO2 | CH4 Global Warming Potential, tonne CO2e /tonne CH4 |
|---|---|---|---|---|---|---|---|
| NA | Pneumatic Pump Venting | 1.66 | 82.64 | 5.262E-05 | 4.790E-04 | 1 | 25 |

The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The conversion factors are taken from Subpart W, Paragraph 98.233(a)
The operating time is provided by Harvest (the default is the entire year)
The global warming potentials are taken from 40 CFR Part 98, Table A-1

# Green House Gas Emissions Data and Calculations

## Malfunction Emissions

| Unit Number | Description | Total Component Weight, lb/lb-mole | VOC Component Weight, lb/lb-mole | CO2 Weight % of Total, % | CH4 Weight % of Total, % | Emission Rates | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | VOC, tpy | CO2, tpy | CH4, tpy |
| M1 | Malfunctions | 20.21 | 3.52 | 3.61 | 65.58 | 10.00 | 2.07 | 37.64 |

The total & VOC component weights and CO2 & CH4 weight % of totals are calculated from the facility extended gas analysis
The VOC emission rate is estimated (see calculations workbook)
CO2 Emission Rate (tpy) = VOC Emission Rate (tpy) x (Total Component Weight (lb/lb-mole) / VOC Component Weight (lb-lb-mole))
x (CO2 Weight % of Total (%) / 100)
CH4 Emission Rate (tpy) = VOC Emission Rate (tpy) x (Total Component Weight (lb/lb-mole) / VOC Component Weight (lb-lb-mole))
x (CH4 Weight % of Total (%) / 100)

| CO2e, tpy |
|---|
| 943.00 |

## Separators & Storage Tanks (Flash Emissions)

| Unit Number | Description | Emission Rates | | Operating Time, hr/yr | Emission Rates | | |
|---|---|---|---|---|---|---|---|
| | | CO2, pph | CH4, pph | | CO2, tpy | CH4, tpy | CO2e, tpy |
| T1 to T3, L1, 18 | Separator, Condensate Tanks, Loading | -- | -- | -- | 0.65 | 2.68 | 67.65 |
| | Total | | | | 0.65 | 2.68 | 67.65 |

Emission rates (tpy) - ProMax '/Tank_Flash_Emissions (Material Stream)' vapor mass fraction of [GHG] x total gas lb/hr x 8760/2000.
The operating times are provided by Harvest
Emission Rate (tpy) = Emission Rate (pph) x Operating Time (hr/yr) / 2,000 lb/ton

| Previously Permitted Tank Flash Emissions | | |
|---|---|---|
| CO2 tpy` | CH4 tpy | CO2e tpy |
| 2.33 | 18.98 | 476.94 |

## Gas Stream Composition

| Components | Mole Percents, % | Molecular Weights, lb/lb-mole | Component Weights, lb/lb-mole | Weight Percent of Total, % | Emission Factors, lb/scf | Previous (4/30/13) Gas Analysis (Mole %) |
|---|---|---|---|---|---|---|
| Carbon Dioxide | 1.6565 | 44.01 | 0.73 | 3.6069 | 0.0019 | 1.5625 |
| Hydrogen Sulfide | 0.0000 | 34.07 | 0.00 | 0.0000 | 0.0000 | 0.0000 |
| Nitrogen | 1.0688 | 28.01 | 0.30 | 1.4812 | 0.0008 | 0.3635 |
| Methane | 82.6372 | 16.04 | 13.26 | 65.5802 | 0.0349 | 84.9931 |
| Ethane | 8.0037 | 30.07 | 2.41 | 11.9074 | 0.0063 | 7.5745 |
| Propane | 3.8334 | 44.09 | 1.69 | 8.3621 | 0.0045 | 3.1538 |
| IsoButane | 0.6777 | 58.12 | 0.39 | 1.9487 | 0.0010 | 0.5947 |
| Normal Butane | 1.1402 | 58.12 | 0.66 | 3.2787 | 0.0017 | 0.8447 |
| IsoPentane | 0.3515 | 72.15 | 0.25 | 1.2547 | 0.0007 | 0.3215 |
| Normal Pentane | 0.2576 | 72.15 | 0.19 | 0.9195 | 0.0005 | 0.2210 |
| Cyclopentane | 0.0098 | 70.14 | 0.01 | 0.0340 | 0.0000 | 0.0000 |
| n-Hexane | 0.0702 | 86.17 | 0.06 | 0.2993 | 0.0002 | 0.0675 |
| Cyclohexane | 0.0237 | 84.16 | 0.02 | 0.0987 | 0.0001 | 0.0312 |
| Other Hexanes | 0.1446 | 86.18 | 0.12 | 0.6165 | 0.0003 | 0.1357 |
| Heptanes | 0.0446 | 100.20 | 0.04 | 0.2211 | 0.0001 | 0.0620 |
| Methylcyclohexane | 0.0379 | 98.19 | 0.04 | 0.1841 | 0.0001 | 0.0340 |
| 2,2,4-Trimethylpentane | 0.0024 | 100.21 | 0.00 | 0.0119 | 0.0000 | 0.0045 |
| Benzene | 0.0096 | 78.11 | 0.01 | 0.0371 | 0.0000 | 0.0123 |
| Toluene | 0.0113 | 92.14 | 0.01 | 0.0515 | 0.0000 | 0.0120 |
| Ethylbenzene | 0.0022 | 106.17 | 0.00 | 0.0116 | 0.0000 | 0.0000 |
| Xylenes | 0.0004 | 106.17 | 0.00 | 0.0021 | 0.0000 | 0.0017 |
| C8+ heavies | 0.0170 | 110.00 | 0.02 | 0.0925 | 0.0000 | 0.0098 |
| Total | 100.0003 | | 20.21 | 100.0000 | 0.0533 | |
| VOC | | | 3.52 | -- | 0.0093 | |

Gas stream composition obtained from the Inlet - La Jara extended gas analysis dated December 31, 2019.
Component Weights (lb/lb-mole) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole)
Weight Percent of Total (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
Emission Factors (lb/scf) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole) / 379.4 scf/lb-mole

# PSD Project Determination Analysis - Step 2: Netting Analysis

## Net Emission Increases and Decreases

### Net Emissions Increase - Scenario 0

| Projected Future Annual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
| VOC tpy | N/A | N/A | 0.0 | 0.0 | 48.5 | 5.9 | 54.5 |

Based on 'Projected Actuals' for each individual emission source

| 2-yr Avg Annual Actual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Total |
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | tpy |
| VOC tpy | N/A | N/A | 0.0 | 0.0 | 28.4 | 5.9 | 34.3 |

Based on 'Past Actuals' calculations for each individual emission source.

| Project Net Emissions Change | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
|---|---|---|---|---|---|---|---|
| VOC tpy | N/A | N/A | 0.0 | 0.0 | 20.1 | 0.0 | 20.1 |

< PSD VOC major mod threshold of 40 tpy

Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions

### Net Emissions Increase - Scenario 1

| Projected Future Annual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
| VOC tpy | 0.0 | 19.3 | 5.4 | 0.0 | 48.5 | 5.9 | 79.1 |

Based on 'Projected Actuals' for each individual emission source

| 2-yr Avg Annual Actual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Total |
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | tpy |
| VOC tpy | 17.05 | 18.27 | 0.0 | 0.0 | 28.4 | 5.9 | 69.7 |

Based on 'Past Actuals' calculations for each individual emission source.

| Project Net Emissions Change | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
|---|---|---|---|---|---|---|---|
| VOC tpy | -17.0 | 1.0 | 5.4 | 0.0 | 20.1 | 0.0 | 9.5 |

< PSD VOC major mod threshold of 40 tpy

Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions

(continued on next page)

# PSD Project Determination Analysis - Step 2: Netting Analysis

## Net Emission Increases and Decreases

### Net Emissions Increase - Scenario 2

| Projected Future Annual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
| VOC tpy | 19.3 | 0.0 | 0.0 | 5.4 | 48.5 | 5.9 | 79.1 |

Based on 'Projected Actuals' for each individual emission source

| 2-yr Avg Annual Actual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Total |
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | tpy |
| VOC tpy | 17.05 | 18.27 | 0.0 | 0.0 | 28.4 | 5.9 | 69.7 |

Based on 'Past Actuals' calculations for each individual emission source.

| Project Net Emissions Change | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
|---|---|---|---|---|---|---|---|
| VOC tpy | 2.3 | -18.3 | 0.0 | 5.4 | 20.1 | 0.0 | 9.5 |

< PSD VOC major mod threshold of 40 tpy

Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions

### Net Emissions Increase - Scenario 3

| Projected Future Annual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
| VOC tpy | 0.0 | 0.0 | 5.4 | 5.4 | 48.5 | 5.9 | 65.2 |

Based on 'Projected Actuals' for each individual emission source

| 2-yr Avg Annual Actual Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Jan. 2018 - Dec. 2019 | Total |
| Unit No. | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | tpy |
| VOC tpy | 17.05 | 18.27 | 0.0 | 0.0 | 28.4 | 5.9 | 69.7 |

Based on 'Past Actuals' calculations for each individual emission source.

| Project Net Emissions Change | EU 01 | EU 02 | EU 08 | EU 09 | EU T-1-T3, L1,18 | EU F1 | Total tpy |
|---|---|---|---|---|---|---|---|
| VOC tpy | -17.0 | -18.3 | 5.4 | 5.4 | 20.1 | 0.0 | -4.4 |

< PSD VOC major mod threshold of 40 tpy

Project Net Emissions Change = Projected Future Annual Emissions - 2-yr Avg Annual Actual Emissions

# PSD Project Determination, Step 2 (Netting Analysis)
## Projected Future Annual Emissions

| Unit No. | EU01 | EU02 | EU 08 | EU 09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| Pkg # | 3020005 | 3020004 | - - | - - | N/A | N/A |
| Turbine Serial No. | OHB16-C1819 | OHB16-C2641 | - - | - - | N/A | N/A |

### Scenario 0 - Projected Future Annual Emissions

| Unit No. | EU01 | EU02 | EU08 | EU09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| VOC tpy | 19.3 | 19.3 | 0 | 0 | 48.54 | 5.9 |

Based on Requested Allowable Emissions (Potential To Emit), NMAQB Universal Air Quality Permit Application, Table 2-A for each individual emission source being added or modified, operating under the indicated scenario.

| Unit No. | EU01 | EU02 | EU 08 | EU 09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| Pkg # | - - | 3020004 | TBD | - - | N/A | N/A |
| Turbine Serial No. | - - | OHB16-C2641 | TBD | - - | N/A | N/A |

### Scenario 1 - Projected Future Annual Emissions

| Unit No. | EU01 | EU02 | EU08 | EU09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| VOC tpy | 0 | 19.3 | 5.38 | 0 | 48.54 | 5.9 |

Based on Requested Allowable Emissions (Potential To Emit), NMAQB Universal Air Quality Permit Application, Table 2-A for each individual emission source being added or modified, operating under the indicated scenario.

| Unit No. | EU01 | EU02 | EU 08 | EU 09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| Pkg # | 3020005 | - - | - - | TBD | N/A | N/A |
| Turbine Serial No. | OHB16-C1819 | - - | - - | TBD | N/A | N/A |

### Scenario 2 - Projected Future Annual Emissions

| Unit No. | EU01 | EU02 | EU08 | EU09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| VOC tpy | 19.3 | 0 | 0 | 5.38 | 48.54 | 5.9 |

Based on Requested Allowable Emissions (Potential To Emit), NMAQB Universal Air Quality Permit Application, Table 2-A for each individual emission source being added or modified, operating under the indicated scenario.

| Unit No. | EU01 | EU02 | EU 08 | EU 09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| Pkg # | - - | - - | TBD | TBD | N/A | N/A |
| Turbine Serial No. | - - | - - | TBD | TBD | N/A | N/A |

### Scenario 3 - Projected Future Annual Emissions

| Unit No. | EU01 | EU02 | EU08 | EU09 | EU T1-T3, L1, 18 | F1 |
|---|---|---|---|---|---|---|
| VOC tpy | 0 | 0 | 5.38 | 5.38 | 48.54 | 5.9 |

Based on Requested Allowable Emissions (Potential To Emit), NMAQB Universal Air Quality Permit Application, Table 2-A for each individual emission source being added or modified, operating under the indicated scenario.

