SWCA
ENVIRONMENTAL CONSULTANTS

NSR Application for the RIO Terminal Loving, Eddy County, New Mexico

Submitted to:

New Mexico Environment Department

Air Quality Bureau
Permits Section
525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505

Submitted by:

Rangeland NM, LLC

2150 Town Square Place, Suite 700
Sugar Land, TX 77479

August 2017

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525 Camino de los Marquez, Suite 1

Santa Fe, New Mexico 87505

Submitted by:

SWCA Environmental Consultants

3033 North Central Avenue, Suite 145

Phoenix, Arizona 85012

On Behalf of:

Rangeland NM, LLC

2150 Town Square Place, Suite 700

Sugar Land, Texas 77479

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Mail Application To:		**For Department use only:**
New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 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. For NOI applications, submit the entire UA1, UA2, and UA3 applications on a single CD (no copies are needed). For NOIs, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required.

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 **X** 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:

X 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.

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

X Check No.: 006431 in the amount of $500.00

☐ 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: **20.2.72.200.A 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.):	Updating Permit/NOI #: 5322
1	Facility Name: RIO Terminal	Plant primary SIC Code (4 digits): 4013	
		Plant NAIC code (6 digits):	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): 71 Potash Mines Road, Loving, NM 88256		
2	Plant Operator Company Name: Rangeland NM, LLC	Phone/Fax: (281) 566-3000	
a	Plant Operator Address: 2150 Town Square Place, Suite 700, Sugar Land, TX 77479		
b	Plant Operator's New Mexico Corporate ID or Tax ID: 46-224-5174		

3	Plant Owner(s) name(s): Rangeland NM, LLC	Phone/Fax: (281) 566-3000
a	Plant Owner(s) Mailing Address(s): 2150 Town Square Place, Suite 700, Sugar Land, TX 77479	
4	Bill To (Company): Rangeland NM, LLC	Phone/Fax: (281) 566-3000
a	Mailing Address: 2150 Town Square Place, Suite 700, Sugar Land, TX 77479	E-mail: jyoung@rgldenergy.com
5	☐ Preparer: **X** Consultant: SWCA Environmental Consultants	Phone/Fax: (602) 274-3831/(602) 274-3958
a	Mailing Address: 3033 North Central Avenue, Suite 145, Phoenix AZ 85012	E-mail: cvillarreal@swca.com
6	Plant Operator Contact: Joe Young	Phone/Fax: (734) 548-3617
a	Address: 2150 Town Square Place, Suite 700, Sugar Land, TX 77479	E-mail: jyoung@rgldenergy.com
7	Air Permit Contact: Joe Young	Title: Superintendent
a	E-mail: jyoung@rgldenergy.com	Phone/Fax: (734) 548-3617
b	Mailing Address: 2150 Town Square Place, Suite 700, Sugar Land, TX 77479	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? **X** Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? **X** Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? **X** Yes ☐ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☐ Yes **X** No
3	Is the facility currently shut down? ☐ Yes **X** No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes **X** No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐Yes ☐No ☐N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes **X** No	If yes, the permit No. is: P-
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes **X** No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? **X** Yes ☐ No	If yes, the NOI No. is: 5322
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☐ Yes **X** No	If yes, the permit No. is:
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes **X** No	If yes, the register No. is:

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 285 bbl/hr	Daily: 6,840 bbl/day	Annually: 2,496,690 bbl/yr
b	Proposed	Hourly: 285 bbl/hr	Daily: 6,840 bbl/day	Annually: 2,000,000 bbl/yr
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 0	Daily: 0	Annually: 0
b	Proposed	Hourly: 0	Daily: 0	Annually: 0

Section 1-D: Facility Location Information

1	Section: 17	Range: 28E	Township: 23S	County: Eddy	Elevation (ft): 3,040
2	UTM Zone: ☐ 12 or **X** 13			Datum: ☐ NAD 27 ☐ NAD 83 **X** WGS 84	
a	UTM E (in meters, to nearest 10 meters): 584300			UTM N (in meters, to nearest 10 meters): 3574275	
b	**AND** Latitude (deg., min., sec.): 32° 18' 08" N			Longitude (deg., min., sec.): 104° 06' 16" W	
3	Name and zip code of nearest New Mexico town: Loving, 88256				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): Go north on Carter Rd (CR-712). Turn left on NM-31/Potash Mines Rd, go approximately 0.5 mile.				
5	The facility is 1.0 (distance) miles north (direction) of Loving (nearest town).				
6	Status of land at facility (check one): **X** Private ☐ Indian/Pueblo ☐ Federal BLM ☐ Federal Forest Service ☐ Other (specify)				
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: Loving, Carlsbad, Eddy County				
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/aqb/modeling/class1areas.html)? **X** Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: Carlsbad Caverns National Park, 30 km West-Southwest Texas, 35 km South				
9	Name nearest Class I area: Carlsbad Caverns National Park				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 29.89 km				
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: 40 m				
12	Method(s) used to delineate the Restricted Area: Barb wire fence around the perimeter of the property. "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.				
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes **X** No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.				
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☐ No ☒ Yes If yes, what is the name and permit number (if known) of the other facility? RIO Terminal Frac Sand Plant NSR Permit No.: 6111				

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): 24	($\frac{\text{days}}{\text{week}}$): 7	($\frac{\text{weeks}}{\text{year}}$): 52	($\frac{\text{hours}}{\text{year}}$): 8,760			
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$)? Start:		☐AM ☐PM	End:	☐AM ☐PM		
3	Month and year of anticipated start of construction: Summer 2017						
4	Month and year of anticipated construction completion: Summer 2017						
5	Month and year of anticipated startup of new or modified facility: Summer 2017						
6	Will this facility operate at this site for more than one year? **X** Yes ☐ No						

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes **X** No If yes, specify:

a	If yes, NOV date or description of issue:		NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes **X** No If Yes, provide the 1c & 1d info below:		
c	Document Title:	Date:	Requirement # (or page # and paragraph #):
d	Provide the required text to be inserted in this permit:		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? **X** Yes ☐ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes **X** No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? **X**Yes ☐ No		
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☐ **Minor** (**X** <10 tpy of any single HAP **AND** **X** <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes **X** No		
a	If yes, include the name of company providing commercial electric power to the facility: _____ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application

(This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, "Addendum for Streamline Applications." **X** N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC):		Phone:
a	R.O. Title:	R.O. e-mail:	
b	R. O. Address:		
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):		Phone:
a	A. R.O. Title:	A. R.O. e-mail:	
b	A. R. O. Address:		
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship):		
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.):		
a	Address of Parent Company:		
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.):		
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations:		
7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers:		

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package printed double sided 'head-to-toe' 2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. If 'head-to-toe printing' is not possible, print single sided. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required.

2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy does not need to be 2-hole punched. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.

3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically on compact disk(s) (CD). For permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal.

4) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver OR** one additional electronic copy of the air dispersion modeling including the input and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau. The complete dispersion modeling study, including all input/output files, should be submitted electronically as part of the electronic submittal.

5) If subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted in duplicate (2 separate CDs). A single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format with the number of additional hard copies corresponding to the number of CD copies required. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 3 electronic files (2 MSWord docs: Universal Application section 1 and Universal Application section 3-19) and 1 Excel file of the tables (Universal Application section 2) on the CD(s). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision # (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. The footer information should not be modified by the applicant.

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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.
TL-1	Crude Oil Transloader #1	TBD	TBD	TBD	347 gal/min	347 gal/min	/ 5/1/2014	N/A / N/A	30699999	X Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TL-2	Crude Oil Transloader #2	TBD	TBD	TBD	347 gal/min	347 gal/min	/ 5/1/2014	N/A / N/A	30699999	X Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
C-1	Frac Sand Transloader #1	S&A	1215	TBD	210 tons/hour	210 tons/hour	/ 5/1/2014	CDC-1 / CDC-1	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced		
C-2	Frac Sand Transloader #2	S&A	1215	TBD	210 tons/hour	210 tons/hour	/ 5/1/2014	CDC-2 / CDC-2	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced		
C-3	Frac Sand Transloader #3	S&A	1215	TBD	210 tons/hour	210 tons/hour	/ 5/1/2014	CDC-3 / CDC-3	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced		
C-4	Frac Sand Transloader #4	S&A	1215	TBD	210 tons/hour	210 tons/hour	/ 5/1/2014	CDC-4 / CDC-4	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced		
C-1	Frac Sand Transloader #1	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-1 / CDC-1	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced		C-1
C-2	Frac Sand Transloader #2	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-2 / CDC-2	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced		C-2
C-3	Frac Sand Transloader #3	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-3 / CDC-3	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced		C-3
C-4	Frac Sand Transloader #4	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-4 / CDC-4	30502760	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced		C-4
C-5	Frac Sand Transloader #5	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	N/A / Upon Permit	CDC-5 / CDC-5	30502760	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
C-6	Frac Sand Transloader #6	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-6 / CDC-6	30502760	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
C-7	Frac Sand Transloader #7	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-7 / CDC-7	30502760	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
C-8	Frac Sand Transloader #8	Rail Barge Truck Services	3655	TBD	237.5 tons/hour	237.5 tons/hour	/ Upon Permit	CDC-8 / CDC-8	30502760	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
CE-1	Transloader Engine #1	Deutz	L03i	TBD	46 hp	46 hp	N/A / 5/1/2014	N/A / CES-1	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced	CI	
CE-2	Transloader Engine #2	Deutz	L03i	TBD	46 hp	46 hp	/ 5/1/2014	N/A / CES-2	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced	CI	

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.
CE-3	Transloader Engine #3	Deutz	L03i	TBD	46 hp	46 hp	5/1/2014	N/A / CES-3	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced	CI	
CE-4	Transloader Engine #4	Deutz	L03i	TBD	46 hp	46 hp	5/1/2014	N/A / CES-4	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified X To be Replaced	CI	
CE-1	Transloader Engine #1	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-1	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	CE-1
CE-2	Transloader Engine #2	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-2	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	CE-2
CE-3	Transloader Engine #3	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-3	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	CE-3
CE-4	Transloader Engine #4	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-4	20200102	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional X Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	CE-4
CE-5	Transloader Engine #5	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-5	20200102	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
CE-6	Transloader Engine #6	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-6	20200102	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
CE-7	Transloader Engine #7	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-7	20200102	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
CE-8	Transloader Engine #8	John Deere	4045T	TBD	74 hp	74 hp	Upon Permit	N/A / CES-8	20200102	☐ Existing (unchanged) ☐ To be Removed X New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
Unpaved Roads	Unpaved Roads	-	-	-	-	-	Upon Permit	N/A / N/A	30501090	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit X To Be Modified ☐ To be Replaced		
Paved Roads	Paved Roads	-	-	-	-	-	Upon Permit	N/A / N/A	30501090	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit X To Be Modified ☐ To be Replaced		
T-1	Diesel Fuel Tank	TBD	TBD	TBD	1,000 gal	1,000 gal	9/10/2014	N/A / N/A	3909003	X Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

[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.
* "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

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at http://www.env.nm.gov/aqb/forms/InsignificantListTitleV.pdf . TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
*** THIS TABLE INTENTIONALLY LEFT BLANK ***							
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

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[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. 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.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
TLVL-1	Vapor line connecting railcar and TL-1	5/1/2014	VOCs, HAPs	TL-1		
TLVL-2	Vapor line connecting railcar and TL-2	5/1/2014	VOCs, HAPs	TL-2		
CDC-1	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-1	99	Vendor
CDC-2	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-2	99	Vendor
CDC-3	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-3	99	Vendor
CDC-4	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-4	99	Vendor
CDC-5	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-5	99	Vendor
CDC-6	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-6	99	Vendor
CDC-7	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-7	99	Vendor
CDC-8	Dust control system C-1	Upon permit	TSP, $PM_{2.5}$ and PM_{10}	C-8	99	Vendor

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Emissions (under normal operating conditions)

This Table was intentionally left blank because it would be identical to Table 2-E.

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. 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		TSP[2]		PM10[2]		PM2.5[2]		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
TL-1	-	-	-	-	10.17	44.57	-	-	-	-	-	-	-	-	-	-	-	-
TL-2	-	-	-	-	10.17	44.57	-	-	-	-	-	-	-	-	-	-	-	-
C-1	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-2	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-3	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-4	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-5	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-6	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-7	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-8	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
CE-1	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-2	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-3	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-4	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-5	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-6	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-7	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-8	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
Unpaved Roads	-	-	-	-	-	-	-	-	7.71	27.49	1.97	7.01	0.20	0.70	-	-	-	-
Paved Roads	-	-	-	-	-	-	-	-	1.73	7.60	0.35	1.52	0.09	0.37	-	-	-	-
T-1	-	-	-	-	2.51E-04	1.10E-03	-	-	-	-	-	-	-	-	-	-	-	-
Totals	4.56	19.97	4.85	21.24	24.90	109.10	0.01	0.03	10.00	37.55	2.61	9.80	0.58	2.34	0	0	0	0

[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 TSP unless TSP is set equal to PM10 and PM2.5.

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		TSP[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
TL-1	-	-	-	-	10.17	35.70	-	-	-	-	-	-	-	-	-	-	-	-
TL-2	-	-	-	-	10.17	35.70	-	-	-	-	-	-	-	-	-	-	-	-
C-1	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-2	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-3	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-4	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-5	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-6	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-7	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
C-8	-	-	-	-	-	-	-	-	0.03	0.15	-	-	-	-	-	-	-	-
CE-1	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-2	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-3	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-4	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-5	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-6	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-7	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
CE-8	0.570	2.50	0.606	2.66	0.570	2.50	0.0010	0.0042	0.036	0.159	0.036	0.159	0.036	0.159	-	-	-	-
Unpaved Roads	-	-	-	-	-	-	-	-	7.71	27.49	1.97	7.01	0.20	0.70	-	-	-	-
Paved Roads	-	-	-	-	-	-	-	-	1.73	7.60	0.35	1.52	0.09	0.37	-	-	-	-
T-1	-	-	-	-	2.51E-04	1.10E-03	-	-	-	-	-	-	-	-	-	-	-	-
Totals	4.56	19.97	4.85	21.24	24.90	91.37	0.01	0.03	10.00	37.55	2.61	9.80	0.58	2.34	0	0	0	0

[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 TSP unless TSP is set equal to PM10 and PM2.5.

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

X This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. 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		TSP[2]		PM10[2]		PM2.5[2]		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
Totals																		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[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 TSP unless TSP is set equal to PM10 and PM2.5.

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

X I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		TSP		PM10		PM2.5		☐ H_2S or ☐ 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
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here: Normal operating scenario

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
CES-1	CE-1	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-2	CE-2	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-3	CE-3	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-4	CE-4	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-5	CE-5	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-6	CE-6	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-7	CE-7	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-8	CE-8	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CDC-1	C-1	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-2	C-2	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-3	C-3	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-4	C-4	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-5	C-5	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-6	C-6	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-7	C-7	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-8	C-8	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here: Alternative operating scenario

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
CES-1	CE-1	V	No	4.25	1238.00	4.416	4.416	Atmospheric	264.419	0.146
CES-2	CE-2	V	No	4.25	1238.00	4.416	4.416	Atmospheric	264.419	0.146
CES-3	CE-3	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-4	CE-4	V	No	4.25	1238.00	4.416	4.416	Atmospheric	264.419	0.146
CES-5	CE-5	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-6	CE-6	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-7	CE-7	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CES-8	CE-8	V	No	8.33	925.00	9.232	9.232	Atmospheric	106.019	0.331
CDC-1	C-1	V	No	6.75	Ambient	4.4494	4.4494	Atmospheric	90.785	0.250
CDC-2	C-2	V	No	6.75	Ambient	4.4494	4.4494	Atmospheric	90.785	0.250
CDC-3	C-3	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-4	C-4	V	No	6.75	Ambient	4.4494	4.4494	Atmospheric	90.785	0.250
CDC-5	C-5	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-6	C-6	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-7	C-7	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005
CDC-8	C-8	V	No	6.75	Ambient	6.666	6.666	Atmospheric	8.399	1.005

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		Benzene X HAP or ☐ TAP		Toluene X HAP or ☐ TAP		Xyelenes X HAP or ☐ TAP		Ethylbenzene X HAP or ☐ TAP		N-Hexane X 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
TL-1	TL-1	0.35	1.2	0.17	0.6	0.02	0.1	0.01	0.0	0.01	0.0	0.13	0.5						
TL-2	TL-2	0.35	1.2	0.17	0.6	0.02	0.1	0.01	0.1	0.01	0.1	0.13	0.5						
Totals:		0.70	2.4	0.34	1.2	0.04	0.2	0.02	0.1	0.02	0.1	0.26	1.0						

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, …)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
CE-1	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-2	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-3	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-4	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-5	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-6	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-7	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0
CE-8	Diesel	purchased	129,488 btu/gal	32.21 lb/hr	282,156 lb/year	15 ppm	0

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
T-1	3909003	Diesel Fuel	Diesel Fuel	7.1	188	60.8	0.0073	70.8	0.0092

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			
T-1	9/10/2014	Diesel Fuel	N/A	FX	24	4	3.3	TBD	WH	WH	Good	317,922	317.92

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
FX: Fixed Roof	**Mechanical Shoe Seal**	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**	**WH**: White	Good
IF: Internal Floating Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**LG**: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Frac Sand	SiO2	Solid	445.4 tons/hour, 3,901,890 tons/yr				
Crude Oil	Crude Oil	Liquid	285 bbl/hr, 2,000,000 bbl/yr				

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
*** THIS TABLE INTENTIONALLY LEFT BLANK ***									

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
*** THIS TABLE INTENTIONALLY LEFT BLANK ***								

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box **X** By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	**N_2O** ton/yr	**CH_4** ton/yr	**SF_6** ton/yr	**PFC/HFC** ton/yr[2]									**Total GHG** Mass Basis ton/yr[4]	**Total CO_2e** ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**22,800**	**footnote 3**										
	mass GHG	*** THIS TABLE INTENTIONALLY LEFT BLANK ***														
	CO_2e															
	mass GHG															
	CO_2e															
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	mass GHG															
	CO2e															
Total	**mass GHG**															
	CO_2e															

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

Section 3

Application Summary

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).

Routine or predictable emissions during Startup, Shutdown, and Maintenance (SSM): 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.

Rangeland New Mexico, LLC (Rangeland) has applied for and received NOI #5322 for a crude oil and frac sand transloading facility (the RIO Terminal) near Loving, New Mexico in October 2013. Rangeland submitted Revision #1 to NOI #5322 on August 27, 2014 and received authorization for the revision on September 10, 2014. This NOI authorized two (2) x 347 gallon per hour (gph) crude transloaders, four (4) x 210 ton per hour (tph) frac sand transloaders, four (4) 46 horsepower (hp) Deutz diesel-fired transloader engines, and a single 1,000-gallon diesel storage tank.

Rangeland is planning to add new emission units to the RIO Terminal and since the potential emission rates will exceed 10 lb/hr and/or 25 tpy of an air pollutant, Rangeland is submitting this New Source Review (NSR) permit application under 20.2.72.200.A.2 NMAC. Revisions to the RIO Terminal will consist of:

(1) adding several emission units not included in the original NOI application or previous NOI revision application (shown in the table below);
(2) replacing emission units (shown in the table below);
(3) updating the current road conditions; and
(4) revising the alternate operating scenario.

Current Activities

Emission units authorized by the NOI at the RIO Terminal are currently in operation. This revision will not change principal operations at the RIO Terminal described in the previous application. Principal operations include:

(1) transloading crude oil from tanker trucks into railcars; and
(2) transloading frac sand from railcars into trucks.

Addition of Emission Units, Removal of Emission Unit, Replacement of Emission Unit, and Update of Current Road Conditions

The proposed equipment changes are summarized in the table below:

Original NOI #5322	Existing NOI #5322	Proposed Revision	Change
2 Frac Sand Transloaders.	5 Frac Sand Transloaders (with one operating as a spare, so only 4 operate at one time).	11 Frac Sand Transloaders (with 3 operating as a spare, so only 8 operate at one time).	Addition of 6 Frac Sand Transloaders.
			Increased truck traffic due to increased frac sand material throughput.
Frac Sand Transloaders are	Frac Sand Transloaders driven	8 Frac Sand Transloaders	Addition of 6 up to 74-hp

driven by 60-hp engines.	by 46-hp engines.	are driven by 74-hp engines. Three (3) spare Frac Sand Transloaders are driven by 46-hp engines. Only 8 transloaders operate at one time.	engines. There were five (5) 46-hp engines, one being a spare. One (1) 46-hp stays a spare. Two (2) 46-hp become spares. Two (2) 46-hp engines are replaced with 74-hp engines. Six (6) additional 74-hp engines are added.
Frac Sand Transloader engines are rated as 60-hp engines	Frac Sand Transloader engines are rated as 46-hp engines	Frac Sand Transloader engines are rated as *up to* 74-hp engines.	The emission calculations are based on the maximum emissions of (8) 74-hp engines
Frac Sand Transloaders are capable of transloading up to 300 tons/hour each	Frac Sand Transloaders are capable of transloading up to 210 tons/hour each	8 Frac Sand Transloaders are capable of transloading up to 237.5 tons/hour each. Three (3) spare transloaders are capable of transloading up to 210 tons/hour each. Only 8 transloaders operate at one time.	Revision of emission calculations for increased throughput rate.
2 Crude Oil Transloaders	2 Crude Oil Transloaders with a 347 gallons/minute flowrate	2 Crude Oil Transloaders with a 347 gallons/minute flowrate	No change.
Crude Oil Transloaders are driven by electric engines	Crude Oil Transloaders are driven by electric engines	Crude Oil Transloaders are driven by electric engines	No change.
Crude Oil Transloaders are capable of transloading up to 400 gallons/min each	Crude Oil Transloaders are capable of transloading up to 347 gallons/min each. Total volume of oil transloaded per year up to 2,496,689.94 bbl/year.	Crude Oil Transloader is capable of transloading up to 347 gallons/min each. Total volume of oil transloaded per year up to 2,000,000 bbl/year.	Oil transloader emissions are based on a total volume of oil transloaded equal to 2,000,000 barrels per year.
No Fuel Tank	1,000 gallon Diesel Fuel Tank	1,000 gallon Diesel Fuel Tank	No change from previous revision.
Material trucks travel 1.5 miles round-trip on unpaved roads with base coarse per trip	Material trucks travel 1.5 miles round-trip on unpaved roads with base coarse per trip	Material trucks travel 1.22 miles round-trip on paved roads and 0.28 miles round-trip on unpaved roads with base coarse and watering per trip.	Revision of fugitive dust emission calculations to account for paving of 3,226 feet of access road. Revision of emission calculations to account for watering of unpaved roads with base coarse.

As noted in the previous revision, the frac sand transloader emissions are separated into material handling emissions and engine emissions in separate emission units. Therefore, material handling emissions from Frac Sand Transloader #1 are labeled "C-1", and emissions from the engine are under emission unit "CE-1". In the original application, emission units C-1 and C-2 represented all emissions from each frac sand transloader (i.e., both material handling and engine emissions).

Startup, Shutdown, and Maintenance (SSM) Emissions

The New Mexico Environment Department requires routine or predictable startup, shutdown, or maintenance (SSM) emissions to be included in this application. Emissions from the RIO Terminal are based on the rate of throughput of frac sand and oil through the plant. Since the plant will not process additional throughput during startup and shutdown, emissions will not exceed the maximums calculated in this application, which assume continuous operation. Plant equipment will be deactivated during periods of maintenance and malfunction, and no emissions are expected during these periods.

Since emissions during SSM periods are expected to be less than or equal to emissions calculated for normal operations, SSM emissions are not estimated in this application.

Section 4

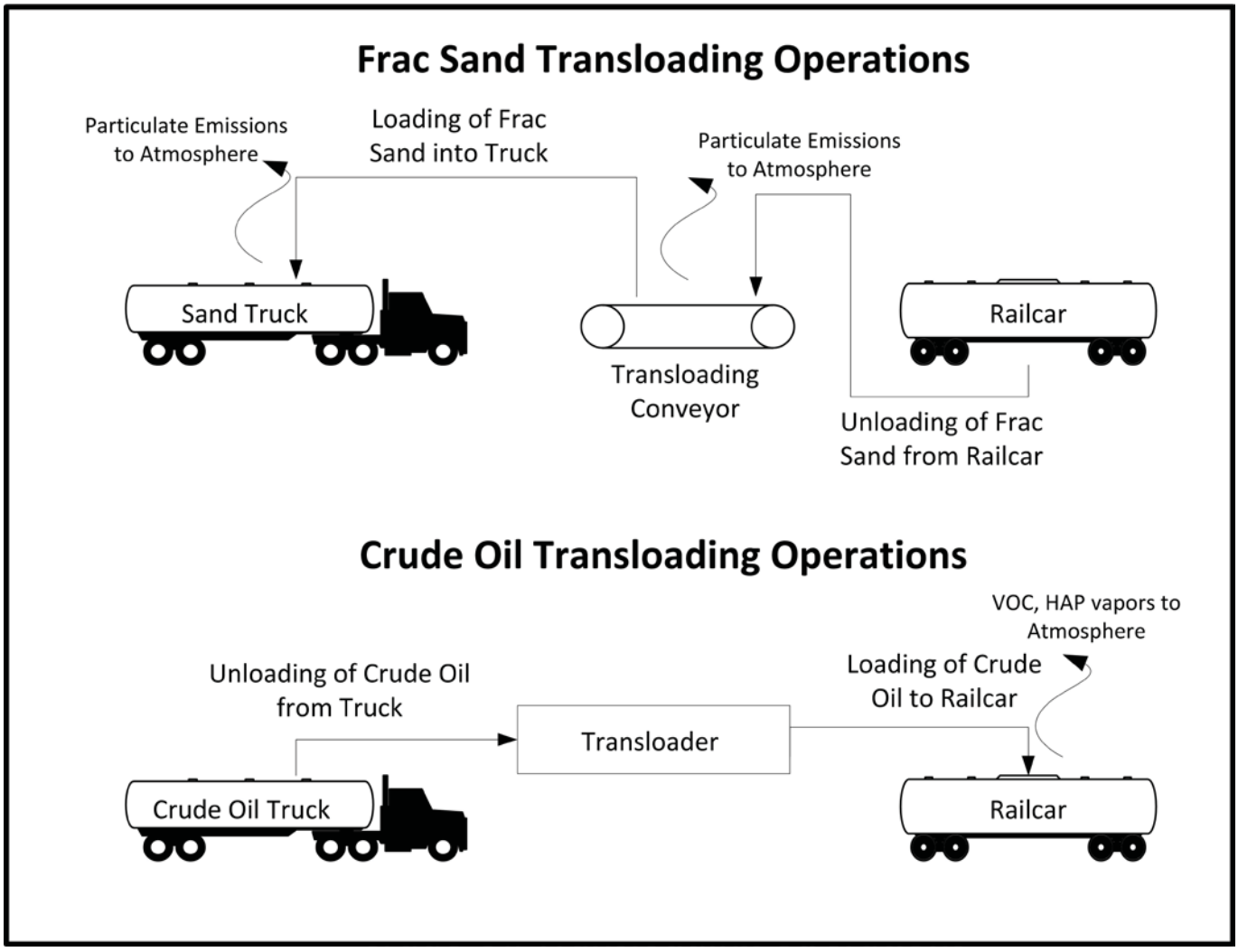
Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

A simple process flow diagram showing transloading operations and emissions from transloading operations is presented below. Other emission sources not directly related to transloading (truck traffic on paved/unpaved roads, the diesel fuel tank, and emissions from the engines) are not shown.

Facility operations will proceed as follows:

Trucks will enter the facility from Route 31 (Potash Mines Road) and drive 0.75 miles to the transloading area. A portion (3,226 feet) of the access road to the transloading area is paved. The rest of the access road (734 feet) is unpaved with base coarse and watering. Depending on the type of truck, it will then proceed to either the crude oil transloading track or the frac sand transloading track. Crude oil trucks will be connected to crude oil transloaders to fill railcars, frac sand trucks will enter the facility empty and be filled with frac sand from the trains. Once the truck has been filled or emptied, the truck will return to Potash Mines Road using the same 0.75 mile route. Emptied sand trains leave the facility. Filled crude oil cars and/or trains may be moved to the manifest storage tracks for temporary storage until a train is complete. They will then leave the facility.

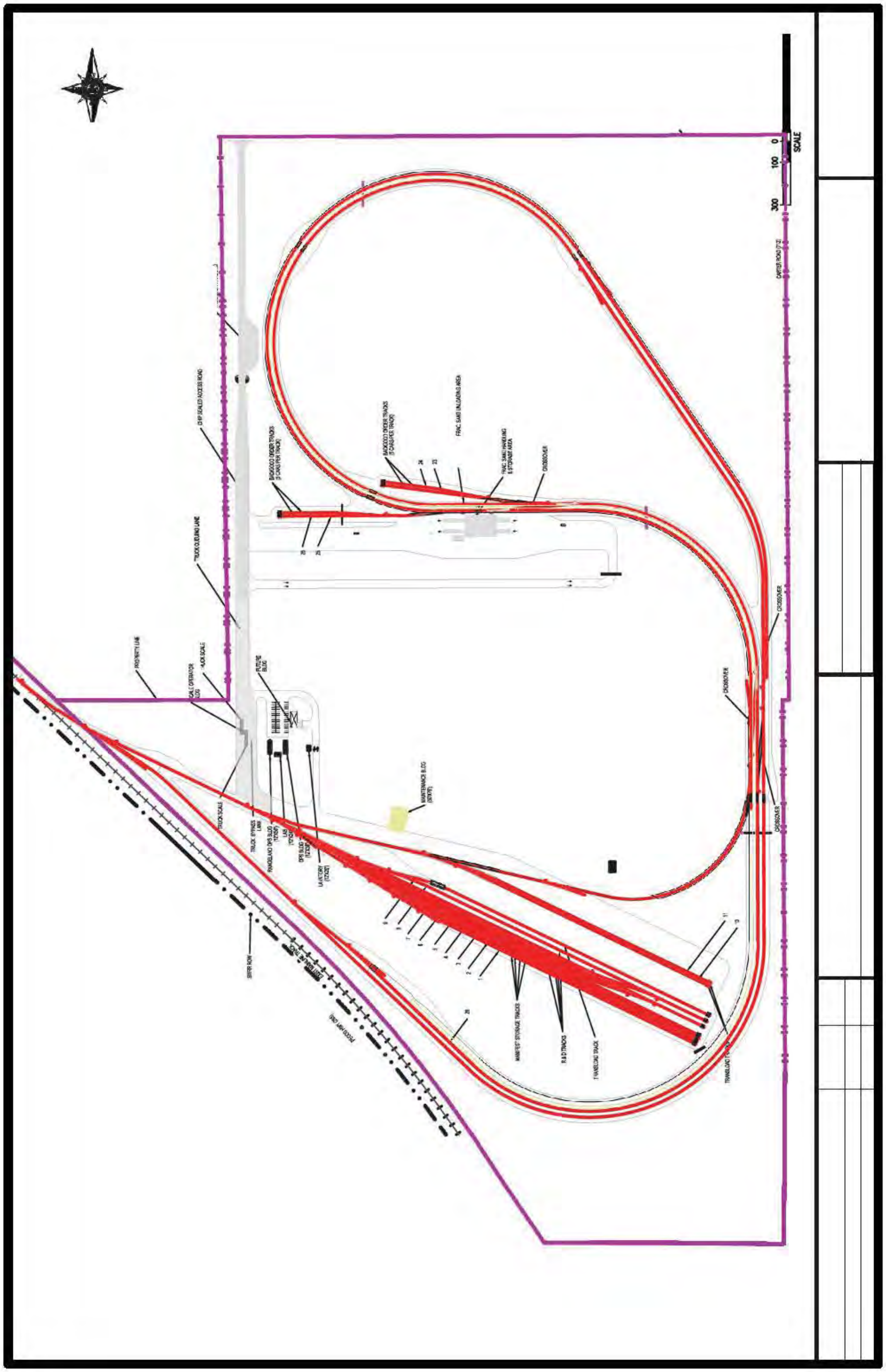


Section 5

Plot Plan Drawn To Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

A plot plan of the site is presented on the following page.



Section 6

All Calculations

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.

Emission calculations are presented in Tables 1-21 at the end of this section. These tables are referenced throughout this section.

1. Crude Oil Transloading Emissions

1.1. Calculation of Maximum Throughput

The calculation of maximum annual throughput of crude oil through transloading operations is presented in Tables 1 and 2. The maximum throughput rate is based on:

- the transloader pumping rate of 347 gal/min,
- the assumption that railcars will be filled to 95% of their total capacity of 757 bbl, (or 719.15 bbl),
- the fact that even at continuous operation of the transloaders, there will be a stoppage of the pump for at least an hour when switching to a new truck (to disconnect the old truck from the transloader, and position, ground, and connect the new truck), and
- that each truck has 200 bbl of oil to unload into the railcar.

From these initial inputs, the maximum throughput is calculated assuming continuous operation of the transloading operation, for 24 hours per day, 365 days per year, but necessarily requires stopping the pump to disconnect old trucks and connect new ones. These stops are necessary, part of the process, and unavoidable, and are therefore used in the PER calculation. These stops increase the average amount of time needed to fill a railcar from 1.45 hours (which would be the time if the transloader was operating constantly) to 5.05 hours (1.45 hours loading time + 3.60 hours connection time). This is because it takes, on average, 3.60 trucks to fill one railcar, and each truck takes an hour to connect, position, ground, and disconnect.

This is very conservative since this process operates on-demand. In order to be continuously loading crude oil the rail cars need to be available and trucks need to be available and ready to off-load. This accounts for no maintenance time and no operator breaks. As shown in Table 2, the maximum volume of oil transloaded per year is about 2,000,000 barrels per year (84,000,000 gallons per year). Please note that this volume of oil is not the maximum annual throughput, but the enforceable operating limit.

1.2. Emission Calculations

Emissions from the transloading of crude oil are presented in Tables 3 and 4. The transloading of crude oil will produce emissions of Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs).

1.2.1. Operational VOC Emissions

Working VOC emissions were calculated using information from AP-42, Section 5.2. Table 5.2-5 provides the uncontrolled total organics emission factor of 2 lb/1000 gallon transferred for rail car "submerged loading, dedicated normal service" operations. Footnote "a" of Table 5.2-5 says that "VOC factors for crude oil can be assumed to be 15% lower than the total organic factors, to account for the methane and ethane content of crude oil evaporative emissions". Therefore, the VOC emission factor is 1.7 lb/1000 gallon, or 0.0017 lb/gallon (85% of the total organic factor).

These emissions are calculated in Table 3 by multiplying the maximum throughput by the emission factor, thusly:

Annual Throughput * Emission Factor / Conversion Factor = Annual Emissions

84,000,000 gallons/year * 0.0017 lb VOC/gallon / 2000 lb/ton = 71.40 tons VOC

Hourly emissions are calculated by multiplying the maximum volume of oil transloaded per day by 365 days per year and dividing the ton/year value by 8,760 hours/year, thusly:

Hourly maximum throughput * Emission Factor *365 / Conversion Factor = Hourly Emissions

287,290.35 gallons/day * 0.0017 lb VOC/gallon * 365 days/year / 8,760 hours/year = 20.35 lb/hr VOC
The emission factor used for calculating VOC emissions is based on the value for "submerged loading, dedicated normal service" even though vapor balance service will be used. The emission factor for vapor balance service was not used for the following reason:

Vapor balance service is where the truck receives the vapors displaced during unloading into the railcar and transports the vapors back to the well lease site. This truck returning to the well lease site is saturated with organic vapors, and the presence of these vapors at the start of submerged loading of the tanker truck results in greater loading losses than encountered during non-vapor balance, or "normal", service. However, these loading losses are at the crude oil suppliers well site and do not occur at the RIO Terminal. These emissions occur off-site (at the supplier's facility) and are not included in the RIO Terminal emissions.

1.2.2. Operational HAP Emissions
Emissions of HAPs are based on the HAP fraction of VOC calculated in the original NOI application. These fractions were calculated using the equations in AP-42, Section 7.1, and representative MSDS. A page from the original application is presented in Section 7.

1.2.3. Startup, Shutdown, and Maintenance Emissions
Emissions from crude oil transloading are proportional only to the rate of transfer. Startup, shutdown, and maintenance (SSM) will not increase the rate of transfer beyond the throughput calculated for maximum operation above. Therefore, there are no additional SSM emissions associated with this equipment.

2. Frac Sand Transloading Emissions

2.1. Maximum Throughput

The calculation of maximum annual throughput of frac sand through transloading operations is presented in Tables 5 and 6. The maximum throughput rate is based on:

- the transloader flowrate of 237.5 tons/hour for transloaders with a 74-hp engine,
- the assumption that railcars can hold up to 100 tons of sand each,
- the fact that even at continuous operation of the transloading operation, there will be a stoppage of the transloader for at least 20 minutes when switching to a new truck (to disconnect the old truck from the transloader, and position and connect the new truck),
- that each truck can be loaded with 24 tons of sand from the railcar, and
- that there are 8 transloaders operating at once.

From these initial inputs, the maximum throughput is calculated assuming continuous operation of the transloading operation, for 24 hours per day, 365 days per year, but necessarily requires stopping the conveyor to disconnect old trucks and connect new ones. These stops are necessary, part of the process, and unavoidable, and are therefore used in the PER calculation. These stops increase the average amount of time needed to empty a railcar. A transloader with a 74-hp engine would unload a railcar in 0.42 hours if the transloader was operating constantly, but takes a total of 1.80 hours when the connection time is figured in (0.42 hours unloading time + 1.38 hours connection time). This is because it takes, on average, 4.17 trucks to unload one railcar, and each truck takes 0.33 hours (20 minutes) to connect, position, and disconnect.

This is very conservative since this process operates on-demand. In order to be continuously unloading frac sand, the rail cars need to be available and trucks need to be available and ready to load. This accounts for no maintenance time and no operator breaks. As shown in Table 6, the maximum volume of frac sand transloaded per year is about 3,901,890.11 tons per year.

2.2. Emission Calculations

2.2.1. Operational Particulate emissions
Total particulate emissions from the transloading of frac sand are estimated with the "Truck loading - Conveyor, crushed stone" emission factor from AP-42, Chapter 11.19.2, Table 11.19.2-2 Crushed Stone Processing and Processing Operations. This table provides a PM_{10} emission factor (0.00010 lb./ton.), but does not provide $PM_{2.5}$ or

PM_{30} emission factors. An uncontrolled PM_{30} emission factor was calculated from the available uncontrolled PM_{10} emission factor using the PM_{30}/PM_{10} ratio calculated from "Conveyor Transfer Point (controlled)" emission factors in Table 11.19.2-2: PM_{30} = (0.00014/0.000046) = 3.043. Therefore, the TSP emission factor is 0.0003043 lb./ton. This emission factor was then multiplied by two (2) to account for particulate emissions generated from the unloading of the frac sand from railcar, and loading of frac sand into trucks.

These emissions are calculated in Table 7 by multiplying the maximum throughput by the emission factor, thusly:

Annual Throughput * Emission Factor / Conversion Factor = Annual Emissions

3,901,890 tons/year * 0.000609 lb TSP/ton / 2000 lb/ton = 1.19 tons TSP

Hourly emissions are calculated by dividing the ton/year value by 8,760 hours/year and converting from tons to pounds.

Emissions of PM_{10} (10 micron)- and $PM_{2.5}$ (2.5 micron)-sized particulate matter are assumed to be zero. Unlike construction or industrial sand, frac sand has specifications for mesh size (see Section 7). Mesh sizes recommended by API for frac sand range from 8/12 (2.38-1.68 mm) to 70/140 (210-105 microns). These particle sizes are well above 10 microns. In addition, API standards require frac sands to meet crush pressure requirements; therefore, fine particulate matter generation during transport is expected to be non-existent.

Each frac sand transloader (C-1 through C-8) will have a dust collector. The dust collector is rated at 99% collection efficiency for 1-micron particulate. The PER calculations do not take credit for this control device.

2.2.2. Startup, Shutdown, and Maintenance Emissions

Emissions from frac sand transloading are proportional only to the rate of transfer. SSM will not increase the rate of transfer beyond the throughput calculated for maximum operation above. Therefore, there are no additional SSM emissions associated with this equipment.

3. Unpaved Road Emissions

3.1. Emission Calculations

Emissions from truck traffic on unpaved roads are particulate matter from tires traveling on unpaved surfaces.

3.1.1. Operational Emissions

Fugitive PM_{30}, PM_{10}, and $PM_{2.5}$ emissions for the unpaved on-site roads are calculated in Tables 9—13. Emissions are estimated using the emission factor equation in AP-42, Section 13.2.2. The emission factor equation is:

$$E = k\,(s/12)^a(W/3)^b$$

Where:

E = Emission factor in pounds per vehicle miles traveled (lb/VMT)
s = silt content (%)
W = mean weight of loaded vehicle (tons)
k, a, b = constants based on the particle size of interest (PM_{30}, PM_{10}, or $PM_{2.5}$)

The silt content, s, of 4.8% was provided by NMED as the average silt content for New Mexico. The mean vehicle weight, W, is calculated in Table 10. It is based on the empty and loaded weights of the trucks hauling crude oil and frac sand and the number of trips by each type of truck.

The access road from facility entrance to railspur is 0.75 miles long. 3,226 feet of the access road is assumed to be paved. The rest (0.14 miles) is unpaved with base course and watering. Per NMED, the resulting emission factor from the equation above is reduced 80% (multiplied by 0.2) for truck travel on the unpaved portion of the access road to account for the fact that the unpaved road has been constructed with base course and watering.

For calculating annual emissions, AP-42 allows the emission factor to be reduced to account for no emissions on rainy days (days with at least 0.01 in of precipitation). According to the NOAA National Environmental Satellite, Data, and Information Service, the total number of rainy days for calendar year 2015 in Carlsbad, NM, (the closest city to Loving, NM listed) was 68 days. Consequently, the calculated emission factor is reduced by 18.63% (68/365).

These emissions are calculated in Table 13 thusly:

$$E = (1 - C)\, k\, (s/12)^a (W/3)^b$$

Emission Factor (lb/VMT) = (1 – Road Type Control Measure) * k * (Silt Content % / 12)^a * (Mean Weight of Vehicle / 3)^b

An example calculation for PM_{30} emissions on unpaved roads is as follows:

$$E = 0.20 * (4.9)\, (4.8/12)^{0.7} (27.84/3)^{0.45} = 1.4063 \text{ lb/VMT}$$

For annual emissions, the emission factor is reduced to account for rainy days as described above:

$$E = 1.4063 \text{ lb/VMT} * (365\text{-}68/365) = 1.144 \text{ lb/VMT}$$

3.1.2. Startup, Shutdown, and Maintenance Emissions

Emissions from unpaved road traffic are proportional only to volume of traffic. Therefore, there are no additional SSM emissions associated with this equipment.

