Enterprise Field Services, LLC – Lindrith Compressor Station
Administrative Record in Support of CAA Part 71 Operating Permit
Jicarilla Apache Reservation, Rio Arriba County, New Mexico

Document Number	Date	Description
1	11/17/03	Title V Operating Permit No. R6FOPP71-03, as issued, 47 pages.
2	04/10/07	Request for Minor Permit Modification, 1 page.
3	05/12/08	Lindrith Compressor Station Permit Renewal Application, 62 pages.
4	06/13/08	EPA Letter: Application Package Permit Renewal for Enterprise Field Services LLC, Lindrith Compressor Station Permit Number R6FOPP71-03, 1 page.
5	11/03/08	Lindrith Application for a Significant Revision to Operating Permit No. R6FOPP71-03, 58 pages.
6	07/02/09	Letter: Enterprise Field Services, LLC Lindrith Compressor Station, Permit No. R6OPP71-03, 7 pages.
7	05/14/10	Revision to Previously Submitted Application Dated May 12, 2008, 96 pages.
8	07/26/10	Letter: Enterprise Field Services LLC, Lindrith Compressor Station, Permit No. R6OPP71-03 Data Request Response, 17 pages.
9	08/15/11	Email: EPA to C. Benton Lindrith Application Update, 1 page.
10	07/11/12	EPA Letter: Enterprise Field Services, LLC, Lindrith Compressor Station, Rio Arriba County, New Mexico, Permit Number NM-1644-M1; Title V Permit Number R6OPP71-03, 7 pages.
11	10/24/12	Letter: Response to Request for Additional Information: Enterprise Field Services, LLC, 11 pages plus CBI (CBI removed).
12	12/04/13	Letter: Enterprise Field Services, LLC – Lindrith Compressor Station, Engine Unit A-03 Serial Number Correction, Permit Number R6OPP71-03, 2 pages.
13	02/14/14	Enterprise Field Services, LLC, Lindrith Compressor Station, Lindrith, Rio Arriba County, New Mexico, Revision to Previously Submitted Application Dated May 14, 2010, 100 pages.
14	05/27/14	Email: Enterprise to EPA; Lindrith Compressor Station, w/att: Lindrith Emission Comparison, 2 pages.
15	09/19/14	Email: EPA to Enterprise; Lindrith Compressor Station Permit Number R6FOPP71-03, w/att: Lindrith Modification Letter 5-14-10, 1 page.
16	03/20/15	Email: EPA to Enterprise, Lindrith Compressor Station, 1 page.
17	09/14/15	Statement of Basis, 19 pages.
18	09/1/15	Draft Part 71 Permit, 24 pages.
19	09/01/15	Source Determination, 7 pages.
20	09/15/15	Public Notice, 3 pages
21	09/15/15	Email: Enterprise to EPA; Lindrith Compressor Station, Pipeline Pigging Station Emission Factors. 3 pages.

AY/A1/PE 1100015484/84

Guy Donaldso

Enterprise Products™

2007 AP 02

EXTER DIVISION

614 Reilly Avenue Farmington, NM 87401
505.599.2180 www.epplp.com

Certified Mail / Return Receipt Requested
7006 0100 0000 9745 8212

Document No. 2

April 10, 2007

Mr. Richard Greene
Regional Administrator
Multimedia Permitting and Planning Division
Environmental Protection Agency – Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Subject: Lindrith Compressor Station
Permit No. R6FOPP71-03 / Request for Minor Permit Modification

Dear Mr. Greene,

On behalf of Enterprise Field Services LLC, Enterprise Products Company, Inc. (EPCO) is submitting this request for a minor permit modification to the Lindrith Compressor Station, in accordance with section 5.9 of Permit No. R6FOPP71-03. The requested minor permit modification consist of a "Like-Kind" replacement of emission unit A-03, Caterpillar 3612LE.

Proposed Minor Permit Modification for Lindrith Compressor Station

Potential to Emit in Tons per Year / Emission Unit A-03 / Lindrith Compressor Station							
Unit ID	NOx	VOC	SO2	PM10	CO	Lead	HAP
Current Unit: A-03, Caterpillar 3612LE, NG Fired Engine / SN: 1YG00061	22.54	45.08	0.074	N/A	70.85	N/A	6.[illegible]
Like-Kind Replacement Unit: A-03, Caterpillar 3612LE, NG Fired Engine / SN: 1YG00072	22.54	45.08	0.074	N/A	70.85	N/A	6.[illegible]

AIR PERMITS SECTION
2007 APR PM 2:35
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This letter is also intended to act as notification for installation of this "Like-Kind" replacement unit which is to occur the week of April 23, 2007 in addition to the subsequent "Start-Up".

Should you have questions or need additional information, please contact Don Fernald, our area Environmental Scientist at (505) 599-2124 or Ms. Beth Hebert, Director – Field Environmental at (713) 880-6518

Sincerely,

Don Fernald

Don Fernald
Environmental Scientist

C: Environmental Director, Jicarilla Apache Reservation
Beth Hebert, Enterprise – Houston
Randy Baysinger, Enterprise – Farmington, NM
Andy Price, Enterprise – Midland, TX

3

Enterprise Products™

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC
ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

May 12, 2008

Document No. 3

Federal Express
8610 9887 3732

Jeffrey Robinson, Chief Air Permits Section
U.S. Environmental Protection Agency
Region 6 (6PD-R)
1445 Ross Avenue
Dallas, Texas 75202

RE: Lindrith Compressor Station
Permit Renewal Application

Dear Mr. Robinson:

Enclosed for your review and handling the referenced application.

Should you have questions or need additional information, please contact our field environmental representative, Mr. Don Fernald at 505-599-2141 or Mr. Andy Price, Permitting Engineer, at 432-528-2777.

Yours truly,

Shiver J. Nolan
Senior Compliance Administrator

/sjn
enclosures
cc: Environmental Director, Jicarilla Nation
Randy Baysinger, Enterprise, Farmington

RECEIVED
2008 MAY 14 AM 10:48
AIR PERMITS SECTION
6PD-R

EPA United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

GENERAL INFORMATION AND SUMMARY (GIS)

A. Mailing Address and Contact Information

Facility name Lindrith Compressor Station

Mailing address: Street or P.O. Box Enterprise Field Services, LLC c/o Environmental Dep't: PO Box 4324

City Houston State TX ZIP 77210 -4324

Contact person: Donald Fernald Title Environmental Scientist

Telephone (505) 599 - 2141 Ext. ________

Facsimile (505) 599 - 2119

B. Facility Location

Temporary source? ___Yes X No Plant site location 20 miles West of Lindrith, New Mexico

East ½ of the Southeast ¼ of Section 18, Township 24 North, Range 5 West

City Lindrith State NM County Rio Arriba EPA Region 6

Is the facility located within:

Indian lands? X YES ___ NO OCS waters? ___YES X NO

Non-attainment area? ___ YES X NO If yes, for what air pollutants? ________

Within 50 miles of affected State? X YES __ NO If yes, What State(s)? NM

C. Owner

Name Enterprise Field Services LLC Street/P.O. Box PO Box 4324

City Houston State TX ZIP 77210 - 4324

Telephone (713) 880 - 6695 Ext. ________

D. Operator

Name Enterprise Products Operating LLC Street/P.O. Box PO Box 4324

City Houston State TX ZIP 77210 - 4324

Telephone (713) 880 - 6500 Ext________

E. Application Type

Mark only one permit application type and answer the supplementary question appropriate for the type marked.

___Initial Permit _X_ Renewal ___ Significant Mod ___ Minor Permit Mod(MPM)

___ Group Processing, MPM ___ Administrative Amendment

For initial permits, when did operations commence? _____ /_____ /_____

For permit renewal, what is the expiration date of current permit? 11 /16 / 2008

F. Applicable Requirement Summary

Mark all types of applicable requirements that apply.

___ SIP ___ FIP/TIP ___ PSD ___Non-attainment NSR

___ Minor source NSR ___ Section 111 ___ Phase I acid rain ___Phase II acid rain

___ Stratospheric ozone ___ OCS regulations ___ NESHAP _X_ Sec. 112(d) MACT

___ Sec. 112(g) MACT ___ Early reduction of HAP ___ Sec 112(j) MACT ___ RMP [Sec.112(r)]

___ Tank Vessel requirements, sec. 183(f)) ___ Section 129 Standards/Requirement

___ Consumer / comm.. products, § 183(e) ___ NAAQS, increments or visibility (temp. sources)

Has a risk management plan been registered? ___YES _X_NO Regulatory agency ____________

Phase II acid rain application submitted? ___YES _X_NO If yes, Permitting authority ____________

G. Source-Wide PTE Restrictions and Generic Applicable Requirements

Cite and describe any emissions-limiting requirements and/or facility-wide "generic" applicable requirements.

Facility previously issued NSR Permit NM-1644-M1, limiting fuel consumption, requiring oxidation catalysts on two RICE, with quarterly testing requirement and condenser on dehydrator still vent. Permit establishes emissions limits for each unit.
Generic requirements identified in Condition 3.2 of Operating Permit R6FOPP71-03

H. Process Description

List processes, products, and SIC codes for the facility.

Process	Products	SIC
Natural gas gathering and transmission facility, with pressurized natural gas as product delivered to pipeline	Pressurized natural gas	1311

I. Emission Unit Identification

Assign an emissions unit ID and describe each emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on a separate line. Applicants may exclude from this list any insignificant emissions units or activities.

Emissions Unit ID	Description of Unit
A-01	Caterpillar 3612 LE, Natural Gas Fired Engine
A-01-CD#1	Oxidation Catalyst for RICE A-01 (Control Device)
A-02	Caterpillar 3612 LE, Natural Gas Fired Engine
A-02-CD#1	Oxidation Catalyst for RICE A-01 (Control Device)
A-03	Caterpillar 3612 LE, Natural Gas Fired Engine
DEHY-1RBLR	Dehy Reboiler
DEHY-STL	Dehy Still Vent
DEHY-STL-CD#1	Condenser attached to DHY1-STL (control device)
FUGVOC	Fugitive VOCs
TK-1	Condensate Tank
TK-2	Condensate Tank

J. Facility Emissions Summary

Enter potential to emit (PTE) for the facility as a whole for each air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information.

+.84 90.3 +.052 2.6 ? 75.55+32.05 2.6 +23.214 +2.6 +2.6 +3.054 (2.634) 107.6

NOx 69.62 68.46 tons/yr VOC 119.32 tons/yr 102.5+.91 139.048 SO2 4.2 tons/yr 4.24+4.24+4.24+4.24+6.12+3.423+.056

PM-10 N/A tons/yr CO 95.2 103.21 tons/yr Lead N/A tons/yr Total HAP 21.2 22.319 tons/yr

Single HAP emitted in the greatest amount Formaldehyde PTE 10.8 tons/yr

Total of regulated pollutants (for fee calculation), Sec. F, line 5 of form FEE N/A tons/yr

permitted NOx 68.48 VOC - 153.53 SO_2 - 0.22 CO - 95.5 PM_{10} - N/A HAP - 55 indiv. = 2.22 but indiv. was 28 need correct.

K. Existing Federally-Enforceable Permits

Permit number(s) NM 1644 M1 Permit type NSR Permitting authority NMED

Permit number(s) R6FOPP71-03 Permit type Title V Permitting authority USEPA

L. Emission Unit(s) Covered by General Permits

Emission unit(s) subject to general permit ______

Check one: ___ Application made ___ Coverage granted

General permit identifier ______ Expiration Date ___/___/___

M. Cross-referenced Information

Does this application cross-reference information? ___ YES X NO (If yes, see instructions)

INSTRUCTIONS FOLLOW

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

POTENTIAL TO EMIT (PTE)

For each unit with emissions that count towards applicability, list the emissions unit ID and the PTE for the air pollutants listed below and sum them up to show totals for the facility. You may find it helpful to complete form **EMISS** before completing this form. Show other pollutants not listed that are present in major amounts at the facility on attachment in a similar fashion. You may round values to the nearest tenth of a ton. Also report facility totals in section J of form **GIS**.

Emissions Unit ID	Regulated Air Pollutants and Pollutants for which the Source is Major (tons/yr)						
	NOx	VOC	SO2	PM10	CO	Lead	HAP
A-01	22.54	20.5	1.4	N/A	11.8	N/A	4.5
A-02	22.54	20.5	1.4	N/A	11.8	N/A	4.5
A-03	22.54	29.3	1.4	N/A	76.85	N/A	4.5
DEHY1-RBLR	0.84	0.05	N/A	N/A	0.71	N/A	neg
DEHY1-STL	N/A	40.0	N/A	N/A	N/A	N/A	8.0
FUGVOC	N/A	3.77	N/A	N/A	N/A	N/A	N/A
TK-1		2.6					
TK-2		2.6					
FACILTY TOTALS	68.46	119.32	4.2	N/A	95.2	N/A	21.5

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID A-01 Description Natural Gas Fired Reciprocating IC Engine

SIC Code (4-digit) 4922 SCC Code 31000203

B. Emissions Unit Description

Primary use Gas Compression Temporary Source ___Yes X No

Manufacturer Caterpillar Model No. 3612 LE

Serial Number 1YG00061 Installation Date 11/16/2007

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Boiler horsepower rating___ Boiler steam flow (lb/hr)___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 27.25 MM BTU/hr Max. Design Heat Input 27.25 MM BTU/hr

C. Fuel Data

Primary fuel type(s)Pipeline Quality Natural Gas Standby fuel type(s)__N/A__

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Pipeline Quality Natural Gas	0.02%	Negligible	1000

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Pipeline Quality Natural Gas	193.5 MMscf	27.25 Mscf	238.7 MMscf
		= 654 Mscf/day subject to	
		MACT HH w/ flash gas emissions added in	

E. Associated Air Pollution Control Equipment

Emissions unit ID_A-01-CD#1_ Device type_Catalytic Oxidation System_

Air pollutant(s) Controlled_CO_ Manufacturer_Houston Industrial Silencing_

Model No._DeCOHx-33c22/24PL_ Serial No._Unknown_

Installation date_4/17/1995_ Control efficiency (%) _80%_

Efficiency estimation method_PSD-NM-1644-M1_

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) 15.0	Inside stack diameter (ft) 1.5
Stack temp(°F) 858	Design stack flow rate (ACFM) 24273
Actual stack flow rate (ACFM) 24273	Velocity (ft/sec) 228.9

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID A-01

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit Hourly (lb/hr)	Potential to Emit Annual (tons/yr)	
NOx	N/A	5.1	22.54	N/A
VOC	N/A	4.7	20.5	N/A
SO2	N/A	0.23	1.4	7446-09-5
CO	N/A	2.7	11.8	630-08-0
Formaldehyde	N/A	0.8	3.6	50-000-0
Methanol	N/A	0.03	0.14	67-56-1
Acetaldehyde	N/A	0.04	0.16	75-07-0
Acrolein	N/A	0.05	0.23	107-02-8
Toluene	N/A	0.03	0.11	108-88-3

4.24 HAPs

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID _A-02_ Description_ Natural Gas Fired Reciprocating IC Engine

SIC Code (4-digit) _4922_ SCC Code_ 31000203_

B. Emissions Unit Description

Primary use _Gas Compression_ Temporary Source ___Yes _X_No

Manufacturer _Caterpillar_ Model No. _3612 LE_

Serial Number _1YG00054_ Installation Date_03/17/2008_

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Boiler horsepower rating___ Boiler steam flow (lb/hr)___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input _27.25_ MM BTU/hr Max. Design Heat Input _27.25_ MM BTU/hr

C. Fuel Data

Primary fuel type(s)Pipeline Quality Natural Gas Standby fuel type(s)__N/A______

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Pipeline Quality Natural Gas	0.02%	Negligible	1000

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Pipeline Quality Natural Gas	193.5 MMscf	27.25 Mscf	238.7 MMscf

E. Associated Air Pollution Control Equipment

Emissions unit ID_A-01-CD#1_ Device type_Catalytic Oxidation System__

Air pollutant(s) Controlled_CO__ Manufacturer_Houston Industrial Silencing_

Model No._DeCOHx-33c22/24PL_ Serial No._Unknown__

Installation date_5/1/1995___ Control efficiency (%) _80%_

Efficiency estimation method_PSD-NM-1644-M1_

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) 15.0 Inside stack diameter (ft) 1.5

Stack temp(°F) 858 Design stack flow rate (ACFM) 24273

Actual stack flow rate (ACFM) 24273 Velocity (ft/sec) 228.9

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID A-02

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
NOx	N/A	5.1	22.54	N/A
VOC	N/A	4.7	20.5	N/A
SO2	N/A	230.	1.4	7446-09-5
CO	N/A	2.7	11.8	630-08-0
Formaldehyde	N/A	0.8	3.6	50-000-0
Methanol	N/A	0.03	0.14	67-56-1
Acetaldehyde	N/A	0.04	0.16	75-07-0
Acrolein	N/A	0.05	0.23	107-02-8
Toluene	N/A	0.03	0.11	108-88-3

4.24 HAPs

EPA United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID _A-03_ Description _Natural Gas Fired Reciprocating IC Engine_

SIC Code (4-digit) _4922_ SCC Code _31000203_

B. Emissions Unit Description

Primary use _Gas Compression_ Temporary Source ___Yes _X_ No

Manufacturer _Caterpillar_ Model No. _3612 LE_

Serial Number _1YG00072_ Installation Date _06/08/2007_

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Boiler horsepower rating ___ Boiler steam flow (lb/hr) ___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input _27.25_ MM BTU/hr Max. Design Heat Input _27.25_ MM BTU/hr

C. Fuel Data

Primary fuel type(s)Pipeline Quality Natural Gas Standby fuel type(s)__N/A___

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Pipeline Quality Natural Gas	0.02%	Negligible	1000

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Pipeline Quality Natural Gas	193.5 MMscf	27.25 Mscf	238.7 MMscf

E. Associated Air Pollution Control Equipment

Emissions unit ID_N/A_ Device type______________________________

Air pollutant(s) Controlled_______ Manufacturer______________________

Model No.____________________ Serial No.____________________

Installation date_____/_____/________ Control efficiency (%) __________

Efficiency estimation method____

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) 15.0 Inside stack diameter (ft) 1.5

Stack temp(°F) 858 Design stack flow rate (ACFM) 24273

Actual stack flow rate (ACFM) 24273 Velocity (ft/sec) 228.9

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID A-03

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
NOx	N/A	5.1	22.54	N/A
VOC	N/A	10.3	29.3	N/A
SO2	N/A	0.31	1.4	7446-09-5
CO	N/A	18.0	78.9	630-08-0
Formaldehyde	N/A	0.8	3.6	50-000-0
Methanol	N/A	0.03	0.14	67-56-1
Acetaldehyde	N/A	0.04	0.16	75-07-0
Acrolein	N/A	0.05	0.23	107-02-8
Toluene	N/A	0.03	0.11	108-88-3

4.24 HAPs

Enterprise Lindrith Compressor Station

Caterpillar G3612 LE

Type:	4SLB with oxidation catalyst AO-1, AO-2, AO-3	
Sea level hp	3550 hp	
Elevation	6653 msl	
Derate T/A	3267	3%/1000>4000
Site hp	3267 hp	

Emission Calculations

Uncontrolled	NOx	CO	VOC	SO_2*	PM	HAPs		
AO-3	0.7	2.5	0.93				g/hp-hr	
					0.010		lb/MMBtu/hr	
	5.0	18.0	6.70	0.316	0.2		lb/hr	g/hp-hr * hp * 1 lb/453.6 g
	22.5	78.9	29.3	1.4	1.0	4.5	tpy	Assumes 8760 hrs/yr operation
permit limits	22.5	70.9	45.1	0.07		7	tpy	
Requested Limits	22.5	78.9	29.3	1.4		4.5	tpy	

Controlled	NOx	CO	VOC	SO_2*				
AO-1, AO-2	5.0	18.0	6.7	0.32	0.22		lb/hr	
		85%	30%				%	Control efficiency
	5.04	2.70	4.69	0.3	0.2		lb/hr	
	22.5	11.8	20.5	1.4	1.0	4.5	tpy	
Permit limits	22.5	12.2	32.2	0.07		7	tpy	
Requested Limits	22.5	11.8	20.5	1.4		4.5	tpy	

*SO_2 emissions based on fuel consumption and fuel sulfur content 5gr/100 scf
HAPs from GRI HAPCalc

Fuel Consumption

Horsepower	3267 hp	
Heat rate	6761 Btu/hp-hr	Mfg
Fuel heat value	1000 Btu/scf	Nominal
Heat input	22.1 MMBtu/hr	Heat rate * hp
Fuel consumption	22.1 Mscf/hr	Heat input / fuel heat value
Annual fuel usage	193.5 MMcf/yr	8760 hrs/yr operation

Exhaust Parameters

858 °F	Exhaust temp	engineering est.
15 ft	Stack height	engineering est.
1.50 ft	Stack diameter	*Flow (acfm) = Flow (scfm) * (Stack Temp + 460) / 528 * 29.92 / Site Bar. Pres. / (100% - Moisture%)*
24273 acfm	Exhaust flow	Exhaust flow / stack area
228.9 ft/sec	Exhaust velocity	

G3612 GAS ENGINE TECHNICAL DATA CATERPILLAR®

Industrial/Petroleum 07/01

ENGINE SPEED (rpm):	1000	FUEL TYPE:	Nat Gas
COMPRESSION RATIO:	9:1	MIN. FUEL PRESSURE (PSIG):	43
AFTERCOOLER WATER (°F)	129	MIN. RATED METHANE NUMBER:	66
JACKET WATER OUTLET (°F)	190	RATED ALTITUDE @ 77°F (ft):	5000
IGNITION SYSTEM:	DST	FUEL LHV (BTU/SCF):	905
EXHAUST MANIFOLD:	DRY		

RATING		NOTES	LOAD	100%	75%	50%
ENGINE POWER		(1) (2)	bhp	3550	2662	1775
ENGINE EFFICIENCY	**(ISO 3046/1)**	**(1)**	**%**	**38.6**	**37.0**	**34.1**
ENGINE EFFICIENCY	(NOMINAL)	(1)	%	37.6	36.1	33.3
ENGINE DATA						
FUEL CONSUMPTION	**(ISO 3046/1)**	**(1)**	**BTU/bhp-hr**	**6601**	**6884**	**7468**
FUEL CONSUMPTION	(NOMINAL)	(1)	BTU/bhp-hr	6761	7051	7650
AIR FLOW (@ 77°F, 13.9 psia)			ft3/min	9,623	7,384	5,051
AIR MASS FLOW			lb/hr	40,345	30,958	21,175
COMPRESSOR OUTLET PRESSURE			psi (abs)	36.4	28.4	20.4
COMPRESSOR OUTLET TEMPERATURE			°F	300	248	154
INLET MANIFOLD PRESSURE			psi (abs)	35.1	27.3	18.7
INLET MANIFOLD TEMPERATURE			°F	147	144	140
LAMBDA				2.07	2.03	1.92
TIMING			°BTDC	18.3	17.6	16.2
EXHAUST STACK TEMPERATURE			°F	858	896	946
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)			ft3/min	24,273	19,160	13,592
EXHAUST GAS MASS FLOW			lb/hr	41,575	31,901	21,820
EMISSIONS						
NOx (as NO)		(3)	g/bhp-hr	0.7	0.7	0.7
CO		(3)	g/bhp-hr	2.5	2.5	2.5
THC (molecular weight of 15.84)		(3)	g/bhp-hr	6.15	6.31	6.5
NMHC (molecular weight of 15.84)		(3)	g/bhp-hr	0.93	0.95	0.98
EXHAUST OXYGEN			%	12.5	11.8	10.7
ENERGY BALANCE DATA						
FUEL INPUT ENERGY (LHV)	(NOMINAL)	(1)	BTU/min	399,965	312,844	226,312
WORK ENERGY	(NOMINAL)	(2)	BTU/min	150,544	112,908	75,272
HEAT REJ. TO JACKET WATER	(NOMINAL)	(4)	BTU/min	36,431	31,107	29,390
HEAT REJ. TO ATMOSPHERE	(NOMINAL)	(5)	BTU/min	13,999	13,139	12,447
HEAT REJ. TO LUBE OIL	(NOMINAL)	(6)	BTU/min	17,998	17,206	16,973
HEAT REJ. TO EXH. (LHV to 77°F)	(NOMINAL)	(4)	BTU/min	154,449	124,159	90,239
HEAT REJ. TO EXH. (LHV to 350°F)	(NOMINAL)	(4)	BTU/min	93,314	77,170	57,985
HEAT REJ. TO AFTERCOOLER	(NOMINAL)	(7) (8)	BTU/min	26,544	14,324	1,990

CONDITIONS AND DEFINITIONS
ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

NOTES
1) FUEL CONSUMPTION TOLERANCE. ISO 3046/1 IS 0, + 5% OF FULL LOAD DATA. NOMINAL IS ± 2.5 % OF FULL LOAD DATA.
2) ENGINE POWER AND WORK ENERGY INCLUDE 2 ENGINE DRIVEN WATER PUMPS.
3) EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED VALUES.
4) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA. (heat rate based on treated water)
5) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ± 50% OF FULL LOAD DATA. (heat rate based on treated water)
6) HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water)
7) HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water)
8) TOTAL AFTERCOOLER HEAT = AFTERCOOLER HEAT x ACHRF (heat rate based on treated water)

G3612

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

FUEL USAGE GUIDE

DERATE FACTOR vs CATERPILLAR METHANE NUMBER

Methane Number	30	35	40	45	50	55	60	65	70>=100
Rating Factor	0.00	0.00	0.00	0.76	0.82	0.87	0.93	0.98	1.00

Minimum Methane Number for Full Rating = 66.3

Fuel System Limit (minimum Wobbe Index) = 1128 BTU/SCF

TOTAL DERATION FACTORS - ALTITUDE & COOLING

AIR TO TURBO (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	0.93	0.89	0.85	0.81	0.78	0.74	0.71	0.68	0.65	0.61	0.58	0.56	0.53
120	0.98	0.94	0.90	0.86	0.82	0.79	0.75	0.72	0.68	0.65	0.62	0.59	0.56
110	1.00	1.00	0.95	0.91	0.87	0.83	0.80	0.76	0.73	0.69	0.66	0.63	0.60
100	1.00	1.00	1.00	0.97	0.93	0.89	0.85	0.81	0.77	0.73	0.70	0.67	0.63
90	1.00	1.00	1.00	1.00	0.98	0.94	0.90	0.86	0.82	0.78	0.74	0.71	0.67
80	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.91	0.87	0.83	0.79	0.75	0.72
70	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.86	0.83	0.80	0.76
60	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.92	0.88	0.85	0.81	0.78
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.86	0.83	0.79

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS

AIR TO TURBO (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.42	1.49	1.56	1.63	1.70	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77
120	1.34	1.40	1.47	1.54	1.61	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
110	1.25	1.32	1.38	1.45	1.52	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
100	1.17	1.23	1.30	1.36	1.43	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
90	1.08	1.14	1.21	1.27	1.34	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
80	1.00	1.06	1.12	1.18	1.25	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
70	1.00	1.00	1.03	1.09	1.16	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
60	1.00	1.00	1.00	1.00	1.07	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
50	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04

ALTITUDE (FEET ABOVE SEA LEVEL)

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE (RPM)

AIR TO TURBO (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	760	780	800	850	850	850	850	850	850	850	850	850	850
120	760	770	790	850	850	850	850	850	850	850	850	850	850
110	750	770	780	800	850	850	850	850	850	850	850	850	850
100	750	760	770	790	850	850	850	850	850	850	850	850	850
90	750	750	770	780	800	850	850	850	850	850	850	850	850
80	750	750	760	770	790	850	850	850	850	850	850	850	850
70	750	750	750	770	780	800	850	850	850	850	850	850	850
60	750	750	750	760	770	790	850	850	850	850	850	850	850
50	750	750	750	750	770	780	800	850	850	850	850	850	850

ALTITUDE (FEET ABOVE SEA LEVEL)

ALLOWABLE INERTS IN THE FUEL:
The maximum amount of free inerts in the fuel is limited to 5%.

FUEL SYSTEM LIMIT:
Fuels with a Wobbe index lower than the limit, require a custom fuel system and engine control system mapping from the factory. The Wobbe index is determined using the Caterpillar Methane Number Calculation program.

FUEL USAGE GUIDE:
This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

TOTAL DERATION FACTORS:
This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site. The total deration factor includes deration due to altitude and ambient temperature, and air inlet manifold temperature deration.

ACTUAL ENGINE RATING:
It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. To determine the actual power available, take the lowest rating between the Altitude/Temperature Deration and the Fuel Usage Guide Deration.

AFTERCOOLER HEAT REJECTION FACTORS:
Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE
This table shows the minimum allowable engine operating speed for site-specific ratings as determined by the Total Deration Factor chart. The minimum allowable engine operating speed cannot be lowered even if the actual engine power falls below the site-specific rating allowed by the Total Deration Factor chart. Turbocharger compressor surge or damage will result if the engine is operated lower than the minimum allowable speed.

DM5310-01

GRI-HAPCalc® 3.0
Engines Report

Facility ID:	**LINDRITH**	**Notes:**
Operation Type:	**COMPRESSOR STATION**	
Facility Name:		
User Name:		
Units of Measure:	**U.S. STANDARD**	

Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".

Engine Unit

Unit Name: 3612

Hours of Operation:	8,760	Yearly
Rate Power:	3,267	hp
Fuel Type:	NATURAL GAS	
Engine Type:	4-Stroke, Lean Burn	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
Formaldehyde	3.6246	0.11500000 g/bhp-hr	GRI Field
Methanol	0.1378	0.00437210 g/bhp-hr	GRI Field
Acetaldehyde	0.1576	0.00500000 g/bhp-hr	GRI Field
Acrolein	0.2332	0.00740000 g/bhp-hr	GRI Literature
Benzene	0.0065	0.00020500 g/bhp-hr	GRI Field
Toluene	0.1144	0.00362870 g/bhp-hr	EPA
Ethylbenzene	0.0102	0.00032210 g/bhp-hr	EPA
Xylenes(m,p,o)	0.0400	0.00127010 g/bhp-hr	EPA
2,2,4-Trimethylpentane	0.0415	0.00131540 g/bhp-hr	EPA
n-Hexane	0.0016	0.00005050 g/bhp-hr	GRI Field
Phenol	0.0028	0.00008850 g/bhp-hr	GRI Field
Styrene	0.0008	0.00002450 g/bhp-hr	GRI Field
Naphthalene	0.0012	0.00003800 g/bhp-hr	GRI Field
Biphenyl	0.0247	0.00078500 g/bhp-hr	GRI Field
Fluorene	0.0012	0.00003650 g/bhp-hr	GRI Field
Ethylene Dibromide	0.0114	0.00036290 g/bhp-hr	EPA
Vinyl Chloride	0.0039	0.00012250 g/bhp-hr	EPA
Methylene Chloride	0.0099	0.00031300 g/bhp-hr	EPA
1,1-Dichloroethane	0.0060	0.00019050 g/bhp-hr	EPA
1,3-Dichloropropene	0.0069	0.00021770 g/bhp-hr	EPA
Chlorobenzene	0.0069	0.00021770 g/bhp-hr	EPA
Chloroform	0.0073	0.00023130 g/bhp-hr	EPA
1,1,2-Trichloroethane	0.0066	0.00020870 g/bhp-hr	EPA

1,1,2,2-Tetrachloroethane	0.0129	0.00040820 g/bhp-hr	EPA
Carbon Tetrachloride	0.0094	0.00029940 g/bhp-hr	EPA
Total	4.4793		

Criteria Pollutants

PM	1.1437	0.03628740 g/bhp-hr	EPA
CO	26.2655	0.83333330 g/bhp-hr	GRI Field
NMEHC	9.8647	0.31297920 g/bhp-hr	EPA
NOx	449.1405	14.25000000 g/bhp-hr	GRI Field
SO2	0.0715	0.00226800 g/bhp-hr	EPA

Other Pollutants

Methane	171.8554	5.45250000 g/bhp-hr	GRI Field
Ethane	4.9642	0.15750000 g/bhp-hr	GRI Field
Propane	0.4728	0.01500000 g/bhp-hr	GRI Field
Butane	0.0630	0.00200000 g/bhp-hr	GRI Field
Cyclopentane	0.0357	0.00113400 g/bhp-hr	EPA
Butyraldehyde	0.0033	0.00010430 g/bhp-hr	EPA
n-Pentane	0.0741	0.00235000 g/bhp-hr	GRI Field
Methylcyclohexane	0.2002	0.00635030 g/bhp-hr	EPA
1,2-Dichloroethane	0.0060	0.00019050 g/bhp-hr	EPA
1,2-Dichloropropane	0.0069	0.00021770 g/bhp-hr	EPA
n-Octane	0.0572	0.00181440 g/bhp-hr	EPA
1,2,4-Trimethylbenzene	0.0021	0.00006800 g/bhp-hr	EPA
1,3,5-Trimethylbenzene	0.0044	0.00014060 g/bhp-hr	EPA
n-Nonane	0.0172	0.00054430 g/bhp-hr	EPA
CO2	13,867.7330	439.98521000 g/bhp-hr	EPA

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID _DEHY-1RBLR__ Description_Dehy Reboiler_

SIC Code (4-digit) _4922__ SCC Code_ 31000228 _

B. Emissions Unit Description

Primary use _Dehydrator Heat Source_ Temporary Source ___Yes _X_No

Manufacturer ______________________ Model No. ______________________

Serial Number ______________________ Installation Date_1995_

Boiler Type: _X_ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ______________________________________

Boiler horsepower rating________________ Boiler steam flow (lb/hr)______________

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input _2.25_MM BTU/hr Max. Design Heat Input _2.25_MM BTU/hr

C. Fuel Data

Primary fuel type(s) Pipeline Quality Natural Gas Standby fuel type(s) N/A

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Pipeline Quality Natural Gas	0.02%	Negligible	1000

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Pipeline Quality Natural Gas		2.3 Mscf	20.1 MMscf

E. Associated Air Pollution Control Equipment

Emissions unit ID__ Device type__

Air pollutant(s) Controlled__ Manufacturer____

Model No.____ Serial No.____

Installation date___/___/___ Control efficiency (%) _

Efficiency estimation method__

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) 12.0 Inside stack diameter (ft) 0.75

Stack temp(°F) 500 Design stack flow rate (ACFM) 920

Actual stack flow rate (ACFM) 920 Velocity (ft/sec) 35

EPA United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID DEHY-RBLR

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
NOx	N/A	0.2	0.84	N/A
VOC	N/A	0.01	0.05	N/A
SO2	N/A	Negligible	Negligible	7446-09-5
CO	N/A	0.2	0.71	630-08-0
HAPs	N/A	Negligible	Negligible	N/A

EPFS--Lindrith

Dehydrator

Emission Unit:	
Source Description:	Natural gas-fired dehydrator
Manufacturer:	Unknown

Fuel Consumption

2250	MBtu/hr	Input heat rate	Nameplate
2475	MBtu/hr	Input heat rate	10% Safety Factor Added
1285	Btu/scf	Fuel heat value	Title V application
1926	scf/hr	Fuel rate	Input heat rate / Fuel heat value
16.9	MMscf/yr	Annual fuel usage	

Emission Rates

Maximum uncontrolled potential emission rate

	NOx	CO	VOC	HAPs	Units	
Reboiler (DEHY a)	100	84	5.5		lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2
	0.19	0.16	0.011		lb/hr	Unit emissions * Input heat rate
	0.84	0.71	0.05		tpy	
Regenerator (DEHY b)	0	0	46.9	31.9	lb/hr	GLYCalc
	0%	0%	0%	0%		Safety factors
	0.00	0.00	47	32	lb/hr	Unit Emissions w/Safety Factors
	0.0	0.0	205	140	tpy	
Flash (DEHY c)	0	0	22.4	2.0	lb/hr	GLYCalc
			0%	0%		Safety Factors
	0	0	22.4393	2.0037	lb/hr	
	0.0	0.0	98.28	8.78	tpy	
*Total Dehydrator Emissions***	**0.2**	**0.2**	**69.4**	**33.9**	lb/hr	**Total Emission rates (reboiler+regenerator+flash)**
	0.8	**0.7**	**303.8**	**148.4**	tpy	**lb/hr * 8760 hrs/yr / 2000lb/ton**

Potential to emit

	NOx	CO	VOC	HAPs	Units	
Reboiler (DEHY a)	100	84	5.5	.	lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2
	0.19	0.16	0.011		lb/hr	Unit emissions * Input heat rate
	0.84	0.71	0.05		tpy	
Regenerator (DEHY b)	0	0	7.3	1.4	lb/hr	GLYCalc
	0%	0%	0%	0%		Safety factors
	0.00	0.00	7	1	lb/hr	Unit Emissions w/Safety Factors
	0.0	0.0	32	6	tpy	
Flash (DEHY c)	0	0	22.4	2.0	lb/hr	GLYCalc
			98%	98%		Destruction efficiency
	0	0	0.448786	0.040074	lb/hr	
	0.0	0.0	1.97	0.18	tpy	
*Total Dehydrator Emissions***	**0.2**	**0.2**	**7.8**	**1.4**	lb/hr	**Total Emission rates (reboiler+regenerator+flash)**
	0.8	**0.7**	**34.1**	**6.3**	tpy	**lb/hr * 8760 hrs/yr / 2000lb/ton**

Site Data

Site Elevation	6500	ft MSL	
Standard Pressure	29.92	in Hg	
Pressure at Elevation	23.52	in Hg	Hess, Introduction to Theoretical Meteorology, eqn. 6.8
Standard Temperature	528	R	

Exhaust Parameters

Reboiler Stack -

500	°F	Exhaust temp	Eng. estimate
12	ft	Stack height	proposed
0.75	ft	Stack diameter	proposed
10610	wscf/10e6 Btu		F factor-40 CFR 60 Appx A Method 19
398	scfm	Exhaust flow	Heat input * F factor/60
920	acfm	Exhaust flow	Va = Vs*(Ps/Pa)*(Ta/Ts)
35	ft/sec	Exhaust velocity	Exhaust flow / stack area

Em. from GRI-GLYCalc (Flash Gas Emissions)

Regenerator condenser stack

100	°F	Exhaust temp	GLYCalc
12	ft	Stack height	proposed
0.33	ft	Stack diameter	proposed
53	scfh	Exhaust flow	GLYCalc
1	acfm	Exhaust flow	Va = Vs*(Ps/Pa)*(Ta/Ts)
0	ft/sec	Exhaust velocity	Exhaust flow / stack area

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID DEHY-STL Description Glycol Dehydration Unit and condenser

SIC Code (4-digit) 4922 SCC Code 31000227

B. Emissions Unit Description

Primary use or equipment type Natural Gas Dehydration

Manufacturer ______ Model No. ______

Serial No. 02271 Installation date 11/24/1957

Raw materials Natural Gas

Finished products Pipeline Quality Natural Gas

Temporary source: X No ___ Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	3.75 MMscf/hour	32,850 MMscf/year
Maximum rate	3.75 MMscf/hour	32,850 MMscf/year

D. Associated Air Pollution Control Equipment

Emissions unit ID DEHY-STL-CD#1 Device Type Condenser

Manufacturer ______ Model No ______

Serial No. ______ Installation date ___/___/___

Control efficiency (%) 84.4% (VOC) Capture efficiency (%) N/A

Air pollutant(s) controlled VOCs and HAPs Efficiency estimation method GLYCalc

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) 12.0 Inside stack diameter (ft) 0.33

Stack temp (F) 100 Design stack flow rate (ACFM) 1

Actual stack flow rate (ACFM) 1 Velocity (ft/sec) 0

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Lindrith Station HAPS Estimate
File Name: C:\rcoldstuff\RC Shared\EP 089 Largo lindrith\lindrith HH.ddf
Date: February 11, 2002

DESCRIPTION:

Description: 1.2X max throughput 90 MMscf/d

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.3304	7.929	1.4471
Ethane	0.7023	16.855	3.0761
Propane	1.7121	41.091	7.4992
Isobutane	0.7079	16.991	3.1008
n-Butane	1.4820	35.568	6.4912
Isopentane	0.5350	12.839	2.3431
n-Pentane	0.4608	11.059	2.0183
n-Hexane	0.2860	6.864	1.2527
Other Hexanes	0.8824	21.177	3.8649
Heptanes	0.1408	3.379	0.6167
2,2,4-Trimethylpentane	0.0085	0.205	0.0373
Benzene	0.6767	16.241	2.9640
Toluene	0.3109	7.462	1.3618
Ethylbenzene	0.0125	0.300	0.0547
Xylenes	0.1027	2.464	0.4498
Total Emissions	8.3510	200.425	36.5776
Total Hydrocarbon Emissions	8.3510	200.425	36.5776
Total VOC Emissions	7.3184	175.641	32.0545
Total HAP Emissions	1.3973	33.536	6.1202
Total BTEX Emissions	1.1028	26.467	4.8302

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.3331	7.994	1.4590
Ethane	0.7299	17.517	3.1969
Propane	2.0522	49.252	8.9885
Isobutane	1.0062	24.150	4.4073
n-Butane	2.3892	57.341	10.4647
Isopentane	1.3732	32.957	6.0147
n-Pentane	1.4834	35.602	6.4973
n-Hexane	1.8539	44.494	8.1202
Other Hexanes	4.0991	98.378	17.9540
Heptanes	2.6248	62.996	11.4967

2,2,4-Trimethylpentane	0.1425	3.421	0.6243
Benzene	7.2162	173.189	31.6070
Toluene	9.5022	228.054	41.6198
Ethylbenzene	1.1179	26.829	4.8963
Xylenes	12.0418	289.003	52.7430
Total Emissions	47.9657	1151.177	210.0898
Total Hydrocarbon Emissions	47.9657	1151.177	210.0898
Total VOC Emissions	46.9027	1125.665	205.4339
Total HAP Emissions	31.8746	764.990	139.6106
Total BTEX Emissions	29.8781	717.075	130.8661

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	6.4013	153.631	28.0376
Ethane	4.5300	108.719	19.8412
Propane	5.8350	140.039	25.5572
Isobutane	2.0471	49.132	8.9665
n-Butane	3.8293	91.903	16.7722
Isopentane	2.0267	48.641	8.8770
n-Pentane	1.8041	43.298	7.9018
n-Hexane	1.3566	32.558	5.9418
Other Hexanes	3.8642	92.740	16.9250
Heptanes	1.0293	24.703	4.5082
2,2,4-Trimethylpentane	0.1063	2.551	0.4656
Benzene	0.2172	5.212	0.9512
Toluene	0.1995	4.789	0.8740
Ethylbenzene	0.0145	0.349	0.0637
Xylenes	0.1096	2.630	0.4800
Total Emissions	33.3705	800.893	146.1630
Total Hydrocarbon Emissions	33.3705	800.893	146.1630
Total VOC Emissions	22.4393	538.543	98.2842
Total HAP Emissions	2.0037	48.089	8.7763
Total BTEX Emissions	0.5408	12.980	2.3689

EQUIPMENT REPORTS:

CONDENSER

Condenser Outlet Temperature:	100.00	deg. F
Condenser Pressure:	14.70	psia
Condenser Duty:	2.34e-001	MM BTU/hr
Hydrocarbon Recovery:	3.18	bbls/day
Produced Water:	19.97	bbls/day
VOC Control Efficiency:	84.40	%
HAP Control Efficiency:	95.62	%
BTEX Control Efficiency:	96.31	%
Dissolved Hydrocarbons in Water:	638.44	mg/L

Component	Emitted	Condensed

Water	0.08%	99.92%
Carbon Dioxide	94.63%	5.37%
Nitrogen	99.06%	0.94%
Methane	99.18%	0.82%
Ethane	96.22%	3.78%
Propane	83.43%	16.57%
Isobutane	70.36%	29.64%
n-Butane	62.03%	37.97%
Isopentane	38.96%	61.04%
n-Pentane	31.06%	68.94%
n-Hexane	15.43%	84.57%
Other Hexanes	21.53%	78.47%
Heptanes	5.36%	94.64%
2,2,4-Trimethylpentane	5.98%	94.02%
Benzene	9.38%	90.62%
Toluene	3.27%	96.73%
Ethylbenzene	1.12%	98.88%
Xylenes	0.85%	99.15%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	4.88 lbs. H2O/MMSCF
Temperature:	71.0 deg. F
Pressure:	264.0 psig
Dry Gas Flow Rate:	108.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.1253 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	69.63 lbs. H2O/MMSCF
Specified Lean Glycol Recirc. Ratio:	3.00 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	6.99%	93.01%
Carbon Dioxide	99.92%	0.08%
Nitrogen	100.00%	0.00%
Methane	100.00%	0.00%
Ethane	99.98%	0.02%
Propane	99.96%	0.04%
Isobutane	99.94%	0.06%
n-Butane	99.91%	0.09%
Isopentane	99.89%	0.11%
n-Pentane	99.86%	0.14%
n-Hexane	99.72%	0.28%
Other Hexanes	99.80%	0.20%
Heptanes	99.36%	0.64%
2,2,4-Trimethylpentane	99.72%	0.28%
Benzene	88.70%	11.30%
Toluene	81.51%	18.49%

Ethylbenzene	70.03%	29.97%
Xylenes	59.79%	40.21%

FLASH TANK

Flash Control: Vented to atmosphere
Flash Temperature: 160.0 deg. F
Flash Pressure: 14.7 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.91%	0.09%
Carbon Dioxide	33.45%	66.55%
Nitrogen	4.72%	95.28%
Methane	4.95%	95.05%
Ethane	13.88%	86.12%
Propane	26.02%	73.98%
Isobutane	32.95%	67.05%
n-Butane	38.42%	61.58%
Isopentane	40.69%	59.31%
n-Pentane	45.40%	54.60%
n-Hexane	57.96%	42.04%
Other Hexanes	51.96%	48.04%
Heptanes	71.97%	28.03%
2,2,4-Trimethylpentane	57.92%	42.08%
Benzene	97.22%	2.78%
Toluene	98.11%	1.89%
Ethylbenzene	98.85%	1.15%
Xylenes	99.21%	0.79%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	28.98%	71.02%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	1.23%	98.77%
n-Pentane	1.10%	98.90%
n-Hexane	0.86%	99.14%
Other Hexanes	1.92%	98.08%
Heptanes	0.69%	99.31%
2,2,4-Trimethylpentane	2.59%	97.41%
Benzene	5.14%	94.86%
Toluene	8.06%	91.94%

Ethylbenzene	10.53%	89.47%
Xylenes	13.02%	86.98%

STREAM REPORTS:

WET GAS STREAM

Temperature: 71.00 deg. F
Pressure: 278.70 psia
Flow Rate: 4.51e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.47e-001	3.14e+002
Carbon Dioxide	9.19e-001	4.80e+003
Nitrogen	4.19e-001	1.40e+003
Methane	8.32e+001	1.58e+005
Ethane	8.57e+000	3.06e+004
Propane	3.89e+000	2.04e+004
Isobutane	6.89e-001	4.76e+003
n-Butane	1.01e+000	6.96e+003
Isopentane	3.69e-001	3.17e+003
n-Pentane	2.70e-001	2.31e+003
n-Hexane	1.11e-001	1.13e+003
Other Hexanes	3.79e-001	3.88e+003
Heptanes	4.80e-002	5.72e+002
2,2,4-Trimethylpentane	6.49e-003	8.81e+001
Benzene	7.09e-003	6.58e+001
Toluene	4.79e-003	5.25e+001
Ethylbenzene	3.00e-004	3.78e+000
Xylenes	2.40e-003	3.02e+001
Total Components	100.00	2.39e+005

DRY GAS STREAM

Temperature: 71.00 deg. F
Pressure: 278.70 psia
Flow Rate: 4.50e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.03e-002	2.19e+001
Carbon Dioxide	9.19e-001	4.80e+003
Nitrogen	4.20e-001	1.40e+003
Methane	8.33e+001	1.58e+005
Ethane	8.58e+000	3.06e+004
Propane	3.90e+000	2.04e+004
Isobutane	6.90e-001	4.75e+003
n-Butane	1.01e+000	6.96e+003
Isopentane	3.70e-001	3.16e+003
n-Pentane	2.70e-001	2.31e+003

n-Hexane	1.11e-001	1.13e+003
Other Hexanes	3.79e-001	3.88e+003
Heptanes	4.78e-002	5.68e+002
2,2,4-Trimethylpentane	6.48e-003	8.78e+001
Benzene	6.30e-003	5.84e+001
Toluene	3.91e-003	4.28e+001
Ethylbenzene	2.10e-004	2.65e+000
Xylenes	1.44e-003	1.81e+001
Total Components	100.00	2.39e+005

LEAN GLYCOL STREAM

Temperature: 71.00 deg. F
Flow Rate: 1.41e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	7.81e+003
Water	1.50e+000	1.19e+002
Carbon Dioxide	4.67e-012	3.70e-010
Nitrogen	7.51e-014	5.96e-012
Methane	2.85e-018	2.26e-016
Ethane	3.13e-008	2.48e-006
Propane	4.05e-009	3.21e-007
Isobutane	1.16e-009	9.16e-008
n-Butane	1.94e-009	1.54e-007
Isopentane	2.15e-004	1.71e-002
n-Pentane	2.08e-004	1.65e-002
n-Hexane	2.03e-004	1.61e-002
Other Hexanes	1.01e-003	8.04e-002
Heptanes	2.32e-004	1.84e-002
2,2,4-Trimethylpentane	4.78e-005	3.79e-003
Benzene	4.93e-003	3.91e-001
Toluene	1.05e-002	8.33e-001
Ethylbenzene	1.66e-003	1.32e-001
Xylenes	2.27e-002	1.80e+000
Total Components	100.00	7.93e+003

RICH GLYCOL STREAM

Temperature: 71.00 deg. F
Pressure: 278.70 psia
Flow Rate: 1.48e+001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.40e+001	7.80e+003
Water	4.95e+000	4.11e+002
Carbon Dioxide	4.46e-002	3.70e+000
Nitrogen	7.17e-004	5.95e-002
Methane	8.11e-002	6.73e+000

Ethane	6.34e-002	5.26e+000
Propane	9.50e-002	7.89e+000
Isobutane	3.68e-002	3.05e+000
n-Butane	7.49e-002	6.22e+000
Isopentane	4.12e-002	3.42e+000
n-Pentane	3.98e-002	3.30e+000
n-Hexane	3.89e-002	3.23e+000
Other Hexanes	9.69e-002	8.04e+000
Heptanes	4.42e-002	3.67e+000
2,2,4-Trimethylpentane	3.04e-003	2.53e-001
Benzene	9.42e-002	7.82e+000
Toluene	1.27e-001	1.05e+001
Ethylbenzene	1.52e-002	1.26e+000
Xylenes	1.68e-001	1.40e+001
Total Components	100.00	8.30e+003

FLASH TANK OFF GAS STREAM

Temperature: 160.00 deg. F
Pressure: 29.40 psia
Flow Rate: 3.77e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.03e+000	3.63e-001
Carbon Dioxide	5.64e+000	2.46e+000
Nitrogen	2.04e-001	5.67e-002
Methane	4.02e+001	6.40e+000
Ethane	1.52e+001	4.53e+000
Propane	1.33e+001	5.83e+000
Isobutane	3.55e+000	2.05e+000
n-Butane	6.64e+000	3.83e+000
Isopentane	2.83e+000	2.03e+000
n-Pentane	2.52e+000	1.80e+000
n-Hexane	1.59e+000	1.36e+000
Other Hexanes	4.52e+000	3.86e+000
Heptanes	1.04e+000	1.03e+000
2,2,4-Trimethylpentane	9.38e-002	1.06e-001
Benzene	2.80e-001	2.17e-001
Toluene	2.18e-001	2.00e-001
Ethylbenzene	1.38e-002	1.45e-002
Xylenes	1.04e-001	1.10e-001
Total Components	100.00	3.63e+001

FLASH TANK GLYCOL STREAM

Temperature: 160.00 deg. F
Flow Rate: 1.48e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.44e+001	7.80e+003
Water	4.97e+000	4.10e+002

Carbon Dioxide	1.50e-002	1.24e+000
Nitrogen	3.40e-005	2.81e-003
Methane	4.03e-003	3.33e-001
Ethane	8.83e-003	7.30e-001
Propane	2.48e-002	2.05e+000
Isobutane	1.22e-002	1.01e+000
n-Butane	2.89e-002	2.39e+000
Isopentane	1.68e-002	1.39e+000
n-Pentane	1.81e-002	1.50e+000
n-Hexane	2.26e-002	1.87e+000
Other Hexanes	5.06e-002	4.18e+000
Heptanes	3.20e-002	2.64e+000
2,2,4-Trimethylpentane	1.77e-003	1.46e-001
Benzene	9.20e-002	7.61e+000
Toluene	1.25e-001	1.03e+001
Ethylbenzene	1.51e-002	1.25e+000
Xylenes	1.67e-001	1.38e+001
Total Components	100.00	8.27e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 6.38e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.62e+001	2.92e+002
Carbon Dioxide	1.67e-001	1.24e+000
Nitrogen	5.97e-004	2.81e-003
Methane	1.23e-001	3.33e-001
Ethane	1.44e-001	7.30e-001
Propane	2.77e-001	2.05e+000
Isobutane	1.03e-001	1.01e+000
n-Butane	2.44e-001	2.39e+000
Isopentane	1.13e-001	1.37e+000
n-Pentane	1.22e-001	1.48e+000
n-Hexane	1.28e-001	1.85e+000
Other Hexanes	2.83e-001	4.10e+000
Heptanes	1.56e-001	2.62e+000
2,2,4-Trimethylpentane	7.42e-003	1.43e-001
Benzene	5.49e-001	7.22e+000
Toluene	6.13e-001	9.50e+000
Ethylbenzene	6.26e-002	1.12e+000
Xylenes	6.74e-001	1.20e+001
Total Components	100.00	3.41e+002

CONDENSER VENT GAS STREAM

Temperature: 100.00 deg. F
Pressure: 14.70 psia
Flow Rate: 7.68e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.51e+000	2.37e-001
Carbon Dioxide	1.32e+001	1.17e+000
Nitrogen	4.91e-002	2.78e-003
Methane	1.02e+001	3.30e-001
Ethane	1.15e+001	7.02e-001
Propane	1.92e+001	1.71e+000
Isobutane	6.02e+000	7.08e-001
n-Butane	1.26e+001	1.48e+000
Isopentane	3.67e+000	5.35e-001
n-Pentane	3.16e+000	4.61e-001
n-Hexane	1.64e+000	2.86e-001
Other Hexanes	5.06e+000	8.82e-001
Heptanes	6.95e-001	1.41e-001
2,2,4-Trimethylpentane	3.69e-002	8.52e-003
Benzene	4.28e+000	6.77e-001
Toluene	1.67e+000	3.11e-001
Ethylbenzene	5.81e-002	1.25e-002
Xylenes	4.78e-001	1.03e-001
Total Components	100.00	9.76e+000

CONDENSER PRODUCED WATER STREAM

Temperature: 100.00 deg. F
Flow Rate: 5.83e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	9.99e+001	2.91e+002	999217.
Carbon Dioxide	1.44e-002	4.20e-002	144.
Nitrogen	7.82e-007	2.28e-006	0.
Methane	1.87e-004	5.46e-004	2.
Ethane	4.79e-004	1.40e-003	5.
Propane	1.02e-003	2.96e-003	10.
Isobutane	2.34e-004	6.82e-004	2.
n-Butane	6.66e-004	1.94e-003	7.
Isopentane	1.74e-004	5.08e-004	2.
n-Pentane	1.63e-004	4.76e-004	2.
n-Hexane	8.74e-005	2.55e-004	1.
Other Hexanes	2.14e-004	6.23e-004	2.
Heptanes	2.45e-005	7.13e-005	0.
2,2,4-Trimethylpentane	9.73e-007	2.84e-006	0.
Benzene	3.92e-002	1.14e-001	392.
Toluene	1.53e-002	4.47e-002	153.
Ethylbenzene	4.78e-004	1.39e-003	5.
Xylenes	5.59e-003	1.63e-002	56.
Total Components	100.00	2.91e+002	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 100.00 deg. F

Flow Rate: 9.28e-002 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	4.25e-002	1.68e-002
Carbon Dioxide	6.20e-002	2.45e-002
Nitrogen	6.10e-005	2.41e-005
Methane	5.51e-003	2.17e-003
Ethane	6.64e-002	2.62e-002
Propane	8.54e-001	3.37e-001
Isobutane	7.54e-001	2.98e-001
n-Butane	2.29e+000	9.05e-001
Isopentane	2.12e+000	8.38e-001
n-Pentane	2.59e+000	1.02e+000
n-Hexane	3.97e+000	1.57e+000
Other Hexanes	8.15e+000	3.22e+000
Heptanes	6.29e+000	2.48e+000
2,2,4-Trimethylpentane	3.40e-001	1.34e-001
Benzene	1.63e+001	6.43e+000
Toluene	2.32e+001	9.15e+000
Ethylbenzene	2.80e+000	1.10e+000
Xylenes	3.02e+001	1.19e+001
Total Components	100.00	3.95e+001

CONDENSER CONTROL CURVE DATA REPORT:

CONDENSER CONTROL EFFICIENCY CURVES

Note: Condenser curves computed for the range 40.0 F <= T <= 170.0 F.
DO NOT EXTRAPOLATE BEYOND THIS RANGE!