# PSD Project Determination, Step 2 (Netting Analysis)
## Past Actuals Analysis

**2-year contemporaneous period = Jan. 2018 - Dec. 2019**

| Unit No. | EU 01 |
|---|---|
| Pkg # | 3020005 |
| Turbine Serial No. | OHB16-C1819 |

**2-yr Avg Annual Actual Emissions**
**Jan 2018 - Dec 2019**
Unit No.

| EU 01 | VOC tpy |
|---|---|
| | 17.05 |

**Annual Operating Hours**

| | EU 01 |
|---|---|
| 2018 hr/yr | 7067.5 |
| 2019 hr/yr | 8431.0 |

Source: NMAQB Annual Emission Inventory documentation for the La Jara Compressor Station, unit 1 turbine, Emission Years 2018 and 2019.

**Actual Annual Emissions**
Unit No.

| EU 01 | VOC tpy |
|---|---|
| Jan 18 - Dec 18 | 15.55 |
| Jan 19 - Dec 19 | 18.55 |

Pollutant tpy = Hourly Emissions (lb/hr) x Annual Operating Hours (hr/yr) / 2000 lb/ton

| Hourly Emissions | VOC lb/hr |
|---|---|
| 2018 | 4.4 |
| 2019 | 4.4 |

VOC emissions are based on the emission inventories reported to NMAQB for emission years 2018 and 2019.

# PSD Project Determination, Step 2 (Netting Analysis)
## Past Actuals Analysis

**2-year contemporaneous period = Jan. 2018 - Dec. 2019**

| Unit No. | EU 02 |
|---|---|
| Pkg # | 3020004 |
| pre-swap RICE s/n | OHB16-C2641 |

**2-yr Avg Annual Actual Emissions**
**Jan 2018 - Dec 2019**
Unit No.

| EU 02 | VOC tpy |
|---|---|
| | 18.27 |

**Annual Operating Hours**

| | EU 02 |
|---|---|
| 2018 hr/yr | 8018.5 |
| 2019 hr/yr | 8588.0 |

Source: NMAQB Annual Emission Inventory documentation for the La Jara Compressor Station, unit 2 turbine, Emission Years 2018 and 2019.

**Actual Annual Emissions**
Unit No.

| EU 02 | VOC tpy |
|---|---|
| Jan 18 - Dec 18 | 17.64 |
| Jan 19 - Dec 19 | 18.89 |

Pollutant tpy = Hourly Emissions (lb/hr) x Annual Operating Hours (hr/yr) / 2000 lb/ton

| Hourly Emissions | VOC lb/hr |
|---|---|
| 2018 | 4.4 |
| 2019 | 4.4 |

VOC emissions are based on the emission inventories reported to NMAQB for emission years 2018 and 2019.

# PSD Project Determination, Step 2 (Netting Analysis)
## Past Actuals Analysis

**2-year contemporaneous period = Jan. 2018 - Dec. 2019**

| Unit No. | EU 08 |
|---|---|
| Pkg # | TBD |
| Turbine Serial No. | TBD |

**2-yr Avg Annual Actual Emissions**
**Jan 2018 - Dec 2019**
Unit No.

| EU 08 | VOC tpy |
|---|---|
| | 0.00 |

**Annual Operating Hours**

| | EU 08 |
|---|---|
| 2018 hr/yr | 0 |
| 2019 hr/yr | 0 |

Source: NMAQB Annual Emission Inventory documentation for the La Jara Compressor Station. Unit 08 turbine has not been installed and therefore has not been operated at the site.

**Actual Annual Emissions**
Unit No.

| EU 08 | VOC tpy |
|---|---|
| N/A* | 0.00 |
| N/A* | 0.00 |

Pollutant tpy = Hourly Emissions (lb/hr) x Annual Operating Hours (hr/yr) / 2000 lb/ton

**** Unit has not been installed.***

| Hourly Emissions | VOC lb/hr |
|---|---|
| N/A* | 0.0 |
| N/A* | 0.0 |

**** Unit has not been installed.***

# PSD Project Determination, Step 2 (Netting Analysis)
## Past Actuals Analysis

**2-year contemporaneous period = Jan. 2018 - Dec. 2019**

| Unit No. | EU 09 |
|---|---|
| Pkg # | TBD |
| Turbine Serial No. | TBD |

**Annual Operating Hours**

| | EU 09 |
|---|---|
| 2018 hr/yr | 0 |
| 2019 hr/yr | 0 |

Source: NMAQB Annual Emission Inventory documentation for the La Jara Compressor Station, Unit 09 turbine has not been installed and therefore has not been operated at the site.

**2-yr Avg Annual Actual Emissions**
**Jan 2018 - Dec 2019**
Unit No.

| EU 09 | VOC tpy |
|---|---|
| | 0.00 |

**Actual Annual Emissions**
Unit No.

| EU 09 | VOC tpy |
|---|---|
| N/A* | 0.00 |
| N/A* | 0.00 |

Pollutant tpy = Hourly Emissions (lb/hr) x Annual Operating Hours (hr/yr) / 2000 lb/ton

**** Unit has not been installed.***

| Hourly Emissions | VOC lb/hr |
|---|---|
| N/A* | 0.0 |
| N/A* | 0.0 |

**** Unit has not been installed.***

# PSD Project Determination, Step 2 (Netting Analysis)
## Past Actuals Analysis

**2-year contemporaneous period = Jan. 2018 - Dec. 2019**

**Unit No.** **T1-T3, L1,18**

| | |
|---|---|
| Pkg # | N/A |
| Serial No. | N/A |

**Annual Operating Hours**

| | T1-T3, L1,18 |
|---|---|
| 2018 subtotal | 8760 |
| 2018 subtotal | 8760 |

**2-yr Avg Annual Actual Emissions**

**Jan 2018 - Dec 2019**

Unit No. **Condensate tanks, truck loading, separator**

| T1-T3, L1,18 | VOC tpy |
|---|---|
| | 28.43 |

**Actual Annual Emissions**

Unit No.

| T1-T3, L1,18 | VOC tpy |
|---|---|
| Jan 18 - Dec 18 | 38.34 |
| Jan 19 - Dec 19 | 18.52 |

Based on emission inventories reported to NMAQB for emission years 2018 and 2019.

The tpy are the aggregated sum of the actual tpy emissions reported to NMAQB for T1-T3 condensate tanks including unit 18 (separator flash) emissions, plus unit L1 (truck loading) emissions.

**T1-T3 (Condensate Tank) including EU 18 (Separator) Emissions**

| Annual Emissions | VOC tpy |
|---|---|
| T1 - 2018 | 12.70 |
| T2 - 2018 | 12.70 |
| T3 - 2018 | 12.70 |
| **2018 Total** | **38.10** |
| T1 - 2019 | 6.1 |
| T2 - 2019 | 6.1 |
| T3 - 2019 | 6.1 |
| **2019 Total** | **18.30** |

Based on emission inventories reported to NMAQB for emission years 2018 and 2019.

**L1 (Truck Loading) Emissions**

| Annual Emissions | VOC tpy |
|---|---|
| **2018** | **0.24** |
| **2019** | **0.22** |

Based on emission inventories reported to NMAQB for emission years 2018 and 2019.

# PSD Project Determination, Step 2 (Netting Analysis)
## Past Actuals Analysis

**2-year contemporaneous period = Jan. 2018 - Dec. 2019**

| Unit No. | F1 |
|---|---|
| Pkg # | N/A |
| Serial No. | N/A |

### Annual Operating Hours

| | F1 |
|---|---|
| 2018 hr/yr | 8760 |
| 2019 hr/yr | 8760 |

Source: NMAQB Annual Emission Inventory documentation for La Jara Compressor Station, Emission Years 2018 and 2019

### 2-yr Avg Annual Actual Emissions

**Jan 2018 - Dec 2019**

Unit No. **Fugitive Emissions**

| F1 | VOC tpy |
|---|---|
| | 5.91 |

### Actual Annual Emissions

Unit No.

| F1 | VOC tpy |
|---|---|
| Jan 18 - Dec 18 | 5.91 |
| Jan 19 - Dec 19 | 5.91 |

Based on reported emissions from the 2018 and 2019 emission inventories reported to NMAQB.

| Hourly Emissions | VOC lb/hr |
|---|---|
| 2018 | 1.349 |
| 2019 | 1.349 |

Based on emission inventories reported to NMAQB for emission years 2018 and 2019.

## Natural Gas Turbine Exhaust Emissions (Criteria Pollutants & HAP) 2018 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | Fuel Heat Content, Btu/scf | Fuel Usage, MMscf/yr | Controls Used, Yes/No | NOX, ton/yr | CO, ton/yr | VOC, ton/yr | SO2, ton/yr | PM10, ton/yr | PM2.5, ton/yr | 2,2,4-Trimethy pentane, ton/yr | Acet aldehyde, ton/yr | Form aldehyde, ton/yr | n-Hexane, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | 7,067.50 | 1,241.50 | 209.49 | No | 53.4 | 50.9 | 15.5 | 0.4 | 0.9 | 0.9 | 0.0 | 0.4 | 0.4 | 0.0 | 1.0 |
| 2 | Solar T4000 | 8,018.50 | 1,241.50 | 237.68 | No | 60.5 | 57.7 | 17.6 | 0.5 | 1.0 | 1.0 | 0.0 | 0.5 | 0.5 | 0.0 | 1.1 |
| 3 | Solar T4700 | 8,089.00 | 1,241.50 | 260.19 | No | 97.5 | 17.8 | 10.1 | 0.5 | 1.1 | 1.1 | 0.1 | 0.6 | 0.6 | 0.1 | 1.4 |
| 6 | Solar T4700S | 6,881.82 | 1,241.50 | 223.64 | No | 12.4 | 15.1 | 4.5 | 0.5 | 0.9 | 0.9 | 0.0 | 0.5 | 0.5 | 0.0 | 1.2 |
| 7 | Solar T4700S | 5,943.40 | 1,241.50 | 193.14 | No | 10.7 | 13.1 | 3.9 | 0.4 | 0.8 | 0.8 | 0.0 | 0.4 | 0.4 | 0.0 | 1.1 |

The operating times are provided by Harvest
The fuel heat contents are calculated from site-specific fuel samples, in accordance with 40 CFR 98.33(a)(2)(ii)(B)
The fuel usages are calculated below
The use of controls is determined from the permit and confirmed by Harvest
Criteria & HAP Emission Rate (ton/yr) = Emission Rate (lb/hr) * Operating Time (hr/yr) / 2,000 lb/ton

| Unit Number | Description | | | | | NOX, lb/hr | CO, lb/hr | VOC, lb/hr | SO2, lb/hr | PM10, lb/hr | PM2.5, lb/hr | Trimethylper lb/hr | cetaldehyd lb/hr | ormaldehyd lb/hr | n-Hexane, lb/hr | Total HAP, lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | | | | | 15.1 | 14.4 | 4.4 | 0.1 | 0.2 | 0.2 | 0.0 | 0.1 | 0.1 | 0.0 | 0.3 |
| 2 | Solar T4000 | | | | | 15.1 | 14.4 | 4.4 | 0.1 | 0.2 | 0.2 | 0.0 | 0.1 | 0.1 | 0.0 | 0.3 |
| 3 | Solar T4700 | | | | | 24.1 | 4.4 | 2.5 | 0.1 | 0.3 | 0.3 | 0.0 | 0.1 | 0.1 | 0.0 | 0.3 |
| 6 | Solar T4700S | | | | | 3.6 | 4.4 | 1.3 | 0.1 | 0.3 | 0.3 | 0.0 | 0.2 | 0.1 | 0.0 | 0.4 |
| 7 | Solar T4700S | | | | | 3.6 | 4.4 | 1.3 | 0.1 | 0.3 | 0.3 | 0.0 | 0.2 | 0.1 | 0.0 | 0.4 |

The NOX, CO & VOC lb/hr emission rates are taken from the current permit or the most recent application
SO2 & Particulate Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) * HHV Design Heat Rate (MMBtu/hr) * (1 - (Control Efficiency (%) / 100))
HAP Emission Rate (lb/hr) = Emission Factor (g/bhp-hr) * Site rating (hp) * (1 - (Control Efficiency (%) / 100)) / 453.59 g/lb