4. Paved Road Emissions

4.1. Emission Calculations

Emissions from truck traffic on paved roads are particulate matter originated from the loose material present on the surface.

4.1.1. Operational Emissions

Fugitive PM_{30}, PM_{10}, and $PM_{2.5}$ emissions for the paved on-site roads are calculated in Tables 14—17. Emissions are estimated using the emission factor equation in AP-42, Section 13.2.1. The emission factor equation is:

$$E = [k\, (sL)^{0.91} \times (W)^{1.02}] \times [1\text{-} (P/4N)]$$

Where:

E = Emission factor in pounds per vehicle miles traveled (lb/VMT)
k= particle size multiplier for particle size range and units of interest
sL= road surface silt loading (grams per square meter) (g/m^2)
W= average weight (tons) of the vehicles traveling the road
P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period
N = number of days in the averaging period

The road surface silt loading, sL, of 0.2 was obtained from Table 13.2.1-2: Baseline for ADT 500-5,000. The mean vehicle weight, W, is calculated in Table 15. It is based on the empty and loaded weights of the trucks hauling crude oil and frac sand and the number of trips by each type of truck. The particle size multipliers were obtained from Table 13.2-1-1: Particle Size Multipliers for Paved Road Equations in AP-42, Section 13.2.1.

The access road from facility entrance to railspur is 0.75 miles long. 3,226 feet of the access road is assumed to be paved. For calculating annual emissions, AP-42 allows the emission factor to be reduced to account for the mitigative effect of moisture on rainy days (days with at least 0.01 in of precipitation). According to the NOAA National Environmental Satellite, Data, and Information Service, the total number of rainy days for calendar year 2015 in Carlsbad, NM, (the closest city to Loving, NM listed) was 68 days.

An example calculation for PM_{30} emissions on paved roads is as follows:

$$E = [0.011*(0.2)^{0.91} * (27.84)^{1.02}]*[1\text{-}(68/4*365)] = 0.0721 \text{ lb/VMT}$$

For annual emissions, the emission factor is multiplied by the annual VMT:

$$E = 0.072 \text{ lb/VMT} * 172{,}578.75 \text{ trips/year} * 1.22 \text{ miles/trip} / 2000 \text{ lb/ton} = 7.60 \text{ tons per year}$$

4.1.2. Startup, Shutdown, and Maintenance Emissions

Emissions from paved road traffic are proportional only to volume of traffic. Therefore, there are no additional SSM emissions associated with this equipment.

5. Frac Sand Transloader Diesel Engine Emissions

5.1. Emission Calculations

Emissions from the diesel engines on the Frac Sand Transloaders include all criteria pollutants (particulate, NO_X, CO, SO_X, and VOC). Table 20 has the total emissions from the engines, both on an hourly and annual basis.

5.1.1. Operational Emissions

5.1.1.1. Particulate, NO_X, CO, and VOC Emissions

The engines are certified to the Interim Tier IV Diesel Emission standards. Therefore, emissions from the diesel engines are calculated using Interim Tier IV emission standards (presented in Table 18) codified in 40 CFR §1039.102. The emission standards are converted to emission rates by multiplying by the power rating (in kW) of the engine.

5.1.1.2. SO_X Emissions

AP-42, section 3.3 provides that, "Sulfur oxides emissions are a function of only the sulfur content in the fuel rather than any combustion variables. In fact, during the combustion process, essentially all the sulfur in the fuel is oxidized to SO_2." Therefore, sulfur emissions are calculated based on the sulfur content of the fuel (15 ppm) and the maximum fuel use rate of the engine (0.435 lb/hp-hr for the 74-hp engine)). The SO_2 emission rate is calculated thusly:

Fuel Use * Engine Power * 0.000015 * 2 lb SO_2/lb S = Emission Factor

(0.435 lb/hp-hr) * (74 hp) * 0.000015 * 2 lb SO_2/lb S = 0.000966 lb/hr for the 74-hp engine

5.1.1.3. HAP Emissions

HAP emissions are not presented because using the methodology from AP-42, they will release less than 0.1 tons of any HAP per year. Table 2-I of this application requires HAP emissions to be rounded to the nearest 0.1 tpy.

5.1.2. Startup, Shutdown, and Maintenance Emissions

These engines are certified to the emission standards in part 4.1.1.1 of this Section (and Table 18 below), and are assumed to comply with those emissions during all operations, including startup, shutdown, and maintenance. SO_X emissions are calculated as a theoretical maximum and cannot be exceeded without the addition of more sulfur to the fuel. Therefore, there are no additional SSM emissions from the engines.

6. Diesel Fuel Tank Emissions

5.1 Emission Calculations

Emissions from the diesel storage tank are VOCs from the storage of diesel fuel.

6.1.1. Operational Emissions

Operational emissions from the diesel fuel tank are calculated using EPA Tanks 4.0.9.d. Total emissions for the year are presented in Table 21. The output from the Tanks program is included in Section 7 of this application.

6.1.2. Startup, Shutdown, and Maintenance Emissions

There are no SSM emissions from the fuel tank.

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following **X** By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

Tables 1 and 2: Calculation of Potential Maximum Volume of Oil Transloaded per Year

Table 1. Inputs

Input	Value	Units
Transloader Flowrate	347	gal/min
Railcar Volume	757	bbl/railcar
Maximum Railcar Fill	95	%
Connection Time per Truck (includes positioning truck, connecting/unconnecting to railcar, grounding, moving truck)	1	hour/truck
Truck Capacity	200	bbl/truck
Number of Transloaders	2	Transloader

Table 2. Calculations

Calculated Value	Value	Units	Calculation
Transloader Flowrate (bbl/hr)	495.71	bbl/hr	= Transloader Flowrate x 60 min/hour / 42 gal/bbl
Railcar Capacity	719.15	bbl	= Railcar Volume x Maximum Railcar Fill
Loading Time of a Railcar	1.45	hour	= Railcar Capacity /Transloader Flowrate (bbl/hr)
Trucks to Fill One Railcar	3.60	trucks	= Railcar Capacity / Truck Capacity
Time Spent Connecting Trucks to Fill One Railcar	3.60	hours	= Trucks to Fill One Railcar x Connection Time per Truck
Time Spent Loading One Railcar	5.05	hours	= Loading Time of a Railcar + Time Spent Connecting Trucks to Fill One Railcar
Railcars Loaded per Transloader per Day	4.76	Railcars/day	= 24 hours/day / Time Spent Loading One Railcar
Total Volume Loaded per Transloader per Day	3,420.12	bbl/day	= Railcar Capacity x Railcars Loaded per Transloader per Day
Total Volume of Oil Transloaded per Day	6,840.25	bbl/day	= Total Volume Loaded per Transloader per Day x Number of Transloaders
Total Volume of Oil Transloaded per Year	**2,000,000.00**	**bbl/year**	**Represents maximum requested annual volume of oil transloaded per year limit**

Table 3. Emissions from Crude Oil Transloading

Emissions Estimate	Annual Throughput[1]		VOC Emissions[2]		
Filling Type	bbl/yr	gal/yr	EF (lb/gal)	PER (lb/hr)	PER (ton/yr)
Submerged Filling, Dedicated Normal Service	2,000,000	84,000,000.00	0.0017	20.35	71.40

VOC Breakout	% of VOC Emissions[3]	PER (lb/hr)	PER (ton/yr)
Benzene[3]	0.017	0.3459	1.21
Toluene[3]	0.002	0.0407	0.14
Xylenes[3]	0.001	0.0203	0.07
Ethylbenzene[3]	0.001	0.0203	0.07
N-Hexane[3]	0.013	0.2645	0.93

[1] From Table 2. Gallon per year value is found by multiplying by a conversion factor of 42 gallons/bbl.

[2] VOC emission factor from AP-42, Section 5.2, Table 5.2-5 for submerged loading, dedicated service. VOC emission factor is 85% of the TOC emission factor (Table 5.2-5, footnote a). Annual emissions are found by multiplying the annual throughput by the emission factor and dividing by a conversion factor of 2,000 lb/ton. Hourly emission rate is found by multiplying the total volume of oil transloaded per day by 365 days per year by the emission factor and dividing by 8,760 hours/year.

[3] Emission Rates are based on the mass fraction of VOC calculated in the previous application and presented in Section 6 of this application.

Table 4. Emissions Crude Oil Transloading

Emission Unit[1]	VOC	
	PER (lb/hr)	PER (ton/yr)
TL-1 and TL-2	20.35	71.40

[1] Crude Oil Transloader TL-1 and TL-2

Tables 5 and 6: Calculation of Potential Maximum Weight of Frac Sand Transloaded per Year

Table 5. Inputs

Input	Value	Units
Transloader Flowrate (46 hp engine)	210	tons/hour
Transloader Flowrate (74 hp engine)	237.5	tons/hour
Railcar Capacity	100	tons/railcar
Connection Time per Truck (includes positioning truck, connecting/unconnecting to railcar, grounding, moving truck)	0.33	hour/truck
Truck Capacity	24	tons/truck
Number of Transloaders (46 hp engines)	0	Transloaders
Number of Transloaders (74 hp engines)	8	Transloaders
Total Number of Transloaders	8	Transloaders

Table 6. Calculations

Calculated Value	Value	Units	Calculation
Trucks Filled by One Railcar	4.17	trucks	= Railcar Capacity / Truck Capacity
Time to Unload a Railcar (74 hp engine)	0.42	hour	= Railcar Capacity / Transloader Flowrate (74 hp engine)
Time Spent Connecting Trucks Filled by One Railcar	1.38	hours	= Trucks Filled by One Railcar x Connection Time per Truck
Time Spent Unloading One Railcar (46 hp engine)	1.85	hours	= Time to Unload a Railcar + Time Spent Connecting Trucks Filled by One Railcar
Time Spent Unloading One Railcar (74 hp engine)	1.80	hours	= Time to Unload a Railcar + Time Spent Connecting Trucks Filled by One Railcar
Railcars Unloaded per Transloader per Year (46 hp engine)	0.00	Railcars/year	= 8,760 hours/year / Time Spent Unloading One Railcar
Railcars Unloaded per Transloader per Year (74 hp engine)	4,877.36	Railcars/year	= 8,760 hours/year / Time Spent Unloading One Railcar
Total Sand Unloaded per Transloader per Year (46 hp engine)	0.00	ton/year	= Railcar Capacity x Railcars Unloaded per Transloader per Year
Total Sand Unloaded per Transloader per Year (74 hp engine)	487,736.26	ton/year	= Railcar Capacity x Railcars Unloaded per Transloader per Year
Total Sand Transloaded per Year	**3,901,890.11**	**tons**	**= Total Volume Unloaded per Transloader per Year x Number of Transloaders**

Table 7. Emissions From Frac Sand Transloading

Emissions Estimate (PER)	Throughput[1]	PER - TSP[3]			
	tons/yr	EF (lb/ton)[2]	PER, lb/yr	PER, lb/hr	PER, ton/yr
Frac Sand	3,901,890	0.000609	2,376	0.27	1.19

[1] From Table 6.

[2] AP-42, Chapter 11.19.2, Table 11.19.2-2 Crushed Stone Processing and Processing Operations for "Truck loading - Conveyer, crushed stone". This table provides a PM10 emission factor of 0.00010 lb/ton, but does not provide PM30 emission factors. An uncontrolled PM30 emission factor was calculated from the available uncontrolled PM10 emission factor using the PM30/PM10 ratio calculated from "Conveyor Transfer Point (controlled)" emission factors in Table 11.19.2-2: PM30 = (0.00014/0.000046) = 3.043. Therefore, the TSP emission factor is 0.0003045 lb./ton. This emission factor was then multiplied by two (2) to account for particulate emissions generated from the unloading of the frac sand from railcar, and loading of frac sand into trucks.

[3] Emissions of PM_{10} and $PM_{2.5}$ are assumed to be 0, because specifications for frac sand are much larger than 10 microns. TSP emissions are calculated by multiplying the throughput by the emission factor and dividing by a conversion factor of 8,760 hours/year or 2,000 lb/ton.

Table 8. Emissions per Frac Sand Transloader

Emission Unit[1]	TSP[2]	
	PER (lb/hr)	PER (ton/yr)
C-1	0.03	0.15
C-2	0.03	0.15
C-3	0.03	0.15
C-4	0.03	0.15
C-5	0.03	0.15
C-6	0.03	0.15
C-7	0.03	0.15
C-8	0.03	0.15

[1] Frac Sand Conveyor Transloaders C-1 through C-8.

[2] Total transloading emissions (from Table 7) are divided by the number of transloaders to find the emissions per transloader.

Tables 9-13: Calculation of Fugitive Dust Emissions from Travel on Unpaved Roads

Per AP-42, Section 13.2.2, Emissions from vehicle travel on unpaved roads can be estimated by the following equation:

$$E = k\,(s/12)^{a}(W/3)^{b}$$

Where E is the emission factor in lb/VMT (pounds per vehicle miles traveled), and k, s, a, W, and b have the values below:

Table 9. Parameters for Emission Factor Equation

Parameter	Value	Description	Source
s	4.8	silt content, %	NMED
W	27.84	mean weight of loaded vehicle, tons	Table 10

Table 10. Calculation of Mean Vehicle Weight, W

Truck Type	Vehicle Weight (tons)			Round-Trip Distance per Trip (miles) [3]	Total Material Throughput per Year [4]	Capacity of Truck	Unit	Trips per Year [5]	Average Vehicle Weight (tons) [6]
	Loaded [1]	Unloaded	Average [2]						
Crude Oil Truck	40	10.6	25.3	1.5	2,000,000	200	bbl	10,000	27.84
Frac Sand Truck	40	16	28.0		3,901,890	24	tons	162,579	
Total								**172,579**	

[1] Based on federal commercial vehicle maximum standards on the Interstate Highway System. (23 USC 127, included in Section 7 of this Application)

[2] Trucks enter the facility loaded and leave unloaded (or vice-versa). Therefore, the average vehicle weight is: unloaded weight + loaded weight / 2

[3] Total distance from facility entrance to railspur is 0.75 miles one-way (1.5 miles round-trip).

[4] From Tables 2 and 6.

[5] Trips per year is calculated by dividing the total material throughput by the capacity of each truck.

[6] Average vehicle weight for the emission factor equation takes into account the average weight of each vehicle type, as well as the frequency of use of each vehicle type.
The calculation is: (Oil Truck Trips/Total Trips)*Oil Truck Avg Weight + (Sand Truck Trips/Total Trips)*Sand Truck Avg Weight.

Table 11. Constants for the Emission Factor Equation[1]

Constant	PM_{30}	PM_{10}	$PM_{2.5}$
	lb/VMT	lb/VMT	lb/VMT
k	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45

[1] From AP-42, Section 13.2.2

Table 12. Portion of Vehicle Travel Paved vs. Unpaved

Type of Road	Round-Trip Distance per Trip (miles) [1]
Paved	1.22
Unpaved	0.28
Total	**1.50**

[1] Total distance from facility entrance to railspur is 0.75 miles one-way. 3,226 feet of the total one-way distance is paved, the rest is unpaved with base course and watered.

Table 13. Emissions from Vehicle Travel on Unpaved Roads

Type of Road	Particle Size[1]	Control Efficiency[2]	Emission Factor (lb/VMT)[3]	Days of Rain per Year[4]	Emission Factor (adj. for rainfall)[5]	Hourly Emission Rate (lbs/hr)[6]	Annual Emission Rate (tons/year)[7]
UNPAVED	PM_{30}	80%	1.406	68	1.144	7.71	27.49
	PM_{10}		0.358		0.292	1.97	7.01
	$PM_{2.5}$		3.584E-02		2.916E-02	0.20	0.70

[1] The PM_{30} emission factor is assumed to be representative for TSP.

[2] New Mexico Environment Department Air Quality Bureau allows an 80% control efficiency of the unpaved road emission factor for roads covered with base course and watering.

[3] From emission factor equation above, and multiplied by 20% (for unpaved road portion) to account for the control efficiency in the previous column.

[4] NOAA National Climatic Data Center, total days of precipitation for calendar year 2015 Station: CARLSBAD, NM US GHCND:USC00291469.

[5] AP-42, Section 13.2.2, allows for the adjustment of the emission factor to assume that no unpaved road emissions occur on days with 0.01 inch of precipitation or more. The original emission factor is multiplied by a factor of (365-68)/365 = 0.8137 to account for rainy days.

[6] Calculated by multiplying annual VMT and Emission Factor (NOT adjusted for rainfall).

[7] Calculated by multiplying annual VMT and Emission Factor (adjusted for rainfall).

Tables 14-17: Calculation of Fugitive Dust Emissions from Travel on Paved Roads

Per AP-42, Section 13.2.1, Emissions from vehicle travel on paved roads can be estimated by the following equation:

$$E_{ext} = [k(sL)^{0.91} x (W)^{1.02}] x \left(1 - \frac{P}{4N}\right)$$

E_{ext} = annual or other long-term average emission factor (lb/VMT)

k = particle size multiplier for particle size range and units of interest; Table 13.2.1-1

sL = road surface silt loading (g/m^2); Table 13.2.1-3

W = average weight (tons) of the vehicles traveling the road

P = number of days with at least 0.01 in of precipitation

N = number of days in the averaging period

Table 14. Parameters for Emission Factor Equation

Parameter	Value	Description	Source
sL	0.2	road surface silt loading (g/m2)	The surface silt content was obtained from Table 13.2.1-2: Baseline for ADT 500-5,000
P	68	Number of days with at least 0.01 in of precipitation	NOAA National Climatic Data Center, total days of precipitation per year for Carlsbad, NM for 2015.
N	365	Number of days in the averaging period	Annual averaging period
W	27.84	mean weight of loaded vehicle, tons	Table 10

Table 15. Calculation of Mean Vehicle Weight, W

Truck Type	Vehicle Weight (tons)			Round-Trip Distance per Trip (miles) [3]	Total Material Throughput per Year [4]	Capacity of Truck	Unit	Trips per Year [5]	Average Vehicle Weight (tons) [6]
	Loaded [1]	Unloaded	Average [2]						
Crude Oil Truck	40	10.6	25.3	1.22	2,000,000	200	bbl	10,000.00	27.84
Frac Sand Truck	40	16	28		3,901,890	24	tons	162,578.75	
Total								**172,578.75**	

[1] Based on federal commercial vehicle maximum standards on the Interstate Highway System. (23 USC 127, included in Section 6 of this Application)

[2] Trucks enter the facility loaded and leave unloaded (or vice-versa). Therefore, the average vehicle weight is: unloaded weight + loaded weight / 2

[3] Total distance from facility entrance to railspur is 0.75 miles one-way. 3,226 feet of the total one-way distance is paved, the rest is unpaved with base course and watered.

[4] From Tables 2 and 6.

[5] Trips per year is calculated by dividing the total material throughput by the capacity of each truck.

[6] Average vehicle weight for the emission factor equation takes into account the average weight of each vehicle type, as well as the frequency of use of each vehicle type. The calculation is:
(Oil Truck Trips/Total Trips)*Oil Truck Avg Weight + (Sand Truck Trips/Total Trips)*Sand Truck Avg Weight.

Table 16. Constants for the Emission Factor Equation[1]

Constant	PM-30	PM-10	PM-2.5
	lb/VMT	lb/VMT	lb/VMT
k	0.01100	0.00220	0.00054

[1] From AP-42, Section 13.2.1

Table 17. Emissions from Vehicle Travel on Paved Roads

Particle Size [1]	Emission Factor (lb/VMT) [3]	Hourly Emission Rate (lbs/hr) [6]	Annual Emission Rate (tons/year) [7]
PM_{30}	7.21E-02	1.73	7.60
PM_{10}	1.44E-02	0.35	1.52
$PM_{2.5}$	3.54E-03	0.09	0.37

[1] The PM_{30} emission factor is assumed to be representative for TSP.

[3] Per the equation at the top of this page.

[6] Calculated by multiplying average VMT (210,824.93 miles/8,760 hours) and Emission Factor.

[7] Calculated by multiplying annual VMT (210,824,93 miles) and Emission Factor and then dividing by 2000 to convert from pounds to tons.

Tables 18-20: Calculation of Combustion Emissions from Engines

Table 18. Engine Emissions Standards

Engine Type	PM	NO_X+ NMHC	CO	Units	Source
46-hp (34 kW) Tier IV	0.3	7.5	5.5	g/kW hr	40 CFR 1039.102
74-hp (55 kW) Tier IV	0.3	4.7	5.0	g/kW hr	40 CFR 1039.102

Table 19. Engine Emission Factors[1]

Engine Type	PM	NO_X	CO	SO_X[2]	VOC	Units
46-hp (34 kW) Tier IV	0.022	0.562	0.412	0.000573	0.562	lb/hr
74-hp (55 kW) Tier IV	0.036	0.570	0.606	0.000966	0.570	lb/hr

[1] Emission factors or PM, NO_X, CO, and VOC are based on the emission standards in Table 18 and found by multiplying the standard by the power of the engine and converting grams to lbs by dividing by a conversion factor of 454 grams/lb. The SO_X emission factor is based on the fuel use of the engine and the sulfur content of the fuel, as described in footnote 2.

[2] SO_2 Emission Factor is based on the assumption that all sulfur in the fuel is converted to SO_2. The sulfur content of fuel is 15 ppm, the 74-hp engine uses 0.435 lb fuel/hp-hr.

The equation is: Fuel Use x Engine Power x 0.000015 x 2 lb SO_2/lb S = Emission Factor.

The calculation for 74-hp engine is: (0.435 lb/hp-hr) x (74 hp) x 0.000015 x 2 lb SO_2/lb S = 0.000966 lb/hr

Table 20. Engine Emissions

Engine Type	Unit No.	PM	NO_X	CO	SO_X	VOC	Units
74-hp (55 kW) Tier IV	CE-1	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-2	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-3	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-4	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-5	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-6	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-7	0.036	0.570	0.606	0.001	0.570	lb/hr
74-hp (55 kW) Tier IV	CE-8	0.036	0.570	0.606	0.001	0.570	lb/hr
Total[1]		**0.29**	**4.56**	**4.85**	**0.01**	**4.56**	**lb/hr**
		1.27	**19.97**	**21.24**	**0.03**	**19.97**	**ton/year**

[1] Total emissions are converted from lb/hour to ton/year by multiplying by 8,760 hours/year and dividing by 2,000 lb/ton.

Table 21. Diesel Tank Emissions[1]

VOC		
lb/year	ton/year	lb/hr
2.2	1.10E-03	2.51E-04

[1]Emissions calculated with EPA Tanks 4.0.9.d.
The output file is included with this application.

Section 7

Information Used To Determine Emissions

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.
- ☐ 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.

This section contains:

1. AP-42, Section 5.2 – Table 5.2-5 for determining crude oil transloading emissions.
2. HAP fraction of VOC calculated in the original NOI application.
3. AP-42, Section 7.1, Tables 7.1-2 and 7.1-5, for calculating crude oil vapor HAP emissions.
4. AP-42, Section 11.19.2 – Table 11.19.2-2, used for frac sand transloading emissions.
5. Mesh sizes recommended by API for frac sand, for determining frac sand transloader emissions.
6. AP-42, Section 13.2.2, used for estimating unpaved road emissions.
7. AP-42, Section 13.2.1, for calculating paved road emissions.
8. 40 CFR 1039, used for engine emissions (Interim Tier IV).
9. NMED – Guidance for Aggregate Piles and Haul Road Emissions, used for unpaved road emissions.
10. New Mexico Environment Department, Air Quality Bureau, Permitting, FAQ.
11. 23 USC 127, which sets the maximum weight of a loaded truck, used in determining loaded vehicle weight in the road emissions calculation.
12. NOAA National Climatic Data Center Average Yearly Precipitation for New Mexico.
13. EPA Tanks output file, used for diesel fuel tank emissions.
14. Engine specification data, for calculating transloader engine emissions.

1. AP-42, Section 5.2 – Table 5.2-5

where:

L_T = transit loss from ships and barges, lb/week-10^3 gal transported
P = true vapor pressure of the transported liquid, psia
W = density of the condensed vapors, lb/gal

Emissions from gasoline truck cargo tanks during transit have been studied by a combination of theoretical and experimental techniques, and typical emission values are presented in Table 5.2-5.[11-12] Emissions depend on the extent of venting from the cargo tank during transit, which in turn depends on the vapor tightness of the tank, the pressure relief valve settings, the pressure in the tank at the start of the trip, the vapor pressure of the fuel being transported, and the degree of fuel vapor saturation of the space in the tank. The emissions are not directly proportional to the time spent in transit. If the vapor leakage rate of the tank increases, emissions increase up to a point, and then the rate changes as other determining factors take over. Truck tanks in dedicated vapor balance service usually contain saturated vapors, and this leads to lower emissions during transit because no additional fuel evaporates to raise the pressure in the tank to cause venting. Table 5.2-5 lists "typical" values for transit emissions and "extreme" values that could occur in the unlikely event that all determining factors combined to cause maximum emissions.

Table 5.2-5 (Metric And English Units). TOTAL UNCONTROLLED ORGANIC EMISSION FACTORS FOR PETROLEUM LIQUID RAIL TANK CARS AND TANK TRUCKS

Emission Source	Gasoline[a]	Crude Oil[b]	Jet Naphtha (JP-4)	Jet Kerosene	Distillate Oil No. 2	Residual Oil No. 6
Loading operations[c]						
Submerged loading - Dedicated normal service[d]						
mg/L transferred	590	240	180	1.9	1.7	0.01
lb/10^3 gal transferred	5	2	1.5	0.016	0.014	0.0001
Submerged loading - Vapor balance service[d]						
mg/L transferred	980	400	300	—[e]	—[e]	—[e]
lb/10^3 gal transferred	8	3	2.5	—[e]	—[e]	—[e]
Splash loading - Dedicated normal service						
mg/L transferred	1,430	580	430	5	4	0.03
lb/10^3 gal transferred	12	5	4	0.04	0.03	0.0003
Splash loading - Vapor balance service						
mg/L transferred	980	400	300	—[e]	—[e]	—[e]
lb/10^3 gal transferred	8	3	2.5	—[e]	—[e]	—[e]

Table 5.2-5 (cont.).

Emission Source	Gasoline[a]	Crude Oil[b]	Jet Naphtha (JP-4)	Jet Kerosene	Distillate Oil No. 2	Residual Oil No. 6
Transit losses						
Loaded with product						
mg/L transported						
Typical	0 - 1.0	ND	ND	ND	ND	ND
Extreme	0 - 9.0	ND	ND	ND	ND	ND
lb/10^3 gal transported						
Typical	0 - 0.01	ND	ND	ND	ND	ND
Extreme	0 - 0.08	ND	ND	ND	ND	ND
Return with vapor						
mg/L transported						
Typical	0 - 13.0	ND	ND	ND	ND	ND
Extreme	0 - 44.0	ND	ND	ND	ND	ND
lb/10^3 gal transported						
Typical	0 - 0.11	ND	ND	ND	ND	ND
Extreme	0 - 0.37	ND	ND	ND	ND	ND

[a] Reference 2. Gasoline factors represent emissions of VOC as well as total organics, because methane and ethane constitute a negligible weight fraction of the evaporative emissions from gasoline. VOC factors for crude oil can be assumed to be 15% lower than the total organic factors, to account for the methane and ethane content of crude oil evaporative emissions. All other products should be assumed to have VOC factors equal to total organics. The example gasoline has an RVP of 69 kPa (10 psia). ND = no data.
[b] The example crude oil has an RVP of 34 kPa (5 psia).
[c] Loading emission factors are calculated using Equation 1 for a dispensed product temperature of 16°C (60°F).
[d] Reference 2.
[e] Not normally used.

In the absence of specific inputs for Equations 1 through 5, the typical evaporative emission factors presented in Tables 5.2-5 and 5.2-6 should be used. It should be noted that, although the crude oil used to calculate the emission values presented in these tables has an RVP of 5, the RVP of crude oils can range from less than 1 up to 10. Similarly, the RVP of gasolines ranges from 7 to 13. In areas where loading and transportation sources are major factors affecting air quality, it is advisable to obtain the necessary parameters and to calculate emission estimates using Equations 1 through 5.

5.2.2.2 Service Stations -

Another major source of evaporative emissions is the filling of underground gasoline storage tanks at service stations. Gasoline is usually delivered to service stations in 30,000-liter (8,000-gal) tank trucks or smaller account trucks. Emissions are generated when gasoline vapors in the underground storage tank are displaced to the atmosphere by the gasoline being loaded into the tank. As with other loading losses, the quantity of loss in service station tank filling depends on several variables, including the method and rate of filling, the tank configuration, and the gasoline temperature, vapor pressure and composition. An average emission rate for submerged filling is 880 mg/L (7.3 lb/1000 gal) of transferred gasoline, and the rate for splash filling is 1380 mg/L (11.5 lb/1000 gal) transferred gasoline (see Table 5.2-7).[5]

2. HAP fraction of VOC calculated in the original NOI application.

Crude Oil Vapor HAP Calculations

Potential HAP Compounds in Crude Oil	mass %[1]	Antoine Constants[2]			Vapor Pressure		MW	liq Mol Frac	Partial Pressure	Mol Frac	Mass Frac	PER
		A	B	C	mmHg	psi	lb/lbmol	lbmol/lbmol	psi	mol HAP/ mol vap	lb HAP/ lb vap	ton/yr
Benzene	3.0%	6.905	1211	220.79	97.424	1.884	78.11	0.019	0.036	0.011	0.017	1.812
Toluene	1.0%	6.9533	1343.9	219.38	29.239	0.565	92.13	0.005	0.003	0.001	0.002	0.181
xylene (o, m, & p)	1.0%	7.009	1426.3	215.11	12.085	0.234	106.16	0.005	0.001	0.000	0.001	0.075
Ethylbenzene	1.0%	6.975	1424.3	213.21	10.221	0.198	106.17	0.005	0.001	0.000	0.001	0.063
N-hexane	1.5%	6.876	1171.2	224.41	155.008	2.997	86.17	0.009	0.026	0.008	0.013	1.442
Cumene	1.0%	6.9367	1460.8	207.78	4.739	0.092	120.19	0.004	0.000	0.000	0.000	0.029
Naphthalene	1.0%	7.37	1968.4	222.61	0.274	0.005	128.17	0.004	0.000	0.000	0.000	0.002

T_{LA}	537.97	R	daily average liquid temperature
	25.54	C	
T_{AA}	521.40	R	daily average ambient temperature
T_B	526.22	R	liquid bulk temperature
α	0.97		paint solar absorption
I	1810	Btu/ft2-d	Annual Avg
T_{AX}	75.3	°F	daily maximum ambient temperperature, average
T_{AN}	47.5	°F	daily minimum ambient temperperature, average
Vp of Crude Oil[2]	3.4	psi	@70°F
MW crude oil vapor[2]	50	lb/lbmol	

Conversion Factors

Temperature	460	F to R
Pressure	51.72	mmHg/psi
Mass	2000	lbs/ton

Notes:
1 Example crude oil MSDS used to determine HAP content of crude oil.
2 Data obtained from AP-42, Chapter 7, Section 7.1, Organic Liquid Storage Tanks, November 2006.

3. AP-42, Section 7.1, Tables 7.1-2 and 7.1-5

Table 7.1-2. PROPERTIES (M_V, P_{VA}, W_L) OF SELECTED PETROLEUM LIQUIDS[a]

Petroleum Liquid	Vapor Molecular Weight at 60°F, M_V (lb/lb-mole)	Liquid Density At 60°F, W_L (lb/gal)	True Vapor Pressure, P_{VA} (psi)						
			40°F	50°F	60°F	70°F	80°F	90°F	100°F
Crude oil RVP 5	50	7.1	1.8	2.3	2.8	3.4	4.0	4.8	5.7
Distillate fuel oil No. 2	130	7.1	0.0031	0.0045	0.0065	0.0090	0.012	0.016	0.022
Gasoline RVP 7	68	5.6	2.3	2.9	3.5	4.3	5.2	6.2	7.4
Gasoline RVP 7.8	68	5.6	2.5929	3.2079	3.9363	4.793	5.7937	6.9552	8.2952
Gasoline RVP 8.3	68	5.6	2.7888	3.444	4.2188	5.1284	6.1891	7.4184	8.8344
Gasoline RVP 10	66	5.6	3.4	4.2	5.2	6.2	7.4	8.8	10.5
Gasoline RVP 11.5	65	5.6	4.087	4.9997	6.069	7.3132	8.7519	10.4053	12.2949
Gasoline RVP 13	62	5.6	4.7	5.7	6.9	8.3	9.9	11.7	13.8
Gasoline RVP 13.5	62	5.6	4.932	6.0054	7.2573	8.7076	10.3774	12.2888	14.4646
Gasoline RVP 15.0	60	5.6	5.5802	6.774	8.1621	9.7656	11.6067	13.7085	16.0948
Jet kerosene	130	7.0	0.0041	0.0060	0.0085	0.011	0.015	0.021	0.029
Jet naphtha (JP-4)	80	6.4	0.8	1.0	1.3	1.6	1.9	2.4	2.7
Residual oil No. 6	190	7.9	0.00002	0.00003	0.00004	0.00006	0.00009	0.00013	0.00019

[a] References 10 and 11

Table 7.1-5. VAPOR PRESSURE EQUATION CONSTANTS FOR ORGANIC LIQUIDS[a]

Name	Vapor Pressure Equation Constants		
	A	B	C
	(Dimensionless)	(°C)	(°C)
Acetaldehyde	8.005	1600.017	291.809
Acetic acid	7.387	1533.313	222.309
Acetic anhydride	7.149	1444.718	199.817
Acetone	7.117	1210.595	229.664
Acetonitrile	7.119	1314.4	230
Acrylamide	11.2932	3939.877	273.16
Acrylic acid	5.652	648.629	154.683
Acrylonitrile	7.038	1232.53	222.47
Aniline	7.32	1731.515	206.049
Benzene	6.905	1211.033	220.79
Butanol (iso)	7.4743	1314.19	186.55
Butanol-(1)	7.4768	1362.39	178.77
Carbon disulfide	6.942	1169.11	241.59
Carbon tetrachloride	6.934	1242.43	230
Chlorobenzene	6.978	1431.05	217.55
Chloroform	6.493	929.44	196.03
Chloroprene	6.161	783.45	179.7
Cresol(m-)	7.508	1856.36	199.07
Cresol(o-)	6.911	1435.5	165.16
Cresol(p-)	7.035	1511.08	161.85
Cumene (isopropylbenzene)	6.93666	1460.793	207.78
Cyclohexane	6.841	1201.53	222.65
Cyclohexanol	6.255	912.87	109.13
Cyclohexanone	7.8492	2137.192	273.16
Dichloroethane(1,2)	7.025	1272.3	222.9
Dichloroethylene(1,2)	6.965	1141.9	231.9
Diethyl (N,N) anilin	7.466	1993.57	218.5
Dimethyl formamide	6.928	1400.87	196.43
Dimethyl hydrazine (1,1)	7.408	1305.91	225.53
Dimethyl phthalate	4.522	700.31	51.42
Dinitrobenzene	4.337	229.2	-137
Dioxane(1,4)	7.431	1554.68	240.34
Epichlorohydrin	8.2294	2086.816	273.16
Ethanol	8.321	1718.21	237.52
Ethanolamine(mono-)	7.456	1577.67	173.37
Ethyl acetate	7.101	1244.95	217.88
Ethyl acrylate	7.9645	1897.011	273.16
Ethyl benzene	6.975	1424.255	213.21
Ethyl chloride	6.986	1030.01	238.61
Ethyl ether	6.92	1064.07	228.8
Formic acid	7.581	1699.2	260.7
Furan	6.975	1060.87	227.74
Furfural	6.575	1198.7	162.8

Table 7.1-5. (cont.)

Name	Vapor Pressure Equation Constants		
	A	B	C
	(Dimensionless)	(°C)	(°C)
Heptane(iso)	6.8994	1331.53	212.41
Hexane(-N)	6.876	1171.17	224.41
Hexanol(-1)	7.86	1761.26	196.66
Hydrocyanic acid	7.528	1329.5	260.4
Isopropyl alcohol	8.1177	1580.92	219.61
Methanol	7.897	1474.08	229.13
Methyl acetate	7.065	1157.63	219.73
Methyl ethyl ketone	6.8645	1150.207	209.246
Methyl isobutyl ketone	6.672	1168.4	191.9
Methyl methacrylate	8.409	2050.5	274.4
Methyl styrene (alpha)	6.923	1486.88	202.4
Methylene chloride	7.409	1325.9	252.6
Morpholine	7.7181	1745.8	235
Naphthalene	7.37	1968.36	222.61
Nitrobenzene	7.115	1746.6	201.8
Pentachloroethane	6.74	1378	197
Phenol	7.133	1516.79	174.95
Picoline(-2)	7.032	1415.73	211.63
Propanol (iso)	8.117	1580.92	219.61
Propylene glycol	8.2082	2085.9	203.540
Propylene oxide	7.0671	1133.267	236.1054
Pyridine	7.041	1373.8	214.98
Resorcinol	6.9243	1884.547	186.060
Styrene	7.14	1574.51	224.09
Tetrachloroethane(1,1,1,2)	6.898	1365.88	209.74
Tetrachloroethane(1,1,2,2)	6.631	1228.1	179.9
Tetrachloroethylene	6.98	1386.92	217.53
Tetrahydrofuran	6.995	1202.29	226.25
Toluene	6.954	1344.8	219.48
Trichloro(1,1,2)trifluoroethane	6.88	1099.9	227.5
Trichloroethane(1,1,1)	8.643	2136.6	302.8
Trichloroethane(1,1,2)	6.951	1314.41	209.2
Trichloroethylene	6.518	1018.6	192.7
Trichlorofluoromethane	6.884	1043.004	236.88
Trichloropropane(1,2,3)	6.903	788.2	243.23
Vinyl acetate	7.21	1296.13	226.66
Vinylidene chloride	6.972	1099.4	237.2
Xylene(m-)	7.009	1426.266	215.11
Xylene(o-)	6.998	1474.679	213.69
Xylene(p-)	7.02	1474.40	217.77

[a]Reference 12.

4. AP-42, Section 11.19.2 – Table 11.19.2-2

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source [b]	Total Particulate Matter [r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

e. Reference 4

f. References 4 and 15

g. Reference 4

h. References 5 and 6

i. References 5, 6, and 15

j. Reference 11

k. Reference 12

l. References 1, 3, 7, and 8

m. References 1, 3, 7, 8, and 15

n. No data available, but emission factors for PM-10 for tertiary crushers can be used as an upper limit for primary or secondary crushing

o. References 2, 3, 7, 8

p. References 2, 3, 7, 8, and 15

q. Reference 15

r. PM emission factors are presented based on PM-100 data in the Background Support Document for Section 11.19.2

s. Emission factors for PM-30 and PM-50 are available in Figures 11.19.2-3 through 11.19.2-6.

Note: Truck Unloading - Conveyor, crushed stone (SCC 3-05-020-32) was corrected to Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32). October 1, 2010.

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5. Mesh sizes recommended by API for frac sand

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Frac sand specs

Frac sand specifications are the responsibility in the USA of the **American Petroleum Institute** (API) and the current standard is **API RP 56.**

These specifications are very demanding and as a result suitable deposits are limited. The limited availability of natural reserves which are suitable for frac sand production coupled with growing demand ensures a high price for any producers able to meet the **API RP 56 frac sand specifications.**

Natural sands must be from high silica (quartz) sandstones or unconsolidated deposits. Other essential requirements are that particles are well rounded, relatively clean of other minerals and impurities and will facilitate the production of fine, medium and coarse grain sands.

Geology

Frac sand must be >99% quartz or silica. Most silica sand deposits are either already being exploited or are at least known of due to the use of this material in many other industrial applications including glass making and filtration media.

High purity quartz sands are common in the USA. These are made up of some deposits that are currently being exploited, some which have been abandoned and others that are so remotely located that costs of transporting material render them commercially unviable.

The **tight specifications for frac sands** – especially in relation to roundness and sphericity – make many deposits unsuitable for frac sand production.

From the work currently being done in the production of frac sands it seems that older quartzose sandstones have a better chance of producing a good frac sand. However, it is possible to upgrade other deposits if carefully controlled.

Grain Size

The sizes recommended by the API for frac sand are:

Mesh

8/12
10/20

20/40
70/140

mm

2.38-1.68
2.00-0.84
0.84-0.42
210-105 micron

The 20/40 mesh size (0.42mm – 0.84mm) is the most widely used.

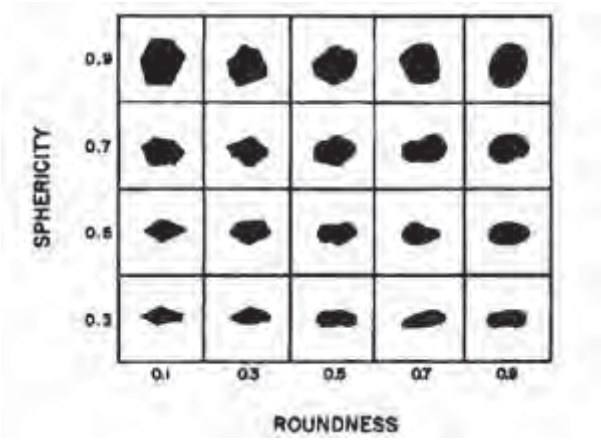
Sphericity & Roundness

The standards prepared by the API in this regard simply estimate how closely the quartz grain conforms to a spherical shape and its relative roundness.

The grain is assessed as follows:

"average radius of the corners / radius of the maximum inscribed circle"

Krumbein and Sloss devised a chart for the visual estimation of sphericity and roundness in 1955 as shown below. API recommends sphericity and roundness of 0.6 or larger.



Crush Resistance

API requires frac sand to be subjected to between 4000psi and 600psi pressure for two minutes in a uniaxial compression cylinder to determine its crush resistance.

The fines generated by this test are limited as shown below:

Size / Max fines by weight

6-12 mesh / 20%

16-30 mesh / 14%

20-40 mesh / 14%

30-50 mesh / 10%

40-70 mesh / 6%

Solubility

This test measures the loss in weight of a sample that has been added to a 100ml solution made up of 12 parts Hydrochloric Acid (HCI) and 3 parts Hydrofluoric Acid (HCI) and subsequently heated at 150 degrees fahrenheit (approximately 65.5 degrees centigrade) in a water bath for 30 minutes.