Temp(F)	BTEX	Total HAP	VOC
40.0	99.66	99.59	95.11
45.0	99.58	99.49	94.57
50.0	99.49	99.37	93.98
55.0	99.36	99.22	93.32
60.0	99.22	99.05	92.63
65.0	99.04	98.84	91.88
70.0	98.83	98.59	91.07
75.0	98.58	98.28	90.18
80.0	98.28	97.93	89.24
85.0	97.92	97.50	88.21
90.0	97.49	96.99	87.07
95.0	96.96	96.37	85.82
100.0	96.33	95.64	84.44
105.0	95.57	94.76	82.92
110.0	94.65	93.71	81.23
115.0	93.54	92.45	79.35
120.0	92.20	90.94	77.25
125.0	90.45	88.99	74.70
130.0	88.40	86.75	71.97
135.0	85.89	84.03	68.85
140.0	82.79	80.73	65.28
145.0	78.95	76.71	61.16
150.0	74.16	71.78	56.40
155.0	68.17	65.71	50.84

160.0	60.61	58.18	44.29
165.0	51.63	49.37	37.00
170.0	38.75	36.90	27.17

ANNUAL AIR-COOLED CONDENSER PERFORMANCE:

ANNUAL AIR-COOLED CONDENSER PERFORMANCE

Nearest Site for Air Temperature Data: Farmington, NM

Ambient Air Dry Bulb Temperature (deg. F)	Frequency (%)	Condenser Outlet Temperature (deg. F)
<=50	46.55	<=70
51-55	7.55	71-75
56-60	7.85	76-80
61-65	8.90	81-85
66-70	8.10	86-90
71-75	6.20	91-95
76-80	5.23	96-100
81-85	4.54	101-105
86-90	3.41	106-110
91-95	1.41	111-115
96-100	0.26	116-120
>100	0.00	>120

Condenser outlet temperature approach to ambient: 20.00 deg. F

Annual air-cooled condenser emissions and control efficiency:

	Uncontrolled emissions tons/year	Controlled emissions tons/year	% Control
Benzene	31.607	1.682	94.68
BTEX	130.866	2.681	97.95
Total HAP	139.611	3.423	97.55
VOC	205.434	23.214	88.70

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID TK-1 Description Condensate Tank

SIC Code (4-digit) 4922 SCC Code 40400311

B. Emissions Unit Description

Primary use or equipment type Condensate Tank

Manufacturer N/A Model No. N/A

Serial No. N/A Installation date <1972

Raw materials Natural Gas Condensate

Finished products Natural Gas Condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	41.7 bbl	36,500 bbl
Maximum rate	41.7 bbl	36,500 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID TBD Device Type Vapor Recovery Unit (VRU)

Manufacturer TBD Model No TBD

Serial No. TBD Installation date TBD

Control efficiency (%) 95.0 Capture efficiency (%) ________.___

Air pollutant(s) controlled VOCs Efficiency estimation method Engineering Estimate

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ___________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ___________.______ Design stack flow rate (ACFM) ___________.______

Actual stack flow rate (ACFM) ___________.______ Velocity (ft/sec) ___________.______

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID TK-1

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates: Actual Annual Emissions (tons/yr)	Potential to Emit: Hourly (lb/hr)	Potential to Emit: Annual (tons/yr)	CAS No.
VOCs	N/A	0.06	2.6	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID TK-2 Description Condensate Tank

SIC Code (4-digit) 4922 SCC Code 40400311

B. Emissions Unit Description

Primary use or equipment type Condensate Tank

Manufacturer N/A Model No. N/A

Serial No. N/A Installation date <1972

Raw materials Natural Gas Condensate

Finished products Natural Gas Condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	41.7 bbl	36,500 bbl
Maximum rate	41.7 bbl	36,500 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID TBD Device Type Vapor Recovery Unit (VRU)

Manufacturer TBD Model No TBD

Serial No. TBD Installation date TBD

Control efficiency (%) 95.0 Capture efficiency (%) ________.___

Air pollutant(s) controlled VOCs Efficiency estimation method Engineering Estimate

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ____________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ____________.______ Design stack flow rate (ACFM) ____________.______

Actual stack flow rate (ACFM) ______________.______ Velocity (ft/sec) ______________.______

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID TK-2

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	0.06	2.6	N/A

```
******************************************************************************************
*     Project Setup Information                                                          *
******************************************************************************************
Project File               : Untitled.Ept
Flowsheet Selection        : Oil Tank with Separator
Calculation Method         : RVP Distillation
Control Efficiency         : 95.0%
Known Separator Stream     : Low Pressure Gas
Entering Air Composition   : No

Date                       : 2008.04.29

******************************************************************************************
*     Data Input                                                                         *
******************************************************************************************

Separator Pressure         : 250.00[psig]
Separator Temperature      : 70.00[F]
Molar GOR                  : 0.0500
Ambient Pressure           : 14.70[psia]
Ambient Temperature        : 70.00[F]
C10+ SG                    : 0.8990
C10+ MW                    : 166.00

-- Low Pressure Gas ----------------------------------------------------------------------
   No.     Component            mol %
   1       H2S                  0.0000
   2       O2                   0.0000
   3       CO2                  2.7917
   4       N2                   0.4337
   5       C1                  68.0461
   6       C2                  11.9601
   7       C3                   7.7790
   8       i-C4                 1.9473
   9       n-C4                 2.7105
   10      i-C5                 1.2521
   11      n-C5                 0.0000
   12      C6                   2.3540
   13      C7+                  0.6794
   14      Benzene              0.0180
   15      Toluene              0.0210
   16      E-Benzene            0.0010
   17      Xylenes              0.0060
   18      n-C6                 0.0000
   19      224Trimethylp        0.0000

   C7+ Molar Ratio: C7  :     C8  :      C9  :     C10+
                    1.0000    1.0000     1.0000    1.0000

-- Sales Oil -----------------------------------------------------------------------------
Production Rate            : 100[bbl/day]
Days of Annual Operation   : 365 [days/year]
API Gravity                : 46.0
Reid Vapor Pressure        : 7.70[psia]

******************************************************************************************
*     Calculation Results                                                                *
******************************************************************************************

-- Emission Summary ----------------------------------------------------------------------
Item                Uncontrolled   Uncontrolled   Controlled    Controlled
                    [ton/yr]       [lb/hr]        [ton/yr]      [lb/hr]
Total HAPs          1.120          0.256          0.056         0.013
Total HC            66.804         15.252         3.340         0.763
```

VOCs, C2+	60.684	13.855	3.034	0.693
VOCs, C3+	52.733	12.039	2.637	0.602

Uncontrolled Recovery Info.

Vapor	3.5800	[MSCFD]
HC Vapor	3.3400	[MSCFD]
GOR	35.80	[SCF/bbl]

-- Emission Composition ---

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
1	H2S	0.605	0.138	0.030	0.007
2	O2	0.000	0.000	0.000	0.000
3	CO2	4.284	0.978	4.284	0.978
4	N2	0.114	0.026	0.114	0.026
5	C1	6.120	1.397	0.306	0.070
6	C2	7.951	1.815	0.398	0.091
7	C3	20.683	4.722	1.034	0.236
8	i-C4	4.884	1.115	0.244	0.056
9	n-C4	13.296	3.036	0.665	0.152
10	i-C5	4.243	0.969	0.212	0.048
11	n-C5	4.992	1.140	0.250	0.057
12	C6	1.448	0.331	0.072	0.017
13	C7	1.394	0.318	0.070	0.016
14	C8	0.534	0.122	0.027	0.006
15	C9	0.108	0.025	0.005	0.001
16	C10+	0.029	0.007	0.001	0.000
17	Benzene	0.105	0.024	0.005	0.001
18	Toluene	0.013	0.003	0.001	0.000
19	E-Benzene	0.002	0.000	0.000	0.000
20	Xylenes	0.014	0.003	0.001	0.000
21	n-C6	0.990	0.226	0.050	0.011
22	224Trimethylp	0.000	0.000	0.000	0.000
	Total	71.809	16.395	3.590	0.820

-- Stream Data ---

No.	Component	MW	LP Oil mol %	Flash Oil mol %	Sale Oil mol %	Flash Gas mol %	W&S Gas mol %	Total Emissions mol %
1	H2S	34.80	0.0508	0.0355	0.0067	0.6810	1.4514	1.0284
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CO2	44.01	0.2437	0.0933	0.0002	6.4383	4.6707	5.6412
4	N2	28.01	0.0102	0.0005	0.0000	0.4113	0.0233	0.2363
5	C1	16.04	0.9543	0.1523	0.0000	33.9966	7.6384	22.1101
6	C2	30.07	0.6701	0.3612	0.0091	13.3981	17.6680	15.3237
7	C3	44.10	2.1827	1.7837	1.0550	18.6221	37.6065	27.1833
8	i-C4	58.12	1.1269	1.0500	0.9581	4.2943	5.5709	4.8700
9	n-C4	58.12	4.6091	4.4244	4.2190	12.2198	14.5215	13.2578
10	i-C5	72.15	3.1066	3.1026	3.0930	3.2694	3.5772	3.4082
11	n-C5	72.15	5.0558	5.0849	5.1030	3.8575	4.1947	4.0096
12	C6	86.16	4.1726	4.2505	4.3157	0.9620	1.0443	0.9991
13	C7	100.20	10.3655	10.5977	10.7955	0.7984	0.8751	0.8330
14	C8	114.23	10.8426	11.0993	11.3191	0.2654	0.2949	0.2787
15	C9	128.28	5.5127	5.6454	5.7591	0.0467	0.0562	0.0510
16	C10+	166.00	45.9695	47.0850	48.0426	0.0091	0.0110	0.0100
17	Benzene	78.11	0.5685	0.5805	0.5906	0.0743	0.0815	0.0776
18	Toluene	92.13	0.2132	0.2182	0.2224	0.0077	0.0086	0.0081
19	E-Benzene	106.17	0.0711	0.0728	0.0743	0.0008	0.0010	0.0009
20	Xylenes	106.17	0.6802	0.6965	0.7105	0.0071	0.0080	0.0075
21	n-C6	86.18	3.5939	3.6656	3.7260	0.6399	0.6968	0.6656
22	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	MW		123.89	125.97	127.60	38.19	45.79	41.62
	Stream Mole Ratio		1.0000	0.9763	0.9568	0.0237	0.0195	0.0432
	Heating Value	[BTU/SCF]				2017.62	2466.09	2219.86
	Gas Gravity	[Gas/Air]				1.32	1.58	1.44
	Bubble Pt. @ 100F	[psia]	56.28	19.99	8.71			
	RVP @ 100F	[psia]	18.38	11.58	7.71			
	Spec. Gravity @ 100F		0.800	0.803	0.806			

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Federal Operating Permit Program (40 CFR Part 71)

INITIAL COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION (I-COMP)

SECTION A - COMPLIANCE STATUS AND COMPLIANCE PLAN

Complete this section for each unique combination of applicable requirements and emissions units at the facility. List all compliance methods (monitoring, recordkeeping and reporting) you used to determine compliance with the applicable requirement described above. Indicate your compliance status at this time for this requirement and compliance methods and check "YES" or "NO" to the follow-up question.

Emission Unit ID(s): DEHY-STL

Applicable Requirement (Describe and Cite): **40 CFR 63, Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities**

Based on existing permit limits, this facility is a major source for HAPs. However, as it is a field compression facility, only emissions from glycol dehydrators and flashing tanks, if any, are aggregated to determine Subpart HH applicability. The facility is therefore a minor source for purposes of Subpart HH. It includes an affected facility, the glycol dehydrator, but no "flashing tanks". Off gas from the dehydrator is directed to a condenser, as required by an enforceable condition; the PTE of the dehydrator is therefore limited by this requirement.

The facility is not located within a UA plus offset and UC boundary and construction commenced prior to July 8, 2005; the compliance date for this facility is therefore January 5, 2009.

Compliance requirements are specified at 40 CFR 63.764 (d)(2)(i) & (ii) & 63.765. Based on the GRI GLYCalc calculations provided with the previous application for revision, HAP emissions are reduced by 95%, satisfying the requirements of 40 CFR 63.765 (c) (3) (i). The facility is therefore in compliance with this requirement.

Compliance Methods for the Above (Description and Citation):

Condenser

Compliance Status:

_X_ In Compliance: Will you continue to comply up to permit issuance? _X_ Yes ____No

___ Not In Compliance: Will you be in compliance at permit issuance? ___Yes ___No

___ Future-Effective Requirement: Do you expect to meet this on a timely basis? ____Yes ____No

Emission Unit ID(s): DEHY-STL

Applicable Requirement (Description and Citation): **40 CFR 64 – Compliance Assurance Monitoring (CAM)**

Compliance Methods for the Above (Description and Citation):

In general terms, an affected unit must

- Be subject to an emission limit for a pollutant;
- Use a control device to achieve compliance with that limit; and
- Have a pre-control potential to emit for that pollutant greater than major source level.

Although the permit specifies that catalytic converters are installed on units A01 and A02, neither engine has pre-control emissions that make the unit a major source in itself.

However, the dehydrator still vent is a major source for HAPs if uncontrolled; and a minor source with the control device, the condenser. A CAM plan is therefore due with renewal. Such a plan is attached.

Compliance Status:

X_ In Compliance: Will you continue to comply up to permit issuance? _X_Yes ____No

___ Not In Compliance: Will you be in compliance at permit issuance? ___Yes ___No

___ Future-Effective Requirement: Do you expect to meet this on a timely basis? ____Yes _____No

Emission Unit ID(s): TK-1, TK-2

Applicable Requirement (Describe and Cite) 40 CFR 71. Condensate tanks previously believed to be insignificant activities have significant calculated emissions. Tanks are not "storage vessel with the potential for flash emissions" by reason of having throughput much less than 79,500 liters/day, and are thus not subject to 40 CFR 63 Subpart HH. Tanks are prior to custody transfer and pre-date Kb, and are therefore not subject to NSPS. Controlled emissions from each tank are less than major source level. However, units are not insignificant and are therefore identified here.

Compliance Methods for the Above (Description and Citation):
This application identifies the tanks as emissions units. Moreover, Enterprise will install a vapor recovery unit (VRU) on the tanks, with a consequent reduction in emissions by approximately 95%.

Compliance Status:

___ In Compliance: Will you continue to comply up to permit issuance? ____Yes ____No

_X__ Not In Compliance: Will you be in compliance at permit issuance? _X__Yes ___No

___ Future-Effective Requirement: Do you expect to meet this on a timely basis? ____Yes ____No

B. SCHEDULE OF COMPLIANCE

Complete this section if you answered "NO" to any of the questions in section A. Also complete this section if required to submit a schedule of compliance by an applicable requirement. Please attach copies of any judicial consent decrees or administrative orders for this requirement.

Unit(s)________TK-1, TK-2 Requirement__identify as emissions units; voluntarily install VRU to control VOC and HAP emissions______

Reason for Noncompliance. Briefly explain reason for noncompliance at time of permit issuance or that future-effective requirement will not be met on a timely basis: Tanks grandfathered into original NSR permit as insignificant sources of emissions.

Narrative Description of how Source Compliance Will be Achieved. Briefly explain your plan for achieving compliance: Identify units as emissions sources in this application, voluntarily install VRU to control emissions.

Schedule of Compliance. Provide a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance, including a date for final compliance.

Remedial Measure or Action	Date to be Achieved
Identify as emissions units in this application	15 May 2008
VRU installation on condensate tanks	15 Nov 2008

C. SCHEDULE FOR SUBMISSION OF PROGRESS REPORTS

Only complete this section if you are required to submit one or more schedules of compliance in section B or if an applicable requirement requires submittal of a progress report. If a schedule of compliance is required, your progress report should start within 6 months of application submittal and subsequently, no less than every six months. One progress report may include information on multiple schedules of compliance.

Contents of Progress Report (describe) Notification of installation of VRU on condensate tanks

First Report_Dec__/_30___/_2008_ Frequency of Submittal___one time__________

D. SCHEDULE FOR SUBMISSION OF COMPLIANCE CERTIFICATIONS

This section must be completed once by every source. Indicate when you would prefer to submit compliance certifications during the term of your permit (at least once per year).

Frequency of submittal_Semi-annually_ Beginning__

E. **COMPLIANCE WITH ENHANCED MONITORING & COMPLIANCE CERTIFICATION REQUIREMENTS**

This section must be completed once by every source. To certify compliance with these, you must be able to certify compliance for every applicable requirement related to monitoring and compliance certification at every unit.

Enhanced Monitoring Requirements: _X_ In Compliance ____ Not In Compliance

Compliance Certification Requirements: _X_ In Compliance ____ Not In Compliance

Note; by this application, permittee notifies EPA of emissions units TK-1 and TK-2, and therefore is in compliance with requirements of 40 CFR 71.

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) Hurlburt (First) Terry (MI) L.

Title Senior Vice President - Operations

Street or P.O. Box P.O. Box 4324

City Houston State TX ZIP 77210 - 4324

Telephone (713) 880 - 6595 Ext. _ Facsimile (713) 880-6660

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) Terry L. Hurlburt

Name (typed) Terry L. Hurlburt Date: 5 / 12 / 2008

NMQ 05/09/2008

Addendum 1

Applicable Requirements Discussion

Applicable Requirements

The following discussion addresses applicable requirements, and requirements that may appear to be applicable but are not. All applicable and non-applicable requirements addressed here are included in the Code of Federal Regulations, Title 40. Requirements imposed by Permit V-SU-0032-02.03 are not addressed here.

Applicable Requirements
Upon reasonable inquiry, Enterprise has determined that the following requirements are relevant to this facility within the meaning of this application.

40 CFR 63, Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities
Based on existing permit limits, this facility is a major source for HAPs. However, as it is a field compression facility, only emissions from glycol dehydrators and flashing tanks, if any, are aggregated to determine Subpart HH applicability. The facility is therefore a minor source for purposes of Subpart HH. It includes an affected facility, the glycol dehydrator, but no "flashing tanks" as defined in this Subpart; tankage throughput at the site is less than the applicability threshold for this Subpart. Off gas from the dehydrator is directed to a condenser, as required by an enforceable condition; the PTE of the dehydrator is therefore limited by this requirement.

The facility is not located within a UA plus offset and UC boundary and construction commenced prior to July 8, 2005; the compliance date for this facility is therefore January 5, 2009.

Compliance requirements are specified at 40 CFR 63.764 (d)(2)(i) & (ii) & 63.765. Based on the GRI GLYCalc calculations provided with the previous application for revision, HAP emissions are reduced by 95%, satisfying the requirements of 40 CFR 63.765 (c) (3) (i). The facility is therefore in compliance with this requirement.

40 CFR 64 – Compliance Assurance Monitoring (CAM)
In general terms, an affected unit must

- Be subject to an emission limit for a pollutant;
- Use a control device to achieve compliance with that limit; and
- Have a pre-control potential to emit for that pollutant greater than major source level.

Although catalytic converters are installed on units A01 and A02, neither engine has pre-control emissions that make the unit a major source in itself.

However, the dehydrator still vent is a major source for HAPs if uncontrolled; and a minor source with the control device, the dehydrator. A CAM plan is therefore due with renewal. Such a plan is attached.

40 CFR 71 – Federal Operating Permits
The facility is a major source of NOx as defined by 40 CFR 71, and is operated in accordance with Permit V-SU-0032-02.03.

40 CFR 71.5(a)(1) requires that "*for each part 71 source, the owner or operator shall submit a timely and complete permit application in accordance with this section*". 40 CFR 71.5(a)(1)(iii) goes on to state that "*for purposes of permit renewal, a timely application is one that is submitted at least 6 months but not more than 18 months prior to expiration of the part 70 or 71 permit*".

Operating Permit R6FOPP71-03 expires on 11/16/08; as required by regulation, this application is being submitted prior to 5/16/08.

Non-Applicable Requirements

Some requirements may appear to apply to this facility when in fact they do not. Non-applicability is discussed here.

40 CFR 50 – National Ambient Air Quality Standards

40 CFR 50 establishes National Ambient Air Quality Standards but does not directly impose requirements on a specific stationary source and is therefore not applicable.

40 CFR 52.21 – Prevention of Significant Deterioration (PSD) of Air Quality

Enterprise has made a determination in accordance with 40 CFR 52.21(a)(1)(2) that the facility is a minor source for PSD purposes as defined at 40 CFR 52.21(b). Lindrith Compressor Station is not a source type identified at 40 CFR 52.21(a), and the facility-wide potential to emit is less than 250 tons per year (tpy) of any regulated pollutant.

40 CFR 60, Subpart A – General Provisions

This subpart is referenced by other NSPSs applicable to the facility and is therefore applicable only in the event that an NSPS is applicable. No NSPSs apply to this facility.

40 CFR 60, Subparts K, Ka, and Kb – Standards of Performance for Storage Vessels

The only tanks that are sources of VOC emissions pre date these regulations. This Subpart does not apply.

40 CFR 60, Subpart GG – Standards of Performance for Stationary Gas Turbines

No turbines are installed at the facility.

40 CFR 60, Subpart KKK – Standards of Performance for Equipment Leaks

The facility is not a gas processing plant as defined in this Subpart.

40 CFR 60, Subpart LLL – Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions

The facility is not a natural gas treating plant as defined in this Subpart.

40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

All engines at the facility were constructed before June 12, 2006 (40 CFR 60.4230.a.4) and have not been modified or reconstructed since (40 CFR 60.4230.a.5). This Subpart does not apply.

40 CFR 61 – National Emissions Standards for Hazardous Air Pollutants (NESHAP)

No 40 CFR 61 NESHAPs apply to this facility. In the case of asbestos demolition, subpart M of 40 CFR 61 may apply.

40 CFR 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

All engines currently installed at the facility are "existing" (constructed before June 12, 2006) 4 stroke lean burns and therefore do not have to meet the requirements of Subpart ZZZZ, including the initial notification, as stated at 40 CFR 63.6590(b)(3).

40 CFR 68 – Accidental Release Prevention Program

This regulation does not apply. This regulation arises from section 112 (r) of the Clean Air Act and establishes thresholds based on inventoried quantity of specific substances in process. This facility does not manufacture, process, use, store, or otherwise handle regulated substances in excess of the quantities specified in 40 CFR 68.

40 CFR 72 – Acid Rain Regulations

The facility is not an electric utility generating facility as defined in the Part and therefore is not an affected facility under the Acid Rain Program.

40 CFR 82, Subpart F – Protection of Stratospheric Ozone

No operations involving CFCs are conducted at the facility.

40 CFR 82, Subpart H – Protection of Stratospheric Ozone
No halon-containing fire extinguishers are used, stored, or disposed of at the facility.

Addendum 2

Compliance Assurance Monitoring (CAM) Plan

Compliance Assurance Monitoring (CAM) Plan
40 CFR 63 Subpart G

Dehydrator Condenser

I Background

A. Emissions Unit
   Dehydrator still vent DEHY1-STL

B. Applicable Regulation(s), Limit, and Requirements
   40 CFR 63 Subpart HH
   Pollutant; VOCs, HAPs
   Emission Limit; 40 tpy VOC

C. Control Technology
   Condenser

II Monitoring Approach

See table

Indicator	Condenser outlet temperature	Integrity of ducting from dehydrator to condenser
Measurement Approach	Excursion defined as daily temperature greater than 100 F as established in application	Excursion defined as visible break, disconnect, or failure in ducting from dehydrator still vent to condensor.
	Excursions trigger permittee to re-measure temperature at regular intervals and establish daily average temperature, and make repairs or adjustments as necessary	Excursions trigger permittee to investigate and repair ducting.
Performance Criteria	Hydrocarbon recovery depends on temperature and heat rejection of condenser. Correct temperature has been established as daily average of 100 F	Control depends on duct integrity.
Verification of status	temperature measurement	inspection and repair
QA/QC practices	periodic measurement, and recording of data. Repair or replacement as needed.	periodic inspection, and recording of results. Repair or replacement as needed.
Monitoring frequency	daily	monthly
Averaging Period	daily	NA

Justification

Background; The controlled emission unit is a glycol dehydrator that can process up to 90 MMscf/day of natural gas. The dehydrator is equipped with a flash tank; offgas from the flash tank is vented. Offgas from the still vent is ducted to a condenser where condensable liquids are recovered. Non-condensible gases from the condenser are vented to atmosphere.

Rational for selection of performance indicators and indicator ranges.

The monitoring is based on two primary indicators; ducting integrity, and condenser operating temperature.

In order for the control device to control emissions to the levels authorized, all gases from the still vent must be directed to the condenser. Routine inspection of the ducting as specified at 40 CFR 63.773 (b)(i) is presumptively acceptable monitoring.

40 CFR 63.773 (e) offers two alternatives for verifying operation of control devices; demonstration by test, or by design analysis. In this case, worst-case calculations by GRI GLYCalc are the basis of the emission limits and control device operating parameters, which in turn are the basis of the performance indicators.

The design temperature of the condenser is based on GRI GLYCalc and EPA TANK data. A typical average annual temperature at Clayton, NM, (climatologically similar) according to TANK, is approximately 53 F; GRI GLYCalc recommends a maximum "approach" temperature (the temperature rise expected at a condenser in full sun) of 40 F; the condenser design temperature is therefore 53 + 40, plus a modest safety factor. Based on this design temperature, GRI GLYCalc calculates the maximum expected emission rate of VOCs and HAPs.

Clearly, emissions from the condenser will be affected by the uncontrolled emissions from the controlled device, the dehydrator. Parameters affecting the uncontrolled emissions, primarily glycol circulation rate and dehydrator throughput, are specified in the NSR permit. Note that 40 CFR 63 Subpart HH requires calculation of and operation at a glycol circulation rate based on specific criteria, resulting in a circulation rate no higher than, and generally lower than, the rate specified in the permit.

Thus, monitoring of key design parameters is sufficient to ensure proper operation of the condenser and compliance with emissions limits.

(4)

Document No. 4

JUN 13 2008

Mr. Donald Fernald
Environmental Scientist
Enterprise Products
P.O. Box 4324
Houston, TX 77210-4324

RE: Application Package Permit Renewal for Enterprise Field Services LLC, Lindrith Compressor Station, Permit Number R6FOPP71-03

Dear Mr. Fernald:

The U.S. Environmental Protection Agency received your application on May 14, 2008. The Region has determined that the information submitted in the Application is administratively complete to process the requested operating permit renewal. Therefore, this application is ruled complete on June 12, 2008.

If the Region determines that additional information is necessary to evaluate the application or to take final action, it may request such information in writing and set a reasonable deadline for response. If you have any questions, please contact me at (214) 665-6435 or Catherine Penland of my staff at (214) 665-7122.

Sincerely yours,

Originally Signed
by Jeff Robinson

Jeff Robinson
Chief
Air Permits Section

bcc: Permit file: Enterprise Products LLC Lindrith Compressor Station, R6FOPP71-03

Penland/cp:6PD-R:x7122/6/11/08\Lindrith application completeness letter.doc
(Penland #1 Disk)

Document No. 5 (5)

Enterprise Products™

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC

ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

November 3, 2008

7008 0150 0003 5621 2510
Return Receipt Requested

David Neleigh
U.S. Environmental Protection Agency
Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RE: Significant Revision to Operating Permit R6FOPP71-03
Lindrith Compressor Station, New Mexico

Dear Mr. Neleigh,

Enterprise Field Services, LLC (Enterprise) is hereby requesting a significant revision to the Lindrith Compressor Station's Operating Permit R6FOPP71-03.

Enterprise seeks to retire its current two condensate tanks in favor of eight new 450 bbl (19,000 gallons) condensate tanks, three new 120 bbl drain tanks, one new 120 bbl sump tank, a stabilizer unit, and a new loading rack for transporting the condensate from the tanks. The total throughput of the tanks and loading rack will be up to 50,000 bbl/yr (6,250 bbl/yr per tank).

The proposed tanks are a source of VOCs; however, 40 CFR 60, Subpart K, Ka, and Kb will not be applicable because each tank will have a capacity less than 40,000 gallons (less than 75 m^3 for Subpart Kb). All the drain tanks and the sump tanks will also be listed as insignificant activities as defined in §71.5 (c)(11)(ii)(A) and §71.5 (c)(11)(ii)(B) because they will emit less than 2 tons per year of VOCs and less than 1,000 lbs per year of HAP.

In addition to the tanks and loading rack, the facility will also be installing a stabilizer unit. This stabilizer unit is not an additional emission source as it will recover heat from the existing compressor's discharge gas to provide for its heating requirement. The vapor produced in the stabilizer will be routed to the compressor suction, and the stabilized condensate liquid will continue to the condensate tanks. The stabilized condensate liquid will have no flashing potential.

Included in this application are the revised calculations of emissions for the new tanks and loading rack and a set of revised application forms.

If you need additional information regarding this notification, please call Don Fernald, area Environmental Scientist at (505) 599-2141 or me directly at (713) 880-6518.

Yours truly,

Mary E. Hebert
Director, Environmental Compliance

/sjn

P. O. BOX 4324
HOUSTON, TX 77210-4324
713.880.6500

2727 NORTH LOOP WEST
HOUSTON, TX 77008-1044
www.epplp.com

Copies to:

Ms. Kathy Penland / US EPA Region VI
Mr. Dixon Sandoval / Jicarilla Apache Tribe Environmental Protection Office
Mr. Sam Cudney / Trinity Consultants

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

GENERAL INFORMATION AND SUMMARY (GIS)

A. Mailing Address and Contact Information

Facility name: Lindrith Compressor Station

Mailing address: Street or P.O. Box: Enterprise Field Services, LLC c/o Envr. Dept: PO Box 4324

City: Houston State: TX ZIP: 77210 – 4324

Contact person: Donald Fernald Title: Environmental Scientist

Telephone: (505) 599 – 2141 Ext.:

Facsimile: (505) 599 – 2119

B. Facility Location

Temporary source? ___ Yes _X_ No Plant site location: 20 miles West of Lindrith, New Mexico

East ½ of the Southeast ¼ of Section 18, Township 24 North, Range 5 West

City: Lindrith State: NM County: Rio Arriba EPA Region: 6

Is the facility located within:

Indian lands? _X_ YES ___ NO OCS waters? ___ YES _X_ NO

Non-attainment area? ___ YES _X_ NO If yes, for what air pollutants? ________

Within 50 miles of affected State? _X_ YES ___ NO If yes, What State(s)? NM

C. Owner

Name: Enterprise Field Services, LLC Street/P. O. Box: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone: (713) 880 – 6595 Ext.:

D. Operator

Name: Enterprise Products Operating LLC Street/P. O. Box: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone: (713) 880 – 6500 Ext.:

E. Application Type

Mark only one permit application type and answer the supplementary question appropriate for the type marked.

___Initial Permit ___ Renewal _X_ Significant Mod ___ Minor Permit Mod(MPM)

___ Group Processing, MPM ___ Administrative Amendment

For initial permits, when did operations commence? _____/_____/_____

For permit renewal, what is the expiration date of current permit? 11 / 16 / 2008

F. Applicable Requirement Summary

Mark all types of applicable requirements that apply.

___ SIP ___ FIP/TIP ___ PSD ___Non-attainment NSR

___ Minor source NSR ___ Section 111 ___ Phase I acid rain ___Phase II acid rain

___ Stratospheric ozone ___ OCS regulations ___ NESHAP _X_ Sec. 112(d) MACT

___ Sec. 112(g) MACT ___ Early reduction of HAP ___ Sec 112(j) MACT ___ RMP [Sec.112(r)]

___ Tank Vessel requirements, sec. 183(f)) ___ Section 129 Standards/Requirement

___ Consumer / comm.. products, § 183(e) ___ NAAQS, increments or visibility (temp. sources)

Has a risk management plan been registered? ___YES _X_NO Regulatory agency ___________

Phase II acid rain application submitted? ___YES _X_NO If yes, Permitting authority ___________

G. Source-Wide PTE Restrictions and Generic Applicable Requirements

Cite and describe any emissions-limiting requirements and/or facility-wide "generic" applicable requirements.

Facility previously issued NRS Permit NM-1644-M1, limiting fuel consumption, requiring oxidation catalysts on two RICE, with quarterly testing requirement and condenser on dehydrator still vent. Permit establishes emissions limits for each unit.
Generic requirements indentified in Condition 3.2 of Operating Permit R6FOPP71-03

H. Process Description

List processes, products, and SIC codes for the facility.

Process	Products	SIC
Natural gas gathering and transmission facility, with pressurized natural gas as product delivered to pipeline	Pressurized natural gas	1311

I. Emission Unit Identification

Assign an emissions unit ID and describe each emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on a separate line. Applicants may exclude from this list any insignificant emissions units or activities.

Emissions Unit ID	Description of Unit
A-01	Caterpillar 3612 LE, Natural Gas Fired Engine
A-01-CD#1	Oxidation Catalyst for Rice A-01 (Control Device)
A-02	Caterpillar 3612 LE, Natural Gas Fired Engine
A-02-CD#1	Oxidation Catalyst for Rice A-01 (Control Device)
A-03	Caterpillar 3612 LE, Natural Gas Fired Engine
DEHY-1RBLR	Dehy Reboiler
DEHY-STL	Dehy Still Vent
DEHY-STL-CD#1	Condenser attached to DHY1-STL (control device)
FUGVOC	Fugitive VOCs
TK-1	450 bbl Condensate Tank
TK-2	450 bbl Condensate Tank
TK-3	450 bbl Condensate Tank
TK-4	450 bbl Condensate Tank
TK-5	450 bbl Condensate Tank
TK-6	450 bbl Condensate Tank
TK-7	450 bbl Condensate Tank
TK-8	450 bbl Condensate Tank
LR-C	Loading Rack

J. Facility Emissions Summary

Enter potential to emit (PTE) for the facility as a whole for each air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information.

NOx: 68.46 tons/yr VOC: 159.86 tons/yr SO2: 4.20 tons/yr

PM-10: N/A tons/yr CO: 103.21 tons/yr Lead: N/A tons/yr Total HAP: 21.50 tons/yr

Single HAP emitted in the greatest amount: Formaldehyde PTE: 10.8 tons/yr

Total of regulated pollutants (for fee calculation), Sec. F, line 5 of form FEE N/A tons/yr

K. Existing Federally-Enforceable Permits

Permit number(s): NM 1644 M1 Permit type: NSR Permitting authority: NMED

Permit number(s): R6FOPP71-03 Permit type: Title V Permitting authority: US EPA

L. Emission Unit(s) Covered by General Permits

Emission unit(s) subject to general permit ____________________

Check one: ___ Application made ___ Coverage granted

General permit identifier ____________________ Expiration Date ___/___/___

M. Cross-referenced Information

Does this application cross-reference information? ___ YES X NO (If yes, see instructions)

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

POTENTIAL TO EMIT (PTE)

For each unit with emissions that count towards applicability, list the emissions unit ID and the PTE for the air pollutants listed below and sum them up to show totals for the facility. You may find it helpful to complete form **EMISS** before completing this form. Show other pollutants not listed that are present in major amounts at the facility on attachment in a similar fashion. You may round values to the nearest tenth of a ton. Also report facility totals in section **J** of form **GIS**.

Emissions Unit ID	Regulated Air Pollutants and Pollutants for which the Source is Major (tons/yr)						
	NOx	VOC	SO2	PM-10	CO	Lead	HAP
A-01	22.54	20.5	1.4	N/A	11.8	N/A	4.5
A-02	22.54	20.5	1.4	N/A	11.8	N/A	4.5
A-03	22.54	29.5	1.4	N/A	78.9	N/A	4.5
DEHY1-RBLR	0.84	0.05	N/A	N/A	0.71	N/A	Neg.
DEHY1-STL	N/A	40.0	N/A	N/A	N/A	N/A	8.0
FUGVOC	N/A	3.77	N/A	N/A	N/A	N/A	N/A
TK-1	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-2	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-3	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-4	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-5	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-6	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-7	N/A	4.40	N/A	N/A	N/A	N/A	N/A
TK-8	N/A	4.40	N/A	N/A	N/A	N/A	N/A
LR-C	N/A	10.34	N/A	N/A	N/A	N/A	N/A
FACILITY TOTALS:	68.46	159.86	4.20	N/A	103.21	N/A	21.50

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

INSIGNIFICANT EMISSIONS (IE)

List each insignificant activity or emission unit. In the "number" column, indicate the number of units in this category. Descriptions should be brief but unique. Indicate which emissions criterion of part 71 is the basis for the exemption.

Number	Description of Activities or Emissions Units	VOC tpy	HAP
DT-1	120 bbl 95% water; 5% condensate tank exempted by §71.5 (c)(11)(ii)(A)	0.02	
DT-2	120 bbl 95% water; 5% condensate tank exempted by §71.5 (c)(11)(ii)(A)	0.02	
DT-3	120 bbl 95% water; 5% condensate tank exempted by §71.5 (c)(11)(ii)(A)	0.02	
ST-1	120 bbl sump tank exempted by §71.5 (c)(11)(ii)(A)	1.19	

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

Identification		
User Identification:	DT-1 to DT-3	
City:	Lindrith	
State:	New Mexico	
Company:	Enterprise Field Services, LLC	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	120 bbl 95% water 5% condensate	
Tank Dimensions		
Shell Height (ft):		12.00
Diameter (ft):		8.50
Liquid Height (ft) :		11.89
Avg. Liquid Height (ft):		5.95
Volume (gallons):		5,047.53
Turnovers:		34.67
Net Throughput(gal/yr):		175,000.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Red/Primer	
Shell Condition	Poor	
Roof Color/Shade:	Red/Primer	
Roof Condition:	Poor	
Roof Characteristics		
Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

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

DT-1 to DT-3 - Vertical Fixed Roof Tank
Lindrith, 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
95% water 5% condensate	Jan	56.33	45.33	67.32	60.61	0.2347	0.1575	0.3437	19.6828			18.88	
Crude oil (RVP 5)						2.6761	2.1394	3.3163	50.0000	0.0500	0.1321	207.00	Option 4: RVP=5
Water						0.2236	0.1485	0.3301	18.0200	0.9500	0.8679	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Feb	61.02	47.73	74.31	60.61	0.2768	0.1721	0.4341	19.5671			18.88	
Crude oil (RVP 5)						2.9369	2.2482	3.7833	50.0000	0.0500	0.1236	207.00	Option 4: RVP=5
Water						0.2646	0.1626	0.4187	18.0200	0.9500	0.8764	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Mar	66.83	50.68	82.97	60.61	0.3379	0.1917	0.5746	19.4378			18.88	
Crude oil (RVP 5)						3.2850	2.3864	4.4333	50.0000	0.0500	0.1140	207.00	Option 4: RVP=5
Water						0.3244	0.1816	0.5569	18.0200	0.9500	0.8860	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Apr	73.63	54.39	93.26	60.61	0.4272	0.2191	0.7918	19.3001			18.88	
Crude oil (RVP 5)						3.7493	2.5746	5.3176	50.0000	0.0500	0.1037	207.00	Option 4: RVP=5
Water						0.4120	0.2083	0.7711	18.0200	0.9500	0.8963	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	May	79.74	58.57	100.91	60.61	0.5180	0.2541	0.9964	19.1971			18.88	
Crude oil (RVP 5)						4.1809	2.7981	6.0604	50.0000	0.0500	0.0959	207.00	Option 4: RVP=5
Water						0.5013	0.2426	0.9732	18.0200	0.9500	0.9041	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Jun	85.03	62.97	107.09	60.61	0.6132	0.2961	1.1941	19.1141			18.88	
Crude oil (RVP 5)						4.5998	3.0494	6.7197	50.0000	0.0500	0.0895	207.00	Option 4: RVP=5
Water						0.5950	0.2836	1.1688	18.0200	0.9500	0.9105	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Jul	85.66	65.36	106.96	60.61	0.6256	0.3215	1.1556	19.1046			18.88	
Crude oil (RVP 5)						4.6520	3.1840	6.5952	50.0000	0.0500	0.0888	207.00	Option 4: RVP=5
Water						0.6071	0.3093	1.1307	18.0200	0.9500	0.9112	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Aug	83.01	64.33	101.68	60.61	0.5752	0.3104	1.0195	19.1449			18.88	
Crude oil (RVP 5)						4.4358	3.1313	6.1400	50.0000	0.0500	0.0919	207.00	Option 4: RVP=5
Water						0.5575	0.2974	0.9960	18.0200	0.9500	0.9081	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Sep	77.48	60.82	94.14	60.61	0.4816	0.2749	0.8133	19.2351			18.88	
Crude oil (RVP 5)						4.0117	2.9247	5.3991	50.0000	0.0500	0.0988	207.00	Option 4: RVP=5
Water						0.4654	0.2628	0.7923	18.0200	0.9500	0.9012	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Oct	69.80	56.21	84.39	60.61	0.3736	0.2256	0.6010	19.3771			18.88	
Crude oil (RVP 5)						3.4762	2.6172	4.5475	50.0000	0.0500	0.1095	207.00	Option 4: RVP=5
Water						0.3584	0.2147	0.5829	18.0200	0.9500	0.8905	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Nov	61.33	49.62	73.04	60.61	0.2798	0.1844	0.4163	19.5597			18.88	
Crude oil (RVP 5)						2.8538	2.3372	3.6948	50.0000	0.0500	0.1231	207.00	Option 4: RVP=5
Water						0.2676	0.1746	0.4012	18.0200	0.9500	0.8769	18.02	Option 2: A=8.07131, B=1730.63, C=233.425
95% water 5% condensate	Dec	58.06	45.83	66.28	60.61	0.2325	0.1605	0.3317	19.6897			18.88	
Crude oil (RVP 5)						2.6818	2.1619	3.2510	50.0000	0.0500	0.1326	207.00	Option 4: RVP=5
Water						0.2214	0.1513	0.3184	18.0200	0.9500	0.8674	18.02	Option 2: A=8.07131, B=1730.63, C=233.425

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

DT-1 to DT-3 - Vertical Fixed Roof Tank
Lindrith, New Mexico

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.6029	1.0340	1.6980	2.5051	3.4254	4.1020	3.9617	3.3340	2.3979	1.6819	0.9796	0.7366
Vapor Space Volume (cu ft):	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154
Vapor Density (lb/cu ft):	0.0008	0.0010	0.0012	0.0014	0.0017	0.0020	0.0020	0.0019	0.0016	0.0013	0.0010	0.0008
Vapor Space Expansion Factor:	0.0958	0.1191	0.1500	0.1895	0.2156	0.2346	0.2161	0.1937	0.1650	0.1370	0.1044	0.0886
Vented Vapor Saturation Factor:	0.9290	0.9173	0.9009	0.8779	0.8557	0.8336	0.8308	0.8423	0.8645	0.8915	0.9165	0.9296
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154	348.6154
Tank Diameter (ft):	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000
Vapor Space Outage (ft):	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435
Tank Shell Height (ft):	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000
Average Liquid Height (ft):	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450	5.9450
Roof Outage (ft):	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885	0.0885
Roof Height (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Roof Slope (ft/ft):	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Shell Radius (ft):	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500	4.2500
Vapor Density												
Vapor Density (lb/cu ft):	0.0008	0.0010	0.0012	0.0014	0.0017	0.0020	0.0020	0.0019	0.0016	0.0013	0.0010	0.0008
Vapor Molecular Weight (lb/lb-mole):	19.6828	19.5671	19.4378	19.3001	19.1971	19.1141	19.1046	19.1449	19.2351	19.3771	19.5597	19.6897
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2347	0.2768	0.3379	0.4272	0.5180	0.6132	0.6256	0.5752	0.4816	0.3736	0.2798	0.2325
Daily Avg. Liquid Surface Temp. (deg. R):	515.9964	520.6894	526.4975	533.4984	539.4094	544.6989	545.3319	542.6785	537.1531	529.4710	521.0008	515.7285
Daily Average Ambient Temp. (deg. F):	34.2500	39.9500	46.8000	55.2000	64.1500	74.1500	78.4500	75.8000	68.5500	57.0000	44.2500	35.3000
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):	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842	520.2842
Tank Paint Solar Absorptance (Shell):	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Tank Paint Solar Absorptance (Roof):	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Daily Total Solar Insulation Factor (Btu/sqft day):	1,017.1676	1,321.1123	1,709.7680	2,169.4923	2,443.9308	2,567.6661	2,392.5331	2,185.3558	1,860.7886	1,499.1008	1,101.2442	915.8412
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0958	0.1191	0.1500	0.1895	0.2156	0.2346	0.2161	0.1937	0.1650	0.1370	0.1044	0.0886
Daily Vapor Temperature Range (deg. R):	43.9894	53.1739	64.5889	77.7427	84.6634	88.2481	81.1937	74.6909	66.6369	58.3571	46.8517	40.8985
Daily Vapor Pressure Range (psia):	0.1861	0.2620	0.3829	0.5727	0.7423	0.8980	0.8341	0.7091	0.5384	0.3754	0.2318	0.1712
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):	0.2347	0.2768	0.3379	0.4272	0.5180	0.6132	0.6256	0.5752	0.4816	0.3736	0.2798	0.2325
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.1575	0.1721	0.1917	0.2191	0.2541	0.2961	0.3215	0.3104	0.2749	0.2256	0.1844	0.1605
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.3437	0.4341	0.5746	0.7918	0.9964	1.1941	1.1556	1.0195	0.8133	0.6010	0.4163	0.3317
Daily Avg. Liquid Surface Temp. (deg R):	515.9964	520.6894	526.4975	533.4984	539.4094	544.6989	545.3319	542.6785	537.1531	529.4710	521.0008	515.7285
Daily Min. Liquid Surface Temp. (deg R):	504.9990	507.3959	510.3502	514.0627	518.2435	522.6369	525.0334	524.0037	520.4939	514.8817	509.2879	505.5038
Daily Max. Liquid Surface Temp. (deg R):	526.9937	533.9829	542.6447	552.9341	560.5752	566.7609	565.6303	561.3492	553.8124	544.0602	532.7137	525.9531
Daily Ambient Temp. Range (deg. R):	25.1000	27.1000	29.2000	31.2000	31.1000	31.7000	28.1000	26.4000	26.7000	28.0000	26.1000	24.4000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9290	0.9173	0.9009	0.8779	0.8557	0.8336	0.8308	0.8423	0.8645	0.8915	0.9165	0.9296

Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2347	0.2768	0.3379	0.4272	0.5180	0.6132	0.6256	0.5752	0.4816	0.3736	0.2798	0.2325
Vapor Space Outage (ft):	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435	6.1435
Working Losses (lb):	1.6043	1.8806	2.2809	2.8629	3.4531	4.0699	4.1498	3.8235	3.2162	2.5138	1.9003	1.5897
Vapor Molecular Weight (lb/lb-mole):	19.6828	19.5671	19.4378	19.3001	19.1971	19.1141	19.1046	19.1449	19.2351	19.3771	19.5597	19.6897
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.2347	0.2768	0.3379	0.4272	0.5180	0.6132	0.6256	0.5752	0.4816	0.3736	0.2798	0.2325
Net Throughput (gal/mo.):	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333	14,583.3333
Annual Turnovers:	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704	34.6704
Turnover 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
Maximum Liquid Volume (gal):	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346	5,047.5346
Maximum Liquid Height (ft):	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910	11.8910
Tank Diameter (ft):	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000	8.5000
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):	2.4072	2.9146	3.9789	5.3681	6.8786	8.1719	8.1115	7.1575	5.6141	4.1956	2.8799	2.3263

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

Emissions Report for: Annual

DT-1 to DT-3 - Vertical Fixed Roof Tank
Lindrith, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
95% water 5% condensate	33.34	26.66	60.00
Crude oil (RVP 5)	3.45	2.68	6.13
Water	29.89	23.98	53.87

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

Identification

User Identification:	ST-1	
City:	Lindrith	
State:	New Mexico	
Company:	Enterprise Field Services, LLC	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	120 bbl Sump Tank	

Tank Dimensions

Shell Height (ft):		12.00
Diameter (ft):		8.50
Liquid Height (ft) :		11.89
Avg. Liquid Height (ft):		5.95
Volume (gallons):		5,047.53
Turnovers:		1.00
Net Throughput(gal/yr):		5,047.53
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Red/Primer	
Shell Condition	Poor	
Roof Color/Shade:	Red/Primer	
Roof Condition:	Poor	

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

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

ST-1 - Vertical Fixed Roof Tank
Lindrith, 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
Stabilized Condensate	All	71.34	55.07	87.61	60.61	6.3811	4.7071	8.4660	66.0000			92.00	Option 1: VP70 = 6.2 VP80 = 7.4

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

ST-1 - Vertical Fixed Roof Tank
Lindrith, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	2,324.2624
Vapor Space Volume (cu ft):	348.8154
Vapor Density (lb/cu ft):	0.0737
Vapor Space Expansion Factor:	0.7614
Vented Vapor Saturation Factor:	0.3256
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	348.8154
Tank Diameter (ft):	8.5000
Vapor Space Outage (ft):	6.1435
Tank Shell Height (ft):	12.0000
Average Liquid Height (ft):	5.9450
Roof Outage (ft):	0.0885
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.0885
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	4.2500
Vapor Density	
Vapor Density (lb/cu ft):	0.0737
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.3611
Daily Avg. Liquid Surface Temp. (deg. R):	531.0126
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	520.2842
Tank Paint Solar Absorptance (Shell):	0.9100
Tank Paint Solar Absorptance (Roof):	0.9100
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.7614
Daily Vapor Temperature Range (deg. R):	65.0863
Daily Vapor Pressure Range (psia):	3.7589
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.3611
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.7071
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	8.4660
Daily Avg. Liquid Surface Temp. (deg R):	531.0126
Daily Min. Liquid Surface Temp. (deg R):	514.7411
Daily Max. Liquid Surface Temp. (deg R):	547.2842
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3256

Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	6.3611
Vapor Space Outage (ft):	6.1435
Working Losses (lb):	50.4554
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	6.3611
Annual Net Throughput (gal/yr.):	5,047.5346
Annual Turnovers:	1.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	5,047.5346
Maximum Liquid Height (ft):	11.8910
Tank Diameter (ft):	8.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	2,374.7178

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

Emissions Report for: Annual

ST-1 - Vertical Fixed Roof Tank
Lindrith, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Stabilized Condensate	50.46	2,324.26	2,374.72

EPA United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-1 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___ Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID: ______ Device Type: ______

Manufacturer: ______ Model No.: ______

Serial No.: ______ Installation date: ______

Control efficiency (%): ______ Capture efficiency (%): ______

Air pollutant(s) controlled: ______ Efficiency estimation method: ______

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ___________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ___________.______ Design stack flow rate (ACFM) ___________.______

Actual stack flow rate (ACFM) ___________.______ Velocity (ft/sec) ___________.______

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-1

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	1.00	4.40	N/A

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

Identification

User Identification:	TK-1 to TK-8	
City:	Lindrith	
State:	New Mexico	
Company:	Enterprise Field Services, LLC	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	450 bbl Condensate Tanks	

Tank Dimensions

Shell Height (ft):		19.00
Diameter (ft):		13.00
Liquid Height (ft) :		19.00
Avg. Liquid Height (ft):		9.50
Volume (gallons):		18,865.29
Turnovers:		13.91
Net Throughput(gal/yr):		262,500.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Red/Primer	
Shell Condition	Poor	
Roof Color/Shade:	Red/Primer	
Roof Condition:	Poor	

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

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

TK-1 to TK-8 - Vertical Fixed Roof Tank
Lindrith, 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
Stabilized Condensate	All	71.34	55.07	87.61	60.61	6.3611	4.7071	8.4660	66.0000			92.00	Option 1: VP70 = 6.2 VP80 = 7.4

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

TK-1 to TK-8 - Vertical Fixed Roof Tank
Lindrith, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	6,164.0285
Vapor Space Volume (cu ft):	1,278.9309
Vapor Density (lb/cu ft):	0.0737
Vapor Space Expansion Factor:	0.7614
Vented Vapor Saturation Factor:	0.2354
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,278.9309
Tank Diameter (ft):	13.0000
Vapor Space Outage (ft):	9.6354
Tank Shell Height (ft):	19.0000
Average Liquid Height (ft):	9.5000
Roof Outage (ft):	0.1354
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1354
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	6.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0737
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.3611
Daily Avg. Liquid Surface Temp. (deg. R):	531.0126
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	520.2842
Tank Paint Solar Absorptance (Shell):	0.9100
Tank Paint Solar Absorptance (Roof):	0.9100
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.7614
Daily Vapor Temperature Range (deg. R):	65.0863
Daily Vapor Pressure Range (psia):	3.7589
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.3611
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.7071
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	8.4680
Daily Avg. Liquid Surface Temp. (deg R):	531.0126
Daily Min. Liquid Surface Temp. (deg R):	514.7411
Daily Max. Liquid Surface Temp. (deg R):	547.2842
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2354

Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	6.3611
Vapor Space Outage (ft):	9.6354
Working Losses (lb):	2,623.9601
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	6.3611
Annual Net Throughput (gal/yr.):	262,500.0000
Annual Turnovers:	13.9144
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	18,865.2856
Maximum Liquid Height (ft):	19.0000
Tank Diameter (ft):	13.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	8,787.9886