**Control Efficiencies**

| Unit Number | Description | | | | | NOX, % | CO, % | VOC, % | SO2, % | PM10, % | PM2.5, % | Trimethylper % | cetaldehyd % | ormaldehyd % | n-Hexane, % | Total HAP, % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Solar T4000 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Solar T4700 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Solar T4700S | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | Solar T4700S | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

A control efficiency of zero indicates there is no control device for the pollutant
Control efficiencies are taken from manufacturer's data

**Emission Factors**

| Unit Number | Description | | | | | NOX, lb/hr | CO, lb/hr | VOC, lb/hr | SO2, lb/MMBtu | PM10, lb/MMBtu | PM2.5, lb/MMBtu | Trimethylper g/bhp-hr | cetaldehyd g/bhp-hr | ormaldehyd g/bhp-hr | n-Hexane, g/bhp-hr | Total HAP, g/bhp-hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | | | | | 15.1 | 14.4 | 4.4 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 1.61E-03 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 4.16E-02 |
| 2 | Solar T4000 | | | | | 15.1 | 14.4 | 4.4 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 1.61E-03 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 4.16E-02 |
| 3 | Solar T4700 | | | | | 24.1 | 4.4 | 2.5 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 1.61E-03 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 4.16E-02 |
| 6 | Solar T4700S | | | | | 3.6 | 4.4 | 1.3 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 1.61E-03 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 4.16E-02 |
| 7 | Solar T4700S | | | | | 3.6 | 4.4 | 1.3 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 1.61E-03 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 4.16E-02 |

The NOX, CO & VOC lb/hr emission rates are taken from the current permit or the most recent application
SO2 and particulate emission factors are taken from AP-42, Table 3.1-2a (particulate emission factors include both filterable and condensible emissions)
The HAP emission factors are taken from GRI-HAPCalc 3.0

**Fuel Usage**

| Unit Number | Description | Fuel Type | Site Rating, hp | Operating Time, hr/yr | LHV Design Heat Rate, MMBtu/hr | HHV | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Design Heat Rate, MMBtu/hr | Fuel Usage, MMBtu/yr | Fuel Heat Content, Btu/scf | Fuel Usage, MMscf/yr |
| 1 | Solar T4000 | Nat. Gas | 3,123 | 7,067.50 | 33.12 | 36.80 | 260,084 | 1,241.50 | 209.49 |
| 2 | Solar T4000 | Nat. Gas | 3,123 | 8,018.50 | 33.12 | 36.80 | 295,081 | 1,241.50 | 237.68 |
| 3 | Solar T4700 | Nat. Gas | 3,779 | 8,089.00 | 35.94 | 39.93 | 323,021 | 1,241.50 | 260.19 |
| 6 | Solar T4700S | Nat. Gas | 3,934 | 6,881.82 | 36.31 | 40.34 | 277,643 | 1,241.50 | 223.64 |
| 7 | Solar T4700S | Nat. Gas | 3,934 | 5,943.40 | 36.31 | 40.34 | 239,783 | 1,241.50 | 193.14 |

The fuel types and operating times are provided by Harvest
The site ratings are taken from the current permit or the most recent application
The LHV design heat rates are taken from manufacturers data
HHV Design Heat Rate (MMBtu/hr) = LHV Design Heat Rate (MMBtu/hr) / 0.9 LHV/HHV
HHV Fuel Usage (MMBtu/yr) = HHV Design Heat Rate (MMBtu/hr) * Operating Time (hr/yr)
The fuel heat contents are calculated from site-specific fuel samples, in accordance with 40 CFR 98.33(a)(2)(ii)(B)
HHV Fuel Usage (MMscf/yr) = HHV Fuel Usage (MMBtu/yr) *1,000,000 Btu/MMBtu / HHV Fuel Heat Content (Btu/scf) / 1,000,000 scf/MMscf

## Storage Tank Emissions (VOC & HAP)

2018 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | Throughput, bbl/yr | VOC, ton/yr | 2,2,4-Trimethyl pentane, ton/yr | Benzene, ton/yr | Ethylbenzene, ton/yr | n-Hexane, ton/yr | Toluene, ton/yr | Xylene, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | Condensate (working/breathing) | | | 3.3 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 |
| | Condensate (flash) | | | 9.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 |
| | Total | 8,760 | | 12.7 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| T2 | Condensate (working/breathing) | | | 3.3 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 |
| | Condensate (flash) | | | 9.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 |
| | Total | 8,760 | | 12.7 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| T3 | Condensate (working/breathing) | | | 3.3 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 |
| | Condensate (flash) | | | 9.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 |
| | Total | 8,760 | | 12.7 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| T4 | Produced Water | 8,760 | 294 | 0.3 | - | - | - | - | - | - | - |
| T9 | Gasoline | 8,760 | 86 | 0.2 | - | - | - | - | - | - | - |

**Condensate Tanks**

The flashed condensate throughput is provided by Harvest
As an estimate, the flashed condensate throughput is evenly divided between the three condensate tanks.
Working breathing losses are taken from the TANKS 4.0 output file submitted in the most recent application.
The flash gas emissions are taken from the ProMax 3.2 output file provided by Harvest
Emissions are evenly distrubuted between the three condensate storage tanks
Total HAP are the sum of the individual HAP identified in the table

A copy of the TANKS 4.0 output file is attached to this spreadsheet as a pdf file
A copy of the ProMax 3.2 output file is attached to this spreadsheet as a pdf file


La Jara TANKS T1 T2 & T3.pdf

**Produced Water**

VOC Emission Rate (ton/yr) = Throughput (bbl/yr) * 42 gal/bbl * 8.34 lb/gal * (0.5 Weight Percent Hydrocarbon (%) / 100) / 2,000 lb/ton

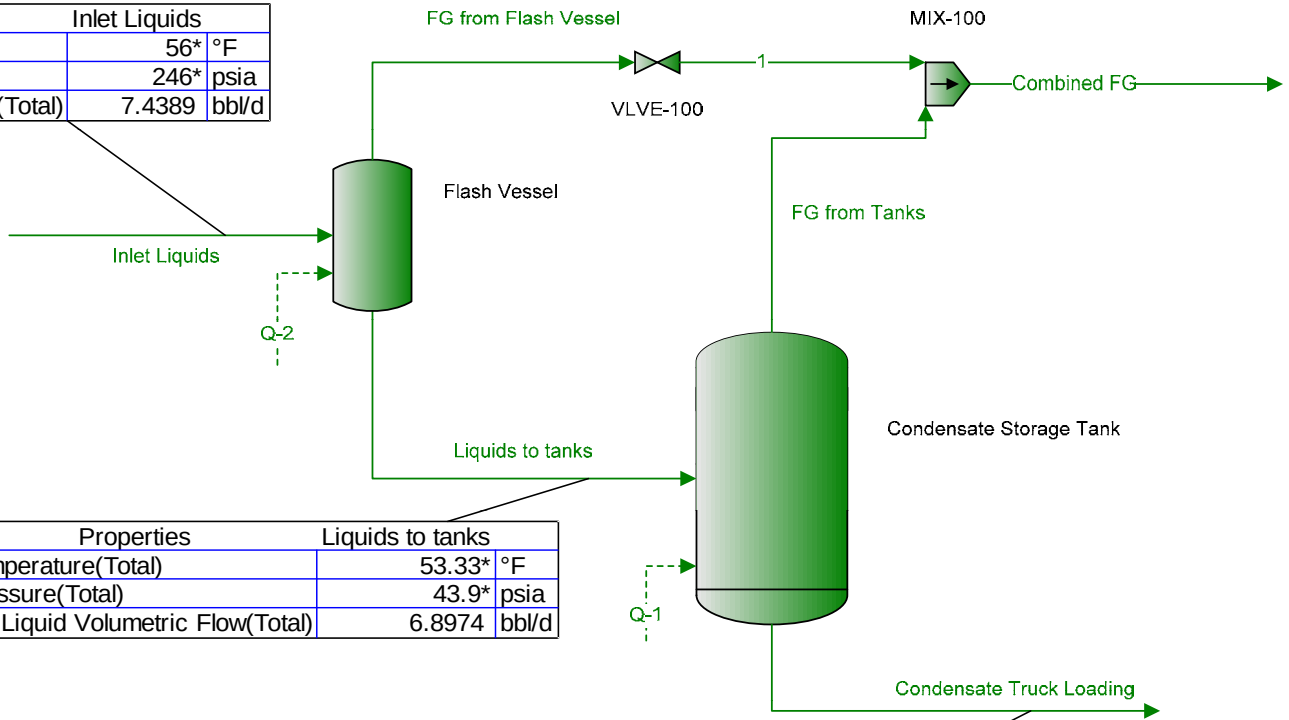
**Gasoline**

Throughput and emission rate taken from the July 2016 NSR application

# La Jara Condensate Flash Emissions

Stream Combined FG C3+ Mass Flow =28.3 ton/yr

| Properties | Inlet Liquids | |
|---|---|---|
| Temperature(Total) | 56* | °F |
| Pressure(Total) | 246* | psia |
| Std Liquid Volumetric Flow(Total) | 7.4389 | bbl/d |




| Properties | Liquids to tanks | |
|---|---|---|
| Temperature(Total) | 53.33* | °F |
| Pressure(Total) | 43.9* | psia |
| Std Liquid Volumetric Flow(Total) | 6.8974 | bbl/d |

| Properties | Condensate Truck Loading | |
|---|---|---|
| Temperature(Total) | 57 | °F |
| Pressure(Total) | 11.9 | psia |
| Std Liquid Volumetric Flow(Total) | 6.227* | bbl/d |