The object of this test is to determine the amount of non-quartz minerals present.

API specifications require that losses by weight as a result of this test are restricted to <2% across all mesh sizes up to 40-70 mesh where the loss permitted rises to 3%.

Turbidity

Turbidity refers to the amount of silt of clay sized particles in the sand sample. This is generally not an issue in frac sand production as production requires a washing process to be introduced which effectively removes these particles.

There can also be an attrition process applied which also serves to remove unwanted fines as well as weaker grains.

Related Products:

- EvoWash Fines Washing Plant

Additional Information:

- Hydraulic Fracturing
- Frac sand specs
- Fracking risks 'overstated'

- Privacy Policy
- Sitemap

website development by 31interactive

6. AP-42, Section 13.2.2

13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23, 26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \quad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \quad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

as shown in Table 13.2.2-4

Table 13.2.2-4. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	*C*, Emission Factor for Exhaust, Brake Wear and Tire Wear[b] lb/VMT
$PM_{2.5}$	0.00036
PM_{10}	0.00047
PM_{30}[c]	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

It is important to note that the vehicle-related source conditions refer to the average weight, speed, and number of wheels for all vehicles traveling the road. For example, if 98 percent of traffic on the road are 2-ton cars and trucks while the remaining 2 percent consists of 20-ton trucks, then the mean weight is 2.4 tons. More specifically, Equations 1a and 1b are *not* intended to be used to calculate a separate emission factor for each vehicle class within a mix of traffic on a given unpaved road. That is, in the example, one should *not* determine one factor for the 2-ton vehicles and a second factor for the 20-ton trucks. Instead, only one emission factor should be calculated that represents the "fleet" average of 2.4 tons for all vehicles traveling the road.

Moreover, to retain the quality ratings when addressing a group of unpaved roads, it is necessary that reliable correction parameter values be determined for the road in question. The field and laboratory procedures for determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. Vehicle-related parameters should be developed by recording visual observations of traffic. In some cases, vehicle parameters for industrial unpaved roads can be determined by reviewing maintenance records or other information sources at the facility.

In the event that site-specific values for correction parameters cannot be obtained, then default values may be used.In the absence of site-specific silt content information, an appropriate mean value from Table 13.2.2-1 may be used as a default value, but the quality rating of the equation is reduced by two letters. Because of significant differences found between different types of road surfaces and between different areas of the country, use of the default moisture content value of 0.5 percent in Equation 1b is discouraged. The quality rating should be downgraded two letters when the default moisture content value is used. (It is assumed that readers addressing industrial roads have access to the information needed to develop average vehicle information in Equation 1a for their facility.)

The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, “Controls”. However, all roads are subject to some natural mitigation because of rainfall and other precipitation. The Equation 1a and 1b emission factors can be extrapolated to annual

average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$$E_{ext} = E\ [(365 - P)/365] \quad (2)$$

where:

E_{ext} = annual size-specific emission factor extrapolated for natural mitigation, lb/VMT

E = emission factor from Equation 1a or 1b

P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation (see below)

Figure 13.2.2-1 gives the geographical distribution for the mean annual number of "wet" days for the United States.

Equation 2 provides an estimate that accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface. In the event that a finer temporal and spatial resolution is desired for inventories of public unpaved roads, estimates can be based on a more complex set of assumptions. These assumptions include:

1. The moisture content of the road surface material is increased in proportion to the quantity of water added;
2. The moisture content of the road surface material is reduced in proportion to the Class A pan evaporation rate;
3. The moisture content of the road surface material is reduced in proportion to the traffic volume; and
4. The moisture content of the road surface material varies between the extremes observed in the area. The CHIEF Web site (http://www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html) has a file which contains a spreadsheet program for calculating emission factors which are temporally and spatially resolved. Information required for use of the spreadsheet program includes monthly Class A pan evaporation values, hourly meteorological data for precipitation, humidity and snow cover, vehicle traffic information, and road surface material information.

It is emphasized that the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution have not been verified in any rigorous manner. For this reason, the quality ratings for either approach should be downgraded one letter from the rating that would be applied to Equation 1.

13.2.2.3 Controls[18-22]

A wide variety of options exist to control emissions from unpaved roads. Options fall into the following three groupings:

1. Vehicle restrictions that limit the speed, weight or number of vehicles on the road;

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and
3. Surface treatment, such as watering or treatment with chemical dust suppressants.

Available control options span broad ranges in terms of cost, efficiency, and applicability. For example, traffic controls provide moderate emission reductions (often at little cost) but are difficult to enforce. Although paving is highly effective, its high initial cost is often prohibitive. Furthermore, paving is not feasible for industrial roads subject to very heavy vehicles and/or spillage of material in transport. Watering and chemical suppressants, on the other hand, are potentially applicable to most industrial roads at moderate to low costs. However, these require frequent reapplication to maintain an acceptable level of control. Chemical suppressants are generally more cost-effective than water but not in cases of temporary roads (which are common at mines, landfills, and construction sites). In summary, then, one needs to consider not only the type and volume of traffic on the road but also how long the road will be in service when developing control plans.

Vehicle restrictions. These measures seek to limit the amount and type of traffic present on the road or to lower the mean vehicle speed. For example, many industrial plants have restricted employees from driving on plant property and have instead instituted bussing programs. This eliminates emissions due to employees traveling to/from their worksites. Although the heavier average vehicle weight of the busses increases the base emission factor, the decrease in vehicle-miles-traveled results in a lower overall emission rate.

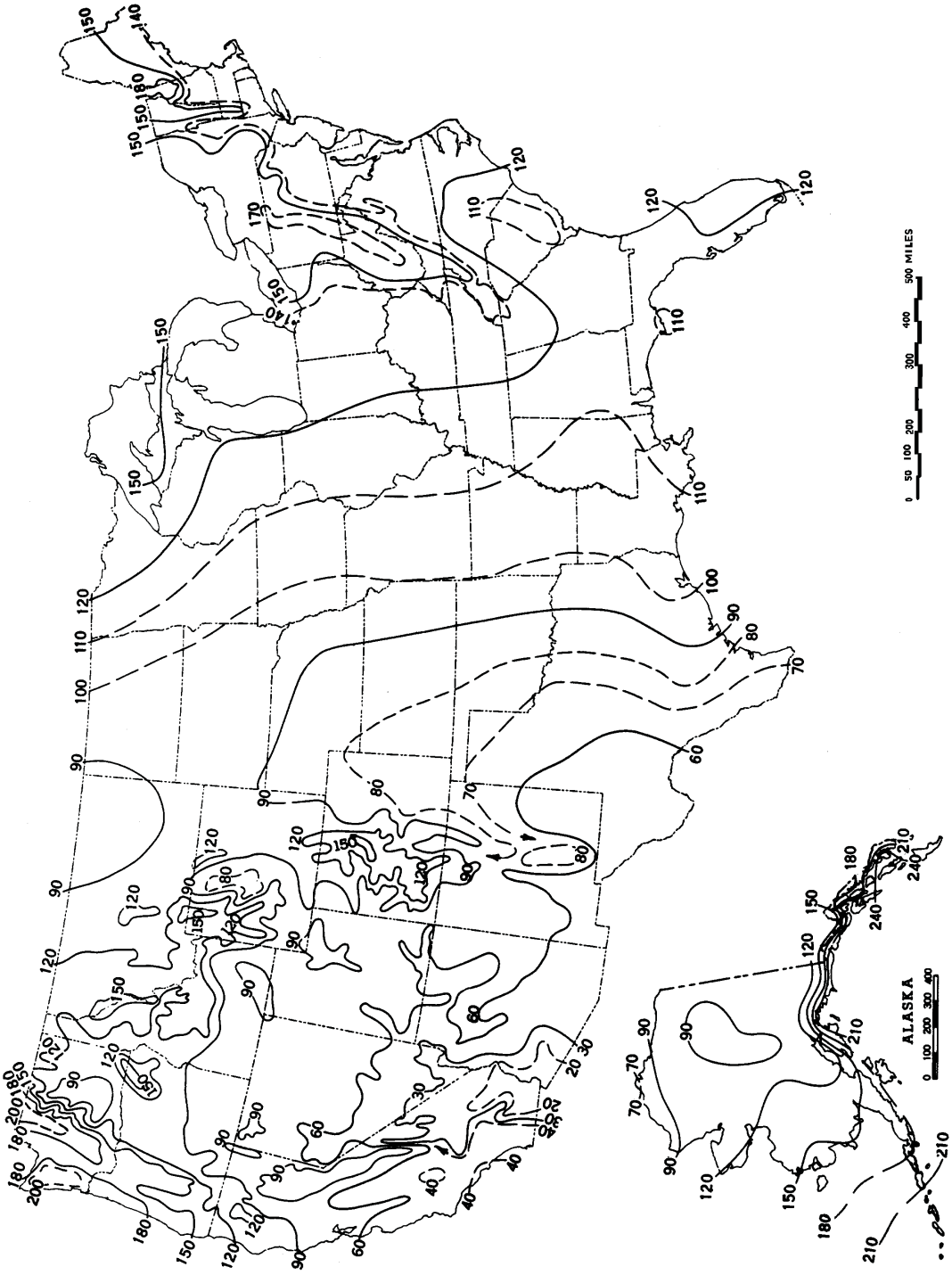


Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

Surface improvements. Control options in this category alter the road surface. As opposed to the "surface treatments" discussed below, improvements are relatively "permanent" and do not require periodic retreatment.

The most obvious surface improvement is paving an unpaved road. This option is quite expensive and is probably most applicable to relatively short stretches of unpaved road with at least several hundred vehicle passes per day. Furthermore, if the newly paved road is located near unpaved areas or is used to transport material, it is essential that the control plan address routine cleaning of the newly paved road surface.

The control efficiencies achievable by paving can be estimated by comparing emission factors for unpaved and paved road conditions. The predictive emission factor equation for paved roads, given in Section 13.2.1, requires estimation of the silt loading on the traveled portion of the paved surface, which in turn depends on whether the pavement is periodically cleaned. Unless curbing is to be installed, the effects of vehicle excursion onto unpaved shoulders (berms) also must be taken into account in estimating the control efficiency of paving.

Other improvement methods cover the road surface with another material that has a lower silt content. Examples include placing gravel or slag on a dirt road. Control efficiency can be estimated by comparing the emission factors obtained using the silt contents before and after improvement. The silt content of the road surface should be determined after 3 to 6 months rather than immediately following placement. Control plans should address regular maintenance practices, such as grading, to retain larger aggregate on the traveled portion of the road.

Surface treatments refer to control options which require periodic reapplication. Treatments fall into the two main categories of (a) "wet suppression" (i. e., watering, possibly with surfactants or other additives), which keeps the road surface wet to control emissions and (b) "chemical stabilization/ treatment", which attempts to change the physical characteristics of the surface. The necessary reapplication frequency varies from several minutes for plain water under summertime conditions to several weeks or months for chemical dust suppressants.

Watering increases the moisture content, which conglomerates particles and reduces their likelihood to become suspended when vehicles pass over the surface. The control efficiency depends on how fast the road dries after water is added. This in turn depends on (a) the amount (per unit road surface area) of water added during each application; (b) the period of time between applications; (c) the weight, speed and number of vehicles traveling over the watered road during the period between applications; and (d) meteorological conditions (temperature, wind speed, cloud cover, etc.) that affect evaporation during the period.

Figure 13.2.2-2 presents a simple bilinear relationship between the instantaneous control efficiency due to watering and the resulting increase in surface moisture. The moisture ratio "M" (i.e., the x-axis in Figure 13.2.2-2) is found by dividing the surface moisture content of the watered road by the surface moisture content of the uncontrolled road. As the watered road surface dries, both the ratio M and the predicted instantaneous control efficiency (i.e., the y-axis in the figure) decrease. The figure shows that between the uncontrolled moisture content and a value twice as large, a small increase in moisture content results in a large increase in control efficiency. Beyond that, control efficiency grows slowly with increased moisture content.

Given the complicated nature of how the road dries, characterization of emissions from watered roadways is best done by collecting road surface material samples at various times between water truck passes. (Appendices C.1 and C.2 present the sampling and analysis procedures.) The moisture content measured can then be associated with a control efficiency by use of Figure 13.2.2-2. Samples that reflect average conditions during the watering cycle can take the form of either a series of samples between water applications or a single sample at the midpoint. It is essential that samples be collected during periods with active traffic on the road. Finally, because of different evaporation rates, it is recommended that samples be collected at various times during the year. If only one set of samples is to be collected, these must be collected during hot, summertime conditions.

When developing watering control plans for roads that do not yet exist, it is strongly recommended that the moisture cycle be established by sampling similar roads in the same geographic area. If the moisture cycle cannot be established by similar roads using established watering control plans, the more complex methodology used to estimate the mitigation of rainfall and other precipitation can be used to estimate the control provided by routine watering. An estimate of the maximum daytime Class A pan evaporation (based upon daily evaporation data published in the monthly Climatological Data for the state by the National Climatic Data Center) should be used to insure that adequate watering capability is available during periods of highest evaporation. The hourly precipitation values in the spreadsheet should be replaced with the equivalent inches of precipitation (where the equivalent of 1 inch of precipitation is provided by an application of 5.6 gallons of water per square yard of road). Information on the long term average annual evaporation and on the percentage that occurs between May and October was published in the Climatic Atlas (Reference 16). Figure 13.2.2-3 presents the geographical distribution for "Class A pan evaporation" throughout the United States. Figure 13.2.2-4 presents the geographical distribution of the percentage of this evaporation that occurs between May and October. The U. S. Weather Bureau Class A evaporation pan is a cylindrical metal container with a depth of 10 inches and a diameter of 48 inches. Periodic measurements are made of the changes of the water level.

The above methodology should be used only for prospective analyses and for designing watering programs for existing roadways. The quality rating of an emission factor for a watered road that is based on this methodology should be downgraded two letters. Periodic road surface samples should be collected and analyzed to verify the efficiency of the watering program.

As opposed to watering, chemical dust suppressants have much less frequent reapplication requirements. These materials suppress emissions by changing the physical characteristics of the existing road surface material. Many chemical unpaved road dust suppressants form a hardened surface that binds particles together. After several applications, a treated road often resembles a paved road except that the surface is not uniformly flat. Because the improved surface results in more grinding of small particles, the silt content of loose material on a highly controlled surface may be substantially higher than when the surface was uncontrolled. For this reason, the models presented as Equations 1a and 1b cannot be used to estimate emissions from chemically stabilized roads. Should the road be allowed to return to an

uncontrolled state with no visible signs of large-scale cementing of material, the Equation 1a and 1b emission factors could then be used to obtain conservatively high emission estimates.

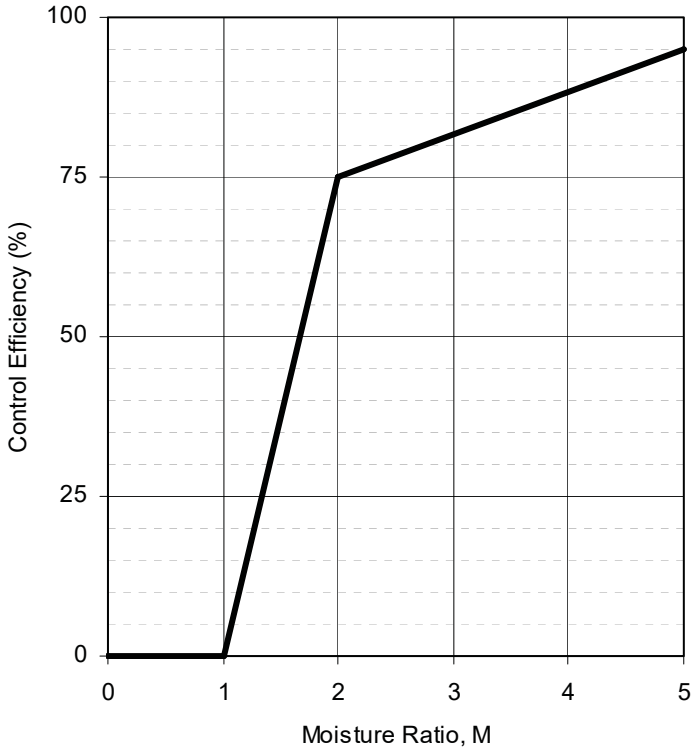


Figure 13.2.2-2. Watering control effectiveness for unpaved travel surfaces

The control effectiveness of chemical dust suppressants appears to depend on (a) the dilution rate used in the mixture; (b) the application rate (volume of solution per unit road surface area); (c) the time between applications; (d) the size, speed and amount of traffic during the period between applications; and (e) meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period. Other factors that affect the performance of dust suppressants include other traffic characteristics (e. g., cornering, track-on from unpaved areas) and road characteristics (e. g., bearing strength, grade). The variabilities in the above factors and differences between individual dust control products make the control efficiencies of chemical dust suppressants difficult to estimate. Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

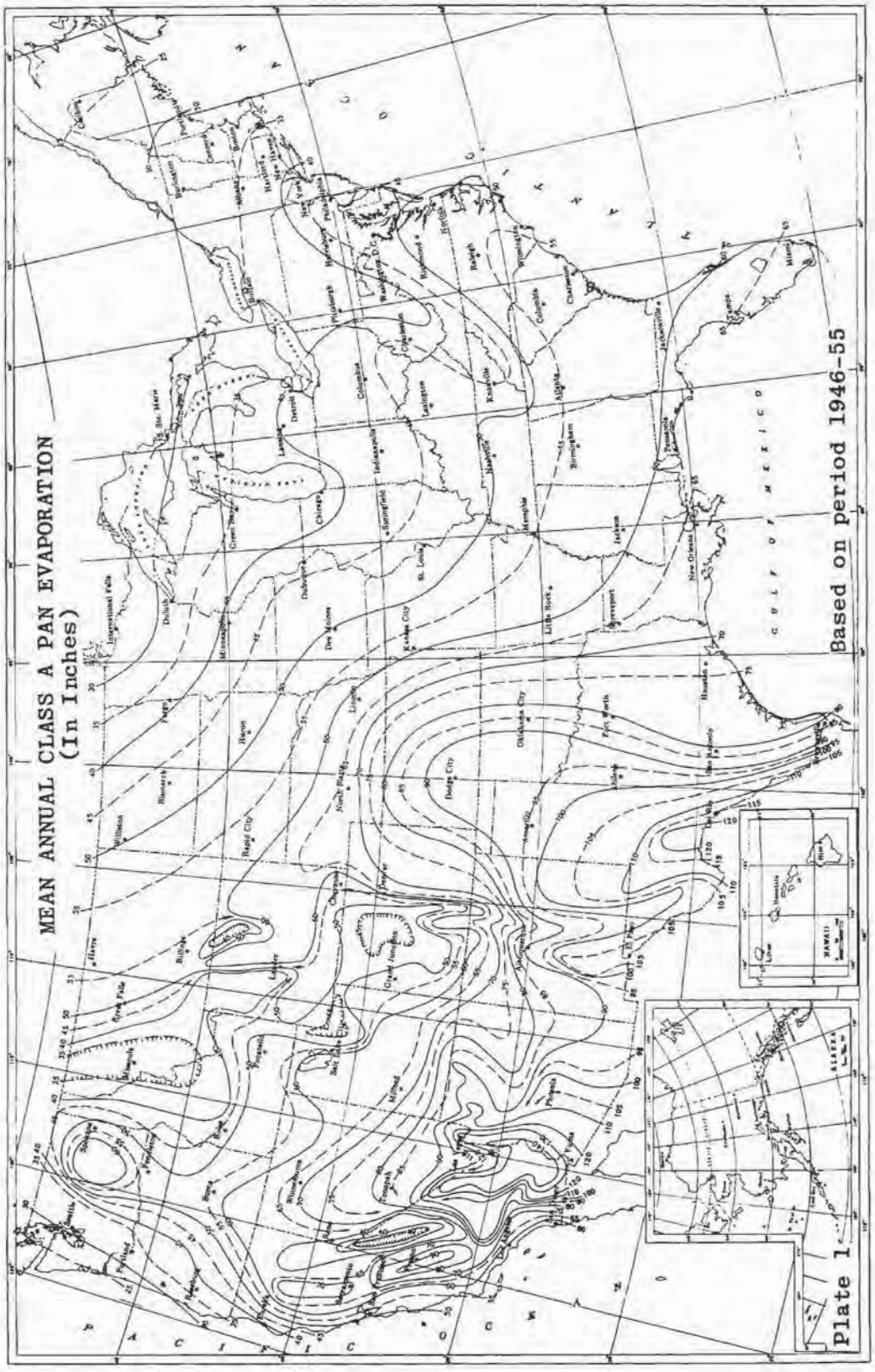


Figure 13.2.2-3. Annual evaporation data.

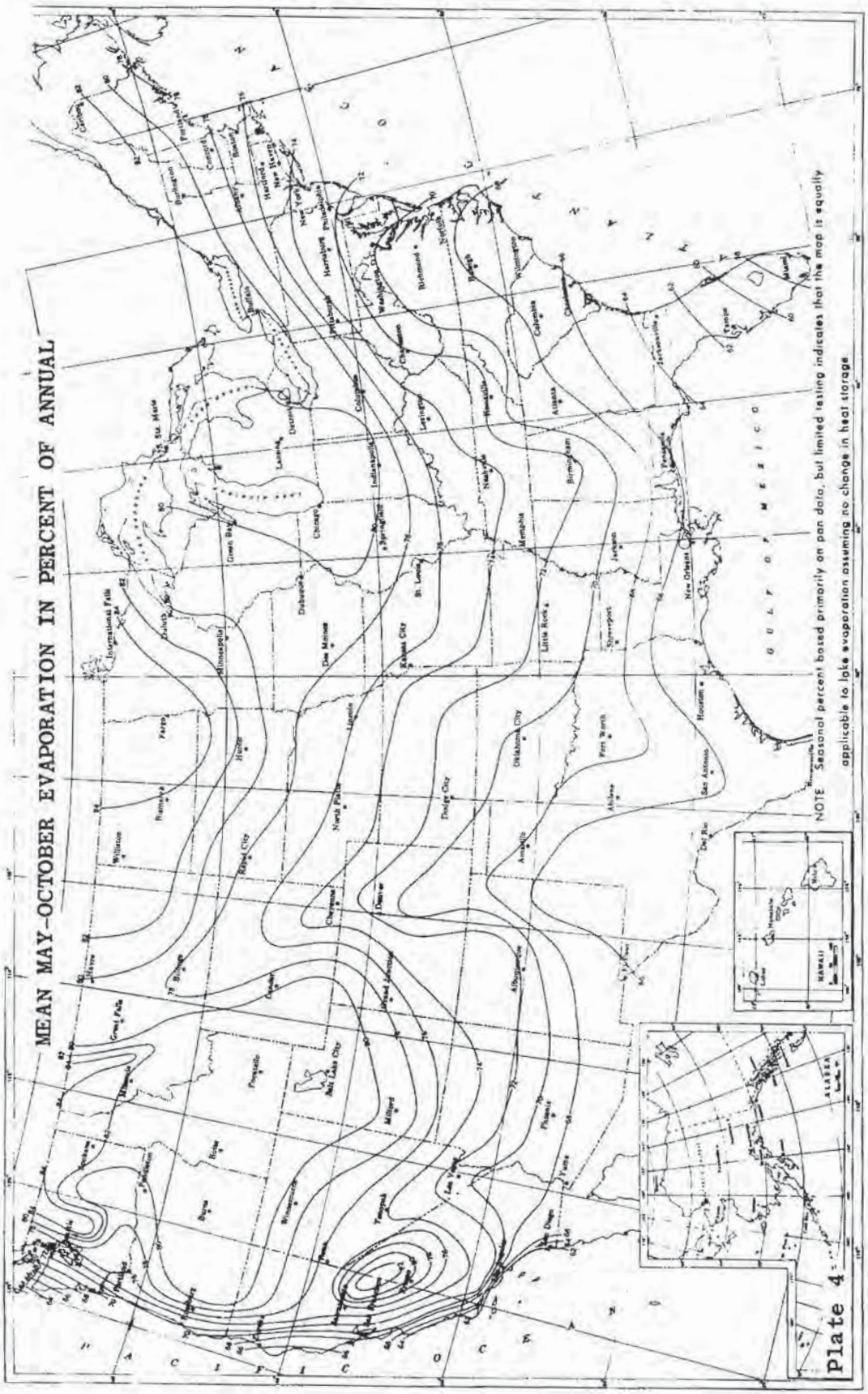


Figure 13.2.2-4. Geographical distribution of the percentage of evaporation occurring between May and October.

Petroleum resin products historically have been the dust suppressants (besides water) most widely used on industrial unpaved roads. Figure 13.2.2-5 presents a method to estimate average control efficiencies associated with petroleum resins applied to unpaved roads.[20] Several items should be noted:

1. The term "ground inventory" represents the total volume (per unit area) of petroleum resin concentrate (*not solution*) applied since the start of the dust control season.

2. Because petroleum resin products must be periodically reapplied to unpaved roads, the use of a time-averaged control efficiency value is appropriate. Figure 13.2.2-5 presents control efficiency values averaged over two common application intervals, 2 weeks and 1 month. Other application intervals will require interpolation.

3. Note that zero efficiency is assigned until the ground inventory reaches 0.05 gallon per square yard (gal/yd^2). Requiring a minimum ground inventory ensures that one must apply a reasonable amount of chemical dust suppressant to a road before claiming credit for emission control. Recall that the ground inventory refers to the amount of petroleum resin concentrate rather than the total solution.

As an example of the application of Figure 13.2.2-5, suppose that Equation 1a was used to estimate an emission factor of 7.1 lb/VMT for PM-10 from a particular road. Also, suppose that, starting on May 1, the road is treated with 0.221 gal/yd^2 of a solution (1 part petroleum resin to 5 parts water) on the first of each month through September. Then, the average controlled emission factors, shown in Table 13.2.2-5, are found.

Table 13.2-2-5. EXAMPLE OF AVERAGE CONTROLLED EMISSION FACTORS FOR SPECIFIC CONDITIONS

Period	Ground Inventory, gal/yd^2	Average Control Efficiency, %[a]	Average Controlled Emission Factor, lb/VMT
May	0.037	0	7.1
June	0.073	62	2.7
July	0.11	68	2.3
August	0.15	74	1.8
September	0.18	80	1.4

[a] From Figure 13.2.2-5, ≤10 µm. Zero efficiency assigned if ground inventory is less than 0.05 gal/yd^2. 1 lb/VMT = 281.9 g/VKT. 1 gal/yd^2 = 4.531 L/m^2.

Besides petroleum resins, other newer dust suppressants have also been successful in controlling emissions from unpaved roads. Specific test results for those chemicals, as well as for petroleum resins and watering, are provided in References 18 through 21.

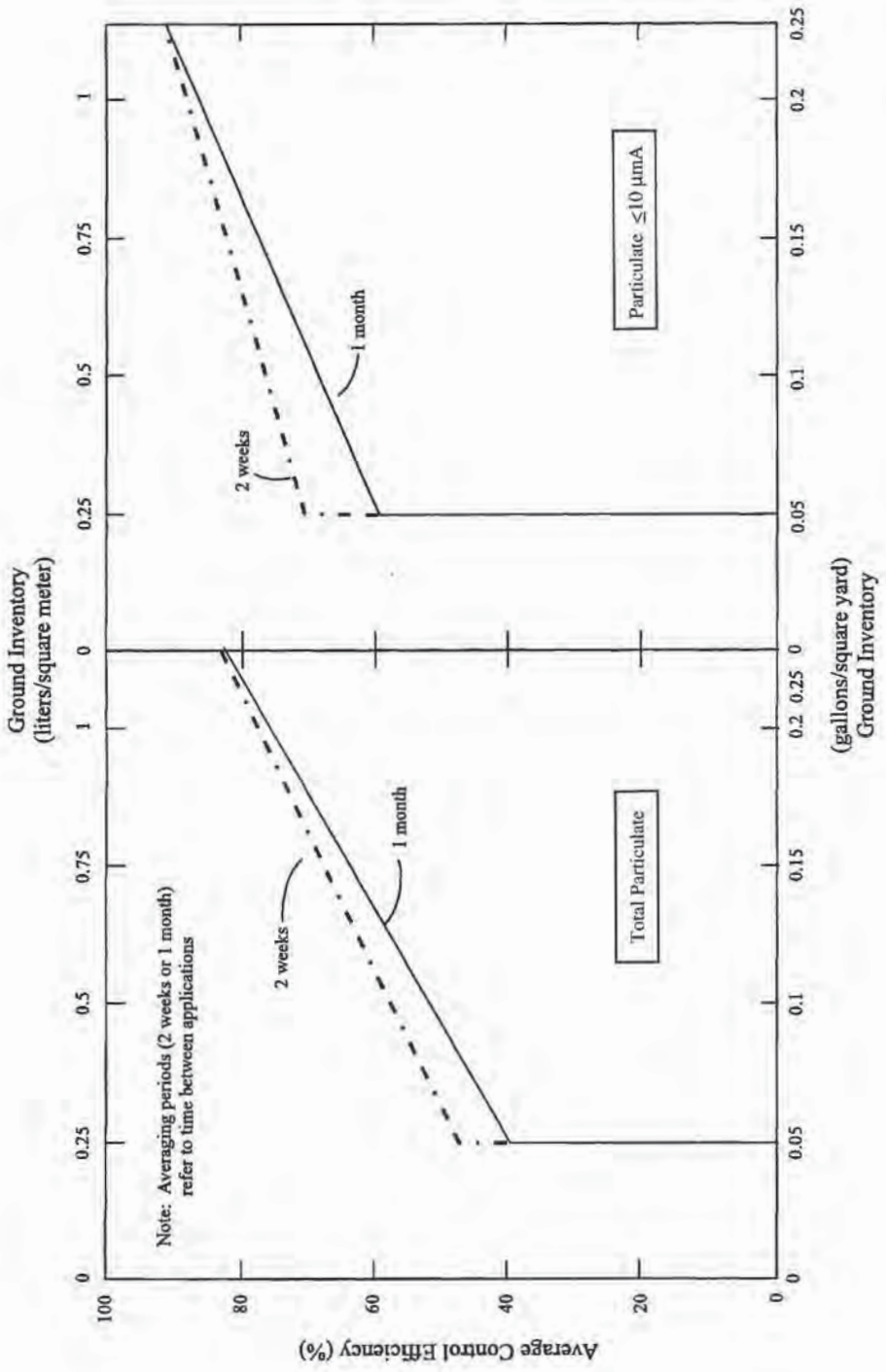


Figure 13.2.2-5. Average control efficiencies over common application intervals.

13.2.2.4 Updates Since The Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the background report for this section (Reference 6).

October 1998 (Supplement E)– This was a major revision of this section. Significant changes to the text and the emission factor equations were made.

October 2001 – Separate emission factors for unpaved surfaces at industrial sites and publicly accessible roads were introduced. Figure 13.2.2-2 was included to provide control effectiveness estimates for watered roads.

December 2003 – The public road emission factor equation (equation 1b) was adjusted to remove the component of particulate emissions from exhaust, brake wear, and tire wear. The parameter C in the new equation varies with aerodynamic size range of the particulate matter. Table 13.2.2-4 was added to present the new coefficients.

January 2006 – The PM-2.5 particle size multipliers (i.e., factors) in Table 13.2.2-2 were modified and the quality ratings were upgraded from C to B based on the wind tunnel studies of a variety of dust emitting surface materials.

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7. AP-42, Section 13.2.1

13.2.1 Paved Roads

13.2.1.1 General

Particulate emissions occur whenever vehicles travel over a paved surface such as a road or parking lot. Particulate emissions from paved roads are due to direct emissions from vehicles in the form of exhaust, brake wear and tire wear emissions and resuspension of loose material on the road surface. In general terms, resuspended particulate emissions from paved roads originate from, and result in the depletion of, the loose material present on the surface (i.e., the surface loading). In turn, that surface loading is continuously replenished by other sources. At industrial sites, surface loading is replenished by spillage of material and trackout from unpaved roads and staging areas. Figure 13.2.1-1 illustrates several transfer processes occurring on public streets.

Various field studies have found that public streets and highways, as well as roadways at industrial facilities, can be major sources of the atmospheric particulate matter within an area.[1-9] Of particular interest in many parts of the United States are the increased levels of emissions from public paved roads when the equilibrium between deposition and removal processes is upset. This situation can occur for various reasons, including application of granular materials for snow and ice control, mud/dirt carryout from construction activities in the area, and deposition from wind and/or water erosion of surrounding unstabilized areas. In the absence of continuous addition of fresh material (through localized track out or application of antiskid material), paved road surface loading should reach an equilibrium value in which the amount of material resuspended matches the amount replenished. The equilibrium surface loading value depends upon numerous factors. It is believed that the most important factors are: mean speed of vehicles traveling the road; the average daily traffic (ADT); the number of lanes and ADT per lane; the fraction of heavy vehicles (buses and trucks); and the presence/absence of curbs, storm sewers and parking lanes.[10]

The particulate emission factors presented in a previous version of this section of AP-42, dated October 2002, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material. EPA included these sources in the emission factor equation for paved roads since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the paved road emission factor equation only estimates particulate emissions from resuspended road surface material[28]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOVES [29] model. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOVES to estimate particulate emissions from vehicle traffic on paved roads. It also incorporates the decrease in exhaust emissions that has occurred since the paved road emission factor equation was developed. Earlier versions of the paved road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.1.2 Emissions And Correction Parameters

Dust emissions from paved roads have been found to vary with what is termed the "silt loading" present on the road surface. In addition, the average weight and speed of vehicles traveling the road influence road dust emissions. The term silt loading (sL) refers to the mass of silt-size material (equal to or less than 75 micrometers [μm] in physical diameter) per unit area of the travel surface. The total road surface dust loading consists of loose material that can be collected by broom sweeping and vacuuming of the traveled portion of the paved road. The silt fraction is determined by measuring the proportion of the loose dry surface dust that passes through a 200-mesh screen, using the ASTM-C-136 method. Silt loading is the product of the silt fraction and the total loading, and is abbreviated "sL". Additional details on the sampling and analysis of such material are provided in AP-42 Appendices C.1 and C.2.

The surface sL provides a reasonable means of characterizing seasonal variability in a paved road emission inventory. In many areas of the country, road surface loadings [11-21] are heaviest during the late winter and early spring months when the residual loading from snow/ice controls is greatest. As noted earlier, once replenishment of fresh material is eliminated, the road surface loading can be expected to reach an equilibrium value, which is substantially lower than the late winter/early spring values.

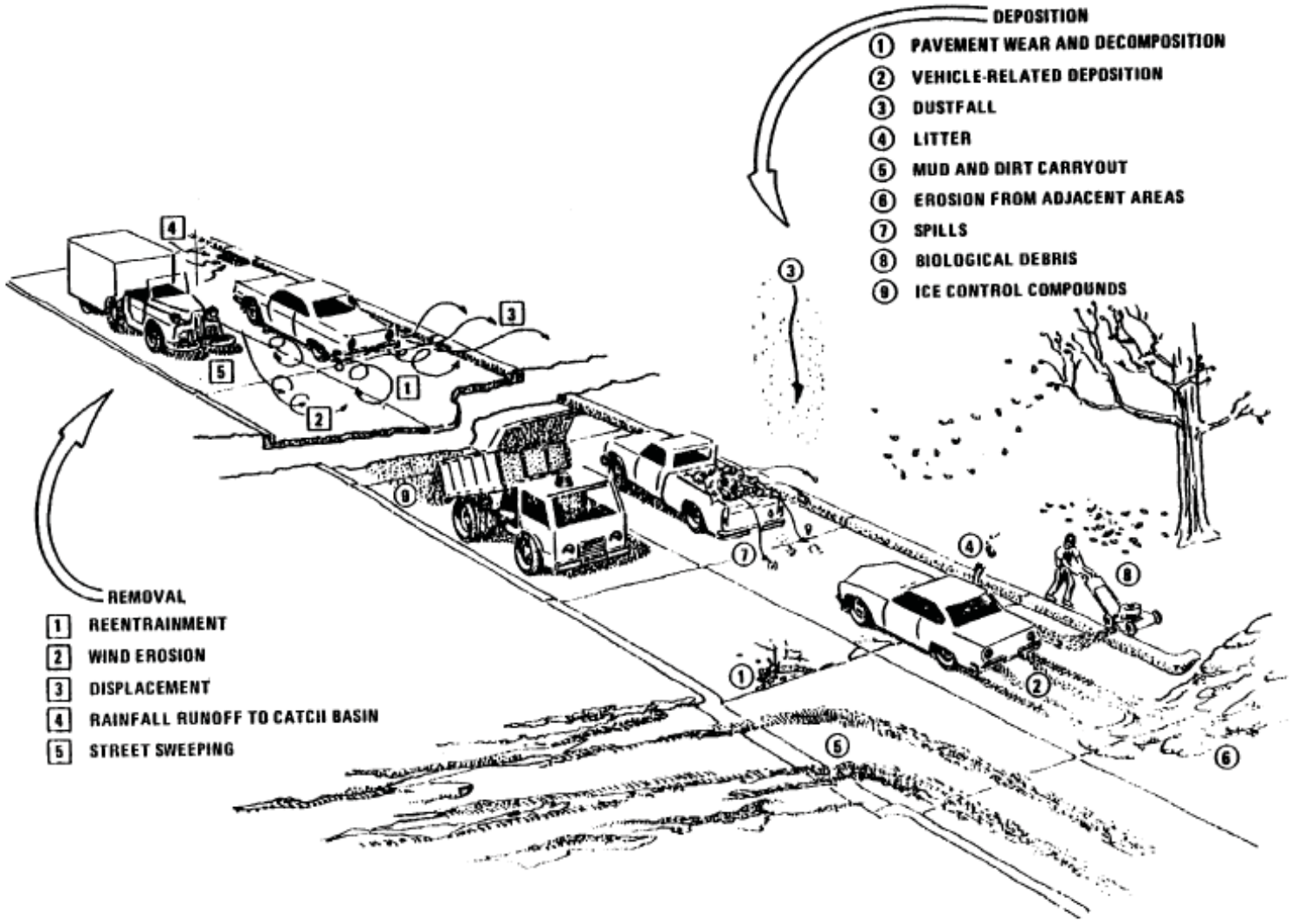

Figure 13.2.1-1. Deposition and removal processes.

13.2.1.3 Predictive Emission Factor Equations[10,29]

The quantity of particulate emissions from resuspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = k\,(sL)^{0.91} \times (W)^{1.02} \quad (1)$$

where: E = particulate emission factor (having units matching the units of k),
k = particle size multiplier for particle size range and units of interest (see below),
sL = road surface silt loading (grams per square meter) (g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

It is important to note that Equation 1 calls for the average weight of all vehicles traveling the road. For example, if 99 percent of traffic on the road are 2 ton cars/trucks while the remaining 1 percent consists of 20 ton trucks, then the mean weight "W" is 2.2 tons. More specifically, Equation 1 is *not* intended to be used to calculate a separate emission factor for each vehicle weight class. Instead, only one emission factor should be calculated to represent the "fleet" average weight of all vehicles traveling the road.

The particle size multiplier (k) above varies with aerodynamic size range as shown in Table 13.2.1-1. To determine particulate emissions for a specific particle size range, use the appropriate value of k shown in Table 13.2.1-1.

To obtain the total emissions factor, the emission factors for the exhaust, brake wear and tire wear obtained from either EPA's MOBILE6.2 [27] or MOVES2010 [29] model should be added to the emissions factor calculated from the empirical equation.

Table 13.2.1-1. PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

Size range[a]	Particle Size Multiplier k[b]		
	g/VKT	g/VMT	lb/VMT
PM-2.5[c]	0.15	0.25	0.00054
PM-10	0.62	1.00	0.0022
PM-15	0.77	1.23	0.0027
PM-30[d]	3.23	5.24	0.011

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.

[b] Units shown are grams per vehicle kilometer traveled (g/VKT), grams per vehicle mile traveled (g/VMT), and pounds per vehicle mile traveled (lb/VMT). The multiplier k includes unit conversions to produce emission factors in the units shown for the indicated size range from the mixed units required in Equation 1.

[c] The k-factors for $PM_{2.5}$ were based on the average $PM_{2.5}$:PM_{10} ratio of test runs in Reference 30.

[d] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

Equation 1 is based on a regression analysis of 83 tests for PM-10.[3, 5-6, 8, 27-29, 31-36] Sources tested include public paved roads, as well as controlled and uncontrolled industrial paved roads. The majority of tests involved freely flowing vehicles traveling at constant speed on relatively level roads. However, 22 tests of slow moving or "stop-and-go" traffic or vehicles under load were available for inclusion in the data base.[32-36] Engine exhaust, tire wear and break wear were subtracted from the emissions measured in the test programs prior to stepwise regression to determine Equation 1.[37, 39] The equations retain the quality rating of A (D for PM-2.5), if applied within the range of source conditions that were tested in developing the equation as follows:

Silt loading:	0.03 - 400 g/m^2 0.04 - 570 grains/square foot (ft^2)
Mean vehicle weight:	1.8 - 38 megagrams (Mg) 2.0 - 42 tons
Mean vehicle speed:	1 - 88 kilometers per hour (kph) 1 - 55 miles per hour (mph)

The upper and lower 95% confidence levels of equation 1 for PM_{10} is best described with equations using an exponents of 1.14 and 0.677 for silt loading and an exponents of 1.19 and 0.85 for weight. Users are cautioned that application of equation 1 outside of the range of variables and operating conditions specified above, e.g., application to roadways or road networks with speeds above 55 mph and average vehicle weights of 42 tons, will result in emission estimates with a higher level of uncertainty. In these situations, users are encouraged to consider an assessment of the impacts of the influence of extrapolation to the overall emissions and alternative methods that are equally or more plausible in light of local emissions data and/or ambient concentration or compositional data.

To retain the quality rating for the emission factor equation when it is applied to a specific paved road, it is necessary that reliable correction parameter values for the specific road in question be determined. With the exception of limited access roadways, which are difficult to sample, the collection and use of site-specific silt loading (sL) data for public paved road emission inventories are strongly recommended. The field and laboratory procedures for determining surface material silt content and surface dust loading are summarized in Appendices C.1 and C.2. In the event that site-specific values cannot be obtained, an appropriate value for a paved public road may be selected from the values in Table 13.2.1-2, but the quality rating of the equation should be reduced by 2 levels.