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

Emissions Report for: Annual

TK-1 to TK-8 - Vertical Fixed Roof Tank
Lindrith, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Stabilized Condensate	2,623.96	6,164.03	8,787.99

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-2 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___ Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:________ Device Type:________

Manufacturer:________ Model No.:________

Serial No.:________ Installation date:________

Control efficiency (%):________ Capture efficiency (%):________

Air pollutant(s) controlled:________ Efficiency estimation method:________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) __________.______ Inside stack diameter (ft) __________.______

Stack temp (F) __________.______ Design stack flow rate (ACFM) __________.______

Actual stack flow rate (ACFM) __________.______ Velocity (ft/sec) __________.______

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-2

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

	Emission Rates			
	Actual Annual Emissions (tons/yr)	Potential to Emit		
Air Pollutants		Hourly (lb/hr)	Annual (tons/yr)	CAS No.
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-3 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:_______ Device Type:_______

Manufacturer:_______ Model No.:_______

Serial No.:_______ Installation date:_______

Control efficiency (%):_______ Capture efficiency (%):_______

Air pollutant(s) controlled:_______ Efficiency estimation method:_______

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ___________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ___________.______ Design stack flow rate (ACFM) ___________.______

Actual stack flow rate (ACFM) ___________.______ Velocity (ft/sec) ___________.______

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-3

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-4 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___ Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:________ Device Type:________

Manufacturer:________ Model No.:________

Serial No.:________ Installation date:________

Control efficiency (%):________ Capture efficiency (%):________

Air pollutant(s) controlled:________ Efficiency estimation method:________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ___________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ___________.______ Design stack flow rate (ACFM) ___________.______

Actual stack flow rate (ACFM) ___________.______ Velocity (ft/sec) ___________.______

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-4

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-5 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:_______ Device Type:_______

Manufacturer:_______ Model No.:_______

Serial No.:_______ Installation date:_______

Control efficiency (%):_______ Capture efficiency (%):_______

Air pollutant(s) controlled:_______ Efficiency estimation method:_______

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ________.____ Inside stack diameter (ft) ________.____

Stack temp (F) ________.____ Design stack flow rate (ACFM) ________.____

Actual stack flow rate (ACFM) ________.____ Velocity (ft/sec) ________.____

EPA United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-5

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-6 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:________ Device Type:________

Manufacturer:________ Model No.:________

Serial No.:________ Installation date:________

Control efficiency (%):________ Capture efficiency (%):________

Air pollutant(s) controlled:________ Efficiency estimation method:________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) __________._____ Inside stack diameter (ft) __________._____

Stack temp (F) __________._____ Design stack flow rate (ACFM) __________._____

Actual stack flow rate (ACFM) __________._____ Velocity (ft/sec) __________._____

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-6

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-7 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___ Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:____ Device Type:____

Manufacturer:____ Model No.:____

Serial No.:____ Installation date:____

Control efficiency (%):____ Capture efficiency (%):____

Air pollutant(s) controlled:____ Efficiency estimation method:____

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ________.____ Inside stack diameter (ft) ________.____

Stack temp (F) ________.____ Design stack flow rate (ACFM) ________.____

Actual stack flow rate (ACFM) ________.____ Velocity (ft/sec) ________.____

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-7

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TK-8 Description: Condensate Tank

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate Tank

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.71 bbl	6,250 bbl
Maximum rate	0.71 bbl	6,250 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:______ Device Type:______

Manufacturer:______ Model No.:______

Serial No.:______ Installation date:______

Control efficiency (%):______ Capture efficiency (%):______

Air pollutant(s) controlled:______ Efficiency estimation method:______

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ___________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ___________.______ Design stack flow rate (ACFM) ___________.______

Actual stack flow rate (ACFM) ___________.______ Velocity (ft/sec) ___________.______

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TK-8

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates: Actual Annual Emissions (tons/yr)	Potential to Emit: Hourly (lb/hr)	Potential to Emit: Annual (tons/yr)	CAS No.
VOCs	N/A	1.00	4.40	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: LR-C Description: Loading Rack

SIC Code (4-digit): 4922 SCC Code: 31088811

B. Emissions Unit Description

Primary use or equipment type: Loading Rack

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date: TBD

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	5.71 bbl	50,000 bbl
Maximum rate	5.71 bbl	50,000 bbl

D. Associated Air Pollution Control Equipment

Emissions unit ID:______ Device Type:______

Manufacturer:______ Model No.:______

Serial No.:______ Installation date:______

Control efficiency (%):______ Capture efficiency (%):______

Air pollutant(s) controlled:______ Efficiency estimation method:______

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ________.____ Inside stack diameter (ft) ________.____

Stack temp (F) ________.____ Design stack flow rate (ACFM) ________.____

Actual stack flow rate (ACFM) ________.____ Velocity (ft/sec) ________.____

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: LR-C

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOCs	N/A	2.36	10.34	N/A

Enterprise Field Products, LLC -- Lindrith Compressor Station

Condensate Loading Operation

Emission Unit: LR-C
Source Description: Condensate Loading Rack Hose Fugitives

VOC Emissions

Loading Rack

				Notes
S	1.00		Saturation Factor (AP-42, Table 5.2-1)	Dedicated Vapor Balance Service, Submerged Loading
P	6.36	psia	True Vapor Pressure	TANKS 4.09b, Stabilized Condensate (RVP 10)
M	66.00	lb/lb-mol	Molecular Weight of Vapors	TANKS 4.09b, Stabilized Condensate (RVP 10)
T	71.34	F	Temperature of Bulk Liquid Loaded	TANKS 4.09b, Stabilized Condensate (RVP 10)
T	531.34	R	F+460	AP-42 Sec. 5.2
L_{LU}	9.85	lb/Mgal	Uncontrolled Loading Rack VOC Emissions	L_{LU} = 12.46 (SPM)/T (AP-42 Sec. 5.2)

Loading Rack Throughput

2,100,000	gal/yr	Maximum Loading Rack Throughput Limit - Condensate	
5,753	gal/day	gal/yr / 365	Facility Permit
5.8	Mgal/day	gal/day / 1000	
0.24	Mgal/hr	Mgal/day / 24	

Uncontrolled Loading Rack Emissions

2.36	lb/hr	L_{LU} (lb/Mgal) * Mgal/hr
10.34	tpy	lb/hr * 8760 hrs/yr / 2000 lb/ton

Plains Bulk Terminal

Diesel Loading Operations

Emission Unit: Diesel loading rack

Source Description: Diesel Fuel Loading Rack Hose Fugitives

VOC Emissions

Loading Rack

				Notes
S	1.00		Saturation Factor (AP-42, Table 5.2-1)	Dedicated Vapor Balance Service, Submerged Loading
P	0.01	psia	True Vapor Pressure	TANKS 4.09b, Distillate Fuel Oil #2
M	130.00	lb/lb-mol	Molecular Weight of Vapors	TANKS 4.09b, Distillate Fuel Oil #2
T	56.17	F	Temperature of Bulk Liquid Loaded	TANKS 4.09b, Met. conditions for Albuquerque
T	516.17	R	F+460	AP-42 Sec. 5.2
L_{LU}	0.02	lb/Mgal	Uncontrolled Loading Rack VOC Emissions	L_{LU} = 12.46 (SPM)/T (AP-42 Sec. 5.2)

Loading Rack Throughput

	124,939,500	gal/yr	Maximum Loading Rack Throughput Limit - Gasoline	
	342,300	gal/day	gal/yr / 365	Facility Permit
	342.3	Mgal/day	gal/day / 1000	
	14.26	Mgal/hr	Mgal/day / 24	

Uncontrolled Loading Rack Emissions

	0.28	lb/hr	L_{LU} (lb/Mgal) * Mgal/hr	
	1.22	tpy	lb/hr * 8760 hrs/yr / 2000 lb/ton	

Controlled Loading Rack Emissions - Accounted for in Chevron Permit #47-M1

	99.5	eff	VRU Control Efficiency	Chevron Permit #47-M1
	0.0050	Overall reduction efficiency	1-eff / 100	AP-42 Sec. 5.2
L_{LC}	0.0001	lb/Mgal	Controlled Loading Rack VOC Emissions	Uncontrolled * Overall Reduction Efficiency
	1.39E-03	lb/hr	L_{LC} (lb/Mgal) * Mgal/hr	
	6.08E-03	tpy	lb/hr * 8760 hrs/yr / 2000 lb/ton	

Loading Rack Hose Fugitives

	99.20%	%	Loading Rack Collection Efficiency	Chevron Permit #47-M1
	0.80%	Remainder	1-Loading Rack Collection Efficiency	
	0.28	lb/hr	Potential Uncontrolled VOC Emissions	Calculated Above
	2.22E-03	lb/hr	Fugitive Loading Rack VOC Emissions	Uncontrolled Loading Rack Emissions * Remainder
	9.72E-03	tpy	Fugitive Loading Rack VOC Emissions	lb/hr * 8760 hrs/yr / 2000 lb/ton

NOTES:

1 Controlled emissions are accounted for in Chevron's permit (47-M1)

2 tpy = lb/hr x 8760hr/yr / 2000lb/ton

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User Name :

PLCAIN

File Name : Document

Start Page

Environmental Data Resources, Inc.
440 Wheelers Farms Road
Milford, CT 06461
Phone: 866-783-4738
Fax: 203-783-0303

STATEMENT

Attention: Accounts Payable
Enterprise Products
1100 Louisiana Street
Houston, TX 77002

Date:05/03/2010

Acct:6014276

Regional Manager: NSR

Account Executive: GON

Invoice Number	Invoice Date	Description	Ordered By	Date Ordered	Date Shipped	Invoice Amount	Payments	Balance	Days Old
2711229	03/24/2010	1 PSP	Peter Cain	03/02/2010	03/24/2010	392.90	0.00	392.90	40
2727737	03/24/2010	1 PBA	Russell Gregg	03/23/2010	03/24/2010	199.22	0.00	199.22	40
2716567	03/22/2010	1 PSP	Peter Cain	03/09/2010	03/22/2010	392.90	0.00	392.90	42
2716592	03/22/2010	1 PSP	Peter Cain	03/09/2010	03/22/2010	392.90	0.00	392.90	42
2723638	03/22/2010	1 PST,1 XAP	Peter Cain	03/17/2010	03/22/2010	804.63	0.00	804.63	42
					Total:	2,182.55	0.00	2,182.55	

Orders totaled less than 30 Days:		
Orders totaled between 31 - 45 Days:		$ 2,182.55
Orders totaled between 46 - 60 Days:		
Orders totaled between 61 - 70 Days:		
Orders totaled greater than 70 Days:		
Total:		$ 2,182.55

Payable Upon Receipt

(6)

Document No. 6

Enterprise Products™

July 2, 2009

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC

ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

Return Receipt Requested
7008 3230 0002 4472 9669

Ms. Catherine G. Penland
U.S. Environmental Protection Agency
Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RE: Enterprise Field Services, LLC
Lindrith Compress Station, Permit No. R6FOPP71-03

Dear Ms. Penland:

Enterprise Field Services, LLC, hereby submits the following response to your request for additional information received in an email dated March 2, 2009. A conference call between United States Environmental Protection Agency (USEPA) Region VI and Enterprise representatives was held on March 12, 2009 to clarify questions included in the inquiry. During this call, Enterprise determined that our Lindrith permit files were incomplete as this facility was acquired in 2004. Subsequently, Enterprise completed a Freedom of Information Act and file review at the USEPA offices in Dallas, TX on March 23, 2009. Requested information was provided to Enterprise on April 15, 2009. The following is in response to the EPA's inquiry dated March 2, 2009.

1. Do you have a functioning flash tank and vent gas emission control system?

Correspondence with USEPA in 2000 and 2002 indicates that the dehydrator was equipped with a condenser to control emissions such that the facility became an area source for HAPs. EPA's response in 2003 and the subsequently revised permit indicate that EPA concurred with that determination. The flash tank on the dehydrator was also present at that time.

Note that the flash tank referred to here is part of the dehydrator, and has no relationship to the condensate tanks.

2. If not, why not?

See above. Flash tank and dehydrator condenser in place.

3. If so, when was it originally installed?

Based on correspondence with USEPA, including the 1994 Letter of Negative Declaration and the 1995 PSD synthetic minor permit, the facility was designed by El Paso Natural Gas to include a condenser on the dehydrator regenerator. The presence of a flash tank on the dehydrator was confirmed, and a condenser was in place, as noted in further correspondence with USEPA in 2002.

4. When the flash tank and vent gas emission control system was first installed, what were the emissions from this system?

Based on calculations submitted to USEPA in 2002, it appears that total dehydrator emissions were calculated at 34.1 tpy VOCs, and 6.3 tpy HAPs. El Paso Field Services, the contemporaneous operator of the facility, sought emission limits of 40 tpy VOCs and 8 tpy HAPs.

5. Have there been modifications to this system? Name equipment related.

Enterprise is not aware of modifications with the potential to affect operation or emissions, prior to the 2008 application to replace the condensate tanks. The engines, dehydrator and associated control devices have been maintained; such maintenance would normally include replacement of components with functional equivalents.

6. If so, what and when, and were they permitted/type permit and number?

See above. Enterprise is not aware of modifications with the potential to affect operation or emissions prior to the 2008 permit modification.

7. This is a PSD source. What BACT controls are selected for this source?

Lindrith Compressor Station is not a PSD source. Although Enterprise was not involved at the time, Enterprise understands that the 1994 "negative declaration" was submitted to EPA for the purpose of establishing that the facility was not subject to PSD; which it so states. Enterprise' understanding is that the facility was in existence well before the effective date of PSD regulations, and that the then-owner of the facility, El Paso Natural Gas, sought to retire existing compressors and install new, low-emitting compressors, as per the 1994 document. The installation of the new units, considered in itself, would have been a major modification. Consequently, El Paso conducted a netting evaluation and determined that the facility would be a minor source after completing the modifications. It appears from context that EPNG submitted the 1994 filing after consultation with USEPA, with the intent of establishing that the facility was, with this change, indeed a minor source; and to establish enforceable conditions to that effect.

EPA's response in the form of Permit PSD-NM-1644 clearly identifies the facility as a minor source; emissions in Table 1 are less than major source thresholds. Moreover, EPA's May 11, 1995 document specifically states that the facility was to be permitted as a synthetic minor source, with the potential to emit below major source threshold. It appears, based on the documentation, that EPA intended Permit PSD-NM-1644 to be, in effect, a minor source permit for the facility.

The April 10, 1997 modification to this permit, PSD-NM-1644-M1, also states in several places in the Determination Summary that the facility is a minor source and not subject to PSD; for example, the second page of the Determination, midway, says "this facility is permitted by EPA as a minor stationary source with emissions below the major source threshold of 250 tpy". The next page, Control Technology Analysis, states "The Best Available Control Technology analysis is not required for this project since the proposed emission increase of all pollutants are below PSD major source threshold."

Enterprise therefore concludes that the facility is not and never has been a PSD source.

Enterprise believes that EPA subsequently chose to use the Title V program to regulate the facility, rather than the minor source—PSD program previously used, as Enterprise notes no further mention of PSD permitting subsequent to the implementation of Title V. Furthermore, Enterprise sees no reference to PSD-NM-1644 in the Title V permit.

Enterprise understands that EPA chose this path because there was, and is at the present time, no minor source program in effect on Tribal lands, and the Title V permit therefore supplants the previously-issued synthetic minor pseudo-PSD permit and is therefore the correct method by which to regulate the source. Enterprise understands that EPA no longer issues such PSD minor source permits and generally regulates PSD minor, but Title V major sources by this mechanism.

8. What is the history of actual emissions from this source for each piece of equipment, including the ECS?

Enterprise can provide a detailed listing of emissions from each source, based on available documentation. Attached is a timeline identifying significant events and correspondence, and emissions from the facility.

9. There is a very large increase in VOC's and HAPs, beginning with the 2005 reporting period, and continuing through the last reporting period. You suspected this might be from flash gas, which may not have been previously accounted for. Explain.

A review of available documents indicates that prior to approximately 2005, it was assumed by the facility operators, including the previous owners, that emissions from the condensate tanks were negligible; in fact, the tanks were not identified by the contemporaneous operator in the 1994 Negative Declaration. Enterprise re-evaluated the tank emissions in 2005-2006 and concluded that emissions from the tanks, taking into account flashing emissions, were not insignificant, as was previously assumed, and calculated and reported such emissions. Enterprise believes that the calculated and reported emission rates were unrealistically high and is investigating the matter.

Note that flashing emissions from the tanks are un-related to the flash tank installed on the dehydrator.

10. If the purpose of the ECS was to control flash gas, further explain the 2005 through present increases.

Enterprise points out that there may be some miscommunication here regarding the facility, and seeks to clarify the matter as follows.

The facility as constructed pursuant to the 1995 permit, and currently operated, consists of the following;

- Three natural gas-fueled compressors (Caterpillar 3612 LE's, two of them equipped with oxidation catalysts to reduce CO emissions);

- A dehydrator, encompassing a reboiler to provide heat, and a regenerator, or still, to remove water from the glycol. The regenerator is a source of VOC and HAP emissions. Offgas from the regenerator is directed to a condenser to recover condensable liquids and therefore reduce VOC and HAP emissions. The dehydrator is also equipped with a flash tank (a vessel in the rich glycol stream in which some volatile components are allowed to "flash" from the glycol, with the effect of reducing emissions from the regenerator). The combined effect of the flash tank in the glycol stream, and the condenser in the regenerator off gas stream, is to substantially reduce emissions from the dehydrator still vent, or regenerator (the terms are often used interchangeably).
- The facility also includes tanks into which condensed liquids from the inlet separators (not in themselves sources of emissions) are directed; as are the condensed liquids from the dehydrator condenser. Prior to approximately 2005, these liquids were believed to have no potential to flash; working and breathing emissions were calculated using EPA TANKS. In 2006 Enterprise proposed to install a vapor recovery system to stabilize the condensate to be stored in the tanks, such that flashing emissions from the tanks would be essentially eliminated. In November 2008 Enterprise submitted an updated application to replace the existing tanks with 8 new tanks, and to install the condensate stabilization system.

Enterprise notes that it may not have been clear in the term "flash", which has two different applications at this facility.

- Emissions from the flash tank component of the dehydrator are accounted for in the calculations of dehydrator emissions.
- The condensate tanks are also sources of emissions from flashing; this is a different potential source from the dehydrator, and one which Enterprise is in process of addressing.

11. Has the facility ever operated the dehydrator unit with condenser tanks without the emission control system? When and why? Details?

The current control system for the dehydrator was installed in approximately 2002. Previous applications and permits indicate the presence of controls on the dehydrator regenerator. The condensate tanks currently installed were constructed prior to 1972, with no controls. The new tanks will be equipped with a stabilization system.

12. What were the flash gas emissions from this facility for the first 2 years of the current Title V permit, if they were not accounted for in the Fee Schedules?

Enterprise understands this question to refer to flashing emissions from the condensate tanks. Enterprise has not quantified these emissions for years prior to the 2005 reporting period; and believes that the quantification for 2005 and subsequent years is a significant over-estimate. Enterprise is investigating this issue.

13. Clarify MACT HH applicability to this source, and provide rationale.

As stated in the 2002 correspondence, Enterprise believes the facility to have been an area source for HH at that time, as HAP emissions as then quantified were less than major source thresholds, and the only identified affected facility, the dehydrator, was controlled to less than major source status. Enterprise has not evaluated consequences from potential HAP emissions from the condensate tanks, and is in the process of doing so.

14. Did you submit a modification request to EPA in 2008 to do a replacement? Have you done that replacement? If so, why?

Enterprise has replaced unit A-03 with an identical unit as the result of catastrophic failure. Enterprise believes such replacement is an administrative modification, authorized by the Title V permit, as it involves only a change in serial number, the facility being a minor source and the replacement requiring no changes or additions to permit terms and conditions.

15. You have a significant modification request in for this source, dated 11/08. Are you already in the process of constructing? If so, why?

Enterprise believes that the replacement is not a significant modification, as discussed above. The failed unit has been replaced.

Enterprise has also sought a modification to replace the existing condensate tanks with new tanks, to be equipped with a condensate stabilization system, resulting in a substantial reduction in emissions.

16. Is Enterprise Services engaged in a Joint Venture with the Jicarilla Apache Tribe? If so, does this Venture in any way involve this facility?

Enterprise' strives to maintain a good relationship with the Jicarilla Apache Tribe. There is no formal "joint venture" relationship regarding this facility. However, Enterprise was in negotiations to form a Joint Venture with the Jicarilla Apache Tribe during the period of 2006 to 2008. Enterprise entered into an agreement to operate on the Jicarilla Apache tribe on May --, 2009. **This paragraph needs clarification from legal.**

Are you aware?:

1. The ECS system is listed for installation twice over 2 separate construction permits (PSD-NM-1644 and NM-1644-R1). Any explanation?

Enterprise understands references to ECS in this context to refer to the emission controls installed on the engines; oxidation catalysts. Enterprise notes that controlled emissions from the facility are below major source thresholds and that therefore PSD is not applicable.

Enterprise suspects that, again, confusion results from the issuance of a PSD permit for a non-PSD source. In 1995, USEPA issued a permit under the PSD program memorializing the facility's minor source status; effectively using the PSD program for minor source permitting. Enterprise understands that this was common practice at the time.

2. The reductions in emissions this system was supposed to initially result in, were included in a netting analysis for PSD-NM-1644, but were also available against the

increases in NM-1644-R1. Can you explain this double use of decreases in two separate PSD significance evaluations?

Enterprise notes that the facility is a minor source, and was a minor source with the issuance of PSD-NM-1644. No actual netting has occurred, although the term was incorrectly used in the Negative Declaration filed in 1994. Permit 1644 authorized construction of a minor source, the facility essentially as it exists now, and required retirement of previously-existing emissions units.

If you have questions or require additional information, please contact Mr. Don Fernald, Area Environmental Scientist at 505-599-2141 or me directly at 713-381-6518.

Yours truly,

Enterprise Field Services LLC
Enterprise Products Operating LLC

Mary E. Hebert
Director, Field Environmental

/sjn
attachment – Permit Timeline

cc: Environmental Director – Jicarilla Apache Reservation
Joe Velasquez, Enterprise/Farmington, NM
Ralph Morris, Enterprise/Farmington, NM

Date	From	To	Summary	NOx	CO	VOC	HAP
				tpy	tpy	tpy	tpy
12/2/1994	EPNG	EPFS	Negative Declaration; facility not major source. EPA evidently issued PSD permit NM 1644 in response to this, to establish enforceable conditions.	56	66	47	
4/25/1995	EPA	EPFS	PSD Permit NM 1644. Remove Coopers, Clarks, Install 3, 3612, 65 MMscf/d dehy (downsized). No tanks mentioned.	57.19	66.29	92.52	
4/15/1996	EPFS	Mary Stanton EPA	re-rate 3612's				
10/3/1996	EPA	EPFS	completeness of re-rate application				
12/6/1996	EPFS	memo to file	public notice addresses				
12/3/1996	EPA	EPFS	Draft permit to uprate horsepower. Same equipment, no tanks	62.62	93.52	191.4	
12/9/1996	EPFS	EPA	Comments on draft permit, testing				
4/10/1997	EPA	EPFS	revised permit NM 1644 M1; uprate hp, increase dehy capacity to 90 MMscf/d, install controls on flash tank and regenerator	62.62	93.53	191.4	
12/22/1999	EPFS	EPA	response to request for information, part 71 permit R6FOPP71-03. Details of emission calculations. Also includes Compliance Progress Report regarding quarterly sulfur in fuel monitoring and g/hp-hr efficiency in permit, requests g/hp-hr be deleted because emission limits met.	70	95	157	58
6/9/2000	EPFS	EPA	initial notification of major source status; states will install controls to be synthetic minor for HAPs.				
2/12/2002	ESI/EPFS	EPA	add condenser to dehy, reduce VOCs, HAPs from dehy to 40 tpy VOC, 8 tpy HAP				
5/15/2003	EPA	EPFS	Draft permit. No tanks.	68.48	95.5	191.47	55
6/11/2003	EPFS	EPA	comments on draft permit. Points out that VOCs and HAPs reduced, points to Table 3, reference to 40 CFR 64 as indication that EPA accepts dehy controls.				
11/17/2003	EPA	EPFS	response to comments.				
12/3/2004	ESI/GulfTerra	EPA	points out that HH not applicable because dehy controlled.				
3/21/2005	Enterprise	EPA	Request for administrative rev; delete HH as applicable and correct dehydrator emissions. Letter also states that no tanks with "potential for flashing emissions".				
9/9/2005	Enterprise	EPA	administrative revision; requests change of dates for reports and certifications				
12/15/2005	Enterprise	EPA	Administrative revision to adjust fuel usage for engines				
4/26/2006	Enterprise	EPA	request that HH be removed as applicable requirement, states that VRU to be installed by August 2006.				
4/30/2008	Enterprise	EPA	Renewal application. Identifies condensate tanks. States that VRU will be installed on tanks by 11/15/08.	68.46	95.2	119.32	21.2
6/11/2008	Enterprise	EPA	update to application. Adds insignificant activities.	68.46	103.3	119.32	21.5
11/3/2008	Enterprise	EPA	Revision to application; replace all tanks with 8 new tanks, with condensate stabilization system	68.49	103.21	159.86	21.5

Enterprise Products™

(7)

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC

ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

May 14, 2010

Return Receipt Requested
7009 2820 0002 5083 2840

Mr. Jeffrey Robinson, Chief, Air Permits Section, 6PD-R
Multimedia Permitting and Planning Division
Environmental Protection Agency – Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Document No. 7

RECEIVED - 6PDL
AIR PLANNING SEC
10 MAY 24 PM 2:07

Re: Enterprise Field Services, LLC
Lindrith Compressor Station (Facility)
Revision to Previously Submitted Application Dated May 12, 2008
Permit Number R6FOPP71-03

Dear Mr. Robinson:

Enterprise Field Services, LLC (Enterprise) is submitting a permit application update for the above referenced Facility. Enterprise submitted a permit renewal package to EPA on May 12, 2008. The renewal application remains pending before EPA. This submittal updates that application and represents recent changes that were designed to reduce emissions from the station.

By way of background, in a letter to EPA dated November 3, 2008, Enterprise requested a significant revision to the Lindrith Compressor Operating Permit R6FOPP71-03. In that letter, Enterprise had requested, among other things, removal of two, existing 500-bbl condensate storage tanks and installation of eight new 450-bbl condensate storage tanks, three 120 bbl drain tanks, one 120 bbl sump, and a new loading rack for transporting the condensate from the tanks. The estimated annual condensate throughput at that time was up to 50,000 bbls total for the new tanks. A copy of the November 3, 2008 letter is attached for your reference. In addition to the removal of the two existing 500 bbl condensate storage tanks located within the station fence line, four 500-bbl tanks located in a battery approximately 225 yards to the southeast of the facility were removed. The former tank battery within the station fence line was used to capture liquids associated with various "scrubber dumps" associated with natural gas compression. The former tank battery located southeast of the facility was used to collect and temporarily store liquids associated with pipeline pigging operations. Both of these tank batteries were removed in the summer of 2009 after construction of the new, eight 450 bbl tank battery. Produced liquids stored in the new tanks (water and petroleum condensate) will gravity separate. The drain tanks are used to separate water from the petroleum condensate prior to trucking off site.

In the May 12, 2008 renewal application, based on Enterprise's understanding of operating criteria and the best emissions estimates at that time, Enterprise voluntarily proposed to install a vapor recovery unit (VRU) or a stabilizer by November, 2008 to recover volatile organic compounds from petroleum condensate prior to routing stabilized condensate to atmospheric storage tanks at the Facility. Enterprise thereafter installed the proposed VRU, but encountered significant operating issues with the unit, which required that Enterprise review other options to address VOC emissions from the tanks at the Facility. Shortly after it became clear that the VRU/stabilizer would not work, Enterprise changed the operating scenario at the Facility. Specifically, it rerouted the final discharge stream, a two phase flow of hydrocarbon vapors and liquids, past the facility "discharge contactor scrubbers," which has resulted in a dramatic decrease in volatile organic compound emissions from the condensate storage tanks. The discharge scrubbers typically operated around 250 PSIG which resulted in the liquid phase of hydrocarbons, such as propane, butane and other VOCs, dumping to the facilities atmospheric storage tanks. The result of rerouting the product flow was that most of the VOC liquids no longer relieve to the tanks, but instead, remain in the pipeline to be later removed and processed at a downstream facility. The annual emissions from the Facility's condensate storage tanks following the change in the operating scenario are estimated to be below five tons per year *in the aggregate* using the HySys model. The condensate storage tanks currently collect mostly produced water and some petroleum condensate. The discharge line from the discharge contactor scrubber is being permanently disconnected.

The following table provides approximate volumes of liquids produced and transported from Lindrith in 2009.

2009 Liquid Production	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Totals
Condensate (bbls)	1578	1497	2290	1726	1422	418	0	0	0	0	0	0	8931
Water/Condensate (bbls)	1520	1840	1520	1770	2320	1360	400	390	560	800	1050	960	14490
Water	560	320	800	160	0	240	0	320	80	80	0	0	2560
Total Liquids	3658	3657	4610	3656	3742	2018	400	710	640	880	1050	960	25981

The majority of liquids currently being removed from Lindrith consist of a water / condensate mix of 42/58 % respectively.

Enterprise emphasizes that it takes environmental compliance most seriously, and has worked diligently to develop a solution to the issue outlined above.

If you need additional information regarding this submittal, please call Don Fernald, our Area Environmental Scientist, at (505) 599-2141, or me directly at (713) 381-6684.

Sincerely,

Matthew E, Marra
Director, Environmental

/mem
enclosures:
Title V Air Permit Application
Revised Calculations for Condensate Storage Tanks

cc: Environmental Director,
Jicarilla Apache Reservation,

PART 71 AIR PERMIT
RENEWAL APPLICATION UPDATE
ENTERPRISE FIELD SERVICES LLC

LINDRITH COMPRESSOR STATION
RIO ARRIBA COUNTY, NEW MEXICO
PERMIT NO. R6FOPP71-03

MAY 2010

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Executive Summary

Lindrith Compressor Station

Part 71 Renewal Application Update

Enterprise Field Services LLC (Enterprise) owns and operates the Lindrith Compressor Station located in Rio Arriba County, New Mexico. The station is located on Jicarilla Apache Nation land and is subject to the 40 CFR Part 71 federal operating program. The station is currently authorized to operate under EPA Part 71 Permit No. R6FOPP71-03. The current operating permit expired on 11/16/2008. Enterprise submitted the required renewal application in 2008 and is currently operating under the application shield. At this time Enterprise is submitting a permit renewal update package to document changes to the station.

The Lindrith Compressor Station is a natural gas gathering compressor station defined by Standard Industrial Classification (SIC) code 1311. The existing operating permit authorizes the following emission sources:

1. Two 3,267-hp Caterpillar 3612LE compressor engines equipped with oxidation catalysts (A-01 and A-02)
2. One 3,267-hp Caterpillar 3612LE compressor engine (A-03)
3. One Glycol Dehydrator equipped with controls (DEHY-1RBLR and DEHY-STL)
4. Two 500-bbl condensate tanks (TK-1 and TK-2)
5. Insignificant sources (drain tanks, lube oil tanks, etc.).

Proposed Changes

This application is an update of the renewal application to account for recent changes to the station. Enterprise is representing the following changes to the Lindrith Compressor Station.

1. The glycol dehydrator and reboiler are permanently shutdown and will be removed from the permit along with all applicable requirements;
2. Remove the two 500-barrel condensate storage tanks;
3. Install eight (8) 450-bbl Fixed Roof Storage Tanks for Condensate and Water Storage. Include these emission sources under a single emission cap (TBATTERY);
4. Add condensate truck loading emissions (TLOAD);
5. Add fugitive emissions (FUGVOC); and
6. Add Maintenance, Startup, and Shutdown Emissions (MSS).

Enterprise is also updating the insignificant source activity list with three 120 bbl drain tanks, which collected gravity separated water from the condensate tanks.

Table 1-1

Pollutant	Current Limits (tpy)	Proposed Limits (tpy)	Change in PTE (tpy)
Nitrogen Oxides	68.48	66.26	-2.22
Carbon Monoxide	95.5	102.54	+7.04
Volatile Organic Compounds	153.3	137.21	-16.09
PM10	N/A	2.90	+2.90
Sulfur Dioxides	0.22	4.27	+4.05
Total HAP	55	36.85	-18.15
Formaldehyde	21	31.05	+10.05

The changes in the proposed station potential to emit totals are due to equipment shutdown and removals, equipment installations, and changes in the emission calculation methodologies. These changes are discussed further in this application.

Calculations Summary

Lindrith Compressor Station

Part 71 Renewal Application Update

The Lindrith Compressor Station is equipped with gas-fired engines, storage tanks in volatile organic liquid service, truck loading, fugitives, and natural gas releases for MSS purposes. The methodologies used to estimate emissions from these sources are detailed in this section.

Engine Emissions (A-01, A-02, A-03)

The station is equipped with three identical 3,267-hp Caterpillar 3612LE gas-fired low emission technology engines to drive gas compressors. Two of the three engines are equipped with oxidation catalysts to reduce CO and VOC/HAP emissions. The engines are permitted to operate continuously at full load (8,760 hours/year). Enterprise is proposing no physical changes to these sources other than updating the emission methodologies.

how about controls on the 3rd engine?

Emissions of NOx, CO, VOC, and formaldehyde are based on vendor data. The Caterpillar 3612LE is a clean burn source that does not require any add-on control device to reduce emissions of NOx. Engines A-01 and A-02 are equipped with oxidation catalysts to reduce emissions of CO by up to 85%. This control technology all reduces VOC/HAP by up to 30%.

Emissions on PM_{10} and $PM_{2.5}$ are calculated using the current AP-42 factors for 4-cycle lean burn engines. Enterprise summed both the filterable and the condensable factors to get a total factor.

Emissions of SO_2 are based on the current AP-42 factor adjusted for higher instances of sulfur in the fuel gas. The AP-42 factor (0.000588 lb/MMBtu) is based on up to 2,000 grains sulfur per million scf of fuel gas. Enterprise adjusted the factor to account for up to 5 grains/100 scf.

All other engine HAP emissions, other than formaldehyde, are current AP-42 for 4-cycle lean burn engines. For the two engines equipped with oxidation catalysts it was assumed that the emissions were reduce by 30%.

Maintenance, Startup, and Shutdown Emissions (MSS)

Enterprise conducts periodic planned and unplanned maintenance, startup, and shutdown activities that result in the venting of natural gas from the stations blowdown vent. These activities include, but are not limited to, engine starts, compressor shutdowns, vessel and piping blowdowns, pipeline pigging activities, etc. Enterprise is including emission estimates for these activities using an estimated volume of natural gas that may be released during an operating year and calculating the mass of VOC released using a station gas analysis.

Condensate Storage Tank Battery (TBATTERY)

Enterprise has replaced the two 500-bbl fixed roof condensate tanks with eight (8) 454-bbl fixed roof storage tanks to handle the produced condensate and water at the station. Enterprise has re-engineered the liquid collection systems in the vicinity of the station to reduce the potential volume of liquids which can be collected at the Lindrith Compressor Station. This reduction in liquid storage potential also reduces the potential VOC emissions at the station.

The eight storage tanks (T-1, T-2, T-3, T-4, T-5, T-6, T-7 and T-8) are plumbed together to aid in the collection of natural gas condensates and produced water. Each tank is vented to atmosphere individually. However, Enterprise is proposing to establish an emission cap on the eight tanks (TBATTERY) to allow maximum operational flexibility for operations. An emission cap will allow operations to direct the collected condensate and water to any of the eight storage tanks in the battery. As long as the volumetric limits (bbls/year) represented in the permit application are not exceeded then the limits on VOC emissions from the tank battery will not be exceeded.

"bubble" cap, is this ok?

is this true?

Emissions from the new condensate tanks were calculated using both a process model (AspenTech) and the EPA Tanks software. The process model was used to calculate potential flash emissions from the storage tanks. The EPA Tanks software was used to estimate breathing and working losses from the tanks. The process model estimates a liquid production rate of 6,389 barrels per year (bbl/yr) under the defined operating conditions. To account for operational variables Enterprise is basing the storage tank emissions on an annual rate of 20,000 bbl/yr.

is this ok?

Process Model

For given input parameters the AspenTech process model estimates liquid volume production numbers as well as component analyses for the storage tank vapor stream and the liquid product. Based on the Lindrith inlet gas quality the process model predicts liquids are produced at the station during cool ambient conditions. During warmer months the model predicts the compressed inlet gas is not condensable even after it runs through the gas coolers. However, for this application Enterprise is conservatively assuming that liquids are produced year around.

ok?

The process model predicts a total VOC emission rate (lb/hr) from the tank battery at the referenced liquid production rate over the specified time period. Enterprise then pro-rated these emission totals up based on a ratio of the proposed permit representation to the model production rate. The total flash emissions were then speciated using the calculated mass fractions from the process model.

EPA Tanks

This software is used to calculate breathing and working losses from storage tanks. For this application Enterprise modeled a single storage tank handling gasoline (RVP 7) at 2500 bbl/yr to get an estimate of the tank emissions. These emissions were multiplied by eight (8) to get total emissions from the tank battery. Enterprise speciated the tank breathing and working emissions by conservatively assuming these emissions would be similar to the flash gas characteristics. The only difference is Enterprise deleted the non-VOC components and then normalized the mass fraction total.

Condensate Truck Loading Emissions (TLOAD)

Emissions from the condensate truck loading were estimated using the AP-42 loading loss equation, hourly filling rate and annual throughput. The annual throughput was estimated by assuming that the total throughput for the eight condensate tanks was loaded. Speciated emissions from this operation were done conservatively assuming the loading vapors were of similar makeup as the storage tank flash gas. The only difference is Enterprise deleted the non-VOC components and then normalized the mass fraction total.

Fugitive Emissions (FUGVOC)

Fugitive emissions were estimated based on an estimated piping component count and the April 2010 Gas Analysis mole percentage of non-methane/non-ethane hydrocarbons. The EPA Oil and Gas factors were used to estimate fugitives.

The following discussion addresses applicable and non-applicable requirements of Code of Federal Regulations, Title 40. General requirements imposed by the current operating permit are not addressed in this section.

Applicable Requirements

The following regulatory requirements have been determined to be potentially applicable to the Lindrith Compressor Station:

40 CFR 71 – Federal Operating Permits

The facility is a major source of CO, VOC, and HAP as defined by 40 CFR 71. Regulation 40 CFR 71.5(a)(1) requires that "for each part 71 source, the owner or operators shall submit a timely and complete application in accordance with this section". 40 CFR 71.5(a)(1)(iii) goes on to state that "for purposes of permit renewal, a timely application is one that is submitted at least 6 months but nor more than 18 months prior to the expiration of the part 70 or 71 permit".

Operating permit R6FOPP71-03 expired on 11/16/08; as required by this regulation, this application was submitted prior to 5/16/08. This current application is a revision to the initial application due to changes that have occurred during the period of review.

Non-Applicable Requirements

Certain regulatory requirements are discussed below for non-applicability because of the facility type and potential applicability.

40 CFR 50 – National Ambient Air Quality Standards

40 CFR 50 establishes National Ambient Air Quality Standards but does not directly impose requirements on a specific stationary source and is therefore not applicable.

40 CFR 52.21 – Prevention of Significant Deterioration of Air Quality

Enterprise has made a determination in accordance with 40 CFR 52.21(a)(1)(2) that the Lindrith Compressor Station is a minor source for PSD purposes as defined under 40 CFR 52.21(b). Lindrith Compressor Station is not a source identified in 40 CFR 52.21(a), and the facility-wide potential to emit is less than 250 tons per year (tpy) of any regulated pollutant. Therefore, PSD is not required for this permit renewal.

But how about historical emits. back in 1992?

40 CFR 60, Subpart A – General Provisions

This subpart is only applicable to facilities that are subject to another NSPS. As detailed in this section no NSPS regulations currently apply to this facility

40 CFR 60, Subparts K, Ka, and Kb

The eight new fixed roof condensate storage tanks at the facility were constructed after July 23, 1984 making them potentially subject to the Subpart Kb rule. However, all eight of these storage tanks have a storage capacity of 454-bbls (72 m^3). Per 40 C FR 60.110b(a) storage tanks in VOL service with less than 75 m^3 in storage capacity are exempt from this regulation. Therefore, the condensate storage tanks included in the source cap TBATTERY are not subject to NSPS Subpart Kb. There are no storage tanks at the Lindrith Compressor Station which exceed 75 m^3.

40 CFR 60, Subpart KKK – Standards of Performance for Equipment Leaks

The Lindrith Compressor Station is not a natural gas processing plant as defined under this subpart. Therefore, Subpart KKK is not applicable.

40 CFR 60, Subpart LLL – Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions

The Lindrith Compressor Station is not an onshore natural gas treating plant as defined in this subpart. Therefore, Subpart LLL is not applicable.

40 CFR 60, Subpart JJJJ – Standards of Performance for Station Spark Ignition Internal Combustion Engines

All engines at the facility were constructed before June 12, 2006 (40 CFR 60.4230.a.4) and have not been modified or reconstructed since (40 CFR 40.4230.a.5). Therefore, this subpart does not currently apply to this facility.

40 CFR 61 – National Emissions Standards for Hazardous Air Pollutants (NESHAP)

There are no 40 CFR 61 NESHAPs regulation currently applicable to this facility.

40 CFR 63 Subpart HH – National Emissions Standards for Hazardous Air Pollutants from Oil and Gas Production Facilities

The Lindrith Compressor Station is a major HAP source and is equipped with condensate storage tanks with the potential for flash emissions. Therefore, the requirements of this subpart are potentially applicable. Enterprise has removed the glycol dehydrator from the station which would have been an affected source.

By definition storage vessels with the potential for flash emissions means any storage vessel that contains a hydrocarbon liquid with a stock tank GOR equal to or greater than 0.31 cubic meters per liter (1740 scf/bbl) and an API gravity equal to or greater than 40 degrees and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day (500 bbls/day). The volume of condensate collected at the Lindrith Compressor Station is less than 79,500 liters per day. Therefore, Subpart HH is not currently applicable.

40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The three existing RICE units currently operating at the facility are "existing" (constructed before December 19, 2002) 4 stroke lean burn engines and therefore do not have to meet the requirements of Subpart ZZZZ, including the initial notification, as stated at 40 CFR 63.6590(b)(3). Enterprise will comply with any applicable revisions to this regulation as they occur.

Case-by-Case MACT Determinations

The Lindrith Compressor Station is a major HAP source. The RICE units, condensate storage tanks, and fugitives are addressed under the promulgated MACT Subpart HH and ZZZZ regulations as addressed above. Emissions of HAP from truck loading (TLOAD) AND maintenance, startup, and shutdown releases (MSS) do not exceed major source levels for HAP. Therefore, case-by-case MACT determinations for these two source categories are not required. true?

40 CFR 68 – Accidental Release Prevention Program

This regulation arises form section 112 (r) of the Clean Air Act and establishes thresholds based on inventoried quantities of specific substances in process. This facility odes not manufacture, process, use, store or otherwise handle regulated substances in excess of the quantities specified in 40 CFR 68, therefore this regulation does not apply.

40 CFR 72 – Acid Rain Regulation

The facility is not an electric utility generating facility as defined in under this part and therefore is not an affected facility under the Acid Rain Program

40 CFR 82, Subpart F & H – Protection of Stratospheric Ozone

No operations involving CFCs are conducted at this facility and no halon-containing fire extinguishers are used, stored or disposed of at this facility.

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

GENERAL INFORMATION AND SUMMARY (GIS)

A. Mailing Address and Contact Information

Facility name: Lindrith Compressor Station

Mailing address: Street or P.O. Box: Enterprise Field Services, LLC c/o Environmental Dep't: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Contact person: Don Fernald Title: Environmental Scientist

Telephone (505) 599 - 2141 Ext. ______

Facsimile (505) 599 - 2119

B. Facility Location

Temporary source? ___Yes _X_ No Plant site location: 20 miles West of Lindrith, NM, East ½ of the Southeast ¼ of Section 18, Township 24 North, Range 5 West

City: Lindrith State: NM County: Rio Arriba EPA Region: 6

Is the facility located within:

Indian lands? _X_ YES ___ NO OCS waters? ___YES _X_ NO

Non-attainment area? ___ YES _X_ NO If yes, for what air pollutants? ______

Within 50 miles of affected State? _X_ YES ___ NO If yes, What State(s)? NM

C. Owner

Name: Enterprise Field Service LLC Street/P.O. Box: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone (713) 381 - 6595 Ext______

D. Operator

Name: Enterprise Products Operating LLC Street/P.O. Box: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone (713) 381 - 6500 Ext______

E. Application Type

Mark only one permit application type and answer the supplementary question appropriate for the type marked.

___Initial Permit _X_ Renewal ___ Significant Mod ___ Minor Permit Mod(MPM)

___ Group Processing, MPM ___ Administrative Amendment

For initial permits, when did operations commence? _____/_____/_____

For permit renewal, what is the expiration date of current permit? 11 / 16 / 2008

F. Applicable Requirement Summary

Mark all types of applicable requirements that apply.

___ SIP ___ FIP/TIP ___ PSD ___Non-attainment NSR

___ Minor source NSR ___ Section 111 ___ Phase I acid rain ___Phase II acid rain

___ Stratospheric ozone ___ OCS regulations ___ NESHAP _X_ Sec. 112(d) MACT

___ Sec. 112(g) MACT ___ Early reduction of HAP ___ Sec 112(j) MACT ___ RMP [Sec.112(r)]

___ Tank Vessel requirements, sec. 183(f)) ___ Section 129 Standards/Requirement

___ Consumer / comm. products, ' 183(e) ___ NAAQS, increments or visibility (temp. sources)

Has a risk management plan been registered? ___YES _X_ NO Regulatory agency ________

Phase II acid rain application submitted? ___YES _X_ NO If yes, Permitting authority ________

G. Source-Wide PTE Restrictions and Generic Applicable Requirements

Cite and describe any emissions-limiting requirements and/or facility-wide "generic" applicable requirements.

Facility previously issue NSR Permit NM-1644-M1, limiting fuel consumption, requiring oxidation catalysts on two RICE, with quarterly testing requirements and condenser on dehydrator still vent. Permit establishes emissions limits for each unit.
Generic requirements identified in Conditions 3.2 of Operating Permit R6FOPP71-03

H. Process Description

List processes, products, and SIC codes for the facility.

Process	Products	SIC
Natural gas gathering and transmission facility, with pressurized natural gas as product delivered to pipeline.	Pressurized natural gas	1311

I. Emission Unit Identification

Assign an emissions unit ID and describe each emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on aseparate line. Applicants may exclude from this list any insignificant emissions units or activities.

Emissions Unit ID	Description of Unit
A-01	Caterpillar 3612 LE, Natural Gas Fired Engine
A-01-CD#1	Oxidation Catalyst for RICE A-01 (Control Device)
A-02	Caterpillar 3612 LE, Natural Gas Fired Engine
A-02-CD#2	Oxidation Catalyst for RICE A-02 (Control Device)
A-03	Caterpillar 3612 LE, Natural Gas Fired Engine
FUG	Fugitive VOCs
TBATTERY	Eight 450-bbl Condensate Storage Tanks (capped emissions and throughput)
TLOAD	Condensate Truck Loading
MSS	Maintenance, Startup, and Shutdown Emissions

J. Facility Emissions Summary

Enter potential to emit (PTE) for the facility as a whole for each air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information.

NOx 66.26 tons/yr VOC: 126.63 tons/yr SO_2: 4.27 tons/yr

PM-10: 2.90 tons/yr CO: 102.54 tons/yr Lead: N/A tons/yr Total HAP: 37.57 tons/yr

Single HAP emitted in the greatest amount Formaldehyde PTE: 31.05 tons/yr

Total of regulated pollutants (for fee calculation), Sec. F, line 5 of form FEE: N/A tons/yr

K. Existing Federally-Enforceable Permits

Permit number(s): NM 1644 M1 Permit type: NSR Permitting Authority: NMED

Permit number(s): R6FOPP71-03 Permit type: Title V (Part 71) Permitting Authority: USEPA

L. Emission Unit(s) Covered by General Permits

Emission unit(s) subject to general permit ____

Check one: ___ Application made ___ Coverage granted

General permit identifier ____ Expiration Date ___/___/___

M. Cross-referenced Information

Does this application cross-reference information? ___ YES _X_ NO (If yes, see instructions)

INSTRUCTIONS FOLLOW

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POTENTIAL TO EMIT (PTE)

For each unit with emissions that count towards applicability, list the emissions unit ID and the PTE for the air pollutants listed below and sum them up to show totals for the facility. You may find it helpful to complete form **EMISS** before completing this form. Show other pollutants not listed that are present in major amounts at the facility on attachment in a similar fashion. You may round values to the nearest tenth of a ton. Also report facility totals in section**J** of form **GIS**.

Emissions Unit ID	Regulated Air Pollutants and Pollutants for which the Source is Major (tons/yr)						
	NOx	VOC	SO2	PM10	CO	Lead	HAP
A-01	22.09	20.54	1.42	0.97	11.83	0	10.28
A-02	22.09	20.54	1.42	0.97	11.83	0	10.28
A-03	22.09	29.34	1.42	0.97	78.88	0	14.69
MSS		23.85					0.62
FUGVOC		2.23					0.03
TBATTERY		37.39					1.07
TLOAD		2.23					0.07
FACILTY TOTALS	66.26	137.21	4.27	2.90	102.54	0	37.04

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INITIAL COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION (I-COMP)

SECTION A - COMPLIANCE STATUS AND COMPLIANCE PLAN

Complete this section for each unique combination of applicable requirements and emissions units at the facility. List all compliance methods (monitoring, recordkeeping and reporting) you used to determine compliance with the applicable requirement described above. Indicate your compliance status at this time for this requirement and compliance methods and check "YES" or "NO" to the follow-up question.

Emission Unit ID(s): N/A

Applicable Requirement (Describe and Cite)

There are no units for which an initial compliance plan or compliance certification is required. Enterprise will comply with any future regulations (i.e. 40 CFR 63 Subpart ZZZZ) which become applicable during the term of this permit.

Compliance Methods for the Above (Description and Citation):

Compliance Status:

_X_ In Compliance: Will you continue to comply up to permit issuance? __X__Yes ___No

___ Not In Compliance: Will you be in compliance at permit issuance? ___Yes ___No

_X_ Future-Effective Requirement: Do you expect to meet this on a timely basis? __X__Yes ____No

B. SCHEDULE OF COMPLIANCE

Complete this section if you answered "NO" to any of the quesfons in section A. Also complete this section if required to submit a schedule of compliance by an applicable requirement. Please attach copies of any judicial consent decrees or administrative orders for this requirement.

Unit(s)____________________ Requirement____

Reason for Noncompliance. Briefly explain reason for noncompliance at time of permit issuance or that future-effective requirement will not be met on a timely basis:

Narrative Description of how Source Compliance Will be Achieved. Briefly explain your plan for achieving compliance:

Schedule of Compliance. Provide a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance, including a date for final compliance.

Remedial Measure or Action	Date to be Achieved

C. SCHEDULE FOR SUBMISSION OF PROGRESS REPORTS

Only complete this section if you are required to submit one or more schedules of compliance in section B or if an applicable requirement requires submittal of a progress report. If a schedule of compliance is required, your progress report should start within 6 months of application submittal and subsequently, no less than every six months. One progress report may include information on multiple schedules of compliance.

Contents of Progress Report (describe):

First Report____/____/___ Frequency of Submittal_______________

Contents of Progress Report (describe):

First Report____/____/___ Frequency of Submittal_______________

D. SCHEDULE FOR SUBMISSION OF COMPLIANCE CERTIFICATIONS

This section must be completed once by every source. Indicate when you would prefer to submit compliance certifications during the term of your permit (at least once per year).

Frequency of submittal______________________ Beginning____/____/____

E. COMPLIANCE WITH ENHANCED MONITORING & COMPLIANCE CERTIFICATION REQUIREMENTS

This section must be completed once by every source. To certify compliance with these, you must be able to certify compliance for every applicable requirement related to monitoring and compliance certification at every unit.

Enhanced Monitoring Requirements: ____ In Compliance ____ Not In Compliance

Compliance Certification Requirements: ____ In Compliance ____ Not In Compliance

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CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) Hurlburt (First) Terry (MI) L.