| Process Streams | | Combined FG | Condensate Truck Loading | Inlet Liquids |
|---|---|---|---|---|
| **Composition** | **Status:** | Solved | Solved | Solved |
| Phase: **Total** | **From Block:** | MIX-100 | Condensate Storage Tank | -- |
| | **To Block:** | -- | -- | Flash Vessel |
| **Mass Fraction** | | | | |
| Nitrogen | | 0 | 0 | 0* |
| Methane | | 0.110304 | 4.86039E-05 | 0.0136325* |
| Carbon Dioxide | | 0.0149134 | 4.40867E-05 | 0.00187603* |
| Ethane | | 0.121091 | 0.00141687 | 0.0161611* |
| Propane | | 0.267049 | 0.0184060 | 0.0490396* |
| Isobutane | | 0.0969182 | 0.0207939 | 0.0301726* |
| n-Butane | | 0.198184 | 0.0648155 | 0.0812469* |
| Isopentane | | 0.0765700 | 0.0703135 | 0.0710844* |
| n-Pentane | | 0.0594645 | 0.0754338 | 0.0734663* |
| Isohexane | | 0.0233134 | 0.0785030 | 0.0717035* |
| n-Hexane | | 0.0116519 | 0.0559735 | 0.0505129* |
| 2,2,4-Trimethylpentane | | 7.81411E-05 | 0.00109313 | 0.000968083* |
| Benzene | | 0.00195821 | 0.00901041 | 0.00814156* |
| Heptane | | 0.0142011 | 0.220825 | 0.195369* |
| Toluene | | 0 | 0 | 0* |
| Octane | | 0.00374793 | 0.198115 | 0.174168* |
| Ethylbenzene | | 2.92816E-05 | 0.00177254 | 0.00155777* |
| o-Xylene | | 2.96546E-05 | 0.00243108 | 0.00213522* |
| Nonane | | 0.000257280 | 0.0454809 | 0.0399092* |
| Decane | | 0.000238833 | 0.135523 | 0.118856* |
| **Mass Flow** | | lb/h | lb/h | lb/h |
| Nitrogen | | 0 | 0 | 0* |
| Methane | | 0.945512 | 0.00296499 | 0.948477* |
| Carbon Dioxide | | 0.127835 | 0.00268942 | 0.130525* |
| Ethane | | 1.03797 | 0.0864331 | 1.12440* |
| Propane | | 2.28910 | 1.12282 | 3.41192* |
| Isobutane | | 0.830767 | 1.26849 | 2.09926* |
| n-Butane | | 1.69880 | 3.95394 | 5.65275* |
| Isopentane | | 0.656346 | 4.28934 | 4.94569* |
| n-Pentane | | 0.509720 | 4.60169 | 5.11141* |
| Isohexane | | 0.199839 | 4.78892 | 4.98876* |
| n-Hexane | | 0.0998786 | 3.41455 | 3.51443* |
| 2,2,4-Trimethylpentane | | 0.000669813 | 0.0666845 | 0.0673543* |
| Benzene | | 0.0167855 | 0.549662 | 0.566448* |
| Heptane | | 0.121730 | 13.4710 | 13.5927* |
| Toluene | | 0 | 0 | 0* |
| Octane | | 0.0321267 | 12.0856 | 12.1177* |
| Ethylbenzene | | 0.000250997 | 0.108131 | 0.108382* |
| o-Xylene | | 0.000254195 | 0.148303 | 0.148557* |
| Nonane | | 0.00220536 | 2.77447 | 2.77668* |
| Decane | | 0.00204724 | 8.26731 | 8.26936* |
| **Mole Fraction** | | | | |
| Nitrogen | | 0 | 0 | 0* |
| Methane | | 0.276459 | 0.000277144 | 0.06718* |
| Carbon Dioxide | | 0.0136251 | 9.16360E-05 | 0.00337* |
| Ethane | | 0.161920 | 0.00431037 | 0.04249* |
| Propane | | 0.243503 | 0.0381829 | 0.08792* |
| Isobutane | | 0.0670458 | 0.0327264 | 0.04104* |
| n-Butane | | 0.137099 | 0.102010 | 0.11051* |
| Isopentane | | 0.0426716 | 0.0891487 | 0.07789* |
| n-Pentane | | 0.0331389 | 0.0956405 | 0.0805* |
| Isohexane | | 0.0108776 | 0.0833314 | 0.06578* |
| n-Hexane | | 0.00543656 | 0.0594161 | 0.04634* |
| 2,2,4-Trimethylpentane | | 2.75051E-05 | 0.000875394 | 0.00067* |
| Benzene | | 0.00100798 | 0.0105520 | 0.00824* |
| Heptane | | 0.00569843 | 0.201594 | 0.15414* |
| Toluene | | 0 | 0 | 0* |
| Octane | | 0.00131925 | 0.158653 | 0.12054* |
| Ethylbenzene | | 1.10898E-05 | 0.00152729 | 0.00116* |
| o-Xylene | | 1.12310E-05 | 0.00209471 | 0.00159* |
| Nonane | | 8.06565E-05 | 0.0324384 | 0.0246* |
| Decane | | 6.74922E-05 | 0.0871303 | 0.06604* |

# Truck Loading Emissions (VOC & HAP)

2018 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | Production Rate, $10^3$ gal/yr | VOC, ton/yr | Benzene, ton/yr | Cumene, ton/yr | Ethylbenzene, ton/yr | n-Hexane, ton/yr | Toluene, ton/yr | Xylene, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | 10.82 | 95.47 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

The operating time is calculated below

The production rate is provided by Harvest

VOC Emission Rate (ton/yr) = Emission Factor (lb/$10^3$ gal) * Production Rate ($10^3$ gal/yr) * (1 - (Control Efficiency [%] / 100)) / 2000 lb/ton

HAP Emission Rate (ton/yr) = VOC Emission Rate (ton/yr) * (HAP Emission Factor (%) / 100)

| Unit Number | Description | | | VOC, lb/hr | Benzene, lb/hr | Cumene, lb/hr | Ethylbenzene, lb/hr | n-Hexane, lb/hr | Toluene, lb/hr | Xylene, lb/hr | Total HAP, lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | | | 45.0 | 0.0 | 0.0 | 0.0 | 2.2 | 0.2 | 0.0 | 2.5 |

VOC Emission Rate (lb/hr) = Emission Factor (lb/$10^3$ gal) * Production Rate ($10^3$ gal/hr) * (1 - (Control Efficiency [%] / 100))

HAP Emission Rate (lb/hr) = VOC Emission Rate (lb/hr) * (HAP Emission Factor (%) / 100)

**Emission Factors**

| Unit Number | Description | | | VOC, lb/$10^3$ gal | Benzene, Weight % | Cumene, Weight % | Ethylbenzene, Weight % | n-Hexane, Weight % | Toluene, Weight % | Xylene, Weight % | Total HAP, Weight % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | | | 5.11 | 0.0804 | 0.0000 | 0.0008 | 4.8133 | 0.5267 | 0.0413 | 5.4625 |

VOC Emission Factor (lb/$10^3$ gal) = 12.46 * Saturation Factor * True Vapor Pressure of Liquid (psia) * Molecular Weight of Vapors (lb/lb-mole) / Temperature of Liquid (°R)

The VOC emission factor is taken from AP-42, Section 5.2, Equation 1

The individual HAP percentages are estimated from the TANKS 4.0 results as identified in the most recent permit application

Total HAP are the sum of the individual HAP identified in the table

**Liquid Data**

| Unit Number | Description | Saturation Factor | True Vapor Pressure of Liquid, psia | Molecular Weight of Vapors, lb/lb-mole | Temperature of Liquid, °F | Temperature of Liquid, °R | Production Rate, $10^3$ gal/hr | Production Rate, $10^3$ gal/yr | Operating Time, hr/yr | Control Efficiency, % |
|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | 0.6 | 5.32 | 67.37 | 64.94 | 524.61 | 8.82 | 95.47 | 10.82 | 0 |

The saturation factor is taken from AP-42, Table 5.2-1 (submerged loading and dedicated service)

The true vapor pressure of the liquid, the molecular weight of the vapors, and the temperature of the liquid (°F) are taken from the TANKS 4.0 results as identified in the most recent permit applicatior

Temperature of Liquid (°R) = Temperature of Liquid (°F) + 459.67 °F

The production rates and control efficiency are provided by Harvest

Operating Time (hr/yr) = Production Rate (gal/yr) / Production Rate (gal/hr)

The control efficiency is equal to the collection efficiency (90%) times the control device control efficiency (95%)

# Equipment Leaks Emissions (VOC & HAP)

2018 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | VOC, ton/yr | 2,2,4-Trimethylpentane, ton/yr | Benzene, ton/yr | Ethylbenzene, ton/yr | n-Hexane, ton/yr | Toluene, ton/yr | Xylene, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|
| F1 | Equipment Leaks | 8,760 | 5.9 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 |

The operating time is provided by Harvest (default is the entire year)

VOC & HAP Emission Rate (ton/yr) = Emission Rate (lb/hr) * Operating Time (hr/yr) / 2,000 lb/ton

| Unit Number | Description | | VOC, lb/hr | 2,2,4-Trimethylpentane, lb/hr | Benzene, lb/hr | Ethylbenzene, lb/hr | n-Hexane, lb/hr | Toluene, lb/hr | Xylene, lb/hr | Total HAP, lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|
| F1 | Equipment Leaks | | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

VOC & HAP Emission Rate (lb/hr) = Total TOC Emission Rate (lb/hr) * (Weight Percent (%) / 100)

**Weight Percents**

| Unit Number | Description | | VOC, Weight % | 2,2,4-Trimethylpentane, Weight % | Benzene, Weight % | Ethylbenzene, Weight % | n-Hexane, Weight % | Toluene, Weight % | Xylene, Weight % | Total HAP, Weight % |
|---|---|---|---|---|---|---|---|---|---|---|
| F1 | Equipment Leaks | | 18.3316 | 0.0103 | 0.0418 | 0.0016 | 0.3646 | 0.0719 | 0.0162 | 0.5064 |

The weight percents are calculated from the gas stream composition (see Gas Stream Composition table)

Total HAP are the sum of the individual HAP identified in the table

| Unit Number | Description | Number of Sources, # | Emission Factor, kg/hr/source | TOC Emission Rate, (lb/hr) |
|---|---|---|---|---|
| NA | Valves | 504 | 4.50E-03 | 4.99 |
| NA | Connectors | 491 | 2.00E-04 | 0.22 |
| NA | Pump Seals | 0 | 2.40E-03 | 0.00 |
| NA | Compressor Seals | 44 | 8.80E-03 | 0.85 |
| NA | Pressure Relief Valves | 37 | 8.80E-03 | 0.72 |
| NA | Open-Ended Lines | 133 | 2.00E-03 | 0.59 |
| | Total | | | 7.36 |

The number of sources are calculated based on the number of compressors and dehydrators at the station (see the equipment and instrument count table)

Emission factors (kg/hr/source) are taken from the EPA "1995 Protocol for Equipment Leak Emission Estimates"

TOC Emission Rate (lb/hr) = Emission Factor (kg/hr/source) * 2.2 lb/kg * Number of Sources (#)

The average weight fractions TOC in the gas stream are conservatively assumed to be 1.0

| Gas Stream Composition | | | | |
|---|---|---|---|---|
| Pollutant | Mole Percent, % | Molecular Weight, lb/lb-mole | Density, lb/scf | Weight Percent (%) |
| Carbon Dioxide | 1.6800 | 44.01 | 1.95E-03 | 3.6293 |
| Hydrogen Sulfide | 0.0000 | 34.07 | 0.00E+00 | 0.0000 |
| Nitrogen | 0.6988 | 28.01 | 5.16E-04 | 0.9608 |
| Methane | 82.3344 | 16.04 | 3.48E-02 | 64.8256 |
| Ethane | 8.3012 | 30.07 | 6.58E-03 | 12.2528 |
| Propane | 4.0246 | 44.09 | 4.68E-03 | 8.7101 |
| IsoButane | 0.6927 | 58.12 | 1.06E-03 | 1.9762 |
| Normal Butane | 1.1559 | 58.12 | 1.77E-03 | 3.2977 |
| IsoPentane | 0.3638 | 72.15 | 6.92E-04 | 1.2884 |
| Normal Pentane | 0.2712 | 72.15 | 5.16E-04 | 0.9605 |
| Cyclopentane | 0.0127 | 70.14 | 2.35E-05 | 0.0437 |
| n-Hexane | 0.0862 | 86.17 | 1.96E-04 | 0.3646 |
| Cyclohexane | 0.0306 | 84.16 | 6.79E-05 | 0.1264 |
| Other Hexanes | 0.1985 | 86.18 | 4.51E-04 | 0.8397 |
| Heptanes | 0.0545 | 100.20 | 1.44E-04 | 0.2681 |
| Methylcyclohexane | 0.0444 | 98.19 | 1.15E-04 | 0.2140 |
| 2,2,4-Trimethylpentane | 0.0021 | 100.21 | 5.55E-06 | 0.0103 |
| Benzene | 0.0109 | 78.11 | 2.24E-05 | 0.0418 |
| Toluene | 0.0159 | 92.14 | 3.86E-05 | 0.0719 |
| Ethylbenzene | 0.0003 | 106.17 | 8.40E-07 | 0.0016 |
| Xylenes | 0.0031 | 106.17 | 8.68E-06 | 0.0162 |
| C8+ heavies | 0.0186 | 110.00 | 5.39E-05 | 0.1004 |
| Total | 100.0004 | | 5.37E-02 | 100.0000 |
| TOC | | | 5.12E-02 | 95.4099 |
| VOC | | | 9.85E-03 | 18.3316 |

The gas stream composition is obtained from the La Jara extended gas analysis sampled 5/25/2018

Density (lb/scf) = [Mole Percent (%) / 100] * Molecular Weight (lb/lb-mole) / 379.3 scf/lb-mole

Weight Percent (%) = 100 * Constituent Density (lb/scf) / Total Density (lb/scf)