Equation 1 may be extrapolated to average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual (or other long-term) average emissions are inversely proportional to the frequency of measurable (> 0.254 mm [0.01 inch]) precipitation by application of a precipitation correction term. The precipitation correction term can be applied on a daily or an hourly basis [26, 38].

For the daily basis, Equation 1 becomes:

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02} \,]\,(1 - P/4N) \qquad (2)$$

where k, sL, W, and S are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

Note that the assumption leading to Equation 2 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2. However, Equation 2 above incorporates an additional factor of "4" in the denominator to account for the fact that paved roads dry more quickly than unpaved roads and that the precipitation may not occur over the complete 24-hour day.

For the hourly basis, equation 1 becomes:

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02} \,]\,(1 - 1.2P/N) \qquad (3)$$

where k, sL, W, and S are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,

P = number of hours with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N = number of hours in the averaging period (e.g., 8760 for annual, 2124 for season 720 for monthly)

Note: In the hourly moisture correction term (1-1.2P/N) for equation 3, the 1.2 multiplier is applied to account for the residual mitigative effect of moisture. For most applications, this equation will produce satisfactory results. Users should select a time interval to include sufficient "dry" hours such that a reasonable emissions averaging period is evaluated. For the special case where this equation is used to calculate emissions on an hour by hour basis, such as would be done in some emissions modeling situations, the moisture correction term should be modified so that the moisture correction "credit" is applied to the first hours following cessation of precipitation. In this special case, it is suggested that this 20% "credit" be applied on a basis of one hour credit for each hour of precipitation up to a maximum of 12 hours.

Note that the assumption leading to Equation 3 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2.

Figure 13.2.1-2 presents the geographical distribution of "wet" days on an annual basis for the United States. Maps showing this information on a monthly basis are available in the *Climatic Atlas of the United States*[23] . Alternative sources include other Department of Commerce publications (such as local climatological data summaries). The National Climatic Data Center (NCDC) offers several products that provide hourly precipitation data. In particular, NCDC offers *Solar and Meteorological Surface Observation Network 1961-1990* (SAMSON) CD-ROM, which contains 30 years worth of hourly meteorological data for first-order National Weather Service locations. Whatever meteorological data are used, the source of that data and the averaging period should be clearly specified.

It is emphasized that the simple assumption underlying Equations 2 and 3 has not been verified in any rigorous manner. For that reason, the quality ratings for Equations 2 and 3 should be downgraded one letter from the rating that would be applied to Equation 1.

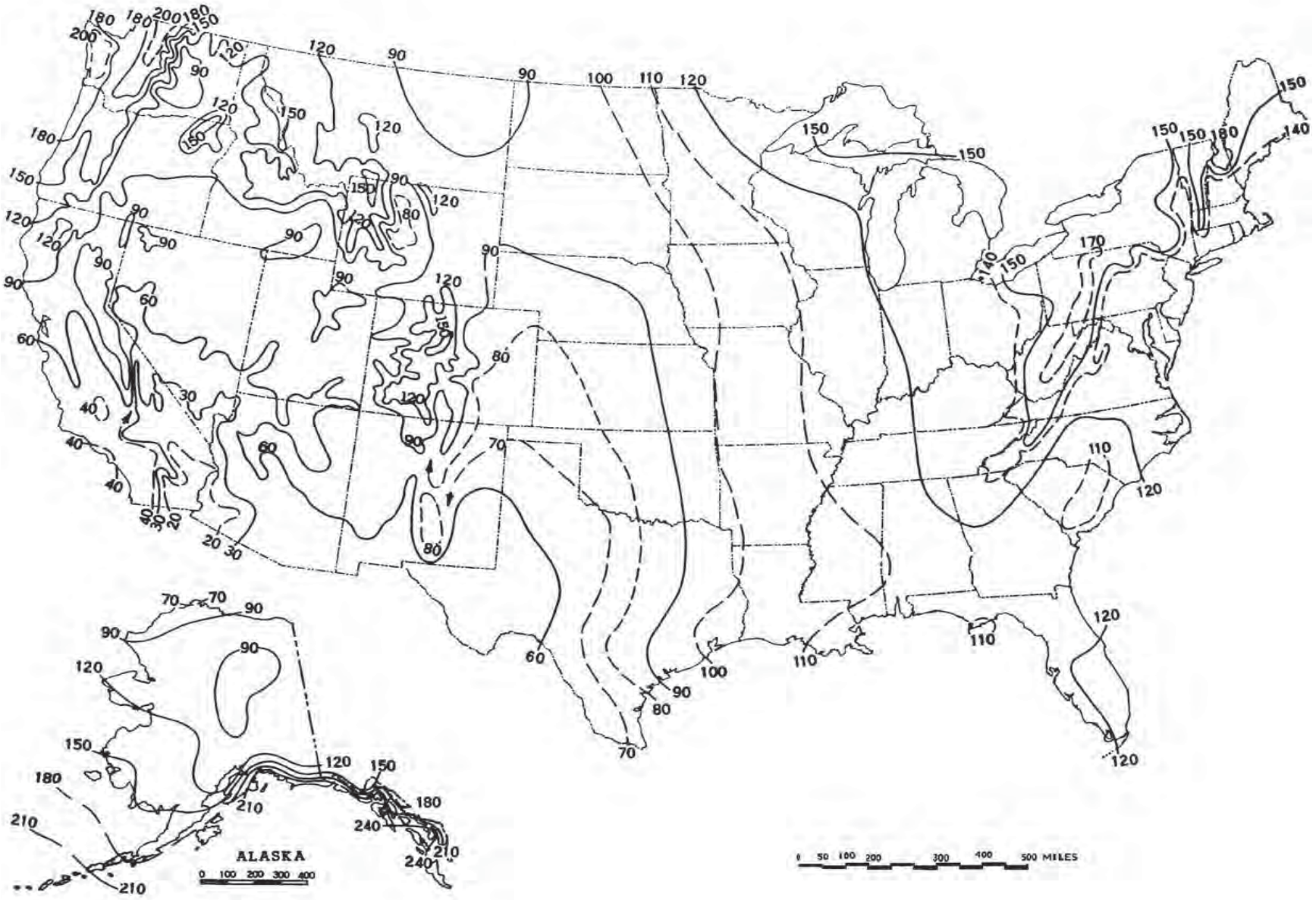

Figure 13.2.1-2. Mean number of days with 0.01 inch or more of precipitation in the United States.

Table 13.2.1-2 presents recommended default silt loadings for normal baseline conditions and for wintertime baseline conditions in areas that experience frozen precipitation with periodic application of antiskid material[24]. The winter baseline is represented as a multiple of the non-winter baseline, depending on the ADT value for the road in question. As shown, a multiplier of 4 is applied for low volume roads (< 500 ADT) to obtain a wintertime baseline silt loading of 4 X 0.6 = 2.4 g/m^2.

Table 13.2.1-2. Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2)

ADT Category	< 500	500-5,000	5,000-10,000	> 10,000
Ubiquitous Baseline g/m^2	0.6	0.2	0.06	0.03 0.015 limited access
Ubiquitous Winter Baseline Multiplier during months with frozen precipitation	X4	X3	X2	X1
Initial peak additive contribution from application of antiskid abrasive (g/m^2)	2	2	2	2
Days to return to baseline conditions (assume linear decay)	7	3	1	0.5

It is suggested that an additional (but temporary) silt loading contribution of 2 g/m^2 occurs with each application of antiskid abrasive for snow/ice control. This was determined based on a typical application rate of 500 lb per lane mile and an initial silt content of 1 % silt content. Ordinary rock salt and other chemical deicers add little to the silt loading, because most of the chemical dissolves during the snow/ice melting process.

To adjust the baseline silt loadings for mud/dirt trackout, the number of trackout points is required. It is recommended that in calculating PM_{10} emissions, six additional miles of road be added for each active trackout point from an active construction site, to the paved road mileage of the specified category within the county. In calculating $PM_{2.5}$ emissions, it is recommended that three additional miles of road be added for each trackout point from an active construction site.

It is suggested the number of trackout points for activities other than road and building construction areas be related to land use. For example, in rural farming areas, each mile of paved road would have a specified number of trackout points at intersections with unpaved roads. This value could be estimated from the unpaved road density (mi/sq. mi.).

The use of a default value from Table 13.2.1-2 should be expected to yield only an order-of-magnitude estimate of the emission factor. Public paved road silt loadings are dependent

upon: traffic characteristics (speed, ADT, and fraction of heavy vehicles); road characteristics (curbs, number of lanes, parking lanes); local land use (agriculture, new residential construction) and regional/seasonal factors (snow/ice controls, wind blown dust). As a result, the collection and use of site-specific silt loading data is highly recommended. In the event that default silt loading values are used, the quality ratings for the equation should be downgraded 2 levels.

Limited access roadways pose severe logistical difficulties in terms of surface sampling, and few silt loading data are available for such roads. Nevertheless, the available data do not suggest great variation in silt loading for limited access roadways from one part of the country to another. For annual conditions, a default value of 0.015 g/m^2 is recommended for limited access roadways.[9,22] Even fewer of the available data correspond to worst-case situations, and elevated loadings are observed to be quickly depleted because of high traffic speeds and high ADT rates. A default value of 0.2 g/m^2 is recommended for short periods of time following application of snow/ice controls to limited access roads.[22]

The limited data on silt loading values for industrial roads have shown as much variability as public roads. Because of the variations of traffic conditions and the use of preventive mitigative controls, the data probably do not reflect the full extent of the potential variation in silt loading on industrial roads. However, the collection of site specific silt loading data from industrial roads is easier and safer than for public roads. Therefore, the collection and use of site-specific silt loading data is preferred and is highly recommended. In the event that site-specific values cannot be obtained, an appropriate value for an industrial road may be selected from the mean values given in Table 13.2.1-3, but the quality rating of the equation should be reduced by 2 levels.

The predictive accuracy of Equation 1 requires thorough on-site characterization of road silt loading. Road surface sampling is time-consuming and potentially hazardous because of the need to block traffic lanes. In addition, large number of samples is required to represent spatial and temporal variations across roadway networks. Mobile monitoring is a new alternative silt loading or road dust emission characterization method for either paved or unpaved roads. It utilizes a test vehicle that generates and monitors its own dust plume concentration (mass basis) at a fixed sampling probe location. A calibration factor is needed for each mobile monitoring configuration (test vehicle and sampling system), to convert the relative dust emission intensity to an equivalent silt loading or emission factor. Typically, portable continuous particle concentration monitors do not comply with Federal Reference Method (FRM) standards. Therefore, a controlled study must be performed to correlate the portable monitor response to the road silt loading or size specific particle concentration measured with an approved FRM sampling system. In the calibration tests, multiple test conditions should be performed to provide an average correlation with known precision and to accommodate variations in road silt loading, vehicle speed, road dust characteristics and other road conditions that may influence mobile monitoring measurements or emissions characteristics. Because the paved road dust emissions are also dependent on the average vehicle weight for the road segment, it is important that the weight of the test vehicle correspond closely to the average vehicle weight for the road segment or be adjusted using the average vehicle weight relationship in Equation 1. In summary, it is believed that the Mobile Monitoring Method will provide improved capabilities to provide reliable temporally and spatially resolved silt loading or emissions factors with increased coverage, improved safety, reduced traffic interference and decreased cost. [40, 41, 42]

Table 13.2.1-3 (Metric And English Units). TYPICAL SILT CONTENT AND LOADING VALUES FOR PAVED ROADS AT INDUSTRIAL FACILITIES [a]

Industry	No. of Sites	No. Of Samples	Silt Content (%)		No. of Travel Lanes	Total Loading x 10^{-3}			Silt Loading (g/m^2)	
			Range	Mean		Range	Mean	Units[b]	Range	Mean
Copper smelting	1	3	15.4-21.7	19.0	2	12.9 - 19.5 45.8 - 69.2	15.9 55.4	kg/km lb/mi	188-400	292
Iron and steel production	9	48	1.1-35.7	12.5	2	0.006 - 4.77 0.020 -16.9	0.495 1.75	kg/km lb/mi	0.09-79	9.7
Asphalt batching	1	3	2.6 - 4.6	3.3	1	12.1 - 18.0 43.0 - 64.0	14.9 52.8	kg/km lb/mi	76-193	120
Concrete batching	1	3	5.2 - 6.0	5.5	2	1.4 - 1.8 5.0 - 6.4	1.7 5.9	kg/km lb/mi	11-12	12
Sand and gravel processing	1	3	6.4 - 7.9	7.1	1	2.8 - 5.5 9.9 - 19.4	3.8 13.3	kg/km lb/mi	53-95	70
Municipal solid waste landfill	2	7		-	2	-			1.1-32.0	7.4
Quarry	1	6		-	2	-			2.4-14	8.2
Corn wet mills	3	15		-	2	-			0.05 – 2.9	1.1

[a] References 1-2,5-6,11-13. Values represent samples collected from *industrial* roads. Public road silt loading values are presented in Table-13.2.1-2. Dashes indicate information not available.[b] Multiply entries by 1000 to obtain stated units; kilograms per kilometer (kg/km) and pounds per mile (lb/mi).

13.2.1.4 Controls[6,25]

Because of the importance of the silt loading, control techniques for paved roads attempt either to prevent material from being deposited onto the surface (preventive controls) or to remove from the travel lanes any material that has been deposited (mitigative controls). Covering of loads in trucks, and the paving of access areas to unpaved lots or construction sites, are examples of preventive measures. Examples of mitigative controls include vacuum sweeping, water flushing, and broom sweeping and flushing. Actual control efficiencies for any - of these techniques can be highly variable. Locally measured silt loadings before and after the application of controls is the preferred method to evaluate controls. It is particularly important to note that street sweeping of gutters and curb areas may actually increase the silt loading on the traveled portion of the road. Redistribution of loose material onto the travel lanes will actually produce a short-term increase in the emissions.

In general, preventive controls are usually more cost effective than mitigative controls. The cost-effectiveness of mitigative controls falls off dramatically as the size of an area to be treated increases. The cost-effectiveness of mitigative measures is also unfavorable if only a short period of time is required for the road to return to equilibrium silt loading condition. That is to say, the number and length of public roads within most areas of interest preclude any widespread and routine use of mitigative controls. On the other hand, because of the more limited scope of roads at an industrial site, mitigative measures may be used quite successfully (especially in situations where truck spillage occurs). Note, however, that public agencies could make effective use of mitigative controls to remove sand/salt from roads after the winter ends.

Because available controls will affect the silt loading, controlled emission factors may be obtained by substituting controlled silt loading values into the equation. (Emission factors from controlled industrial roads were used in the development of the equation.) The collection of surface loading samples from treated, as well as baseline (untreated), roads provides a means to track effectiveness of the controls over time. The use of Mobile Monitoring Methodologies provide an improved means to track progress in controlling silt loading values.

13.2.1.5 Changes since Fifth Edition

The following changes were made since the publication of the Fifth Edition of AP-42:

October 2002

1) The particle size multiplier for $PM_{2.5}$ was revised to 25% of PM_{10}. The approximately 55% reduction was a result of emission testing using FRM monitors. The monitoring was specifically intended to evaluate the PM-2.5 component of the emissions.

2) Default silt loading values were included in Table 13.2.1-2 replacing the Tables and Figures containing silt loading statistical information.

3) Editorial changes within the text were made indicating the possible causes of variations in the silt loading between roads within and among different locations. The uncertainty of using the default silt loading value was discussed.

4) Section 13.2.1.1 was revised to clarify the role of dust loading in resuspension. Additional minor text changes were made.

5) Equations 2 and 3, Figure 13.2.1-2, and text were added to incorporate natural mitigation into annual or other long-term average emission factors.

December 2003

1) The emission factor equation was adjusted to remove the component of particulate emissions- from exhaust, brake wear, and tire wear. A parameter C representing these emissions was included in the predictive equation. The parameter C varied with aerodynamic size range of the particulate matter. Table 13.2.1-2 was added to present the new coefficients.

2) The default silt loading values in Table 13.2.1-3 were revised to incorporate the results from a recent analysis of silt loading data.

November 2006

1) The $PM_{2.5}$ particle size multiplier was revised to 15% of PM_{10} as the result of wind tunnel studies of a variety of dust emitting surface materials.

2) References were rearranged and renumbered.

January 2011

1) The empirical predictive equation was revised. The revision is based upon stepwise regression of 83 profile emissions tests and an adjustment of individual test data for the exhaust; break wear and tire wear emissions prior to regression of the data.

2) The C term is removed from the empirical predictive equation and Table 13.2.1-2 with the C term values is removed since the exhaust; break wear and tire wear emissions were no longer part of the regressed data.

3) The $PM_{2.5}$ particle size multiplier was revised to 25% of PM_{10} since the PM_{10} test data used to develop the equation did not meet the necessary PM_{10} concentrations for a ratio of 15%.

4) The lower speed of the vehicle speed range supported by the empirical predictive equation was revised to 1 mph.

5) Information was added on an improved methodology to develop spatially and temporally resolved silt loadings or emissions factors by Mobile Monitoring Methodologies.

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other cases, your demonstration must include an engineering analysis of information equivalent to such in-use data, such as data from research engines or similar engine models that are already in production. Your demonstration must also include any overhaul interval that you recommend, any mechanical warranty that you offer for the engine or its components, and any relevant customer design specifications. Your demonstration may include any other relevant information. The useful life value may not be shorter than any of the following:

(i) 1,000 hours of operation.

(ii) Your recommended overhaul interval.

(iii) Your mechanical warranty for the engine.

(h) *Applicability for testing.* The emission standards in this subpart apply to all testing, including certification, selective enforcement audits, and in-use testing. For selective enforcement audits, we will require you to perform duty-cycle testing as specified in §§ 1039.505 and 1039.510. The NTE standards of this section apply for those tests. We will not direct you to do additional testing under a selective enforcement audit to show that your engines meet the NTE standards.

[69 FR 39213, June 29, 2004, as amended at 70 FR 40462, July 13, 2005]

§ 1039.102 What exhaust emission standards and phase-in allowances apply for my engines in model year 2014 and earlier?

The exhaust emission standards of this section apply for 2014 and earlier model years. See § 1039.101 for exhaust emission standards that apply to later model years. See 40 CFR 89.112 for exhaust emission standards that apply to model years before the standards of this part 1039 take effect.

(a) *Emission standards for transient testing.* Transient exhaust emissions from your engines may not exceed the applicable emission standards in Tables 1 through 6 of this section. Measure emissions using the applicable transient test procedures described in subpart F of this part. See paragraph (c) of this section for a description of provisions related to the phase-in and phase-out standards shown in Tables 4 through 6 of this section. The emission standards for transient testing are limited for certain engines, as follows:

(1) The transient standards in this section do not apply for the following engines:

(i) Engines below 37 kW for model years before 2013.

(ii) Engines certified under Option #1 of Table 3 of this section. These are the small-volume manufacturer engines certified to the Option #1 standards for model years 2008 through 2015 under § 1039.104(c), and other engines certified to the Option #1 standards for model years 2008 through 2012.

(iii) Engines certified to an alternate FEL during the first four years of the Tier 4 standards for the applicable power category, as allowed in § 1039.104(g). However, you may certify these engines to the transient standards in this section to avoid using temporary compliance adjustment factors, as described in § 1039.104(g)(2). Note that in some cases this four-year period extends into the time covered by the standards in § 1039.101.

(iv) Constant-speed engines.

(v) Engines above 560 kW.

(2) The transient standards in this section for gaseous pollutants do not apply to phase-out engines that you certify to the same numerical standards (and FELs if the engines are certified using ABT) for gaseous pollutants as you certified under the Tier 3 requirements of 40 CFR part 89. However, except as specified by paragraph (a)(1) of this section, the transient PM emission standards apply to these engines.

(b) Emission standards for steady-state testing. Steady-state exhaust emissions from your engines may not exceed the applicable emission standards in Tables 1 through 7 of this section. Measure emissions using the applicable steady-state test procedures described in subpart F of this part. See paragraph (c) of this section for a description of provisions related to the phase-in and phase-out standards shown in Tables 4 through 6 of this section.

TABLE 1 OF § 1039.102—TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): KW < 19

Maximum engine power	Model years	PM	NO_X + NMHC	CO
kW < 8	2008–2014	[1] 0.40	7.5	8.0
8 ≤ kW < 19	2008–2014	0.40	7.5	6.6

[1] For engines that qualify for the special provisions in § 1039.101(c), you may delay certifying to the standards in this part 1039 until 2010. In 2009 and earlier model years, these engines must instead meet the applicable Tier 2 standards and other requirements from 40 CFR part 89. Starting in 2010, these engines must meet a PM standard of 0.60 g/kW-hr, as described in § 1039.101(c). Engines certified to the 0.60 g/kWhr PM standard may not generate ABT credits.

TABLE 2 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 19 ≤ KW < 37

Model years	PM	NO_X + NMHC	CO
2008–2012	0.30	7.5	5.5
2013–2014	0.03	4.7	5.5

TABLE 3 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 37 ≤ KW < 56

Option [1]	Model years	PM	NO_X + NMHC	CO
#1	2008–2012	0.30	4.7	5.0
#2	2012	0.03	4.7	5.0
All	2013–2014	0.03	4.7	5.0

[1] You may certify engines to the Option #1 or Option #2 standards starting in the listed model year. Under Option #1, all engines at or above 37 kW and below 56 kW produced before the 2013 model year must meet the applicable Option #1 standards in this table. These engines are considered to be ''Option #1 engines.'' Under Option #2, all these engines produced before the 2012 model year must meet the applicable standards under 40 CFR part 89. Engines certified to the Option #2 standards in model year 2012 are considered to be ''Option #2 engines.''

TABLE 4 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 56 ≤ KW < 75

Model years [1]	Phase-in option	PM	NO_X	NMHC	NO_X + NMHC	CO
2012–2013	Phase-in	0.02	0.40	0.19		5.0
	Phase-out	0.02			4.7	5.0
2014	All engines	0.02	0.40	0.19		5.0

[1] See paragraph (d)(2) of this section for provisions that allow for a different phase-in schedule than that specified in paragraph (c)(1) of this section.

TABLE 5 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 75 ≤ KW < 130

Model years [1]	Phase-in option	PM	NO_X	NMHC	NO_X + NMHC	CO
2012–2013	Phase-in	0.02	0.40	0.19		5.0
	Phase-out	0.02			4.0	5.0
2014	All engines	0.02	0.40	0.19		5.0

[1] See paragraph (d)(2) of this section for provisions that allow for a different phase-in schedule than that specified in paragraph (c)(1) of this section.

TABLE 6 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): 130 ≤ KW < 560

Model years [1]	Phase-in option	PM	NO_X	NMHC	NO_X + NMHC	CO
2011–2013	Phase-in	0.02	0.40	0.19		3.5
	Phase-out	0.02			4.0	3.5
2014	All engines	0.02	0.40	0.19		3.5

TABLE 7 OF § 1039.102—INTERIM TIER 4 EXHAUST EMISSION STANDARDS (G/KW-HR): KW > 560

Model years	Maximum engine power	Application	PM	NO_X	NMHC	CO
2011–2014	560 < kW ≤ 900	All	0.10	3.5	0.40	3.5
	kW > 900	Generator sets	0.10	0.67	0.40	3.5
		All except generator sets	0.10	3.5	0.40	3.5

(c) *Phase-in requirements.* The following phase-in provisions apply for engines in 56–560 kW power categories meeting the interim Tier 4 standards in paragraphs (a) and (b) of this section:

(1) For each model year before 2014 noted in Tables 4 through 6 of this section, you must certify engine families representing at least 50 percent of your U.S.-directed production volume for each power category to the applicable phase-in standards, except as allowed by paragraph (c)(3), (d)(2), or (e) of this section. Any engines not certified to the phase-in standards must be certified to the corresponding phase-out standards.

(2) Engines certified to the phase-out standards in Tables 4 through 6 of this section must comply with all other requirements that apply to Tier 4 engines, except as otherwise specified in this section.

(3) At the time of certification, show how you intend to meet the phase-in requirements of this paragraph (c) based on projected U.S.-directed production volumes. If your actual U.S.-directed production volume fails to meet the phase-in requirements for a given model year, you must make up the shortfall (in terms of number of engines) by the end of the model year representing the final year of the phase-in period. For example, if you plan in good faith to produce 50 percent of a projected 10,000 engines in the 56–130 kW power category (*i.e.*, 5,000 engines) in 2012 in compliance with the Tier 4 phase-in standards for NO_X and NMHC in Table 4 of this section, but produce 4,500 such engines of an actual 10,000 engines, you must produce 500 engines in model year 2013 (*i.e.*, the final year of the phase-in for this power category) that meet the Tier 4 phase-in standards above and beyond the production otherwise needed to meet the 50-percent phase-in requirement for model year 2013. If any shortfall exceeds the applicable limit of paragraph (c)(3)(i) or (ii) of this section, that number of phase-out engines will be considered not covered by a certificate of conformity and in violation of § 1068.101(a)(1). The shortfall allowed by this paragraph (c)(3) may not exceed a certain number of engines, as follows:

(i) For engine families certified according to the alternate phase-in schedule described in paragraph (d)(2) of this section, for model years prior to the final year of the phase-in, 5 percent of your actual U.S.-directed production volume for that power category in that model year.

(ii) For all other engine families, for model years prior to the final year of the phase-in, 25 percent of your actual U.S.-directed production volume for that power category in that model year.

(iii) No shortfall is allowed in the final year of the phase-in.

(4) Engines you introduce into commerce beyond the limits described in paragraphs (c)(3) of this section will be considered not covered by a certificate of conformity and in violation of § 1068.101(a)(1).

(5) For the purposes of this part, the term ''phase-in'' means relating to a standard that is identified in this section as a phase-in standard and the term ''phase-out'' means relating to a standard that is identified in this section as a phase-out standard. For example, a 200–kW engine from the 2012 model year that is certified to the 4.0 g/kW-hr NO_X+NMHC standard in Table 6 of § 1039.102 is a phase-out engine.

(d) *Banked credits and alternate phase-in for 56–130 kW engines.* For engines in the 56–130 kW power category, you may use only one of the following additional provisions:

(1) For model years 2012 through 2014, you may use banked NO_X+NMHC credits from any Tier 2 engine at or above 37 kW certified under 40 CFR part 89 to

meet the NO_X phase-in standards or the NO_X+NMHC phase-out standards under paragraphs (b) and (c) of this section, subject to the additional ABT provisions in §1039.740.

(2) Instead of meeting the phase-in requirements of paragraph (c)(1) of this section, you may certify engine families representing at least 25 percent of your U.S.-directed production volume for each model year from 2012 through 2014 to the applicable phase-in standards in Tables 4 and 5 of this section, except as allowed by paragraph (c)(3) or (e) of this section. Any engines not certified to the phase-in standards must be certified to the corresponding phase-out standards. Engines certified under this paragraph (d)(2) may generate NO_X emission credits only for averaging within the same power category during the same model year. For engines certified under this paragraph (d)(2), the 2014 model year may not extend beyond December 30, 2014.

(e) *Alternate NO_X standards.* For engines in 56–560 kW power categories during the phase-in of Tier 4 standards, you may certify engine families to the alternate NO_X or NO_X + NMHC standards in this paragraph (e) instead of the phase-in and phase-out NO_X and NO_X + NMHC standards described in Tables 4 through 6 of this section. Engines certified to an alternate NO_X standard under this section must be certified to an NMHC standard of 0.19 g/kW-hr. Do not include engine families certified under this paragraph (e) in determining whether you comply with the percentage phase-in requirements of paragraphs (c) and (d)(2) of this section. Except for the provisions for alternate FEL caps in §1039.104(g), the NO_X and NO_X + NMHC standards and FEL caps under this paragraph (e) are as follows:

(1) For engines in the 56–130 kW power category, apply the following alternate NO_X standards and FEL caps:

(i) If you use the provisions of paragraph (d)(1) of this section, your alternate NO_X standard for any engine family in the 56–130 kW power category is 2.3 g/kW-hr for model years 2012 and 2013. Engines certified to this standard may not exceed a NO_X FEL cap of 3.0 g/kW-hr.

(ii) If you use the provisions of paragraph (d)(2) of this section, your alternate NO_X standard for any engine family in the 56–130 kW power category is 3.4 g/kW-hr for model years 2012 through 2014. Engines below 75 kW certified to this standard may not exceed a NO_X FEL cap of 4.4 g/kW-hr; engines at or above 75 kW certified to this standard may not exceed a NO_X FEL cap of 3.8 g/kW-hr.

(iii) If you do not use the provisions of paragraph (d) of this section, you may apply the alternate NO_X standard and the appropriate FEL cap from either paragraph (e)(1)(i) or (ii) of this section.

(2) For engines in the 130–560 kW power category, the alternate NO_X standard is 2.0 g/kW-hr for model years 2011 through 2013. Engines certified to this standard may not exceed a NO_X FEL cap of 2.7 g/kW-hr.

(3) You use NO_X + NMHC emission credits to certify an engine family to the alternate NO_X + NMHC standards in this paragraph (e)(3) instead of the otherwise applicable alternate NO_X and NMHC standards. Calculate the alternate NO_X + NMHC standard by adding 0.1 g/kW-hr to the numerical value of the applicable alternate NO_X standard of paragraph (e)(1) or (2) of this section. Engines certified to the NO_X + NMHC standards of this paragraph (e)(3) may not generate emission credits. The FEL caps for engine families certified under this paragraph (e)(3) are the previously applicable NO_X + NMHC standards of 40 CFR 89.112 (generally the Tier 3 standards).

(f) *Split families.* For generating or using credits for engines in 56–560 kW power categories during the phase-in of Tier 4 standards, you may split an engine family into two subfamilies (for example, one that uses credits and one that generates credits for the same pollutant).

(1) Identify any split engine families in your application for certification. Your engines must comply with all the standards and requirements applicable to Tier 4 engines, except as noted in this paragraph (f). You may calculate emission credits relative to different emission standards (*i.e.*, phase-in and phase-out standards) for different sets of engines within the engine family, but the engine family must be certified to a single set of standards and FELs.

To calculate NO_X+NMHC emission credits, add the NO_X FEL to the NMHC phase-in standard for comparison with the applicable NO_X+NMHC phase-out standard. Any engine family certified under this paragraph (f) must meet the applicable phase-in standard for NMHC. You may assign the number and configurations of engines within the respective subfamilies any time before the due date for the final report required in §1039.730. Apply the same label to each engine in the family, including the NO_X FEL to which it is certified.

(2) For example, a 10,000-unit engine family in the 75–130 kW power category may be certified to meet the standards for PM, NMHC, and CO that apply to phase-in engines, with a 0.8 g/kW-hr FEL for NO_X. When compared to the phase-out NO_X+NMHC standard, this engine family would generate positive NO_X+NMHC emission credits. When compared to the phase-in NO_X standard, this engine family would generate negative NO_X emission credits. You could create a subfamily with 2,500 engines (one-quarter of the 10,000 engines) and identify them as phase-in engines. You would count these 2,500, with their negative NO_X credits, in determining compliance with the 50-percent phase-in requirement in paragraph (c)(1) of this section. You would calculate negative credits relative to the 0.40 g/kW-hr NO_X standard for these 2,500 engines. You would identify the other 7,500 engines in the family as phase-out engines and calculate positive credits relative to the 4.0 g/kW-hr NO_X+NMHC standard.

(g) *Other provisions.* The provisions of §1039.101(d) through (h) apply with respect to the standards of this section, with the following exceptions and special provisions:

(1) *NTE standards.* Use the provisions of §1039.101(e)(3) to calculate and apply the NTE standards, but base these calculated values on the applicable standards in this section or the applicable FEL, instead of the standards in Table 1 of §1039.101. All other provisions of §1039.101(e) apply under this paragraph (g)(1). The NTE standards do not apply for certain engines and certain pollutants, as follows:

(i) All engines below 37 kW for model years before 2013.

(ii) All engines certified under Option #1 of Table 3 of this section. These are small-volume manufacturer engines certified to the Option #1 standards for model years 2008 through 2015 under §1039.104(c), and other engines certified to the Option #1 standards for model years 2008 through 2012.

(iii) All engines less than or equal to 560 kW that are certified to an FEL under the alternate FEL program during the first four years of the Tier 4 standards for the applicable power category, as described in §1039.104(g). However, if you apply to meet transient emission standards for these engines under §1039.102(a)(1)(iii), you must also meet the NTE standards in this paragraph (g)(1).

(iv) Gaseous pollutants for phase-out engines that you certify to the same numerical standards and FELs for gaseous pollutants to which you certified under the Tier 3 requirements of 40 CFR part 89. However, the NTE standards for PM apply to these engines.

(2) *Interim FEL caps.* As described in §1039.101(d), you may participate in the ABT program in subpart H of this part by certifying engines to FELs for PM, NO_X, or NO_X+NMHC instead of the standards in Tables 1 through 7 of this section for the model years shown. The FEL caps listed in the following table apply instead of the FEL caps in §1039.101(d)(1), except as allowed by §1039.104(g):

TABLE 8 OF §1039.102—INTERIM TIER 4 FEL CAPS, G/KW-HR

Maximum engine power	Phase-in option	Model years[1]	PM	NO_X	NO_X+NMHC
kW < 19		2008–2014	0.80		[2]9.5
19 ≤ kW < 37		2008–2012	0.60		9.5
37 ≤ kW < 56		[3]2008–2012	0.40		7.5
56 ≤ kW < 130	phase-in	2012–2013	0.04	0.80	
56 ≤ kW < 130	phase-out	2012–2013	0.04		[4]6.6
130 ≤ kW ≤ 560	phase-in	2011–2013	0.04	0.80	
130 ≤ kW ≤ 560	phase-out	2011–2013	0.04		[5]6.4

TABLE 8 OF § 1039.102—INTERIM TIER 4 FEL CAPS, G/KW-HR—Continued

Maximum engine power	Phase-in option	Model years [1]	PM	NO_X	NO_X+NMHC
kW > 560		2011–2014	0.20	6.2	

[1] For model years before 2015 where this table does not specify FEL caps, apply the FEL caps shown in § 1039.101.
[2] For engines below 8 kW, the FEL cap is 10.5 g/kW-hr for NO_X+NMHC emissions.
[3] For manufacturers certifying engines to the standards of this part 1039 in 2012 under Option #2 of Table 3 of § 1039.102, the FEL caps for 37–56 kW engines in the 19–56 kW category of Table 2 of § 1039.101 apply for model year 2012 and later; see 40 CFR part 89 for provisions that apply to earlier model years.
[4] For engines below 75 kW, the FEL cap is 7.5 g/kW-hr for NO_X+NMHC emissions.
[5] For engines below 225 kW, the FEL cap is 6.6 g/kW-hr for NO_X+NMHC emissions.

(3) *Crankcase emissions.* The crankcase emission requirements of § 1039.115(a) do not apply to engines using charge-air compression that are certified to an FEL under the alternate FEL program in § 1039.104(g) during the first four years of the Tier 4 standards for the applicable power category.

(4) *Special provisions for 37–56 kW engines.* For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, you must add information to the emission-related installation instructions to clarify the equipment manufacturer's obligations under § 1039.104(f).

[69 FR 39213, June 29, 2004, as amended at 72 FR 53130, Sept. 18, 2007; 73 FR 59191, Oct. 8, 2008; 75 FR 68461, Nov. 8, 2010]

§ 1039.104 Are there interim provisions that apply only for a limited time?

The provisions in this section apply instead of other provisions in this part. This section describes when these interim provisions apply.

(a) *Incentives for early introduction.* This paragraph (a) allows you to reduce the number of engines subject to the applicable standards in § 1039.101 or § 1039.102, when some of your engines are certified to the specified levels earlier than otherwise required. The engines that are certified early are considered offset-generating engines. The provisions of this paragraph (a), which describe the requirements applicable to offset-generating engines, apply beginning in model year 2007. These offset generating engines may generate additional allowances for equipment manufacturers under the incentive program described in § 1039.627; you may instead use these offsets under paragraph (a)(2) of this section in some cases.

(1) For early-compliant engines to generate offsets for use either under this paragraph (a) or under § 1039.627, you must meet the following general provisions:

(i) You may not generate offsets from engines below 19 kW.

(ii) You must begin actual production of engines covered by the corresponding certificate by the following dates:

(A) For engines at or above 19 kW and below 37 kW: September 1, 2012.

(B) For engines at or above 37 kW and below 56 kW: September 1, 2012 if you choose Option #1 in Table 3 of § 1039.102, or September 1, 2011 if you do not choose Option #1 in Table 3 of § 1039.102.

(C) For engines in the 56–130 kW power category: September 1, 2011.

(D) For engines in the 130–560 kW power category: September 1, 2010.

(E) For engines above 560 kW: September 1, 2014.

(iii) Engines you produce after December 31 of the year shown in paragraph (a)(1)(ii) of this section may not generate offsets.

(iv) You may not use ABT credits to certify offset-generating engines.

(v) Offset-generating engines must be certified to the Tier 4 standards and requirements under this part 1039.

(2) If equipment manufacturers decline offsets for your offset-generating engines under § 1039.627, you may not generate ABT credits with these engines, but you may reduce the number of engines that are required to meet the standards in § 1039.101 or § 1039.102 as follows:

9. NMED – Guidance for Aggregate Piles and Haul Road Emissions

New Mexico
ENVIRONMENT DEPARTMENT

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JC BORREGO
ACTING DEPUTY SECRETARY

DEPARTMENT ACCEPTED VALUES FOR: AGGREGATE HANDLING, STORAGE PILE, and HAUL ROAD EMISSIONS

TO: Applicants and Air Quality Bureau Permitting Staff

SUBJECT: Department accepted default values for percent silt, wind speed, moisture content, and control efficiencies for haul road control measures

This guidance document provides the Department accepted default values for correction parameters in the emission calculation equations for aggregate handling and storage piles emissions in construction permit applications and notices of intent submitted under 20.2.72 and 20.2.73 NMAC; and the Department accepted control efficiencies for haul road control measures for applications submitted under 20.2.72 NMAC.

Aggregate Handling and Storage Pile Emission Calculations

Applicants should calculate the particulate matter emissions from aggregate handling and storage piles using the EPA's AP-42 Chapter 13.2.4.
http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0204.pdf

Equation 1 from Chapter 13.2.4 requires users to input values for two correction parameters, U and M, where U = mean wind speed and M = material moisture content. Below are the accepted values for U and M:

Default Values for Chapter 13.2.4, Equation 1:

Parameter	Default Value
U = Mean wind speed (miles per hour)	11 mph
M = Material moisture content (% water)	2%

Applicants must receive preapproval from the Department if they wish to assume a higher moisture content and/or a lower wind speed in these calculations. Higher moisture contents may require site specific testing either as a permit condition or submitted with the application. Applicants may assume higher wind speeds and lower percent moisture content in their calculations without prior approval from the Department.

Haul Road Emissions and Control Measure Efficiencies

Applicants should calculate the particulate matter emissions from unpaved haul roads using the EPA's AP-42 Chapter 13.2.2. http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

Equation 1(a) from Chapter 13.2.2 requires users to input values for two correction parameters, s and W, where s = surface material silt content (%) and W = mean vehicle weight (tons). The applicant should calculate the mean vehicle weight in accordance with the chapter's instructions. Below is the accepted value for the parameter s:

Default Values for Chapter 13.2.2, Equation 1(a):

Parameter	Default Value
s = surface material silt content (%)	4.8%

Applicants may use a higher silt content without prior approval from the Department. Use of a lower silt content requires prior approval from the Department and may require site specific testing in support of the request.

Equation 2 from Chapter 13.2.2 allows users to take credit for the number of days that receive precipitation in excess of 0.01 inches, in the annual emissions calculation, where P = number of days in a year with at least 0.01 inches of precipitation.

Default Values for Chapter 13.2.2, Equation 2:

Parameter	Default Value
P = number of days in a year with at least 0.01 inches of precipitation	70 days

Applications submitted under Part 72 may request to apply control measures to reduce the particulate matter emissions from facility haul roads. Applications submitted under Part 73 may not consider any emission reduction from control measures in the potential emission rate calculation, as registrations issued under Part 73 are not federally enforceable under the Clean Air Act or the New Mexico Air Quality Control Act. In order for those control measures to be federally enforceable, the controls must be a requirement in an air quality permit.

Below are the Department accepted control efficiencies for various haul road control measures:

Haul Road Control Measures and Control Efficiency:

Control Measure	Control Efficiency
None	0%
Base course or watering	60%
Base course and watering	80%
Base course and surfactant	90%
Paved and Swept	95%

10. New Mexico Environment Department, Air Quality Bureau, Permitting, FAQ.

Opacity Based Emission Calculations

Q. Does the Department accept opacity based emission calculations?

Technical FAQ

Q: We have a permit condition for the fuel gas to have no more than 0.1 grains total sulfur per dry standard cubic foot. What would this equate to in ppm H2S?

Installing Units Authorized by an Old Permit

Q: I have a permit issued more than five years ago that allows installation of a unit that I have not installed yet. 20.2.72.211.B NMAC says "The Department may cancel a permit if the construction or modification is not commenced within two years..." Since the times in 20.2.72.211.B NMAC [two year action] and 20.2.72.211.A [five year action] have passed, can I still install this unit?

Relocation Modeling

Q: Relocation Modeling: When can I model for relocation set back distances?

Emission Factors

Q: Paved Road Emission Factors: Which AP-42 emission factors should I use for paved roads?

NOI Excess Emissions

Q: Do I need to report malfunction excess emissions if I have a NOI?

Answers to FAQs

Tank-Flashing Emissions

Q. What are tank-flashing emissions?

A. Tank-flashing emissions occur when crude oil or condensate is exposed to temperature increases or pressure drops. In natural gas extraction and processing, there are many areas where tank-flashing losses occur, including well sites (where high-pressure liquids are flashed into stock tanks at atmospheric pressure), locations where produced liquids from the production separators dump into stock tanks, when gas lines are "pigged" (or physically purged of condensate), and when gas plant inlet separators dump into storage tanks at atmospheric pressure. Tank-flashing emissions are in addition to working and breathing emissions.

Q. Do I need to estimate my tank-flashing emissions?

A. Yes, for new permit applications, significant revisions and emissions inventories, tank-flashing emissions must be estimated and provided to the Department on the appropriate forms. The Universal Application form, which is used for New Source Review (NSR) permits and Notices Of Intent (NOI), contains requirements for identifying tank-flashing emissions data. Also, the Title V operating permit application form has similar requirements.