Title: Senior Vice President – Operations

Street or P.O. Box: P.O. Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone (713) 381 - 6595 Ext. ______ Facsimile (713) 381 - 6660

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed): [signature]

Name (typed): Terry L. Hurlburt Date: 4 / 14 / 10

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: A-01

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.22	0.97	N/A
SO_2	N/A	0.32	1.42	7446-09-5
NOx	N/A	5.04	22.09	N/A
CO	N/A	2.70	11.83	630-08-0
VOC	N/A	4.69	20.54	N/A
Acetaldehyde	N/A	0.13	0.57	00075-07-0
Acrolein	N/A	0.08	0.35	00107-02-8
Benzene	N/A	0.01	0.03	00071-43-2
Formaldehyde	N/A	2.07	9.06	00050-00-0
Methanol	N/A	0.04	0.17	00067-56-1
n-hexane	N/A	0.02	0.08	00110-54-3
Toluene	N/A	0.01	0.03	00108-88-3
Xylene (mixed isomers)	N/A	0.00	0.01	N/A

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: A-02

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.22	0.97	N/A
SO_2	N/A	0.32	1.42	7446-09-5
NOx	N/A	5.04	22.09	N/A
CO	N/A	2.70	11.83	630-08-0
VOC	N/A	4.69	20.54	N/A
Acetaldehyde	N/A	0.13	0.57	00075-07-0
Acrolein	N/A	0.08	0.35	00107-02-8
Benzene	N/A	0.01	0.03	00071-43-2
Formaldehyde	N/A	2.07	9.06	00050-00-0
Methanol	N/A	0.04	0.17	00067-56-1
n-hexane	N/A	0.02	0.08	00110-54-3
Toluene	N/A	0.01	0.03	00108-88-3
Xylene (mixed isomers)	N/A	0.00	0.01	N/A

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: A-03

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.22	0.97	N/A
SO_2	N/A	0.32	1.42	7446-09-5
NOx	N/A	5.04	22.09	N/A
CO	N/A	18.01	78.88	630-08-0
VOC	N/A	6.70	29.34	N/A
Acetaldehyde	N/A	0.18	0.81	00075-07-0
Acrolein	N/A	0.11	0.50	00107-02-8
Benzene	N/A	0.01	0.04	00071-43-2
Formaldehyde	N/A	2.95	12.94	00050-00-0
Methanol	N/A	0.06	0.24	00067-56-1
n-hexane	N/A	0.02	0.11	00110-54-3
Toluene	N/A	0.01	0.04	00108-88-3
Xylene (mixed isomers)	N/A	0.00	0.02	N/A

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TBATTERY (Includes emissions from 8 Condensate Tanks)

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	8.54	37.39	N/A
n-Hexane	N/A	0.19	0.84	00110-54-3
Benzene	N/A	0.03	0.12	00071-43-2
Toluene	N/A	0.03	0.11	00108-88-3

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: MSS

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amourts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	119.25	23.85	N/A
Benzene	N/A	0.35	0.07	00071-43-2
n-Hexane	N/A	2.74	0.55	00110-54-3

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: FUGVOC

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	0.76	3.31	N/A
Benzene	N/A	0.001	0.004	00071-43-2
n-Hexane	N/A	0.007	0.031	00110-54-3

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EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TLOAD

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or presentin major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	89.32 (Max)	2.23	N/A
Benzene	N/A	0.30 (Max)	0.01	00071-43-2
Toluene	N/A	0.25 (Max)	0.01	00108-88-3
n-Hexane	N/A	2.0 (Max)	0.05	00110-54-3

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: A-01 Description: Compressor No. 1 Engine

SIC Code (4-digit): 4922 SCC Code: 31000203

B. Emissions Unit Description

Primary use: Engine for Compressor No. 1 Temporary Source ___Yes X No

Manufacturer: Caterpillar Model No.: 3612 LE

Serial Number: 1YG00055 Installation Date: 4 / 17 / 1995

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ____________

Horsepower rating: 3,267 Boiler steam flow (lb/hr)____________

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 22.09 MM BTU/hr Max. Design Heat Input 22.09 MM BTU/hr

C. Fuel Data

Primary fuel type(s)__________ Standby fuel type(s)__________

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	5 grains/100 scf	N/A	905 Btu/scf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	N/A	0.024 MMscf/hr	213.83 MMscf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID: A-01-CD#1 Device type: Catalytic Oxidation System

Air pollutant(s) Controlled: CO, VOC Manufacturer: Houston Industrial Silencing

Model No.: DeCOHx33c22/24PL Serial No.: Unknown

Installation date: 4 / 17 / 1995 Control efficiency (%): 85% (CO); 30% (VOC)

Efficiency estimation method__________

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft): 15.0	Inside stack diameter (ft): 1.5
Stack temp (^{o}F): 858	Design stack flow rate (ACFM): 24273
Actual stack flow rate (ACFM): 24273	Velocity (ft/sec): 228.9

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EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: A-02 Description: Compressor No. 2 Engine

SIC Code (4-digit): 4922 SCC Code: 31000203

B. Emissions Unit Description

Primary use: Engine for Compressor No. 2 Temporary Source ___Yes _X_No

Manufacturer: Caterpillar Model No.: 3612 LE

Serial Number: 1YG00054 Installation Date: 5 / 1 / 1995

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Horsepower rating: 3,267 Boiler steam flow (lb/hr)___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 22.09 MM BTU/hr Max. Design Heat Input 22.09 MM BTU/hr

C. Fuel Data

Primary fuel type(s)__________ Standby fuel type(s)__________

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	0.02%	Negligible	905 Btu/scf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	N/A	0.024 MMscf/hr	213.83 MMscf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID: A-01-CD#1 Device type: Catalytic Oxidation System

Air pollutant(s) Controlled: CO, VOC Manufacturer: Houston Industrial Silencing

Model No.: DeCOHx33c22/24PL Serial No.: Unknown

Installation date: 4 / 17 / 1995 Control efficiency (%): 85% (CO); 30% (VOC)

Efficiency estimation method__________

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft): 15.0 Inside stack diameter (ft): 1.5

Stack temp (°F): 858 Design stack flow rate (ACFM): 24273

Actual stack flow rate (ACFM): 24273 Velocity (ft/sec): 228.9

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EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: A-03 Description: Compressor No. 3 Engine

SIC Code (4-digit): 4922 SCC Code: 31000203

B. Emissions Unit Description

Primary use: Engine for Compressor No. 3 Temporary Source ___Yes X No

Manufacturer: Caterpillar Model No.: 3612 LE

Serial Number: 1YG00072 Installation Date: 5 / 15 / 1995

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Horsepower rating: 3,267 Boiler steam flow (lb/hr) ___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 22.09 MM BTU/hr Max. Design Heat Input 22.09 MM BTU/hr

C. Fuel Data

Primary fuel type(s): Natural Gas Standby fuel type(s): N/A

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	0.02%	Negligible	905 Btu/scf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	N/A	0.024 MMscf/hr	213.83 MMscf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device type: ________

Air pollutant(s) Controlled: ________ Manufacturer: ________

Model No.: ________ Serial No.: ________

Installation date: ___/___/___ Control efficiency (%): ________

Efficiency estimation method ________

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft): 15.0 Inside stack diameter (ft): 1.5

Stack temp (°F): 858 Design stack flow rate (ACFM): 24273

Actual stack flow rate (ACFM): 24273 Velocity (ft/sec): 228.9

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EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: FUGVOC Description: Fugitive emissions from leaking components

SIC Code (4-digit): 4922 SCC Code: 31000220

B. Emissions Unit Description

Primary use or equipment type: Components associated with equipment at the facility

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date ____/____/____

Raw materials __________

Finished products __________

Temporary source: X No ___ Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.76 lb/hr	3.31 TPY
Maximum rate		

D. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device Type __________

Manufacturer __________ Model No __________

Serial No. __________ Installation date ____/____/____

Control efficiency (%) ____.__ Capture efficiency (%) ____.__

Air pollutant(s) controlled __________ Efficiency estimation method __________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) ___________.______ Inside stack diameter (ft) ___________.______

Stack temp (F) ___________.______ Design stack flow rate (ACFM) ___________.______

Actual stack flow rate (ACFM) ___________.______ Velocity (ft/sec) ___________.______

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EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: MSS Description: Compressor blowdowns for maintenance, startup and shutdown

SIC Code (4-digit): 4922 SCC Code: ____________

B. Emissions Unit Description

Primary use or equipment type: Blowdowns associated with station operation

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date ____/____/____

Raw materials ____________

Finished products ____________

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate		
Maximum rate	10,000 scf/hr	4.0 MMscf/yr

D. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device Type: N/A

Manufacturer ____________ Model No ____________

Serial No. ____________ Installation date ____/____/____

Control efficiency (%) ______.___ Capture efficiency (%) ______.___

Air pollutant(s) controlled ____________ Efficiency estimation method ____________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) __________.______ Inside stack diameter (ft) __________.______

Stack temp (F) __________.______ Design stack flow rate (ACFM) __________.______

Actual stack flow rate (ACFM) ____________.______ Velocity (ft/sec) ____________.______

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TBATTERY Description: Eight 454 bbl condensate tanks

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate storage

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date ____/____/____

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	-	20,000 bbls/year
Maximum rate	-	-

D. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device Type ____

Manufacturer ____ Model No ____

Serial No. ____ Installation date ____/____/____

Control efficiency (%) ____.____ Capture efficiency (%) ____.____

Air pollutant(s) controlled ____ Efficiency estimation method ____

Federal Operating Permit Program (40 CFR Part 71)

INSIGNIFICANT EMISSIONS (IE)

List each insignificant activity or emission unit. In the "number" column, indicate the number of units in this category. Descriptions should be brief but unique. Indicate which emissions criterion of part 71 is the basis for the exemption.

Number	Description of Activities or Emissions Units	RAP, except HAP	HAP
T-9	120 bbl Compressor Skid Sump Drain Tank	X	
T-10	120 bbl Water Separation Tank	X	
T-11	120 bbl Water Separation Tank	X	
T-12	120 bbl Water Separation Tank	X	
T-13	500 gal Lube Oil Tank	X	
T-14	500 gal Lube Oil Tank	X	
T-15	500 gal Lube Oil Tank	X	
T-16	500 gal Ambitrol (AntiFreeze) Tank	X	
T-17	500 gal Ambitrol (AntiFreeze) Tank	X	
T-18	500 gal Ambitrol (AntiFreeze) Tank	X	

APPENDIX A
Emission Calculations and Supporting Data

Enterprise Field Services LLC

Lindrith Compressor Station
Part 71 Renewal Application Update

Emissions Calculations
Summary of Emissons

Max Single HAP 31.05
Total HAPs 37.04

Pollutant	CAS No.	Emissions (tons/yr)							
		A-01	A-02	A-03	FUGVOC	MSS	TLOAD	TBATTERY	Total
Particulate Matter (PM_{10})		0.97	0.97	0.97					2.90
Particulate Matter ($PM_{2.5}$)		0.97	0.97	0.97					2.90
Sulfur Dioxide (SO_2)		1.42	1.42	1.42					4.27
Nitrogen Oxides (NO_x)		22.09	22.09	22.09					66.26
Carbon Monoxide (CO)		11.83	11.83	78.88					102.54
Volatile Organic Compounds (VOC)		20.54	20.54	29.34	3.31	23.85	2.23	37.39	137.21
Acetaldehyde	00075-07-0	0.57	0.57	0.81					1.94
Acrolein	00107-02-8	0.35	0.35	0.50					1.19
Benzene	00071-43-2	0.03	0.03	0.04	0.00	0.07	0.01	0.12	0.31
Formaldehyde	00050-00-0	9.06	9.06	12.94					31.05
Methanol	00067-56-1	0.17	0.17	0.24					0.58
n-Hexane	00110-54-3	0.08	0.08	0.11	0.03	0.55	0.05	0.84	1.72
Toluene	00108-88-3	0.03	0.03	0.04			0.01	0.11	0.21
Xylene (mixed isomers)	0	0.01	0.01	0.02			0.00	0.00	0.04

Operating Parameters

Annual Operaton:	8,760 hrs/yr			
Mfr Rating	3,550 bhp =			
Elevation	6,653 ft MSL			
DeRate	3% per 1,000 ft > 4000 ft			
Average Operating Rate:	3,267 bhp =		6,761 BTU/bhp-hr =	22.09 MMBtu/hr
				0.024 MMscf/hr @905 Btu/scf
				213.83 MMscf/yr
Maximum Operating Rate:	3,267 bhp =		6,761 BTU/bhp-hr =	22.09 MMBtu/hr
				0.024 MMscf/hr @905 Btu/scf
				213.83 MMscf/yr

Pollutant	CAS No.	Emission Factor(1)	Control Efficiency(2) (%)	Emissions Average(3) (lbs/hr)	Maximum(4) (lbs/hr)	Annual(5) (tons/yr)
Particulate Matter (PM_{10})		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Particulate Matter ($PM_{2.5}$)		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Sulfur Dioxide (SO_2)		1.47E-02 lbs/MMBtu	0%	0.32	0.32	1.42
Nitrogen Oxides (NO_x)		0.70 g/bhp-hr	0%	5.04	5.04	22.09
Carbon Monoxide (CO)		2.50 g/bhp-hr	85%	2.70	2.70	11.83
Volatile Organic Compounds (VOC)		0.93 g/bhp-hr	30%	4.69	4.69	20.54
Acetaldehyde	00075-07-0	8.36E-03 lbs/MMBtu	30%	0.13	0.13	0.57
Acrolein	00107-02-8	5.14E-03 lbs/MMBtu	30%	0.08	0.08	0.35
Benzene	00071-43-2	4.40E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Formaldehyde	00050-00-0	0.41 g/bhp-hr	30%	2.07	2.07	9.06
Methanol	00067-56-1	2.50E-03 lbs/MMBtu	30%	0.04	0.04	0.17
n-Hexane	00110-54-3	1.11E-03 lbs/MMBtu	30%	0.02	0.02	0.08
Toluene	00108-88-3	4.08E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Xylene (mixed isomers)	#N/A	1.84E-04 lbs/MMBtu	30%	0.00	0.00	0.01

(1) Emission factors for NOx, CO, and VOC based on vendor specifications. All other emission factors from AP-42 (7/00); Table 3.2-2.
The AP-42 factor for SO2 is based on 2,000 grains/MMscf. The factor is adjusted to allow for up to 5 grains sulfur per 100 scf.
PM10 and PM2.5 include both condensible and filterable portions.

(2) Control efficiency based on vendor data for CO and VOC. Reduction efficiency for HAP assumed to be same as for VOC.

(3) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Avg Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Avg Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(4) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Max Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Max Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(5) Calculated as: Average Emissions (lbs/hr) X Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

Enterprise Field Services LLC

Lindrith Compressor Station
Part 71 Renewal Application Update

Emissions Calculations
Compressor No. 1 Engine
Source ID No.: A-02

Operating Parameters

Annual Operaton:	8,760 hrs/yr			
Mfr Rating	3,550 bhp	=		
Elevation	6,653 ft MSL			
DeRate	3% per 1,000 ft > 4000 ft			
Average Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr 0.024 MMscf/hr @905 Btu/scf 213.83 MMscf/yr
Maximum Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr 0.024 MMscf/hr @905 Btu/scf 213.83 MMscf/yr

Pollutant	CAS No.	Emission Factor[1]	Control Efficiency[2] (%)	Emissions Average[3] (lbs/hr)	Emissions Maximum[4] (lbs/hr)	Emissions Annual[5] (tons/yr)
Particulate Matter (PM_{10})		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Particulate Matter ($PM_{2.5}$)		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Sulfur Dioxide (SO_2)		1.47E-02 lbs/MMBtu	0%	0.32	0.32	1.42
Nitrogen Oxides (NO_x)		0.70 g/bhp-hr	0%	5.04	5.04	22.09
Carbon Monoxide (CO)		2.50 g/bhp-hr	85%	2.70	2.70	11.83
Volatile Organic Compounds (VOC)		0.93 g/bhp-hr	30%	4.69	4.69	20.54
Acetaldehyde	00075-07-0	8.36E-03 lbs/MMBtu	30%	0.13	0.13	0.57
Acrolein	00107-02-8	5.14E-03 lbs/MMBtu	30%	0.08	0.08	0.35
Benzene	00071-43-2	4.40E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Formaldehyde	00050-00-0	0.41 g/bhp-hr	30%	2.07	2.07	9.06
Methanol	00067-56-1	2.50E-03 lbs/MMBtu	30%	0.04	0.04	0.17
n-Hexane	00110-54-3	1.11E-03 lbs/MMBtu	30%	0.02	0.02	0.08
Toluene	00108-88-3	4.08E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Xylene (mixed isomers)	#N/A	1.84E-04 lbs/MMBtu	30%	0.00	0.00	0.01

(1) Emission factors for NOx, CO, and VOC based on vendor specifications. All other emission factors from AP-42 (7/00); Table 3.2-2. The AP-42 factor for SO2 is based on 2,000 grains/MMscf. The factor is adjusted to allow for up to 5 grains sulfur per 100 scf. PM10 and PM2.5 include both condensible and filterable portions.

(2) Control efficiency based on vendor data for CO and VOC. Reduction efficiency for HAP assumed to be same as for VOC.

(3) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Avg Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Avg Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(4) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Max Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Max Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(5) Calculated as: Average Emissions (lbs/hr) X Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

Operating Parameters

Annual Operaton:	8,760 hrs/yr			
Mfr Rating	3,550 bhp	=		
Elevation	6,653 ft MSL			
DeRate	3% per 1,000 ft > 4000 ft			
Average Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr 0.024 MMscf/hr @905 Btu/scf 213.83 MMscf/yr
Maximum Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr 0.024 MMscf/hr @905 Btu/scf 213.83 MMscf/yr

Pollutant	CAS No.	Emission Factor[(1)]	Control Efficiency[(2)] (%)	Emissions Average[(3)] (lbs/hr)	Emissions Maximum[(4)] (lbs/hr)	Emissions Annual[(5)] (tons/yr)
Particulate Matter (PM_{10})		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Particulate Matter ($PM_{2.5}$)		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Sulfur Dioxide (SO_2)		1.47E-02 lbs/MMBtu	0%	0.32	0.32	1.42
Nitrogen Oxides (NO_x)		0.70 g/bhp-hr	0%	5.04	5.04	22.09
Carbon Monoxide (CO)		2.50 g/bhp-hr	0%	18.01	18.01	78.88
Volatile Organic Compounds (VOC)		0.93 g/bhp-hr	0%	6.70	6.70	29.34
Acetaldehyde	00075-07-0	8.36E-03 lbs/MMBtu	0%	0.18	0.18	0.81
Acrolein	00107-02-8	5.14E-03 lbs/MMBtu	0%	0.11	0.11	0.50
Benzene	00071-43-2	4.40E-04 lbs/MMBtu	0%	0.01	0.01	0.04
Formaldehyde	00050-00-0	0.41 g/bhp-hr	0%	2.95	2.95	12.94
Methanol	00067-56-1	2.50E-03 lbs/MMBtu	0%	0.06	0.06	0.24
n-Hexane	00110-54-3	1.11E-03 lbs/MMBtu	0%	0.02	0.02	0.11
Toluene	00108-88-3	4.08E-04 lbs/MMBtu	0%	0.01	0.01	0.04
Xylene (mixed isomers)	#N/A	1.84E-04 lbs/MMBtu	0%	0.00	0.00	0.02

(1) Emission factors for NOx, CO, and VOC based on vendor specifications. All other emission factors from AP-42 (7/00); Table 3.2-2.
The AP-42 factor for SO2 is based on 2,000 grains/MMscf. The factor is adjusted to allow for up to 5 grains sulfur per 100 scf.
PM10 and PM2.5 include both condensible and filterable portions.

(2) Control efficiency based on vendor data for CO and VOC. Reduction efficiency for HAP assumed to be same as for VOC.

(3) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Avg Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Avg Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(4) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Max Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Max Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(5) Calculated as: Average Emissions (lbs/hr) X Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

G3612

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

Industrial/Petroleum

07/01

ENGINE SPEED (rpm):	1000	FUEL TYPE:	Nat Gas
COMPRESSION RATIO:	9:1	MIN. FUEL PRESSURE (PSIG):	43
AFTERCOOLER WATER (°F)	129	MIN. RATED METHANE NUMBER:	66
JACKET WATER OUTLET (°F)	190	RATED ALTITUDE @ 77°F (ft):	5000
IGNITION SYSTEM:	DST	FUEL LHV (BTU/SCF):	905
EXHAUST MANIFOLD:	DRY		

RATING		NOTES	LOAD	100%	75%	50%
ENGINE POWER		(1) (2)	bhp	3550	2662	1775
ENGINE EFFICIENCY	(ISO 3046/1)	(1)	%	38.6	37.0	34.1
ENGINE EFFICIENCY	(NOMINAL)	(1)	%	37.6	36.1	33.3
ENGINE DATA						
FUEL CONSUMPTION	(ISO 3046/1)	(1)	BTU/bhp-hr	6601	6884	7468
FUEL CONSUMPTION	(NOMINAL)	(1)	BTU/bhp-hr	6761	7051	7650
AIR FLOW (@ 77°F, 13.9 psia)			ft3/min	9,623	7,384	5,051
AIR MASS FLOW			lb/hr	40,345	30,958	21,175
COMPRESSOR OUTLET PRESSURE			psi (abs)	36.4	28.4	20.4
COMPRESSOR OUTLET TEMPERATURE			°F	300	248	154
INLET MANIFOLD PRESSURE			psi (abs)	35.1	27.3	18.7
INLET MANIFOLD TEMPERATURE			°F	147	144	140
LAMBDA				2.07	2.03	1.92
TIMING			°BTDC	18.3	17.6	16.2
EXHAUST STACK TEMPERATURE			°F	858	896	946
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)			ft3/min	24,273	19,160	13,592
EXHAUST GAS MASS FLOW			lb/hr	41,575	31,901	21,820
EMISSIONS						
NOx (as NO)		(3)	g/bhp-hr	0.7	0.7	0.7
CO		(3)	g/bhp-hr	2.5	2.5	2.5
THC (molecular weight of 15.84)		(3)	g/bhp-hr	6.15	6.31	6.5
NMHC (molecular weight of 15.84)		(3)	g/bhp-hr	0.93	0.95	0.98
EXHAUST OXYGEN			%	12.5	11.8	10.7
ENERGY BALANCE DATA						
FUEL INPUT ENERGY (LHV)	(NOMINAL)	(1)	BTU/min	399,965	312,844	226,312
WORK ENERGY	(NOMINAL)	(2)	BTU/min	150,544	112,908	75,272
HEAT REJ. TO JACKET WATER	(NOMINAL)	(4)	BTU/min	38,431	31,107	29,390
HEAT REJ. TO ATMOSPHERE	(NOMINAL)	(5)	BTU/min	13,999	13,139	12,447
HEAT REJ. TO LUBE OIL	(NOMINAL)	(6)	BTU/min	17,998	17,206	16,973
HEAT REJ. TO EXH. (LHV to 77°F)	(NOMINAL)	(4)	BTU/min	154,449	124,159	90,239
HEAT REJ. TO EXH. (LHV to 350°F)	(NOMINAL)	(4)	BTU/min	93,314	77,170	57,985
HEAT REJ. TO AFTERCOOLER	(NOMINAL)	(7) (8)	BTU/min	26,544	14,324	1,990

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

NOTES

1) FUEL CONSUMPTION TOLERANCE. ISO 3046/1 IS 0, + 5% OF FULL LOAD DATA. NOMINAL IS ± 2.5 % OF FULL LOAD DATA.
2) ENGINE POWER AND WORK ENERGY INCLUDE 2 ENGINE DRIVEN WATER PUMPS.
3) EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED VALUES.
4) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA. (heat rate based on treated water)
5) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ± 50% OF FULL LOAD DATA. (heat rate based on treated water)
6) HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water)
7) HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water)
8) TOTAL AFTERCOOLER HEAT = AFTERCOOLER HEAT x ACHRF (heat rate based on treated water)

G3612 GAS ENGINE TECHNICAL DATA **CATERPILLAR®**

FUEL USAGE GUIDE

DERATE FACTOR vs CATERPILLAR METHANE NUMBER

Methane Number	30	35	40	45	50	55	60	65	70>=100
Rating Factor	0.00	0.00	0.00	0.76	0.82	0.87	0.93	0.98	1.00

Minimum Methane Number for Full Rating = 66.3

Fuel System Limit (minimum Wobbe Index) = 1126 BTU/SCF

TOTAL DERATION FACTORS - ALTITUDE & COOLING

AIR TO TURBO (°F) vs ALTITUDE (FEET ABOVE SEA LEVEL)

°F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	0.93	0.89	0.85	0.81	0.78	0.74	0.71	0.68	0.65	0.61	0.58	0.56	0.53
120	0.98	0.94	0.90	0.86	0.82	0.79	0.75	0.72	0.68	0.65	0.62	0.59	0.56
110	1.00	1.00	0.95	0.91	0.87	0.83	0.80	0.76	0.73	0.69	0.66	0.63	0.60
100	1.00	1.00	1.00	0.97	0.93	0.89	0.85	0.81	0.77	0.73	0.70	0.67	0.63
90	1.00	1.00	1.00	1.00	0.98	0.94	0.90	0.86	0.82	0.78	0.74	0.71	0.67
80	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.91	0.87	0.83	0.79	0.75	0.72
70	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.86	0.83	0.80	0.76
60	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.92	0.88	0.85	0.81	0.78
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.86	0.83	0.79

AFTERCOOLER HEAT REJECTION FACTORS

AIR TO TURBO (°F) vs ALTITUDE (FEET ABOVE SEA LEVEL)

°F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.42	1.49	1.56	1.63	1.70	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77
120	1.34	1.40	1.47	1.54	1.61	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
110	1.25	1.32	1.38	1.45	1.52	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
100	1.17	1.23	1.30	1.36	1.43	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
90	1.08	1.14	1.21	1.27	1.34	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
80	1.00	1.06	1.12	1.18	1.25	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
70	1.00	1.00	1.03	1.09	1.16	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
60	1.00	1.00	1.00	1.00	1.07	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
50	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE (RPM)

AIR TO TURBO (°F) vs ALTITUDE (FEET ABOVE SEA LEVEL)

°F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	760	780	800	850	850	850	850	850	850	850	850	850	850
120	760	770	790	850	850	850	850	850	850	850	850	850	850
110	750	770	780	800	850	850	850	850	850	850	850	850	850
100	750	760	770	790	850	850	850	850	850	850	850	850	850
90	750	750	770	780	800	850	850	850	850	850	850	850	850
80	750	750	760	770	790	850	850	850	850	850	850	850	850
70	750	750	750	770	780	800	850	850	850	850	850	850	850
60	750	750	750	760	770	790	850	850	850	850	850	850	850
50	750	750	750	750	770	780	800	850	850	850	850	850	850

ALLOWABLE INERTS IN THE FUEL:
The maximum amount of free inerts in the fuel is limited to 5%.

FUEL SYSTEM LIMIT:
Fuels with a Wobbe index lower than the limit, require a custom fuel system and engine control system mapping from the factory. The Wobbe index is determined using the Caterpillar Methane Number Calculation program.

FUEL USAGE GUIDE:
This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

TOTAL DERATION FACTORS:
This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site. The total deration factor includes deration due to altitude and ambient temperature, and air inlet manifold temperature deration.

ACTUAL ENGINE RATING
It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. To determine the actual power available, take the lowest rating between the Altitude/Temperature Deration and the Fuel Usage Guide Deration.

AFTERCOOLER HEAT REJECTION FACTORS:
Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE
This table shows the minimum allowable engine operating speed for site-specific ratings as determined by the Total Deration Factor chart. The minimum allowable engine operating speed cannot be lowered even if the actual engine power falls below the site-specific rating allowed by the Total Deration Factor chart. Turbocharger compressor surge or damage will result if the engine is operated lower than the minimum allowable speed.

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})(\text{heat input, MMBtu/hr})(1/\text{operating HP, } 1/\text{hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

Enterprise Field Services LLC

Lindrith Compressor Station
Part 71 Renewal Application Update

Emissions Calculations
Condensate Tanks
Source ID No.: TBATTERY

Condensate Storage Tank Battery Operating Parameters

Throughput Estimates (Hysis Model)

	days	gpm	bbl/day	bbl/yr	gal/yr
Summer	90	-	-	-	-
Spring/Fall	155	-	-	-	-
Winter	120	1.55	53.25	6,389	268,358

Proposed Throughput Limit:	20,000	bbl/yr
	55	bbl/day (average)
Numbr of Tanks in Battery	8	

Estimated Emissions (NonSpeciated)

	Modeled		Proposed
Steam	lb/yr	Data Source	tpy
Flash	18,060.8	Hysis	28.27
Breathing	4,401.1	EPA Tanks	17.60
Working	686.8	EPA Tanks	2.75

Notes

1. The Hysis VOC estimate is for the battery - not per tank.
2. The EPA Tanks estimates are per tank.
3. Flash emissions are prorated by ratio of (Proposed Throughput / Hysis Throughput * Hysis Flash VOC tpy)
4. AspenTech predicts 6.271 lb/hr of flash emissions over the 120 day "Winter" period. This equates to 9.03 tons.

Speciated Tank Emissions (Vapor Phase)

	Aspen Analysis	Normalized Aspen Analysis			
	Flash	Breathing/Working	Flash	Breathing/Working	Total
Component	Mass Fraction	Mass Fraction	tpy	tpy	tpy
Nitrogen	0.0008		0.02	-	0.02
CO2	0.0089		0.25	-	0.25
Methane	0.1857		5.25	-	5.25
Ethane	0.1969		5.57	-	5.57
Propane	0.2589	0.43	7.32	8.74	16.06
i-Butane	0.069	0.11	1.95	2.33	4.28
n-Butane	0.1131	0.19	3.20	3.82	7.02
i-Pentane	0.0481	0.08	1.36	1.62	2.98
n-Pentane	0.0376	0.06	1.06	1.27	2.33
n-Hexane	0.0135	0.02	0.38	0.46	0.84
n-Heptane	0.0142	0.02	0.40	0.48	0.88
n-Octane	0.0027	0.00	0.08	0.09	0.17
Cyclopentane	0.0031	0.01	0.09	0.10	0.19
Benzene	0.002	0.00	0.06	0.07	0.12
Cyclohexane	0.0064	0.01	0.18	0.22	0.40
2-Mhexane	0.0297	0.05	0.84	1.00	1.84
25-Mhexane	0.0028	0.00	0.08	0.09	0.17
Toluene	0.0017	0.00	0.05	0.06	0.11
H2O	0.0047		0.13	-	0.13
Total	1.00	1.00	17.17	20.35	37.52
Total VOC	0.60	1.00	17.04	20.35	37.39
Total HAP	0.02	0.04	0.67	0.80	1.46

Aspen VOC	Normalized Aspen VOC
0.2589	0.4
0.069	0.1
0.1131	0.1
0.0481	0.0
0.0376	0.0
0.0135	0.0
0.0142	0.0
0.0027	0.0
0.0031	0.0
0.002	0.0
0.0064	0.0
0.0297	0.0
0.0028	0.0
0.0017	0.0
0.6028	1.0

Notes:

1. The speciated flash emissions are based on the AspenTech process model results.
2. The speciated breathing/working losses were conservatively based on the AspenTech process model results minus the non-VOC components. The AspenTech VOC mass fraction was normalized to 1.0.

Material Stream: VENT1

Fluid Package: Basis-1
Property Package: Peng-Robinson

CONDITIONS

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase
Vapour / Phase Fraction		1.0000	1.0000	0.0000	0.0000
Temperature:	(F)	36.62	36.62	36.62	36.62
Pressure:	(psig*)	0.0000	0.0000	0.0000	0.0000
Molar Flow	(MMSCFD)	1.691e-003	1.691e-003	0.0000	0.0000
Mass Flow	(lb/hr)	6.271	6.271	0.0000	0.0000
Std Ideal Liq Vol Flow	(USGPM)	2.836e-002	2.836e-002	0.0000	0.0000
Molar Enthalpy	(Btu/lbmole)	-4.255e+004	-4.255e+004	-8.874e+004	-1.235e+005
Molar Entropy	(Btu/lbmole-F)	44.25	44.25	17.78	11.38
Heat Flow	(Btu/hr)	-7903	-7903	0.0000	0.0000
Liq Vol Flow @Std Cond	(USGPM)	3.343e-002 *	3.343e-002	0.0000	0.0000

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase
Molecular Weight		33.76	33.76	92.61	18.02
Molar Density	(lbmole/ft3)	2.238e-003	2.238e-003	0.4697	3.548
Mass Density	(lb/ft3)	7.555e-002	7.555e-002	43.50	63.93
Act. Volume Flow	(USGPM)	10.35	10.35	0.0000	0.0000
Mass Enthalpy	(Btu/lb)	-1260	-1260	-958.3	-6853
Mass Entropy	(Btu/lb-F)	1.311	1.311	0.1920	0.6314
Heat Capacity	(Btu/lbmole-F)	13.79	13.79	44.45	18.60
Mass Heat Capacity	(Btu/lb-F)	0.4083	0.4083	0.4800	1.033
Lower Heating Value	(Btu/lbmole)	6.716e+005	6.716e+005	1.783e+006	1.342e-004
Mass Lower Heating Value	(Btu/lb)	1.989e+004	1.989e+004	1.926e+004	7.447e-006
Phase Fraction [Vol. Basis]		---	1.000	---	---
Phase Fraction [Mass Basis]		2.122e-314	1.000	0.0000	0.0000
Partial Pressure of CO2	(psig*)	-11.72	---	---	---
Cost Based on Flow	(Cost/s)	0.0000	0.0000	0.0000	0.0000
Act. Gas Flow	(ACFM)	1.383	1.383	---	---
Avg. Liq. Density	(lbmole/ft3)	0.8166	0.8166	0.4582	3.458
Specific Heat	(Btu/lbmole-F)	13.79	13.79	44.45	18.60
Std. Gas Flow	(MMSCFD)	1.692e-003	1.692e-003	0.0000	0.0000
Std. Ideal Liq. Mass Density	(lb/ft3)	27.57	27.57	42.44	62.30
Act. Liq. Flow	(USGPM)	0.0000	---	---	0.0000
Z Factor		---	0.9904	4.718e-003	6.245e-004
Watson K		15.81	15.81	12.62	8.520
User Property		---	---	---	---
Cp/(Cp - R)		1.168	1.168	1.047	1.120
Cp/Cv		1.175	1.175	1.047	1.130
Heat of Vap.	(Btu/lbmole)	1.060e+004	---	---	---
Kinematic Viscosity	(cSt)	7.446	7.446	0.6690	1.579
Liq. Mass Density (Std. Cond)	(lb/ft3)	23.39	23.39	42.78	63.33
Liq. Vol. Flow (Std. Cond)	(USGPM)	3.343e-002	3.343e-002	0.0000	0.0000
Liquid Fraction		0.0000	0.0000	1.000	1.000
Molar Volume	(ft3/lbmole)	446.9	446.9	2.129	0.2818
Mass Heat of Vap.	(Btu/lb)	314.1	---	---	---
Phase Fraction [Molar Basis]		1.0000	1.0000	0.0000	0.0000
Surface Tension	(dyne/cm)	---	---	20.63	75.96
Thermal Conductivity	(Btu/hr-ft-F)	1.175e-002	1.175e-002	7.013e-002	0.3314
Viscosity	(cP)	9.011e-003	9.011e-003	0.4661	1.616
Cv (Semi-Ideal)	(Btu/lbmole-F)	11.80	11.80	42.46	16.62
Mass Cv (Semi-Ideal)	(Btu/lb-F)	0.3495	0.3495	0.4585	0.9223

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase	
Cv	(Btu/lbmole-F)	11.73	11.73	42.46	16.46	
Mass Cv	(Btu/lb-F)	0.3475	0.3475	0.4585	0.9136	
Cv (Ent. Method)	(Btu/lbmole-F)	---	---	---	16.11	
Mass Cv (Ent. Method)	(Btu/lb-F)	---	---	---	0.8944	
Cp/Cv (Ent. Method)		---	---	---	1.155	
Liq. Vol. Flow - Sum(Std. Cond)	(USGPM)	3.343e-002	3.343e-002	0.0000	0.0000	
Reid VP at 37.8 C	(psig*)	---	---	3.010	---	
True VP at 37.8 C	(psig*)	1309	1309	11.46	-10.00	
Partial Pressure of H2S	(psig*)	-11.80	---	---	---	
Viscosity Index		---	---	-2.140	-0.1073	

COMPOSITION

Overall Phase

Vapour Fraction 1.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0002	0.0009	0.0048	0.0008	0.0000	0.0004
CO2	0.0013	0.0069	0.0560	0.0089	0.0001	0.0048
Methane	0.0726	0.3909	1.1647	0.1857	0.0078	0.2740
Ethane	0.0411	0.2211	1.2348	0.1969	0.0069	0.2445
Propane	0.0368	0.1982	1.6236	0.2589	0.0064	0.2257
i-Butane	0.0074	0.0401	0.4330	0.0690	0.0015	0.0543
n-Butane	0.0122	0.0657	0.7091	0.1131	0.0024	0.0856
i-Pentane	0.0042	0.0225	0.3016	0.0481	0.0010	0.0341
n-Pentane	0.0033	0.0176	0.2360	0.0376	0.0007	0.0264
n-Hexane	0.0010	0.0053	0.0847	0.0135	0.0003	0.0090
n-Heptane	0.0009	0.0048	0.0891	0.0142	0.0003	0.0091
n-Octane	0.0002	0.0008	0.0171	0.0027	0.0000	0.0017
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0003	0.0015	0.0195	0.0031	0.0001	0.0018
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0002	0.0009	0.0129	0.0020	0.0000	0.0010
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0005	0.0026	0.0401	0.0064	0.0001	0.0036
2-Mhexane	0.0019	0.0100	0.1863	0.0297	0.0005	0.0193
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0002	0.0008	0.0177	0.0028	0.0001	0.0018
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0001	0.0006	0.0106	0.0017	0.0000	0.0009

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Overall Phase (continued)

Vapour Fraction 1.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0016	0.0088	0.0293	0.0047	0.0001	0.0021
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1857	1.0000	6.2711	1.0000	0.0284	1.0000

Vapour Phase

Phase Fraction 1.000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0002	0.0009	0.0048	0.0008	0.0000	0.0004
CO2	0.0013	0.0069	0.0560	0.0089	0.0001	0.0048
Methane	0.0726	0.3909	1.1647	0.1857	0.0078	0.2740
Ethane	0.0411	0.2211	1.2348	0.1969	0.0069	0.2445
Propane	0.0368	0.1982	1.6236	0.2589	0.0064	0.2257
i-Butane	0.0074	0.0401	0.4330	0.0690	0.0015	0.0543
n-Butane	0.0122	0.0657	0.7091	0.1131	0.0024	0.0856
i-Pentane	0.0042	0.0225	0.3016	0.0481	0.0010	0.0341
n-Pentane	0.0033	0.0176	0.2360	0.0376	0.0007	0.0264
n-Hexane	0.0010	0.0053	0.0847	0.0135	0.0003	0.0090
n-Heptane	0.0009	0.0048	0.0891	0.0142	0.0003	0.0091
n-Octane	0.0002	0.0008	0.0171	0.0027	0.0000	0.0017
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0003	0.0015	0.0195	0.0031	0.0001	0.0018
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0002	0.0009	0.0129	0.0020	0.0000	0.0010
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0005	0.0026	0.0401	0.0064	0.0001	0.0036
2-Mhexane	0.0019	0.0100	0.1863	0.0297	0.0005	0.0193
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0002	0.0008	0.0177	0.0028	0.0001	0.0018
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0001	0.0006	0.0106	0.0017	0.0000	0.0009

aspentech	EPCO HOLDINGS, INC. Burlington, MA USA	Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
		Unit Set:	USField3
		Date/Time:	Wed May 12 08:13:01 2010

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Vapour Phase (continued)

Phase Fraction 1.000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0016	0.0088	0.0293	0.0047	0.0001	0.0021
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1857	1.0000	6.2711	1.0000	0.0284	1.0000

Liquid Phase

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO2	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000
Methane	0.0000	0.0019	0.0000	0.0003	0.0000	0.0008
Ethane	0.0000	0.0080	0.0000	0.0026	0.0000	0.0050
Propane	0.0000	0.0315	0.0000	0.0150	0.0000	0.0201
i-Butane	0.0000	0.0188	0.0000	0.0118	0.0000	0.0143
n-Butane	0.0000	0.0461	0.0000	0.0289	0.0000	0.0337
i-Pentane	0.0000	0.0454	0.0000	0.0354	0.0000	0.0386
n-Pentane	0.0000	0.0503	0.0000	0.0392	0.0000	0.0423
n-Hexane	0.0000	0.0588	0.0000	0.0547	0.0000	0.0562
n-Heptane	0.0000	0.1967	0.0000	0.2128	0.0000	0.2107
n-Octane	0.0000	0.1217	0.0000	0.1501	0.0000	0.1446
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0059	0.0000	0.0045	0.0000	0.0041
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0104	0.0000	0.0088	0.0000	0.0068
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0368	0.0000	0.0335	0.0000	0.0291
2-Mhexane	0.0000	0.2908	0.0000	0.3146	0.0000	0.3138
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0481	0.0000	0.0594	0.0000	0.0579
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0285	0.0000	0.0283	0.0000	0.0221

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Liquid Phase (continued)

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000

Aqueous Phase

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Aqueous Phase (continued)

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000

K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Nitrogen	786.2	786.2	6.176e+004
CO2	62.97	62.97	1389
Methane	203.2	203.2	1.017e+009
Ethane	27.66	27.66	9.300e+010
Propane	6.292	6.292	---
i-Butane	2.136	2.136	---
n-Butane	1.424	1.424	---
i-Pentane	0.4954	0.4954	---
n-Pentane	0.3499	0.3499	---
n-Hexane	8.992e-002	8.992e-002	---
n-Heptane	2.435e-002	2.435e-002	---
n-Octane	6.639e-003	6.639e-003	---
n-Nonane	---	---	---
n-C11	---	---	---
22-Mbutane	---	---	---
Cyclopentane	0.2536	0.2536	---
2-Mpentane	---	---	---
3-Mpentane	---	---	---
22-Mpentane	---	---	---
Mcyclopentan	---	---	---
24-Mpentane	---	---	---
Benzene	8.516e-002	8.516e-002	---
33-Mpentane	---	---	---
Cyclohexane	6.962e-002	6.962e-002	---
2-Mhexane	3.444e-002	3.444e-002	---
23-Mpentane	---	---	---
11Mcycpentan	---	---	---
3-Mhexane	---	---	---
1-tr3-MCC5	---	---	---
1-ci3-MCC5	---	---	---
Mcyclohexane	---	---	---
113-MCC5	---	---	---
25-Mhexane	1.734e-002	1.734e-002	---
MCC5==	---	---	---
Toluene	2.172e-002	2.172e-002	---
Naphthalene	---	---	---

Material Stream: VENT1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Ecyclohexane	---	---	---
p-Xylene	---	---	---
m-Xylene	---	---	---
2-Moctane	---	---	---
o-Xylene	---	---	---
H2O	60.45	60.45	8.766e-003
Methanol	---	---	---

EPCO HOLDINGS, INC. Burlington, MA USA	Case Name: LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc Unit Set: USField3 Date/Time: Wed May 12 08:16:12 2010

Material Stream: CONDENSATE1

Fluid Package: Basis-1

Property Package: Peng-Robinson

CONDITIONS

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase
Vapour / Phase Fraction		0.0000	0.0000	0.1928	0.8072
Temperature:	(F)	36.62	36.62	36.62	36.62
Pressure:	(psig*)	0.0000	0.0000	0.0000	0.0000
Molar Flow	(MMSCFD)	0.1286	0.0000	2.479e-002	0.1038
Mass Flow	(lb/hr)	457.5	0.0000	252.1	205.3
Std Ideal Liq Vol Flow	(USGPM)	1.152	0.0000	0.7407	0.4109
Molar Enthalpy	(Btu/lbmole)	-1.168e+005	-4.255e+004	-8.874e+004	-1.235e+005
Molar Entropy	(Btu/lbmole-F)	12.61	44.25	17.78	11.38
Heat Flow	(Btu/hr)	-1.649e+006	0.0000	-2.416e+005	-1.407e+006
Liq Vol Flow @Std Cond	(USGPM)	1.069 *	0.0000	0.7349	0.4043

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase
Molecular Weight		32.40	33.76	92.61	18.02
Molar Density	(lbmole/ft3)	1.568	2.238e-003	0.4697	3.548
Mass Density	(lb/ft3)	50.78	7.555e-002	43.50	63.93
Act. Volume Flow	(USGPM)	1.123	0.0000	0.7226	0.4005
Mass Enthalpy	(Btu/lb)	-3604	-1260	-958.3	-6853
Mass Entropy	(Btu/lb-F)	0.3893	1.311	0.1920	0.6314
Heat Capacity	(Btu/lbmole-F)	23.58	13.79	44.45	18.60
Mass Heat Capacity	(Btu/lb-F)	0.7280	0.4083	0.4800	1.033
Lower Heating Value	(Btu/lbmole)	3.438e+005	6.716e+005	1.783e+006	1.342e-004
Mass Lower Heating Value	(Btu/lb)	1.061e+004	1.989e+004	1.926e+004	7.447e-006
Phase Fraction [Vol. Basis]		---	---	0.6432	0.3568
Phase Fraction [Mass Basis]		2.122e-314	0.0000	0.5511	0.4489
Partial Pressure of CO2	(psig*)	-11.80	---	---	---
Cost Based on Flow	(Cost/s)	0.0000	0.0000	0.0000	0.0000
Act. Gas Flow	(ACFM)	---	---	---	---
Avg. Liq. Density	(lbmole/ft3)	1.529	0.8166	0.4582	3.458
Specific Heat	(Btu/lbmole-F)	23.58	13.79	44.45	18.60
Std. Gas Flow	(MMSCFD)	0.1286	0.0000	2.480e-002	0.1038
Std. Ideal Liq. Mass Density	(lb/ft3)	49.52	27.57	42.44	62.30
Act. Liq. Flow	(USGPM)	1.123	---	0.7226	0.4005
Z Factor		---	0.9904	4.718e-003	6.245e-004
Watson K		12.62	15.81	12.62	8.520
User Property		---	---	---	---
Cp/(Cp - R)		1.092	1.168	1.047	1.120
Cp/Cv		1.092	1.175	1.047	1.130
Heat of Vap.	(Btu/lbmole)	2.068e+004	---	---	---
Kinematic Viscosity	(cSt)	2.069	7.446	0.6690	1.579
Liq. Mass Density (Std. Cond)	(lb/ft3)	53.36	23.39	42.78	63.33
Liq. Vol. Flow (Std. Cond)	(USGPM)	1.069	0.0000	0.7349	0.4043
Liquid Fraction		1.000	0.0000	1.000	1.000
Molar Volume	(ft3/lbmole)	0.6379	446.9	2.129	0.2818
Mass Heat of Vap.	(Btu/lb)	638.2	---	---	---
Phase Fraction [Molar Basis]		0.0000	0.0000	0.1928	0.8072
Surface Tension	(dyne/cm)	---	---	20.63	75.96
Thermal Conductivity	(Btu/hr-ft-F)	0.1243	1.175e-002	7.013e-002	0.3314
Viscosity	(cP)	1.683	9.011e-003	0.4661	1.616
Cv (Semi-Ideal)	(Btu/lbmole-F)	21.60	11.80	42.46	16.62
Mass Cv (Semi-Ideal)	(Btu/lb-F)	0.6667	0.3495	0.4585	0.9223

* Specified by user.

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase	
Cv	(Btu/lbmole-F)	21.60	11.73	42.46	16.46	
Mass Cv	(Btu/lb-F)	0.6667	0.3475	0.4585	0.9136	
Cv (Ent. Method)	(Btu/lbmole-F)	---	---	---	16.11	
Mass Cv (Ent. Method)	(Btu/lb-F)	---	---	---	0.8944	
Cp/Cv (Ent. Method)		---	---	---	1.155	
Liq. Vol. Flow - Sum(Std. Cond)	(USGPM)	1.139	0.0000	0.7349	0.4043	
Reid VP at 37.8 C	(psig*)	3.019	---	3.010	---	
True VP at 37.8 C	(psig*)	12.14	1309	11.46	-10.00	
Partial Pressure of H2S	(psig*)	-11.80	---	---	---	
Viscosity Index		-0.2559	---	-2.140	-0.1073	

COMPOSITION

Overall Phase

Vapour Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
CO2	0.0004	0.0000	0.0155	0.0000	0.0000	0.0000
Methane	0.0052	0.0004	0.0840	0.0002	0.0006	0.0005
Ethane	0.0218	0.0015	0.6545	0.0014	0.0037	0.0032
Propane	0.0858	0.0061	3.7827	0.0083	0.0149	0.0129
i-Butane	0.0511	0.0036	2.9721	0.0065	0.0106	0.0092
n-Butane	0.1255	0.0089	7.2974	0.0160	0.0250	0.0217
i-Pentane	0.1237	0.0088	8.9238	0.0195	0.0286	0.0248
n-Pentane	0.1370	0.0097	9.8877	0.0216	0.0314	0.0272
n-Hexane	0.1602	0.0113	13.8017	0.0302	0.0416	0.0361
n-Heptane	0.5355	0.0379	53.6629	0.1173	0.1560	0.1355
n-Octane	0.3312	0.0235	37.8337	0.0827	0.1071	0.0930
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0161	0.0011	1.1269	0.0025	0.0030	0.0026
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0283	0.0020	2.2124	0.0048	0.0050	0.0043
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.1002	0.0071	8.4361	0.0184	0.0215	0.0187
2-Mhexane	0.7916	0.0561	79.3196	0.1734	0.2324	0.2018
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.1310	0.0093	14.9641	0.0327	0.0429	0.0372
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0775	0.0055	7.1431	0.0156	0.0164	0.0142

* Specified by user.

aspentech

EPCO HOLDINGS, INC.
Burlington, MA
USA

Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
Unit Set:	USField3
Date/Time:	Wed May 12 08:16:12 2010

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Overall Phase (continued)

Vapour Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	11.3985	0.8072	205.3451	0.4489	0.4109	0.3568
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	14.1207	1.0000	457.4633	1.0000	1.1516	1.0000

Vapour Phase

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0009	0.0000	0.0008	0.0000	0.0004
CO2	0.0000	0.0069	0.0000	0.0089	0.0000	0.0048
Methane	0.0000	0.3909	0.0000	0.1857	0.0000	0.2740
Ethane	0.0000	0.2211	0.0000	0.1969	0.0000	0.2445
Propane	0.0000	0.1982	0.0000	0.2589	0.0000	0.2257
i-Butane	0.0000	0.0401	0.0000	0.0690	0.0000	0.0543
n-Butane	0.0000	0.0657	0.0000	0.1131	0.0000	0.0856
i-Pentane	0.0000	0.0225	0.0000	0.0481	0.0000	0.0341
n-Pentane	0.0000	0.0176	0.0000	0.0376	0.0000	0.0264
n-Hexane	0.0000	0.0053	0.0000	0.0135	0.0000	0.0090
n-Heptane	0.0000	0.0048	0.0000	0.0142	0.0000	0.0091
n-Octane	0.0000	0.0008	0.0000	0.0027	0.0000	0.0017
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0015	0.0000	0.0031	0.0000	0.0018
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0009	0.0000	0.0020	0.0000	0.0010
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0026	0.0000	0.0064	0.0000	0.0036
2-Mhexane	0.0000	0.0100	0.0000	0.0297	0.0000	0.0193
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0008	0.0000	0.0028	0.0000	0.0018
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0006	0.0000	0.0017	0.0000	0.0009

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

COMPOSITION

Vapour Phase (continued)

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0000	0.0088	0.0000	0.0047	0.0000	0.0021
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000

Liquid Phase

Phase Fraction 0.1928

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
CO2	0.0003	0.0001	0.0130	0.0001	0.0000	0.0000
Methane	0.0052	0.0019	0.0840	0.0003	0.0006	0.0008
Ethane	0.0218	0.0080	0.6545	0.0026	0.0037	0.0050
Propane	0.0858	0.0315	3.7827	0.0150	0.0149	0.0201
i-Butane	0.0511	0.0188	2.9721	0.0118	0.0106	0.0143
n-Butane	0.1255	0.0461	7.2974	0.0289	0.0250	0.0337
i-Pentane	0.1237	0.0454	8.9238	0.0354	0.0286	0.0386
n-Pentane	0.1370	0.0503	9.8877	0.0392	0.0314	0.0423
n-Hexane	0.1602	0.0588	13.8017	0.0547	0.0416	0.0562
n-Heptane	0.5355	0.1967	53.6629	0.2128	0.1560	0.2107
n-Octane	0.3312	0.1217	37.8337	0.1501	0.1071	0.1446
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0161	0.0059	1.1269	0.0045	0.0030	0.0041
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0283	0.0104	2.2124	0.0088	0.0050	0.0068
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.1002	0.0368	8.4361	0.0335	0.0215	0.0291
2-Mhexane	0.7916	0.2908	79.3196	0.3146	0.2324	0.3138
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.1310	0.0481	14.9641	0.0594	0.0429	0.0579
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0775	0.0285	7.1431	0.0283	0.0164	0.0221

* Specified by user.

aspentech	EPCO HOLDINGS, INC. Burlington, MA USA	Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
		Unit Set:	USField3
		Date/Time:	Wed May 12 08:16:12 2010

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Liquid Phase (continued)

Phase Fraction 0.1928

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0004	0.0001	0.0071	0.0000	0.0000	0.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.7225	1.0000	252.1228	1.0000	0.7407	1.0000

Aqueous Phase

Phase Fraction 0.8072

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO2	0.0001	0.0000	0.0025	0.0000	0.0000	0.0000
Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

* Specified by user.

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Aqueous Phase (continued)

Phase Fraction 0.8072

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	11.3981	1.0000	205.3380	1.0000	0.4109	1.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	11.3982	1.0000	205.3405	1.0000	0.4109	1.0000

K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Nitrogen	3872	786.2	6.176e+004
CO2	274.5	62.97	1389
Methane	1054	203.2	1.017e+009
Ethane	143.4	27.66	9.300e+010
Propane	32.63	6.292	---
i-Butane	11.08	2.136	---
n-Butane	7.388	1.424	---
i-Pentane	2.570	0.4954	---
n-Pentane	1.815	0.3499	---
n-Hexane	0.4664	8.992e-002	---
n-Heptane	0.1263	2.435e-002	---
n-Octane	3.444e-002	6.639e-003	---
n-Nonane	---	---	---
n-C11	---	---	---
22-Mbutane	---	---	---
Cyclopentane	1.315	0.2536	---
2-Mpentane	---	---	---
3-Mpentane	---	---	---
22-Mpentane	---	---	---
Mcyclopentan	---	---	---
24-Mpentane	---	---	---
Benzene	0.4417	8.516e-002	---
33-Mpentane	---	---	---
Cyclohexane	0.3611	6.962e-002	---
2-Mhexane	0.1786	3.444e-002	---
23-Mpentane	---	---	---
11Mcycpentan	---	---	---
3-Mhexane	---	---	---
1-tr3-MCC5	---	---	---
1-ci3-MCC5	---	---	---
Mcyclohexane	---	---	---
113-MCC5	---	---	---
25-Mhexane	8.995e-002	1.734e-002	---
MCC5==	---	---	---
Toluene	0.1126	2.172e-002	---
Naphthalene	---	---	---

* Specified by user.