Number of Compression Units at the Facility: 5
Number of Dehydrators at the Facility: 0

| PROCESS EQUIPMENT DESCRIPTION | EQUIPMENT COUNT | | | | | | INSTRUMENT COUNT | | |
|---|---|---|---|---|---|---|---|---|---|
| | Valves | Connectors | Pump Seals | Compressor Seals | Pressure Relief Valves | Open-end | Flow | Level | Pressure |
| Station inlet, meter run to pulsation dampener | 17 | 14 | 0 | 0 | 1 | 13 | 3 | 0 | 3 |
| Pulsation dampener | 12 | 8 | 0 | 0 | 0 | 2 | 0 | 4 | 1 |
| Compressor suction header | 7 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 1 |
| Suction header feed to instrument gas header | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Compressor discharge header and bypass to station discharge | 6 | 5 | 0 | 0 | 0 | 3 | 0 | 1 | 1 |
| Compressor discharge header and suction header bypass lines | 4 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| Fuel gas header | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 |
| Instrument gas header | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| Station discharge header | 9 | 5 | 0 | 0 | 1 | 6 | 0 | 0 | 2 |
| Fuel gas recovery header | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| Fuel gas feed and filter loop | 15 | 9 | 0 | 0 | 0 | 1 | 0 | 4 | 1 |
| Instrument gas feed and filter loop | 9 | 11 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Produced water storage tank | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| ESD panel | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Starting gas header | 6 | 2 | 0 | 0 | 1 | 3 | 0 | 0 | 0 |
| Hot gas header | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Volume bottle lop | 12 | 4 | 0 | 24 | 1 | 2 | 0 | 0 | 1 |
| Components from Compressors | 220 | 295 | 0 | 20 | 30 | 55 | 0 | 20 | 45 |
| Components from dehydrators | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 341 | 368 | 0 | 44 | 37 | 103 | 3 | 30 | 57 |
| ADJUSTED TOTAL | 504 | 491 | 0 | 44 | 37 | 133 | -- | -- | -- |

The following additions are included in the Adjusted Total:

1 valve is added for each open end line

2 connectors are added for each flow meter

2 valves, 2 connectors and 1 open end line are added for each level gauge

1 connector is added for each pressure gauge

The component count is based on an evaluation of the Sim Mesa Compressor Station (two stage compression)

## Natural Gas Turbine Exhaust Emissions (Criteria Pollutants & HAP) 2019 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | Fuel Heat Content, Btu/scf | Fuel Usage, MMscf/yr | Controls Used, Yes/No | NOX, ton/yr | CO, ton/yr | VOC, ton/yr | SO2, ton/yr | PM10, ton/yr | PM2.5, ton/yr | CO2, tonne/yr | CH4, tonne/yr | N2O, tonne/yr | Acet aldehyde, ton/yr | Form aldehyde, ton/yr | n-Hexane, ton/yr | 2,2,4-TriMP Isooctane, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | 8,431.00 | 1,204.70 | 257.54 | No | 63.5 | 60.7 | 18.6 | 0.5 | 1.0 | 1.0 | 16,462.4 | 0.3 | 0.0 | 0.5 | 0.5 | 0.0 | 0.0 | 1.2 |
| 2 | Solar T4000 | 8,588.00 | 1,204.70 | 262.34 | No | 64.7 | 61.9 | 18.9 | 0.5 | 1.0 | 1.0 | 16,769.0 | 0.3 | 0.0 | 0.5 | 0.5 | 0.0 | 0.0 | 1.2 |
| 3 | Solar T4700 | 8,259.00 | 1,204.70 | 273.77 | No | 99.4 | 18.1 | 10.4 | 0.6 | 1.1 | 1.1 | 17,499.7 | 0.3 | 0.0 | 0.6 | 0.6 | 0.1 | 0.1 | 1.4 |
| 6 | Solar T4700S | 8,446.00 | 1,204.70 | 282.85 | No | 15.3 | 18.7 | 5.4 | 0.6 | 1.1 | 1.1 | 18,080.2 | 0.3 | 0.0 | 0.6 | 0.6 | 0.1 | 0.1 | 1.5 |
| 7 | Solar T4700S | 8,133.00 | 1,204.70 | 272.37 | No | 14.8 | 18.0 | 5.2 | 0.6 | 1.1 | 1.1 | 17,410.1 | 0.3 | 0.0 | 0.6 | 0.6 | 0.1 | 0.1 | 1.5 |

The operating times are provided by Harvest
The fuel heat contents are obtained from the La Jara extended gas analysis sampled 05/25/2018
The fuel usages are calculated below
The use of controls is determined from the permit and confirmed by Harvest
Criteria & HAP Emission Rate (ton/yr) = Emission Rate (lb/hr) * Operating Time (hr/yr) / 2,000 lb/ton
GHG Emission Rate (ton/yr) = Emission Rate (lb/hr) * Operating Time (hr/yr) / 2,204.6 lb/tonne

| Unit Number | Description | | | | | NOX, lb/hr | CO, lb/hr | VOC, lb/hr | SO2, lb/hr | PM10, lb/hr | PM2.5, lb/hr | CO2, lb/hr | CH4, lb/hr | N2O, lb/hr | cetaldehyd lb/hr | ormaldehyd lb/hr | n-Hexane, lb/hr | Isooctane, lb/hr | Total HAP, lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | | | | | 15.1 | 14.4 | 4.4 | 0.1 | 0.2 | 0.2 | 4304.7 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.3 |
| 2 | Solar T4000 | | | | | 15.1 | 14.4 | 4.4 | 0.1 | 0.2 | 0.2 | 4304.7 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.3 |
| 3 | Solar T4700 | | | | | 24.1 | 4.4 | 2.5 | 0.1 | 0.3 | 0.3 | 4671.2 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.3 |
| 6 | Solar T4700S | | | | | 3.6 | 4.4 | 1.3 | 0.1 | 0.3 | 0.3 | 4719.3 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.4 |
| 7 | Solar T4700S | | | | | 3.6 | 4.4 | 1.3 | 0.1 | 0.3 | 0.3 | 4719.3 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.0 | 0.4 |

The NOX, CO & VOC lb/hr emission rates are taken from the current permit or the most recent application
SO2 & Particulate Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) * HHV Design Heat Rate (MMBtu/hr) * (1 - (Control Efficiency (%) / 100))
CO2, CH4 & N2O Emission Rates (lb/hr) = Emission Factor (kg/MMBtu) * 2.2046 lb/kg * HHV Fuel Usage (MMBtu/hr) * (1 - (Control Efficiency (%) / 100))
HAP Emission Rate (lb/hr) = Emission Factor (g/bhp-hr) * Site rating (hp) * (1 - (Control Efficiency (%) / 100)) / 453.59 g/lb

**Control Efficiencies**

| Unit Number | Description | | | | | NOX, % | CO, % | VOC, % | SO2, % | PM10, % | PM2.5, % | CO2, % | CH4, % | N2O, % | cetaldehyd % | ormaldehyd % | n-Hexane, % | Isooctane, % | Total HAP, % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Solar T4000 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Solar T4700 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Solar T4700S | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | Solar T4700S | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

A control efficiency of zero indicates there is no control device for the pollutant
Control efficiencies are taken from manufacturer's data

**Emission Factors**

| Unit Number | Description | | | | | NOX, lb/hr | CO, lb/hr | VOC, lb/hr | SO2, lb/MMBtu | PM10, lb/MMBtu | PM2.5, lb/MMBtu | CO2, kg/MMBtu | CH4, kg/MMBtu | N2O, kg/MMBtu | cetaldehyd g/bhp-hr | ormaldehyd g/bhp-hr | n-Hexane, g/bhp-hr | Isooctane, g/bhp-hr | Total HAP, g/bhp-hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Solar T4000 | | | | | 15.07 | 14.41 | 4.41 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 53.06 | 1.00E-03 | 1.00E-04 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 1.61E-03 | 4.16E-02 |
| 2 | Solar T4000 | | | | | 15.07 | 14.41 | 4.41 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 53.06 | 1.00E-03 | 1.00E-04 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 1.61E-03 | 4.16E-02 |
| 3 | Solar T4700 | | | | | 24.06 | 4.38 | 2.51 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 53.06 | 1.00E-03 | 1.00E-04 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 1.61E-03 | 4.16E-02 |
| 6 | Solar T4700S | | | | | 3.63 | 4.43 | 1.28 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 53.06 | 1.00E-03 | 1.00E-04 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 1.61E-03 | 4.16E-02 |
| 7 | Solar T4700S | | | | | 3.63 | 4.43 | 1.28 | 3.40E-03 | 6.60E-03 | 6.60E-03 | 53.06 | 1.00E-03 | 1.00E-04 | 1.73E-02 | 1.69E-02 | 1.51E-03 | 1.61E-03 | 4.16E-02 |

The NOX, CO & VOC lb/hr emission rates are taken from the current permit or the most recent application
SO2 and particulate emission factors are taken from AP-42, Table 3.1-2a (particulate emission factors include both filterable and condensible emissions)
The CO2, CH4 & N2O emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2
The HAP emission factors are taken from GRI-HAPCalc 3.0

**Fuel Usage**

| Unit Number | Description | Fuel Type | Site Rating, hp | Operating Time, hr/yr | LHV Design Heat Rate, MMBtu/hr | HHV | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Design Heat Rate, MMBtu/hr | Fuel Usage, MMBtu/yr | Fuel Heat Content, Btu/scf | Fuel Usage, MMscf/yr |
| 1 | Solar T4000 | Nat. Gas | 3,123 | 8,431.00 | 33.12 | 36.80 | 310,261 | 1,204.70 | 257.54 |
| 2 | Solar T4000 | Nat. Gas | 3,123 | 8,588.00 | 33.12 | 36.80 | 316,038 | 1,204.70 | 262.34 |
| 3 | Solar T4700 | Nat. Gas | 3,779 | 8,259.00 | 35.94 | 39.93 | 329,809 | 1,204.70 | 273.77 |
| 6 | Solar T4700S | Nat. Gas | 3,934 | 8,446.00 | 36.31 | 40.34 | 340,749 | 1,204.70 | 282.85 |
| 7 | Solar T4700S | Nat. Gas | 3,934 | 8,133.00 | 36.31 | 40.34 | 328,121 | 1,204.70 | 272.37 |

The fuel types and operating times are provided by Harvest
The site ratings are taken from the current permit or the most recent application
The LHV design heat rates are taken from manufacturers data
HHV Design Heat Rate (MMBtu/hr) = LHV Design Heat Rate (MMBtu/hr) / 0.9 LHV/HHV
HHV Fuel Usage (MMBtu/yr) = HHV Design Heat Rate (MMBtu/hr) * Operating Time (hr/yr)
The fuel heat contents are obtained from the La Jara extended gas analysis sampled 05/25/2018
HHV Fuel Usage (MMscf/yr) = HHV Fuel Usage (MMBtu/yr) *1,000,000 Btu/MMBtu / HHV Fuel Heat Content (Btu/scf) / 1,000,000 scf/MMscf

# Storage Tank Emissions (VOC & HAP) 2019 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | Throughput, bbl/yr | VOC, ton/yr | Benzene, ton/yr | Ethylbenzene, ton/yr | n-Hexane, ton/yr | Isooctane, ton/yr | Toluene, ton/yr | Xylene, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | Condensate (working/breathing) | | | 3.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.2 |
| | Condensate (flash) | | | 2.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| | Total | 8,760 | 681 | 6.1 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 |
| T2 | Condensate (working/breathing) | | | 3.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.2 |
| | Condensate (flash) | | | 2.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| | Total | 8,760 | 681 | 6.1 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 |
| T3 | Condensate (working/breathing) | | | 3.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.2 |
| | Condensate (flash) | | | 2.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| | Total | 8,760 | 681 | 6.1 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 |
| T9 | Gasoline | 8,760 | 86 | 0.2 | - | - | - | - | - | - | - |

**Condensate Tanks**

The flashed condensate throughput is provided by Harvest
As an estimate, the flashed condensate throughput is evenly divided between the three condensate tanks.
Working breathing losses are taken from the TANKS 4.0 output file submitted in the most recent application.
The flash gas emissions are taken from the ProMax 3.2 output file provided by Harvest
Total HAP are the sum of the individual HAP identified in the table

A copy of the TANKS 4.0 output file is attached to this spreadsheet as a pdf file
A copy of the ProMax 3.2 output file is attached to this spreadsheet as a pdf file