In addition to already permitted sites, tank-flashing emissions can occur at facilities where other emissions are below permit levels - these facilities may have been issued a Notice Of Intent or a determination of No Permit Required in the past. These facilities must estimate their tank-flashing emission along with all other emission sources to determine the applicable permitting mechanism. Including tank-flashing emissions, a minor source with a permit pursuant to 20.2.72 NMAC may now be subject to the Title V or PSD permit program. Similarly, a source with a determination of No Permit Required may need to submit a Notice of Intent under 20.2.73 NMAC, or may be subject to the Title V or PSD permitting programs.

Considering that tank-flashing emissions "can be reasonably passed through a stack", they are considered normal process emissions, not fugitive.

The Department's authority to collect this information is in the following state regulations: 20.2.72.203.A(3) NMAC, 20.2.70.300.D(5) NMAC, and 20.2.73.300.C(4) NMAC

Q. Are there exemptions or thresholds for reporting flash emissions?

A. For facilities with permits (either NSR or Title V), the current regulations do not allow any exemptions other then those listed in Section 202 of 20.2.72 NMAC for NSR permits or in the list of Insignificant Activities for Title V facilities referenced in Section 300.D(5) and (6) of 20.2.70 NMAC.

Facilities without permits do not need to submit information for a tank or combination of tanks (tank battery) that have a total throughput of no more than 12 barrels per day of black oil (API gravity less than 40 degrees). This threshold is based on studies by the Colorado Department of Public Health and Environment that each barrel per day of throughput of this oil will result in an average emission of 2 tons per year of volatile organic compounds.

Q. What is the timing of submittals and the circumstances and methods of submittals?

A. As of January 2003, the Air Quality Bureau required by letter that all Title V sources submit current estimates of flash emissions using the method that is appropriate to the source. Non-Title V sources have a similar obligation to evaluate flash emissions. All sources (both Title V and non-Title V) must submit the appropriate permit application if flash emissions cause the source to exceed an applicability threshold.

The AQB's emission inventory for year 2002 required all major and minor sources with permits to submit emissions from flashing of oil and gas liquids by April 1, 2003.

The AQB will not normally re-open a NSR or Title V permit nor request that the owner/operator revise such a permit solely to incorporate VOC emissions from flashing operations.

If a pre-existing and now-known VOC flash emission would exceed a VOC emission limit in a NSR or Title V permit the owner/operator may wish to revise that permit. NSR permits would be revised using either the technical revision process at 20.2.72.219.B(1)(b) NMAC or as a significant revision at 20.2.72.219.D NMAC. Title V permits would be revised using a minor modification process at 20.2.70.404.B NMAC.

If there is no apparent violation of a VOC limit in a NSR permit by a pre-existing and now-known VOC flash emission, the AQB does not require that the permit be updated, but an owner/operator may update the permit file for that facility by submitting a letter with supporting documents and calculations. This letter will be considered as an emissions inventory submittal under 20.2.73.300.B(4).

As AQB obtains additional experience with flash emissions, it may change its guidance on when these emissions are reported.

Also, a "rule of thumb" is that 0.25 grains/100 SCF hydrogen sulfide is approximately 4 ppmv **or** 0.25 grains/1SCF is approximately 400ppmv. The ratio of molecular weights of sulfur to hydrogen sulfide is approximately 32/34 or 0.94 so I used the formula in the link to find the ppmv total sulfur and then multiplied by 0.94 to find the ppmv of H2S. Using the "rule of thumb" would yield 160 ppmv.

Installing Units Authorized by an Old Permit (9/10/10)

Q: I have a permit issued more than five years ago that allows installation of a unit that I have not installed yet. 20.2.72.211.B NMAC says "The Department may cancel a permit if the construction or modification is not commenced within two years..." Since the times in 20.2.72.211.B NMAC [two year action] and 20.2.72.211.A [five year action] have passed, can I still install this unit?

A: For minor sources subject to 20.2.72 NMAC, the unit can be installed at any time after permit issuance unless the permit states otherwise. The Department does not require notification beyond what is required in your permit. If your facility's PSD permit was issued under 20.2.74 NMAC and if 18 months has lapsed since permit issuance (20.2.74.302.G NMAC), you should contact the Major Source Unit Section Manager, Ned Jerabek, with the specifics of your situation prior to commencing construction.

Q: Relocation Modeling: When can I model for relocation set back distances?

A: There are two opportunities to submit relocation modeling. First, in addition to your modeling submitted with your permit application for the initial site, you may submit additional modeling to establish separate set back distances for future relocation sites. The resulting permit will include language establishing the set back conditions for future relocations. Second, two weeks prior to submitting a relocation application for an existing portable permit, you may submit relocation modeling to establish new set back distances at the proposed site. This is a general answer. Be careful to read the current Modeling Guidelines on this subject to ensure you meet all the specific modeling requirements prior to submitting relocation modeling.

Q: Paved Roads Emission Factors : Which AP 42 emission factors should I use for paved roads ?

A. The Department allows the use of paved road emission factors for both permitted and unpermitted facilities. The new AP 42 published in January of 2011 changed the previous restriction on the use of the equation for vehicles traveling above 10 miles per hour to 1 mph. This change allows this equation to be more universally applied to facilities. In the event that site-specific values cannot be obtained, an appropriate value from an industrial road may be selected from the mean values given in AP 42, Table 13.2.1-3. Facilities using paved factors for NPR or NOI determinations must operate as represented in the application and must maintain the road as paved in order to maintain the facility's NPR or NOI status.

Alternatively for permit applications, facilities may choose to use unpaved emission factor calculations with a control efficiency of 95% for paving and sweeping. Permits based on this approach will include conditions assuring continued compliance with maintenance and sweeping.

Q: Do I need to report malfunction excess emissions if I have a NOI?

A. A facility covered solely by a NOI does not need to report excess emissions resulting from a malfunction.

"**Excess Emission**" means the emission of an air contaminant, including fugitive emissions, in excess of the quantity, rate, opacity or concentration specified by an air quality regulation or permit condition. (20.2.7.6.D NMAC)

"Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment beyond the control of the owner or operator, including malfunction during startup or shutdown. A failure that is caused entirely or in part by poor maintenance, careless operation, or any other preventable equipment breakdown shall not be considered a malfunction. (20.2.7.6.E NMAC)

20.2.73 NMAC, which regulates Notices of Intent does not specify a limit. It establishes a threshold, requiring facilities that emit in excess of, to file and obtain a Notice of Intent. Even a facility that has 300 tons of a criteria pollutant is required to have an NOI. Of course, in this case, it is likely the facility will also require either or both a TV and PSD permit. However, malfunction excess emissions are not in excess of any NOI requirement.

If a facility, which is classified as a NOI has emissions that are part of normal operations or considered SSM, these emissions will need to be evaluated under the appropriate programs for applicability (Parts 70, 72 and 74).

page last updated 07/10/2017

11. 23 USC 127

ecuted by making the insertion after ''State's apportionment'' the second place it appeared, to reflect the probable intent of Congress.

1999—Pub. L. 106–159 renumbered section 110 of this title as this section.

EFFECTIVE DATE OF 2012 AMENDMENT

Amendment by Pub. L. 112–141 effective Oct. 1, 2012, see section 3(a) of Pub. L. 112–141, set out as an Effective and Termination Dates of 2012 Amendment note under section 101 of this title.

§ 127. Vehicle weight limitations—Interstate System

(a) IN GENERAL.—

(1) The Secretary shall withhold 50 percent of the apportionment of a State under section 104(b)(1) in any fiscal year in which the State does not permit the use of The Dwight D. Eisenhower System of Interstate and Defense Highways within its boundaries by vehicles with a weight of twenty thousand pounds carried on any one axle, including enforcement tolerances, or with a tandem axle weight of thirty-four thousand pounds, including enforcement tolerances, or a gross weight of at least eighty thousand pounds for vehicle combinations of five axles or more.

(2) However, the maximum gross weight to be allowed by any State for vehicles using The Dwight D. Eisenhower System of Interstate and Defense Highways shall be twenty thousand pounds carried on one axle, including enforcement tolerances, and a tandem axle weight of thirty-four thousand pounds, including enforcement tolerances and with an overall maximum gross weight, including enforcement tolerances, on a group of two or more consecutive axles produced by application of the following formula:

$$W=500\left(\frac{LN}{N-1}+12N+36\right)$$

where W equals overall gross weight on any group of two or more consecutive axles to the nearest five hundred pounds, L equals distance in feet between the extreme of any group of two or more consecutive axles, and N equals number of axles in group under consideration, except that two consecutive sets of tandem axles may carry a gross load of thirty-four thousand pounds each providing the overall distance between the first and last axles of such consecutive sets of tandem axles (1) is thirty-six feet or more, or (2) in the case of a motor vehicle hauling any tank trailer, dump trailer, or ocean transport container before September 1, 1989, is 30 feet or more: *Provided*, That such overall gross weight may not exceed eighty thousand pounds, including all enforcement tolerances, except for vehicles using Interstate Route 29 between Sioux City, Iowa, and the border between Iowa and South Dakota or vehicles using Interstate Route 129 between Sioux City, Iowa, and the border between Iowa and Nebraska, and except for those vehicles and loads which cannot be easily dismantled or divided and which have been issued special permits in accordance with applicable State laws, or the corresponding maximum weights permitted for vehicles using the public highways of such State under laws or regulations established by appropriate State authority in effect on July 1, 1956, except in the case of the overall gross weight of any group of two or more consecutive axles on any vehicle (other than a vehicle comprised of a motor vehicle hauling any tank trailer, dump trailer, or ocean transport container on or after September 1, 1989), on the date of enactment of the Federal-Aid Highway Amendments of 1974, whichever is the greater.

(3) Any amount which is withheld from apportionment to any State pursuant to the foregoing provisions shall lapse if not released and obligated within the availability period specified in section 118(b)(2)[1] of this title.

(4) This section shall not be construed to deny apportionment to any State allowing the operation within such State of any vehicles or combinations thereof, other than vehicles or combinations subject to subsection (d) of this section, which the State determines could be lawfully operated within such State on July 1, 1956, except in the case of the overall gross weight of any group of two or more consecutive axles, on the date of enactment of the Federal-Aid Highway Amendments of 1974.

(5) With respect to the State of Hawaii, laws or regulations in effect on February 1, 1960, shall be applicable for the purposes of this section in lieu of those in effect on July 1, 1956.

(6) With respect to the State of Colorado, vehicles designed to carry 2 or more precast concrete panels shall be considered a nondivisible load.

(7) With respect to the State of Michigan, laws or regulations in effect on May 1, 1982, shall be applicable for the purposes of this subsection.

(8) With respect to the State of Maryland, laws and regulations in effect on June 1, 1993, shall be applicable for the purposes of this subsection.

(9) The State of Louisiana may allow, by special permit, the operation of vehicles with a gross vehicle weight of up to 100,000 pounds for the hauling of sugarcane during the harvest season, not to exceed 100 days annually.

(10) With respect to Interstate Routes 89, 93, and 95 in the State of New Hampshire, State laws (including regulations) concerning vehicle weight limitations that were in effect on January 1, 1987, and are applicable to State highways other than the Interstate System, shall be applicable in lieu of the requirements of this subsection.

(11)(A) With respect to all portions of the Interstate Highway System in the State of Maine, laws (including regulations) of that State concerning vehicle weight limitations applicable to other State highways shall be applicable in lieu of the requirements under this subsection through December 31, 2031.

(B) With respect to all portions of the Interstate Highway System in the State of Vermont, laws (including regulations) of that State concerning vehicle weight limitations applicable to other State highways shall be applicable in lieu of the requirements under this subsection through December 31, 2031.

[1] See References in Text note below.

12. NOAA National Climatic Data Center Average Yearly Precipitation for New Mexico.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.
Generated on 07/12/2017

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	1	1	19	13	19	0.01		T		T								
	2015	1	2																
	2015	1	3	28	9	21	0.20		3.0		3.0								
	2015	1	4	48	11	26	0.32		0.0		0.0								
	2015	1	5	42	22	25	0.00												
	2015	1	6	47	23	26	0.02												
	2015	1	7	56	26	32	0.00												
	2015	1	8	41	25	25	0.00												
	2015	1	9	46	24	38	0.00												
	2015	1	10	38	26	28	0.00												
	2015	1	11	40	24	24	0.00												
	2015	1	12	65	23	40	0.00												
	2015	1	13	42	30	30	0.04												
	2015	1	14	31	30	30	0.00												
	2015	1	15	37	28	28	0.00												
	2015	1	16	54	25	25	0.00												
	2015	1	17	63	24	34	0.00												
	2015	1	18	66	26	27	0.00												
	2015	1	19	73	26	37	0.00												
	2015	1	20	77	35	38	0.00												
	2015	1	21	68	31	31	0.00												
	2015	1	22	43	31	32	0.07		1.0		1.0								
	2015	1	23	34	23	23	0.26		3.8		2.0								
	2015	1	24	49	20	26	0.14		T		T								
	2015	1	25	59	24	34	0.00												
	2015	1	26	59	31	31	0.00												
	2015	1	27	67	30	34	0.00												
	2015	1	28	71	32	39	0.00												
	2015	1	29	76	38	46	0.00												
	2015	1	30	58	43	43	0.00												
	2015	1	31	43	38	40	0.45												
			Summary	51	26		1.51		7.8										

The '*' flags in Preliminary indicate the data have not completed processing and qualitycontrol and may not be identical to the original observation
Empty, or blank, cells indicate that a data observation was not reported.
***Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown**
"s" This data value failed one of NCDC's quality control tests.
"T" values in the Precipitation category above indicate a TRACE value was recorded.
"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.
Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.
Generated on 07/12/2017

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	2	1	48	38	38	0.00												
	2015	2	2	52	37	37	0.00												
	2015	2	3	55	32	32	0.00												
	2015	2	4	65	30	33	0.00												
	2015	2	5	76	31	31	0.00												
	2015	2	6	52	29	29	0.00												
	2015	2	7	71	29	34	0.00												
	2015	2	8	81	34	53	0.00												
	2015	2	9	81	41	41	0.00												
	2015	2	10	76	41	42	0.00												
	2015	2	11	79	39	48	0.00												
	2015	2	12	52	38	39	0.06												
	2015	2	13	53	33	33	0.00												
	2015	2	14	69	32	36	0.00												
	2015	2	15	70	35	43	0.00												
	2015	2	16	78	35	35	0.00												
	2015	2	17	51	34	34	0.00												
	2015	2	18	51	27	27	0.00												
	2015	2	19	69	26	37	0.00												
	2015	2	20	77	33	60	0.00												
	2015	2	21	79	42	46	0.00												
	2015	2	22	64	42	48	0.00												
	2015	2	23	48	21	21	0.00												
	2015	2	24																
	2015	2	25	39	24	37	0.00												
	2015	2	26	66	24	42	0.00												
	2015	2	27	42	24	24	0.00												
	2015	2	28																
			Summary	63	33		0.06		0										

The '*' flags in Preliminary indicate the data have not completed processing and qualitycontrol and may not be identical to the original observation
Empty, or blank, cells indicate that a data observation was not reported.
***Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown**
"s" This data value failed one of NCDC's quality control tests.
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National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	3	1	32	21	31	0.00												
	2015	3	2	46	30	32	0.00												
	2015	3	3	39	32	38	0.00												
	2015	3	4	65	37	51	0.00												
	2015	3	5	52	26	26	0.07												
	2015	3	6																
	2015	3	7																
	2015	3	8																
	2015	3	9																
	2015	3	10																
	2015	3	11																
	2015	3	12																
	2015	3	13																
	2015	3	14																
	2015	3	15																
	2015	3	16																
	2015	3	17																
	2015	3	18																
	2015	3	19																
	2015	3	20																
	2015	3	21																
	2015	3	22																
	2015	3	23																
	2015	3	24																
	2015	3	25																
	2015	3	26																
	2015	3	27																
	2015	3	28																
	2015	3	29																
	2015	3	30																
	2015	3	31	72	48	48	0.00												
			Summary	51	32		0.07		0										

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Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	4	1	83	48	49	0.00												
	2015	4	2	86	48	59	0.00												
	2015	4	3	85	59	65	0.00												
	2015	4	4	68	48	48	0.00												
	2015	4	5	57	46	46	0.00												
	2015	4	6	85	43	51	0.00												
	2015	4	7	86	46	49	0.00												
	2015	4	8	87	44	55	0.00												
	2015	4	9	87	52	52	0.00												
	2015	4	10	78	49	53	0.00												
	2015	4	11	73	48	50	0.00												
	2015	4	12	86	48	61	0.00												
	2015	4	13	79	51	53	0.11												
	2015	4	14	55	45	46	0.50												
	2015	4	15	67	42	44	0.00												
	2015	4	16	82	42	52	0.00												
	2015	4	17	81	49	49	0.00												
	2015	4	18	77	43	43	0.00												
	2015	4	19	77	42	47	0.00												
	2015	4	20	75	42	42	0.00												
	2015	4	21	71	42	45	0.00												
	2015	4	22	83	42	52	0.00												
	2015	4	23	85	51	51	0.00												
	2015	4	24	78	44	59	0.00												
	2015	4	25	76	49	49	0.00												
	2015	4	26	81	48	48	0.00												
	2015	4	27	75	45	45	0.00												
	2015	4	28	63	43	46	0.00												
	2015	4	29	68	38	38	0.00												
	2015	4	30	75	37	42	0.00												
			Summary	77	46		0.61		0										

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Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	5	1	84	41	47	0.00												
	2015	5	2	87	47	52	0.00												
	2015	5	3	89	48	57	0.00												
	2015	5	4	86	53	58	0.04												
	2015	5	5	80	57	57	1.24												
	2015	5	6	79	52	52	0.00												
	2015	5	7	80	52	60	0.00												
	2015	5	8	86	52	52	0.00												
	2015	5	9	88	51	65	0.00												
	2015	5	10	80	50	51	0.00												
	2015	5	11	81	46	46	0.00												
	2015	5	12	74	45	57	0.00												
	2015	5	13	60	51	57	0.73												
	2015	5	14	79	53	53	0.00												
	2015	5	15	81	52	53	0.00												
	2015	5	16	84	52	56	0.00												
	2015	5	17	79	52	53	0.00												
	2015	5	18	83	50	52	0.00												
	2015	5	19	87	50	65	0.09												
	2015	5	20	88	54	55	0.02												
	2015	5	21	75	53	53	0.02												
	2015	5	22	54	52	54	0.30												
	2015	5	23	75	54	64	0.09												
	2015	5	24	86	50	50	0.00												
	2015	5	25	83	49	64	0.00												
	2015	5	26	85	54	54	0.00												
	2015	5	27	90	51	55	0.00												
	2015	5	28	90	55	65	0.00												
	2015	5	29	88	55	55	0.00												
	2015	5	30	89	54	58	0.13												
	2015	5	31	78	58	62	0.00												
			Summary	82	51		2.66		0										

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Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	6	1	83	59	59	0.00												
	2015	6	2	94	58	61	0.00												
	2015	6	3	96	57	57	0.00												
	2015	6	4	101	56	67	0.00												
	2015	6	5	96	64	64	0.00												
	2015	6	6	91	63	67	0.05												
	2015	6	7	89	65	69	0.00												
	2015	6	8	89	68	69	0.00												
	2015	6	9	84	67	67	0.15												
	2015	6	10	89	66	67	0.00												
	2015	6	11	97	66	68	0.00												
	2015	6	12	102	65	68	0.00												
	2015	6	13	96	65	65	0.00												
	2015	6	14	90	59	59	0.00												
	2015	6	15	93	59	63	0.13												
	2015	6	16	91	61	65	0.00												
	2015	6	17	89	65	65	0.00												
	2015	6	18	93	63	71	0.00												
	2015	6	19	98	68	71	0.00												
	2015	6	20	93	64	64	0.00												
	2015	6	21	96	63	67	0.00												
	2015	6	22	95	67	69	0.00												
	2015	6	23	91	68	69	0.00												
	2015	6	24	86	65	65	0.03												
	2015	6	25	89	64	67	0.00												
	2015	6	26	94	65	69	0.00												
	2015	6	27	99	67	68	0.00												
	2015	6	28	91	65	65	0.00												
	2015	6	29	93	64	67	0.00												
	2015	6	30	97	64	65	0.34												
			Summary	93	64		0.70		0										

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Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	7	1	90	65	66	0.00												
	2015	7	2	94	65	67	0.00												
	2015	7	3	95	66	73	0.00												
	2015	7	4	90	66	66	0.02												
	2015	7	5	91	65	69	0.00												
	2015	7	6	95	68	73	0.00												
	2015	7	7	100	69	69	0.62												
	2015	7	8	81	65	65	0.22												
	2015	7	9	89	64	67	0.00												
	2015	7	10	94	66	70	0.02												
	2015	7	11	91	69	69	0.16												
	2015	7	12	93	68	68	0.20												
	2015	7	13	102	67	70	0.00												
	2015	7	14	100	67	69	0.00												
	2015	7	15	103	67	71	0.00												
	2015	7	16	100	68	68	0.30												
	2015	7	17	100	68	70	0.00												
	2015	7	18	101	69	69	0.00												
	2015	7	19	102	69	72	0.00												
	2015	7	20	104	71	77	0.00												
	2015	7	21	100	69	69	0.00												
	2015	7	22	94	67	67	0.05												
	2015	7	23	98	67	70	0.00												
	2015	7	24	102	67	71	0.51												
	2015	7	25	102	70	74	0.00												
	2015	7	26	103	68	68	0.00												
	2015	7	27	103	68	77	0.00												
	2015	7	28	102	74	74	0.18												
	2015	7	29	102	69	69	0.41												
	2015	7	30	94	69	71	0.00												
	2015	7	31	95	71	71	0.00												
			Summary	97	68		2.69		0										

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Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	8	1	96	71	71	0.00												
	2015	8	2	98	69	69	0.03												
	2015	8	3	98	69	74	0.02												
	2015	8	4	95	67	67	0.00												
	2015	8	5	101	67	71	0.00												
	2015	8	6	105	68	74	0.00												
	2015	8	7	104	68	73	0.00												
	2015	8	8	101	70	70	0.00												
	2015	8	9	104	70	77	0.00												
	2015	8	10	103	75	75	0.27												
	2015	8	11	101	68	68	0.00												
	2015	8	12	96	67	69	0.00												
	2015	8	13	98	66	72	0.00												
	2015	8	14	101	70	72	0.00												
	2015	8	15	106	70	71	0.00												
	2015	8	16	96	69	72	0.11												
	2015	8	17	90	65	65	0.02												
	2015	8	18	95	64	71	0.00												
	2015	8	19	101	68	72	0.00												
	2015	8	20	81	66	66	0.00												
	2015	8	21	90	66	67	0.16												
	2015	8	22	98	66	69	0.21												
	2015	8	23	98	69	70	0.00												
	2015	8	24	89	67	67	0.09												
	2015	8	25	90	65	70	0.00												
	2015	8	26	96	67	69	0.00												
	2015	8	27	95	66	68	0.00												
	2015	8	28	96	65	67	0.00												
	2015	8	29	99	65	67	0.00												
	2015	8	30	89	62	62	0.00												
	2015	8	31	90	61	64	0.00												
			Summary	97	67		0.91		0										

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Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	9	1	94	61	66	0.00		0.0		0.0								
	2015	9	2	96	63	67	0.00		0.0		0.0								
	2015	9	3	95	65	69	0.00		0.0		0.0								
	2015	9	4	96	66	68	0.00		0.0		0.0								
	2015	9	5	96	68	68	0.00		0.0		0.0								
	2015	9	6	96	67	75	0.00		0.0		0.0								
	2015	9	7	96	73	73	0.00		0.0		0.0								
	2015	9	8	96	68	68	0.10		0.0		0.0								
	2015	9	9	96	67	71	0.00		0.0		0.0								
	2015	9	10	91	66	66	0.00		0.0		0.0								
	2015	9	11	88	64	65	0.00		0.0		0.0								
	2015	9	12	92	65	65	0.53		0.0		0.0								
	2015	9	13	89	63	65	0.00		0.0		0.0								
	2015	9	14	97	63	66	0.00		0.0		0.0								
	2015	9	15	97	61	64	0.00		0.0		0.0								
	2015	9	16	99	59	69	0.00		0.0		0.0								
	2015	9	17	98	68	72	0.00		0.0		0.0								
	2015	9	18	99	69	70	0.20		0.0		0.0								
	2015	9	19	98	67	67	0.50		0.0		0.0								
	2015	9	20	71	65	70	0.32		0.0		0.0								
	2015	9	21	80	63	63	0.00		0.0		0.0								
	2015	9	22	85	60	68	0.05		0.0		0.0								
	2015	9	23	88	66	66	0.41		0.0		0.0								
	2015	9	24	78	62	62	0.04		0.0		0.0								
	2015	9	25	80	62	65	0.75		0.0		0.0								
	2015	9	26	85	60	60	0.00		0.0		0.0								
	2015	9	27	88	57	57	0.00		0.0		0.0								
	2015	9	28	89	56	60	0.00		0.0		0.0								
	2015	9	29	89	58	61	0.00		0.0		0.0								
	2015	9	30	88	58	59	0.00		0.0		0.0								
			Summary	91	64		2.90		0.0										

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

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Generated on 07/12/2017

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	10	1	87	57	62	0.00		0.0		0.0								
	2015	10	2	93	59	63	0.00		0.0		0.0								
	2015	10	3	89	60	65	0.00		0.0		0.0								
	2015	10	4	79	55	56	1.37		0.0		0.0								
	2015	10	5	61	55	56	0.75		0.0		0.0								
	2015	10	6	67	55	56	0.00		0.0		0.0								
	2015	10	7	76	55	58	0.21		0.0		0.0								
	2015	10	8	77	57	58	0.57		0.0		0.0								
	2015	10	9	71	57	60	0.00		0.0		0.0								
	2015	10	10	75	59	62	0.00		0.0		0.0								
	2015	10	11	80	57	58	0.00		0.0		0.0								
	2015	10	12	88	57	65	0.00		0.0		0.0								
	2015	10	13	83	56	56	0.00		0.0		0.0								
	2015	10	14	84	55	55	0.00		0.0		0.0								
	2015	10	15	88	53	56	0.00		0.0		0.0								
	2015	10	16	88	54	62	0.00		0.0		0.0								
	2015	10	17	69	49	49	0.00		0.0		0.0								
	2015	10	18	75	48	52	0.00		0.0		0.0								
	2015	10	19	72	51	56	0.00		0.0		0.0								
	2015	10	20	78	55	57	0.00		0.0		0.0								
	2015	10	21	79	54	62	0.00		0.0		0.0								
	2015	10	22	73	52	53	0.88		0.0		0.0								
	2015	10	23	73	51	51	0.00		0.0		0.0								
	2015	10	24	77	50	57	0.00		0.0		0.0								
	2015	10	25	67	42	43	0.00		0.0		0.0								
	2015	10	26	69	41	41	0.00		0.0		0.0								
	2015	10	27	69	40	45	0.00		0.0		0.0								
	2015	10	28	81	43	51	0.00		0.0		0.0								
	2015	10	29	66	41	41	0.00		0.0		0.0								
	2015	10	30	67	40	54	0.05		0.0		0.0								
	2015	10	31	69	44	44	0.10		0.0		0.0								
			Summary	76	52		3.93		0.0										

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151 Patton Avenue
Asheville, North Carolina 28801

Elev: 3120 ft. Lat: 32.348° N Lon: 104.222° W
Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	11	1	70	42	42	0.00		0.0		0.0								
	2015	11	2	79	40	43	0.00		0.0		0.0								
	2015	11	3	81	41	41	0.00		0.0		0.0								
	2015	11	4	79	41	49	0.00		0.0		0.0								
	2015	11	5	79	48	49	0.00		0.0		0.0								
	2015	11	6	70	36	36	0.00		0.0		0.0								
	2015	11	7	65	34	42	0.00		0.0		0.0								
	2015	11	8	58	36	36	0.00		0.0		0.0								
	2015	11	9	58	36	37	0.00		0.0		0.0								
	2015	11	10	78	33	42	0.00		0.0		0.0								
	2015	11	11	78	41	56	0.00		0.0		0.0								
	2015	11	12	67	30	30	0.00		0.0		0.0								
	2015	11	13	64	28	33	0.00		0.0		0.0								
	2015	11	14	63	32	39	0.00		0.0		0.0								
	2015	11	15	63	39	51	0.00		0.0		0.0								
	2015	11	16	63	51	55	0.02		0.0		0.0								
	2015	11	17	78	42	42	0.00		0.0		0.0								
	2015	11	18	60	29	29	0.00		0.0		0.0								
	2015	11	19	71	28	40	0.00		0.0		0.0								
	2015	11	20	58	31	31	0.00		0.0		0.0								
	2015	11	21	72	30	37	0.00		0.0		0.0								
	2015	11	22	49	23	23	0.00		0.0		0.0								
	2015	11	23	62	22	29	0.00		0.0		0.0								
	2015	11	24	55	28	29	0.00		0.0		0.0								
	2015	11	25	76	27	37	0.00		0.0		0.0								
	2015	11	26	81	37	53	0.00		0.0		0.0								
	2015	11	27	74	37	37	0.18		0.0		0.0								
	2015	11	28	38	31	31	0.07		0.0		0.0								
	2015	11	29	36	31	36	0.00		0.0		0.0								
	2015	11	30	46	35	41	0.09		0.0		0.0								
			Summary	66	35		0.36		0.0										

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Station: **CARLSBAD, NM US GHCND:USC00291469**

Observation Time Temperature: 0700 Observation Time Precipitation: 0700

Preliminary	Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
				24 hrs. ending at observation time		at Observation	24 Hour Amounts ending at observation time				At Obs Time			4 in depth			8 in depth		
				Max.	Min.		Rain, melted snow, etc. (in)	Flag	Snow, ice pellets, hail (in)	Flag	Snow, ice pellets, hail, ice on ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
	2015	12	1	56	30	30	0.00		0.0		0.0								
	2015	12	2	61	24	24	0.00		0.0		0.0								
	2015	12	3	56	24	27	0.00		0.0		0.0								
	2015	12	4	62	24	27	0.00		0.0		0.0								
	2015	12	5	61	26	34	0.00		0.0		0.0								
	2015	12	6	53	32	32	0.00		0.0		0.0								
	2015	12	7	60	27	27	0.00		0.0		0.0								
	2015	12	8	63	24	24	0.00		0.0		0.0								
	2015	12	9	72	24	35	0.00		0.0		0.0								
	2015	12	10	75	32	43	0.00		0.0		0.0								
	2015	12	11	82	39	58	0.00		0.0		0.0								
	2015	12	12	78	39	39	0.00		0.0		0.0								
	2015	12	13	70	38	44	0.00		0.0		0.0								
	2015	12	14	60	43	49	0.00		0.0		0.0								
	2015	12	15	72	42	44	0.00		0.0		0.0								
	2015	12	16	51	25	25	0.00		0.0		0.0								
	2015	12	17	54	22	42	0.00		0.0		0.0								
	2015	12	18	54	21	24	0.00		0.0		0.0								
	2015	12	19	64	19	24	0.00		0.0		0.0								
	2015	12	20	65	22	40	0.00		0.0		0.0								
	2015	12	21	74	36	37	0.00		0.0		0.0								
	2015	12	22	69	34	40	0.00		0.0		0.0								
	2015	12	23																
	2015	12	24	67	49	49	0.00		0.0		0.0								
	2015	12	25	69	39	39	0.00		0.0		0.0								
	2015	12	26	63	37	43	0.00		0.0		0.0								
	2015	12	27	54	24	24	0.07		4.5		6.0								
	2015	12	28	31	23	29	0.01		3.0		9.0								
	2015	12	29	37	17	18	0.00		0.0		5.0								
	2015	12	30	35	16	20	0.00		0.0		0.0s								
	2015	12	31	34	18	20	0.00		0.0s		3.0s								
			Summary	60	29		0.08		7.5										

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13. EPA Tanks output file

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T-1 Diesel Fuel Tank
City:	Loving
State:	New Mexico
Company:	Rangeland
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	10.83
Diameter (ft):	4.00
Volume (gallons):	1,000.00
Turnovers:	317.92
Net Throughput(gal/yr):	317,922.50
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-1 Diesel Fuel Tank - Horizontal Tank
Loving, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jan	52.85	46.28	59.43	60.84	0.0051	0.0040	0.0064	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Feb	55.49	48.31	62.67	60.84	0.0056	0.0043	0.0072	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Mar	59.40	51.58	67.22	60.84	0.0064	0.0048	0.0083	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Apr	63.89	55.60	72.18	60.84	0.0075	0.0056	0.0097	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	May	68.04	59.71	76.37	60.84	0.0085	0.0064	0.0109	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Jun	71.83	63.05	80.60	60.84	0.0095	0.0073	0.0122	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jul	72.83	64.91	80.76	60.84	0.0098	0.0077	0.0123	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Aug	71.58	64.05	79.10	60.84	0.0095	0.0075	0.0117	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Sep	68.58	61.48	75.68	60.84	0.0086	0.0069	0.0107	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Oct	63.49	56.23	70.74	60.84	0.0074	0.0057	0.0092	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Nov	57.83	50.92	64.74	60.84	0.0061	0.0047	0.0077	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Dec	53.30	46.69	59.90	60.84	0.0052	0.0040	0.0065	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-1 Diesel Fuel Tank - Horizontal Tank
Loving, New Mexico

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.0151	0.0164	0.0223	0.0265	0.0308	0.0349	0.0332	0.0303	0.0254	0.0234	0.0181	0.0154
Vapor Space Volume (cu ft):	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
Vapor Space Expansion Factor:	0.0468	0.0512	0.0558	0.0589	0.0587	0.0617	0.0552	0.0523	0.0494	0.0510	0.0489	0.0470
Vented Vapor Saturation Factor:	0.9995	0.9994	0.9993	0.9992	0.9991	0.9990	0.9990	0.9990	0.9991	0.9992	0.9994	0.9995
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839	86.6839
Tank Diameter (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Effective Diameter (ft):	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286	7.4286
Vapor Space Outage (ft):	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
Tank Shell Length (ft):	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300	10.8300
Vapor Density												
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051	0.0056	0.0064	0.0075	0.0085	0.0095	0.0098	0.0095	0.0086	0.0074	0.0061	0.0052
Daily Avg. Liquid Surface Temp. (deg. R):	512.5247	515.1625	519.0673	523.5573	527.7090	531.4978	532.5028	531.2455	528.2517	523.1573	517.4995	512.9691
Daily Average Ambient Temp. (deg. F):	39.5000	44.5000	52.0500	61.0000	69.7000	77.8500	80.6500	78.4000	72.6000	62.2000	50.5500	40.8000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067	520.5067
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,047.0000	1,373.0000	1,807.0000	2,218.0000	2,459.0000	2,610.0000	2,441.0000	2,242.0000	1,913.0000	1,527.0000	1,131.0000	952.0000
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0468	0.0512	0.0558	0.0589	0.0587	0.0617	0.0552	0.0523	0.0494	0.0510	0.0489	0.0470
Daily Vapor Temperature Range (deg. R):	26.2957	28.7115	31.2813	33.1657	33.3048	35.1036	31.7072	30.1119	28.4019	29.0125	27.6316	26.4195
Daily Vapor Pressure Range (psia):	0.0024	0.0029	0.0035	0.0040	0.0045	0.0050	0.0046	0.0042	0.0038	0.0035	0.0030	0.0024
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051	0.0056	0.0064	0.0075	0.0085	0.0095	0.0098	0.0095	0.0086	0.0074	0.0061	0.0052
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0040	0.0043	0.0048	0.0056	0.0064	0.0073	0.0077	0.0075	0.0069	0.0057	0.0047	0.0040
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0064	0.0072	0.0083	0.0097	0.0109	0.0122	0.0123	0.0117	0.0107	0.0092	0.0077	0.0065
Daily Avg. Liquid Surface Temp. (deg R):	512.5247	515.1625	519.0673	523.5573	527.7090	531.4978	532.5028	531.2455	528.2517	523.1573	517.4995	512.9691
Daily Min. Liquid Surface Temp. (deg R):	505.9507	507.9846	511.2470	515.2659	519.3828	522.7219	524.5760	523.7176	521.1512	515.9042	510.5916	506.3642
Daily Max. Liquid Surface Temp. (deg R):	519.0986	522.3403	526.8877	531.8487	536.0352	540.2737	540.4296	538.7735	535.3522	530.4104	524.4074	519.5739
Daily Ambient Temp. Range (deg. R):	29.6000	30.8000	31.5000	31.4000	30.0000	31.5000	27.9000	27.0000	26.8000	30.2000	30.9000	30.4000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9995	0.9994	0.9993	0.9992	0.9991	0.9990	0.9990	0.9990	0.9991	0.9992	0.9994	0.9995
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0051	0.0056	0.0064	0.0075	0.0085	0.0095	0.0098	0.0095	0.0086	0.0074	0.0061	0.0052
Vapor Space Outage (ft):	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
Working Losses (lb):	0.1085	0.1198	0.1366	0.1599	0.1822	0.2044	0.2108	0.2028	0.1851	0.1578	0.1298	0.1104
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0051	0.0056	0.0064	0.0075	0.0085	0.0095	0.0098	0.0095	0.0086	0.0074	0.0061	0.0052
Net Throughput (gal/mo.):	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417	26,493.5417
Annual Turnovers:	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225	317.9225
Turnover Factor:	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610	0.2610

Tank Diameter (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.1236	0.1362	0.1589	0.1864	0.2130	0.2393	0.2440	0.2331	0.2105	0.1812	0.1479	0.1258

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

T-1 Diesel Fuel Tank - Horizontal Tank
Loving, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.91	0.29	2.20

14. Transloader engine specs

46 hp Engine Specs

Used for diesel engine emissions

D 2011 L03i Specification data

General

Cylinders	3	
Cylinder arrangement	Vertical in-line	
Bore	94 mm	3.7 in.
Stroke	112 mm	4.4 in.
Cylinder Displacement	0.78 liter	47.4 $in.^3$
Total displacement	2.33 liter	142.2 $in.^3$
Compression ratio	19.0:1	
Combustion system	Direct injection	
Aspiration	Natural	

Fuel system

Lift pump suction head, max	3 m	118.1 in.
Lift pump flow @max rpm	140.0 l/h	37.0 GPH
Max restriction in fuel supply line	300 mbar	120 in. H_2O
Max restriction in fuel return line	200 mbar	80 in. H_2O
Max restriction in fuel pre-filter	200 mbar	80 in. H_2O
Fuel filter type	Spin-on cartridge	
Fuel consumption @ max rating	10.9 l/h	2.9 GPH
Fuel consumption @ peak torque	7.0 l/h	1.8 GPH

Combustion air system

Combustion air flow @ max rating	165.0 m^3/h	97.1 CFM
Max allowable clean restriction	25 mbar	10 in. H_2O
Max allowable dirty restriction	55 mbar	22 in. H_2O
Max inlet temp rise over ambient	10 °C	18 °F

Exhaust system

Exhaust gas flow @ max rating	450 m^3/h	265 CFM
Exhaust temp @ max rating	670 °C	1238 °F
Max allowable back pressure	65 mbar	26 in. H_2O

Cooling system

Type	Integrated oil cooling	
Cooling air flow rate @ max rpm	1450 m^3/h	853 CFM
Max inlet air temp rise over ambient	10 °C	18 °F
Discharge air temp rise over inlet	52 °C	93.6 °F
Cowling pressure:		
Max loss due to inlet duct	10 %	
Max loss due to discharge duct	10 %	

Lubrication system

Lubrication type	Forced feed	
Oil flow through filter at max rpm	17.5 l/min	4.6 GPM
Oil pump relief valve setting	7 bar	101.5 psi
Max oil temperature in oil sump	135 °C	275 °F
Filter volume	0.4 liter	0.423 qt.
Oil change interval	1000 hours	

Electrical

Starter motor	12V, 2.3 kW	24V, 4.0 kW
Max battery CCA	950A	750A
Voltage drop, battery (+), max	1.0V	

Physical data

	minimum dimensions	
Length	599 mm	23.6 in.
Width	460 mm	18.1 in.
Height	672 mm	26.5 in.
Weight, dry	216 kg	475.2 lb.
Max bending @ housing:	650 Nm	479.1 lb-ft
Max force @ flywheel:		
Axial:	1500 N	337.8 lb.
Radial:	3700 N	833.3 lb.

Performance data

Peak torque	137 Nm	101.0 lb-ft
@ rpm	1700	
low idle speed	900 rpm	

Engine power

	Genset	Variable speed		
Engine RPM	1800	2300	2500	2800
kW, Gross intermittent	23.9	31.3	33.3	36.4
Hp, Gross intermittent	32.0	41.9	44.6	48.8
kW, Net intermittent	23.8	30.9	32.8	35.8
Hp, Net intermittent	31.9	41.4	44.0	48.0
kW, Gross continuous	21.5	29.7	31.6	34.6
Hp, Gross continuous	28.8	39.8	42.3	46.4
kW, Net continuous	21.4	29.3	31.1	34.0
Hp, Net continuous	28.7	39.3	41.7	45.6

Fuel consumption

g/kWh	225.0	238.0	245.0	253.0
lb/hphr	0.369	0.390	0.402	0.415

Combustion air

m^3/hr	105.0	135.0	147.0	165.0
CFM	61.8	79.4	86.5	97.1

Exhaust gas

m^3/h	280	365	405	450
CFM	165	215	238	265

Cooling air

m^3/h	933	1192	1295	1450
CFM	549	701	762	853

Noise, dB(A)

Avg. @ 1 meter

Certifications

U.S. EPA Non Road Tier 4 Interim as of Jan 1, 2008
Europe COM 3a as of Jan 1, 2007

All data refer to standard conditions of 25 °C, 1000 mbar
Data are based on max intermittent output, unless noted

DEUTZ Corporation
3883 Steve Reynolds Blvd
Norcross, GA 30093 USA

Document: D2011L03i_T4i
Revision: 0
Date: 10 Dec, 2007

74 hp Engine Specs

Used for diesel engine emissions

California Environmental Protection Agency AIR RESOURCES BOARD	JOHN DEERE POWER SYSTEMS	EXECUTIVE ORDER U-R-004-0444 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2012	CJDXL04.5130	4.5	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection, Turbocharger	Pump, Compressor, Generator Set, Other Industrial Equipment

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
37 ≤ kW < 56	Tier 4 Interim	STD	N/A	N/A	4.7	5.0	0.30	20	15	50
		CERT	--	--	4.6	1.2	0.29	2	1	4

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 20 day of September 2011.