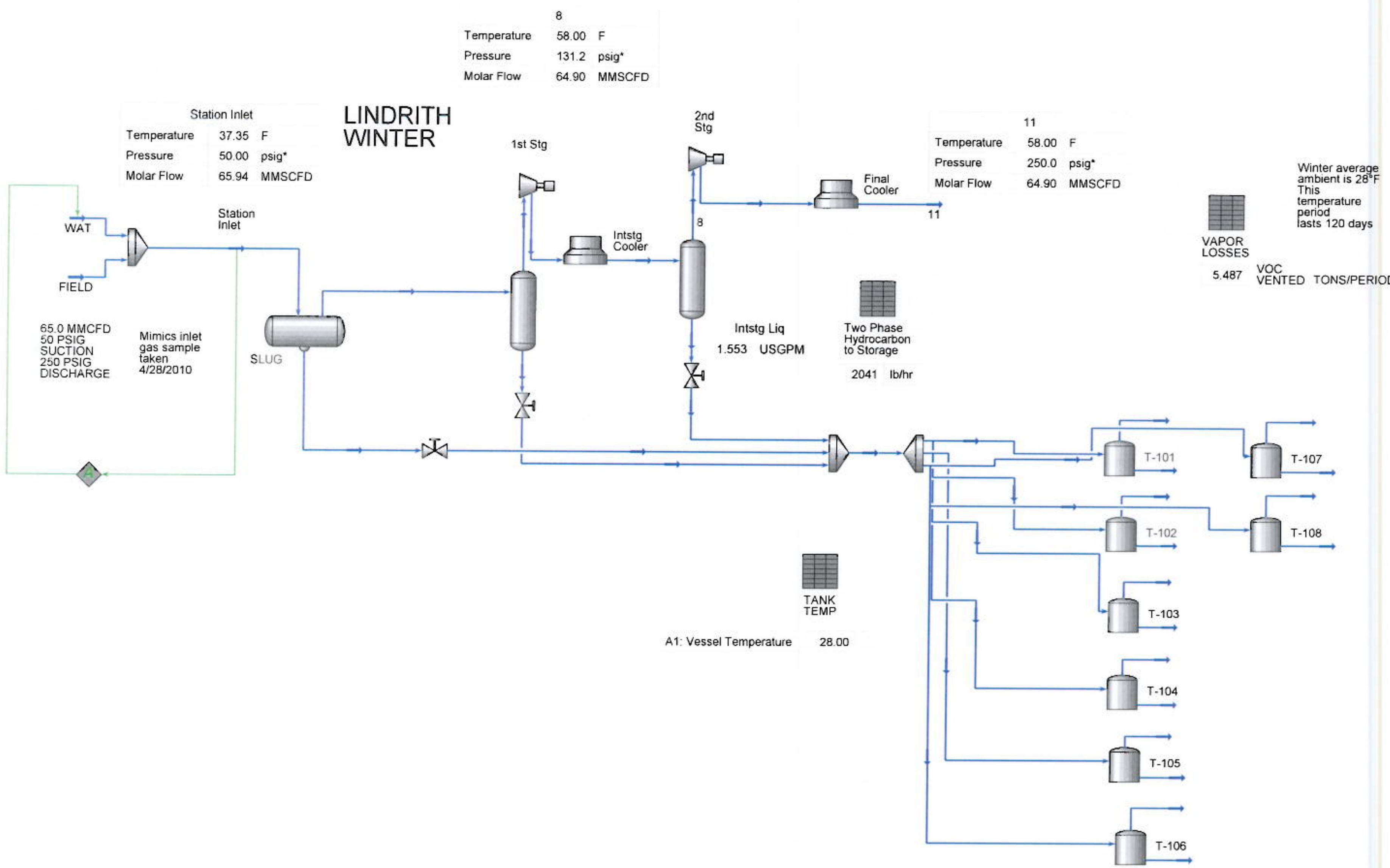
Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1

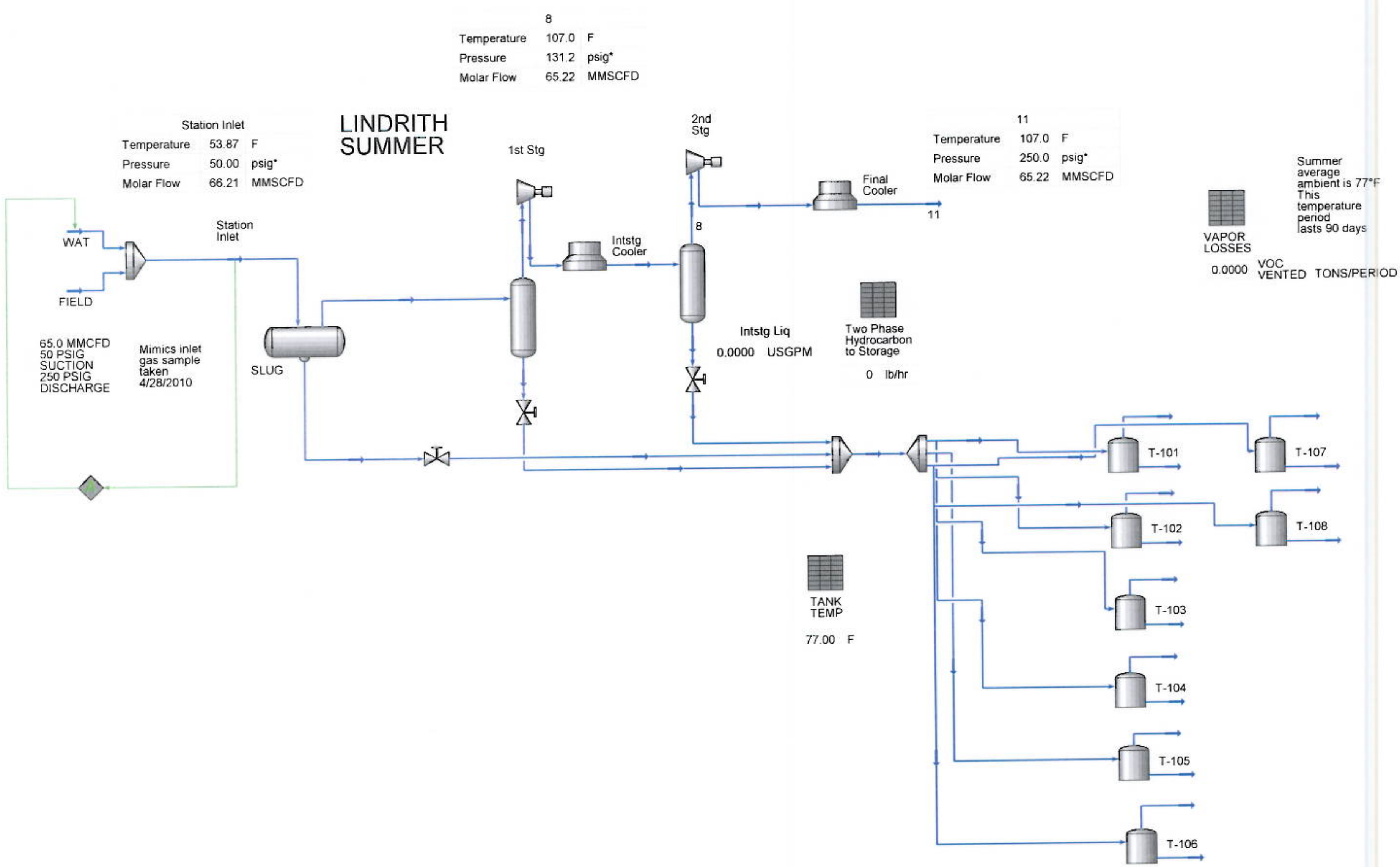
Property Package: Peng-Robinson

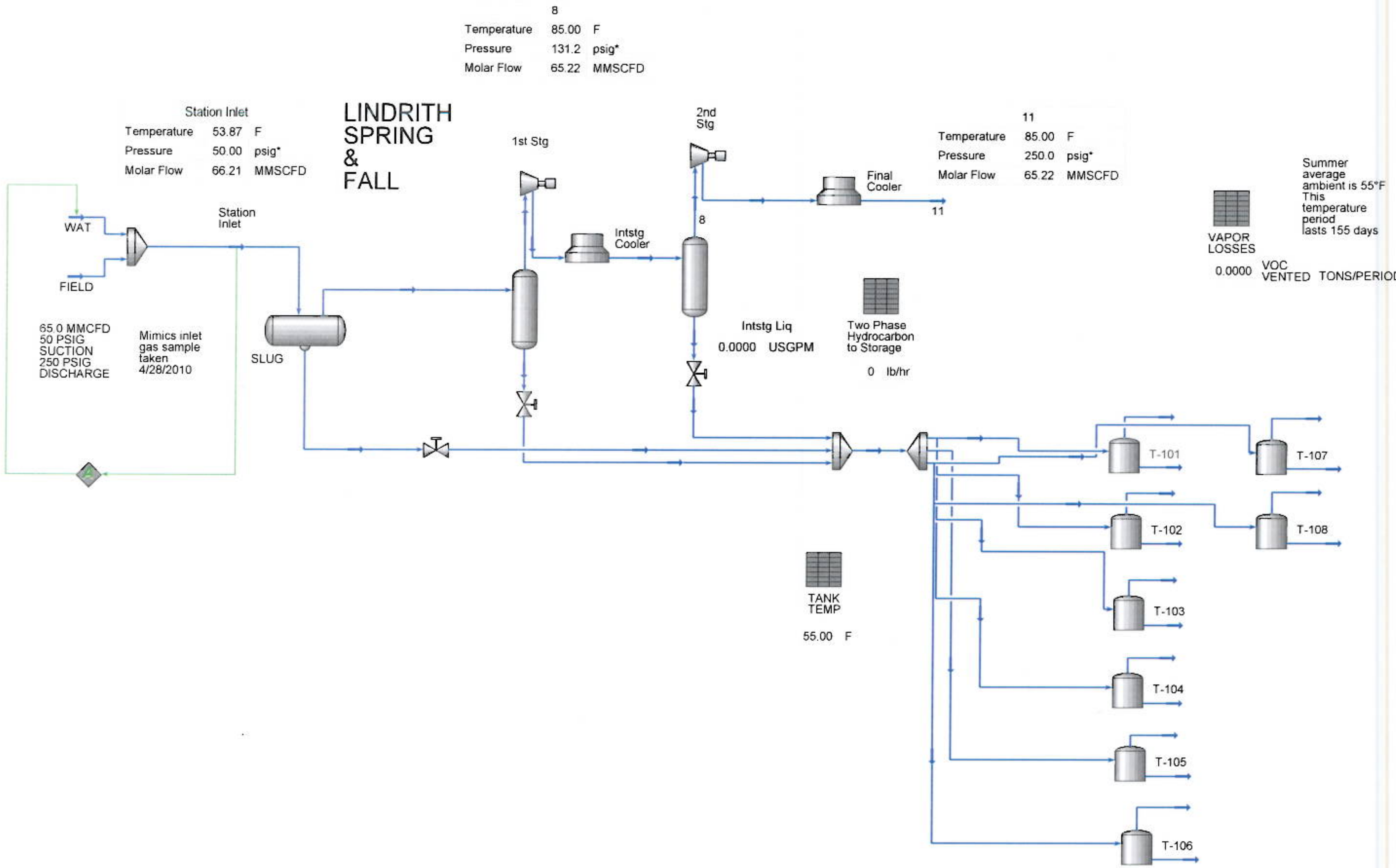
K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Ecyclohexane	---	---	---
p-Xylene	---	---	---
m-Xylene	---	---	---
2-Moctane	---	---	---
o-Xylene	---	---	---
H2O	1.086e-002	60.45	8.766e-003
Methanol	---	---	---



8
Temperature 58.00 F
Pressure 131.2 psig*
Molar Flow 64.90 MMSCFD
Station Inlet
Temperature 37.35 F
Pressure 50.00 psig*
Molar Flow 65.94 MMSCFD
LINDRITH
WINTER
1st Stg
2nd Stg
11
Temperature 58.00 F
Pressure 250.0 psig*
Molar Flow 64.90 MMSCFD
Final Cooler
Winter average ambient is 28°F This temperature period lasts 120 days
WAT
FIELD
Station Inlet
Intstg Cooler
8
11
VAPOR LOSSES
5.487 VOC VENTED TONS/PERIOD
65.0 MMCFD 50 PSIG SUCTION 250 PSIG DISCHARGE
Mimics inlet gas sample taken 4/28/2010
SLUG
Intstg Liq
1.553 USGPM
Two Phase Hydrocarbon to Storage
2041 lb/hr
T-101
T-102
T-103
T-104
T-105
T-106
T-107
T-108
TANK TEMP
A1: Vessel Temperature 28.00


8
Temperature 107.0 F
Pressure 131.2 psig*
Molar Flow 65.22 MMSCFD
Station Inlet
Temperature 53.87 F
Pressure 50.00 psig*
Molar Flow 66.21 MMSCFD
LINDRITH SUMMER
1st Stg
2nd Stg
11
Temperature 107.0 F
Pressure 250.0 psig*
Molar Flow 65.22 MMSCFD
Summer average ambient is 77°F This temperature period lasts 90 days
Final Cooler
11
8
Station Inlet
WAT
FIELD
Intstg Cooler
VAPOR LOSSES
0.0000 VOC VENTED TONS/PERIOD
Two Phase Hydrocarbon to Storage
0 lb/hr
Intstg Liq
0.0000 USGPM
65.0 MMCFD 50 PSIG SUCTION 250 PSIG DISCHARGE
Mimics inlet gas sample taken 4/28/2010
SLUG
T-101
T-107
T-102
T-108
T-103
T-104
T-105
T-106
TANK TEMP
77.00 F


LINDRITH SPRING & FALL
Station Inlet
Temperature 53.87 F
Pressure 50.00 psig*
Molar Flow 66.21 MMSCFD
8
Temperature 85.00 F
Pressure 131.2 psig*
Molar Flow 65.22 MMSCFD
11
Temperature 85.00 F
Pressure 250.0 psig*
Molar Flow 65.22 MMSCFD
WAT
FIELD
Station Inlet
SLUG
1st Stg
Intstg Cooler
2nd Stg
8
Final Cooler
11
65.0 MMCFD
50 PSIG SUCTION
250 PSIG DISCHARGE
Mimics inlet gas sample taken 4/28/2010
Intstg Liq
0.0000 USGPM
Two Phase Hydrocarbon to Storage
0 lb/hr
TANK TEMP
55.00 F
VAPOR LOSSES
0.0000 VOC VENTED TONS/PERIOD
Summer average ambient is 55°F This temperature period lasts 155 days
T-101
T-102
T-103
T-104
T-105
T-106
T-107
T-108

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

Identification

User Identification:	Lindrith CS
City:	
State:	NM
Company:	Enterprise
Type of Tank:	Horizontal Tank
Description:	Lindrith CS TK- / 450 bbl tank 12.75' diameter x 20' tall

Tank Dimensions

Shell Length (ft):	20.00
Diameter (ft):	12.75
Volume (gallons):	18,900.00
Turnovers:	5.56
Net Throughput(gal/yr):	105,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

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

Lindrith CS - Horizontal Tank

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp	Vapor Pressure (psia)			Vapor Mol.	Liquid Mass	Vapor Mass	Mol.	Basis for Vapor Pressure
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Weight	Calculations
Gasoline (RVP 7)	All	67.36	53.93	80.79	59.23	4.0400	3.0751	5.2361	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3

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

Lindrith CS - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	4,401.0651
Vapor Space Volume (cu ft):	1,626.4495
Vapor Density (lb/cu ft):	0.0486
Vapor Space Expansion Factor:	0.3610
Vented Vapor Saturation Factor:	0.4228
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,626.4495
Tank Diameter (ft):	12.7500
Effective Diameter (ft):	18.0233
Vapor Space Outage (ft):	6.3750
Tank Shell Length (ft):	20.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0486
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3610
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	2.1610
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	3.0751
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2361
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4228
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Vapor Space Outage (ft):	6.3750
Working Losses (lb):	686.7932
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Annual Net Throughput (gal/yr.):	105,000.0000
Annual Turnovers:	5.5556
Turnover Factor:	1.0000
Tank Diameter (ft):	12.7500
Working Loss Product Factor:	1.0000
Total Losses (lb):	5,087.8783

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

Emissions Report for: Annual

Lindrith CS - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 7)	686.79	4,401.09	5,087.88

Truck Loading

Operating Parameters

Loading Rate	20,000	bbls/yr	
	840,000	gallon/yr	
	16,800	gal/hr	(Assume one 400 tank per hour)
Vapor MW	33.76		AspenTech Condensate Analysis
Temp	85	F	Assumed Average
	544	R	
TVP	11.46	psia	@37.8C
Saturation factor	0.6		
Loading Loss	5.32	lb/Mgal	

AP-42 Calculation:	L= 12.46*S*P*M/T
L	Loading Losses (lb/1000)
S	Saturation Factor
P	True Vapor Pressure
M	Molecular weight of vapor
T	Temperature

Estimated Emissions (NonSpeciated)

89.32	lb/hr	Gal/hr / 1000 x L
2.23	tpy	Gal/yr / 1000 x L / 2000 lb/ton

Speciated Truck Loading Emissions (Vapor Phase)

Component	Aspen Analysis Mass Fraction	VOC Aspen Analysis Mass Fraction	VOC Normalized Mass Fraction	lb/hr	tpy
Nitrogen	0.0008				
CO2	0.0089				
Methane	0.1857				
Ethane	0.1969				
Propane	0.2589	0.2589	0.43	38.36	0.96
i-Butane	0.069	0.069	0.11	10.22	0.26
n-Butane	0.1131	0.1131	0.19	16.76	0.42
i-Pentane	0.0481	0.0481	0.08	7.13	0.18
n-Pentane	0.0376	0.0376	0.06	5.57	0.14
n-Hexane	0.0135	0.0135	0.02	2.00	0.05
n-Heptane	0.0142	0.0142	0.02	2.10	0.05
n-Octane	0.0027	0.0027	0.00	0.40	0.01
Cyclopentane	0.0031	0.0031	0.01	0.46	0.01
Benzene	0.002	0.002	0.00	0.30	0.01
Cyclohexane	0.0064	0.0064	0.01	0.95	0.02
2-Mhexane	0.0297	0.0297	0.05	4.40	0.11
25-Mhexane	0.0028	0.0028	0.00	0.41	0.01
Toluene	0.0017	0.0017	0.00	0.25	0.01
H2O	0.0047				
Total	1.00	0.60	1.00	89.32	2.23
Total VOC	0.60	0.60	1.00	89.32	2.23
Total HAP	0.02	0.02	0.04	3.50	0.09

Notes:
1. The speciated truck emissions are based on the AspenTech Condensate analysis (vapor phase) mass fractions.
The vapor mass fraction analysis was normalized by deleting all non-VOC components.

loading operation, resulting in high levels of vapor generation and loss. If the turbulence is great enough, liquid droplets will be entrained in the vented vapors.

A second method of loading is submerged loading. Two types are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The recent loading history of a cargo carrier is just as important a factor in loading losses as the method of loading. If the carrier has carried a nonvolatile liquid such as fuel oil, or has just been cleaned, it will contain vapor-free air. If it has just carried gasoline and has not been vented, the air in the carrier tank will contain volatile organic vapors, which will be expelled during the loading operation along with newly generated vapors.

Cargo carriers are sometimes designated to transport only one product, and in such cases are practicing "dedicated service". Dedicated gasoline cargo tanks return to a loading terminal containing air fully or partially saturated with vapor from the previous load. Cargo tanks may also be "switch loaded" with various products, so that a nonvolatile product being loaded may expel the vapors remaining from a previous load of a volatile product such as gasoline. These circumstances vary with the type of cargo tank and with the ownership of the carrier, the petroleum liquids being transported, geographic location, and season of the year.

One control measure for vapors displaced during liquid loading is called "vapor balance service", in which the cargo tank retrieves the vapors displaced during product unloading at bulk plants or service stations and transports the vapors back to the loading terminal. Figure 5.2-5 shows a tank truck in vapor balance service filling a service station underground tank and taking on displaced gasoline vapors for return to the terminal. A cargo tank returning to a bulk terminal in vapor balance service normally 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 nonvapor balance, or "normal", service. Vapor balance service is usually not practiced with marine vessels, although some vessels practice emission control by means of vapor transfer within their own cargo tanks during ballasting operations, discussed below.

Emissions from loading petroleum liquid can be estimated (with a probable error of ±30 percent)[4] using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \tag{1}$$

where:

L_L = loading loss, pounds per 1000 gallons (lb/10^3 gal) of liquid loaded

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Figure 7.1-5, Figure 7.1-6, and Table 7.1-2)
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Table 7.1-2)
T = temperature of bulk liquid loaded, °R (°F + 460)

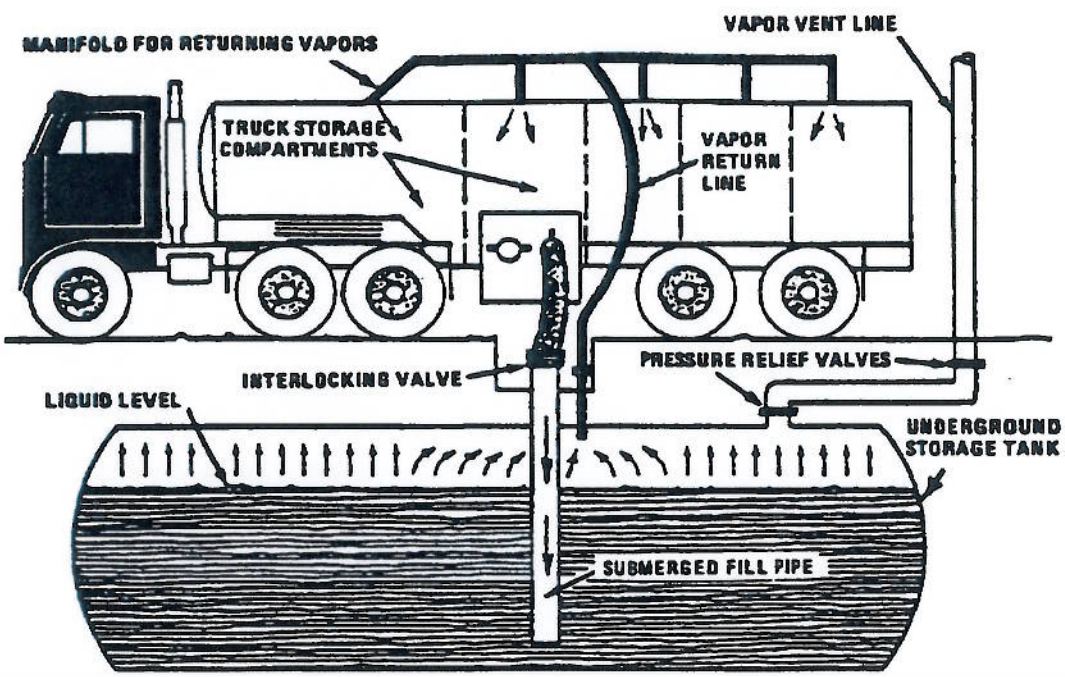


Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

Fugitives

Operating Parameters

Annual Operaton: 8,760 hrs/yr

Pollutant	CAS No.	Stream Composition (Wt%)		Emissions	
		Gas	Light Oil	Average[1] (lbs/hr)	Annual[2] (tons/yr)
Volatile Organic Compounds (VOC)		21.71%	100.00%	0.756	3.310
Benzene	00071-43-2	0.065%		0.001	0.004
n-Hexane	00110-54-3	0.498%		0.007	0.031

(1) Calculated as:

Gas Comp. (wt%) **X** Total Gas Service Emissions (lbs/hr) **+** Lt Oil Composition (wt%) X Total Lt Oil Service Emisisons (lbs/hr)

(2) Calculated as: Average Emissions (lbs/hr) X Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

Component Type	Service	Number of Components[1]	Emission Factors[2]		Hourly Emissions[3] (lbs/hr)
			(kg/hr/source)	(lbs/hr/source)	
Valves	Gas	100	4.5E-03	9.9E-03	0.992
	Light Oil	50	2.5E-03	5.5E-03	0.276
Pump Seals	Gas	0	2.4E-03	5.3E-03	0.000
	Light Oil	2	1.3E-02	2.9E-02	0.057
Other Equipment	Gas	10	8.8E-03	1.9E-02	0.194
	Light Oil	5	7.5E-03	1.7E-02	0.083
Connectors	Gas	50	2.0E-04	4.4E-04	0.022
	Light Oil	25	2.1E-04	4.6E-04	0.012
Flanges	Gas	200	3.9E-04	8.6E-04	0.172
	Light Oil	100	1.1E-04	2.4E-04	0.024
Open-Ended Lines	Gas	5	2.0E-03	4.4E-03	0.022
	Light Oil	0	1.4E-03	3.1E-03	0.000
Totals	Gas	365			1.40
	Light Oil	182			0.45

(1) Number of components is a conservative estimate based on similar installations.

(2) Source: 1995 Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017); Table 2-4. Oil and Gas Production Operations Average Emission Factors (kg/hr/source factors converted to lbs/hr/source by multiplying by 2.20462 lbs/kg)

(3) Calculated as: Number of components**X** Emission Factor (lbs/hr/source)

Enterprise Field Services LLC
Lindrith Compressor Station
Part 71 Renewal Application Update

April 2010 Gas Analysis

Meter Number:	--		**Flow Pressure:**	57
Meter Name:	Lindrith Inlet		**Flow Temp:**	57
Location:			**H20, Lb/MMCF:**	--
Sample Date:	4/28/2010		**H2S, ppmmol:**	--
File name, TCD	Lindrith Inlet.run		**Type:**	Spot
File name, FID	Lindrith Inlet.run		**Pulled by:**	Dennis Bird

Component	Mol%	MolWt	Mol% x MW	Wt%
Carbon Dioxide	0.4879	44.0	0.21	1.03%
Hydrogen Sulfide	0.0000	34.0	0.00	0.00%
Nitrogen	0.6416	28.0	0.18	0.86%
Methane	80.7843	16.0	12.96	62.25%
Ethane	9.7943	30.1	2.95	14.15%
Propane	4.6660	44.1	2.06	9.88%
Isobutane	0.8009	58.1	0.47	2.24%
n-Butane	1.2840	58.1	0.75	3.58%
Isopentane	0.4379	72.2	0.32	1.52%
n-Pentane	0.3499	72.2	0.25	1.21%
Cyclopentane	0.0259	70.1	0.02	0.09%
n-Hexane	0.1203	86.2	0.10	0.50%
Cyclohexane	0.0564	84.2	0.05	0.23%
Other Hexanes	0.2785	86.2000	0.24	1.15%
Heptanes	0.1469	100.2000	0.15	0.71%
Methylcyclohexane	0.0415	98.2	0.04	0.20%
2,2,4 Trimethylpentar	0.0000	114.2	0.00	0.00%
Benzene	0.0172	78.1	0.01	0.06%
Toluene	0.0199	92.1	0.02	0.09%
Ethylbenzene	0.0007	106.2	0.00	0.00%
Xylenes	0.0009	106.2	0.00	0.00%
C8+ Heavies	0.0450	114.2300	0.05	0.25%
Total	**100.0000**		20.82	**100.00%**
VOC Wt%				21.71%

Maintenance, Startup, and Shutdown

Maintanence, Startup, and Shutdown Emissions

Pollutant	CAS No.	Stream Composition (Wt%)	Emissions	
		Gas	Hourly (lb/hr)	Annual (tons/yr)
Volatile Organic Compounds (VOC)		21.71%	119.25	23.85
Benzene	00071-43-2	0.06%	0.35	0.07
n-Hexane	00110-54-3	0.50%	2.74	0.55

Gas Molecular Weight: 20.82 lb/lb/mol
Gas Constant 379 scf/lb-mol

Component Type	Blowdown		Hourly	Annual
	scf/hr	MMscf/yr	lb/hr	tpy
Total Natural Gas Blown Down for MSS	10,000	4.0	549.26	109.85

Notes
(1) MSS emissions include gas blowdown for maintenance, startups, and shutdowns.

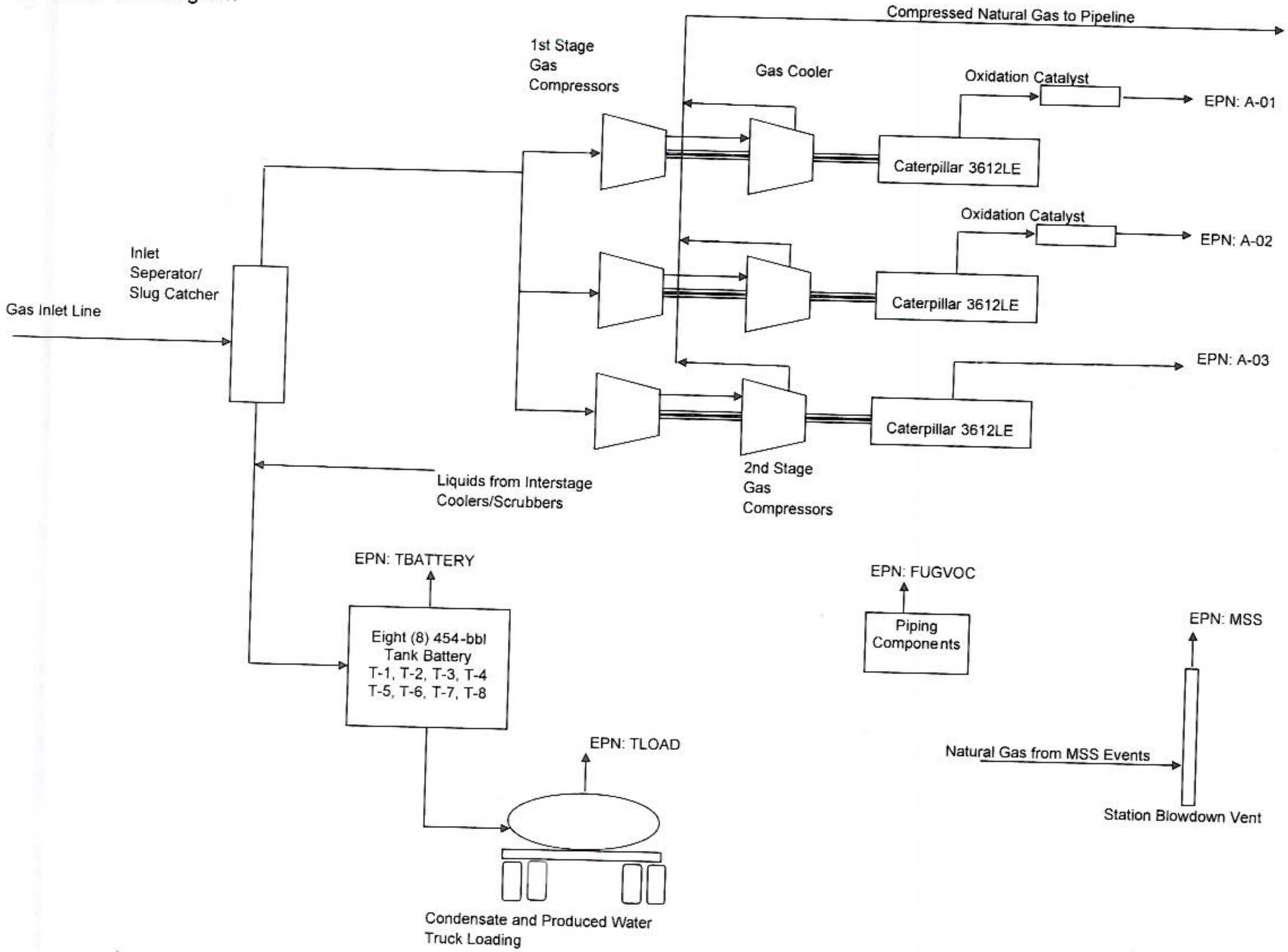
APPENDIX B
Process Flow Diagram

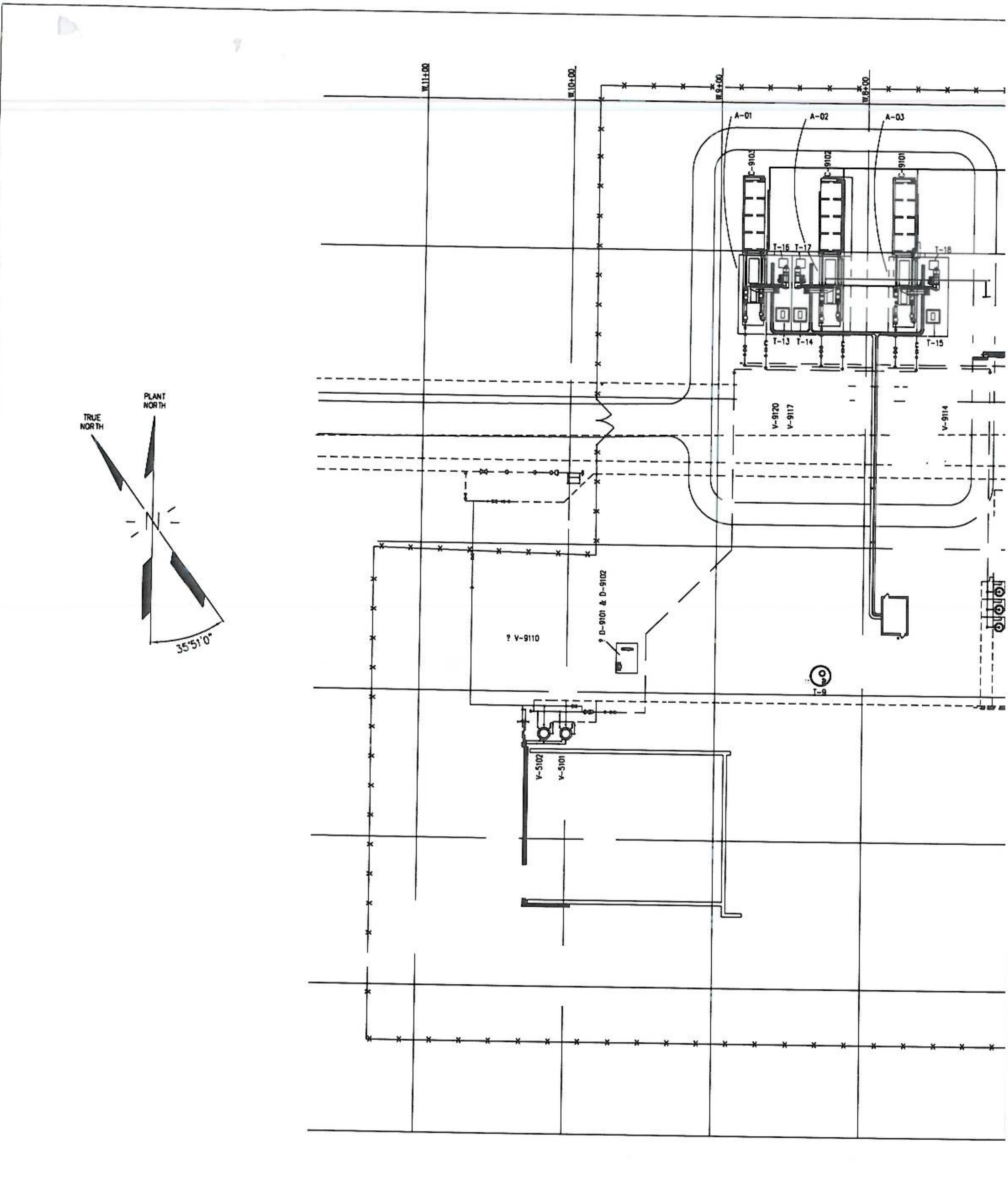
Enterprise Field Services

Lindrith Compressor Station

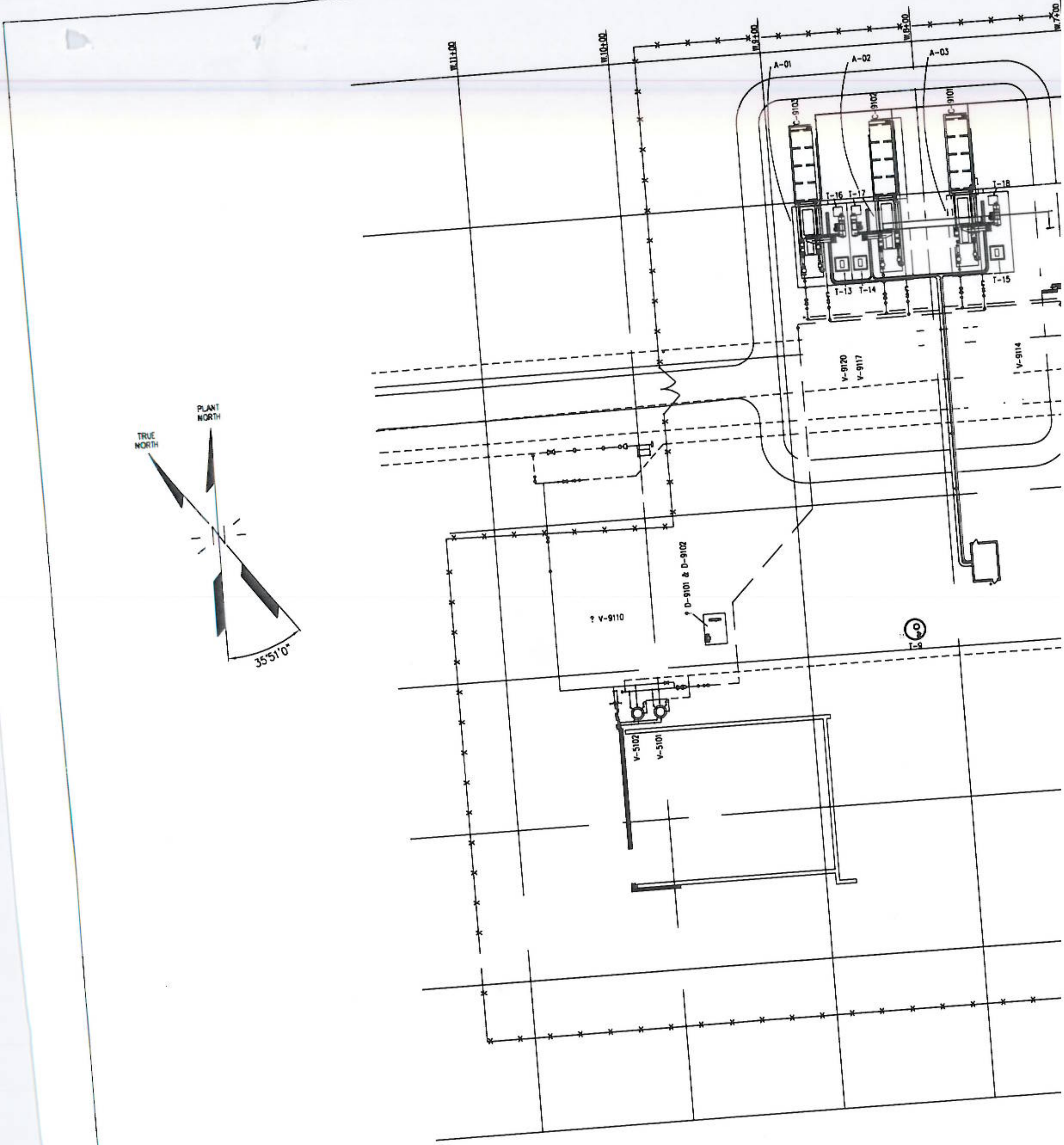
Part 71 Renewal Application Update

Process Flow Diagram





REV.	DATE	REVISION	BY	CHK'D	ENGR.	REV.	DATE	REVISION	BY	CHK'D	ENGR.	NOTES:
9	05/03/10	REVISED DRAWING FOR ENVIRONMENTAL DEPT.	DB			4	09/07/95	REVISED FOR CONSTRUCTION	HMN	LDH		
8	03/18/10	REMOVED TANKS AND LEADER	LB			3	08/15/95	REVISED FOR CONSTRUCTION	JMF	LDH		
7	12/11/08	ADDED CONDENSATE & WATER STORAGE-ISSUED FOR CONSTRUCTION	RB		RB	2	07/27/95	REVISED FOR CONSTRUCTION	JMF	LDH		
6	01/17/06	PROPOSED LAYOUT FOR VRU	FJP		AB	1	06/06/95	REVISED FOR CONSTRUCTION	JMF	DRM		
5		REVISED FOR DEHYDRATION MODIFICATION	JMF			0	05/17/95	ISSUED FOR CONSTRUCTION	DRM			



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6	01/17/06	PROPOSED LAYOUT FOR VRU	FJP		AB
5		REVISED FOR DEHYDRATION MODIFICATION	JMF		

REV.	DATE	REVISION	BY	CHK'D	ENGR.
4	09/07/95	REVISED FOR CONSTRUCTION	HMN	LDH	
3	08/15/95	REVISED FOR CONSTRUCTION	JMF	LDH	
2	07/27/95	REVISED FOR CONSTRUCTION	JMF	LDH	
1	06/06/95	REVISED FOR CONSTRUCTION	JMF	DRM	
0	05/17/95	ISSUED FOR CONSTRUCTION	DRM		

NOTES:

(8)

Enterprise Products

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS GP, LLC
(General Partner)

ENTERPRISE PRODUCTS OPERATING LLC

July 26, 2010

Document No. 8

7009-2820 0002 5082 5224
Return Receipt Requested

Ms. Catherine G. Penland
U.S. Environmental Protection Agency
Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RECEIVED - 6PDL
AIR PLANNING SEC.
10 JUL 28 PM 2:50

RE: Enterprise Field Services LLC
Lindrith Compressor Station, Permit No. R6FOPP71-03
Data Request Response

Dear Ms. Penland

Enterprise Products Operating LLC, as operator, hereby submits the following in response to our meeting with you and other EPA officials on June 2, 2010. The following is a listing of the requested information as we understood it:

1. **What is the basis for the emissions from the three Caterpillar 3612 Engines as represented in the recently submitted permit revision, specifically the formaldehyde emissions?**

   The formaldehyde emissions are based on a factor from Caterpillar that it represents as a "typical" rate for Caterpillar lean burn engines. This factor is not listed on the data sheet included in the application. Please find the attached Caterpillar formaldehyde emissions data. All other emissions from the Caterpillar engines are based on current AP-42 factors taken from the AP-42 07/00 version Table 3.2.2 for 4SLB engines. Please see Attachment A.

2. **Review of BACT applicability to the three Caterpillar engines.**

   A BACT review was not conducted on the Caterpillar engines in connection with the Part 71 renewal application because the engines are not being modified or reconstructed.

3. **Enterprise should review the requirements and EPA process for like-kind replacements of Caterpillar engines.**

   Enterprise understands that the requirements and processes for like-kind replacement of engines have varied over time. To be sure that we are reviewing the current EPA policy on this topic, we request that EPA forward copies of the current policy or guidance and any pertinent regulations on this topic.

4. **Caterpillar emission documentation on replaced units (Serial Number specific).**

The Caterpillar unit serial numbers at Lindrith begin with the sequence "1YG" which is specific to the engine and the programming of the software for emissions. Copies of those data sheets are also included with this letter for your review. The Lindrith units are set at <1.0 g/hp-hr. NOx. All Caterpillar units at Lindrith (original or like-kind replacements) have had the "1YG" serial number which identifies them as <1.0 g/hp-hr. NOx units to match the software settings.

5. **Conduct emissions testing on the three existing Caterpillar engines at Lindrith.**

   Emission testing is completed on the two engines that use catalyst to control emissions on a quarterly basis using a portable analyzer for CO and NOx. Test data from emissions testing is provided to the EPA. Enterprise requests that EPA provide a description and methodology for any other emission testing parameters to be conducted.

6. **Details regarding management of liquids at the Lindrith facility and various operating scenarios relating to tank emissions from that facility.**

   Enterprise is currently reviewing liquids handling at Lindrith. Current emissions are based on HYSYS models and E&P Version 2.0 working and standing losses based on conservative flow through. Given the limitations of these models, they cannot predict the short term emissions fluctuations which may occur during loading operations and periods of incoming liquids. The volume of liquids handled at Lindrith has reduced dramatically over the past year due to changes in facility piping. Liquids are now being discharged to a downstream facility for processing as opposed to being routed from high pressure contactor-scrubber to the produced water / condensate storage tanks. Please find a copy of the attached operating parameters (Attachment B) for Winter/Summer/Annual Average scenarios using the HYSYS Model to calculate Volatile Organic Compound (VOC) flash emissions from the storage tanks.

7. **Historical PFDs and respective facility emission estimates dating back to 1995.**

   As we discussed at our June 2 meeting, Enterprise did not acquire the Lindrith Facility until late 2004 and the facility's prior owner did not transfer all of its records concerning the facility. Through diligent efforts, Enterprise has determined that it cannot provide detailed information back to 1995; however, based on our knowledge of the facility and historic operations, the facility has been operated with the equipment represented in the operating permit until October 2008 when the dehydrator was removed from service. As referenced in the recent Title V application renewal, the storage tanks were replaced with the new tank battery in early 2009. The stabilizer was placed into service in June 2009; however, it was proved to not operate as planned. At this time, the high pressure contactor-scrubber was disconnected which removed liquids being discharged to the produced water / condensate storage tanks. The removal of the higher pressure discharge liquids from the process has reduced VOC emissions at the facility. Please see Attachment C that shows a current plot plan of the facility.

8. EPA has provided a sample of a construction permit survey for Enterprise to complete that will provide information regarding construction activities related to NEPA related issues. The survey is currently in process of being completed and will be submitted to EPA in the near future.

9. EPA has requested that the permit renewal be submitted on a PSD Amendment format.

Enterprise is currently reviewing the PSD process and applicability to Lindrith.

10. EPA has requested that SSM emissions be included in the permit amendment.

Enterprise will amend the application to include SSM emissions.

11. Short term emissions (pounds per hour) are to be included in the permit revision.

The permit revision submitted in May 2010 included (tons per year) for each emission source represented in the application on the EPA forms. The (pounds per hour) emissions for the engines are based on 8,760 hours annually. The emissions from the tanks would vary depending upon the tank loading/unloading activities; however, the cumulative hourly emissions would correlate with the annual emissions. Short term "hourly" emission rates from tanks could either be above or below the average annual hourly limit.

Please note that we'd also like to discuss permitting strategy and revisit the appropriate permitting mechanism for this facility in light of the above information and recent emissions history. If you have questions about the submittal or require additional information, please contact Don Fernald, Senior Environmental Scientist at (505) 599-2141 or me directly at 713-381-6684.

Sincerely,

Enterprise Field Services LLC
Enterprise Products Operating LLC

Matthew E. Marra
Environmental Director

/sjn
atachments

bcc:

Kevin Bodenhamer
Steve Fisher
Bill Scott
Steve Lee
Joe Velasquez
Jon Fields
Don Fernald

Enterprise Field Services LLC
Lindrith Compressor Station
Permit No. R6FOPP71-03
Data Request Response

Attachment A

G3612

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

Industrial/Petroleum 07/01

ENGINE SPEED (rpm):	1000	FUEL TYPE:	Nat Gas
COMPRESSION RATIO:	9:1	MIN. FUEL PRESSURE (PSIG):	43
AFTERCOOLER WATER (°F)	129	MIN. RATED METHANE NUMBER:	66
JACKET WATER OUTLET (°F)	190	RATED ALTITUDE @ 77°F (ft):	5000
IGNITION SYSTEM:	DST	FUEL LHV (BTU/SCF):	905
EXHAUST MANIFOLD:	DRY		

RATING		NOTES	LOAD	100%	75%	50%
ENGINE POWER		(1) (2)	bhp	3550	2662	1775
ENGINE EFFICIENCY	(ISO 3046/1)	(1)	%	38.6	37.0	34.1
ENGINE EFFICIENCY	(NOMINAL)	(1)	%	37.8	36.1	33.3
ENGINE DATA						
FUEL CONSUMPTION	(ISO 3046/1)	(1)	BTU/bhp-hr	6601	6884	7468
FUEL CONSUMPTION	(NOMINAL)	(1)	BTU/bhp-hr	6761	7051	7650
AIR FLOW (@ 77°F, 13.9 psia)			ft3/min	9,823	7,384	5,051
AIR MASS FLOW			lb/hr	40,345	30,958	21,175
COMPRESSOR OUTLET PRESSURE			psi (abs)	36.4	28.4	20.4
COMPRESSOR OUTLET TEMPERATURE			°F	300	248	154
INLET MANIFOLD PRESSURE			psi (abs)	35.1	27.3	18.7
INLET MANIFOLD TEMPERATURE			°F	147	144	140
LAMBDA				2.07	2.03	1.92
TIMING			°BTDC	18.3	17.6	16.2
EXHAUST STACK TEMPERATURE			°F	858	896	946
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)			ft3/min	24,273	19,180	13,592
EXHAUST GAS MASS FLOW			lb/hr	41,575	31,901	21,820
EMISSIONS						
NOx (as NO)		(3)	g/bhp-hr	0.7	0.7	0.7
CO		(3)	g/bhp-hr	2.5	2.5	2.5
THC (molecular weight of 15.84)		(3)	g/bhp-hr	6.15	6.31	6.5
NMHC (molecular weight of 15.84)		(3)	g/bhp-hr	0.93	0.95	0.98
EXHAUST OXYGEN			%	12.5	11.8	10.7
ENERGY BALANCE DATA						
FUEL INPUT ENERGY (LHV)	(NOMINAL)	(1)	BTU/min	399,985	312,844	226,312
WORK ENERGY	(NOMINAL)	(2)	BTU/min	150,544	112,908	75,272
HEAT REJ. TO JACKET WATER	(NOMINAL)	(4)	BTU/min	36,431	31,107	29,390
HEAT REJ. TO ATMOSPHERE	(NOMINAL)	(5)	BTU/min	13,999	13,139	12,447
HEAT REJ. TO LUBE OIL	(NOMINAL)	(6)	BTU/min	17,998	17,206	16,973
HEAT REJ. TO EXH. (LHV to 77°F)	(NOMINAL)	(4)	BTU/min	154,449	124,159	90,239
HEAT REJ. TO EXH. (LHV to 350°F)	(NOMINAL)	(4)	BTU/min	93,314	77,170	57,985
HEAT REJ. TO AFTERCOOLER	(NOMINAL)	(7) (8)	BTU/min	26,544	14,324	1,990

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

NOTES

1) FUEL CONSUMPTION TOLERANCE. ISO 3046/1 IS 0, + 5% OF FULL LOAD DATA. NOMINAL IS ± 2.5 % OF FULL LOAD DATA.
2) ENGINE POWER AND WORK ENERGY INCLUDE 2 ENGINE DRIVEN WATER PUMPS
3) EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED VALUES.
4) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA. (heat rate based on treated water)
5) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ± 50% OF FULL LOAD DATA. (heat rate based on treated water)
6) HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water)
7) HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water)
8) TOTAL AFTERCOOLER HEAT = AFTERCOOLER HEAT x ACHRF (heat rate based on treated water)

G3612 GAS ENGINE TECHNICAL DATA **CATERPILLAR®**

FUEL USAGE GUIDE

DERATE FACTOR vs CATERPILLAR METHANE NUMBER

Methane Number	30	35	40	45	50	55	60	65	70>=100
Rating Factor	0.00	0.00	0.00	0.76	0.82	0.87	0.93	0.98	1.00

Minimum Methane Number for Full Rating = 86.3

Fuel System Limit (minimum Wobbe Index) = 1128 BTU/SCF

TOTAL DERATION FACTORS - ALTITUDE & COOLING

ALTITUDE (FEET ABOVE SEA LEVEL)

AIR TO TURBO (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	0.93	0.89	0.85	0.81	0.78	0.74	0.71	0.68	0.65	0.61	0.58	0.56	0.53
120	0.96	0.94	0.90	0.86	0.82	0.79	0.75	0.72	0.68	0.65	0.62	0.59	0.56
110	1.00	1.00	0.95	0.91	0.87	0.83	0.80	0.76	0.73	0.69	0.66	0.63	0.60
100	1.00	1.00	1.00	0.97	0.93	0.89	0.85	0.81	0.77	0.73	0.70	0.67	0.63
90	1.00	1.00	1.00	1.00	0.98	0.94	0.90	0.86	0.82	0.78	0.74	0.71	0.67
80	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.91	0.87	0.83	0.79	0.75	0.72
70	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.86	0.83	0.80	0.76
60	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.95	0.92	0.88	0.85	0.81	0.78
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.90	0.86	0.83	0.79

AFTERCOOLER HEAT REJECTION FACTORS

ALTITUDE (FEET ABOVE SEA LEVEL)

AIR TO TURBO (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.42	1.49	1.56	1.63	1.70	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77
120	1.34	1.40	1.47	1.54	1.61	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
110	1.25	1.32	1.38	1.45	1.52	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
100	1.17	1.23	1.30	1.36	1.43	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
90	1.08	1.14	1.21	1.27	1.34	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
80	1.00	1.06	1.12	1.18	1.25	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
70	1.00	1.00	1.03	1.09	1.16	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
60	1.00	1.00	1.00	1.00	1.07	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
50	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE (RPM)

ALTITUDE (FEET ABOVE SEA LEVEL)

AIR TO TURBO (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	760	780	800	850	850	850	850	850	850	850	850	850	850
120	760	770	780	850	850	850	850	850	850	850	850	850	850
110	750	770	780	800	850	850	850	850	850	850	850	850	850
100	760	760	770	790	850	850	850	850	850	850	850	850	850
90	750	750	770	780	800	850	850	850	850	850	850	850	850
80	750	750	780	770	790	850	850	850	850	850	850	850	850
70	750	750	750	770	780	800	850	850	850	850	850	850	850
60	750	750	750	780	770	790	850	850	850	850	850	850	850
50	750	750	750	750	770	780	800	850	850	850	850	850	850

ALLOWABLE INERTS IN THE FUEL:
The maximum amount of free inerts in the fuel is limited to 5%.

FUEL SYSTEM LIMIT:
Fuels with a Wobbe Index lower than the limit, require a custom fuel system and engine control system mapping from the factory. The Wobbe index is determined using the Caterpillar Methane Number Calculation program.

FUEL USAGE GUIDE:
This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

TOTAL DERATION FACTORS:
This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site. The total deration factor includes deration due to altitude and ambient temperature, and air inlet manifold temperature deration.

ACTUAL ENGINE RATING
It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. To determine the actual power available, take the lowest rating between the Altitude/Temperature Deration and the Fuel Usage Guide Deration.

AFTERCOOLER HEAT REJECTION FACTORS:
Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

MINIMUM SPEED CAPABILITY AT MAX SITE TORQUE
This table shows the minimum allowable engine operating speed for site-specific ratings as determined by the Total Deration Factor chart. The minimum allowable engine operating speed cannot be lowered even if the actual engine power falls below the site-specific rating allowed by the Total Deration Factor chart. Turbocharger compressor surge or damage will result if the engine is operated lower than the minimum allowable speed.

DM5310-01

G3612

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1000	FUEL SYSTEM:	GAV WITH AIR FUEL RATIO CONTROL
COMPRESSION RATIO:	9:1		
AFTERCOOLER WATER INLET (°F):	130	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	190	FUEL:	Field Gas
COOLING SYSTEM:	JW, OC+AC	FUEL PRESSURE RANGE(psig):	42.8-47.0
IGNITION SYSTEM:	CIS/ADEM3	FUEL METHANE NUMBER:	62.2
EXHAUST MANIFOLD:	DRY	FUEL LHV (Btu/scf):	1027
COMBUSTION:	Low Emission	ALTITUDE(ft):	500
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.7	MAXIMUM INLET AIR TEMPERATURE(°F):	77
		NAMEPLATE RATING:	3550 bhp@1000rpm

			MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING	**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(1)	bhp	3550	3527	2645	1775
INLET AIR TEMPERATURE		°F	70	77	77	77
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(2)	Btu/bhp-hr	6761	6769	7063	7650
FUEL CONSUMPTION (HHV)	(2)	Btu/bhp-hr	7471	7479	7804	8453
AIR FLOW	(3)(4)	lb/hr	40343	40097	30764	21174
AIR FLOW WET (77°F, 14.7 psia)	(3)(4)	scfm	9098	9043	6938	4775
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	71.7	71.2	55.3	38.2
EXHAUST STACK TEMPERATURE	(6)	°F	858	859	897	946
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)	(7)(4)	ft3/min	23743	23617	18656	13344
EXHAUST GAS MASS FLOW	(7)(4)	lb/hr	41500	41247	31664	21828
EMISSIONS DATA						
NOx (as NO2)	(8)	g/bhp-hr	0.70	0.70	0.70	0.70
CO	(8)	g/bhp-hr	2.50	2.50	2.50	2.50
THC (mol. wt. of 15.84)	(8)	g/bhp-hr	6.15	6.15	6.31	6.50
NMHC (mol. wt. of 15.84)	(8)	g/bhp-hr	1.59	1.60	1.64	1.68
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	1.07	1.07	1.10	1.13
HCHO (Formaldehyde)	(8)	g/bhp-hr	0.40	0.40	0.44	0.48
CO2	(8)	g/bhp-hr	439	439	458	497
EXHAUST OXYGEN	(10)	% DRY	12.5	12.5	11.8	10.7
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(11)	Btu/min	36626	36551	31332	29350
HEAT REJ. TO ATMOSPHERE	(11)	Btu/min	14001	13998	13157	12447
HEAT REJ. TO LUBE OIL (OC)	(11)	Btu/min	18001	18008	17247	16974
HEAT REJ. TO AFTERCOOLER (AC)	(11)(12)	Btu/min	26659	26659	14046	1988

HEAT EXCHANGER SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW)	(12)	Btu/min	40289
TOTAL AFTERCOOLER CIRCUIT (OC+AC)	(12)(13)	Btu/min	49602
A cooling system safety factor of 0% has been added to the heat exchanger sizing criteria.			