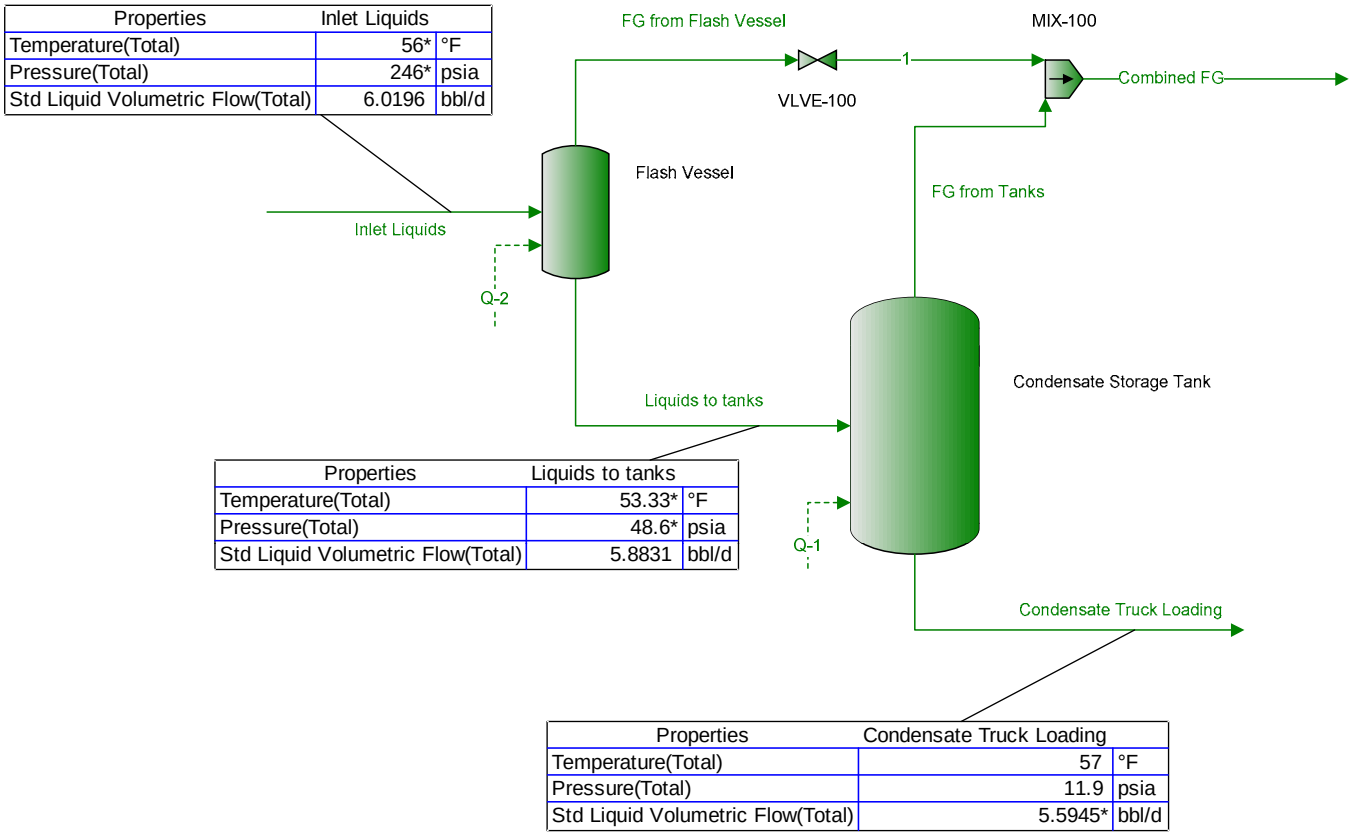

La Jara TANKS T1 T2 & T3.pdf

**Gasoline**

Throughput and emission rate taken from the July 2016 NSR application

# La Jara Condensate Flash Emissions

Stream Combined FG C3+ Mass Flow =8.41 ton/yr




| Properties | Inlet Liquids | |
|---|---|---|
| Temperature(Total) | 56* | °F |
| Pressure(Total) | 246* | psia |
| Std Liquid Volumetric Flow(Total) | 6.0196 | bbl/d |

| Properties | Liquids to tanks | |
|---|---|---|
| Temperature(Total) | 53.33* | °F |
| Pressure(Total) | 48.6* | psia |
| Std Liquid Volumetric Flow(Total) | 5.8831 | bbl/d |

| Properties | Condensate Truck Loading | |
|---|---|---|
| Temperature(Total) | 57 | °F |
| Pressure(Total) | 11.9 | psia |
| Std Liquid Volumetric Flow(Total) | 5.5945* | bbl/d |

| Process Streams | | Combined FG | Condensate Truck Loading | Inlet Liquids | Liquids to tanks |
|---|---|---|---|---|---|
| **Composition** | **Status:** | Solved | Solved | Solved | Solved |
| Phase: **Total** | **From Block:** | MIX-100 | Condensate Storage Tank | -- | Flash Vessel |
| | **To Block:** | -- | -- | Flash Vessel | Condensate Storage Tank |
| **Mass Fraction** | | | | | |
| Nitrogen | | 0.00160500 | 1.21912E-07 | 7.90995E-05* | 7.86591E-06 |
| Methane | | 0.135954 | 0.000109669 | 0.00679469* | 0.00198135 |
| Carbon Dioxide | | 0.0218589 | 9.93702E-05 | 0.00117018* | 0.000654061 |
| Ethane | | 0.175966 | 0.00248999 | 0.0110269* | 0.00831410 |
| Propane | | 0.261756 | 0.0164842 | 0.0285542* | 0.0264777 |
| Isobutane | | 0.0694226 | 0.0126825 | 0.0154747* | 0.0151723 |
| n-Butane | | 0.122324 | 0.0339875 | 0.0383347* | 0.0380022 |
| Isopentane | | 0.0533632 | 0.0387698 | 0.0394880* | 0.0396773 |
| n-Pentane | | 0.0416284 | 0.0418948 | 0.0418817* | 0.0421831 |
| Isohexane | | 0.0621142 | 0.165928 | 0.160819* | 0.162608 |
| n-Hexane | | 0.0186757 | 0.0726428 | 0.0699870* | 0.0708185 |
| 2,2,4-Trimethylpentane | | 0 | 0 | 0* | 0 |
| Benzene | | 0.00265924 | 0.0104172 | 0.0100354* | 0.0101547 |
| Heptane | | 0.0165111 | 0.223729 | 0.213532* | 0.216318 |
| Toluene | | 0.00231199 | 0.0332518 | 0.0317293* | 0.0321442 |
| Octane | | 0.00444569 | 0.209896 | 0.199786* | 0.202461 |
| Ethylbenzene | | 4.69501E-05 | 0.00228339 | 0.00217334* | 0.00220244 |
| o-Xylene | | 0.000333163 | 0.0202662 | 0.0192852* | 0.0195440 |
| Nonane | | 0.000277995 | 0.0464382 | 0.0441666* | 0.0447623 |
| Decane | | 4.53507E-05 | 0.0246637 | 0.0234522* | 0.0237691 |
| Cyclohexane | | 0.00870072 | 0.0439651 | 0.0422297* | 0.0427472 |
| **Mass Flow** | | lb/h | lb/h | lb/h | lb/h |
| Nitrogen | | 0.00463694 | 6.80496E-06 | 0.00464375* | 0.000455627 |
| Methane | | 0.392779 | 0.00612155 | 0.398901* | 0.114768 |
| Carbon Dioxide | | 0.0631517 | 0.00554671 | 0.0686984* | 0.0378860 |
| Ethane | | 0.508375 | 0.138988 | 0.647363* | 0.481588 |
| Propane | | 0.756229 | 0.920124 | 1.67635* | 1.53370 |
| Isobutane | | 0.200566 | 0.707920 | 0.908486* | 0.878846 |
| n-Butane | | 0.353402 | 1.89714 | 2.25054* | 2.20125 |
| Isopentane | | 0.154170 | 2.16408 | 2.31825* | 2.29828 |
| n-Pentane | | 0.120267 | 2.33851 | 2.45878* | 2.44342 |
| Isohexane | | 0.179452 | 9.26187 | 9.44132* | 9.41897 |
| n-Hexane | | 0.0539553 | 4.05482 | 4.10878* | 4.10211 |
| 2,2,4-Trimethylpentane | | 0 | 0 | 0* | 0 |
| Benzene | | 0.00768270 | 0.581474 | 0.589157* | 0.588201 |
| Heptane | | 0.0477016 | 12.4883 | 12.5360* | 12.5301 |
| Toluene | | 0.00667947 | 1.85607 | 1.86275* | 1.86193 |
| Octane | | 0.0128439 | 11.7161 | 11.7290* | 11.7274 |
| Ethylbenzene | | 0.000135642 | 0.127456 | 0.127592* | 0.127575 |
| o-Xylene | | 0.000962529 | 1.13123 | 1.13219* | 1.13207 |
| Nonane | | 0.000803145 | 2.59212 | 2.59292* | 2.59282 |
| Decane | | 0.000131021 | 1.37669 | 1.37682* | 1.37681 |
| Cyclohexane | | 0.0251369 | 2.45408 | 2.47921* | 2.47610 |
| **Mole Fraction** | | | | | |
| Nitrogen | | 0.00214246 | 3.95991E-07 | 0.00024* | 2.46032E-05 |
| Methane | | 0.316901 | 0.000622036 | 0.036* | 0.0108218 |
| Carbon Dioxide | | 0.0185731 | 0.000205454 | 0.00226* | 0.00130221 |
| Ethane | | 0.218832 | 0.00753499 | 0.03117* | 0.0242273 |
| Propane | | 0.221975 | 0.0340155 | 0.05504* | 0.0526129 |
| Isobutane | | 0.0446644 | 0.0198549 | 0.02263* | 0.0228728 |
| n-Butane | | 0.0786996 | 0.0532087 | 0.05606* | 0.0572895 |
| Isopentane | | 0.0276577 | 0.0488956 | 0.04652* | 0.0481861 |
| n-Pentane | | 0.0215756 | 0.0528368 | 0.04934* | 0.0512292 |
| Isohexane | | 0.0269532 | 0.175203 | 0.15862* | 0.165336 |
| n-Hexane | | 0.00810396 | 0.0767033 | 0.06903* | 0.0720066 |
| 2,2,4-Trimethylpentane | | 0 | 0 | 0* | 0 |
| Benzene | | 0.00127304 | 0.0121350 | 0.01092* | 0.0113909 |
| Heptane | | 0.00616173 | 0.203166 | 0.18113* | 0.189159 |
| Toluene | | 0.000938313 | 0.0328382 | 0.02927* | 0.0305682 |
| Octane | | 0.00145535 | 0.167200 | 0.14866* | 0.155301 |
| Ethylbenzene | | 1.65370E-05 | 0.00195706 | 0.00174* | 0.00181774 |
| o-Xylene | | 0.000117349 | 0.0173698 | 0.01544* | 0.0161303 |
| Nonane | | 8.10524E-05 | 0.0329462 | 0.02927* | 0.0305806 |
| Decane | | 1.19190E-05 | 0.0157730 | 0.01401* | 0.0146377 |
| Cyclohexane | | 0.00386594 | 0.0475346 | 0.04265* | 0.0445054 |

## Truck Loading Emissions (VOC & HAP) 2019 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | Production Rate, $10^3$ gal/yr | VOC, ton/yr | Benzene, ton/yr | Cumene, ton/yr | Ethylbenzene, ton/yr | n-Hexane, ton/yr | Toluene, ton/yr | Xylene, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | 9.72 | 85.76 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

The operating time is calculated below

The production rate is provided by Harvest

VOC Emission Rate (ton/yr) = Emission Factor (lb/$10^3$ gal) * Production Rate ($10^3$ gal/yr) * (1 - (Control Efficiency [%] / 100)) / 2000 lb/ton

HAP Emission Rate (ton/yr) = VOC Emission Rate (ton/yr) * (HAP Emission Factor (%) / 100)

| Unit Number | Description | | | VOC, lb/hr | Benzene, lb/hr | Cumene, lb/hr | Ethylbenzene, lb/hr | n-Hexane, lb/hr | Toluene, lb/hr | Xylene, lb/hr | Total HAP, lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | | | 45.0 | 0.0 | 0.0 | 0.0 | 2.2 | 0.2 | 0.0 | 2.5 |

VOC Emission Rate (lb/hr) = Emission Factor (lb/$10^3$ gal) * Production Rate ($10^3$ gal/hr) * (1 - (Control Efficiency [%] / 100))