Annette Hebert, Chief
Mobile Source Operations Division

8-11-2011 CUM: U-R-0054-0444 Attachment. page 1 of 1

Engine Model Summary Form

Manufacturer: **John Deere Power Systems**
Engine category: **Nonroad CI**
EPA Engine Family: **CJDXL04.5130**
Mfr Family Name: **350TAC**
Process Code: **Correction**

1. Engine code	2. Engine Model	3. kW@RPM (SAE Gross)	4. Fuel Rate: mm/stroke@peak kW (for diesel only)	5. Fuel Rate: (kg/hr)@peak kW (for diesels only)	6. Torque (Nm) @RPM (SEA Gross)	7. Fuel Rate: mm/stroke@peak torque	8. Fuel Rate: (kg/hr)@peak torque	9. Emission Control Device Per SAE J1930
4045TF290A	4045T	55.0@2400	59.7@2400	14.61@2400	268@1700	66.4@1700	11.51@1700	EM DFI TC
4045TF290B	4045T	55.0@1800	73@1800	13.4@1800				EM DFI TC
4045TF290C	4045T	55.0@2350	59.2@2350	14.19@2350				EM DFI TC
4045TF290D	4045T	55.0@2100	63@2100	13.49@2100				EM DFI TC
4045TF290E	4045T	48.0@1760	64.1@1760	11.51@1760				EM DFI TC
4045TF290F	4045T	36.0@2350	39.8@2350	9.54@2350				EM DFI TC
4045TF290G	4045T	36.0@2100	41.3@2100	8.65@2100				EM DFI TC
4045TF290H	4045T	36.0@1760	48.1@1760	8.63@1760				EM DFI TC

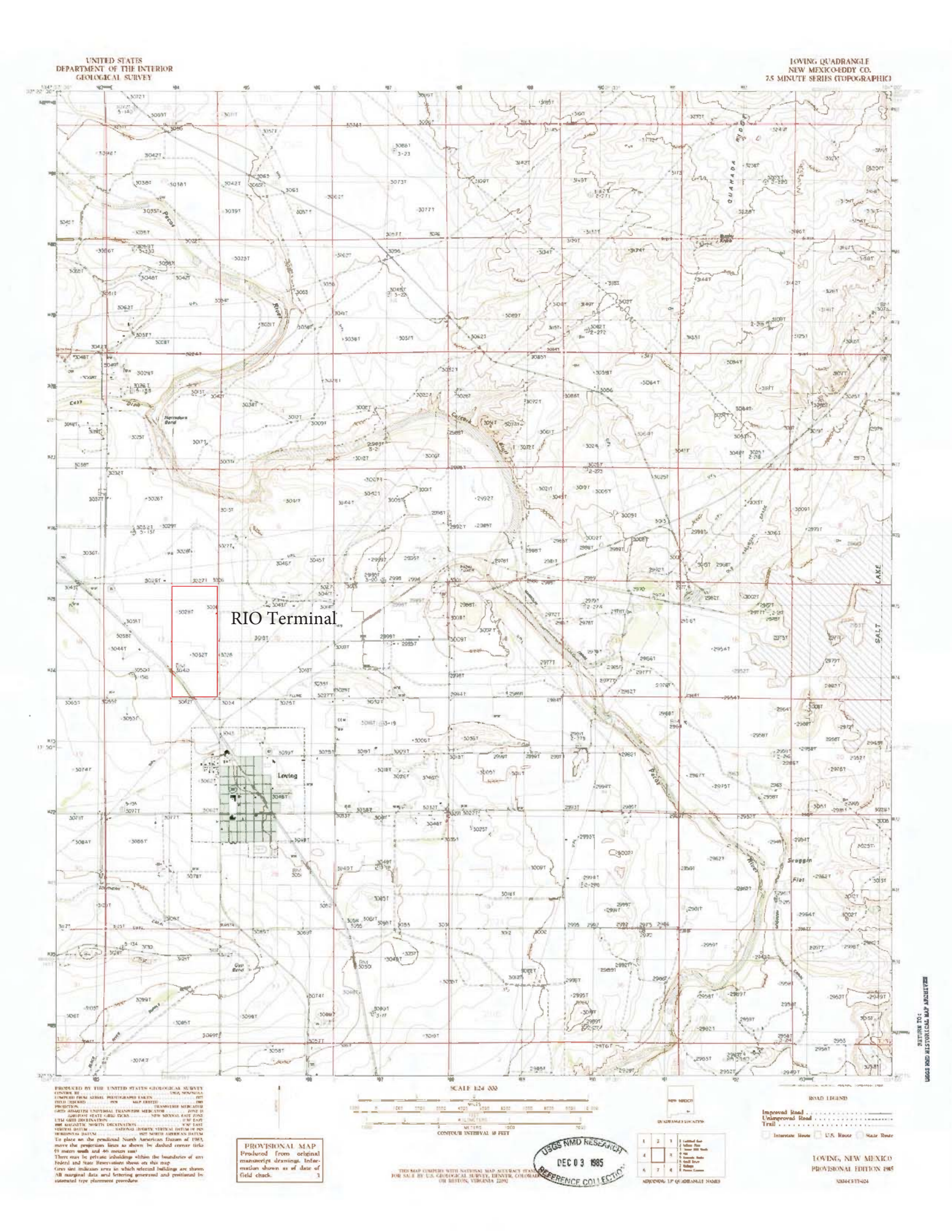
Section 8

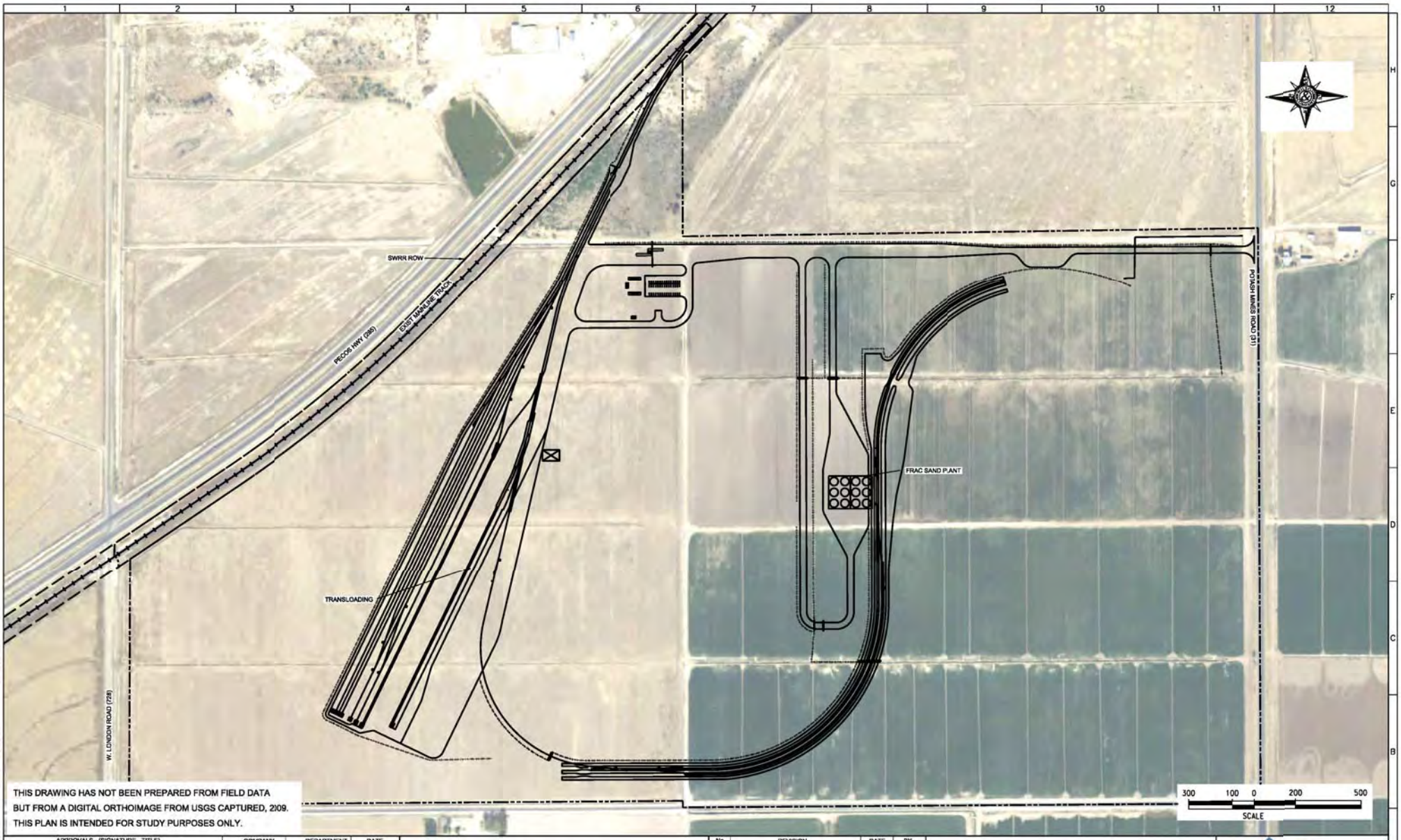
Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

Not all the information required for the map could be found on one map available. Therefore, 3 maps of the site are presented.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
LOVING QUADRANGLE
NEW MEXICO-EDDY CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
RIO Terminal
Loving
LAKE
SALT
Scoggin
Flat
PROVISIONAL MAP
Produced from original manuscript drawings. Information shown as of date of field check.
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
ROAD LEGEND
Improved Road
Unimproved Road
Trail
Interstate Route
U.S. Route
State Route
LOVING, NEW MEXICO
PROVISIONAL EDITION 1985
USGS NMD RESEARCH
DEC 03 1985
REFERENCE COLLECTION
RETURN TO:
USGS NMD HISTORICAL MAP ARCHIVE



THIS DRAWING HAS NOT BEEN PREPARED FROM FIELD DATA
BUT FROM A DIGITAL ORTHOIMAGE FROM USGS CAPTURED, 2009.
THIS PLAN IS INTENDED FOR STUDY PURPOSES ONLY.

APPROVALS - (SIGNATURE - TITLE)	COMPANY	DEPARTMENT	DATE

SITE PLAN

WILSON & COMPANY
13105 NW FREEWAY, SUITE 525
HOUSTON, TEXAS 77040
PHONE: 713-934-7070
FAX: 713-934-7330

No.	REVISION	DATE	BY

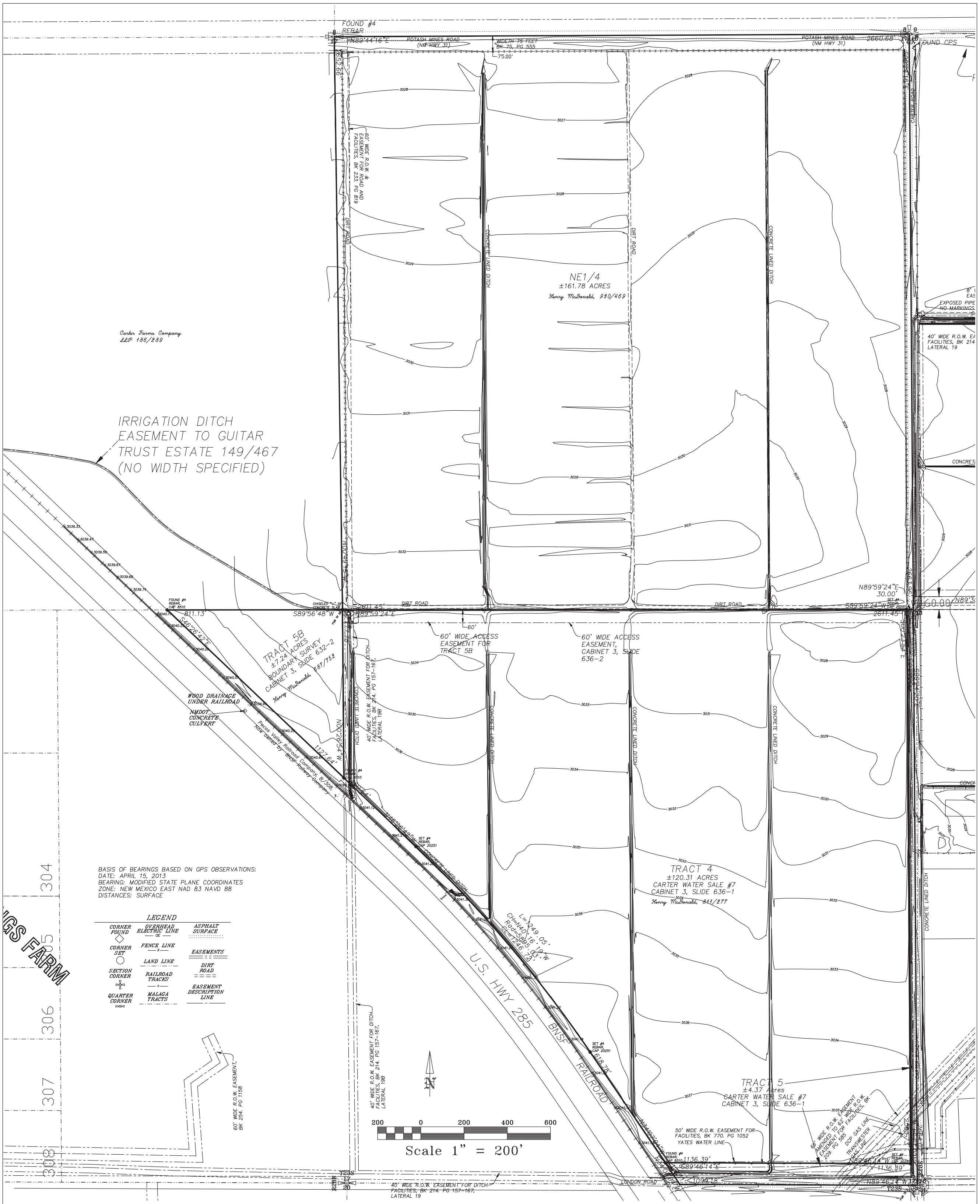
DESIGNED BY:
DRAWN BY:
REVIEWED BY:
JOB NUMBER: 13-400-023-00
FILE: Site Plan-9-3-2014.ssh

RIO FACILITY
LOVING, NEW MEXICO

Rangeland Energy

DATE: 9/3/2014
SHEET NO:

PATH: c:\wilcpw\d0756607\ Site Plan-9-3-2014 ssh.dgn
TIME: 1:34:35 PM
BY: pbarvay
PRINTED: 9/3/2014



EXCEPTIONS:

1. AT THE TIME OF THE SURVEY THE ONLY OCCUPANCY LINE IS THAT OF A FENCE ALONG THE WEST LINE OF THE NE1/4 OF SECTION 17.

2. AN EASEMENT DOES NOT APPEAR IN PUBLIC RECORDS, THAT OF THE WEST 1/2 OF CARTER ROAD ALONG THE NE1/4 OF SECTION 17. ALONG WATER SALE #7 PROPERTY, THE ROAD IS A PART OF TRACT 5.

3. THE SURVEY SHOWS MEASUREMENTS OF RECORD, IF ANY DISCREPANCIES, THEN M=1234.56' AND (REC=1234.56') WOULD APPEAR.

4. LIENS ARE NOT A SURVEY RELATED MATTER.

5. THERE IS NOT ANY COMMUNITY PROPERTY IN THE SUBJECT PROPERTY SURVEY.

7. THE WATER RIGHTS HAVE BEEN SOLD TO THE STATE, THEREFORE NO NEW WATER WELLS CAN BE DRILLED ON THE McDONALD PROPERTY. THE NE1/4 OF SECTION 17 STILL HAS WATER RIGHTS ON THE PROPERTY.

9. TAXES ARE NOT A SURVEY RELATED MATTER.

10. THERE ARE NO DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS, FIRST APPEARING IN PUBLIC RECORDS SUBSEQUENT TO THE EFFECTIVE DATE.

11. THE MINERAL RIGHTS ATTACHED TO THE PROPERTY IS NOT PART OF THIS SURVEY.

12. THERE ARE NO TENANTS WITH OR WITHOUT A LEASE ON THE SUBJECT PROPERTY.

13. DITCHES ARE SHOWN, AND THE MAIN LATERALS HAVE EASEMENTS AND LABELED BY BOOK/PAGE.

14. THE CHARGES FOR WATER ALLOCATION BY THE CARLSBAD IRRIGATION DISTRICT IS NOT A SURVEY RELATED MATTER.

15. THE CONDITIONS OF DITCHES AND CANALS ACROSS THE SUBJECT PROPERTY, BY RIGHTS OF WAY, BY THE UNITED STATES GOVERNMENT.

16. THE EASEMENT GRANTED IN BOOK 75, PAGE 555 IS FOR THAT PART OF POTASH MINES ROAD (HWY 31), IS SHOWN.

17. THE R.O.W. EASEMENT TO EL PASO NATURAL GAS COMPANY IN BOOK 233, PAGE 819, IS SHOWN.

18. THE PARTITION DEED FILED IN BOOK 218, PAGE 871, LISTS THE BENEFICIARIES OF THE GUITAR TRUST, CHAIN OF TITLE TO THE PROPERTY, TO THE NE1/4 OF SECTION 17.

19. THE CONDITIONS OF DITCHES AND CANALS ACROSS THE SUBJECT TRACTS, BY RIGHTS OF WAY, BY THE UNITED STATES GOVERNMENT.

20. RIGHT OF WAY IN BOOK B, PAGE 308, FOR THE PECOS VALLEY RAILWAY COMPANY IS AN ADJOINING PROPERTY OWNER, DOES AFFECT AND IS SHOWN, NOW OWNED BY BNSF RAILWAY COMPANY LEASED TO SOUTHWESTERN RAILWAY COMPANY.

21. RIGHT OF WAY GRANTED TO EDDY COUNTY IN BOOK 64, PAGE 267, IS FOR PART OF HWY 285 R.O.W. DOES NOT AFFECT.

22. RIGHT OF WAY GRANTED TO EDDY COUNTY IN BOOK 64, PAGE 568, IS FOR PART OF HWY 285 R.O.W., DOES NOT AFFECT.

23. EASEMENT GRANTED TO THE GUITAR TRUST IN BOOK 149, PAGE 467, IS SHOWN AND DOES AFFECT.

24. EASEMENT GRANTED IN BOOK 162, PAGE 334 WAS AMENDED BY THE EASEMENT IN BOOK 209, PAGE 585, AND IS SHOWN.

25. EASEMENT GRANTED IN BOOK 202, PAGE 25 TO MALAGA WATER USERS COOPERATIVE ASSOCIATION LIES WEST OF HWY 285, THEREFORE DOES NOT AFFECT SUBJECT PROPERTY.

26. THE EASEMENT GRANTED IN BOOK 214, PAGE 157, TO THE UNITED STATES IS FOR THAT OF THE CANAL LATERALS LYING ACROSS AND THRU THE SUBJECT PROPERTY, SHOWN.

27. THE EASEMENT IN BOOKS 253 AND 254, PAGES 221 AND 1158, TO EL PASO NATURAL GAS COMPANY DOES NOT AFFECT THE SUBJECT PROPERTY, BUT IS SHOWN WEST OF HWY 285.

28. EASEMENT TO THE NMSHTD IN BOOK 126, PAGE 33 AND 37 LIES ON THE WESTERLY SIDE OF HWY 285 IS NOT SHOWN, DOES NOT AFFECT.

29. 60 FOOT EASEMENT TO TRACT 5B, ACROSS TRACT 2 OF THE CARTER FARMS WATER SALE #7, IS SHOWN AND LABELED.

30. THE PIPELINE EASEMENT GRANTED TO YATES PETROLEUM CORPORATION, IN BOOK 770, PAGE 1052, IS SHOWN AND LABELED.

31. THE RESTRICTION LISTED IN BOOK 811, PAGE 270, IS NOT SURVEY RELATED, HOWEVER IT DEALS WITH THE DRILLING OF WATER WELLS ON THE SUBJECT PROPERTY.

PYEATTS LLC
A LAND SURVEYING COMPANY
PHONE/FAX: 1-575-885-1331/1-575-885-6867
EMAIL: PyeattsLLC@HOTMAIL.COM
ADDRESS: 423 W. GREENE ST
CARLSBAD, NM, 88220

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

X I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

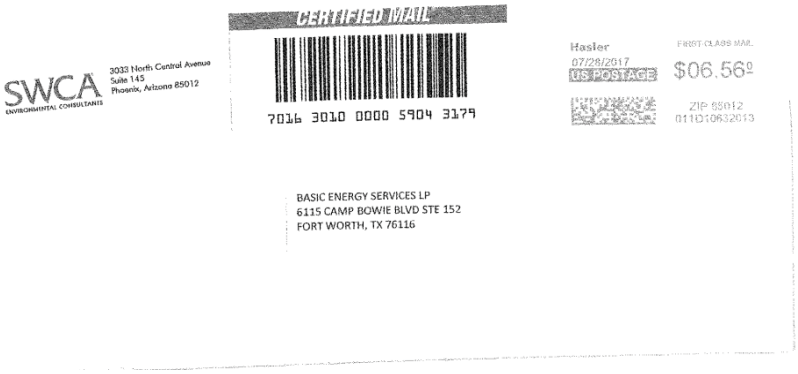
Technical Revision public notices require only items 1, 5, 9, and 10.

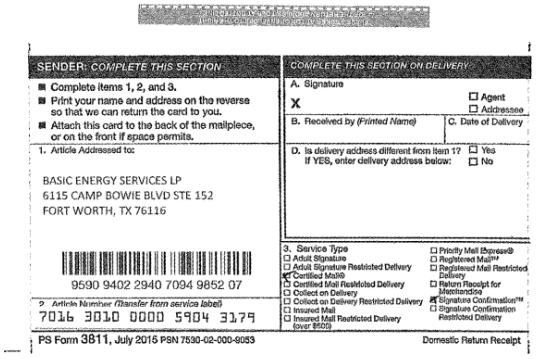
Per the Guidelines for Public Notification document mentioned above, include:

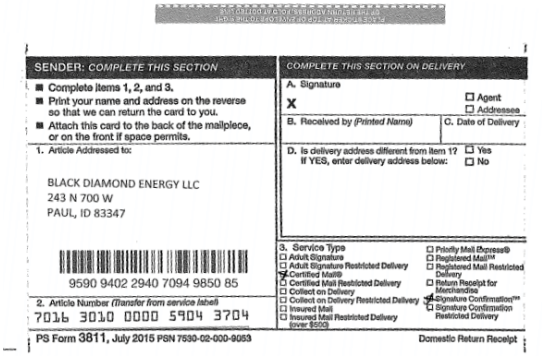
1. X A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. X A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. X A copy of the property tax record (20.2.72.203.B NMAC).
4. X A sample of the letters sent to the owners of record.
5. X A sample of the letters sent to counties, municipalities, and Indian tribes.
6. X A sample of the public notice posted and a verification of the local postings.
7. X A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. X A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. X A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. X A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. X A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

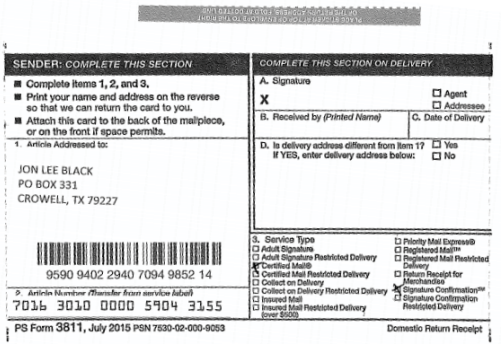
Section 9.1

Copy of Certified Letter Receipts









SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL

7016 3010 0000 5904 3131

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

BUREAU OF LAND MANAGEMENT
414 WEST TAYLOR
HOBBS, NM 88240

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
BUREAU OF LAND MANAGEMENT
414 WEST TAYLOR
HOBBS, NM 88240

9590 9402 2940 7094 9852 21

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3131

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL

7016 3010 0000 5904 3674

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

BNSF RAILWAY COMPANY
PO BOX 961089
FORT WORTH, TX 76161

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
BNSF RAILWAY COMPANY
PO BOX 961089
FORT WORTH, TX 76161

9590 9402 2940 7094 9850 54

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3674

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL

7016 2710 0000 8629 5745

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

CITY OF CARLSBAD, NM
DALE W. JANWAY, MAYOR
101 N HALAGUENO ST.
CARLBAD, NM 88221

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
CITY OF CARLSBAD, NM
DALE W. JANWAY, MAYOR
101 N HALAGUENO ST.
CARLBAD, NM 88221

9590 9402 1503 5362 6747 12

2. Article Number (Transfer from service label)
7016 2710 0000 8629 5745

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3100

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56º
ZIP 85012
011D10632013

JOHN DRAPER & GEORGE BRANTLEY
706 W RIVERSIDE DR
CARLSBAD, NM 88220

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
JOHN DRAPER & GEORGE BRANTLEY
706 W RIVERSIDE DR
CARLSBAD, NM 88220

9590 9402 2940 7094 9838 76

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3100

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3650

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56º
ZIP 85012
011D10632013

EDDY COUNTY, NM
RICK J. RUDOMETKIN COUNTY MGR.
EDDY CNTY ADMINISTRATION COMPLEX
COUNTY 101 W GREENE STREET
CARLSBAD, NM 88220

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
EDDY COUNTY, NM
RICK J. RUDOMETKIN COUNTY MGR.
EDDY CNTY ADMINISTRATION COMPLEX
COUNTY 101 W GREENE STREET
CARLSBAD, NM 88220

9590 9402 2940 7094 9850 16

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3650

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3681

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56º
ZIP 85012
011D10632013

EOG RESOURCES INC.
ATTN: PROPERTY TAX DEPT
PO BOX 4362
HOUSTON, TX 77210-4362

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
EOG RESOURCES INC.
ATTN: PROPERTY TAX DEPT
PO BOX 4362
HOUSTON, TX 77210-4362

9590 9402 2940 7094 9850 61

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3681

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

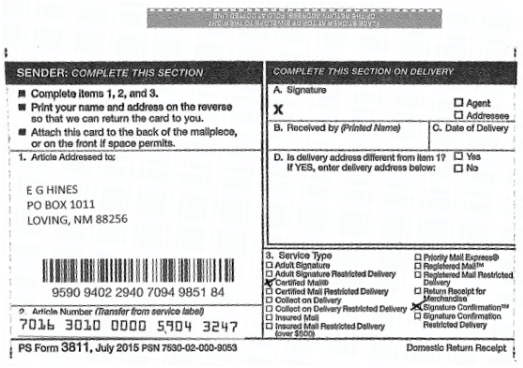

CERTIFIED MAIL®

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

7016 3010 0000 5904 3247

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

E G HINES
PO BOX 1011
LOVING, NM 88256


SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
E G HINES
PO BOX 1011
LOVING, NM 88256

9590 9402 2940 7094 9851 84

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3247

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☒ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

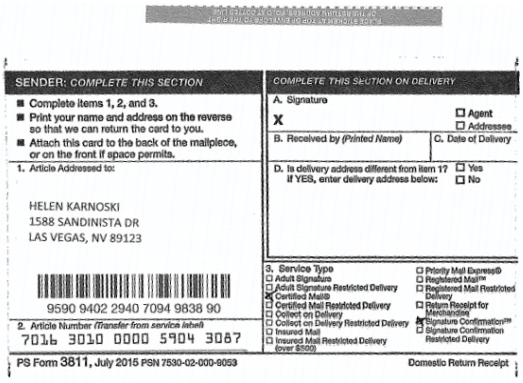

CERTIFIED MAIL®

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

7016 3010 0000 5904 3087

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

HELEN KARNOSKI
1588 SANDINISTA DR
LAS VEGAS, NV 89123


SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
HELEN KARNOSKI
1588 SANDINISTA DR
LAS VEGAS, NV 89123

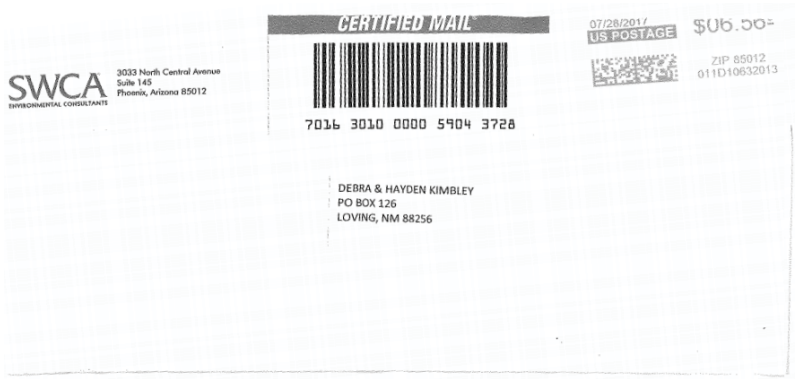
9590 9402 2940 7094 9838 90

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3087

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☒ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

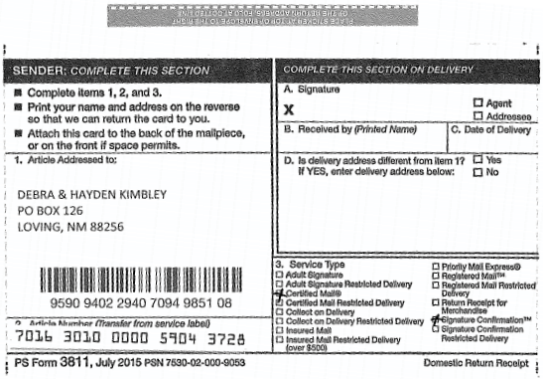

CERTIFIED MAIL®

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

7016 3010 0000 5904 3728

07/28/2017
US POSTAGE
$06.56⁰
ZIP 85012
011D10632013

DEBRA & HAYDEN KIMBLEY
PO BOX 126
LOVING, NM 88256


SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
DEBRA & HAYDEN KIMBLEY
PO BOX 126
LOVING, NM 88256

9590 9402 2940 7094 9851 08

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3728

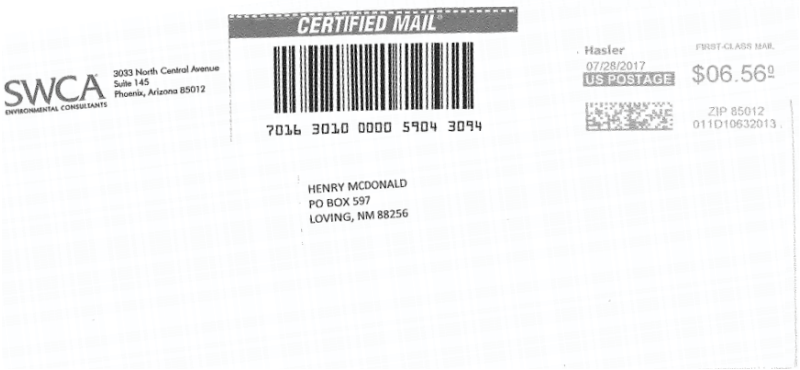
COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

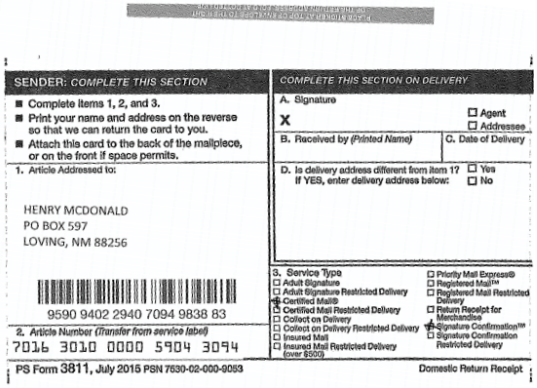
3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☒ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

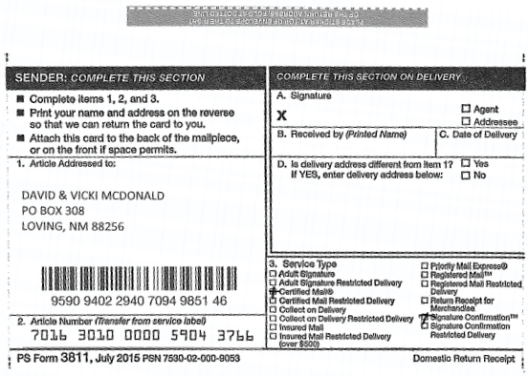

CERTIFIED MAIL
SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
7016 2710 0000 8629 5752
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56º
ZIP 85012
011D10632013
LINCK PROPERTIES LLC
105 SUMMER STREET
REHOBOTH, MA 02769-1719

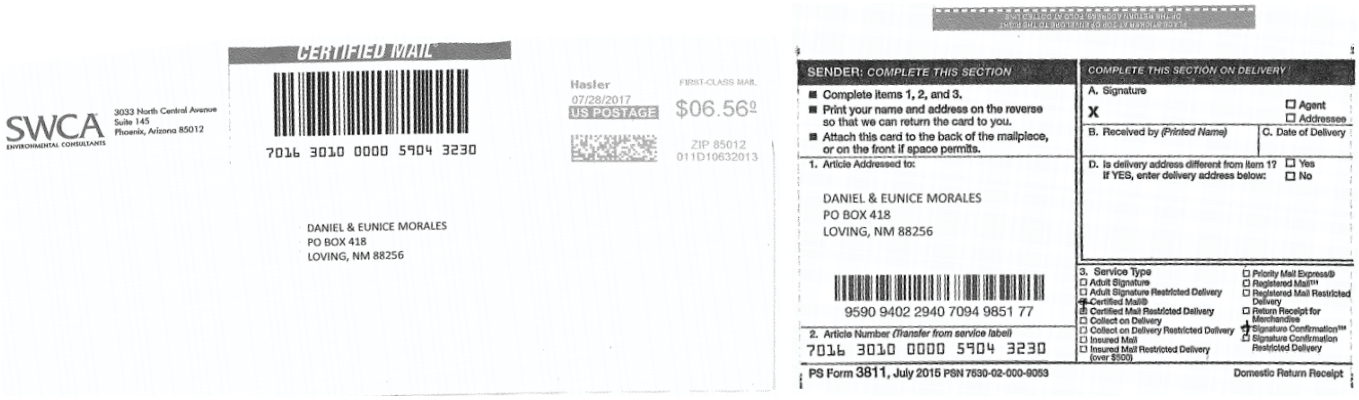

SENDER: COMPLETE THIS SECTION
COMPLETE THIS SECTION ON DELIVERY
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
A. Signature
X
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
1. Article Addressed to:
LINCK PROPERTIES LLC
105 SUMMER STREET
REHOBOTH, MA 02769-1719
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
9590 9402 1503 5362 6746 99
2. Article Number (Transfer from service label)
7016 2710 0000 8629 5752
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

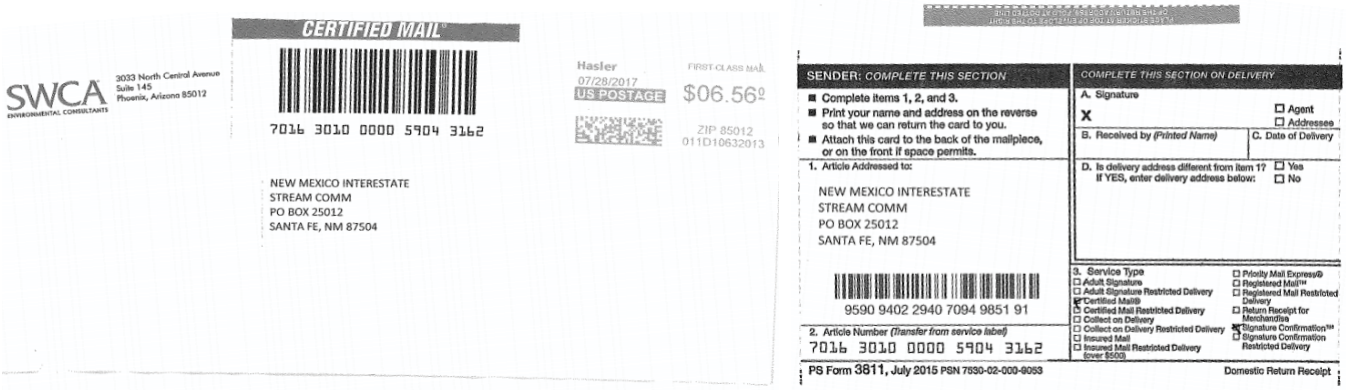

CERTIFIED MAIL
SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
7016 3010 0000 5904 3094
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56º
ZIP 85012
011D10632013
HENRY MCDONALD
PO BOX 597
LOVING, NM 88256

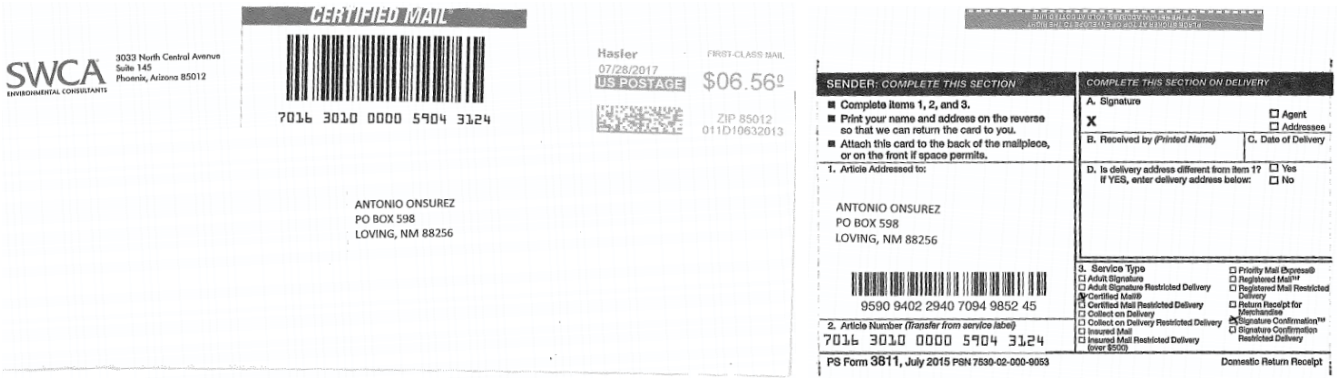

SENDER: COMPLETE THIS SECTION
COMPLETE THIS SECTION ON DELIVERY
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
A. Signature
X
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
1. Article Addressed to:
HENRY MCDONALD
PO BOX 597
LOVING, NM 88256
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
9590 9402 2940 7094 9838 83
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3094
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

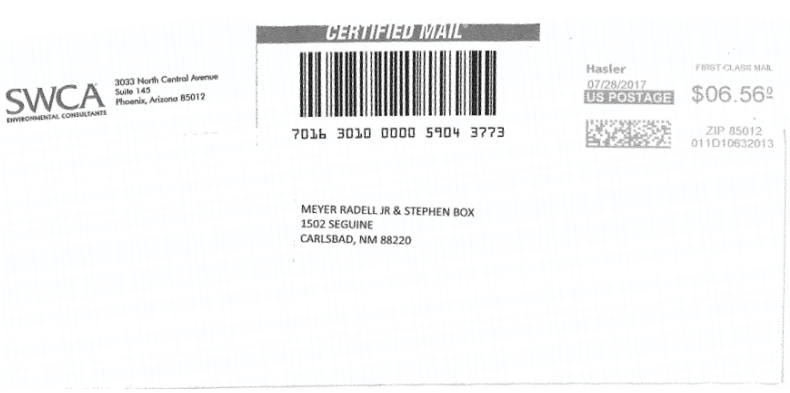

CERTIFIED MAIL
SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
7016 3010 0000 5904 3766
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56º
ZIP 85012
011D10632013
DAVID & VICKI MCDONALD
PO BOX 308
LOVING, NM 88256

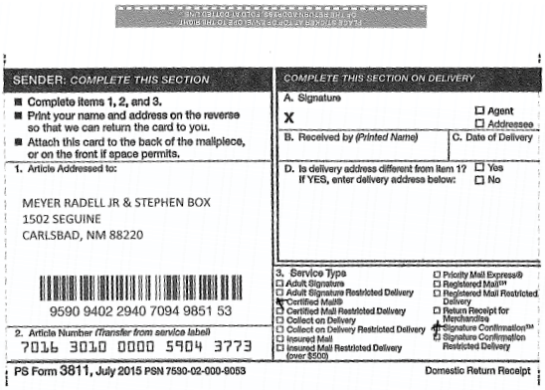

SENDER: COMPLETE THIS SECTION
COMPLETE THIS SECTION ON DELIVERY
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
A. Signature
X
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
1. Article Addressed to:
DAVID & VICKI MCDONALD
PO BOX 308
LOVING, NM 88256
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
9590 9402 2940 7094 9851 46
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3766
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

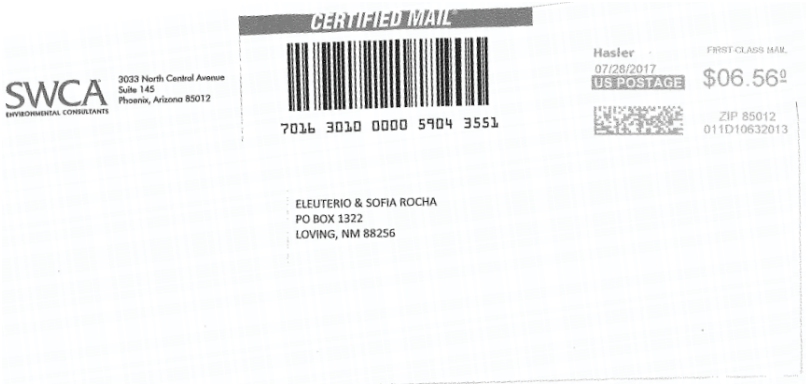

CERTIFIED MAIL
7016 3010 0000 5904 3230
SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56
ZIP 85012
011D10632013
DANIEL & EUNICE MORALES
PO BOX 418
LOVING, NM 88256
SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
DANIEL & EUNICE MORALES
PO BOX 418
LOVING, NM 88256
9590 9402 2940 7094 9851 77
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3230
COMPLETE THIS SECTION ON DELIVERY
A. Signature
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

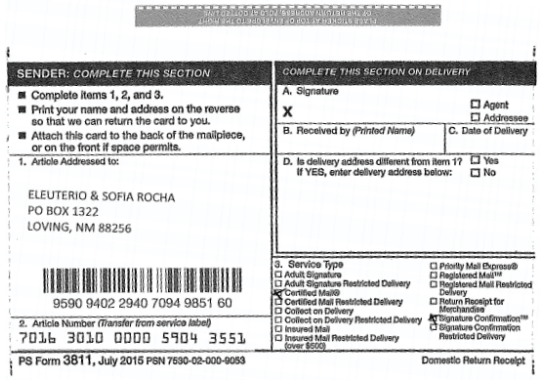

CERTIFIED MAIL
7016 3010 0000 5904 3162
SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56
ZIP 85012
011D10632013
NEW MEXICO INTERESTATE
STREAM COMM
PO BOX 25012
SANTA FE, NM 87504
SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
NEW MEXICO INTERESTATE
STREAM COMM
PO BOX 25012
SANTA FE, NM 87504
9590 9402 2940 7094 9851 91
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3162
COMPLETE THIS SECTION ON DELIVERY
A. Signature
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