CONDITIONS AND DEFINITIONS

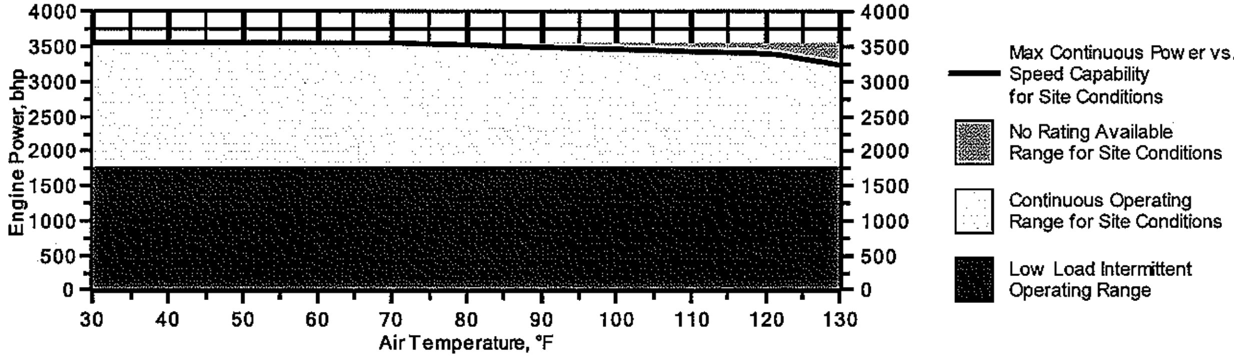
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature.
100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature.
Max. rating is the maximum capability for the specified fuel at site altitude and reduced inlet air temperature.
Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 3.03.01
Ref. Data Set DM5310-05-000, Printed 15Jun2010

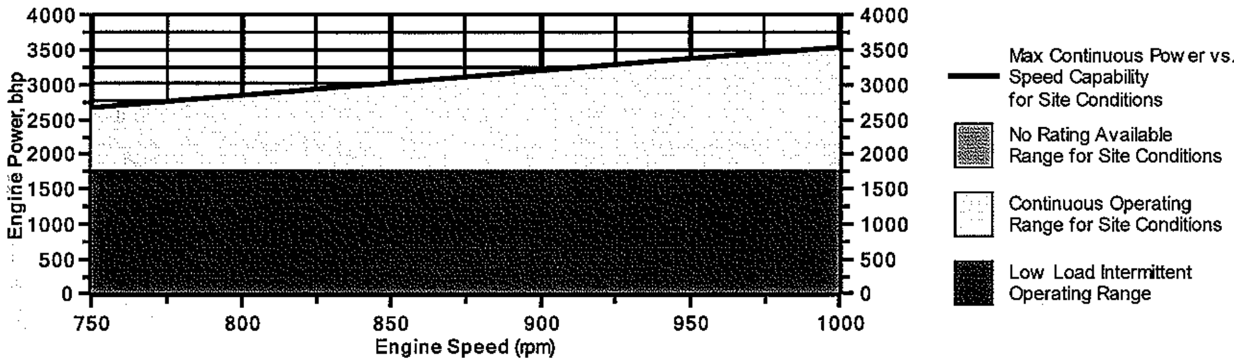
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 500 ft and 1000 rpm



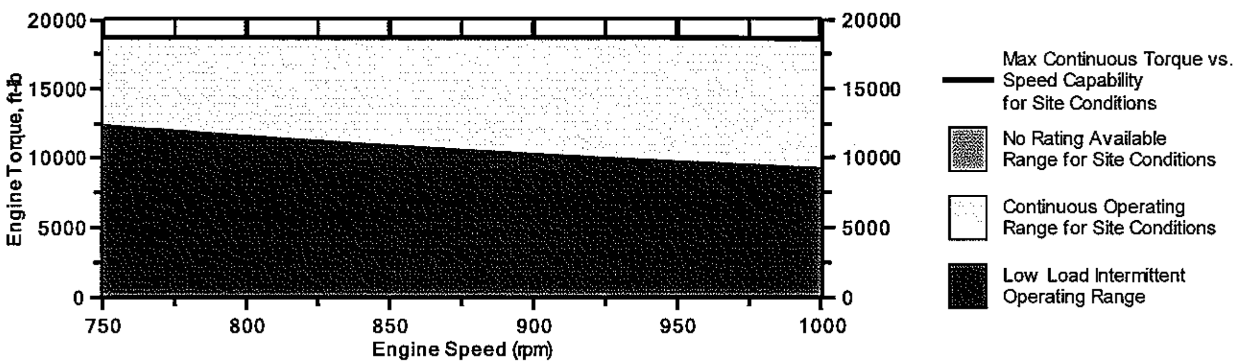
Engine Power vs. Engine Speed

Data represents speed sweep at 500 ft and 77 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 500 ft and 77 °F



Note: At site conditions of 500 ft and 77°F inlet air temp., constant torque can be maintained down to 750 rpm. The minimum speed for loading at these conditions is 750 rpm.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 3.03.01
Ref. Data Set DM5310-05-000, Printed 15Jun2010

NOTES

1. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

2. Fuel consumption tolerance is ± 2.5% of full load data.

3. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

4. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

5. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

6. Exhaust stack temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

7. Exhaust flow value is on a "wet" basis. Flow is a nominal value for total flow rate with a tolerance of ±6%. Exhaust gas vented through the wastegate flows only to the right exhaust outlet. The total flow through the wastegate may be as great as 15% of the total value for conditions under which the wastegate is open. For installations that use dual exhaust runs this difference must be taken into account when specifying any items to be connected to the exhaust outlets. The flow in the right exhaust outlet must be sized for at least 65% of the total flow to allow for the wastegate full open condition, while the left outlet must be sized for 50% of the total flow for the wastegate closed condition. Both runs must meet the allowable backpressure requirement as described in the Exhaust Systems A&I Guide.

8. Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions, adjusted to the specified NOx level at 100% load. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

9. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

10. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

11. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

12. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

13. Heat exchanger sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	2.5211	2.5211
Methane	CH4	86.6340	86.6340
Ethane	C2H6	4.9767	4.9767
Propane	C3H8	3.5670	3.5670
Isobutane	iso-C4H1O	0.0000	0.0000
Norbutane	nor-C4H1O	1.8211	1.8211
Isopentane	iso-C5H12	0.0000	0.0000
Norpentane	nor-C5H12	0.4802	0.4802
Hexane	C6H14	0.0000	0.0000
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.0000	0.0000
Carbon Dioxide	CO2	0.0000	0.0000
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Field Gas
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	62.2
Lower Heating Value (Btu/scf):	1027
Higher Heating Value (Btu/scf):	1135
WOBBE Index (Btu/scf):	1274
THC: Free Inert Ratio:	0
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	10.68
Stoich A/F Ratio (Mass/Mass):	16.43
Specific Gravity (Relative to Air):	0.650
Specific Heat Constant (K):	1.297

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

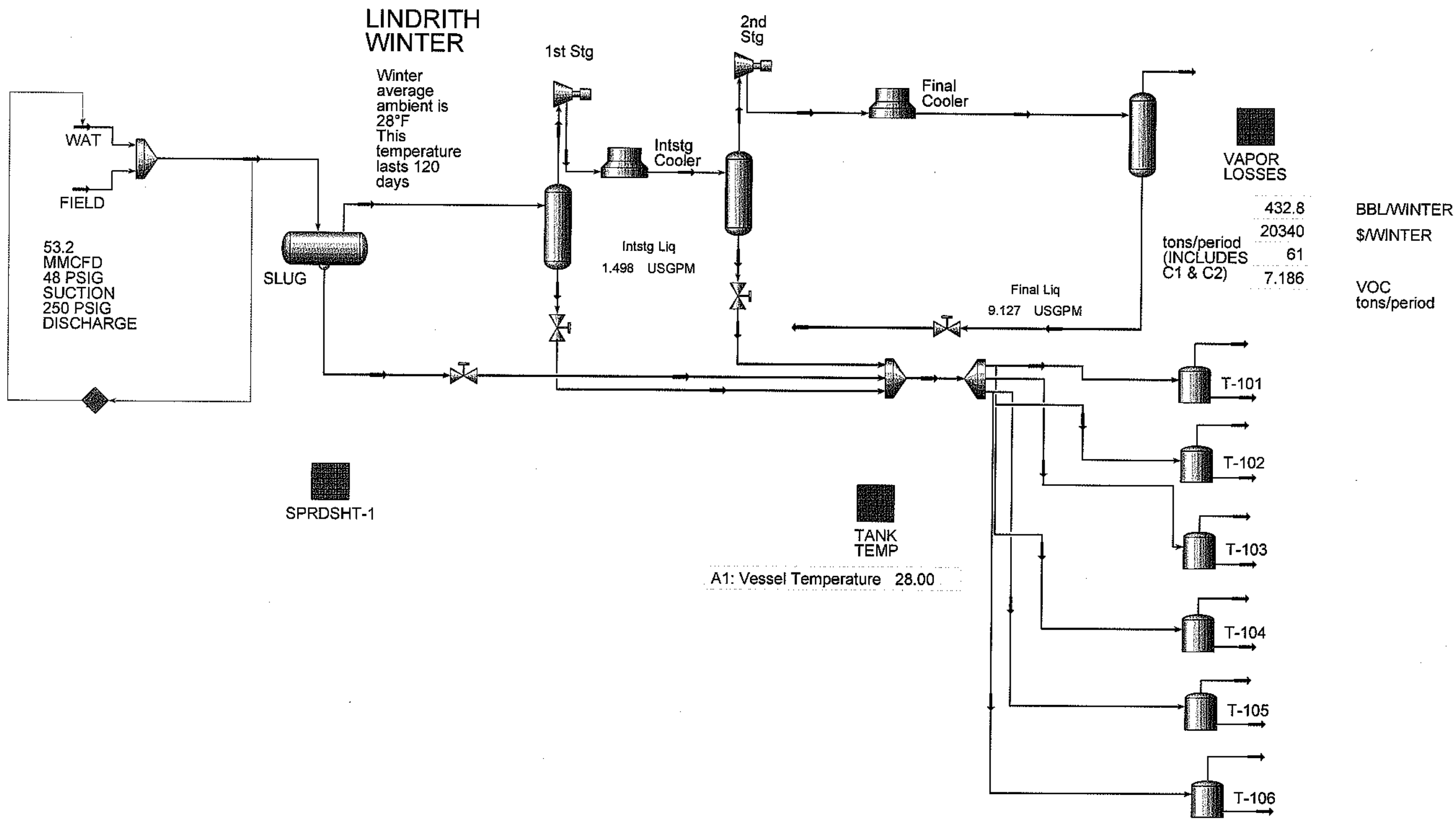
FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

Enterprise Field Services LLC
Lindrith Compressor Station
Permit No. R6FOPP71-03
Data Request Response

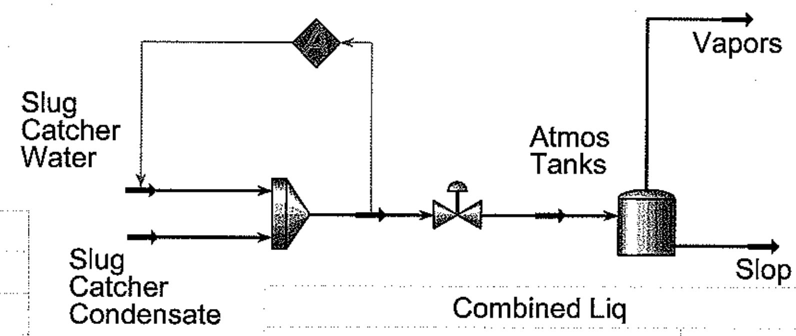
Attachment B


LINDRITH
WINTER
Winter average ambient is 28°F This temperature lasts 120 days
WAT
FIELD
53.2 MMCFD 48 PSIG SUCTION 250 PSIG DISCHARGE
SLUG
1st Stg
Intstg Cooler
Intstg Liq
1.498 USGPM
2nd Stg
Final Cooler
Final Liq
9.127 USGPM
VAPOR LOSSES
432.8
BBL/WINTER
20340
$/WINTER
tons/period (INCLUDES C1 & C2)
61
7.186
VOC tons/period
SPRDSHT-1
TANK TEMP
A1: Vessel Temperature 28.00
T-101
T-102
T-103
T-104
T-105
T-106

Lindrith Slug Catcher Liquids

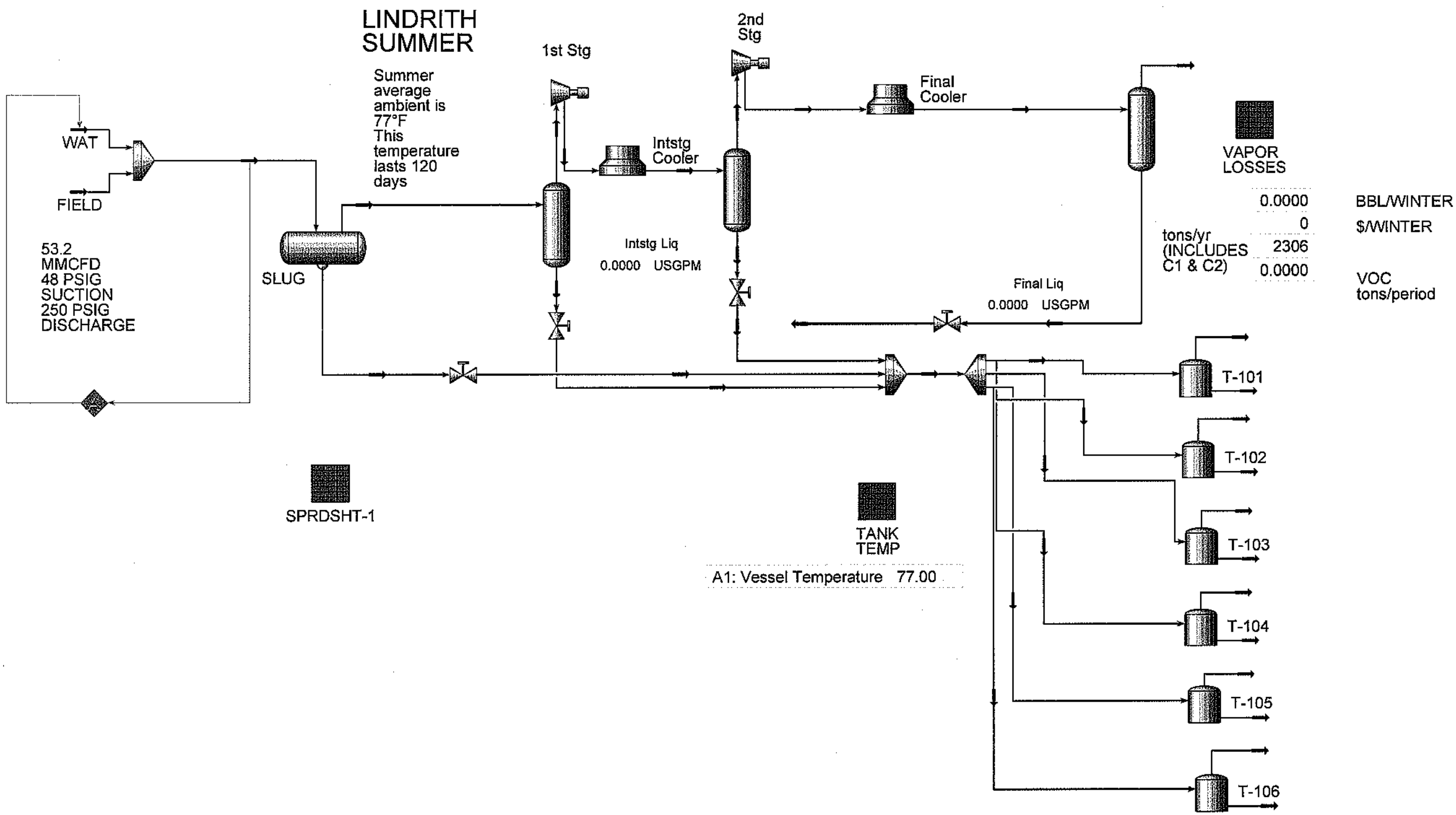
Slug Catcher Water		
Temperature	35.00	F
Pressure	50.00	psig*
Std Ideal Liq Vol Flow	0.3932	USGPM

VOC	
0.2895	tons/yr



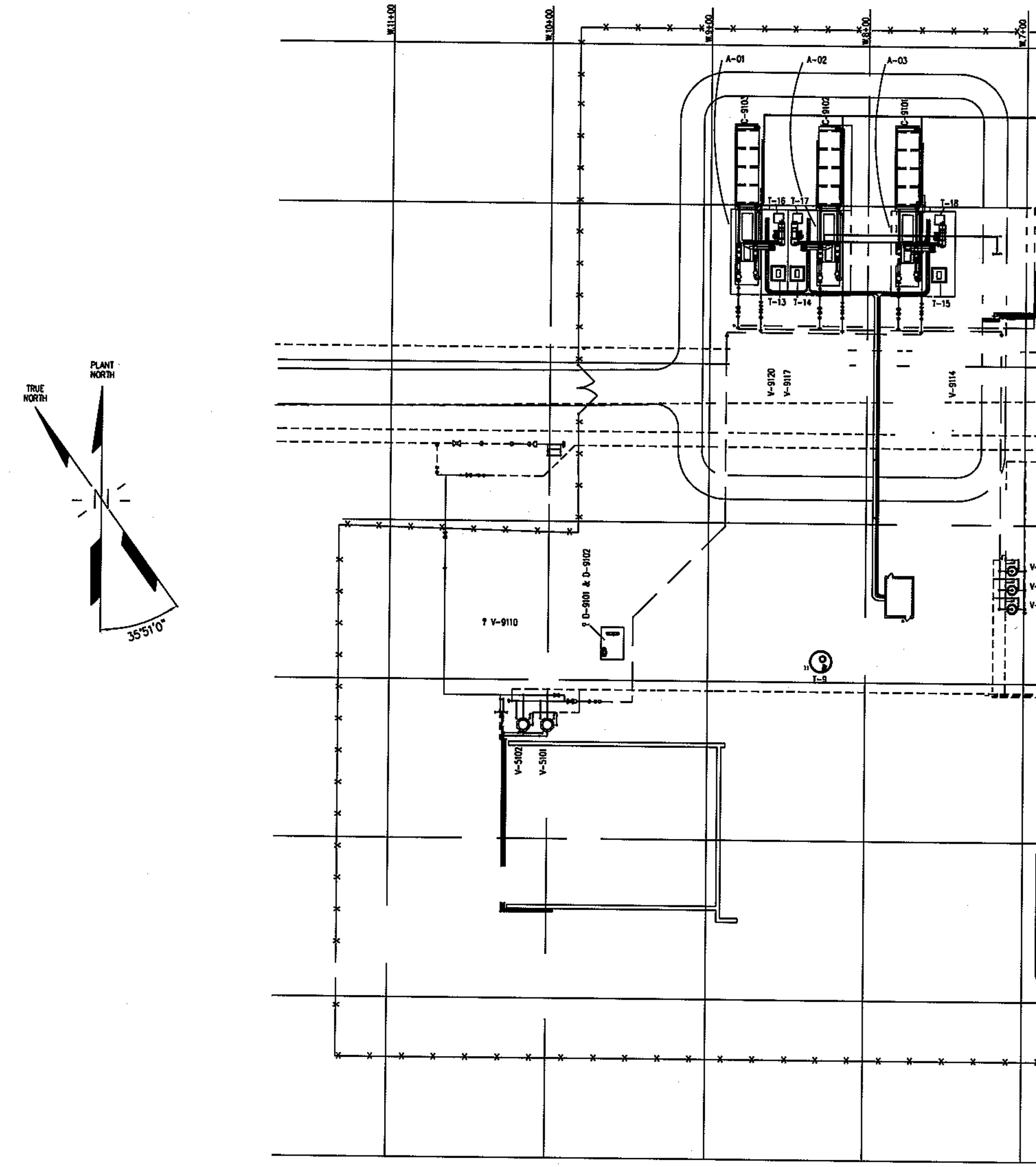
Slug Catcher Condensate		
Temperature	35.00	F
Pressure	50.00	psig*
Std Ideal Liq Vol Flow	0.5425	USGPM

Combined Liq		
Std Ideal Liq Vol Flow	0.9357	USGPM


LINDRITH SUMMER
Summer average ambient is 77°F This temperature lasts 120 days
1st Stg
2nd Stg
Intstg Cooler
Final Cooler
WAT
FIELD
53.2 MMCFD 48 PSIG SUCTION 250 PSIG DISCHARGE
SLUG
Intstg Liq 0.0000 USGPM
Final Liq 0.0000 USGPM
VAPOR LOSSES
0.0000 BBL/WINTER
0 $/WINTER
tons/yr (INCLUDES C1 & C2) 2306
0.0000 VOC tons/period
SPRDSHT-1
TANK TEMP
A1: Vessel Temperature 77.00
T-101
T-102
T-103
T-104
T-105
T-106

Enterprise Field Services LLC
Lindrith Compressor Station
Permit No. R6FOPP71-03
Data Request Response

Attachment C



REV.	DATE	REVISION	BY	CHK'D	ENGR.	REV.	DATE	REVISION	BY	CHK'D	ENGR.	NOTES:
9	05/03/10	REVISED DRAWING FOR ENVIRONMENTAL DEPT.	DB			4	09/07/95	REVISED FOR CONSTRUCTION	HMN	LDH		
8	03/18/10	REMOVED TANKS AND LEADER	LB			3	08/15/95	REVISED FOR CONSTRUCTION	JMF	LDH		
7	12/11/08	ADDED CONDENSATE & WATER STORAGE-ISSUED FOR CONSTRUCTION	RB		RB	2	07/27/95	REVISED FOR CONSTRUCTION	JMF	LDH		
6	01/17/06	PROPOSED LAYOUT FOR VRU	FJP		AB	1	06/06/95	REVISED FOR CONSTRUCTION	JMF	DRM		
5		REVISED FOR DEHYDRATION MODIFICATION	JMF			0	05/17/95	ISSUED FOR CONSTRUCTION	DRM			

{In Archive} Lindrith Compressor Station, Permit No. R6FOPP71-03

Randy Pitre to: Benton, Christopher 08/15/2011 01:00 PM
Cc: "Marra, Matthew", Bonnie Braganza, Jeffrey Robinson

From: Randy Pitre/R6/USEPA/US
To: "Benton, Christopher" <CRBENTON@eprod.com>,
Cc: "Marra, Matthew" <MEMARRA@eprod.com>, Bonnie Braganza/R6/USEPA/US@EPA, Jeffrey Robinson/R6/USEPA/US@EPA
Archive: This message is being viewed in an archive.

Please be advised that during the most recent telephone conference call conducted during May 2011, with Enterprise Field Services, on the renewal permit for the Lindrith Compressor Station, it was agreed that a revised 40 CFR Part 71 Permit Application would be submitted to EPA Region 6 Multimedia, Permitting and Planning Division, Air Permits Section (6 PD-R).

Additionally, Ms. Catherine Penland has retired, and I will be the EPA Region 6 contact for your permit. Please provide the status of your updated application.

Regards,

Randy L. Pitre
Environmental Scientist
EPA Region 6 - Air Permits Section
Office (214) 665-7299
Fax (214) 665-6762

Document No. 9

(11)

JUL 1 1 2012

Mr. Chris Benton
Manager – Environmental Permitting
Enterprise Products
P.O. Box 4324
Houston, Texas 77210

Document No. 10

RE: Enterprise Field Services, LLC
Lindrith Compressor Station, Rio Arriba County, New Mexico
Permit Number NM-1644-M1; Title V Permit Number R6FOPP71-03

Dear Mr. Benton:

This letter is in response to your August 10, 2011, letter enclosing the application to amend the Prevention of Significant Deterioration (PSD) air quality permit for the Lindrith Compressor Station. Your application included an analysis of federal New Source Review (NSR) applicability, reflecting changes made at the station since the most recent amendment of the PSD permit, dated April 10, 1997.

As discussed during past meetings with representatives of Enterprise Products, the U.S. Environmental Protection Agency's (EPA) intent is to take action on the above referenced application to amend the PSD permit, and then we will complete action on your application to renew the Title V permit, dated May 12, 2008, and updated by letter dated May 14, 2010. After conducting an initial review, we have determined additional information is necessary to continue processing your PSD and Title V permit applications. Specifically, we are requesting Enterprise Products provide additional information necessary for our determination of the pollutant-emitting activities which comprise the stationary source which includes the Lindrith Compressor Station. EPA regulations at 40 C.F.R. §§ 71.5(a)(2) and 124.3(c) allow us to request such information and set a reasonable deadline for response.[1]

Our review is based on the requirements of the Clean Air Act (Act) and EPA regulations found at 40 C.F.R. Part 71 and 40 C.F.R. § 52.21, as well as EPA's September 22, 2009, guidance document entitled "Withdrawal of Source Determinations for Oil and Gas Industries" (the "McCarthy Memo"). For purposes of determining applicability of the NSR and Title V programs of the Act, the McCarthy Memo states that permitting authorities should rely foremost on the three regulatory criteria for identifying emissions activities that

[1] "If, while processing an application [for a Title V permit] that has been determined or deemed to be complete, the permitting authority determines that additional information is necessary to evaluate or take final action on that application, it may request such information in writing and set a reasonable deadline for a response." 40 C.F.R. § 71.5(a)(2). In addition, "after the application [for a PSD permit] is completed, the Regional Administrator may request additional information from an applicant but only when necessary to clarify, modify, or supplement previously submitted material." 40 C.F.R. § 124.3(c).

belong to the same "building," "structure," "facility," or "installation." These criteria are: (1) whether the activities are under the control of the same person (or persons under common control); (2) whether the activities are located on one or more contiguous or adjacent properties; and (3) whether the activities belong to the same industrial grouping. See 40 C.F.R. § 71.2 and 40 C.F.R. § 52.21(b)(6). The McCarthy Memo emphasizes that whether to aggregate sources for purposes of NSR and Title V applicability is a case-by-case determination that represents highly fact-specific decisions, and that no single determination can serve as an adequate justification for how to treat any other source determination for pollutant-emitting activities with different fact-specific circumstances. Thus, EPA is seeking the supplemental information set forth in Enclosure A on fact-specific circumstances regarding Enterprise's operations within the San Juan Basin in order to fulfill our obligations under the Act and EPA's implementing regulations.

Please provide the information requested in Enclosure A, accompanied by a Part 71 Form CTAC signed by the Responsible Official, to certify the truth, accuracy, and completeness, by **August 20, 2012**. If a business confidentiality claim is made covering any part of the submitted information, please see Enclosure B, which specifies the assertion and substantiation requirements for business confidentiality claims. Upon receipt of your submittal, if we determine that additional information is necessary to evaluate Enterprise's NSR and/or Title V permit applications or to take final action on any of those applications, we may request such information in writing under the above-referenced authorities.

Should you have any questions, please contact Randy Pitre, of my staff at (214) 665-7299. We look forward to continuing to work with you and your company in completing the NSR and Title V permitting activities associated with Enterprise Product's Lindrith Compressor Station.

Sincerely yours,

/S/ Steve Vargo for

Carl E. Edlund, P.E.
Director
Multimedia Planning and
Permitting Division

Enclosures (2)

cc: Environmental Director
Jicarilla Apache Tribe

Pitre/rp-rhb:6PD-R:x7299/7/5/12\Lindrith – Letter – Revised Draft – July 5, 2012.docx
(H:6PD:6PD-R)

6RC-M	6RC-M	6PD-R	6PD
Bartley	Andrews	Robinson	Diggs

Enclosure A - Additional Information Requested

Pursuant to 40 C.F.R. §§ 71.5(a)(2) and 124.3(c), EPA is seeking the following supplemental information to further assist in understanding your operations, evaluating the source, and developing comprehensive NSR and Title V permits for Enterprise Product's Lindrith Compressor Station. More specifically, EPA is requesting you provide information on the nature of your operations in the San Juan Basin, in order to determine the stationary source to be permitted by our office. We also request that you provide adequate documentation to support the information you submit. It is also recommended that the information provided be in a form that can be released to the public, in the event we rely upon such information in our source determination.

If a business confidentiality claim is made covering any part of the submitted information, please see Enclosure B, which specifies the assertion and substantiation requirements for business confidentiality claims.

Please provide, at a minimum, the following information. However, feel free to provide other information beyond that requested below, if you deem it necessary to describe the stationary source. Your response should be accompanied by a Part 71 Form CTAC signed by the Responsible Official, to certify truth, accuracy, and completeness.

Note that the term "Enterprise" used below includes Enterprise Field Services, LLC; Enterprise Products Partners, LP; Enterprise Products Holdings LLC; Enterprise Products GP, LLC; Enterprise Products Operating LLC; Enterprise Products OLPGP, Inc.; and all other parents, subsidiaries, and partners of said entities that conduct business in the San Juan Basin. Unless otherwise specifically stated and fully explained in the response to the information requested in this letter, the above entities shall be considered to share operational interests with the Lindrith Compressor Station and shall be considered "under common control" within the meaning of such term found at 40 C.F.R. § 52.21(b)(6) (definition of "building, structure, facility, or installation") and 40 C.F.R. § 71.2 (definition of "major source"). Also, the term "operation" or "operations" used below means pollutant-emitting activities.

1. A map showing the location of the field operations and production field facilities associated with production unit(s) in the San Juan Basin which gather and/or transport natural gas directly or indirectly to the Lindrith Compressor Station or from that station to other facilities. This would include well sites that are connected to gathering pipelines, tank batteries, compressor stations, gas plants, etc. Include latitude and longitude coordinates for each field operation and production field component identified on said map.

2. For each field operation and production field component identified on the above referenced map, confirm Enterprise's ownership or operational interest (or indicate the name and address of the owner and/or operator of those operations or components for which Enterprise does not have any interest) and provide the Standard Industrial Classification (SIC) code.

3. A simple process flow diagram of the gas flow among the field components identified on the above referenced map.

4. A description of the operations associated with each production facility on the above referenced map.

5. A description of how the pipeline gathering systems that serve the Lindrith Compressor Station are utilized. Are they exclusive to Enterprise? Or are they a shared resource with other companies? Is natural gas from the gathering pipeline transferred to other third party compressor stations? Are there any gathering pipelines used exclusively by Enterprise?

6. Operational agreements between Enterprise and other gas production and gathering companies that are relevant to or discuss the Lindrith Compressor Station.

7. A description of operations at the Lindrith Compressor Station facility. Where does the natural gas from the Lindrith Compressor Station move to next in the natural gas pipeline?

Please be advised if we determine that additional information is necessary to evaluate any of the applications or to take final action on any of the air permit applications currently pending before us, we may request such information in writing and set a reasonable deadline for a response.

Enclosure B - Confidential Business Information (CBI)
Assertion and Substantiation Requirements

Assertion Requirements

You may assert a business confidentiality claim covering all or part of the information requested in response to this information request, as provided in 40 C.F.R. § 2.203(b). You may assert a business confidentiality claim covering such information by placing on (or attaching to) the information you desire to assert a confidentiality claim, at the time it is submitted to EPA, a cover sheet, stamped, or typed legend (or other suitable form of notice) employing language such as "trade secret," "proprietary," or "company confidential." Allegedly confidential portions of otherwise non-confidential documents should be clearly identified, and may be submitted separately to facilitate identification and handling by EPA. If confidential treatment is desired up until a certain date or until the occurrence of a certain event, the notice should state this. Information covered by such a claim will be disclosed by EPA only to the extent, and by means of the procedures, set forth in 40 C.F.R. Part 2. EPA will construe the failure to furnish a confidentiality claim with your response to Enclosure A to this letter as a waiver of that claim, and the information may be made available to the public without further notice to you. You should read 40 C.F.R. Part 2 carefully before asserting a business confidentiality claim, since certain categories of information are not properly the subject of a claim. Emission data is exempt from claims of confidentiality under Section 114 of the Clean Air Act (the Act), and the emissions data that you provide may be made available to the public. Information subject to a business confidentiality claim is available to the public only to the extent allowed under 40 C.F.R. Part 2, Subpart B.

Please segregate personnel, medical and similar files from your responses and include that information on separate sheet(s) marked as "Personal Privacy Information" given that disclosure of such information to the general public may constitute an invasion of privacy.

Substantiation Requirements

All confidentiality claims are subject to EPA verification in accordance with 40 C.F.R. Part 2, Subpart B. The criteria for determining whether material claimed as confidential is entitled to such treatment are set forth at 40 C.F.R. §§ 2.208 and 2.301, which provide, in part, that you must satisfactorily show that you have taken reasonable measures to protect the confidentiality of the information and that you intend to continue to do so; that the information is not and has not been reasonably obtainable by legitimate means without your consent; and the disclosure of the information is likely to cause substantial harm to your business's competitive edge.

Pursuant to 40 C.F.R. Part 2, Subpart B, EPA may at any time send you a letter asking you to substantiate fully your CBI claim. If you receive such a letter, you must provide EPA with a response within the number of days set forth in the EPA request letter. Failure to submit your comments within that time would be regarded as a waiver of your confidentiality claim or claims, and EPA may release the information. If you receive such a letter, EPA will ask you to specify which portions of the information you consider confidential. You must be specific by page, paragraph, and sentence when identifying the information subject to your claim. Any information not specifically identified as subject to a confidentiality claim may be disclosed without further notice to you. For each item or class of information that you identify as being subject to CBI, you must answer the following questions, giving as much detail as possible, in accordance with 40 C.F.R. § 2.204(e):

1. What specific portions of the information do you allege to be entitled to confidential treatment? For what period of time do you request that the information be maintained as confidential, e.g., until a certain date, until the occurrence of a specified event, or permanently? If the occurrence of a specific event will eliminate the need for confidentiality, please specify that event.

2. Information submitted to EPA becomes stale over time. Why should the information you claim as confidential be protected for the time period specified in your answer to question #1?

3. What measures have you taken to protect the information claimed as confidential? Have you disclosed the information to anyone other than a governmental body or someone who is bound by an agreement not to disclose the information further? If so, why should the information still be considered confidential?

4. Is the information contained in any publicly available material such as the Internet, publicly available databases, promotional publications, annual reports, or articles? Is there any means by which a member of the public could obtain access to the information? Is the information of a kind that you would customarily not release to the public?

5. Has any governmental body made a determination as to the confidentiality of the information? If so, please attach a copy of the determination.

6. For each category of information claimed as confidential, explain with specificity why release of the information is likely to cause substantial harm to your competitive position. Explain the specific nature of those harmful effects, why they should be viewed as substantial, and the causal relationship between disclosure and such harmful effects. How could your competitors make use of this information to your detriment?

7. Do you assert that the information is submitted on a voluntary or a mandatory basis? Please explain the reason for your assertion. If you assert that the information is voluntarily submitted information, explain whether and why disclosure of the information would tend to lessen the availability to EPA of similar information in the future.

8. Any other issue you deem relevant.

Please note that emission data provided under Section 114 of the Act, 42 U.S.C. § 7414, is not entitled to confidential treatment under 40 C.F.R. Part 2, Subpart B. "Emission data" means, with reference to any source of emission of any substance into the air:

(A) Information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of any emission which has been emitted by the source (or of any pollutant resulting from any emission by the source), or any combination of the foregoing;

(B) Information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of the emissions which, under an applicable standard or limitation, the source was authorized to emit (including, to the extent necessary for such purposes, a description of the manner and rate of operation of the source); and

(C) A general description of the location and/or nature of the source to the extent necessary to identify the source and to distinguish it from other sources (including, to the extent necessary for such purposes, a description of the device, installation, or operation constituting the source).

40 C.F.R. §§ 2.301(a)(2)(i)(A),(B) and (C).

If you receive a request for a substantiation letter from EPA, you bear the burden of substantiating your confidentiality claim. Conclusory allegations will be given little or no weight in the determination. If you fail to claim the information as confidential, it may be made available to the public without further notice to you.

Enterprise Products

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS HOLDINGS LLC
(General Partner)

ENTERPRISE PRODUCTS OPERATING LLC

(12)

October 24, 2012

Document No. 11

Federal Express

Mr. Randy Pitre
United States Environmental Agency – Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RECEIVED
12 OCT 26 PM 4:47
AIR PERMITS SECTION
6PD-R

Re: **Response to Request for additional Information:**
Enterprise Field Services, LLC
Permit No. NM-1544-M1, Title V Permit Number R6FOPP71-03
Lindrith Compressor Station
Lindrith, Rio Arriba County, New Mexico

Dear Mr. Pitre:

Enterprise Fields Services, LLC (Enterprise) submits the enclosed information in response to your letter requesting additional information dated July 11, 2012. Based on the understanding communicated at the meeting held at your offices on July 25, 2012, we have narrowed the scope of our response to several of your specific requests. We believe that the attached information will allow you to complete a determination that the pollutant-emitting activities at the Lindrith Compressor Station as described in Enterprise's August, 2011 application comprise the entirety of the stationary source for purposes of that application.

In your July 11 letter, you stated that your determination will be based on the requirements of the Clean Air Act, the EPA regulations at 40 CFR Part 71 and 40 CFR §52.21 as well as EPA's September 22, 2009, guidance document entitled "Withdrawal of Source Determinations for Oil and Gas Industries" (the "McCarthy Memo"). The McCarthy Memo provides the following three criteria for identifying emissions activities that belong to the same "building," "structure," or "installation:" (1) whether the activities are under the control of the same person, (or persons under common control), (2) whether the activities are located on one or more contiguous or adjacent properties, and (3) whether the activities belong to the same industrial grouping (if they belong to the same "Major Group" (i.e., which have the same first two digit SIC code). Those criteria originated in the 1980 PSD regulations (45 Fed. Reg. 52676).

The preamble to the 1980 PSD regulations reflects that, consistent with the court's direction in *Alabama Power Company v. Costle*, 636 F.2d 323 (D.C. Cir. 1979), in defining "building, structure, facility, or installation," EPA relied on the following standards: (1) the definition must carry out reasonably the purposes of PSD; (2) the definition must approximate a common sense notion of "plant"; and (3) the definition must avoid aggregating pollutant emitting activities that as a group would not fit within the ordinary meaning of "building," "structure," "facility," or "installation." (*see* 45 Fed. Reg. 52695). Here, the Lindrith Compressor Station, as described in Enterprise's application, constitutes the facility that is the stationery source.

Enterprise is one of several midstream companies, including, but not limited to, Conoco Phillips, Williams, and BP, operating in the expansive San Juan Basin. Enterprise does not own or

P. O. BOX 4324
HOUSTON, TX 77210-4324
713.381.6500

1100 LOUISIANA STREET
HOUSTON, TX 77002-5227
www.epplp.com

operate any oil or gas wells in the San Juan Basin. Enterprise only provides contract gas gathering, processing and compression services. Enterprise's Lindrith Compressor Station receives gas from more than 1,300 separate wells, operated by more than 50 different operators. Once gas from a particular well is metered and flows into the gathering lines, that gas becomes commingled with other gas from wells operated by other, separate companies. While Enterprise owns its gathering pipelines that feed the Lindrith Compressor Station, Enterprise does not own the property between individual well sites or the property between those well sites and the Lindrith compressor station. Once the treated gas is discharged from Lindrith, the gas may be transported by pipeline to any one of several destinations, including the Chaco Plant (located some 42 miles away from Lindrith), or facilities owned and operated by Conoco Phillips, Williams, or BP.

In a recent decision of the United States Court of Appeals for the Sixth Circuit reviewing an applicability determination from EPA on an aggregation issue (*Summit Petroleum Corporation v. US EPA, Jackson*, 09-4348: 10-4572 (6th Cir. 2012), the court found that "the EPA's determination that the physical requirement of adjacency can be established through mere functional relatedness is unreasonable and contrary to the plain meaning of the term 'adjacent'." The court rejected EPA's expansion of the aggregation test and required EPA to rely on the plain definition of contiguous or adjacent. In *Summit Petroleum*, Summit was both a producer of natural gas (owning and operating 100 wells), a processor of gas (Summit owns and operates its own sweetening plant)and a transporter of that gas (Summit owns the subsurface pipelines that connect each of its wells to its sweetening plant). Summit's wells are scattered over a 43 mile area at distances from the sweetening plant ranging from 500 feet to roughly 8 miles. Summit did not own the property between individual wells or between the wells and the sweetening plant. The court there vacated EPA's determination that Summit Petroleum's wells and sweetening plant should be aggregated, finding the EPA determination that the wells and sweetening plant were adjacent unreasonable. The court there noted that "[n]one of the well sites share a common boundary with each other, nor do any of the well sites share a common boundary with Summit's [sweetening] plant."

With respect to the Lindrith plant, there is even less reason to consider aggregation. Unlike Summit, Enterprise does not own or operate any wells. Instead, Lindrith provides contract compression and processing services for gas produced from more than 1,300 wells operated by more than 50 different operators. Because Enterprise does not own or operate any wells in the San Juan Basin, those wells are not under common ownership or control with the Lindrith Station. Moreover, none of these wells share a common boundary with the Lindrith Station.

The following is a list of your requests followed by Enterprise's response in **bold font.**

1. A map showing the location of the field operations and production field facilities associated with production units in the San Juan Basin which gather and/or transport natural gas directly or indirectly to the Lindrith Compressor Station or from that station to other facilities. His would include sites that are connected to gathering pipelines, tank batteries, compressor stations, gas plants, etc. Include latitude and longitude coordinates for each field operation and production field component identified on said map.

<u>Response</u>: **Attachment A contains a map showing Enterprise's gathering lines, compressor stations, and gas processing plants in the San Juan Basin. The map also indicates other company's plants. The latitude and longitude coordinates of the Enterprise facilities are indicated on the map and included in a summary table in Attachment B. As you will note, there are no Enterprise facilities upstream (east) of the Lindrith Compressor Station.**

2. For each field operation and production field component identified on the above referenced map, confirm Enterprise's ownership or operational interest (or indicate the name and address of the owner and/or operation of those operations or components for which Enterprise does not have any interest) and provide the Standard Industrial Classification (SIC) Code.

   <u>Response</u>: **Attachment B contains a summary table of the assets Enterprise owns in the San Juan Basin. The SIC Codes are all the same (1311).**

3. A simple process flow diagram of the gas flow among the field components identified on the above referenced map.

   <u>Response</u>: **Attachment C contains a simple process flow diagram of the gas flow gathered from the 53 separate well operators operating 1,379 wells upstream of the Lindrith Compressor Station. A summary table of the operators of each well is also included in Attachment C.**

4. A description of the operations associated with each production facility on the above referenced map.

   <u>Response</u>: **As shown on the simplified flow diagram in Attachment C, the Lindrith Compressor station boosts the pressure of the gas from 60 psig to approximately 250-300 psig before sending the gas back into a pipeline for delivery to either Enterprise's Chaco Gas Processing Plant, the Williams Plant, or the San Juan Gas Processing Plant which is operated by Conoco Phillips and owned by Conoco Phillips and BP. From those facilities gas is then delivered into interstate transmission lines operated by Transwestern or Kinder Morgan for delivery to end users.**

5. A description of how the pipeline gathering systems that serve the Lindrith Compressor Station are utilized. Are they exclusive to Enterprise? Or are they a shared resource with other companies? Is natural gas from the gathering pipeline transferred to other third party compressor stations? Are there any gathering pipelines used exclusively by Enterprise?

   <u>Response</u>: **Enterprise owns the gathering pipelines that carry the gas to the Lindrith Compressor Station but does not own the wells or production equipment at**

any well site, the property between the individual well sites or the property between the wells and the compressor station. As noted above, more than 1,300 wells operated by more than 50 separate operators deliver gas to the Lindrith Stations. Once a well delivers its gas into a pipeline for delivery to the Lindrith Station, that gas is commingled with gas from other wells. Enterprise is the sole owner of the Lindrith Compressor Station. No other entity has an ownership interest in or a right to control the operation of the Lindrith Station.

6. Operational agreement between Enterprise and other gas production and gathering companies that are relevant to or discuss the Lindrith Compressor Station.

Response: Attachment D contains a representative Gas Dedication, Gathering, and Processing Agreement between Enterprise and Wellhead Owner. Please note that this contract contains proprietary confidential information and Enterprise has submitted this contract subject to the confidential business information protections under 40 CFR Part 2, subpart B.

7. A description of the operation at the Lindrith Compressor Station facility. Where does the natural gas from the Lindrith Compressor Station move to next in the natural gas pipeline.

Response: See response to No. 4 above.

We believe that this answers your remaining questions. If you or your staff should have any questions during your review, please feel free to contact me at (713) 381-5437.

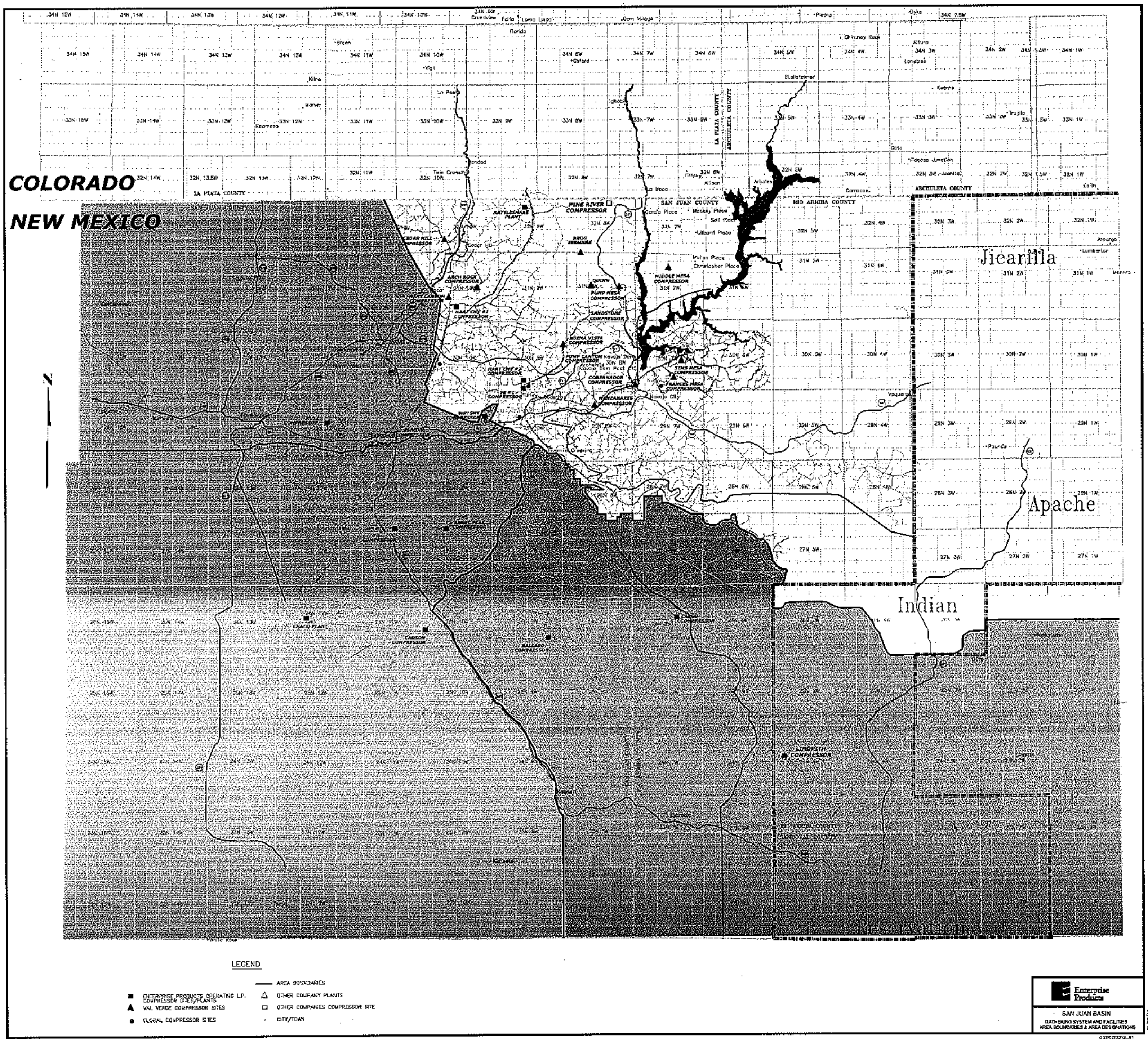
Sincerely,

Christopher Benton
Manager – Environmental Permitting

/sjn
attachments
cc: Mr. Carl E. Edlund, P.E., Director, Multimedia Planning and Permitting Division, EPA Region 6
Mr. Kevin Bodenhammer, VP, Enterprise, Houston, TX
Mr. Matthew Marra, Sr. Director, Enterprise, Houston, TX
Mr. Shanon DiSorbo, P.E., Project Manager, RPS, Houston, TX

Attachment A

San Juan Gathering System



COLORADO
NEW MEXICO
N
LA PLATA COUNTY
ARCHULETA COUNTY
SAN JUAN COUNTY
RIO ARRIBA COUNTY
PINE RIVER COMPRESSOR
RATTLESNAKE PLANT
CEDAR HILL COMPRESSOR
ARCH ROCK COMPRESSOR
MIDDLE MESA COMPRESSOR
PUMP MESA COMPRESSOR
SANDSTONE COMPRESSOR
BUENA VISTA COMPRESSOR
SIMS MESA COMPRESSOR
MANZANARES COMPRESSOR
CHACO PLANT
CARSON COMPRESSOR
LYBROOK COMPRESSOR
Jicarilla
Apache
Indian
LEGEND
AREA BOUNDARIES
ENTERPRISE PRODUCTS OPERATING L.P. COMPRESSOR SITES/PLANTS
VAL VERDE COMPRESSOR SITES
GLOBAL COMPRESSOR SITES
OTHER COMPANY PLANTS
OTHER COMPANIES COMPRESSOR SITE
CITY/TOWN
Enterprise Products
SAN JUAN BASIN
GATHERING SYSTEM AND FACILITIES
AREA BOUNDARIES & AREA DESIGNATIONS

Attachment B

Enterprise Assets in San Juan Basin

GPS COMPRESSOR INFORMATION FOR ENTERPRIE FIELD SERVICE, LP
FARMINGTON NM, SAN JUAN DIVISION

DATE 4-26-06

Compressor Sites	Lattitude:	Longitude:	County:	Section:	Township:	Range:
Blanco Sites						
Blanco Plant	36°43'43"N	107°57'21"W	SAN JUAN CO, NM	14	29N	11W
3B-1	36°46'03"N	107°47'43"W	SAN JUAN CO, NM	33	30N	9W
Manzanares Compressor Station	36°43'38"N	107°47'37"W	SAN JUAN CO, NM	SE 16	27N	6W
McDermott Compressor Station	36°55'43"N	108°08'58"W	SAN JUAN CO, NM	1	31N	13W
Navajo City Compressor Station	36°46'12"N	107°34'57"W	RIO ARRIBA CO, NM	33	30N	7W
Potter Compressor Station	36°48'13"N	107°55'17"W	SAN JUAN CO, NM	19	30N	10W
Rattlesnake Plant	36°46'06"N	107°46'42"W	SAN JUAN CO, NM	16	32N	9W
Turley Compressor Station	36°46'06"N	107°47'31"W	SAN JUAN CO, NM	33	30	9
Wright Compressor Station	36°43'22"N	107°50'55"W	SAN JUAN CO, NM	14	29N	10W
Hart Canyon Compressor Station SITE #1	36°52'21"N	107°54'02"W	SAN JUAN CO, NM	29	31N	10W
Hart Canyon Compressor Station SITE #1	36°46'44"N	107°47'45"W	SAN JUAN CO, NM	33	30N	9W
Kutz Compressor Station	36°43'25"N	108°05'20"W	SAN JUAN CO, NM	15	29N	12W

Chaco Sites	Lattitude:	Longitude:	County:	Section:	Township:	Range:
Chaco Plant	36°22'08"N	108°07'23"W	SAN JUAN CO, NM	16	26N	12W
Ballard Compressor Station	36°27'36"N	107°45'12"W	SAN JUAN CO, NM	SE 26	26N	9W
Angel Peak Compressor SITE #3	36°35'38"N	107°54'50"W	SAN JUAN CO, NM	NE 8	27N	10W
Martinez Canyon Compressor Station	36°34'07"N	107°27'52"W	RIO ARRIBA CO, NM	SE 16	27N	6W
Carson Compressor Station	36°28'10"N	107°56'26"W	SAN JUAN CO, NM	19	26N	10W
Hilltop Compressor	36°35'43"N	107°59'05"W	SAN JUAN CO, NM	10	27N	11W
Largo Compressor Site	36°29'07"N	107°33'27"W	RIO ARRIBA CO, NM	SE 15	26N	7W
Lindrith Compressor Station	36°18'38"N	107°23'47"W	RIO ARRIBA CO, NM	SE 18	24N	5W

Val Verde Sites	Lattitude:	Longitude:	County:	Section:	Township:	Range:
Val Verde Plant	N36°-43.492'	W107°-57.211'	SAN JUAN CO, NM	14	29N	11W
Arch Rock	N36°-53.573'	W107°-51.336'	SAN JUAN CO, NM	SW 1/4		
Buena Vista Cedar Hill	N36°-48.979'	W107°-43.702'	SAN JUAN CO, NM	NE 1/4	30N	9W
Cedar Hill	N36°-56.996'	W107°-54.449'	SAN JUAN CO, NM	SW 1/4	32N	10W
Frances Mesa	N36°-46.829'	W107°-33.719'	RIO ARRIBA CO, NM	SW 1/4	30N	7W
Gobernador	N36°-46.495'	W107°-37.028'	RIO ARRIBA CO, NM	NW 1/4	30N	7W
Hart Canyon	N36°-52.884'	W107°-54.032'	SAN JUAN CO, NM	SE 1/4	31N	10W
Manzanares	N36°-44.865'	W107°-40.516'	SAN JUAN CO, NM	SE 1/4	29N	8W
Middle Mesa	N36°-54.446'	W107°-33.866'	SAN JUAN CO, NM	SW 1/4	31N	7W
Pump Canyon	N36°-47.749'	W107°43.936'	SAN JUAN CO, NM	NE 1/4	31N	9W
Pump Mesa	N36°-53.590'	W107°-38.712'	SAN JUAN CO, NM	SW 1/4	31N	8W
Quinn	N36°-53.673'	W107°-41.303'	SAN JUAN CO, NM	SW 1/4	31N	8W
Sandstone	N36°-51.2'	W107°-41.5'	SAN JUAN CO, NM	SW 1/4	31N	8W
Sims Mesa	N36°-48.110'	W107°-33.096'	RIO ARRIBA CO, NM	NE 1/4	30N	7W

Attachment C

Lindrith Compressor Station – Simplified Process Flow Diagram

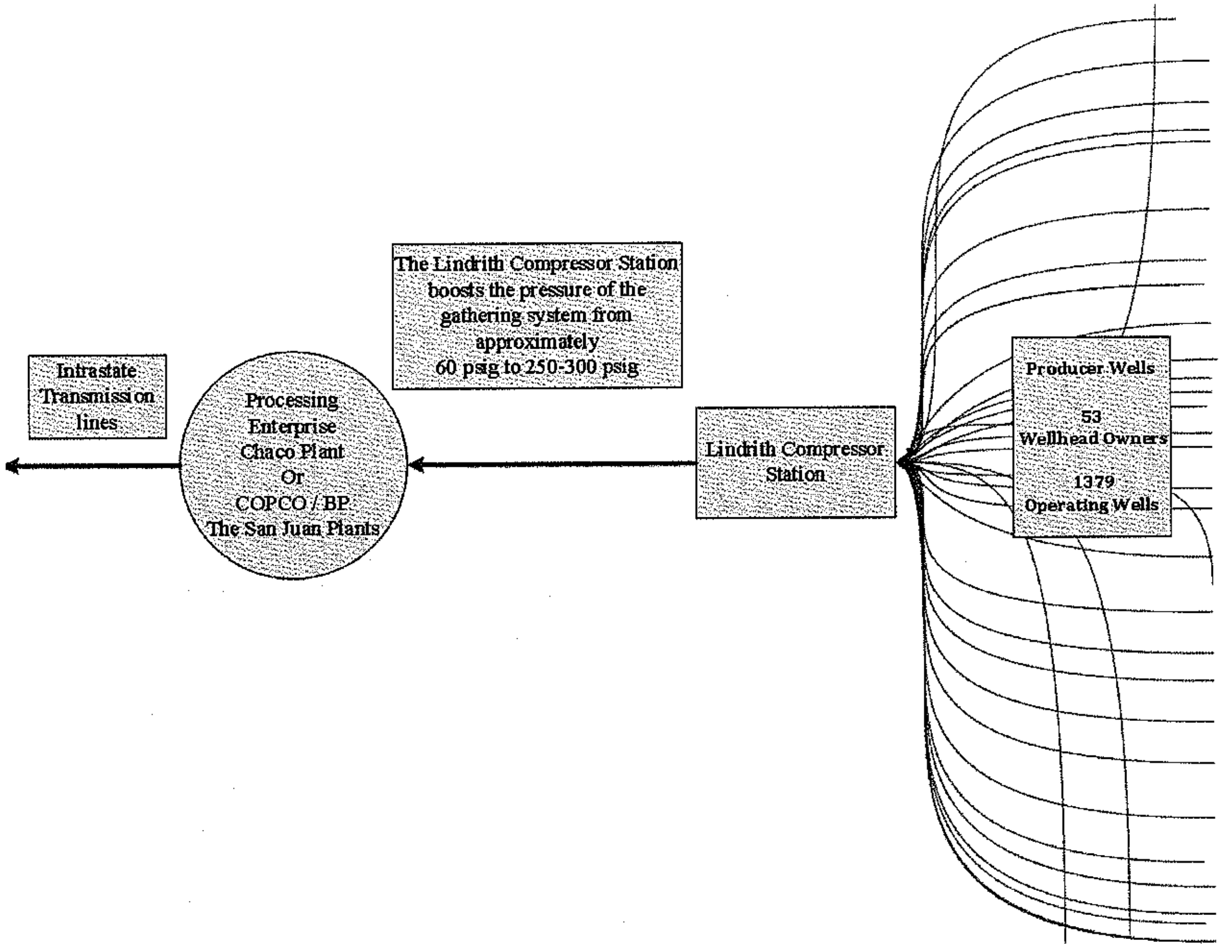


Figure 1. Simplified Process Flow Diagram – Lindrith Compressor Station

Operator	No. of Wells
AMERICO ENERGY RES.	1
BENSON MONTIN GREER	6
BRECK OPERATING CORP	2
BURLINGTON RESOURCES	122
CHACE OIL CO INC	11
CHEVRON MIDCONTINENT LP	1
CONOCOPHILLIPS	102
DB & G GAS & OIL LLC	3
DUGAN PROD. CORP.	42
ELM RIDGE RESOURCES	269
ENERGEN RESOURCES	259
ENERVEST MESA, LLC	39
ENERVEST OPERATING	74
FOUR STAR OIL & GAS	47
FUNDINGSLAND E L	3
GENERAL MINERALS CORP	12
GILBREATH NORMAN	4
GOLDEN OIL COMPANY	2
HOLCOMB OIL & GAS	1
HUNTINGTON ENERGY	38
JICARILLA APACHE ENERGY CORP	13
KEESEE H K	5
KIMBELL OIL CO.	22
M & M PROD & OPER	31
MARTINEZ JB	1
MCELVAIN OIL AND GAS	62
MERRION OIL & GAS CO	11
MINEL INC	4
NM & O OPERATING CO	24
PARKER & PARKER OIL	1
PARKO INC.	2
PLATINUM OIL PROPERTIES, LLC	4
QUALLS NANCY WILCOX	4
QUESTAR EXPLOR & PRO	1
REDWOLF PRODUCTION	4
REGINA OIL & GAS	1
RESOURCE DEVELOPMENT TECH	24
RITTER LAURENCE W	2
ROBERT L BAYLESS PRO	3
RODDY PRODUCTION CO	26
SAN JUAN RESOURCES	10
SCHALK DEVELOPMENT	7
SCHALK JOHN E	2
SCHALK M R	1
SHORELINE OIL & GAS	15
SIMMONS D J ET AL	2
STANDARD SILVER CORP	1
STAR VII	2
THOMPSON ENGINEERING	18
WAGENSELLER SHERMAN	22
WESTERLY	3
WESTERN OIL AND MIN	2
XTO ENERGY	11
Total Wells	**1379**

RECORD OF COMMUNICATION	_ Phone Call __ Discussion __ Field Trip __ Conference _X_ Other (Specify)	
To: STAFF	From: Allen Chang/Erica Le Doux, 6PD-R, 5-7541/5-7265	Date: Oct#1,2012 Time:

Subject: **Confidential Business Information**

Summary of Communication:
Enterprise Field Services, LLC
Lindrith Compressor Station

Company Official Contact: Graham Bacon
Senior Vice President
Ph- 713-381-6595

Mailing Address:
P.O. Box 4324
Houston, TX 77210

Permit No. NM _ 1544-M1, Title V Permit Number R6OPP71-03

Lindrith Compressor Station
Lindrith, Rio Arriba County, New Mexico

Conclusions, Actions Taken, or Required:

Record has been process to R6 File Room

Rec#__________________

Enterprise Products

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS HOLDINGS LLC
(General Partner)

ENTERPRISE PRODUCTS OPERATING LLC

December 4, 2013

7012 3460 0000 1945 3920
Return Receipt Requested

Document No. 12

Mr. Randy L. Pitre
Air Permits Section
U. S. EPA, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Enterprise Field Services, LLC
– Lindrith Compressor Station
Engine Unit A-03 Serial Number Correction
Permit Number R6FOPP71-03

Dear Mr. Pitre:

Enterprise Field Services, LLC submitted an engine swap notification letter in November 2008 for a swap of the engine A-03. For your convenience, I have included a copy of the 2008 letter with this letter. In the letter, Enterprise provided the serial number 1YG00055 as the serial number for the replacement engine. During an in-house environmental audit that was recently conducted in November 2013, Enterprise determined that the serial number that Enterprise provided in the 2008 letter was incorrect. The correct serial number that Enterprise should have been provided in the 2008 notification for engine Unit A-03 is 1YG00072. Enterprise has provided the correct serial number for engine A-03 (1YG00072) in the annual certification letters it has provided to USEPA.