HAP Emission Rate (lb/hr) = VOC Emission Rate (lb/hr) * (HAP Emission Factor (%) / 100)

**Emission Factors**

| Unit Number | Description | | | VOC, lb/$10^3$ gal | Benzene, Weight % | Cumene, Weight % | Ethylbenzene, Weight % | n-Hexane, Weight % | Toluene, Weight % | Xylene, Weight % | Total HAP, Weight % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | | | 5.11 | 0.0804 | 0.0000 | 0.0008 | 4.8133 | 0.5267 | 0.0413 | 5.4625 |

VOC Emission Factor (lb/$10^3$ gal) = 12.46 * Saturation Factor * True Vapor Pressure of Liquid (psia) * Molecular Weight of Vapors (lb/lb-mole) / Temperature of Liquid (°R)

The VOC emission factor is taken from AP-42, Section 5.2, Equation 1

The individual HAP percentages are estimated from the TANKS 4.0 results as identified in the most recent permit application

Total HAP are the sum of the individual HAP identified in the table

**Liquid Data**

| Unit Number | Description | Saturation Factor | True Vapor Pressure of Liquid, psia | Molecular Weight of Vapors, lb/lb-mole | Temperature of Liquid, °F | Temperature of Liquid, °R | Production Rate, $10^3$ gal/hr | Production Rate, $10^3$ gal/yr | Operating Time, hr/yr | Control Efficiency, % |
|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Truck Loading | 0.6 | 5.32 | 67.37 | 64.94 | 524.61 | 8.82 | 85.76 | 9.72 | 0 |

The saturation factor is taken from AP-42, Table 5.2-1 (submerged loading and dedicated service)

The true vapor pressure of the liquid, the molecular weight of the vapors, and the temperature of the liquid (°F) are taken from the TANKS 4.0 results as identified in the most recent permit app

Temperature of Liquid (°R) = Temperature of Liquid (°F) + 459.67 °F

The production rates and control efficiency are provided by Harvest

Operating Time (hr/yr) = Production Rate (gal/yr) / Production Rate (gal/hr)

The control efficiency is equal to the collection efficiency (90%) times the control device control efficiency (95%)

## Equipment Leaks Emissions (VOC & HAP) 2019 Emission Inventory

**Emission Rates**

| Unit Number | Description | Operating Time, hr/yr | VOC, ton/yr | Benzene, ton/yr | Ethylbenzene, ton/yr | n-Hexane, ton/yr | Isooctane, ton/yr | Toluene, ton/yr | Xylene, ton/yr | Total HAP, ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|
| F1 | Equipment Leaks | 8,760 | 5.9 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 |

The operating time is provided by Harvest (default is the entire year)
VOC & HAP Emission Rate (ton/yr) = Emission Rate (lb/hr) * Operating Time (hr/yr) / 2,000 lb/ton

| Unit Number | Description | | VOC, lb/hr | Benzene, lb/hr | Ethylbenzene, lb/hr | n-Hexane, lb/hr | Isooctane, lb/hr | Toluene, lb/hr | Xylene, lb/hr | Total HAP, lb/hr |
|---|---|---|---|---|---|---|---|---|---|---|
| F1 | Equipment Leaks | | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

VOC & HAP Emission Rate (lb/hr) = Total TOC Emission Rate (lb/hr) * (Weight Percent (%) / 100)

**Weight Percents**

| Unit Number | Description | | VOC, Weight % | Benzene, Weight % | Ethylbenzene, Weight % | n-Hexane, Weight % | Isooctane, Weight % | Toluene, Weight % | Xylene, Weight % | Total HAP, Weight % |
|---|---|---|---|---|---|---|---|---|---|---|
| F1 | Equipment Leaks | | 18.3316 | 0.0418 | 0.0016 | 0.3646 | 0.0103 | 0.0719 | 0.0162 | 0.5064 |

The weight percents are calculated from the gas stream composition (see Gas Stream Composition table)
Total HAP are the sum of the individual HAP identified in the table

| Unit Number | Description | Number of Sources, # | Emission Factor, kg/hr/source | TOC Emission Rate, (lb/hr) |
|---|---|---|---|---|
| NA | Valves | 504 | 4.50E-03 | 4.99 |
| NA | Connectors | 491 | 2.00E-04 | 0.22 |
| NA | Pump Seals | 0 | 2.40E-03 | 0.00 |
| NA | Compressor Seals | 44 | 8.80E-03 | 0.85 |
| NA | Pressure Relief Valves | 37 | 8.80E-03 | 0.72 |
| NA | Open-Ended Lines | 133 | 2.00E-03 | 0.59 |
| | Total | | | 7.36 |

The number of sources are calculated based on the number of compressors and dehydrators at the station (see the equipment and instrument count table)
Emission factors (kg/hr/source) are taken from the EPA "1995 Protocol for Equipment Leak Emission Estimates"
TOC Emission Rate (lb/hr) = Emission Factor (kg/hr/source) * 2.2 lb/kg * Number of Sources (#)
The average weight fractions TOC in the gas stream are conservatively assumed to be 1.0

| Gas Stream Composition | | | | |
|---|---|---|---|---|
| Pollutant | Mole Percent, % | Molecular Weight, lb/lb-mole | Density, lb/scf | Weight Percent (%) |
| Carbon Dioxide | 1.6800 | 44.01 | 1.95E-03 | 3.6293 |
| Hydrogen Sulfide | 0.0000 | 34.07 | 0.00E+00 | 0.0000 |
| Nitrogen | 0.6988 | 28.01 | 5.16E-04 | 0.9608 |
| Methane | 82.3344 | 16.04 | 3.48E-02 | 64.8256 |
| Ethane | 8.3012 | 30.07 | 6.58E-03 | 12.2528 |
| Propane | 4.0246 | 44.09 | 4.68E-03 | 8.7101 |
| IsoButane | 0.6927 | 58.12 | 1.06E-03 | 1.9762 |
| Normal Butane | 1.1559 | 58.12 | 1.77E-03 | 3.2977 |
| IsoPentane | 0.3638 | 72.15 | 6.92E-04 | 1.2884 |
| Normal Pentane | 0.2712 | 72.15 | 5.16E-04 | 0.9605 |
| Cyclopentane | 0.0127 | 70.14 | 2.35E-05 | 0.0437 |
| n-Hexane | 0.0862 | 86.17 | 1.96E-04 | 0.3646 |
| Cyclohexane | 0.0306 | 84.16 | 6.79E-05 | 0.1264 |
| Other Hexanes | 0.1985 | 86.18 | 4.51E-04 | 0.8397 |
| Heptanes | 0.0545 | 100.20 | 1.44E-04 | 0.2681 |
| Methylcyclohexane | 0.0444 | 98.19 | 1.15E-04 | 0.2140 |
| Isooctane | 0.0021 | 100.21 | 5.55E-06 | 0.0103 |
| Benzene | 0.0109 | 78.11 | 2.24E-05 | 0.0418 |
| Toluene | 0.0159 | 92.14 | 3.86E-05 | 0.0719 |
| Ethylbenzene | 0.0003 | 106.17 | 8.40E-07 | 0.0016 |
| Xylenes | 0.0031 | 106.17 | 8.68E-06 | 0.0162 |
| C8+ heavies | 0.0186 | 110.00 | 5.39E-05 | 0.1004 |
| Total | 100.0004 | | 5.37E-02 | 100.0000 |
| TOC | | | 5.12E-02 | 95.4099 |
| VOC | | | 9.85E-03 | 18.3316 |

The gas stream composition is obtained from the La Jara extended gas analysis sampled 05/25/2018
Density (lb/scf) = [Mole Percent (%) / 100] * Molecular Weight (lb/lb-mole) / 379.3 scf/lb-mole
Weight Percent (%) = 100 * Constituent Density (lb/scf) / Total Density (lb/scf)

Number of Compression Units at the Facility: 5
Number of Dehydrators at the Facility: 0

| PROCESS EQUIPMENT DESCRIPTION | EQUIPMENT COUNT | | | | | | INSTRUMENT COUNT | | |
|---|---|---|---|---|---|---|---|---|---|
| | Valves | Connectors | Pump Seals | Compressor Seals | Pressure Relief Valves | Open-end | Flow | Level | Pressure |
| Station inlet, meter run to pulsation dampener | 17 | 14 | 0 | 0 | 1 | 13 | 3 | 0 | 3 |
| Pulsation dampener | 12 | 8 | 0 | 0 | 0 | 2 | 0 | 4 | 1 |
| Compressor suction header | 7 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 1 |
| Suction header feed to instrument gas header | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Compressor discharge header and bypass to station discharge | 6 | 5 | 0 | 0 | 0 | 3 | 0 | 1 | 1 |
| Compressor discharge header and suction header bypass lines | 4 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| Fuel gas header | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 |
| Instrument gas header | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| Station discharge header | 9 | 5 | 0 | 0 | 1 | 6 | 0 | 0 | 2 |
| Fuel gas recovery header | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| Fuel gas feed and filter loop | 15 | 9 | 0 | 0 | 0 | 1 | 0 | 4 | 1 |
| Instrument gas feed and filter loop | 9 | 11 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Produced water storage tank | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| ESD panel | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Starting gas header | 6 | 2 | 0 | 0 | 1 | 3 | 0 | 0 | 0 |
| Hot gas header | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Volume bottle lop | 12 | 4 | 0 | 24 | 1 | 2 | 0 | 0 | 1 |
| Components from Compressors | 220 | 295 | 0 | 20 | 30 | 55 | 0 | 20 | 45 |
| Components from dehydrators | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 341 | 368 | 0 | 44 | 37 | 103 | 3 | 30 | 57 |
| ADJUSTED TOTAL | 504 | 491 | 0 | 44 | 37 | 133 | -- | -- | -- |

The following additions are included in the Adjusted Total:

1 valve is added for each open end line

2 connectors are added for each flow meter

2 valves, 2 connectors and 1 open end line are added for each level gauge

1 connector is added for each pressure gauge

The component count is based on an evaluation of the Sim Mesa Compressor Station (two stage compression)

# Section 15

## Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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**Alternative Operating Scenarios:** Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

**Construction Scenarios**: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: https://www.env.nm.gov/aqb/permit/aqb_pol.html. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

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With this application, Harvest proposes to have the discretion to replace either or both of its unit 1 and/or unit 2 Solar Centaur T-4002 gas turbine compressor engines with a Solar Centaur 40-4702S upgrade turbine (proposed unit 8 and/or 9, respectively). The emission estimates in this permit application take into account four turbine replacement scenarios:

- Scenario 0: Continued operation of turbine units 1 and 2 at the facility (i.e., no turbines replaced);
- Scenario 1: Replacement of the unit 1 turbine with unit 8, and no replacement of unit 2;
- Scenario 2: Replacement of the unit 2 turbine with unit 9, and no replacement of unit 1; and
- Scenario 3 Replacement of both turbine units 1 and 2 with turbine units 8 and 9, respectively.

A period of simultaneous operation of the existing turbine (unit 1 and/or 2) and its replacement turbine (unit 8 and/or 9, respectively) is not requested.

Whether or not turbines 1 and/or 2 are replaced, Harvest is also proposing the following additional permit changes which would be in effect regardless of which scenario (0, 1, 2, or 3) the facility is operated under:

- Revise condition A203 to allow a monthly rolling 12-month total condensate throughput/truck loading to/from the combined units to 6,500 bpy; and the monthly rolling 12-month average 3-phase separator (unit 18) inlet pressure to 205.0 psia.

- Revise permit condition A106, Table 106.A: Allowable Emissions, to limit aggregated emission source unit 'T1 to T3, L1, 18' to 48.6 tpy of VOC.

Under the current permit equivalent to Scenario 0 (no replacement of either turbine unit 1 or 2), the facility $NO_X$ and VOC emissions are greater than 250 tpy, making it a major source under the 20.2.74 NMAC '*Permits - Prevention of Significant Deterioration*' (PSD) permitting program.

If implemented, the above proposed scenarios 1, 2 or 3 would result in an overall lowering of facility emissions of $NO_X$, CO and VOC to below 250 tpy, making the facility a minor PSD source under the 20.2.74 NMAC.