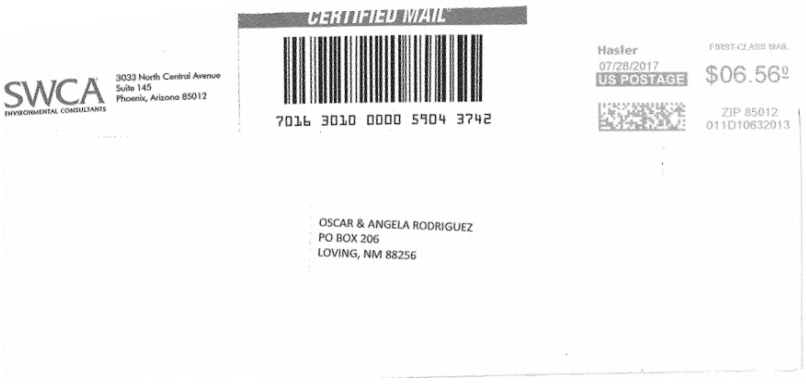

CERTIFIED MAIL
7016 3010 0000 5904 3124
SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56
ZIP 85012
011D10632013
ANTONIO ONSUREZ
PO BOX 598
LOVING, NM 88256
SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
ANTONIO ONSUREZ
PO BOX 598
LOVING, NM 88256
9590 9402 2940 7094 9852 45
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3124
COMPLETE THIS SECTION ON DELIVERY
A. Signature
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

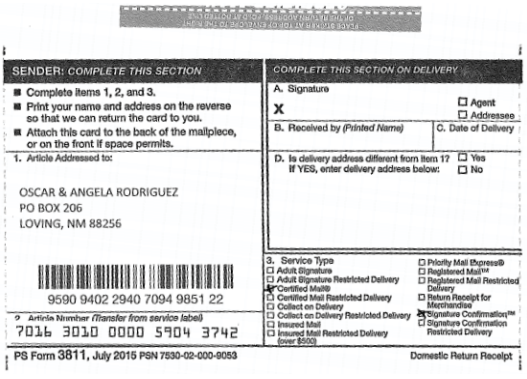

SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
CERTIFIED MAIL
7016 3010 0000 5904 3773
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013
MEYER RADELL JR & STEPHEN BOX
1502 SEGUINE
CARLSBAD, NM 88220

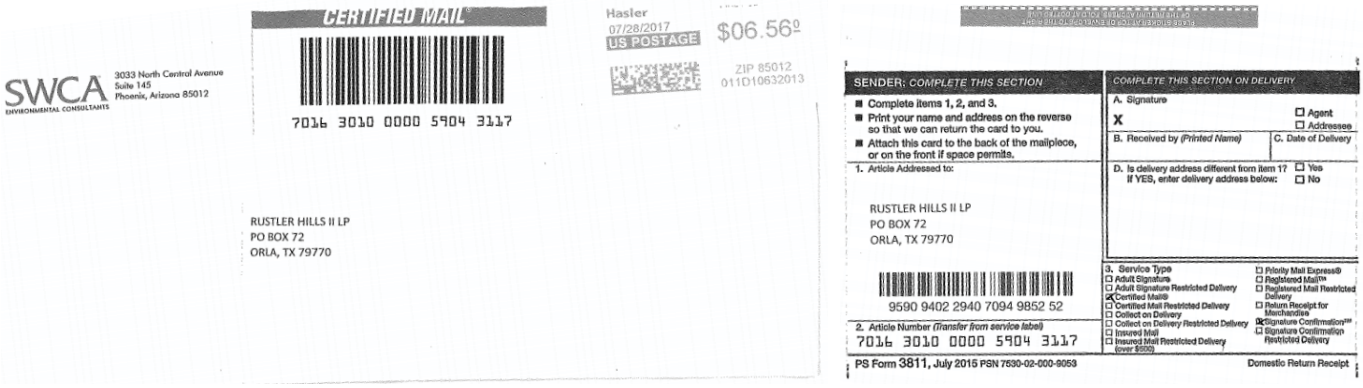

SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
MEYER RADELL JR & STEPHEN BOX
1502 SEGUINE
CARLSBAD, NM 88220
9590 9402 2940 7094 9851 53
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3773
COMPLETE THIS SECTION ON DELIVERY
A. Signature
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

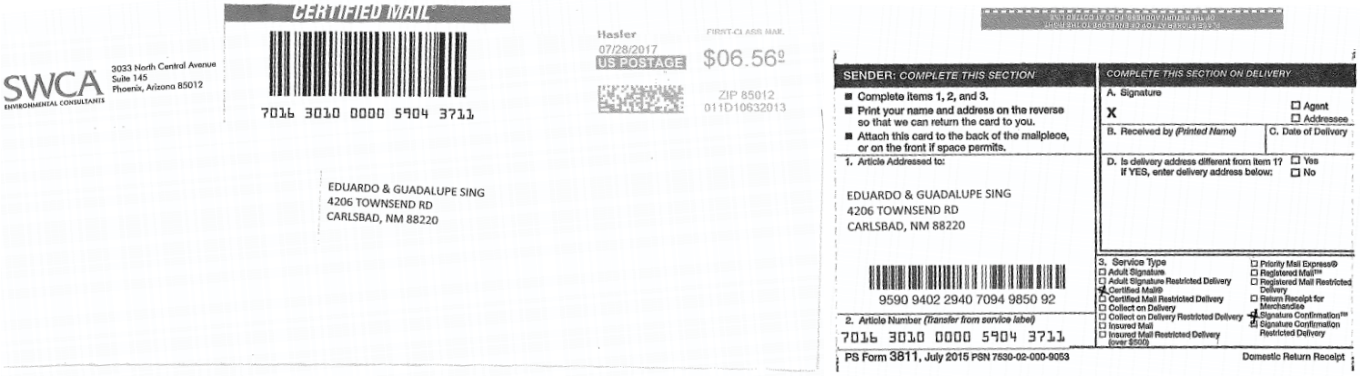

SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
CERTIFIED MAIL
7016 3010 0000 5904 3551
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013
ELEUTERIO & SOFIA ROCHA
PO BOX 1322
LOVING, NM 88256

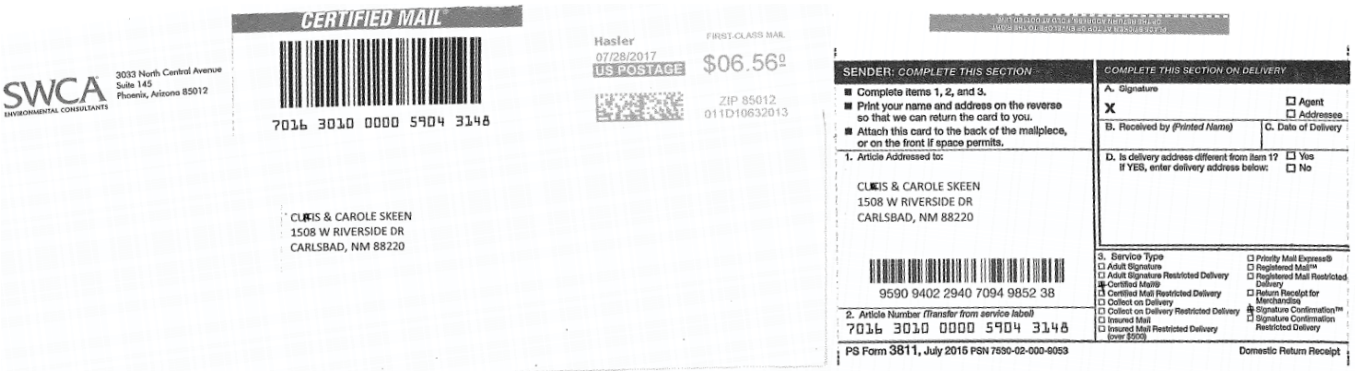

SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
ELEUTERIO & SOFIA ROCHA
PO BOX 1322
LOVING, NM 88256
9590 9402 2940 7094 9851 60
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3551
COMPLETE THIS SECTION ON DELIVERY
A. Signature
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt


SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
CERTIFIED MAIL
7016 3010 0000 5904 3742
Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013
OSCAR & ANGELA RODRIGUEZ
PO BOX 206
LOVING, NM 88256


SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
OSCAR & ANGELA RODRIGUEZ
PO BOX 206
LOVING, NM 88256
9590 9402 2940 7094 9851 22
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3742
COMPLETE THIS SECTION ON DELIVERY
A. Signature
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Adult Signature
Adult Signature Restricted Delivery
Certified Mail®
Certified Mail Restricted Delivery
Collect on Delivery
Collect on Delivery Restricted Delivery
Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Registered Mail Restricted Delivery
Return Receipt for Merchandise
Signature Confirmation™
Signature Confirmation Restricted Delivery
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt


SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
CERTIFIED MAIL
7016 3010 0000 5904 3117
Hasler
07/28/2017
US POSTAGE
$06.56º
ZIP 85012
011D10632013
RUSTLER HILLS II LP
PO BOX 72
ORLA, TX 79770
SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
RUSTLER HILLS II LP
PO BOX 72
ORLA, TX 79770
9590 9402 2940 7094 9852 52
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3117
COMPLETE THIS SECTION ON DELIVERY
A. Signature
X
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Certified Mail®
Signature Confirmation™
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt


SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
CERTIFIED MAIL
7016 3010 0000 5904 3711
Hasler
07/28/2017
US POSTAGE
$06.56º
ZIP 85012
011D10632013
EDUARDO & GUADALUPE SING
4206 TOWNSEND RD
CARLSBAD, NM 88220
SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
EDUARDO & GUADALUPE SING
4206 TOWNSEND RD
CARLSBAD, NM 88220
9590 9402 2940 7094 9850 92
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3711
COMPLETE THIS SECTION ON DELIVERY
A. Signature
X
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Certified Mail®
Signature Confirmation™
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt


SWCA
ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012
CERTIFIED MAIL
7016 3010 0000 5904 3148
Hasler
07/28/2017
US POSTAGE
$06.56º
ZIP 85012
011D10632013
CURTIS & CAROLE SKEEN
1508 W RIVERSIDE DR
CARLSBAD, NM 88220
SENDER: COMPLETE THIS SECTION
Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.
1. Article Addressed to:
CURTIS & CAROLE SKEEN
1508 W RIVERSIDE DR
CARLSBAD, NM 88220
9590 9402 2940 7094 9852 38
2. Article Number (Transfer from service label)
7016 3010 0000 5904 3148
COMPLETE THIS SECTION ON DELIVERY
A. Signature
X
Agent
Addressee
B. Received by (Printed Name)
C. Date of Delivery
D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No
3. Service Type
Certified Mail®
Signature Confirmation™
PS Form 3811, July 2015 PSN 7530-02-000-9053
Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3667

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

STATE HIGHWAY DEPT - ROSWELL OFFICE
PO BOX 1457
ROSWELL, NM 88202-1457

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
STATE HIGHWAY DEPT - ROSWELL OFFICE
PO BOX 1457
ROSWELL, NM 88202-1457

9590 9402 2940 7094 9850 47

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3667

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature ☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery ☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery ☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express® ☐ Registered Mail™ ☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☒ Signature Confirmation™ ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3735

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

SERVANDO & MELISSA VASQUEZ
C/O MELISSA SKIPPER
1905 SENTRY CIRCLE
CARLSBAD, NM 88220

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
SERVANDO & MELISSA VASQUEZ
C/O MELISSA SKIPPER
1905 SENTRY CIRCLE
CARLSBAD, NM 88220

9590 9402 2940 7094 9851 15

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3735

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature ☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery ☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery ☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express® ☐ Registered Mail™ ☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☒ Signature Confirmation™ ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3780

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

MIQUELA VILLA
108 KELLY RD
CARLSBAD, NM 88220

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
MIQUELA VILLA
108 KELLY RD
CARLSBAD, NM 88220

9590 9402 2940 7094 9850 30

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3780

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature ☐ Adult Signature Restricted Delivery
☒ Certified Mail®
☐ Certified Mail Restricted Delivery ☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery ☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express® ☐ Registered Mail™ ☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☒ Signature Confirmation™ ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 2710 0000 8629 5738

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

VILLAGE OF LOVING, NM
P.O BOX 56
LOVING, NM 88256

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
VILLAGE OF LOVING, NM
P.O BOX 56
LOVING, NM 88256

9590 9402 2940 7094 9850 23

2. Article Number (Transfer from service label)
7016 2710 0000 8629 5738

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3759

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

VILLAGE OF LOVING
PO BOX 56
LOVING, NM 88256

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
VILLAGE OF LOVING
PO BOX 56
LOVING, NM 88256

9590 9402 2940 7094 9851 39

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3759

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SWCA ENVIRONMENTAL CONSULTANTS
3033 North Central Avenue
Suite 145
Phoenix, Arizona 85012

CERTIFIED MAIL
7016 3010 0000 5904 3698

Hasler
07/28/2017
US POSTAGE
FIRST-CLASS MAIL
$06.56⁰
ZIP 85012
011D10632013

WILDCAT OIL TOOLS LLC
PO BOX 50592
MIDLAND, TX 79710

SENDER: COMPLETE THIS SECTION
- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
WILDCAT OIL TOOLS LLC
PO BOX 50592
MIDLAND, TX 79710

9590 9402 2940 7094 9850 78

2. Article Number (Transfer from service label)
7016 3010 0000 5904 3698

COMPLETE THIS SECTION ON DELIVERY
A. Signature
X ☐ Agent ☐ Addressee
B. Received by (Printed Name) C. Date of Delivery
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☑ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Section 9.2

Public Notice Posting Locations

This information is provided in Section 9.6: General Public Notice Posting – Certification.

Section 9.3

Property Tax Record

Property Record Card

Eddy Assessor

RANGELAND NM LLC
C/O: RANGELAND ENERGY C/O

ATTN: ACCOUNTS PAYABLE
1111 NORTH LOOP WEST SUITE 250
HOUSTON, TX 77008

Account: R040034
Tax Area: 10O_NR - LOVING-OUT (Nonresidential)
Acres: 0.000

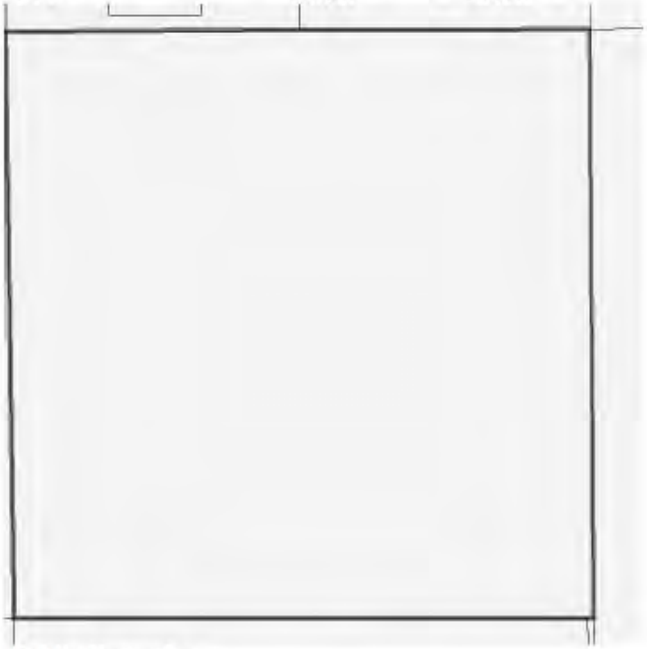
Parcel: 4-164-135-397-116
Situs Address:
71 POTASH MINES ROAD

Value Summary

Value By:	Market	Override
Land (1)	$399,999	N/A
Total	**$399,999**	**$399,999**

Legal Description

Quarter: NE S: 17 T: 23S R: 28E NE MAP# 304-1 LOC 71 POTASH MINES ROAD



Public Remarks

Entry Date	Model	Remark
07/18/2013		BOOK 943 PG 464

Land Occurrence 1

Property Code	0200 - NON-RESIDENTIAL LAND	Land Code	111_2499_99 - Commercial Land N/R - 2499.99
Description	NON-RESIDENTIAL LAND		

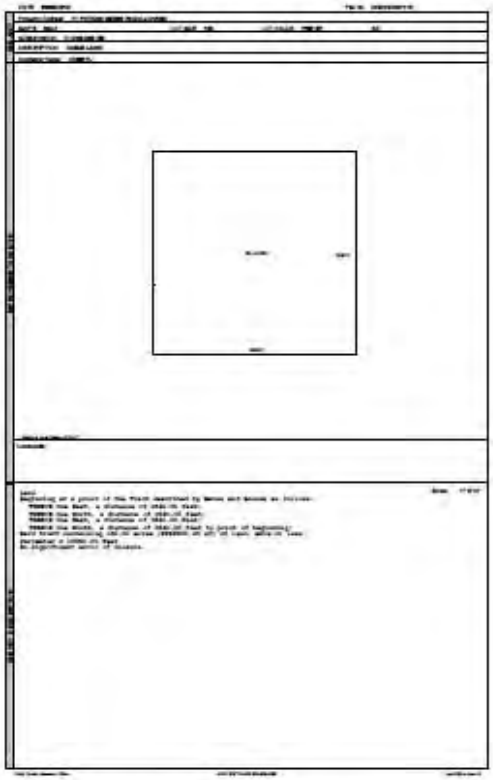
SubArea		ACTUAL	EFFECTIVE	HEATED	FOOTPRINT
LAND - Land		6969600.0	6969600.0	6969600.0	6969600.0
Total		6,969,600.00	6,969,600.00	6,969,600.00	6,969,600.00
	Value	Rate	Rate	Rate	Rate
	$399,999	0.06	0.06	0.06	0.06

Property Record Card

Eddy Assessor

Land Occurrence 1

SKETCHAREA TABLE ADDENDUM



Abstract Summary

Code	Classification	Actual Value Value	Taxable Value	Actual Value Override	Taxable Override
0200	NON-RESIDENTIAL LAND	$399,999	$133,333	NA	NA
Total		**$399,999**	**$133,333**	**NA**	**NA**

Property Record Card

Eddy Assessor

RANGELAND NM LLC
C/O: RANGELAND ENERGY C/O

ATTN: ACCOUNTS PAYABLE
1111 NORTH LOOP WEST SUITE 250
HOUSTON, TX 77008

Account: R093736
Tax Area: 10O_NR - LOVING-OUT (Nonresidential)
Acres: 0.000

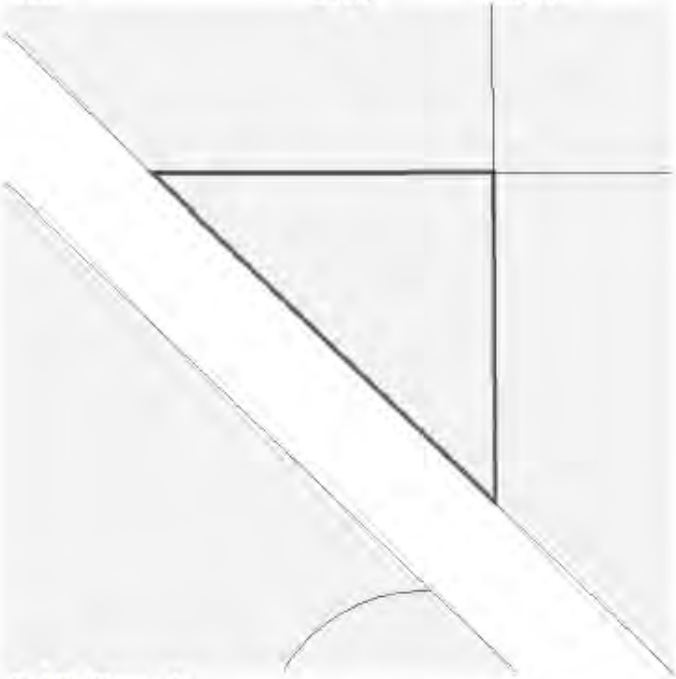
Parcel: 4-164-135-240-292
Situs Address:
PECOS HWY

Value Summary

Value By:	Market	Override
Land (1)	$50,679	N/A
Total	**$50,679**	**$50,679**

Legal Description

Quarter: SW S: 17 T: 23S R: 28E NESW N & E OF HWY MAP# 304-2 LOC E OF 2265 PECOS HWY ODD SHAPE TRACT



Public Remarks

Entry Date	Model	Remark
07/18/2013		BOOK 943 PG 464

Land Occurrence 1

Property Code	0200 - NON-RESIDENTIAL LAND	Land Code	111_6999_99 - Commercial Land N/R - 6999.99
Description	NON-RESIDENTIAL LAND		

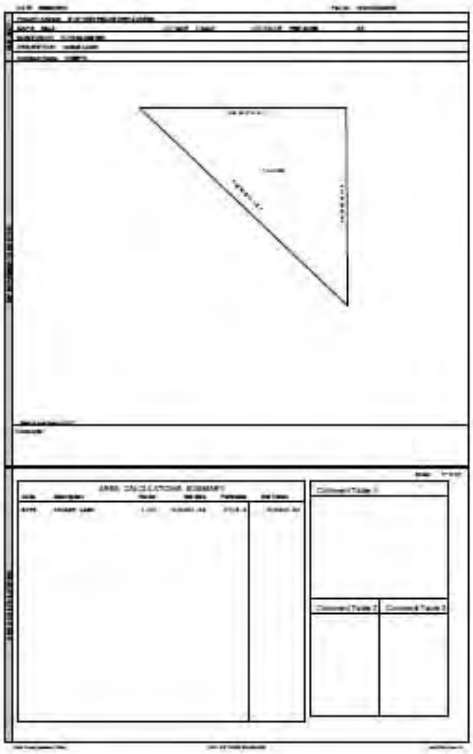
SubArea		ACTUAL	EFFECTIVE	HEATED	FOOTPRINT
SITE - VACANT LAND		315452.8	315452.8	315452.8	315452.8
Total		315,452.80	315,452.80	315,452.80	315,452.80
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$50,679	0.16	0.16	0.16	0.16

Property Record Card

Eddy Assessor

Land Occurrence 1

SKETCH/AREA TABLE ADDENDUM



Abstract Summary

Code	Classification	Actual Value Value	Taxable Value	Actual Value Override	Taxable Override
0200	NON-RESIDENTIAL LAND	$50,679	$16,893	NA	NA
Total		**$50,679**	**$16,893**	**NA**	**NA**

Property Record Card

Eddy Assessor

RANGELAND NM LLC
C/O: RANGELAND ENERGY C/O

ATTN: ACCOUNTS PAYABLE
1111 NORTH LOOP WEST SUITE 250
HOUSTON, TX 77008

Account: R093779
Tax Area: 10O_NR - LOVING-OUT (Nonresidential)
Acres: 0.000

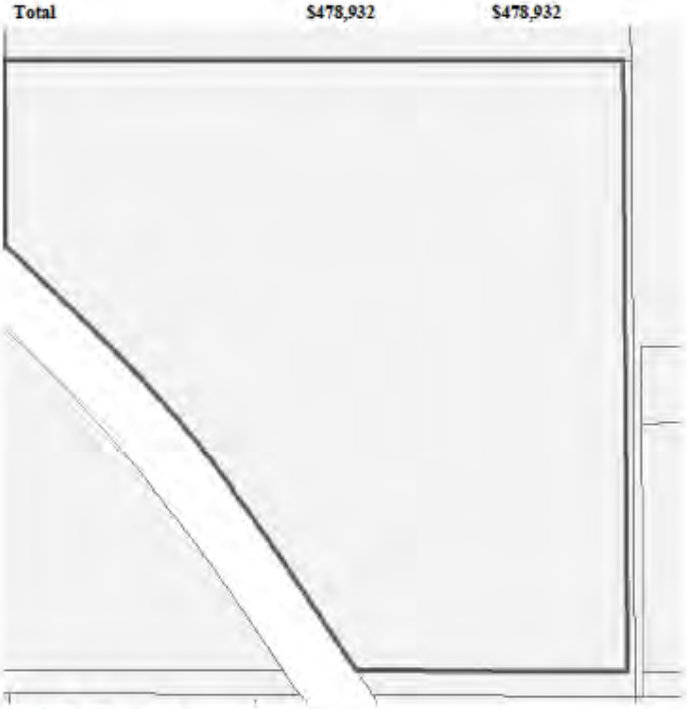
Parcel: 4-164-135-420-376
Situs Address:
71 POTASH MINES ROAD

Value Summary

Value By:	Market	Override
Commercial (1)	$178,182	$178,182
Land (1)	$300,750	N/A
Total	**$478,932**	**$478,932**

Legal Description

Subd: CARTER FARMS WATER SALE #7 Tract: 4 TRACT 4 MAP# 304-CF7-4 CAB# 3 636-1 LOC 71 POTASH MINES ROAD ODD SHAPE TRACT



Public Remarks

Entry Date	Model	Remark
07/18/2013		BOOK 943 PG 464

Commercial Occurrence 1

Property Code	0220 - NON-RESIDENTIAL IMPROVEMENT	Building Type	250 - Comm Structures

SubArea	ACTUAL	EFFECTIVE	HEATED	FOOTPRINT
GBA1 - First Floor	2220.0	2220.0	2220.0	2220.0
STR - STORAGE	2407.0	2407.0	2407.0	2407.0
SHED - SHED	3000.0	3000.0	3000.0	3000.0
Total	7,627.00	7,627.00	7,627.00	7,627.00

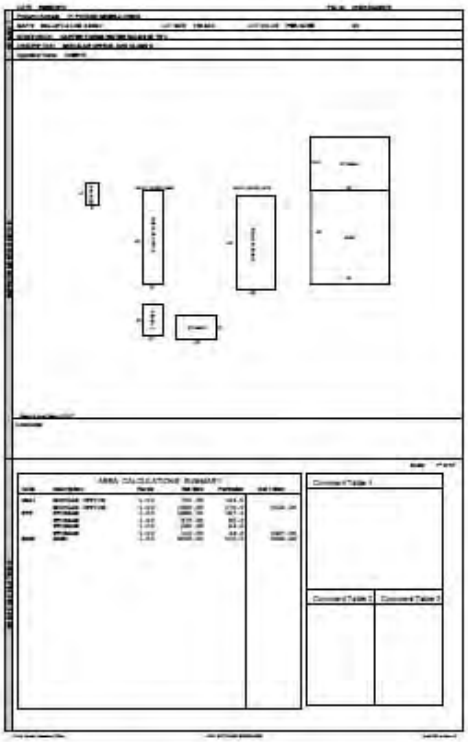
Property Record Card

Eddy Assessor

Commercial Occurrence 1

$178,182	23.36	23.36	23.36	23.36

SKETCH/AREA TABLE ADDENDUM



Land Occurrence 1

Property Code	0200 - NON-RESIDENTIAL LAND	Land Code	111_2499_99 - Commercial Land N/R - 2499.99
Description	NON-RESIDENTIAL LAND		

Abstract Summary

Code	Classification	Actual Value Value	Taxable Value	Actual Value Override	Taxable Override
0200	NON-RESIDENTIAL LAND	$300,750	$100,250	NA	NA
0220	NON-RESIDENTIAL IMPROVEMENT	$178,182	$59,394	NA	NA
Total		**$478,932**	**$159,644**	**NA**	**NA**

Property Record Card

Eddy Assessor

RANGELAND NM LLC
C/O: RANGELAND ENERGY C/O

ATTN: ACCOUNTS PAYABLE
1111 NORTH LOOP WEST SUITE 250
HOUSTON, TX 77008

Account: R093780
Tax Area: 10O_NR - LOVING-OUT (Nonresidential)
Acres: 0.000

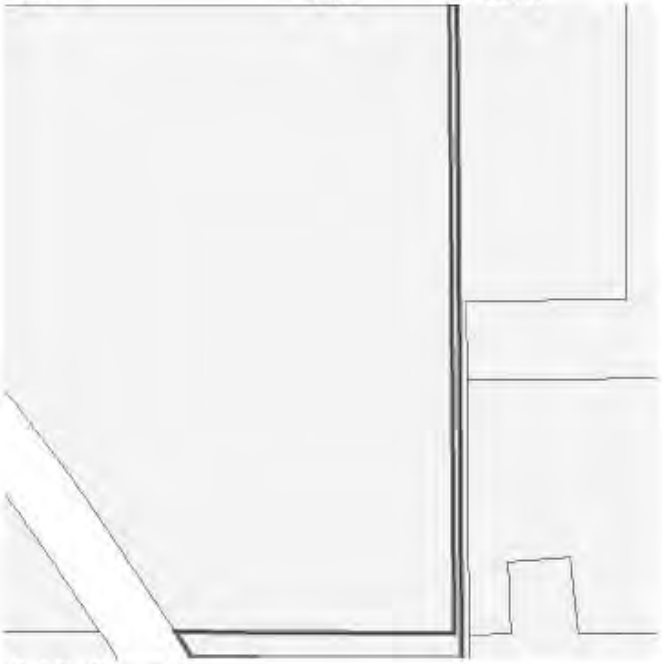
Parcel: 4-164-135-503-528
Situs Address:
CARTER ROAD

Value Summary

Value By:	Market	Override
Land (1)	$30,591	N/A
Total	**$30,591**	**$30,591**

Legal Description

Subd: CARTER FARMS WATER SALE #7 Tract: 5 TRACT 5 MAP# 304-CF7-5 CAB# 3 636-1 LOC S OF 56 CARTER RD ODD SHAPE TRACT



Public Remarks

Entry Date	Model	Remark
07/18/2013		BOOK 943 PG 464

Land Occurrence 1

Property Code	0200 - NON-RESIDENTIAL LAND	Land Code	111_6999_99 - Commercial Land N/R - 6999.99
Description	NON-RESIDENTIAL LAND		

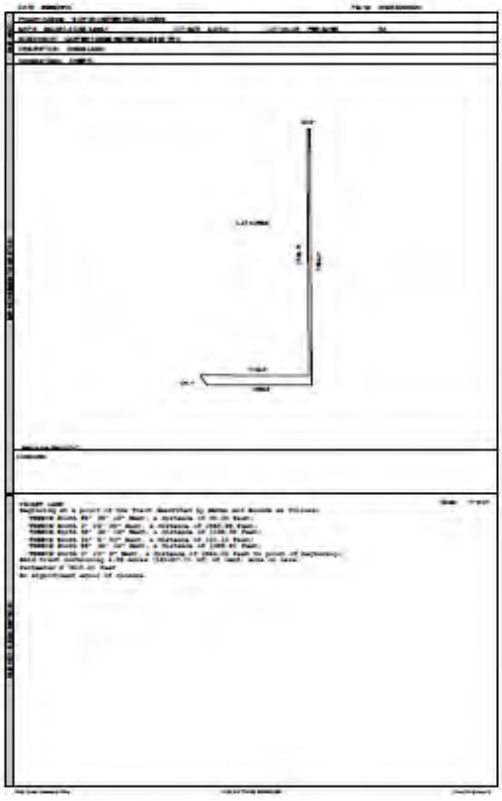
SubArea		ACTUAL	EFFECTIVE	HEATED	FOOTPRINT
LAND - Land		191037.7	191037.7	191037.7	191037.7
Total		191,037.70	191,037.70	191,037.70	191,037.70
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$30,591	0.16	0.16	0.16	0.16

Property Record Card

Eddy Assessor

Land Occurrence 1

SKETCH/AREA TABLE ADDENDUM



Abstract Summary

Code	Classification	Actual Value Value	Taxable Value	Actual Value Override	Taxable Override
0200	NON-RESIDENTIAL LAND	$30,591	$10,197	NA	NA
Total		**$30,591**	**$10,197**	**NA**	**NA**

Section 9.4 & 9.5

Letter sent to owners of record and Letter sent to counties, municipalities, and Indian tribes

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July 28, 2017

CERTIFIED MAIL XXXX XXXX XXXX XXXX

Dear **[Neighbor/Environmental Director/county or municipal official]**

Rangeland NM, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the modification of its crude oil and frac sand transloading facility. The expected date of application submittal to the Air Quality Bureau is July 31, 2017.

The exact location for the proposed facility known as the RIO Terminal, is at 71 Potash Mines Road, Loving, NM 88256, latitude 32 deg, 18 min, 08 sec and longitude -104 deg, 6 min, 16 sec. The entrance of the facility is 0.75 miles east of the intersection of Pecos Highway (U.S. Highway 285) and Potash Mines Road (New Mexico Highway 31) in Eddy County.

The proposed modification consists of the expansion of the number of transloaders and throughput of frac sand that can be received by the facility, replacement of emission units, update of the current haul road conditions, and revisions to the alternate operating scenario.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and may change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Total Suspended Particulates (TSP)	10.00 pph	37.55 tpy
PM_{10}	2.61 pph	9.80 tpy
$PM_{2.5}$	0.58 pph	2.34 tpy
Nitrogen Oxides (NO_x)	4.56 pph	19.97 tpy
Carbon Monoxide (CO)	4.85 pph	21.24 tpy
Volatile Organic Compounds (VOC)	24.90 pph	91.37 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	0.70 pph	2.40 tpy
Green House Gas Emissions as Total CO_2e	n/a	<75,000 tpy

The standard and maximum operating schedules of the facility will be from midnight to midnight, 7 days a week, and a maximum of 52 weeks per year.

The owner and operator of the facility is Rangeland NM, LLC.

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: New Mexico Environment Department; Air Quality Bureau – Permitting Section; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención

Este es un aviso de la Agencia de Calidad de Aire del Departamento de Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor de comunicarse con la oficina de Calidad de Aire al teléfono 505-476-5557.

Sincerely,

Rangeland NM, LLC
2150 Town Square Place, Suite 700,
Sugar Land, TX 77479

Notice of Non-Discrimination

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/NMED/EJ/index.html to learn how and where to file a complaint of discrimination.

Section 9.6

Sample of the public notice posted and a verification of the local postings

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General Posting of Notices – Certification

I, Joe Young, the undersigned, certify that on **{7/28/17},** posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the **{City of Loving and Carlsbad}** of **{Eddy}** County, State of New Mexico on the following dates:

1. Facility entrance {7/28/17}
2. {Loving Post Office}{7/28/17}
3. {Loving City Hall}{7/28/17}
4. {Carlsbad Post Office}{7/28/17}

Signed this 31 day of July, 2017.

Signature

7-31-17
Date

Joe Young
Printed Name

Operations Manager
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

NOTICE

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The owner and/or operator of the Facility is: Rangeland NM, LLC; 2150 Town Square Place, Suite 700, Sugar Land, TX, 77479.

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: New Mexico Environment Department; Air Quality Bureau – Permitting Section; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

With your comments, please refer to the company name and facility name, or send a copy of this notice along with your comments. This information is necessary since the Department may have not yet received the permit application. Please include a legible return mailing address. Once the Department has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención

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NOTICE
07/28/2017 14:30


NOTICE
07/28/2017 14:29

Section 9.7

Table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent.

The notice letter was sent to the following owners of record:

Land Owner	Street	City	State	ZIP	Certified Mail - Article Number
VILLA, MIQUELA	108 KELLY RD	CARLSBAD	NM	88220	7016-3010-0000-5907-3780
MCDONALD, HENRY	PO BOX 597	LOVING	NM	88256	7016 3010 0000 5904 3094
BRANTLEY, JOHN DRAPER & GEORGE (NOT JT)	706 W RIVERSIDE DR	CARLSBAD	NM	88220	7016 3010 0000 5904 3100
KARNOSKI, HELEN D	1588 SANDINISTA DR	LAS VEGAS	NV	89123	7016 3010 0000 5904 3087
RUSTLER HILLS II, LP	PO BOX 72	ORLA	TX	79770	7016 3010 0000 5904 3117
ONSUREZ, ANTONIO C	PO BOX 598	LOVING	NM	88256	7016 3010 0000 5904 3124
SKEEN, CUTIS K & CAROLE D	1508 W RIVERSIDE DR	CARLSBAD	NM	88220	7016 3010 0000 5904 3148
BUREAU OF LAND MANAGEMENT	414 WEST TAYLOR	HOBBS	NM	88240	7016 3010 0000 5904 3131
BLACK, JON LEE	PO BOX 331	CROWELL	TX	79227	7016 3010 0000 5904 3155
BASIC ENERGY SERVICES LP	6115 CAMP BOWIE BLVD STE 152	FORT WORTH	TX	76116	7016 3010 0000 5904 3179
NEW MEXICO INTERESTATE STREAM COMM	PO BOX 25012	SANTA FE	NM	87504	7016 3010 0000 5904 3162
HINES, E G	PO BOX 1011	LOVING	NM	88256	7016 3010 0000 5904 3247

MORALES,DANIEL R & EUNICE	PO BOX 418	LOVING	NM	88256	7016 3010 0000 5904 3230
ROCHA, ELEUTERIO P & SOFIA M	PO BOX 1322	LOVING	NM	88256	7016 3010 0000 5904 3551
BOX, RADELL JR MEYER, STEPHEN K / S	1502 SEGUINE	CARLSBAD	NM	88220	7016 3010 0000 5904 3773
MCDONALD, DAVID & VICKI	PO BOX 308	LOVING	NM	88256	7016 3010 0000 5904 3766
VILLAGE OF LOVING	PO BOX 56	LOVING	NM	88256	7016 3010 0000 5904 3759
RODRIGUEZ, OSCAR C & ANGELA A	PO BOX 206	LOVING	NM	88256	7016 3010 0000 5904 3742
VASQUEZ,SERVANDO B & MELISSA C SKIPPER , MELISSA C/O	1905 SENTRY CIRCLE	CARLSBAD	NM	88220	7016 3010 0000 5904 3735
KIMBLEY, DEBRA & HAYDEN	PO BOX 126	LOVING	NM	88256	7016 3010 0000 5904 3728
SING, EDUARDO C & GUADALUPE G	4206 TOWNSEND RD	CARLSBAD	NM	88220	7016 3010 0000 5904 3711
BLACK DIAMOND ENERGY LLC	243 N 700 W	PAUL	ID	83347	7016 3010 0000 5904 3704
WILDCAT OIL TOOLS LLC	PO BOX 50592	MIDLAND	TX	79710	7016 3010 0000 5904 3698
EOG RESOURCES INC.	ATTN:PROPERTY TAX DEPT PO BOX 4362	HOUSTON	TX	77210	7016 3010 0000 5904 3681
BNSF RAILWAY COMPANY	PO BOX 961089	FORT WORTH	TX	76161	7016 3010 0000 5904 3674
STATE HIGHWAY DEPARTMENT ROSWELL OFFICE	PO BOX 1457	ROSWELL	NM	88202	7016 3010 0000 5904 3667
LINCK PROPERTIES LLC	105 SUMMER STREET	REHOBOTH	MA	02769	7016 3010 0000 5904 5752

The notice letter was sent to the following counties, municipalities, and Indian tribes:

EDDY COUNTY NM County Manager	101 W Greene St. County Administration Complex	CARLSBAD	NM	88220-6258	7016 3010 0000 5904 3650
VILLAGE OF LOVING, NM	415 W. CEDAR P.O BOX 56	LOVING	NM	88256	7016 3010 0000 5904
CITY OF CARLSBAD, NM DALE W. JANWAY, MAYOR	101 N HALAGUENO ST.	CARLBAD	NM	88220	7016 3010 0000 5904 5745

Section 9.8

Copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.

Radio Public Service Announcement

NOTICE

Rangeland NM, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the modification of its crude oil and frac sand transloading facility. The expected date of application submittal to the Air Quality Bureau is July 31, 2017.

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The proposed modification consists of the expansion of the number of transloaders and throughput of frac sand that can be received by the facility, replacement of emission units, update of the current haul road conditions, and revisions to the alternate operating scenario.

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, please contact the New Mexico Environment Department, Air Quality Bureau – Permitting Section, 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. The phone number of the Air Quality Bureau is (505) 476-4300.

Submittal of Public Service Announcement – Certification

I, Carlos M. Ituarte-Villarreal, the undersigned, certify that on Thursday, July 27, 2017, submitted a public service announcement to KAMQ/ESPN-AM, KATK-AM, KATK-FM, KCDY-FM that serves the Village of Loving, Eddy County, New Mexico, in which the source is or is proposed to be located and that KAMQ/ESPN-AM, KATK-AM, KATK-FM, KCDY-FM **RESPONDED THAT IT WOULD AIR THE ANNOUNCEMENT.**

Signed this 31st day of July, 2017.

Signature

July 31, 2017
Date

Carlos M. Ituarte-Villarreal
Printed Name

Air Quality and Modeling Specialist, SWCA Consultants
Title

CARLSBAD RADIO, INC
PO Box 1538
CARLSBAD, NM 88221

Order #: 3247-00002
Description: Air Quality Permit
Date Entered: 7/27/2017
P.O.#:
Salesperson: Thomas, Debbie
Invoice Frequency: Billed at end of Cal Month, Sorted by Date Notary Req'd

SWCA Environmental Consultants
3303 North Central Ave. Suite 145
Phoenix, AZ 85012

Other (Non-Spot) Charges

	Start Date	End Date	Station	Description of Charge	Repeated	Qtv	Rate	Total
1	7/27/2017	7/27/2017	KCDY-FM	Air Quality Permit	Monthly	1	500.00	500.00

On-Air Schedule

	Start Date	End Date	Station	Scheduled Time/Event	Repeated	Length	Qtv	Rate	Total	M	Tu	W	Th	F	Sa	Su
1	7/29/2017	7/29/2017	KAMQ/ESPN-AM	12:30:00p to 01:30:00p	Weekly	1:30	1	0.00	0.00	0	0	0	0	0	1	0
2	7/29/2017	7/29/2017	KATK-AM	12:30:00p to 01:30:00p	Weekly	1:30	1	0.00	0.00	0	0	0	0	0	1	0
3	7/29/2017	7/29/2017	KATK-FM	12:30:00p to 01:30:00p	Weekly	1:30	1	0.00	0.00	0	0	0	0	0	1	0
4	7/29/2017	7/29/2017	KCDY-FM	12:30:00p to 01:30:00p	Weekly	1:30	1	0.00	0.00	0	0	0	0	0	1	0

Order Start Date: 7/27/2017 **Order End Date: 7/29/2017** **Spots: 4**

Total Charges: $500.00
Taxes : $37.81
Total Net: $537.81

Projected Calendar Month Billing Totals for SWCA Environmental Consultants / 3247-00002 :

		Spot Count	Net Billing
July	2017	4	$500.00

CARLSBAD RADIO, INC
PO Box 1538
CARLSBAD, NM 88221

SWCA Environmental Consultants
Advertiser ID: 3247 Amount Paid _____

3247-00002-0000	7/31/2017	1
Official Invoice	**Date**	**Page**

DETACH AND RETURN WITH PAYMENT

3247-00002-0000 O 7/31/2017 1

SWCA Environmental Consultants
3303 North Central Ave. Suite 145
Phoenix, AZ 85012

Purchase Order Number:
Est. Number:
Co-Op:
Description: Air Quality Permit
Salesperson: Thomas, Debbie

Date	Day	Length			Qty	Rate	Total
7/27/2017	Thu		KCDY-FM	Air Quality Permit			$500.00
7/29/2017	Sat	1:30	KAMQ/ESPN	12:41:30 PM	1	$0.00	$0.00
7/29/2017	Sat	1:30	KATK-AM	12:41:00 PM	1	$0.00	$0.00
7/29/2017	Sat	1:30	KATK-FM	12:41:15 PM	1	$0.00	$0.00
7/29/2017	Sat	1:30	KCDY-FM	12:51:31 PM	1	$0.00	$0.00
7/31/2017				Sales Tax:			$37.81

paid

We appreciate your business!