If you have any questions, please contact our environmental field representative, James Lieb at (505) 632-2159.

Sincerely,

Jon Fields

Jon Fields
Field Environmental Director

/sjn
cc: James Lieb

RECEIVED - 6PDL
AIR PLANNING SEC.
13 DEC 10 PM 5:07

P. O. BOX 4324
HOUSTON, TX 77210-4324
713.381.6500

1100 LOUISIANA STREET
HOUSTON, TX 77002-5227
www.enterpriseproducts.com

Enterprise Products™

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC

ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

November 14, 2008

Return Receipt Requested
7006 1140 0004 9601 6825

Mr. Richard Greene
Regional Administrator
Multimedia Permitting and Planning Division
Environmental Protection Agency – Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

RE: Lindrith Compressor Station
Permit No. R6FOPP71-03
Start Up Notification

Dear Mr. Greene:

Enterprise Field Services LLC, (Enterprise) is submitting this start up notification for a like-kind engine replacement at the Lindrith Compressor Station, in accordance with Section 3.1 of Permit No. R6FOPP71-03 and General Condition 2 of New Source Review Permit No. NM-1644-M-1. The start-up of the replacement unit was November 4, 2008 due to a crank shaft failure of the current unit.

	Potential to Emit, Tons per Year						
Emission Unit A-03	NO_X	VOC	SO_2	PM_{10}	CO	Lead	HAP
Current Engine: Caterpillar 3612LE Natural Gas Fired Engine S/N: 1YG00061	22.54	45.08	0.074	N/A	70.85	N/A	6
Replacement Engine: Caterpillar 3612LE Natural Gas Fired Engine S/N: 1YG00055	22.54	45.08	0.074	N/A	70.85	N/A	6

During installation, the engine will be tuned to the operating conditions where fuel efficiency is highest and the NO_X and CO emissions are mutually lowest.

If you have questions or require additional information, please contact Don Fernald, our area Environmental Scientist at (505) 599-2124 or me directly at (713) 880-6518.

Yours truly,

Mary E. Hebert

Mary E. Hebert
Director, Field Environmental

Copies: Environmental Director, Jicarilla Apache Reservation
Don Fernald, Enterprise - Farmington, NM
Ralph Morris, Enterprise – Farmington, NM

(14)

Enterprise Products

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS HOLDINGS LLC
(General Partner)

ENTERPRISE PRODUCTS OPERATING LLC

February 14, 2014

Federal Express

Mr. Randy Pitre
United States Environmental Agency – Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Document No. 13

Re: Enterprise Field Services, LLC
Lindrith Compressor Station
Lindrith, Rio Arriba County, New Mexico
Revision to Previously Submitted Application Dated May 14, 2010
Title V Permit Number R6FOPP71-03, Permit No. NM-1544-M1

Dear Mr. Pitre:

Enterprise Fields Services, LLC (Enterprise) is submitting a permit application update for the above referenced facility. Enterprise submitted a permit renewal package to EPA on May 12, 2008 and an update on May 14, 2010.

On October 2, 2013 Enterprise submitted an application for a synthetic minor source permit for operations at Lindrith, as provided by EPA's Tribal New Source Review Rule in 40 CFR §§ 49.153(a)(3)(iv) and 49.158(c)(2)(iii). The cover letter of that application indicated that Enterprise would submit separately an update to the Part 71 renewal application to reflect the information in the Tribal NSR application. This updated application accounts for all changes made at Lindrith since the issuance of the Part 71 permit in 2003.

If you or your staff should have any questions during your review, please feel free to contact me at (713) 381-4535. An electronic copy of the application is also available upon request.

Sincerely,

J. Neely Ashe

J. Neely Ashe
Sr. Environmental Engineer

RECEIVED - 6PDL
AIR PLANNING SEC.
14 FEB 19 PM 6: 08

/sjn
Attachments
cc: Environmental Director, Jicarilla
Wren Stenger, Director, Multimedia Planning and Permitting Division, EPA Region 6

PART 71 AIR PERMIT
RENEWAL APPLICATION UPDATE
ENTERPRISE FIELD SERVICES LLC

LINDRITH COMPRESSOR STATION

RIO ARRIBA COUNTY, NEW MEXICO
PERMIT NO. R6FOPP71-03

December 2013

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Lindrith Compressor Station
Part 71 Renewal Application Update

Executive Summary

Lindrith Compressor Station
Part 71 Renewal Application Update

Enterprise Field Services LLC (Enterprise) owns and operates the Lindrith Compressor Station located in Rio Arriba County, New Mexico. The station is located on Jicarilla Apache Nation land and is subject to the 40 CFR Part 71 federal operating program. The station is currently authorized to operate under EPA Part 71 Permit No. R6FOPP71-03. The current operating permit expired on 11/16/2008. Enterprise submitted the required renewal application in 2008 and is currently operating under the application shield. At this time Enterprise is submitting a permit renewal update package to document changes to the station that are reflected on the Federal Tribal Minor New Source dated September 2013.

The Lindrith Compressor Station is a natural gas gathering compressor station defined by Standard Industrial Classification (SIC) code 1311. The existing operating permit authorizes the following emission sources:

1. Two 3,267-hp Caterpillar 3612LE compressor engines equipped with oxidation catalysts (A-01 and A-02)
2. One 3,267-hp Caterpillar 3612LE compressor engine (A-03)
3. One Glycol Dehydrator equipped with controls (DEHY-1RBLR and DEHY-STL)
4. Two 500-bbl condensate tanks (TK-1 and TK-2)
5. Insignificant sources (drain tanks, lube oil tanks, etc.).

Proposed Changes

This application is an update of the renewal application to account for recent changes to the station. Enterprise is representing the following changes to the Lindrith Compressor Station.

1. The glycol dehydrator and reboiler are permanently shutdown and will be removed from the permit along with all applicable requirements;
2. Remove the two 500-barrel condensate storage tanks;
3. Install eight (8) 450-bbl Fixed Roof Storage Tanks for Condensate and Water Storage. Include these emission sources under a single emission cap (TBATTERY);
4. Add condensate truck loading emissions (TLOAD);

5. Add fugitive emissions (FUGVOC); and
6. Add Maintenance, Startup, and Shutdown Emissions (MSS);
7. Add a 192 hp Caterpillar 3304 emergency generator (EMERGEN);
8. Add 40 CFR Part 63, Subpart ZZZZ to the three (3) compressor engines and the emergency generator.

Enterprise is also updating the insignificant source activity list with three 120 bbl drain tanks, which collected gravity separated water from the condensate tanks.

Table 1-1

Pollutant	Current Limits (tpy)	Proposed Limits (tpy)	Change in PTE (tpy)
Nitrogen Oxides	68.48	66.28	-2.20
Carbon Monoxide	95.5	102.57	+7.01
Volatile Organic Compounds	153.3	137.22	-16.08
$PM_{10}/PM_{2.5}$	N/A	2.90	+2.90
Sulfur Dioxides	0.22	4.27	+4.05
Total HAP	55	37.04	-17.96
Formaldehyde	21	31.05	+10.05
CO2e	N/A	35,554	+35,554

The changes in the proposed station potential to emit totals are due to equipment shutdown and removals, equipment installations, and changes in the emission calculation methodologies. These changes are discussed further in this application.

Calculations Summary

Lindrith Compressor Station
Part 71 Renewal Application Update

The Lindrith Compressor Station is equipped with gas-fired engines, storage tanks in volatile organic liquid service, truck loading, fugitives, and natural gas releases for MSS purposes. The methodologies used to estimate emissions from these sources are detailed in this section.

Engine Emissions (A-01, A-02, A-03)

The station is equipped with three identical 3,267-hp Caterpillar 3612LE gas-fired low emission technology engines to drive gas compressors. Two of the three engines are equipped with oxidation catalysts to reduce CO and VOC/HAP emissions. The engines are permitted to operate continuously at full load (8,760 hours/year). Enterprise is proposing no physical changes to these sources other than updating the emission methodologies.

Emissions of NO_x, CO, VOC, and formaldehyde are based on vendor data. The Caterpillar 3612LE is a clean burn source that does not require any add-on control device to reduce emissions of NO_x. Engines A-01 and A-02 are equipped with oxidation catalysts to reduce emissions of CO by up to 85%. This control technology all reduces VOC/HAP by up to 30%.

Emissions on $PM_{10}/PM_{2.5}$ are calculated using the current AP-42 factors for 4-cycle lean burn engines. Both the filterable and the condensable emissions are included in the proposed $PM_{10}/PM_{2.5}$ emission limits.

Emissions of SO_2 are based on a maximum sulfur content of 5 grains/100 scf in the natural gas.

Engine HAP emissions, other than formaldehyde, are based on current AP-42 factors for 4-cycle lean burn engines. Formaldehyde emissions are based on emissions from similar facilities. For the two engines equipped with oxidation catalysts it was assumed that the emissions were reduced by 30% from the AP-42-based rates.

Emergency Generator Emissions (EMERGEN)

The station is equipped with 192-hp Caterpillar 3304 diesel fired engine to provide the site with emergency back-up power. The engine is run approximately 52 hours per year for maintenance checks.

Emission factors for NO_x, CO, and PM_{10} based on NSPS Subpart IIII, Table 4. Emissions of VOC based on AP-42 factors (5th Edition, 10/96) from Table 3.3-1 Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines. NO_x Factor use is NSPS NO_x + NMHC factor minus AP-42 VOC factor. The PM_{10} emission factor is assumed to be the same for PM, PM_{10}, and $PM_{2.5}$.

Emission factor for SO_2 based on 100% conversion of fuel bound sulfur into SO_2.

Maintenance, Startup, and Shutdown Emissions (MSS)

Enterprise conducts periodic planned and unplanned maintenance, startup, and shutdown activities that result in the venting of natural gas from the station's blowdown vent. These activities include, but are not limited to, engine starts, compressor shutdowns, vessel and piping blowdowns, and pipeline pigging activities, etc. Emission estimates for these activities are based on the estimated volume of natural gas that may be released during an operating year and the VOC content of the natural gas based on a typical analysis of the natural gas received at the station.

Condensate Storage Tank Battery (TBATTERY)

Enterprise has replaced the two 500-bbl fixed roof condensate tanks with eight (8) 454-bbl fixed roof storage tanks to handle the produced condensate and water at the station. Enterprise has re-engineered the liquid collection systems in the vicinity of the station to reduce the potential volume of liquids which can be collected at the Lindrith Compressor Station. This reduction in liquid storage potential also reduces the potential VOC emissions at the station.

The eight storage tanks (T-1, T-2, T-3, T-4, T-5, T-6, T-7 and T-8) are plumbed together to aid in the collection of natural gas condensates and produced water. Each tank is vented to atmosphere individually. However, Enterprise is proposing to establish an emission cap on the eight tanks (TBATTERY) to allow maximum operational flexibility for operations. An emission cap will allow operations to direct the collected condensate and water to any of the eight storage tanks in the battery. As long as the volumetric limits (bbls/year) represented in the permit application are not exceeded then the limits on VOC emissions from the tank battery will not be exceeded.

Emissions from the condensate tanks were calculated using both a process model (AspenTech Hysys) and the EPA Tanks 4.09d software. The process model was used to calculate potential flash emissions from the storage tanks. The EPA Tanks software was used to calculate breathing and working losses from the tanks. The process model estimates a liquid production rate of 6,389 barrels per year (bbl/yr) under the defined operating conditions; however, to account for operational variables, the storage tank emissions are based on an annual liquid production rate of 20,000 bbl/yr.

Process Model

For given input parameters the AspenTech Hysys process model estimates liquid volume production rates as well as component analyses for the storage tank vapor stream and the liquid product. Based on the Lindrith inlet gas quality, the process model predicts liquids are produced at the station during cool ambient conditions. During warmer months the model predicts the compressed inlet gas is not condensable even after it runs through the gas coolers. However, for this application it is conservatively assumed that liquids are produced year-round.

The process model predicts a total VOC emission rate (lb/hr) from the tank battery at the referenced liquid production rate over the specified time period. The emissions were then ratioed up based on the ratio of the proposed permitted production rate to the model production rate. The total flash emissions were then speciated using the calculated mass fractions from the process model.

EPA Tanks

Tanks 4.09d was used to calculate breathing and working losses from the storage tanks. For this application, a single storage tank handling gasoline (RVP 7) at 2,500 bbl/yr to was assumed to provide a conservative estimate of the tank emissions. The resulting emission rate was then multiplied by eight to get total emissions from the eight tanks in the tank battery. The emissions were speciated by conservatively assuming the emissions would be similar to the flash gas characteristics. The non-VOC mass fractions were deleted and then the remaining VOC fractions were normalized to give a total mass fraction of 1.0.

Condensate Truck Loading Emissions (TLOAD)

Emissions from the condensate truck loading were calculated using the AP-42 loading loss equation, hourly filling rate, and annual throughput. The annual throughput was estimated by assuming that the total throughput for the eight condensate tanks was loaded. Speciated emissions from this operation were calculated by conservatively assuming the loading vapors were of similar composition as the storage tank flash gas. The non-VOC mass fractions were deleted and then the remaining VOC fractions were normalized to give a total mass fraction of 1.0.

Fugitive Emissions (FUGVOC)

Fugitive emissions were estimated based on an estimated piping component count and the April 2010 Gas Analysis mole percentage of non-methane/non-ethane hydrocarbons. The EPA Oil and Gas factors were used to estimate fugitives.

Applicable Requirements

The following discussion addresses applicable and non-applicable requirements of Code of Federal Regulations, Title 40. General requirements imposed by the current operating permit are not addressed in this section.

Applicable Requirements

The following regulatory requirements have been determined to be potentially applicable to the Lindrith Compressor Station:

40 CFR 71 – Federal Operating Permits

The facility is a major source of CO, VOC, and HAP as defined by 40 CFR 71. Regulation 40 CFR 71.5(a)(1) requires that "for each part 71 source, the owner or operators shall submit a timely and complete application in accordance with this section". 40 CFR 71.5(a)(1)(iii) goes on to state that "for purposes of permit renewal, a timely application is one that is submitted at least 6 months but nor more than 18 months prior to the expiration of the part 70 or 71 permit."

Operating permit R6FOPP71-03 expired on 11/16/08; as required by this regulation, this application was submitted prior to 5/16/08. This current application is a revision to the initial application due to changes that have occurred during the period of review.

40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The four existing RICE units currently operating at the facility are "existing" (constructed before December 19, 2002) 4 stroke lean burn engines. Since the site is a major source of HAP as defined by 40 CFR 63, Enterprise has been complying with the applicable requirement for this regulation since May 3, 2013, as stated in 40 CFR 63.6595(a)(1).

Non-Applicable Requirements

Certain regulatory requirements are discussed below for non-applicability because of the facility type and potential applicability.

40 CFR 50 – National Ambient Air Quality Standards

40 CFR 50 establishes National Ambient Air Quality Standards but does not directly impose requirements on a specific stationary source and is therefore not applicable.

40 CFR 52.21 – Prevention of Significant Deterioration of Air Quality

Enterprise has made a determination in accordance with 40 CFR 52.21(a)(1)(2) that the Lindrith Compressor Station is a minor source for PSD purposes as defined under 40 CFR 52.21(b). Lindrith Compressor Station is not a source identified in 40 CFR 52.21(a), and the facility-wide potential to emit is less than 250 tons per year (tpy) of any regulated pollutant. Therefore, PSD is not required for this permit renewal.

40 CFR 60, Subpart A – General Provisions

This subpart is only applicable to facilities that are subject to another NSPS. As detailed in this section no NSPS regulations currently apply to this facility

40 CFR 60, Subparts K, Ka, and Kb

The eight new fixed roof condensate storage tanks at the facility were constructed after July 23, 1984 making them potentially subject to the Subpart Kb rule. However, all eight of these storage tanks have a storage capacity of 454-bbls (72 m^3). Per 40 CFR 60.110b(a) storage tanks in VOL service with less than 75 m^3 in storage capacity are exempt from this regulation. Therefore, the condensate storage tanks included in the source cap TBATTERY are not subject to NSPS Subpart Kb. There are no storage tanks at the Lindrith Compressor Station which exceed 75 m^3.

40 CFR 60, Subpart KKK – Standards Of Performance For Equipment Leaks Of VOC From Onshore Natural Gas Processing Plants For Which Construction, Reconstruction, Or Modification Commenced After 01/20/1984, And On Or Before 08/23/2011

The Lindrith Compressor Station is not a natural gas processing plant as defined under this subpart. Therefore, Subpart KKK is not applicable.

40 CFR 60, Subpart LLL – Standards of Performance For SO_2 Emissions From Onshore Natural Gas Processing For Which Construction, Reconstruction, Or Modification Commenced After 01/20/1984, And On Or Before 08/23/2011

The Lindrith Compressor Station is not an onshore natural gas treating plant as defined in this subpart. Therefore, Subpart LLL is not applicable.

40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

All engines at the facility were constructed before June 12, 2006 (40 CFR 60.4230(a)(4)) and have not been modified or reconstructed since (40 CFR 40.4230(a)(5)). Therefore, this subpart does not currently apply to this facility.

40 CFR 60, Subpart OOOO – Standards of Performance For Crude Oil And Natural Gas Production, Transmission And Distribution

All components were constructed before August 23, 2011 (40 CFR 60.5365) and have not been modified or reconstructed since. Therefore, this subpart does not currently apply to this facility.

40 CFR 61 – National Emissions Standards for Hazardous Air Pollutants (NESHAP)

There are no 40 CFR 61 NESHAPs regulation currently applicable to this facility.

40 CFR 63 Subpart HH – National Emissions Standards for Hazardous Air Pollutants from Oil and Gas Production Facilities

"Major source," as defined in 40 CFR 63.761, specifies that "for facilities that are production field facilities, only HAP emissions from glycol dehydration units and storage vessels shall be aggregated for a major source determination." From this definition the Lindrith Compressor Station is a minor HAP source. The facility is equipped with condensate storage tanks with the potential for flash emissions. Therefore, the requirements of this subpart are potentially applicable. Enterprise has removed the glycol dehydrator from the station which would have been an affected source.

By definition storage vessels with the potential for flash emissions means any storage vessel that contains a hydrocarbon liquid with a stock tank GOR equal to or greater than 0.31 cubic meters per liter (1740 scf/bbl) and an API gravity equal to or greater than 40 degrees and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day (500 bbls/day). The volume of condensate collected at the Lindrith Compressor Station is less than 79,500 liters per day. Therefore, Subpart HH is not currently applicable.

Case-by-Case MACT Determinations

The Lindrith Compressor Station is a major HAP source. The RICE units, condensate storage tanks, and fugitives are addressed under the promulgated MACT Subpart HH and ZZZZ regulations as addressed above. Emissions of HAP from truck loading (TLOAD) AND maintenance, startup, and shutdown releases (MSS) do not exceed major source levels for HAP. Therefore, case-by-case MACT determinations for these two source categories are not required.

40 CFR 68 – Accidental Release Prevention Program

This regulation arises form section 112 (r) of the Clean Air Act and establishes thresholds based on inventoried quantities of specific substances in process. This facility odes not manufacture, process, use, store or otherwise handle regulated substances in excess of the quantities specified in 40 CFR 68, therefore this regulation does not apply.

40 CFR 72 – Acid Rain Regulation

The facility is not an electric utility generating facility as defined in under this part and therefore is not an affected facility under the Acid Rain Program.

40 CFR 82, Subpart F & H – Protection of Stratospheric Ozone

No operations involving CFCs are conducted at this facility and no halon-containing fire extinguishers are used, stored or disposed of at this facility.

EPA Part 71 Application Administrative Forms

Lindrith Compressor Station
Part 71 Renewal Application Update

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

GENERAL INFORMATION AND SUMMARY (GIS)

A. Mailing Address and Contact Information

Facility name: Lindrith Compressor Station

Mailing address: Street or P.O. Box: Enterprise Field Services, LLC c/o Environmental Dep't: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Contact person: Jim Lieb Title: Senior Environmental Engineer

Telephone (505) 599 - 2159 Ext. _________

Facsimile (866) 226 - 9817

B. Facility Location

Temporary source? ___Yes _X_ No Plant site location: 20 miles West of Lindrith, NM, East ½ of the Southeast ¼ of Section 18, Township 24 North, Range 5 West

City: Lindrith State: NM County: Rio Arriba EPA Region: 6

Is the facility located within:

Indian lands? _X_ YES ___ NO OCS waters? ___YES _X_ NO

Non-attainment area? ___ YES _X_ NO If yes, for what air pollutants? _________

Within 50 miles of affected State? _X_ YES ___ NO If yes, What State(s)? NM

C. Owner

Name: Enterprise Field Service LLC Street/P.O. Box: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone (713) 381 - 6595 Ext_________

D. Operator

Name: Enterprise Products Operating LLC Street/P.O. Box: PO Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone (713) 381 - 6500 Ext_________

E. Application Type

Mark only one permit application type and answer the supplementary question appropriate for the type marked.

___ Initial Permit __X__ Renewal ___ Significant Mod ___ Minor Permit Mod(MPM)

___ Group Processing, MPM ___ Administrative Amendment

For initial permits, when did operations commence? _____ /_____ /_____

For permit renewal, what is the expiration date of current permit? **__11_/_16__/__2008_**

F. Applicable Requirement Summary

Mark all types of applicable requirements that apply.

___ SIP ___ FIP/TIP ___ PSD ___Non-attainment NSR

___ Minor source NSR ___ Section 111 ___ Phase I acid rain ___Phase II acid rain

___ Stratospheric ozone ___ OCS regulations ___ NESHAP __X__ Sec. 112(d) MACT

___ Sec. 112(g) MACT ___ Early reduction of HAP ___ Sec 112(j) MACT ___ RMP [Sec.112(r)]

___ Tank Vessel requirements, sec. 183(f)) ___ Section 129 Standards/Requirement

___ Consumer / comm. products, ' 183(e) ___ NAAQS, increments or visibility (temp. sources)

Has a risk management plan been registered? ___YES __X__ NO Regulatory agency ____________

Phase II acid rain application submitted? ___YES __X__ NO If yes, Permitting authority ____________

G. Source-Wide PTE Restrictions and Generic Applicable Requirements

Cite and describe any emissions-limiting requirements and/or facility-wide "generic" applicable requirements.

Facility previously issue NSR Permit NM-1644-M1, limiting fuel consumption, requiring oxidation catalysts on two RICE, with quarterly testing requirements and condenser on dehydrator still vent. Permit establishes emissions limits for each unit.
Generic requirements identified in Conditions 3.2 of Operating Permit R6FOPP71-03

H. Process Description

List processes, products, and SIC codes for the facility.

Process	Products	SIC
Natural gas gathering and transmission facility, with pressurized natural gas as product delivered to pipeline.	Pressurized natural gas	1311

I. Emission Unit Identification

Assign an emissions unit ID and describe each emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on a separate line. Applicants may exclude from this list any insignificant emissions units or activities.

Emissions Unit ID	Description of Unit
A-01	Caterpillar 3612 LE, Natural Gas Fired Engine
A-01-CD#1	Oxidation Catalyst for RICE A-01 (Control Device)
A-02	Caterpillar 3612 LE, Natural Gas Fired Engine
A-02-CD#2	Oxidation Catalyst for RICE A-02 (Control Device)
A-03	Caterpillar 3612 LE, Natural Gas Fired Engine
EMERGEN	Caterpillar 3304, Diesel Generator
FUG	Fugitive VOCs
MSS	Maintenance, Startup, and Shutdown Emissions
TBATTERY	Eight 450-bbl Condensate Storage Tanks (capped emissions and throughput)
TLOAD	Condensate Truck Loading

J. Facility Emissions Summary

Enter potential to emit (PTE) for the facility as a whole for each air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information.

NOx 66.28 tons/yr VOC: 137.22 tons/yr SO_2: 4.27 tons/yr PM_{10}: 2.90 tons/yr

$PM_{2.5}$: 2.90 tons/yr CO: 102.57 tons/yr Lead: N/A tons/yr Total HAP: 37.04 tons/yr

Single HAP emitted in the greatest amount: Formaldehyde PTE: 31.05 tons/yr

Total of regulated pollutants (for fee calculation), Sec. F, line 5 of form FEE: N/A tons/yr

K. Existing Federally-Enforceable Permits

Permit number(s): NM 1644 M1 Permit type: NSR Permitting Authority: NMED

Permit number(s): R6FOPP71-03 Permit type: Title V (Part 71) Permitting Authority: USEPA

L. Emission Unit(s) Covered by General Permits

Emission unit(s) subject to general permit ______________________________

Check one: ___ Application made ___ Coverage granted

General permit identifier ______________________ Expiration Date ____/____/____

M. Cross-referenced Information

Does this application cross-reference information? ___ YES X NO (If yes, see instructions)

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

POTENTIAL TO EMIT (PTE)

For each unit with emissions that count towards applicability, list the emissions unit ID and the PTE for the air pollutants listed below and sum them up to show totals for the facility. You may find it helpful to complete form **EMISS** before completing this form. Show other pollutants not listed that are present in major amounts at the facility on attachment in a similar fashion. You may round values to the nearest tenth of a ton. Also report facility totals in section **J** of form **GIS**.

Emissions Unit ID	Regulated Air Pollutants and Pollutants for which the Source is Major (tons/yr)								
	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO	Lead	HAP	CO_2e
A-01	22.09	20.54	1.42	0.97	0.97	11.83	0	10.28	11,304
A-02	22.09	20.54	1.42	0.97	0.97	11.83	0	10.28	11, 304
A-03	22.09	29.34	1.42	0.97	0.97	78.88	0	14.69	11,305
EMERGEN	0.02	0.01	0.0001	0.002	0.002	0.03	0		5
FUGVOC		2.23						0.03	80
MSS		23.85						0.62	1,437
TBATTERY		37.39						1.07	110
TLOAD		2.23						0.07	9
FACILTY TOTALS	66.29	137.13	4.26	2.91	2.91	102.57	0	37.04	35,554

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

INITIAL COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION (I-COMP)

SECTION A - COMPLIANCE STATUS AND COMPLIANCE PLAN

Complete this section for each unique combination of applicable requirements and emissions units at the facility. List all compliance methods (monitoring, recordkeeping and reporting) you used to determine compliance with the applicable requirement described above. Indicate your compliance status at this time for this requirement and compliance methods and check "YES" or "NO" to the follow-up question.

Emission Unit ID(s): N/A

Applicable Requirement (Describe and Cite)

There are no units for which an initial compliance plan or compliance certification is required.

Compliance Methods for the Above (Description and Citation):

Compliance Status:

_X_ In Compliance: Will you continue to comply up to permit issuance? __X__Yes ___No

___ Not In Compliance: Will you be in compliance at permit issuance? ___Yes ___No

_X_ Future-Effective Requirement: Do you expect to meet this on a timely basis? __X__Yes ____No

B. SCHEDULE OF COMPLIANCE

Complete this section if you answered "NO" to any of the questions in section A. Also complete this section if required to submit a schedule of compliance by an applicable requirement. Please attach copies of any judicial consent decrees or administrative orders for this requirement.

Unit(s)____________________ Requirement____

Reason for Noncompliance. Briefly explain reason for noncompliance at time of permit issuance or that future-effective requirement will not be met on a timely basis:

Narrative Description of how Source Compliance Will be Achieved. Briefly explain your plan for achieving compliance:

Schedule of Compliance. Provide a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance, including a date for final compliance.

Remedial Measure or Action	Date to be Achieved

C. SCHEDULE FOR SUBMISSION OF PROGRESS REPORTS

Only complete this section if you are required to submit one or more schedules of compliance in section B or if an applicable requirement requires submittal of a progress report. If a schedule of compliance is required, your progress report should start within 6 months of application submittal and subsequently, no less than every six months. One progress report may include information on multiple schedules of compliance.

Contents of Progress Report (describe):

First Report____/____/___ Frequency of Submittal_______________

Contents of Progress Report (describe):

First Report____/____/___ Frequency of Submittal_______________

D. SCHEDULE FOR SUBMISSION OF COMPLIANCE CERTIFICATIONS

This section must be completed once by every source. Indicate when you would prefer to submit compliance certifications during the term of your permit (at least once per year).

Frequency of submittal______________________ Beginning____/____/____

E. COMPLIANCE WITH ENHANCED MONITORING & COMPLIANCE CERTIFICATION REQUIREMENTS

This section must be completed once by every source. To certify compliance with these, you must be able to certify compliance for every applicable requirement related to monitoring and compliance certification at every unit.

Enhanced Monitoring Requirements: ____ In Compliance ____ Not In Compliance

Compliance Certification Requirements: ____ In Compliance ____ Not In Compliance

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) Hurlburt (First) Terry (MI) L.

Title: Senior Vice President

Street or P.O. Box: P.O. Box 4324

City: Houston State: TX ZIP: 77210 - 4324

Telephone (713) 381-6595 Ext. ________ Facsimile (866) 226-9817

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed): ______________________________________

Name (typed): Terry Hurlburt Date: _____ /_____ /_________

EPA Part 71 Application Source Forms

Lindrith Compressor Station

Part 71 Renewal Application Update

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: A-01

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.22	0.97	N/A
PM_{10}	N/A	0.22	0.97	N/A
$PM_{2.5}$	N/A	0.22	0.97	N/A
SO_2	N/A	0.32	1.42	7446-09-5
NO_x	N/A	5.04	22.09	N/A
CO	N/A	2.70	11.83	630-08-0
VOC	N/A	4.69	20.54	N/A
Acetaldehyde	N/A	0.13	0.57	00075-07-0
Acrolein	N/A	0.08	0.35	00107-02-8
Benzene	N/A	0.01	0.03	00071-43-2
Formaldehyde	N/A	2.07	9.06	00050-00-0
Methanol	N/A	0.04	0.17	00067-56-1
n-hexane	N/A	0.02	0.08	00110-54-3
Toluene	N/A	0.01	0.03	00108-88-3
Xylene (mixed isomers)	N/A	0.00	0.01	N/A
N_2O	N/A	0.00	0.01	N/A
Methane	N/A	0.02	0.07	N/A
CO_2	N/A	2,580	11,304	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: A-02

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.22	0.97	N/A
PM_{10}	N/A	0.22	0.97	N/A
$PM_{2.5}$	N/A	0.22	0.97	N/A
SO_2	N/A	0.32	1.42	7446-09-5
NO_x	N/A	5.04	22.09	N/A
CO	N/A	2.70	11.83	630-08-0
VOC	N/A	4.69	20.54	N/A
Acetaldehyde	N/A	0.13	0.57	00075-07-0
Acrolein	N/A	0.08	0.35	00107-02-8
Benzene	N/A	0.01	0.03	00071-43-2
Formaldehyde	N/A	2.07	9.06	00050-00-0
Methanol	N/A	0.04	0.17	00067-56-1
n-hexane	N/A	0.02	0.08	00110-54-3
Toluene	N/A	0.01	0.03	00108-88-3
Xylene (mixed isomers)	N/A	0.00	0.01	N/A
N_2O	N/A	0.00	0.01	N/A
Methane	N/A	0.02	0.07	N/A
CO_2	N/A	2,580	11,304	N/A

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: A-03

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.22	0.97	N/A
PM_{10}	N/A	0.22	0.97	N/A
$PM_{2.5}$	N/A	0.22	0.97	N/A
SO_2	N/A	0.32	1.42	7446-09-5
NO_x	N/A	5.04	22.09	N/A
CO	N/A	18.01	78.88	630-08-0
VOC	N/A	6.70	29.34	N/A
Acetaldehyde	N/A	0.18	0.81	00075-07-0
Acrolein	N/A	0.11	0.50	00107-02-8
Benzene	N/A	0.01	0.04	00071-43-2
Formaldehyde	N/A	2.95	12.94	00050-00-0
Methanol	N/A	0.06	0.24	00067-56-1
n-hexane	N/A	0.02	0.11	00110-54-3
Toluene	N/A	0.01	0.04	00108-88-3
Xylene (mixed isomers)	N/A	0.00	0.02	N/A
N_2O	N/A	0.00	0.01	N/A
Methane	N/A	0.02	0.07	N/A
CO_2	N/A	2,580	11,305	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TBATTERY (Includes emissions from 8 Condensate Tanks)

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	8.54	37.39	N/A
n-Hexane	N/A	0.19	0.84	00110-54-3
Benzene	N/A	0.03	0.12	00071-43-2
Toluene	N/A	0.03	0.11	00108-88-3
CO_2e	N/A	25.11	110	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: MSS

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	119.25	23.85	N/A
Benzene	N/A	0.35	0.07	00071-43-2
n-Hexane	N/A	2.74	0.55	00110-54-3
CO_2e	N/A	285.4	1,437	N/A

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: FUGVOC

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	0.76	3.31	N/A
Benzene	N/A	0.001	0.004	00071-43-2
n-Hexane	N/A	0.007	0.031	00110-54-3
CO_2e	N/A	18.30	80	N/A

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID: TLOAD

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	N/A	89.32 (Max)	2.23	N/A
Benzene	N/A	0.30 (Max)	0.01	00071-43-2
Toluene	N/A	0.25 (Max)	0.01	00108-88-3
n-Hexane	N/A	2.0 (Max)	0.05	00110-54-3
CO_2e	N/A	360 (Max)	9	N/A

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION CALCULATIONS (EMISS)

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID _EMERGEN_______

B. Identification and Quantification of Emissions

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

Air Pollutants	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM	N/A	0.06	0.002	N/A
PM_{10}	N/A	0.06	0.002	N/A
$PM_{2.5}$	N/A	0.06	0.002	N/A
SO_2	N/A	0.002	0.0001	7446-09-5
NO_x	N/A	0.69	0.02	N/A
CO	N/A	1.10	0.03	630-08-0
VOC	N/A	0.58	0.01	N/A
N_2O	N/A	0.00	0.00	N/A
Methane	N/A	0.00	0.00	N/A
CO_2	N/A	220	5	N/A

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: A-01 Description: Compressor No. 1 Engine

SIC Code (4-digit): 4922 SCC Code: 31000203

B. Emissions Unit Description

Primary use: Engine for Compressor No. 1 Temporary Source ___Yes X No

Manufacturer: Caterpillar Model No.: 3612 LE

Serial Number: 1YG00055 Installation Date: 4 / 17 / 1995

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Horsepower rating: 3,267 Boiler steam flow (lb/hr)___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 22.09 MM BTU/hr Max. Design Heat Input 22.09 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Natural Gas Standby fuel type(s) N/A

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	0.02%	Negligible	905 Btu/scf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	N/A	0.024 MMscf/hr	213.83 MMscf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID: A-01-CD#1 Device type: Catalytic Oxidation System

Air pollutant(s) Controlled: CO, VOC Manufacturer: Houston Industrial Silencing

Model No.: DeCOHx33c22/24PL Serial No.: Unknown

Installation date: 4 / 17 / 1995 Control efficiency (%): 85% (CO); 30% (VOC)

Efficiency estimation method ______

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft): 15.0 Inside stack diameter (ft): 1.5

Stack temp (^{o}F): 858 Design stack flow rate (ACFM): 24,273

Actual stack flow rate (ACFM): 24,273 Velocity (ft/sec): 228.9

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: A-02 Description: Compressor No. 2 Engine

SIC Code (4-digit): 4922 SCC Code: 31000203

B. Emissions Unit Description

Primary use: Engine for Compressor No. 2 Temporary Source ___Yes X No

Manufacturer: Caterpillar Model No.: 3612 LE

Serial Number: 1YG00054 Installation Date: 5 / 1 / 1995

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Horsepower rating: 3,267 Boiler steam flow (lb/hr)___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 22.09 MM BTU/hr Max. Design Heat Input 22.09 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Natural Gas Standby fuel type(s) N/A

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	0.02%	Negligible	905 Btu/scf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage Hourly	Maximum Usage Annual
Natural Gas	N/A	0.024 MMscf/hr	213.83 MMscf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID: A-01-CD#1 Device type: Catalytic Oxidation System

Air pollutant(s) Controlled: CO, VOC Manufacturer: Houston Industrial Silencing

Model No.: DeCOHx33c22/24PL Serial No.: Unknown

Installation date: 4 / 17 / 1995 Control efficiency (%): 85% (CO); 30% (VOC)

Efficiency estimation method ______

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft): 15.0 Inside stack diameter (ft): 1.5

Stack temp (^oF): 858 Design stack flow rate (ACFM): 24,273

Actual stack flow rate (ACFM): 24,273 Velocity (ft/sec): 228.9

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID: A-03 Description: Compressor No. 3 Engine

SIC Code (4-digit): 4922 SCC Code: 31000203

B. Emissions Unit Description

Primary use: Engine for Compressor No. 3 Temporary Source ___Yes X No

Manufacturer: Caterpillar Model No.: 3612 LE

Serial Number: 1YG00072 Installation Date: 5 / 15 / 1995

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ___

Horsepower rating: 3,267 Boiler steam flow (lb/hr)___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input 22.09 MM BTU/hr Max. Design Heat Input 22.09 MM BTU/hr

C. Fuel Data

Primary fuel type(s): Natural Gas Standby fuel type(s): N/A

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Natural Gas	0.02%	Negligible	905 Btu/scf

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural Gas	N/A	0.024 MMscf/hr	213.83 MMscf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device type: ____________

Air pollutant(s) Controlled: ____________ Manufacturer: ____________

Model No.: ____________ Serial No.: ____________

Installation date: ___/___/____ Control efficiency (%): ____________

Efficiency estimation method ____________

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft): 15.0 Inside stack diameter (ft): 1.5

Stack temp (^{o}F): 858 Design stack flow rate (ACFM): 24,273

Actual stack flow rate (ACFM): 24,273 Velocity (ft/sec): 228.9

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)

A. General Information

Emissions unit ID _EMERGEN__ Description _Emergency Generator__________

SIC Code (4-digit):_4922___ SCC Code:__31000203__

B. Emissions Unit Description

Primary use ___Emergency Generator____________________ Temporary Source ___ Yes _X_ No

Manufacturer _Caterpillar___________________________ Model No. __3304_____________

Serial Number ____83X09381________________ Installation Date_5_/_1_/_1995__

Boiler Type: ___ Industrial boiler ___ Process burner ___ Electric utility boiler

Other (describe) ____

Boiler horsepower rating____192__________ Boiler steam flow (lb/hr)_______________

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___Spreader stoker ___Underfeed stoker ___Overfeed stoker

___ Traveling grate ___Shaking grate ___Pulverized, wet bed ___ Pulverized, dry bed

Actual Heat Input __1.30___MM BTU/hr Max. Design Heat Input ___1.30___MM BTU/hr

C. Fuel Data

Primary fuel type(s)___Diesel__________________ Standby fuel type(s)____N/A_____________

Describe each fuel you expected to use during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (cf, gal., or lb.)
Diesel Fuel	0.00015%	Negligible	19,300 BTU/lb

D. Fuel Usage Rates

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Diesel Fuel	N/A	9.7 gallons	504.4 gallons

E. Associated Air Pollution Control Equipment

Emissions unit ID___N/A_________ Device type____

Air pollutant(s) Controlled____________________ Manufacturer__________________________

Model No.________________________ Serial No.________________________

Installation date_____/_____/_________ Control efficiency (%) ____________

Efficiency estimation method____

F. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

Stack height (ft) ___________._____ Inside stack diameter (ft) __________._____

Stack temp (^oF) ___________._____ Design stack flow rate (ACFM) ___________.____

Actual stack flow rate (ACFM) _____________.____ Velocity (ft/sec) _____________._______

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID:__FUGVOC__ Description:__Fugitive emissions from leaking components__

SIC Code (4-digit):__4922__ SCC Code:__31000220

B. Emissions Unit Description

Primary use or equipment type:__Components associated with equipment at the facility______

Manufacturer:____N/A________ Model No.:____N/A______________

Serial No.:_____N/A_______ Installation date _____/_____/_____

Raw materials ____

Finished products ____

Temporary source: _X__No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	0.76 lb/hr	3.31 TPY
Maximum rate		

D. Associated Air Pollution Control Equipment

Emissions unit ID:_N/A____ Device Type_____________________________________

Manufacturer ________________________ Model No_______________________________

Serial No. _______________________________ Installation date _____/_____/_________

Control efficiency (%) _________.___ Capture efficiency (%) ________.___

Air pollutant(s) controlled ______________ Efficiency estimation method _______________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) __________._____ Inside stack diameter (ft) _________._____

Stack temp (F) __________._____ Design stack flow rate (ACFM) __________.____

Actual stack flow rate (ACFM) ____________.____ Velocity (ft/sec) ____________.____

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: MSS   Description: Compressor blowdowns for maintenance, startup and shutdown

SIC Code (4-digit): 4922   SCC Code: ______________

B. Emissions Unit Description

Primary use or equipment type: Blowdowns associated with station operation

Manufacturer: N/A   Model No.: N/A

Serial No.: N/A   Installation date _____/_____/_____

Raw materials ______________________________

Finished products ______________________________

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate		
Maximum rate	10,000 scf/hr	4.0 MMscf/yr

D. Associated Air Pollution Control Equipment

Emissions unit ID: N/A   Device Type: N/A

Manufacturer ______________________   Model No______________________

Serial No. ______________________   Installation date _____/_____/_________

Control efficiency (%) _________.___   Capture efficiency (%) ________.___

Air pollutant(s) controlled ______________   Efficiency estimation method _______________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) __________._____ Inside stack diameter (ft) _________._____

Stack temp (F) __________._____ Design stack flow rate (ACFM) __________.____

Actual stack flow rate (ACFM) ____________.____ Velocity (ft/sec) ____________.____

United States Environmental Protection Agency

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Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TBATTERY Description: Eight 454 bbl condensate tanks

SIC Code (4-digit): 4922 SCC Code: 40400311

B. Emissions Unit Description

Primary use or equipment type: Condensate storage

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date _____/_____/_____

Raw materials: Natural gas condensate

Finished products: Natural gas condensate

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	-	20,000 bbls/year
Maximum rate	-	-

D. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device Type____________________

Manufacturer ____________________ Model No____________________

Serial No. ____________________ Installation date _____/_____/_____

Control efficiency (%) __________.___ Capture efficiency (%) _________.___

Air pollutant(s) controlled _______________ Efficiency estimation method _______________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Diameter (ft): 12.75 Shell Height (ft): 20.00 Average Liquid Height (ft.): 8

Capacity (bbls): 454 Design stack flow rate (ACFM): N/A

Actual stack flow rate (ACFM): N/A Velocity (ft/sec): N/A

** For each tank in battery

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)

A. General Information

Emissions unit ID: TLOAD Description: Loading of condensate from tanks into trucks

SIC Code (4-digit): 4922 SCC Code________

B. Emissions Unit Description

Primary use or equipment type: Emissions associated with loading condensate into trucks

Manufacturer: N/A Model No.: N/A

Serial No.: N/A Installation date _____/_____/_____

Raw materials ____________________

Finished products ____________________

Temporary source: X No ___Yes

C. Activity or Production Rates

Activity or Production Rate	Amount/Hour	Amount/Year
Actual Rate	-	-
Maximum rate	-	20,000 bbls/yr

D. Associated Air Pollution Control Equipment

Emissions unit ID: N/A Device Type: N/A

Manufacturer ____________________ Model No____________________

Serial No. ____________________ Installation date _____/_____/_________

Control efficiency (%) _________.___ Capture efficiency (%) ________.___

Air pollutant(s) controlled ______________ Efficiency estimation method ______________

E. Ambient Impact Assessment

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) __________.______ Inside stack diameter (ft) __________.______

Stack temp (F) __________.______ Design stack flow rate (ACFM) __________.____

Actual stack flow rate (ACFM) ____________.____ Velocity (ft/sec) ____________.____

Federal Operating Permit Program (40 CFR Part 71)

INSIGNIFICANT EMISSIONS (IE)

List each insignificant activity or emission unit. In the “number” column, indicate the number of units in this category. Descriptions should be brief but unique. Indicate which emissions criterion of part 71 is the basis for the exemption.

Number	Description of Activities or Emissions Units	RAP, except HAP	HAP
T-9	120 bbl Compressor Skid Sump Drain Tank	X	
T-10	120 bbl Water Separation Tank	X	
T-11	120 bbl Water Separation Tank	X	
T-12	120 bbl Water Separation Tank	X	
T-13	500 gal Lube Oil Tank	X	
T-14	500 gal Lube Oil Tank	X	
T-15	500 gal Lube Oil Tank	X	
T-16	500 gal Ambitrol (AntiFreeze) Tank	X	
T-17	500 gal Ambitrol (AntiFreeze) Tank	X	
T-18	500 gal Ambitrol (AntiFreeze) Tank	X	

APPENDIX A

Emission Calculations and Supporting Data

Enterprise Field Services LLC

Emissions Calculations

Lindrith Compressor Station

Summary of Emissions

Part 71 Renewal Application Update

Max Single HAP **31.05**

Total HAPs **37.04**

Pollutant	CAS No.	Emissions (tons/yr)								
		A-01	A-02	A-03	EMERGEN	FUGVOC	MSS	TLOAD	TBATTERY	Total
Particulate Matter (PM_{10})		0.97	0.97	0.97	0.002					2.90
Particulate Matter ($PM_{2.5}$)		0.97	0.97	0.97	0.002					2.90
Sulfur Dioxide (SO_2)		1.42	1.42	1.42	0.002					4.27
Nitrogen Oxides (NO_x)		22.09	22.09	22.09	0.02					66.28
Carbon Monoxide (CO)		11.83	11.83	78.88	0.03					102.57
Volatile Organic Compounds (VOC)		20.54	20.54	29.34	0.01	3.31	23.85	2.23	37.39	137.22
Acetaldehyde	00075-07-0	0.57	0.57	0.81						1.94
Acrolein	00107-02-8	0.35	0.35	0.50						1.19
Benzene	00071-43-2	0.03	0.03	0.04		0.00	0.07	0.01	0.12	0.31
Formaldehyde	00050-00-0	9.06	9.06	12.94						31.05
Methanol	00067-56-1	0.17	0.17	0.24						0.58
n-Hexane	00110-54-3	0.08	0.08	0.11		0.03	0.55	0.05	0.84	1.72
Toluene	00108-88-3	0.03	0.03	0.04				0.01	0.11	0.21
Xylene (mixed isomers)		0.01	0.01	0.02				0.00	0.00	0.04
GHG (CO_2e)		11,304	11,304	11,305	5	80	1,437	9	110	35,554

Engines

Enterprise Field Services LLC **Emissions Calculations**

Lindrith Compressor Station **Compressor No. 1 Engine**

Part 71 Renewal Application Update **Source ID No.: A-01**

Operating Parameters

Annual Operaton:	8,760 hrs/yr			
Mfr Rating	3,550 bhp	=		
Elevation	6,653 ft MSL			
DeRate	3% per 1,000 ft > 4000 ft			
Average Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr
				0.024 MMscf/hr @905 Btu/scf
				213.83 MMscf/yr
Maximum Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr
				0.024 MMscf/hr @905 Btu/scf
				213.83 MMscf/yr

Pollutant	CAS No.	Emission Factor(1)	Control Efficiency(2) (%)	Emissions		
				Average(3) (lbs/hr)	Maximum(4) (lbs/hr)	Annual(5) (tons/yr)
Particulate Matter (PM_{10})		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Particulate Matter ($PM_{2.5}$)		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Sulfur Dioxide (SO_2)		1.47E-02 lbs/MMBtu	0%	0.32	0.32	1.42
Nitrogen Oxides (NO_x)		0.70 g/bhp-hr	0%	5.04	5.04	22.09
Carbon Monoxide (CO)		2.50 g/bhp-hr	85%	2.70	2.70	11.83
Volatile Organic Compounds (VOC)		0.93 g/bhp-hr	30%	4.69	4.69	20.54
Acetaldehyde	00075-07-0	8.36E-03 lbs/MMBtu	30%	0.13	0.13	0.57
Acrolein	00107-02-8	5.14E-03 lbs/MMBtu	30%	0.08	0.08	0.35
Benzene	00071-43-2	4.40E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Formaldehyde	00050-00-0	0.41 g/bhp-hr	30%	2.07	2.07	9.06
Methanol	00067-56-1	2.50E-03 lbs/MMBtu	30%	0.04	0.04	0.17
n-Hexane	00110-54-3	1.11E-03 lbs/MMBtu	30%	0.02	0.02	0.08
Toluene	00108-88-3	4.08E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Xylene (mixed isomers)		1.84E-04 lbs/MMBtu	30%	0.00	0.00	0.01
Nitrous Oxide (N_2O)		1.00E-04 lbs/MMBtu	0%	0.00	0.00	0.01
Methane		1.00E-03 lbs/MMBtu	30%	0.02	0.02	0.07
Carbon Dioxide		1.17E+02 lbs/MMBtu	0%	2,580	2,580	11,300

(1) Emission factors for NOx, CO, and VOC based on vendor specifications. All other emission factors from AP-42 (7/00); Table 3.2-2.
The AP-42 factor for SO2 is based on 2,000 grains/MMscf. The factor is adjusted to allow for up to 5 grains sulfur per 100 scf.
PM10 and PM2.5 include both condensible and filterable portions.