The overall permit application is oriented toward the presentation of data and analyses in support of the proposed turbine options, including the emission calculations, dispersion modeling, and regulatory applicability analysis. (For example, section 6 presents emission calculations for all of the proposed turbine scenarios as well as VOC calculations in support of the proposed permit changes for condensate throughput and emissions; section 7 includes supporting documentation for the proposed unit 8 and 9 Solar Centaur 40-4702S turbines.) Therefore, the reader is directed to the appropriate application section for scenario-specific information.

# Section 20

## Other Relevant Information

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**Other relevant information**. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

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Permitting Administrative Multi-Form, Nov. 7, 2019 removal of gasoline storage tank T-9 from La Jara Compressor Station construction permit 0339-M8-R1 (including delivery verification)

# Permitting Administrative Multi-Form

Use for NSR administrative permit revisions (including GCPs), TV administrative amendments, TV responsible official notifications, and other submittals required by a permit condition. Refer to Section 4 for instructions, acronyms, and mailing addresses.

| **For Department use only:** | | **For Department use only:** |
|---|---|---|
| Reviewed by: | | Received Date |
| Permit revision number: | | |
| Date: | | |
| ☐ Approved ☐ Completed ☐ Denied | | |

## Section 1: General Information – Required for All Submittals

| | | | |
|---|---|---|---|
| 1 | Facility Name: La Jara Compressor Station | | |
| 3 | Preparer/Consultant Name: Lisa Killion | Title: Environmental Scientist | |
| 4 | E-mail: lkillion@cirrusllc.com | Phone: 505-466-1790 | |
| 4 | Address: | | |
| 5 | Air Permit Contact: Kijun Hong | Title: Environmental Specialist | |
| 6 | E-mail: KHong@harvestmidstream.com | Phone: 505-632-4475 | |
| 7 | Address: 1755 Arroyo Drive, Bloomfield, NM 87413 | | |
| 8 | Check all boxes below for which this submittal applies: | AI #: **1010** | Permit #: **339-M8-R1** |

| | | |
|---|---|---|
| ☐ NSR Construction Permit (20.2.72 NMAC)<br>☐ TV Operating Permit (20.2.70 NMAC) | ☐ NOI (20.2.73 NMAC) (Sections 2-B, 2-D)<br>☐ Notice of Exemption (20.2.72.202.B NMAC) (Section 2-F) | ☒ **PSD Permit (20.2.74 NMAC)**<br>☐ Nonattainment Permit (20.2.79 NMAC) |

## Section 2: Details of Submittal

**Only print and submit the pages necessary for your submittal**. Print double sided head-to-toe, flip on short end (tablet). The Permit Section responds to all TV Administrative amendments and responds only to denials of NSR administrative revisions. Courier proof of delivery is required if you want confirmation that the Department received this submittal. Check the box(es) applicable to this submittal:

☐ 2-A(i) & 2-A(ii): Identical Engine or Turbine Replacements

☐ 2-B: Owner, Operator, and Name Changes to NOIs or Construction Permits

☐ 2-C: Ownership or Operational Control Changes for Title V Permits

☒ **2-D: Closing a Facility or Removing Units from a Permit**

☐ 2-E: Correct Typographical Error

☐ 2-F: Reporting Exempt Equipment for Minor Construction Permits or for No Permit Required (NPR) Facilities

☐ 2-G: Add Minor NSR Exempt Equipment to Construction Permits for PSD or Nonattainment Sources

☐ 2-H: Title V Responsible Official Designations

☐ 2-I: Submittals to the Permit Programs Manager

Section 3: Certification – Required for All Changes

Section 4: Form Instructions

## *Section 2-D: Closing a Facility or Removing Units from a Permit*

(Administrative Revision)

Check the appropriate boxes and provide complete information in the table. Closing the permit does not relieve the permittee from any outstanding permit fees.

If any of the units being removed are emission control equipment explain how a permit, federal regulation, or state regulation will not be violated by removal of the control equipment.

☐ Cease operations of the entire facility and cancel the construction permit (20.2.72.219.A(1)(c) NMAC).

| Date the facility ceased operating: |
|---|

☒ **Retire an emissions unit and remove it from the construction permit (20.2.72.219.A(1)(c) NMAC).**

| Date unit(s) retired: **November 1, 2019** |
|---|
| List all retired unit numbers to be removed from the permit: **T-9 (300 barrel gasoline storage tank)** |

☐ Cancel a construction permit for a facility or remove an emissions unit that has not and will not be constructed (20.2.72.219.A(1)(d) NMAC).

| ☐ Facility (plant) will not be constructed, or | ☐ The following units will not be constructed and should be removed from the permit: |
|---|---|

☐ Retire an emissions unit and remove it from the TV permit (20.2.70.404.A(1)(c) NMAC).

| Date unit(s) retired: |
|---|
| List all retired unit numbers to be removed from the permit: |

☐ Voluntary Discontinuation of the TV permit (20.2.70.400.I NMAC).

| Date the TV permit was no longer required: |
|---|
| Explanation: |

☐ Cancel a construction permit that is no longer required.

| Explanation: |
|---|

☐ Removal of minor NSR exempt equipment.

| Explanation: |
|---|

## Section 3: Certification – Required for All Applications

Company Name: Harvest Four Corners, LLC

I, Kijun Hong, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 7th day of November, 2019, upon my oath or affirmation, before a notary of the State of New Mexico.

Signature[1] Date: 11/7/2019

Kijun Hong — Printed Name

Env. Specialist — Title

Scribed and sworn before me on this 7th day of November, 2019.

My authorization as a notary of the State of New Mexico expires on the 10th day of January, 2022.

Rose M Costa — Notary's Signature

Date: 11-07-19

Rose M. Costa

Notary's Printed Name

[1] For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC:

ROSE M. COSTA NOTARY PUBLIC STATE OF NEW MEXICO

## Section 4: Form Instructions

- Every administrative revision, amendment, or notification must include a completed **Section 1 - General Information**, and **Section 3 - Certification**.
- Complete and print only the appropriate page(s) in **Section 2**.
- Do not include **Section 4** in your submittal.
- To reduce file space please **only submit the necessary pages**, and print double-sided head to toe, flip on short end (tablet). No fee is required with this form. Attach the submitted form to the permit being revised or amended for your records. Use this multi-form for:

1) Replacements of identical internal combustion (IC) engines and turbines must meet the requirements of AQB procedure number 02-007.00, Replacement of Identical IC Engines and Turbines, found at www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. [Section 2-A(i) and (ii).]
2) Administrative permit revisions to construction permits per 20.2.72.219.A(1) NMAC (New Mexico Administrative Code), including:
    - changes in ownership [Section 2-B].
    - a change in the permit to retire a source [Section 2-D].
    - closing of a facility and canceling the permit [Section 2-D].
    - correcting typographical errors [Section 2-E].
    - notifying the Department that the source(s) have not and will not be built [Section 2-D].
3) Administrative permit amendments to Title V operating permits per 20.2.70.404.A(1) NMAC, including:
    - a change in the permit to retire an emissions unit [Section 2-D].
    - canceling the Title V permit [Section 2-D].
    - changes in ownership or operational control of a Title V source that meet the requirements in 20.2.70.404.A(2) NMAC [Section 2-C].
    - correcting typographical errors [Section 2-E].
4) Designations of Responsible Officials for Title V operating permits [Section 2-H].
5) Addition of exempt equipment to a construction permit under 20.2.72.202 NMAC [Section 2-G].
6) Addition of certain exempt equipment to a Prevention of Significant Deterioration (PSD) major source (20.2.74.7.AG NMAC) or Nonattainment major source (20.2.79.7.V NMAC). For PSD or Nonattainment sources, equipment must meet the exemption in 20.2.72.202.A(4), B(1), (2), (3), (5), (6), or (7). Potential to emit must be below significant emission rates to add this equipment using an administrative permit revision [fill out Sections 2-F(i) and (ii)].

Do **not** use this form in place of the **Compliance and Enforcement "Report Submittal Form"** for the Compliance and Enforcement program (such as notifications required by NSPS or MACTs, excess emissions reports, Title V semi-annual or annual reports, or test reports.)

### *Mail Application To:*

New Mexico Environment Department Air Quality Bureau
Permit Programs Manager
525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505

### *Contact:*

Phone: (505) 476-4300
Fax: (505) 476-4375
www.env.nm.gov/air-quality/

## *Acronym List*

NSR – New Source Review
GCP – General Construction Permit
TV – Title V
RO – Responsible Official for TV program
NOI – Notice of Intent
PSD – Prevention of Significant Deterioration
NMAC – New Mexico Administrative Code
CFR – Code of Federal Regulations
NSPS – New Source Performance Standard
MACT – Maximum Achievable Control Technology (National Emission Standards for Hazardous Air Pollutants in 40 CFR Part 63)
AQB – Air Quality Bureau
NPR – No Permit Required

## *Nonattainment Information*

The major nonattainment significant emission rates apply only in areas that are modeled or monitored nonattainment regardless of the federal Clean Air Act 107 area designation. See 20.2.79.109.A(2) NMAC and the following definition from 20.2.79.7.AA: "Nonattainment area" means, for any air pollutant an area which is shown by monitored data or which is calculated by air quality modeling (or other methods determined by the administrator to be reliable) to exceed any national ambient air quality standard for such pollutant. Such term includes any area identified under Subparagraphs (A) through (C) of Section 107(d)(1) of the federal Clean Air Act.

The significant emission rates for carbon monoxide, nitrogen oxides, and volatile organic compounds are lower when an area is classified as serious, severe, or extreme (20.2.79.7.AM NMAC).

| **Pollutant** | **Nonattainment Significant Emission Rates (tpy)** |
|---|---|
| Carbon Monoxide (CO) | 100<br>50 (in areas classified as severe for carbon monoxide) |
| Nitrogen Oxides ($NO_X$) | 40 (in areas classified as marginal or moderate for ozone)<br>25 (in areas classified as serious or severe for ozone)<br>any amount (in areas classified as extreme for ozone) |
| Volatile Organic Compounds (VOC) | 40 (in areas classified as marginal or moderate for ozone)<br>25 (in areas classified as serious or severe for ozone)<br>any amount (in areas classified as extreme for ozone |


**After printing this label**:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning**: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Tristen Ruybalid

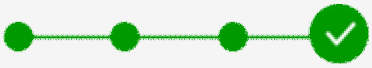
From: TrackingUpdates@fedex.com
Sent: Friday, November 8, 2019 11:09 AM
To: Tristen Ruybalid
Subject: [EXTERNAL] FedEx Shipment 776929760057 Delivered

# Your package has been delivered

## Tracking # 776929760057

Ship date:
Thu, 11/7/2019

**Tristen Ruybalid**
Harvest Four Corners, LLC
Bloomfield, NM 87413
US




Delivery date:
Fri, 11/8/2019 11:03 am

**Program Manager, Permits Section**
NMED Air Quality Bureau
525 Camino de los Marquez
Suite 1
SANTA FE, NM 87505
US

## Personalized Message

La Jara T-9 Removal Admin Rev

## Shipment Facts

Our records indicate that the following package has been delivered.

| | |
|---|---|
| **Tracking number:** | 776929760057 |
| **Status:** | Delivered: 11/08/2019 11:03 AM Signed for By: J.LOPEZ |
| **Signed for by:** | J.LOPEZ |
| **Delivery location:** | SANTA FE, NM |
| **Delivered to:** | Receptionist/Front Desk |
| **Service type:** | FedEx Standard Overnight® |
| **Packaging type:** | FedEx® Envelope |
| **Number of pieces:** | 1 |
| **Weight:** | 0.50 lb. |

| | |
|---|---|
| **Special handling/Services:** | Deliver Weekday |
| **Standard transit:** | 11/8/2019 by 3:00 pm |

## This tracking update has been requested by:

| | |
|---|---|
| **Company name:** | Harvest Four Corners, LLC |
| **Name:** | Tristen Ruybalid |
| **Email:** | truybalid@harvestmidstream.com |

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 12:08 PM CST on 11/08/2019.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

This tracking update has been sent to you by FedEx on behalf of the Requestor truybalid@harvestmidstream.com. FedEx does not validate the authenticity of the requestor and does not validate, guarantee or warrant the authenticity of the request, the requestor's message, or the accuracy of this tracking update.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.



Thank you for your business.