Quantity	4	Total	$500.00
TOTAL SALES TAX			$37.81
Total Due			**$537.81**

Affidavit Of Performance. I, P. Calderon
Patsy Calderon - Station Official
certify that in accordance with official station logs, the above announcements were broadcast on the days and hours stated.
Subscribed and sworn before me this 31st day of July, 2017

Don Hughes
Don Hughes - *NOTARY PUBLIC*
Commission Expires - 3/30/2020

OFFICIAL SEAL
DON HUGHES
Notary Public
State of New Mexico
My Comm. Expires _____

County: Eddy State: New Mexico

INVOICE

Section 9.9

Newspaper Classified/Legal Advertisement

Affidavit of Publication

State of New Mexico,
County of Eddy, ss.

Danny Fletcher, being first duly sworn, on oath says:

That he is the Publisher of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

July 29 2017

That the cost of publication is **$295.80** and that payment thereof has been made and will be assessed as court costs.

Subscribed and sworn to before me this 1 day of July ST, 2017

Cynthia Arredondo

My commission Expires 2/13/21

Notary Public

OFFICIAL SEAL
CYNTHIA ARREDONDO
Notary Public
State of New Mexico
My Comm. Expires 2/13/21

NOTICE OF AIR QUALITY PERMIT APPLICATION

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The exact location for the proposed facility known as, RIO Terminal, is at 71 Potash Mines Road, Loving, NM 88256, latitude 32 deg. 18 min. 08 sec and longitude -104 deg. 6 min. 16 sec. The entrance of the facility is 0.75 miles east of the intersection of Pecos Highway (U.S. Highway 285) and Potash Mines Road (New Mexico Highway 31) in Eddy County.

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PM 10	2.61 pph	9.80 tpy
PM 2.5	0.58 pph	2.34 tpy
Nitrogen Oxides (NOx)	4.56 pph	19.97 tpy
Carbon Monoxide (CO)	4.85 pph	21.24 tpy
Volatile Organic Compounds (VOC)	24.90 pph	91.37 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	0.70 pph	2.40 tpy
Green House Gas Emissions as Total CO2e	n/a	<75,000 tpy

The standard and maximum operating schedules of the facility will be from midnight to midnight; 7 days a week, and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is:
Rangeland NM, LLC
2150 Town Square Place, Suite 700,
Sugar Land, TX 77479

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: New Mexico Environment Department; Air Quality Bureau Permitting Section; 525 Camino de los Marquez suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 800-224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

General information about air quality and the permitting process can be found at the Air Quality Bureau's web site. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC. This regulation can be found in the "Permits" section of this web site.

Atención

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The exact location for the proposed facility known as, RIO Terminal, is at 71 Potash Mines Road, Loving, NM 88256, latitude 32 deg, 18 min, 08 sec and longitude -104 deg, 6 min, 16 sec. The entrance of the facility is 0.75 miles east of the intersection of Pecos Highway (U.S. Highway 285) and Potash Mines Road (New Mexico Highway 31) in Eddy County.

The proposed modification consists of the expansion of the number of transloaders and throughput of frac sand that can be received by the facility, replacement of emission units, update of the current haul road conditions, and revisions to the alternate operating scenario.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and may change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Total Suspended Particulates (TSP)	10.00 pph	37.55 tpy
PM 10	2.61 pph	9.80 tpy
PM 2.5	0.58 pph	2.34 tpy
Nitrogen Oxides (NOx)	4.56 pph	19.97 tpy
Carbon Monoxide (CO)	4.85 pph	21.24 tpy
Volatile Organic Compounds (VOC)	24.90 pph	91.37 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	0.70 pph	2.40 tpy
Green House Gas Emissions as Total CO2e	n/a	<75,000 tpy

The standard and maximum operating schedules of the facility will be from midnight to midnight, 7 days a week, and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is:
Rangeland NM, LLC
2150 Town Square Place, Suite 700,
Sugar Land, TX 77479

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: New Mexico Environment Department; Air Quality Bureau Permitting Section; 525 Camino de los Marquez suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 800-224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and site name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

General information about air quality and the permitting process can be found at the Air Quality Bureau's web site. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC. This regulation can be found in the "Permits" section of this web site.

Atención

Este es un aviso de la Agencia de Calidad de Aire del Departamento de Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor de comunicarse con la oficina de Calidad de Aire al teléfono 505-476-5557.

TX-0001201864-01

☐ PROOF O.K. BY: _____ ☐ O.K. WITH CORRECTIONS BY: _____

PLEASE READ CAREFULLY • SUBMIT CORRECTIONS ONLINE

ADVERTISER: SWCA ENVIRONMENTAL CONSU PROOF CREATED AT: 7/27/2017 10:21 PM
SALES PERSON: Cynthia Arredondo PROOF DUE: -
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Section 9.10

Newspaper Display Advertisement

Affidavit of Publication

State of New Mexico,
County of Eddy, ss.

Danny Fletcher, being first duly sworn, on oath says:

That he is the Publisher of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

July 29 2017

That the cost of publication is **$287.84** and that payment thereof has been made and will be assessed as court costs.

Subscribed and sworn to before me this 1 day of August, 2017

Cynthia Arredondo

My commission Expires 2/13/21

Notary Public

OFFICIAL SEAL
CYNTHIA ARREDONDO
Notary Public
State of New Mexico
My Comm. Expires 2/13/21

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TX-0001201758-01

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TX-0001201768-01

☐ PROOF O.K. BY: _____ ☐ O.K. WITH CORRECTIONS BY: _____

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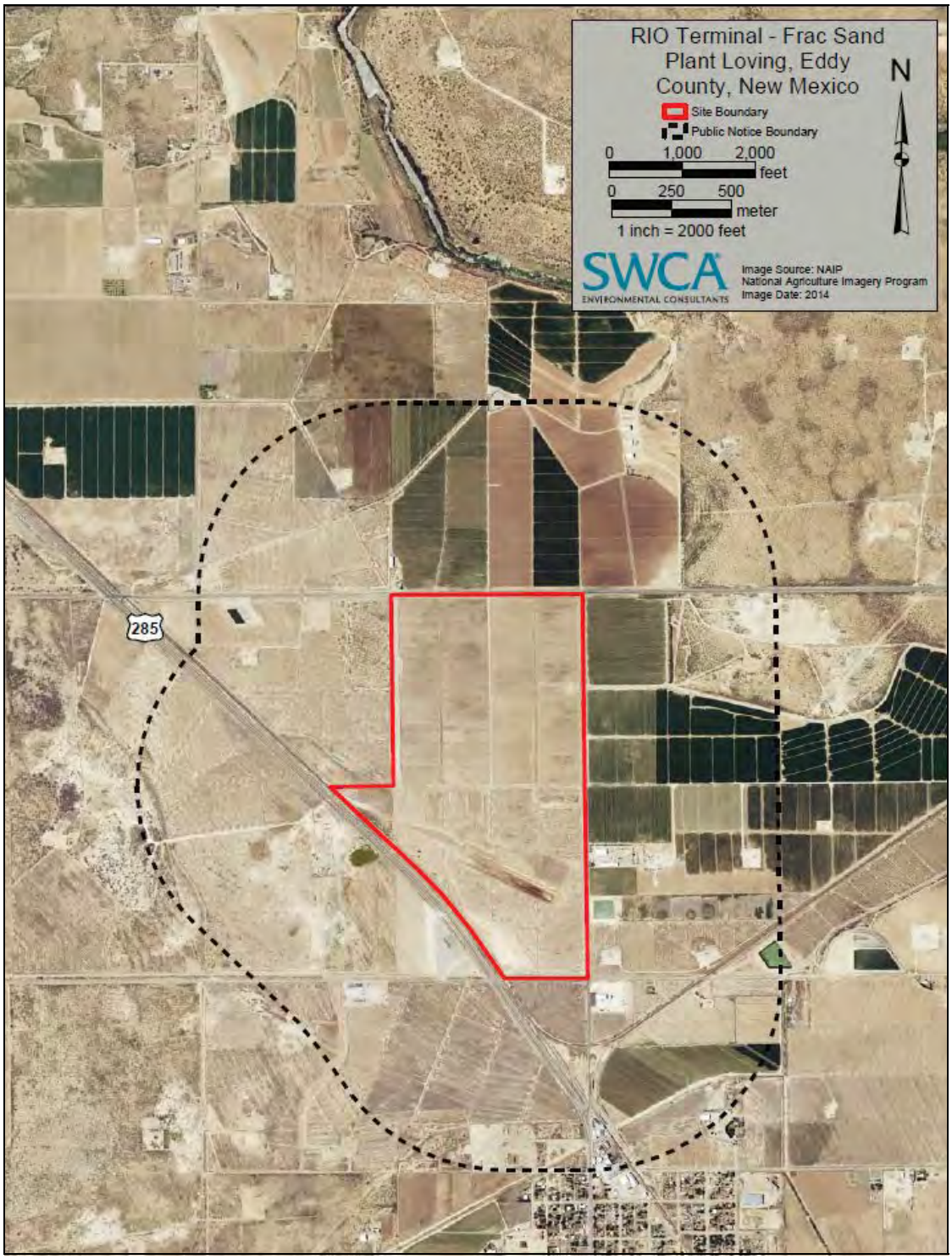
Section 9.11

Facility Boundary Map



Section 10

Written Description of the Routine Operations of the Facility

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A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

Routine Operations

Activities at the facility will proceed as follows:

1. Trucks will enter the facility from Route 31 (Potash Mines Road) and drive 0.75 miles to the transloading area. A portion (3,226 feet) of the access road to the transloading area is paved. The rest of the access road (734 feet) is unpaved with base coarse and watering.
2. Depending on the type of truck, it will then proceed to either the crude oil transloading track or the frac sand transloading track.

3a. Crude oil transloading:

3.a.1. Trucks carrying crude oil will enter the site and proceed to the crude oil transloading area.
3.a.2. Empty trains will enter the site and proceed to the crude oil transloading area.
3.a.3. Crude oil trucks will be connected to crude oil transloaders (TL-1 and TL-2) to fill railcars.
3.a.4. Once the truck has been emptied, the truck will return to Potash Mines Road using the same 0.75-mile route.
3.a.5. Filled crude oil cars and/or trains may be moved to the manifest storage tracks for temporary storage until a train is complete.
3.a.6. Filled trains will then leave the facility.

3b. Frac sand transloading:

3.b.1. Trains carrying frac sand will enter the site and proceed to transloading tracks.
3.b.2. Empty frac sand trucks will proceed to the frac sand transloading track area.
3.b.3. Empty trucks will be filled with frac sand from the trains using one of the eight (8) frac sand transloaders (Transloaders C-1 – C-8 *).
3.b.4. Particulate released into the air by this process is controlled by a dust control system (CDC-1 – CDC-8).
3.b.4. Once the truck is full, it will drive approximately 0.75 miles back to Potash mines road.
3.b.5. Empty trains will then leave the facility.

* The frac sand transloader emissions are separated into material handling emissions and engine emissions in separate emission units. Therefore, material handling emissions from Frac Sand Transloader #1 are labeled “C-1”, and emissions from the engine are under emission unit “CE-1”.

Process Bottlenecks

Crude oil transloading:

The two main bottlenecks associated with this process are:

1) Connection time per truck. It is estimated that it will take at least 1 hour (60 minutes) to position, connect/disconnect to railcar, grounding and moving each crude oil truck.
2) Crude oil transloader flowrate. An estimated transloader flowrate of 347 gal/min limits the maximum volume of oil transloaded per day per transloader to 3,420.12 bbls/day (6,840.25 bbls/day total), equating to 1.45 hours needed to fill one rail car (on average, 3.6 trucks).

3) The annual maximum volume of oil transloaded per year will be limited to about 2,000,000 barrels per year (84,000,000 gallons per year).

Frac sand transloading:

The main bottlenecks associated with this process is:

1) It is estimated that it will take at least 1.8 hours to position, connect, disconnect, move and unload 100 tons of frac sand from each railcar. This is because it takes, on average, 4.17 trucks to unload one railcar, and each truck takes 0.33 hours (20 minutes) to connect, position and disconnect, and 6 minutes to be filled.

The proposed modifications and/or revisions to the equipment and to the process are summarized in Section 3.

Section 11
Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**

Transloading area with the following emission sources: (SIC 4013, authorized by NOI #5322, described in this application)

1. Frac Sand Transloading Emissions
2. Crude Oil Transloading Emissions
3. Frac Sand Transloader Engine Emissions
4. Diesel Fuel Tank
5. Haul Road Emissions

Frac Sand Plant with the following emission sources: (SIC 4226, authorized by NSR #6111)

1. Frac Sand Handling and Storage Emissions

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☐ Yes X No

The RIO Terminal transloading area has SIC Code 4013 - Railroad Switching and Terminal Establishments.
The RIO Terminal Frac Sand Plant has SIC Code 4226 - Special Warehousing and Storage, not elsewhere classified.

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

X Yes ☐ No

The RIO Terminal Frac Sand Plant is owned by Rangeland New Mexico, LLC. RIO Terminal transloading area is also owned by Rangeland New Mexico, LLC.

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

X Yes ☐ No

The Frac Sand Plant is adjacent to the transloading area.

C. Make a determination:

X The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Because the facilities do not belong to the same 2-digit industrial grouping, as shown in step B, the facilities are determined to be separate, single sources.

Section 12

Section 12.A
PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

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 or not significant]. [Discuss why.] The "project" emissions listed below [do or do not] only result from changes described in this permit application, thus no emissions from other [revisions or modifications, past or future] to this facility. Also, specifically discuss whether this project results 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]:**

a. **NOx: XX.X TPY**
b. **CO: XX.X TPY**
c. **VOC: XX.X TPY**
d. **SOx: XX.X TPY**
e. **TSP (PM): XX.X TPY**
f. **PM10: XX.X TPY**
g. **PM2.5: XX.X TPY**
h. **Fluorides: XX.X TPY**
i. **Lead: XX.X TPY**
j. **Sulfur compounds (listed in Table 2): XX.X TPY**
k. **GHG: XX.X TPY**

C. **Netting [is required, and analysis is attached to this document.] OR [is not required (project is not significant)] OR [Applicant is submitting a PSD Major Modification and chooses not to net.]**

D. **BACT** is **[not required for this modification, as this application is a minor modification.] OR [required, as this application is a major modification. List pollutants subject to BACT review and provide a full top down BACT determination.]**

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.

This application is not for a permit revision, and this section is not applicable.

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:
For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

STATE REGULATIONS

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	The facility is located in Air Quality Control Region 155, and must comply with the NMAAQS.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This source is applying for a permit under 20.2.72 NMAC, and is subject to this section (20.2.7. NMAC)
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No	N/A	No external combustion equipment is being proposed for the facility.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	No external combustion equipment is being proposed for the facility.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	No	N/A	The proposed facility is not a natural gas processing plant.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	N/A	N/A	**These regulations were repealed by the Environmental Improvement Board. If you had equipment subject to 20.2.37 NMAC before the repeal, your combustion emission sources are now subject to 20.2.61 NMAC.**
20.2.38 NMAC	Hydrocarbon Storage Facility	No	N/A	Hydrocarbons are not permanently stored at this site, only transloaded from truck to railcar, and temporarily stored on railcars until they are picked up.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	The proposed facility is not a sulfur recovery plant.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	CE-1 thru CE-8	Engines are Stationary Combustion Equipment.
20.2.70 NMAC	Operating Permits	No	N/A	The facility' potential to emit (PTE) is not 100 tpy or more of any regulated air pollutant other than HAPs; and/or a HAPs PTE of 10 tpy or more for a single HAP or 25 or more tpy for combined HAPs; and the facility does not require to obtain an operating permit.
20.2.71 NMAC	Operating Permit Fees	No	N/A	The facility is not subject to 20.2.70 NMAC.
20.2.72 NMAC	Construction Permits	Yes	Facility	This facility is subject to 20.2.72 NMAC and is applying for a permit with this application.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	No	N/A	Facility is subject to 20.2.72 NMAC.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This facility is subject to 20.2.72 NMAC and is in turn subject to 20.2.75 NMAC.
20.2.77 NMAC	New Source Performance	No	N/A	No sources at this facility are subject to NSPS.
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	No sources at this facility are subject to the requirements of 40 CFR Part 61.
20.2.80 NMAC	Stack Heights	Yes	Facility	Stacks at the Frac Sand Plant will not exceed good engineering practice stack height.

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.82 NMAC	MACT Standards for source categories of HAPS	No	N/A	No sources at this facility are subject to MACT standards.

Applicable FEDERAL REGULATIONS

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	Facility is subject to 20.2.72 NMAC.
NSPS 40 CFR 60, Subpart A	General Provisions	No	N/A	No sources at this facility are subject to NSPS.
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced after August 23, 2011 and before September 18, 2015	No	N/A	Operations at this facility do not fit into any of the categories in Subpart OOOO, therefore, NSPS 40 CFR Part 60 Subpart OOOO does not apply.
NSPS 40 CFR Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015	No	N/A	Operations at this facility do not fit into any of the categories in Subpart OOOOa, therefore, NSPS 40 CFR Part 60 Subpart OOOOa does not apply.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	Subpart IIII regulates stationary engines, all engines at this facility are on mobile equipment, and are therefore classified as “nonroad engines”.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion	No	N/A	Subpart IIII regulates stationary engines, all engines at this facility are on mobile equipment, and are therefore classified as “nonroad engines”.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
	Engines			
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	No sources at this facility are subject to the requirements of 40 CFR Part 61.
MACT 40 CFR 63, Subpart A	General Provisions	No	N/A	Applies if any other Subpart in 40 CFR 63 applies.
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	No	N/A	No processing or upgrading is done at the site. There is no permanent storage of hydrocarbon liquids on-site, and is not a production facility,therefore, this facility is not subject to the requirements of 40 CFR 63 Subpart HH.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	No	N/A	Subpart ZZZZ regulates stationary engines, all engines at this facility are on mobile equipment, and are therefore classified as “nonroad engines”.
40 CFR 64	**Compliance Assurance Monitoring**	No	N/A	Applies only to Title V Major Sources.
Title IV – Acid Rain 40 CFR 72	**Acid Rain**	No	N/A	The proposed facility does not generates commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No	N/A	The proposed facility does not generates commercial electric power or electric power for sale.
Title IV-Acid Rain 40 CFR 75	**Continuous Emissions Monitoring**	No	N/A	The proposed facility does not generates commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 76	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**	No	N/A	The proposed facility does not generates commercial electric power or electric power for sale.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

X NSR (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☐ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

Rangeland NM, LLC has developed an Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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.

Alternative Operating Scenario

Rangeland's contracts with its suppliers require its frac sand transloading operation to have 100% uptime. Rangeland plans to keep up to three (3) of the permitted 210 tons/hour frac sand transloaders driven by 46-hp engines as spares to be used if any of the operating transloaders fails. Therefore, Rangeland proposes an alternative operating scenario where three (3) additional non-operating transloaders can exist on site, but only eight (8) transloaders rated at up to 74-hp each can operate at one time.

Furthermore, each frac sand transloader (C-1 through C-8) will have a dust collector. The dust collector is rated at 99% collection efficiency for 1-micron particulate. The PER calculations do not take credit for this control device. The calculated PER has been presented on an uncontrolled basis as required.

Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. 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 modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	X
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.

☐ See attached, approved modeling **waiver for some** pollutants from the facility.

X Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.

☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.

☐ No modeling is required.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

This facility is currently authorized under NOI #5322R1. The facility does not have compliance test requirements and therefore, no compliance test history is available.

Section 20

Other Relevant Information

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.

There is no other relevant information for this application.

Section 22: Certification

Company Name: Rangeland NM, LLC

I, Joe Young, 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 28th day of July, 2017, upon my oath or affirmation, before a notary of the State of New Mexico.

*Signature

7-28-17
Date

Joe Young
Printed Name

Operations Manager
Title

Scribed and sworn before me on this 28th day of July, 2017.

My authorization as a notary of the State of New Mexico expires on the 3rd day of August, 2020.

OFFICIAL SEAL
Juan F. Murillo
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 02/03/2020

Notary's Signature

7/28/2017
Date

Juan F. Murillo
Notary's Printed Name

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility: RIO Terminal
2	Name of company: Rangeland NM, LLC
3	Current Permit number: NOI #: 5322-R1
4	Name of applicant's modeler: Carlos M. Ituarte-Villarreal
5	Phone number of modeler: 602.274.3831
6	E-mail of modeler: cvillarreal@swca.com

16-B: Brief

1	Why is the modeling being done? Adding new equipment		
2	Describe the permit changes relevant to the modeling. The proposed expansion of the facility would include: Eight (8) 237.5 tph frac sand transloaders each powered by a 74-hp diesel-fired engine; three (3) spare 210 tph frac sand transloaders each powered by a 46-hp diesel-fired engine; authorize control measures for limiting fugitive dust from the unpaved portion of the haul road.		
3	What geodetic datum was used in the modeling? NAD83		
4	How long will the facility be at this location? Permanently		
5	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes	No X

6	Identify the Air Quality Control Region (AQCR) in which the facility is located. 155
7	List the PSD baseline dates for this region (minor or major, as appropriate). NO_2: March 16, 1988 SO_2: July 28, 1978 PM_{10}: February 20, 1979 $PM_{2.5}$: November 13, 2013
8	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits). Carlsbad Caverns National Park, 28 km West-Southwest
9	Is the facility located in a non-attainment area? If so, describe. No
10	Describe any special modeling requirements, such as streamline permit requirements. N/A

16-C: Modeling History of Facility

1 Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

	Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
	CO			
	NO_2			
	SO_2			
	H_2S			
	$PM_{2.5}$			
	PM_{10}			
	TSP			
	Lead			
	Ozone (PSD only)			
	NM Toxic Air Pollutants (20.2.72.402 NMAC)			

16-D: Modeling performed for this application

1 For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

	Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
	CO	X				
	NO_2		X			
	SO_2	X				
	H_2S					Pollutant not emitted
	$PM_{2.5}$		X			
	PM_{10}		X			
	TSP		X			

	Lead					Pollutant not emitted
	Ozone					PSD minor source
	State air toxic(s) (20.2.72.402 NMAC)					Pollutant not emitted

16-E: New Mexico toxic air pollutants modeling

1	List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application. N/A

List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

	Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor

16-F: Modeling options

1	What model(s) were used for the modeling? Why? AERMOD modeling system (AERMOD version 16216R). AERMOD is intended to be the standard regulatory model.
2	What model options were used and why were they considered appropriate to the application? Default regulatory options

16-G: Surrounding source modeling

1	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the unmerged list of sources to describe the changes.

2	Date of surrounding source retrieval. May 5, 2017	
	AQB Source ID	Description of Corrections

16-H: Building and structure downwash

1	How many buildings are present at the facility?	7	
2	How many above ground storage tanks are present at the facility?	0	
3	Was building downwash modeled for all buildings?	Yes X	No
4	If not, explain why.		
5	Building comments:		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area. Barb wire fence around the perimeter of the property.		
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes	No X
3	Are restricted area boundary coordinates included in the modeling files?	Yes X	No
4	Describe the receptor grids and their spacing.		

	Receptors were spaced at 50 meter intervals at the fence line out, in each direction, to a distance of 500 meters. Additional receptors were spaced at 100 m intervals up to approximately 1 km, a 250-meter spacing to a distance of 3-km from the facility boundary, and then spaced at 500 m intervals to approximately 5 km from the site boundary
5	Describe receptor spacing along the fence line. 50 meter spacing was used for fence line receptors.
6	Describe the PSD Class I area receptors. Two receptors were placed near the boundary of the Class I area.

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? This information is optional (and purposely undefined), but may help determine issues related to public notice.	Yes	No X
2	If so, describe.		
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes	No X

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3). Two different modeling scenarios were used for demonstrating compliance with all the applicable NMAAQS and NAAQS. The first scenario was used to demonstrate compliance with NO_2, SO_2 and CO standards. This scenario (alternative operating scenario) assumes the operation of up to three (3) of the existing frac sand transloaders driven by 46-hp engines operating as spares, and up to five (5) of the proposed replacement frac sand transloaders and 74-hp engines, for a total of eight (8) frac sand transloaders operating simultaneously. The second scenario (routine operation) was modeled for TSP, PM_{10} and $PM_{2.5}$ and corresponds to the simultaneous operation of up to eight (8) replacement transloaders and their respective 74-hp engines.		
2	Which scenario produces the highest concentrations? Why? After performing a sensitivity analysis, it was demonstrated that the worst-case operating scenario for NO_2, SO_2 and CO modeling was the use of three (3) of the existing transloaders and 46-hp engines and five (5) replacement engines and transloaders. In this modeling exercise, the existing 46-hp engines and their respective transloaders were placed at the closest locations to the plant boundary as permitted by the facility operation constraints. Replacement 74-hp engines presented better plume dispersion characteristics when compared to the existing 46-hp engines, therefore, producing lower ground level concentrations. In the case of TSP, PM_{10} and $PM_{2.5}$ modeling, the increase in the haul road traffic volumes for the operation of up to eight (8) of the larger replacement transloaders and eight (8) 74-hp engines, caused an increase in the particle matter emission rates and, at the same time, provided higher ground level concentrations for the TSP, PM_{10} and $PM_{2.5}$.		
3	Were emission factor sets used to limit emission rates or hours of operation?	Yes	No X

	(This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)		
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources:		

5

Hour of Day	Factor	Hour of Day	Factor								
1		13									
2		14									
3		15									
4		16									
5		17									
6		18									
7		19									
8		20									
9		21									
10		22									
11		23									
12		24									

If hourly, variable emission rates were used that were not described above, describe them here:

6	Were different emission rates used for short-term and annual modeling?	Yes	No X
7	If yes, describe.		

16-L: NO_2 Modeling

Which types of NO_2 modeling were used?
Check all that apply.

1

	100% NO_X to NO_2 conversion
X	ARM
	PVMRM
	OLM
	ARM2
	Other:

2	Describe the NO_2 modeling. For the 1-hour NO_2 SIL and cumulative modeling, a Tier 2 scalar or Ambient Ratio Method (ARM) value of 0.75 was applied. For the annual NO_2 SIL and cumulative assessment, an Ambient Ratio of 0.75 was used. The 1-hour ROI was determined by selecting the high-first-high concentration. Cumulative analysis 1-hour NO_2 design value was represented by the high-eighth-high concentration and the background concentration. Modeling for the annual NO_2 NMAAQS design value was performed by modeling the entire facility and adding the annual background concentration.
3	In-stack NO_2/NO_X ratio(s) used in modeling. A fixed 1-hour and annual rate of conversion of 75% was applied to estimate NO_2 concentrations.
4	Equilibrium NO_2/NO_X ratio(s) used in modeling. N/A
5	Describe/justify the use of the ratios chosen. In-stack NO_2/NO_x ratios were chosen following sections 2.6.4.3 and 2.6.4.4 of the New Mexico AQB Air Dispersion Modeling Guidelines (2016)
6	Describe the design value used for each averaging period modeled. 1-hour: High-eighth-high Annual: High-first-high

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	X	$PM_{2.5}$
	X	PM_{10}
	X	TSP
		None
2	Describe the particle size distributions used. Include the source of information. Particle distribution information was obtained from the *Sample particle sizes for plume depletion* spreadsheet published in the AQB modeling website and available here: https://www.env.nm.gov/air-quality/modeling-publications/	
3	Was secondary PM modeled for $PM_{2.5}$? Only required for PSD major modifications that are significant for NO_x and/or SO_x. Optional for minor sources, but allows use of high-eighth-high.	Yes / No X

16-N: Setback Distances and Source Classification

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location. N/A	
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling. N/A	
3	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match?	Yes / No X
4	Provide a cross-reference table between unit numbers if they do not match. It's ok to place the table below section 16-N for easier formatting.	

5	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match?	Yes X	No
6	If not, explain why.		
7	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes	No X
8	Which units consume increment for which pollutants? PM_{10}: Transloader engines CE-1 – CE-11, Roads $PM_{2.5}$: Transloader engines CE-1 – CE-11, Roads NO_2: Transloader engines CE-1 – CE-11 SO_2: Transloader engines CE-1 – CE-11		
9	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).		
10	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling.	Yes	No X
11	If not please explain how increment consumption status is determined for the missing installation dates. Increment consumption status were assumed based on the PSD baseline dates for Air Quality Control Region 155 NO_2: March 16, 1988 SO_2: July 28, 1978 PM_{10}: February 20, 1979 $PM_{2.5}$: November 13, 2013		

Unit Number	Stack	Model Source ID	Description
C-1	CDC-1	FST_1	Franc Sand Transloader 1
C-2	CDC-2	FST_2	Franc Sand Transloader 2
C-3	CDC-3	FST_3	Franc Sand Transloader 3
C-4	CDC-4	FST_4	Franc Sand Transloader 4
C-5	CDC-5	FST_5	Franc Sand Transloader 5
C-6	CDC-6	FST_6	Franc Sand Transloader 6
C-7	CDC-7	FST_7	Franc Sand Transloader 7
C-8	CDC-8	FST_8	Franc Sand Transloader 8
CE-1	CES-1	ST_ENG_1	Sand Transloading Engine 1
CE-2	CES-2	ST_ENG_2	Sand Transloading Engine 2
CE-3	CES-3	ST_ENG_3	Sand Transloading Engine 3
CE-4	CES-4	ST_ENG_4	Sand Transloading Engine 4
CE-5	CES-5	ST_ENG_5	Sand Transloading Engine 5
CE-6	CES-6	ST_ENG_6	Sand Transloading Engine 6
CE-7	CES-7	ST_ENG_7	Sand Transloading Engine 7
CE-8	CES-8	ST_ENG_8	Sand Transloading Engine 8
Paved Roads		SLINE1	Paved Road Section 1
		SLINE2	Paved Road Section 2
		SLINE3	Paved Road Section 3
Unpaved Roads		SLINE4	Unpaved Road

16-O: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)

16-P: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines?	Yes	No X
2	If the dimensions of volume sources are different from standard dimensions in the AQB Modeling Guidelines, describe how the dimensions were determined.		
3	Describe the determination of sigma-Y and sigma-Z for fugitive sources. Haul road emissions were modeled as a series of adjacent volume sources. Initial sigma-Y and sigma-Z were determined following section 5.3.3 of the New Mexico AQB Air Dispersion Modeling Guidelines (2016).		
4	Describe how the volume sources are related to unit numbers. Or say they are the same. Paved road emissions are represented by three (3) line volume sources: SLINE1, SLINE2 and SLINE 3. Unpaved road emissions were represented by SLINE4.		
5	Describe any open pits.		
6	Describe emission units included in each open pit.		

16-Q: Background Concentrations

1	Identify and justify the background concentrations used. In selecting a background monitor for particulate matter, Rangeland looked at sites presented in the New Mexico Modeling Guidelines that met two criteria: (1) both PM_{10} and $PM_{2.5}$ data was available at the same site, and (2) the site was located in southeastern New Mexico. The selected monitoring site was Hobbs 5ZS, located in Hobbs, NM. Background concentrations for other pollutants were obtained from the most representative monitoring sites listed in the New Mexico AQB Air Dispersion Modeling Guidance (September, 2016) for the location of the proposed site. The use of these monitoring sites was justified in the approved modeling protocol dated March 31, 2017. CO – "The rest of New Mexico" in Table 16 of New Mexico Monitoring Guidelines, September 2016. Ambient CO background concentrations for "The rest of New Mexico" are represented by monitor 350010023 located in Albuquerque, NM. NO_2 – Eastern NM 5ZR. This monitoring site is located outside the city of Carlsbad, NM. SO_2 – "The rest of New Mexico" in Table 21 of New Mexico Monitoring Guidelines, September 2016. This monitoring data was represented by monitoring site 1ZB located in Bloomfield, NM.		
2	Were background concentrations refined to monthly or hourly values? Refined monthly background concentrations were used for the modeling of the 24-hour $PM_{2.5}$ and the 24-hour TSP NMAAQS. Refined 24-hour background concentrations were	Yes X	No

	developed following section 4.4.1.2 of the New Mexico Monitoring Guidelines, (September 2016).		

16-R: Meteorological Data

1	Identify and justify the meteorological data set(s) used. Rangeland used the one-year Empire Abo met data set with plume depletion parameters, collected from 1993-1994 and available on the NMED website, as the facility is located in the eastern part of New Mexico.
2	Discuss how missing data were handled, how stability class was determined, and how the data were processed, if the Bureau did not provide the data.

16-S: Terrain

1	Was complex terrain used in the modeling? If no, describe why. Yes
2	What was the source of the terrain data? Elevations of the sources and structures at the RIO terminal, and the receptors examined in the modeling were determined from U.S. Geological Survey Digital Elevation Map (DEM) files. The DEM files, each with a 30-m resolution (7.5-minute DEM providing coverage of 7.5 X 7.5-minute blocks), were obtained from www.webgis.com.

16-T: Modeling Files

Describe the modeling files:

File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
Rangeland_CO_SIL	CO	ROI/SIA
Rangeland_SO2_SIL	SO_2	ROI/SIA
Rangeland_NO2_SIL	NO_2	ROI/SIA
Rangeland_PM10_SIL_PD	PM_{10}	ROI/SIA
Rangeland_PM25_SIL_PD	$PM_{2.5}$	ROI/SIA
Rangeland_TSP_SIL_PD	TSP	ROI/SIA
Rangeland_NO2_CIA	NO_2	Cumulative
Rangeland_PM10_CIA_PD	PM_{10}	Cumulative
Rangeland_PM25_CIA_PD	$PM_{2.5}$	Cumulative
Rangeland_TSP_CIA_PD	TSP	Cumulative

16-U: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis.	Yes	No

	Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Pre-application Guidance on the AQB website)?		
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes	No
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
5	If required, have ozone and secondary $PM_{2.5}$ ambient impacts analyses been completed?		

16-V: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant.
2	Identify the maximum concentrations from the modeling analysis.

Pollutant	Period	Facility Concentration (µg/m3)	Total Modeled Concentration (µg/m3)	Total Modeled Concentration (PPM)	Background Concentration	Cumulative Concentration	Standard	Value of Standard	Units of Standard, Background, and Total	Percent of Standard
TSP	Annual	16.49	16.49				Significance Level	1.0	µg/m3	
TSP	24-hour	52.38	52.38				Significance Level	5.0	µg/m3	
TSP	30-day	19.53	19.64		21.28	40.92	NMAAQS	90	µg/m3	45.47%
TSP	Annual	16.49	16.59		21.28	37.87	NMAAQS	60	µg/m3	63.12%
TSP	24-hour	52.18	52.29		37.30	89.59	NMAAQS	150	µg/m3	59.73%
PM_{10}	Annual	6.01	6.01				Significance Level	1.0	µg/m3	
PM_{10}	24-hour	29.63	29.63				Significance Level	5.0	µg/m3	
PM_{10}	24-hour	29.63	31.20		38.50	69.70	NAAQS	150	µg/m3	46.47%
PM_{10}	Annual	6.01	6.12				PSD Increment	17	µg/m3	36.03%
PM_{10}	24-hour	27.56	27.65				PSD Increment	30	µg/m3	92.17%
$PM_{2.5}$	Annual	1.00	1.00				Significance Level	0.3	µg/m3	
$PM_{2.5}$	24-hour	3.36	3.36				Significance Level	1.2	µg/m3	

$PM_{2.5}$	Annual	1.00	1.32		5.81	7.13	NAAQS	12	µg/m3	59.38%
$PM_{2.5}$	24-hour	3.36	3.92		14.80	18.72	NAAQS	35	µg/m3	53.47%
$PM_{2.5}$	Annual	1.00	1.06				PSD Increment	4	µg/m3	26.52%
$PM_{2.5}$	24-hour	3.14	3.69				PSD Increment	9	µg/m3	40.96%
NO_2	Annual	3.12	3.12				Significance Level	1.0	µg/m3	
NO_2	24-hour	25.93	25.93				Significance Level	5.0	µg/m3	
NO_2	1-hour	128.87	128.87				Significance Level	7.52	µg/m3	
NO_2	1-hour	114.99	114.99		48.26	163.26	NAAQS	188.03	µg/m3	86.82%
NO_2	Annual	3.12	3.12		4.62	7.74	NMAAQS	94.02	µg/m3	8.23%
NO_2	Annual	3.12	16.98				PSD Increment	25	µg/m3	67.93%
CO	8-hour	53.68	53.68				Significance Level	500	µg/m3	10.74%
CO	1-hour	151.32	151.32				Significance Level	2000	µg/m3	7.57%
SO_2	Annual	0.01	0.01				Significance Level	1.0	µg/m3	0.56%
SO_2	24-hour	0.05	0.05				Significance Level	5.0	µg/m3	0.93%
SO_2	3-hour	0.14	0.14				Significance Level	25.0	µg/m3	0.57%
SO_2	1-hour	0.23	0.23				Significance Level	7.8	µg/m3	2.91%

16-W: Location of maximum concentrations

1 Identify the locations of the maximum concentrations.

Pollutant	Period	UTM East (m)	UTM North (m)	Elevation (m)	Distance (m)	Radius of Impact (ROI) (m)
TSP (Significance Level)	Annual	583821.46	3574669.78	923.50	283.96	1,012
TSP (Significance Level)	24-hour	583881.41	3574333.47	926.06	367.37	1,106
TSP (NMAAQS)	30-day	583821.46	3574669.78	923.50	283.96	
TSP (NMAAQS)	Annual	583821.46	3574669.78	923.50	283.96	
TSP (NMAAQS)	24-hour	583917.52	3574299.98	926.25	375.65	
PM_{10} (Significance Level)	Annual	583822.44	3574622.24	923.58	279.80	863
PM_{10} (Significance Level)	24-hour	583775.81	3574431.88	925.00	380.31	1,136
PM_{10} (NAAQS)	24-hour	583775.81	3574431.88	925.00	380.31	
PM_{10} (PSD Increment)	Annual	583822.44	3574622.24	923.58	279.80	
PM_{10} (PSD Increment)	24-hour	583775.81	3574431.88	925.00	380.31	

$PM_{2.5}$ (Significance Level)	Annual	583821.46	3574669.78	923.50	283.96	863
$PM_{2.5}$ (Significance Level)	24-hour	583822.44	3574622.24	923.58	279.80	961
$PM_{2.5}$ (NAAQS)	Annual	583821.46	3574669.78	923.50	283.96	
$PM_{2.5}$ (NAAQS)	24-hour	583822.44	3574622.24	923.58	279.80	
$PM_{2.5}$ (PSD Increment)	Annual	583821.46	3574669.78	923.50	283.96	
$PM_{2.5}$ (PSD Increment)	24-hour	583917.52	3574299.98	926.25	375.65	
NO_2 (Significance Level)	Annual	584622.98	3574286.32	923.49	622.36	978
NO_2 (Significance Level)	24-hour	584623.65	3574237.64	923.48	650.83	1,589
NO_2 (Significance Level)	1-hour	584624.98	3574140.28	923.48	714.34	7,915
NO_2 (NAAQS)	1-hour	584624.98	3574140.28	923.48	714.34	
NO_2 (NMAAQS)	Annual	584622.98	3574286.32	923.49	622.36	
NO_2 (PSD Increment)	Annual	584075.50	3570345.00	950.65	4282.1	
CO (Significance Level)	8-hour	584623.65	3574237.64	923.48	650.83	-
CO (Significance Level)	1-hour	584624.98	3574140.28	923.48	714.34	-
SO_2 (Significance Level)	Annual	584622.98	3574286.32	923.49	622.36	-
SO_2 (Significance Level)	24-hour	584623.65	3574237.64	923.48	650.83	-
SO_2 (Significance Level)	3-hour	584625.50	3574195.00	923.46	678.64	-
SO_2 (Significance Level)	1-hour	584624.98	3574140.28	923.48	714.34	-

16-X: Summary/conclusions

1

As presented within this modeling report, this analysis demonstrates the following:

- The Significance Analysis for CO (1-hour and 8-hour) and SO_2 (1-hour, 3-hour, 24-hour and Annual) demonstrated that all receptors were below the applicable SILs;
- The Full Impact Analysis for 1-hour NO_2 demonstrated that all significant receptors were below the 1-hour NO_2 NAAQS;
- The Full Impact Analysis for annual NO_2 demonstrated that all significant receptors were below the annual NO_2 NMAAQS and Class II increment;
- The Full Impact Analysis for 24-hour PM_{10} demonstrated that all significant receptors were below the PM_{10} 24-hour NAAQS;
- The Full Impact Analysis for 24-hour and annual PM_{10} demonstrated that all significant receptors were below the 24-hour and annual Class II increment;
- The Full Impact Analysis for 24-hour and annual $PM_{2.5}$ demonstrated that all significant receptors were below the $PM_{2.5}$ 24-hour and annual NAAQS;
- The Full Impact Analysis for 24-hour and annual $PM_{2.5}$ demonstrated that all significant receptors were below the $PM_{2.5}$ 24-hour and annual Class II increment; and
- The Full Impact Analysis for 24-hour, 30-day and annual TSP demonstrated that all significant receptors were below the TSP 24-hour, 30-day and annual NMAAQS.

Therefore, the predicted air quality impacts from the proposed project will not cause or contribute to a violation of any applicable NAAQS, NMAAQS or PSD Increment Standard, or cause or contribute to adverse impacts on human health or the environment.