(2) Control efficiency based on vendor data for CO and VOC. Reduction efficiency for HAP assumed to be same as for VOC.

(3) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Avg Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Avg Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(4) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Max Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Max Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(5) Calculated as: Average Emissions (lbs/hr) **X** Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

Enterprise Field Services LLC | **Emissions Calculations**

Lindrith Compressor Station | **Compressor No. 2 Engine**

Part 71 Renewal Application Update | **Source ID No.: A-02**

Operating Parameters

Annual Operaton:	8,760 hrs/yr			
Mfr Rating	3,550 bhp =			
Elevation	6,653 ft MSL			
DeRate	3% per 1,000 ft > 4000 ft			
Average Operating Rate:	3,267 bhp =	6,761 BTU/bhp-hr =	22.09	MMBtu/hr
			0.024	MMscf/hr @905 Btu/scf
			213.83	MMscf/yr
Maximum Operating Rate:	3,267 bhp =	6,761 BTU/bhp-hr =	22.09	MMBtu/hr
			0.024	MMscf/hr @905 Btu/scf
			213.83	MMscf/yr

Pollutant	CAS No.	Emission Factor[(1)]	Control Efficiency[(2)] (%)	Emissions		
				Average[(3)] (lbs/hr)	Maximum[(4)] (lbs/hr)	Annual[(5)] (tons/yr)
Particulate Matter (PM_{10})		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Particulate Matter ($PM_{2.5}$)		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Sulfur Dioxide (SO_2)		1.47E-02 lbs/MMBtu	0%	0.32	0.32	1.42
Nitrogen Oxides (NO_x)		0.70 g/bhp-hr	0%	5.04	5.04	22.09
Carbon Monoxide (CO)		2.50 g/bhp-hr	85%	2.70	2.70	11.83
Volatile Organic Compounds (VOC)		0.93 g/bhp-hr	30%	4.69	4.69	20.54
Acetaldehyde	00075-07-0	8.36E-03 lbs/MMBtu	30%	0.13	0.13	0.57
Acrolein	00107-02-8	5.14E-03 lbs/MMBtu	30%	0.08	0.08	0.35
Benzene	00071-43-2	4.40E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Formaldehyde	00050-00-0	0.41 g/bhp-hr	30%	2.07	2.07	9.06
Methanol	00067-56-1	2.50E-03 lbs/MMBtu	30%	0.04	0.04	0.17
n-Hexane	00110-54-3	1.11E-03 lbs/MMBtu	30%	0.02	0.02	0.08
Toluene	00108-88-3	4.08E-04 lbs/MMBtu	30%	0.01	0.01	0.03
Xylene (mixed isomers)		1.84E-04 lbs/MMBtu	30%	0.00	0.00	0.01
Nitrous Oxide (N_2O)		1.00E-04 lbs/MMBtu	0%	0.00	0.00	0.01
Methane		1.00E-03 lbs/MMBtu	30%	0.02	0.02	0.07
Carbon Dioxide		1.17E+02 lbs/MMBtu	0%	2,580	2,580	11,300

(1) Emission factors for NOx, CO, and VOC based on vendor specifications. All other emission factors from AP-42 (7/00); Table 3.2-2.
The AP-42 factor for SO2 is based on 2,000 grains/MMscf. The factor is adjusted to allow for up to 5 grains sulfur per 100 scf.
PM10 and PM2.5 include both condensible and filterable portions.

(2) Control efficiency based on vendor data for CO and VOC. Reduction efficiency for HAP assumed to be same as for VOC.

(3) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Avg Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Avg Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(4) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Max Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Max Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(5) Calculated as: Average Emissions (lbs/hr) **X** Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

Enterprise Field Services LLC — **Emissions Calculations**

Lindrith Compressor Station — **Compressor No. 3 Engine**

Part 71 Renewal Application Update — **Source ID No.: A-03**

Operating Parameters

Annual Operaton:	8,760 hrs/yr			
Mfr Rating	3,550 bhp	=		
Elevation	6,653 ft MSL			
DeRate	3% per 1,000 ft > 4000 ft			
Average Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr
				0.024 MMscf/hr @905 Btu/scf
				213.83 MMscf/yr
Maximum Operating Rate:	3,267 bhp	=	6,761 BTU/bhp-hr =	22.09 MMBtu/hr
				0.024 MMscf/hr @905 Btu/scf
				213.83 MMscf/yr

Pollutant	CAS No.	Emission Factor[(1)]	Control Efficiency[(2)] (%)	Emissions		
				Average[(3)] (lbs/hr)	Maximum[(4)] (lbs/hr)	Annual[(5)] (tons/yr)
Particulate Matter (PM_{10})		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Particulate Matter ($PM_{2.5}$)		9.99E-03 lbs/MMBtu	0%	0.22	0.22	0.97
Sulfur Dioxide (SO_2)		1.47E-02 lbs/MMBtu	0%	0.32	0.32	1.42
Nitrogen Oxides (NO_x)		0.70 g/bhp-hr	0%	5.04	5.04	22.09
Carbon Monoxide (CO)		2.50 g/bhp-hr	0%	18.01	18.01	78.88
Volatile Organic Compounds (VOC)		0.93 g/bhp-hr	0%	6.70	6.70	29.34
Acetaldehyde	00075-07-0	8.36E-03 lbs/MMBtu	0%	0.18	0.18	0.81
Acrolein	00107-02-8	5.14E-03 lbs/MMBtu	0%	0.11	0.11	0.50
Benzene	00071-43-2	4.40E-04 lbs/MMBtu	0%	0.01	0.01	0.04
Formaldehyde	00050-00-0	0.41 g/bhp-hr	0%	2.95	2.95	12.94
Methanol	00067-56-1	2.50E-03 lbs/MMBtu	0%	0.06	0.06	0.24
n-Hexane	00110-54-3	1.11E-03 lbs/MMBtu	0%	0.02	0.02	0.11
Toluene	00108-88-3	4.08E-04 lbs/MMBtu	0%	0.01	0.01	0.04
Xylene (mixed isomers)		1.84E-04 lbs/MMBtu	0%	0.00	0.00	0.02
Nitrous Oxide (N_2O)		1.00E-04 lbs/MMBtu	0%	0.00	0.00	0.01
Methane		1.00E-03 lbs/MMBtu	30%	0.02	0.02	0.07
Carbon Dioxide		1.17E+02 lbs/MMBtu	0%	2,580	2,580	11,300

(1) Emission factors for NOx, CO, and VOC based on vendor specifications. All other emission factors from AP-42 (7/00); Table 3.2-2.
The AP-42 factor for SO2 is based on 2,000 grains/MMscf. The factor is adjusted to allow for up to 5 grains sulfur per 100 scf.
PM10 and PM2.5 include both condensible and filterable portions.

(2) Control efficiency based on vendor data for CO and VOC. Reduction efficiency for HAP assumed to be same as for VOC.

(3) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Avg Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Avg Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(4) For NOx, CO, and VOC, calculated as: Emission Factor (g/bhp-hr) X Max Operating Rate (bhp) X (100 - % Control Eff.) ÷ 453.59 g/lb
All other pollutants calculated as: Emission Factor (lbs/MMBtu) X Max Operating Rate (MMBtu/hr) X (100 - % Control Eff.)

(5) Calculated as: Average Emissions (lbs/hr) **X** Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

G3612

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1000	FUEL SYSTEM:	GAV
COMPRESSION RATIO:	9:1		WITH AIR FUEL RATIO CONTROL
AFTERCOOLER WATER INLET (°F):	130	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	190	FUEL:	Field Gas
COOLING SYSTEM:	JW, OC+AC	FUEL PRESSURE RANGE(psig):	42.8-47.0
IGNITION SYSTEM:	CIS/ADEM3	FUEL METHANE NUMBER:	62.2
EXHAUST MANIFOLD:	DRY	FUEL LHV (Btu/scf):	1027
COMBUSTION:	Low Emission	ALTITUDE(ft):	500
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.7	MAXIMUM INLET AIR TEMPERATURE(°F):	77
		NAMEPLATE RATING:	3550 bhp@1000rpm

			MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING	**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(1)	bhp	3550	3527	2645	1775
INLET AIR TEMPERATURE		°F	70	77	77	77
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(2)	Btu/bhp-hr	6761	6769	7063	7650
FUEL CONSUMPTION (HHV)	(2)	Btu/bhp-hr	7471	7479	7804	8453
AIR FLOW	(3)(4)	lb/hr	40343	40097	30764	21174
AIR FLOW WET (77°F, 14.7 psia)	(3)(4)	scfm	9098	9043	6938	4775
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	71.7	71.2	55.3	38.2
EXHAUST STACK TEMPERATURE	(6)	°F	858	859	897	946
EXHAUST GAS FLOW (@ stack temp, 14.5 psia)	(7)(4)	ft3/min	23743	23617	18656	13344
EXHAUST GAS MASS FLOW	(7)(4)	lb/hr	41500	41247	31664	21828
EMISSIONS DATA						
NOx (as NO2)	(8)	g/bhp-hr	0.70	0.70	0.70	0.70
CO	(8)	g/bhp-hr	2.50	2.50	2.50	2.50
THC (mol. wt. of 15.84)	(8)	g/bhp-hr	6.15	6.15	6.31	6.50
NMHC (mol. wt. of 15.84)	(8)	g/bhp-hr	1.59	1.60	1.64	1.68
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	1.07	1.07	1.10	1.13
HCHO (Formaldehyde)	(8)	g/bhp-hr	0.40	0.40	0.44	0.48
CO2	(8)	g/bhp-hr	439	439	458	497
EXHAUST OXYGEN	(10)	% DRY	12.5	12.5	11.8	10.7
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(11)	Btu/min	36626	36551	31332	29350
HEAT REJ. TO ATMOSPHERE	(11)	Btu/min	14001	13998	13157	12447
HEAT REJ. TO LUBE OIL (OC)	(11)	Btu/min	18001	18008	17247	16974
HEAT REJ. TO AFTERCOOLER (AC)	(11)(12)	Btu/min	26659	26659	14046	1988

HEAT EXCHANGER SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW)	(12)	Btu/min	40289
TOTAL AFTERCOOLER CIRCUIT (OC+AC)	(12)(13)	Btu/min	49602
A cooling system safety factor of 0% has been added to the heat exchanger sizing criteria.			

CONDITIONS AND DEFINITIONS

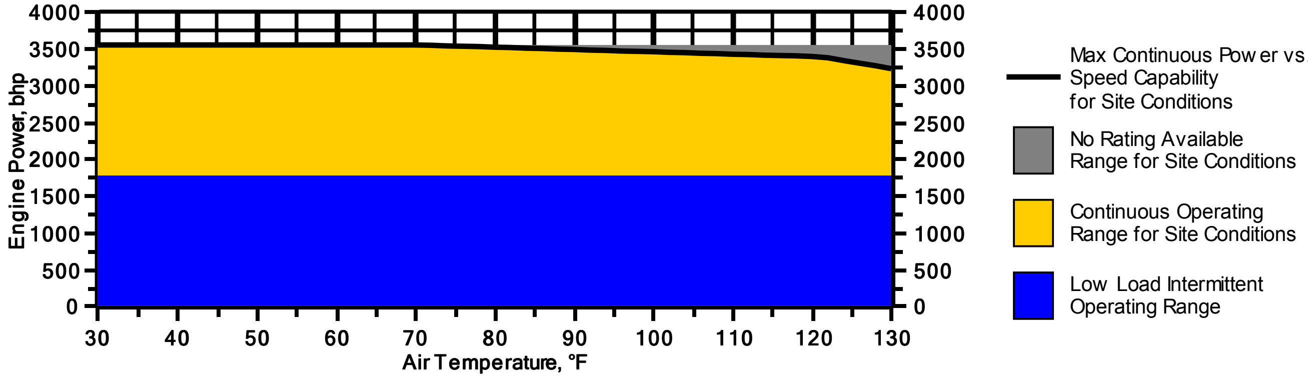
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature.
100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature.
Max. rating is the maximum capability for the specified fuel at site altitude and reduced inlet air temperature.
Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 3.03.01
Ref. Data Set DM5310-05-000, Printed 15Jun2010

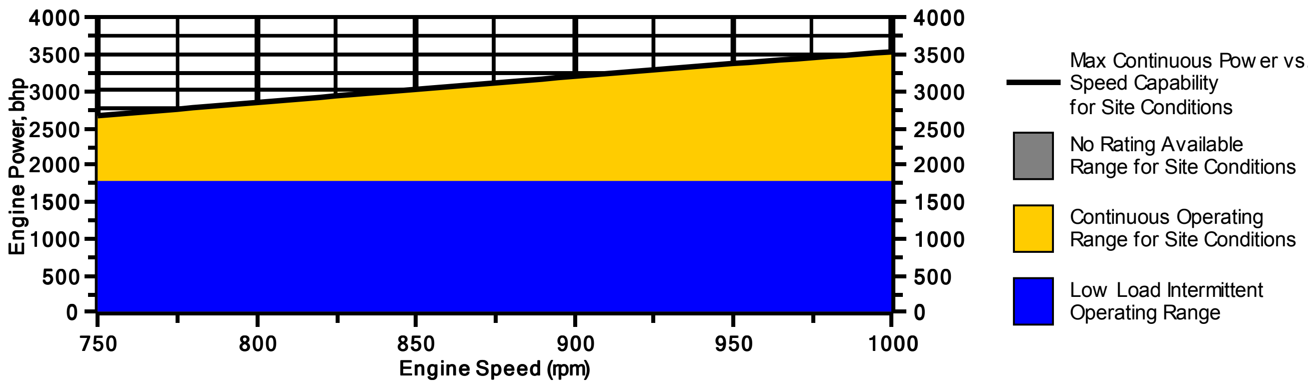
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 500 ft and 1000 rpm



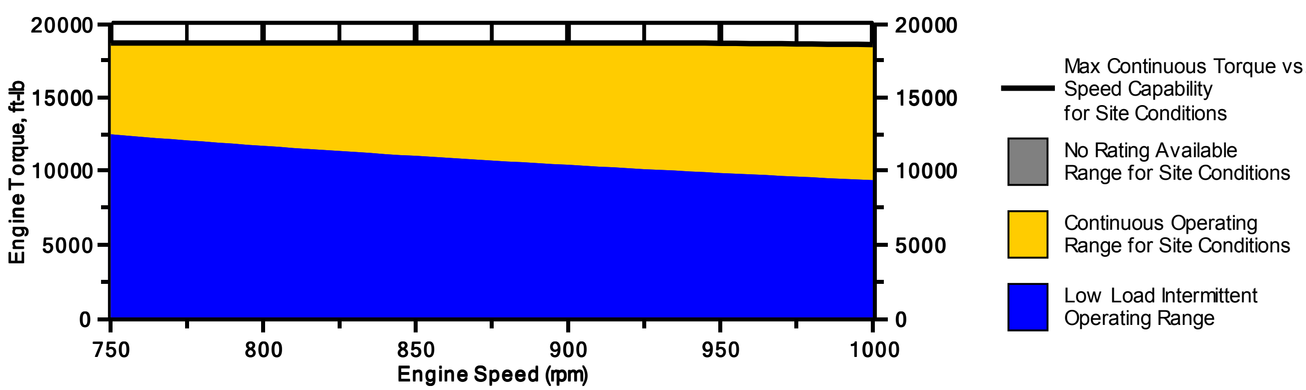
Engine Power vs. Engine Speed

Data represents speed sweep at 500 ft and 77 ºF



Engine Torque vs. Engine Speed

Data represents speed sweep at 500 ft and 77 ºF



Note: At site conditions of 500 ft and 77°F inlet air temp., constant torque can be maintained down to 750 rpm.
The minimum speed for loading at these conditions is 750 rpm.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 3.03.01
Ref. Data Set DM5310-05-000, Printed 15Jun2010

NOTES

1. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

2. Fuel consumption tolerance is ± 2.5% of full load data.

3. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

4. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

5. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

6. Exhaust stack temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

7. Exhaust flow value is on a "wet" basis. Flow is a nominal value for total flow rate with a tolerance of ±6%. Exhaust gas vented through the wastegate flows only to the right exhaust outlet. The total flow through the wastegate may be as great as 15% of the total value for conditions under which the wastegate is open. For installations that use dual exhaust runs this difference must be taken into account when specifying any items to be connected to the exhaust outlets. The flow in the right exhaust outlet must be sized for at least 65% of the total flow to allow for the wastegate full open condition, while the left outlet must be sized for 50% of the total flow for the wastegate closed condition. Both runs must meet the allowable backpressure requirement as described in the Exhaust Systems A&I Guide.

8. Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions, adjusted to the specified NOx level at 100% load. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

9. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

10. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

11. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

12. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

13. Heat exchanger sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	2.5211	2.5211
Methane	CH4	86.6340	86.6340
Ethane	C2H6	4.9767	4.9767
Propane	C3H8	3.5670	3.5670
Isobutane	iso-C4H1O	0.0000	0.0000
Norbutane	nor-C4H1O	1.8211	1.8211
Isopentane	iso-C5H12	0.0000	0.0000
Norpentane	nor-C5H12	0.4802	0.4802
Hexane	C6H14	0.0000	0.0000
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.0000	0.0000
Carbon Dioxide	CO2	0.0000	0.0000
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0000	100.0000

Fuel Makeup:	Field Gas
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	62.2
Lower Heating Value (Btu/scf):	1027
Higher Heating Value (Btu/scf):	1135
WOBBE Index (Btu/scf):	1274
THC: Free Inert Ratio:	0
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.997
Stoich A/F Ratio (Vol/Vol):	10.68
Stoich A/F Ratio (Mass/Mass):	16.43
Specific Gravity (Relative to Air):	0.650
Specific Heat Constant (K):	1.297

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES (Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	5.53 E-06	C
Acetaldehyde[k,l]	8.36 E-03	A
Acrolein[k,l]	5.14 E-03	A
Benzene[k]	4.40 E-04	A
Benzo(b)fluoranthene[k]	1.66 E-07	D
Benzo(e)pyrene[k]	4.15 E-07	D
Benzo(g,h,i)perylene[k]	4.14 E-07	D
Biphenyl[k]	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride[k]	<3.67 E-05	E
Chlorobenzene[k]	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform[k]	<2.85 E-05	E
Chrysene[k]	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene[k]	3.97 E-05	B
Ethylene Dibromide[k]	<4.43 E-05	E
Fluoranthene[k]	1.11 E-06	C
Fluorene[k]	5.67 E-06	C
Formaldehyde[k,l]	5.28 E-02	A
Methanol[k]	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride[k]	2.00 E-05	C
n-Hexane[k]	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter $\leq$ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})(\text{heat input, MMBtu/hr})(\text{1/operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

Operating Parameters

Parameter	Value	Units	Notes
Fuel Higher Heating Value (HHV)	19,300	BTU/lb	AP-42 Table 3.4.1
Fuel Density	7.10	lb/gal	AP-42 Table 3.4.1
Fuel Sulfur Content	15.00	ppmw	
Power Output: Emergency Generator	192	hp (mech.)	
Operating Hours	52	hrs/yr	Based on 1 hour per week
Heat Rate at HHV	7,000	BTU/hp-hr	

Emission Factors

SO_2	NO_x	PM/PM10/PM2.5	CO	VOC
lb/MMBtu	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr
0.0016	1.64	0.15	2.6	1.36

EMISSION UNIT	Description	Hourly Emissions (lb/hr)				
		CO	NO_x	PM/PM10/PM2.5	VOC	SO_2
EMERGEN	Emergency Generator	1.10	0.69	0.06	0.58	0.002
		Annual Emissions (tpy)				
EMERGEN	Emergency Generator	0.03	0.02	0.002	0.01	0.0001

Emission Factors

N_2O	Methane	CO_2
lb/MMBtu	lb/MMBtu	lb/MMBtu
0.001322772	0.00661386	163

EMISSION UNIT	Description	Hourly Emissions (lb/hr)			
		Methane	N_2O	CO_2	CO_2e
EMERGEN	Emergency Generator	0.0089	0.0018	219	220
		Annual Emissions (tpy)			
EMERGEN	Emergency Generator	0.0002	0.0000	5	5

Notes:
1) Emission factors for NO_x, CO, and PM_{10} based on NSPS Subpart IIII, Table 4. Emissions of VOC based on AP-42 factors (5th Edition, 10/96) from Table 3.3-1 *Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines*. Emissions of GHG based on 40 CFR 98, Subpart C, Tables C-1 and C-2. NOx Factor use is NSPS NOx + NMHC factor minus AP-42 VOC factor.
2) Emission factor for SO_2 based on 100% conversion of fuel bound sulfur into SO_2.

Sample Calculations:

CO Hourly Emissions for EP-EMERGEN = $\frac{2.6\ \text{g}}{\text{hp-hr}} \times 192\ \text{hp} \times \frac{\text{lb}}{453.6\ \text{g}}$ = 1.10 lb/hr

CO Annual Emissions for EP-EMERGEN = $\frac{1.10\ \text{lb}}{\text{hr}} \times \frac{52\ \text{hr}}{\text{yr}} \times \frac{1\ \text{ton}}{2000\ \text{lb}}$ = 0.03 tpy

Conversion Factors:		
Heat Input	2544	Btu/hr = 1 hp
	453.6	grams/lb
	1.341	hp/kW

Storage Tanks

Condensate Storage Tank Battery Operating Parameters

Throughput Estimates (Hysis Model)

	days	gpm	bbl/day	bbl/yr	gal/yr
Summer	90	-	-	-	-
Spring/Fall	155	-	-	-	-
Winter	120	1.55	53.25	6,389	268,358

Proposed Throughput Limit:	20,000	bbl/yr
	55	bbl/day (average)
Number of Tanks in Battery	8	

Estimated Emissions (NonSpeciated)

	Modeled		Proposed
Steam	lb/yr	Data Source	tpy
Flash	18,060.8	Hysis	28.27
Breathing	4,401.1	EPA Tanks	17.60
Working	686.8	EPA Tanks	2.75

Notes

1. The Hysis VOC estimate is for the battery - not per tank.
2. The EPA Tanks estimates are per tank.
3. Flash emissions are prorated by ratio of (Proposed Throughput / Hysis Throughput * Hysis Flash VOC tpy)
4. AspenTech predicts 6.271 lb/hr of flash emissions over the 120 day "Winter" period. This equates to 9.03 tons.

Condensate Storage Tank Battery Operating Parameters *(continued)*

Speciated Tank Emissions (Vapor Phase)

Component	Aspen Analysis Flash Mass Fraction	Normalized Aspen Analysis Breathing/Working Mass Fraction	Flash tpy	Breathing/Working tpy	Total tpy
Nitrogen	0.0008		0.02	-	0.02
CO2	0.0089		0.25	-	0.25
Methane	0.1857		5.25	-	5.25
Ethane	0.1969		5.57	-	5.57
Propane	0.2589	0.43	7.32	8.74	16.06
i-Butane	0.069	0.11	1.95	2.33	4.28
n-Butane	0.1131	0.19	3.20	3.82	7.02
i-Pentane	0.0481	0.08	1.36	1.62	2.98
n-Pentane	0.0376	0.06	1.06	1.27	2.33
n-Hexane	0.0135	0.02	0.38	0.46	0.84
n-Heptane	0.0142	0.02	0.40	0.48	0.88
n-Octane	0.0027	0.00	0.08	0.09	0.17
Cyclopentane	0.0031	0.01	0.09	0.10	0.19
Benzene	0.002	0.00	0.06	0.07	0.12
Cyclohexane	0.0064	0.01	0.18	0.22	0.40
2-Mhexane	0.0297	0.05	0.84	1.00	1.84
25-Mhexane	0.0028	0.00	0.08	0.09	0.17
Toluene	0.0017	0.00	0.05	0.06	0.11
H2O	0.0047		0.13	-	0.13
Total	1.00	1.00	17.17	20.35	37.52
Total VOC	0.60	1.00	17.04	20.35	37.39
Total HAP	0.02	0.04	0.67	0.80	1.46

Aspen VOC	Normalized Aspen VOC
0.2589	0.43
0.069	0.11
0.1131	0.19
0.0481	0.08
0.0376	0.06
0.0135	0.02
0.0142	0.02
0.0027	0.00
0.0031	0.01
0.002	0.00
0.0064	0.01
0.0297	0.05
0.0028	0.00
0.0017	0.00
0.6028	1.00

Notes:

1. The speciated flash emissions are based on the AspenTech process model results.
2. The speciated breathing/working losses were conservatively based on the AspenTech process model results minus the non-VOC components. The AspenTech VOC mass fraction was normalized to 1.0.

EPCO HOLDINGS, INC.
Burlington, MA
USA

Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
Unit Set:	USField3
Date/Time:	Wed May 12 08:13:01 2010

Material Stream: VENT1

Fluid Package: Basis-1

Property Package: Peng-Robinson

CONDITIONS

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase
Vapour / Phase Fraction		1.0000	1.0000	0.0000	0.0000
Temperature:	(F)	36.62	36.62	36.62	36.62
Pressure:	(psig*)	0.0000	0.0000	0.0000	0.0000
Molar Flow	(MMSCFD)	1.691e-003	1.691e-003	0.0000	0.0000
Mass Flow	(lb/hr)	6.271	6.271	0.0000	0.0000
Std Ideal Liq Vol Flow	(USGPM)	2.836e-002	2.836e-002	0.0000	0.0000
Molar Enthalpy	(Btu/lbmole)	-4.255e+004	-4.255e+004	-8.874e+004	-1.235e+005
Molar Entropy	(Btu/lbmole-F)	44.25	44.25	17.78	11.38
Heat Flow	(Btu/hr)	-7903	-7903	0.0000	0.0000
Liq Vol Flow @Std Cond	(USGPM)	3.343e-002 *	3.343e-002	0.0000	0.0000

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase
Molecular Weight		33.76	33.76	92.61	18.02
Molar Density	(lbmole/ft3)	2.238e-003	2.238e-003	0.4697	3.548
Mass Density	(lb/ft3)	7.555e-002	7.555e-002	43.50	63.93
Act. Volume Flow	(USGPM)	10.35	10.35	0.0000	0.0000
Mass Enthalpy	(Btu/lb)	-1260	-1260	-958.3	-6853
Mass Entropy	(Btu/lb-F)	1.311	1.311	0.1920	0.6314
Heat Capacity	(Btu/lbmole-F)	13.79	13.79	44.45	18.60
Mass Heat Capacity	(Btu/lb-F)	0.4083	0.4083	0.4800	1.033
Lower Heating Value	(Btu/lbmole)	6.716e+005	6.716e+005	1.783e+006	1.342e-004
Mass Lower Heating Value	(Btu/lb)	1.989e+004	1.989e+004	1.926e+004	7.447e-006
Phase Fraction [Vol. Basis]		---	1.000	---	---
Phase Fraction [Mass Basis]		2.122e-314	1.000	0.0000	0.0000
Partial Pressure of CO2	(psig*)	-11.72	---	---	---
Cost Based on Flow	(Cost/s)	0.0000	0.0000	0.0000	0.0000
Act. Gas Flow	(ACFM)	1.383	1.383	---	---
Avg. Liq. Density	(lbmole/ft3)	0.8166	0.8166	0.4582	3.458
Specific Heat	(Btu/lbmole-F)	13.79	13.79	44.45	18.60
Std. Gas Flow	(MMSCFD)	1.692e-003	1.692e-003	0.0000	0.0000
Std. Ideal Liq. Mass Density	(lb/ft3)	27.57	27.57	42.44	62.30
Act. Liq. Flow	(USGPM)	0.0000	---	---	0.0000
Z Factor		---	0.9904	4.718e-003	6.245e-004
Watson K		15.81	15.81	12.62	8.520
User Property		---	---	---	---
Cp/(Cp - R)		1.168	1.168	1.047	1.120
Cp/Cv		1.175	1.175	1.047	1.130
Heat of Vap.	(Btu/lbmole)	1.060e+004	---	---	---
Kinematic Viscosity	(cSt)	7.446	7.446	0.6690	1.579
Liq. Mass Density (Std. Cond)	(lb/ft3)	23.39	23.39	42.78	63.33
Liq. Vol. Flow (Std. Cond)	(USGPM)	3.343e-002	3.343e-002	0.0000	0.0000
Liquid Fraction		0.0000	0.0000	1.000	1.000
Molar Volume	(ft3/lbmole)	446.9	446.9	2.129	0.2818
Mass Heat of Vap.	(Btu/lb)	314.1	---	---	---
Phase Fraction [Molar Basis]		1.0000	1.0000	0.0000	0.0000
Surface Tension	(dyne/cm)	---	---	20.63	75.96
Thermal Conductivity	(Btu/hr-ft-F)	1.175e-002	1.175e-002	7.013e-002	0.3314
Viscosity	(cP)	9.011e-003	9.011e-003	0.4661	1.616
Cv (Semi-Ideal)	(Btu/lbmole-F)	11.80	11.80	42.46	16.62
Mass Cv (Semi-Ideal)	(Btu/lb-F)	0.3495	0.3495	0.4585	0.9223

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase	
Cv	(Btu/lbmole-F)	11.73	11.73	42.46	16.46	
Mass Cv	(Btu/lb-F)	0.3475	0.3475	0.4585	0.9136	
Cv (Ent. Method)	(Btu/lbmole-F)	---	---	---	16.11	
Mass Cv (Ent. Method)	(Btu/lb-F)	---	---	---	0.8944	
Cp/Cv (Ent. Method)		---	---	---	1.155	
Liq. Vol. Flow - Sum(Std. Cond)	(USGPM)	3.343e-002	3.343e-002	0.0000	0.0000	
Reid VP at 37.8 C	(psig*)	---	---	3.010	---	
True VP at 37.8 C	(psig*)	1309	1309	11.46	-10.00	
Partial Pressure of H2S	(psig*)	-11.80	---	---	---	
Viscosity Index		---	---	-2.140	-0.1073	

COMPOSITION

Overall Phase

Vapour Fraction 1.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0002	0.0009	0.0048	0.0008	0.0000	0.0004
CO2	0.0013	0.0069	0.0560	0.0089	0.0001	0.0048
Methane	0.0726	0.3909	1.1647	0.1857	0.0078	0.2740
Ethane	0.0411	0.2211	1.2348	0.1969	0.0069	0.2445
Propane	0.0368	0.1982	1.6236	0.2589	0.0064	0.2257
i-Butane	0.0074	0.0401	0.4330	0.0690	0.0015	0.0543
n-Butane	0.0122	0.0657	0.7091	0.1131	0.0024	0.0856
i-Pentane	0.0042	0.0225	0.3016	0.0481	0.0010	0.0341
n-Pentane	0.0033	0.0176	0.2360	0.0376	0.0007	0.0264
n-Hexane	0.0010	0.0053	0.0847	0.0135	0.0003	0.0090
n-Heptane	0.0009	0.0048	0.0891	0.0142	0.0003	0.0091
n-Octane	0.0002	0.0008	0.0171	0.0027	0.0000	0.0017
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0003	0.0015	0.0195	0.0031	0.0001	0.0018
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0002	0.0009	0.0129	0.0020	0.0000	0.0010
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0005	0.0026	0.0401	0.0064	0.0001	0.0036
2-Mhexane	0.0019	0.0100	0.1863	0.0297	0.0005	0.0193
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0002	0.0008	0.0177	0.0028	0.0001	0.0018
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0001	0.0006	0.0106	0.0017	0.0000	0.0009

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Overall Phase (continued)

Vapour Fraction 1.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0016	0.0088	0.0293	0.0047	0.0001	0.0021
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1857	1.0000	6.2711	1.0000	0.0284	1.0000

Vapour Phase

Phase Fraction 1.000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0002	0.0009	0.0048	0.0008	0.0000	0.0004
CO2	0.0013	0.0069	0.0560	0.0089	0.0001	0.0048
Methane	0.0726	0.3909	1.1647	0.1857	0.0078	0.2740
Ethane	0.0411	0.2211	1.2348	0.1969	0.0069	0.2445
Propane	0.0368	0.1982	1.6236	0.2589	0.0064	0.2257
i-Butane	0.0074	0.0401	0.4330	0.0690	0.0015	0.0543
n-Butane	0.0122	0.0657	0.7091	0.1131	0.0024	0.0856
i-Pentane	0.0042	0.0225	0.3016	0.0481	0.0010	0.0341
n-Pentane	0.0033	0.0176	0.2360	0.0376	0.0007	0.0264
n-Hexane	0.0010	0.0053	0.0847	0.0135	0.0003	0.0090
n-Heptane	0.0009	0.0048	0.0891	0.0142	0.0003	0.0091
n-Octane	0.0002	0.0008	0.0171	0.0027	0.0000	0.0017
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0003	0.0015	0.0195	0.0031	0.0001	0.0018
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0002	0.0009	0.0129	0.0020	0.0000	0.0010
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0005	0.0026	0.0401	0.0064	0.0001	0.0036
2-Mhexane	0.0019	0.0100	0.1863	0.0297	0.0005	0.0193
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0002	0.0008	0.0177	0.0028	0.0001	0.0018
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0001	0.0006	0.0106	0.0017	0.0000	0.0009

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Vapour Phase (continued)

Phase Fraction 1.000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0016	0.0088	0.0293	0.0047	0.0001	0.0021
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1857	1.0000	6.2711	1.0000	0.0284	1.0000

Liquid Phase

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO2	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000
Methane	0.0000	0.0019	0.0000	0.0003	0.0000	0.0008
Ethane	0.0000	0.0080	0.0000	0.0026	0.0000	0.0050
Propane	0.0000	0.0315	0.0000	0.0150	0.0000	0.0201
i-Butane	0.0000	0.0188	0.0000	0.0118	0.0000	0.0143
n-Butane	0.0000	0.0461	0.0000	0.0289	0.0000	0.0337
i-Pentane	0.0000	0.0454	0.0000	0.0354	0.0000	0.0386
n-Pentane	0.0000	0.0503	0.0000	0.0392	0.0000	0.0423
n-Hexane	0.0000	0.0588	0.0000	0.0547	0.0000	0.0562
n-Heptane	0.0000	0.1967	0.0000	0.2128	0.0000	0.2107
n-Octane	0.0000	0.1217	0.0000	0.1501	0.0000	0.1446
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0059	0.0000	0.0045	0.0000	0.0041
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0104	0.0000	0.0088	0.0000	0.0068
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0368	0.0000	0.0335	0.0000	0.0291
2-Mhexane	0.0000	0.2908	0.0000	0.3146	0.0000	0.3138
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0481	0.0000	0.0594	0.0000	0.0579
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0285	0.0000	0.0283	0.0000	0.0221

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Liquid Phase (continued)

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000

Aqueous Phase

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

 * Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Aqueous Phase (continued)

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000

K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Nitrogen	786.2	786.2	6.176e+004
CO2	62.97	62.97	1389
Methane	203.2	203.2	1.017e+009
Ethane	27.66	27.66	9.300e+010
Propane	6.292	6.292	---
i-Butane	2.136	2.136	---
n-Butane	1.424	1.424	---
i-Pentane	0.4954	0.4954	---
n-Pentane	0.3499	0.3499	---
n-Hexane	8.992e-002	8.992e-002	---
n-Heptane	2.435e-002	2.435e-002	---
n-Octane	6.639e-003	6.639e-003	---
n-Nonane	---	---	---
n-C11	---	---	---
22-Mbutane	---	---	---
Cyclopentane	0.2536	0.2536	---
2-Mpentane	---	---	---
3-Mpentane	---	---	---
22-Mpentane	---	---	---
Mcyclopentan	---	---	---
24-Mpentane	---	---	---
Benzene	8.516e-002	8.516e-002	---
33-Mpentane	---	---	---
Cyclohexane	6.962e-002	6.962e-002	---
2-Mhexane	3.444e-002	3.444e-002	---
23-Mpentane	---	---	---
11Mcycpentan	---	---	---
3-Mhexane	---	---	---
1-tr3-MCC5	---	---	---
1-ci3-MCC5	---	---	---
Mcyclohexane	---	---	---
113-MCC5	---	---	---
25-Mhexane	1.734e-002	1.734e-002	---
MCC5==	---	---	---
Toluene	2.172e-002	2.172e-002	---
Naphthalene	---	---	---

* Specified by user.

Material Stream: VENT1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Ecyclohexane	---	---	---
p-Xylene	---	---	---
m-Xylene	---	---	---
2-Moctane	---	---	---
o-Xylene	---	---	---
H2O	60.45	60.45	8.766e-003
Methanol	---	---	---

aspentech

EPCO HOLDINGS, INC.
Burlington, MA
USA

Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
Unit Set:	USField3
Date/Time:	Wed May 12 08:16:12 2010

Material Stream: CONDENSATE1

Fluid Package: Basis-1

Property Package: Peng-Robinson

CONDITIONS

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase	
Vapour / Phase Fraction		0.0000	0.0000	0.1928	0.8072	
Temperature:	(F)	36.62	36.62	36.62	36.62	
Pressure:	(psig*)	0.0000	0.0000	0.0000	0.0000	
Molar Flow	(MMSCFD)	0.1286	0.0000	2.479e-002	0.1038	
Mass Flow	(lb/hr)	457.5	0.0000	252.1	205.3	
Std Ideal Liq Vol Flow	(USGPM)	1.152	0.0000	0.7407	0.4109	
Molar Enthalpy	(Btu/lbmole)	-1.168e+005	-4.255e+004	-8.874e+004	-1.235e+005	
Molar Entropy	(Btu/lbmole-F)	12.61	44.25	17.78	11.38	
Heat Flow	(Btu/hr)	-1.649e+006	0.0000	-2.416e+005	-1.407e+006	
Liq Vol Flow @Std Cond	(USGPM)	1.069 *	0.0000	0.7349	0.4043	

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase	
Molecular Weight		32.40	33.76	92.61	18.02	
Molar Density	(lbmole/ft3)	1.568	2.238e-003	0.4697	3.548	
Mass Density	(lb/ft3)	50.78	7.555e-002	43.50	63.93	
Act. Volume Flow	(USGPM)	1.123	0.0000	0.7226	0.4005	
Mass Enthalpy	(Btu/lb)	-3604	-1260	-958.3	-6853	
Mass Entropy	(Btu/lb-F)	0.3893	1.311	0.1920	0.6314	
Heat Capacity	(Btu/lbmole-F)	23.58	13.79	44.45	18.60	
Mass Heat Capacity	(Btu/lb-F)	0.7280	0.4083	0.4800	1.033	
Lower Heating Value	(Btu/lbmole)	3.438e+005	6.716e+005	1.783e+006	1.342e-004	
Mass Lower Heating Value	(Btu/lb)	1.061e+004	1.989e+004	1.926e+004	7.447e-006	
Phase Fraction [Vol. Basis]		---	---	0.6432	0.3568	
Phase Fraction [Mass Basis]		2.122e-314	0.0000	0.5511	0.4489	
Partial Pressure of CO2	(psig*)	-11.80	---	---	---	
Cost Based on Flow	(Cost/s)	0.0000	0.0000	0.0000	0.0000	
Act. Gas Flow	(ACFM)	---	---	---	---	
Avg. Liq. Density	(lbmole/ft3)	1.529	0.8166	0.4582	3.458	
Specific Heat	(Btu/lbmole-F)	23.58	13.79	44.45	18.60	
Std. Gas Flow	(MMSCFD)	0.1286	0.0000	2.480e-002	0.1038	
Std. Ideal Liq. Mass Density	(lb/ft3)	49.52	27.57	42.44	62.30	
Act. Liq. Flow	(USGPM)	1.123	---	0.7226	0.4005	
Z Factor		---	0.9904	4.718e-003	6.245e-004	
Watson K		12.62	15.81	12.62	8.520	
User Property		---	---	---	---	
Cp/(Cp - R)		1.092	1.168	1.047	1.120	
Cp/Cv		1.092	1.175	1.047	1.130	
Heat of Vap.	(Btu/lbmole)	2.068e+004	---	---	---	
Kinematic Viscosity	(cSt)	2.069	7.446	0.6690	1.579	
Liq. Mass Density (Std. Cond)	(lb/ft3)	53.36	23.39	42.78	63.33	
Liq. Vol. Flow (Std. Cond)	(USGPM)	1.069	0.0000	0.7349	0.4043	
Liquid Fraction		1.000	0.0000	1.000	1.000	
Molar Volume	(ft3/lbmole)	0.6379	446.9	2.129	0.2818	
Mass Heat of Vap.	(Btu/lb)	638.2	---	---	---	
Phase Fraction [Molar Basis]		0.0000	0.0000	0.1928	0.8072	
Surface Tension	(dyne/cm)	---	---	20.63	75.96	
Thermal Conductivity	(Btu/hr-ft-F)	0.1243	1.175e-002	7.013e-002	0.3314	
Viscosity	(cP)	1.683	9.011e-003	0.4661	1.616	
Cv (Semi-Ideal)	(Btu/lbmole-F)	21.60	11.80	42.46	16.62	
Mass Cv (Semi-Ideal)	(Btu/lb-F)	0.6667	0.3495	0.4585	0.9223	

* Specified by user.

Material Stream: CONDENSATE1 (continued)

Fluid Package:	Basis-1
Property Package:	Peng-Robinson

PROPERTIES

		Overall	Vapour Phase	Liquid Phase	Aqueous Phase	
Cv	(Btu/lbmole-F)	21.60	11.73	42.46	16.46	
Mass Cv	(Btu/lb-F)	0.6667	0.3475	0.4585	0.9136	
Cv (Ent. Method)	(Btu/lbmole-F)	---	---	---	16.11	
Mass Cv (Ent. Method)	(Btu/lb-F)	---	---	---	0.8944	
Cp/Cv (Ent. Method)		---	---	---	1.155	
Liq. Vol. Flow - Sum(Std. Cond)	(USGPM)	1.139	0.0000	0.7349	0.4043	
Reid VP at 37.8 C	(psig*)	3.019	---	3.010	---	
True VP at 37.8 C	(psig*)	12.14	1309	11.46	-10.00	
Partial Pressure of H2S	(psig*)	-11.80	---	---	---	
Viscosity Index		-0.2559	---	-2.140	-0.1073	

COMPOSITION

Overall Phase

Vapour Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
CO2	0.0004	0.0000	0.0155	0.0000	0.0000	0.0000
Methane	0.0052	0.0004	0.0840	0.0002	0.0006	0.0005
Ethane	0.0218	0.0015	0.6545	0.0014	0.0037	0.0032
Propane	0.0858	0.0061	3.7827	0.0083	0.0149	0.0129
i-Butane	0.0511	0.0036	2.9721	0.0065	0.0106	0.0092
n-Butane	0.1255	0.0089	7.2974	0.0160	0.0250	0.0217
i-Pentane	0.1237	0.0088	8.9238	0.0195	0.0286	0.0248
n-Pentane	0.1370	0.0097	9.8877	0.0216	0.0314	0.0272
n-Hexane	0.1602	0.0113	13.8017	0.0302	0.0416	0.0361
n-Heptane	0.5355	0.0379	53.6629	0.1173	0.1560	0.1355
n-Octane	0.3312	0.0235	37.8337	0.0827	0.1071	0.0930
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0161	0.0011	1.1269	0.0025	0.0030	0.0026
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0283	0.0020	2.2124	0.0048	0.0050	0.0043
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.1002	0.0071	8.4361	0.0184	0.0215	0.0187
2-Mhexane	0.7916	0.0561	79.3196	0.1734	0.2324	0.2018
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.1310	0.0093	14.9641	0.0327	0.0429	0.0372
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0775	0.0055	7.1431	0.0156	0.0164	0.0142

* Specified by user.

EPCO HOLDINGS, INC.
Burlington, MA
USA

Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
Unit Set:	USField3
Date/Time:	Wed May 12 08:16:12 2010

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

COMPOSITION

Overall Phase (continued)

Vapour Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	11.3985	0.8072	205.3451	0.4489	0.4109	0.3568
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	14.1207	1.0000	457.4633	1.0000	1.1516	1.0000

Vapour Phase

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0009	0.0000	0.0008	0.0000	0.0004
CO2	0.0000	0.0069	0.0000	0.0089	0.0000	0.0048
Methane	0.0000	0.3909	0.0000	0.1857	0.0000	0.2740
Ethane	0.0000	0.2211	0.0000	0.1969	0.0000	0.2445
Propane	0.0000	0.1982	0.0000	0.2589	0.0000	0.2257
i-Butane	0.0000	0.0401	0.0000	0.0690	0.0000	0.0543
n-Butane	0.0000	0.0657	0.0000	0.1131	0.0000	0.0856
i-Pentane	0.0000	0.0225	0.0000	0.0481	0.0000	0.0341
n-Pentane	0.0000	0.0176	0.0000	0.0376	0.0000	0.0264
n-Hexane	0.0000	0.0053	0.0000	0.0135	0.0000	0.0090
n-Heptane	0.0000	0.0048	0.0000	0.0142	0.0000	0.0091
n-Octane	0.0000	0.0008	0.0000	0.0027	0.0000	0.0017
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0015	0.0000	0.0031	0.0000	0.0018
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0009	0.0000	0.0020	0.0000	0.0010
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0026	0.0000	0.0064	0.0000	0.0036
2-Mhexane	0.0000	0.0100	0.0000	0.0297	0.0000	0.0193
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0008	0.0000	0.0028	0.0000	0.0018
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0006	0.0000	0.0017	0.0000	0.0009

* Specified by user.

EPCO HOLDINGS, INC.
Burlington, MA
USA

Case Name:	LINDRITH LIQUIDS WEATHERING WINTER CASE REV 5.hsc
Unit Set:	USField3
Date/Time:	Wed May 12 08:16:12 2010

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

COMPOSITION

Vapour Phase (continued)

Phase Fraction 0.0000

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0000	0.0088	0.0000	0.0047	0.0000	0.0021
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000

Liquid Phase

Phase Fraction 0.1928

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
CO2	0.0003	0.0001	0.0130	0.0001	0.0000	0.0000
Methane	0.0052	0.0019	0.0840	0.0003	0.0006	0.0008
Ethane	0.0218	0.0080	0.6545	0.0026	0.0037	0.0050
Propane	0.0858	0.0315	3.7827	0.0150	0.0149	0.0201
i-Butane	0.0511	0.0188	2.9721	0.0118	0.0106	0.0143
n-Butane	0.1255	0.0461	7.2974	0.0289	0.0250	0.0337
i-Pentane	0.1237	0.0454	8.9238	0.0354	0.0286	0.0386
n-Pentane	0.1370	0.0503	9.8877	0.0392	0.0314	0.0423
n-Hexane	0.1602	0.0588	13.8017	0.0547	0.0416	0.0562
n-Heptane	0.5355	0.1967	53.6629	0.2128	0.1560	0.2107
n-Octane	0.3312	0.1217	37.8337	0.1501	0.1071	0.1446
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0161	0.0059	1.1269	0.0045	0.0030	0.0041
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0283	0.0104	2.2124	0.0088	0.0050	0.0068
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.1002	0.0368	8.4361	0.0335	0.0215	0.0291
2-Mhexane	0.7916	0.2908	79.3196	0.3146	0.2324	0.3138
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.1310	0.0481	14.9641	0.0594	0.0429	0.0579
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0775	0.0285	7.1431	0.0283	0.0164	0.0221

* Specified by user.

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

COMPOSITION

Liquid Phase (continued)

Phase Fraction 0.1928

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	0.0004	0.0001	0.0071	0.0000	0.0000	0.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.7225	1.0000	252.1228	1.0000	0.7407	1.0000

Aqueous Phase

Phase Fraction 0.8072

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO2	0.0001	0.0000	0.0025	0.0000	0.0000	0.0000
Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mbutane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclopentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23-Mpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11Mcycpentan	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-tr3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-ci3-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mcyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113-MCC5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-Mhexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MCC5==	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

* Specified by user.

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1

Property Package: Peng-Robinson

COMPOSITION

Aqueous Phase (continued)

Phase Fraction 0.8072

COMPONENTS	MOLAR FLOW (lbmole/hr)	MOLE FRACTION	MASS FLOW (lb/hr)	MASS FRACTION	LIQUID VOLUME FLOW (USGPM)	LIQUID VOLUME FRACTION
Naphthalene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ecyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
p-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Moctane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2O	11.3981	1.0000	205.3380	1.0000	0.4109	1.0000
Methanol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	11.3982	1.0000	205.3405	1.0000	0.4109	1.0000

K VALUE

COMPONENTS	MIXED	LIGHT	HEAVY
Nitrogen	3872	786.2	6.176e+004
CO2	274.5	62.97	1389
Methane	1054	203.2	1.017e+009
Ethane	143.4	27.66	9.300e+010
Propane	32.63	6.292	---
i-Butane	11.08	2.136	---
n-Butane	7.388	1.424	---
i-Pentane	2.570	0.4954	---
n-Pentane	1.815	0.3499	---
n-Hexane	0.4664	8.992e-002	---
n-Heptane	0.1263	2.435e-002	---
n-Octane	3.444e-002	6.639e-003	---
n-Nonane	---	---	---
n-C11	---	---	---
22-Mbutane	---	---	---
Cyclopentane	1.315	0.2536	---
2-Mpentane	---	---	---
3-Mpentane	---	---	---
22-Mpentane	---	---	---
Mcyclopentan	---	---	---
24-Mpentane	---	---	---
Benzene	0.4417	8.516e-002	---
33-Mpentane	---	---	---
Cyclohexane	0.3611	6.962e-002	---
2-Mhexane	0.1786	3.444e-002	---
23-Mpentane	---	---	---
11Mcycpentan	---	---	---
3-Mhexane	---	---	---
1-tr3-MCC5	---	---	---
1-ci3-MCC5	---	---	---
Mcyclohexane	---	---	---
113-MCC5	---	---	---
25-Mhexane	8.995e-002	1.734e-002	---
MCC5==	---	---	---
Toluene	0.1126	2.172e-002	---
Naphthalene	---	---	---

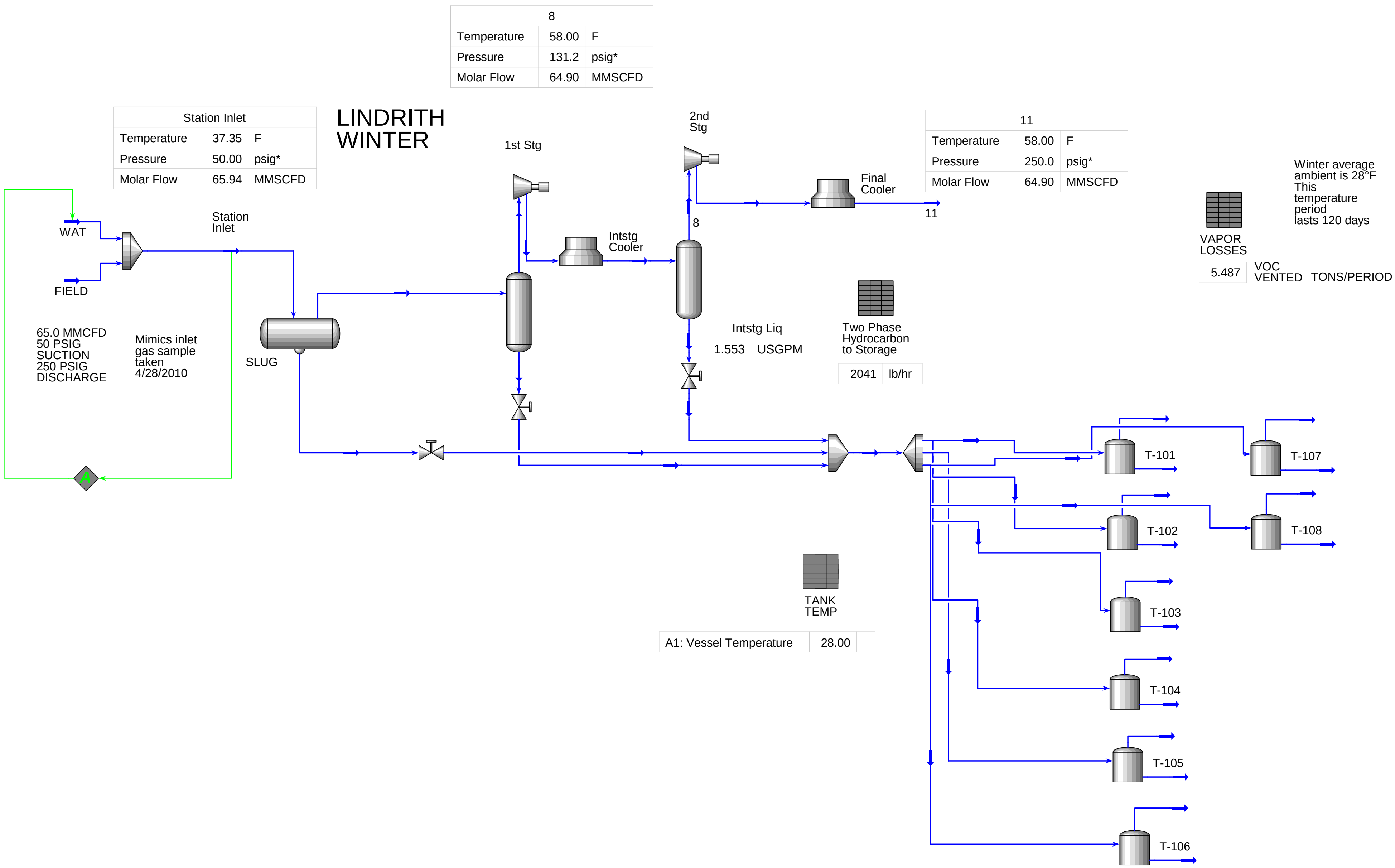
* Specified by user.

Material Stream: CONDENSATE1 (continued)

Fluid Package: Basis-1
Property Package: Peng-Robinson

K VALUE

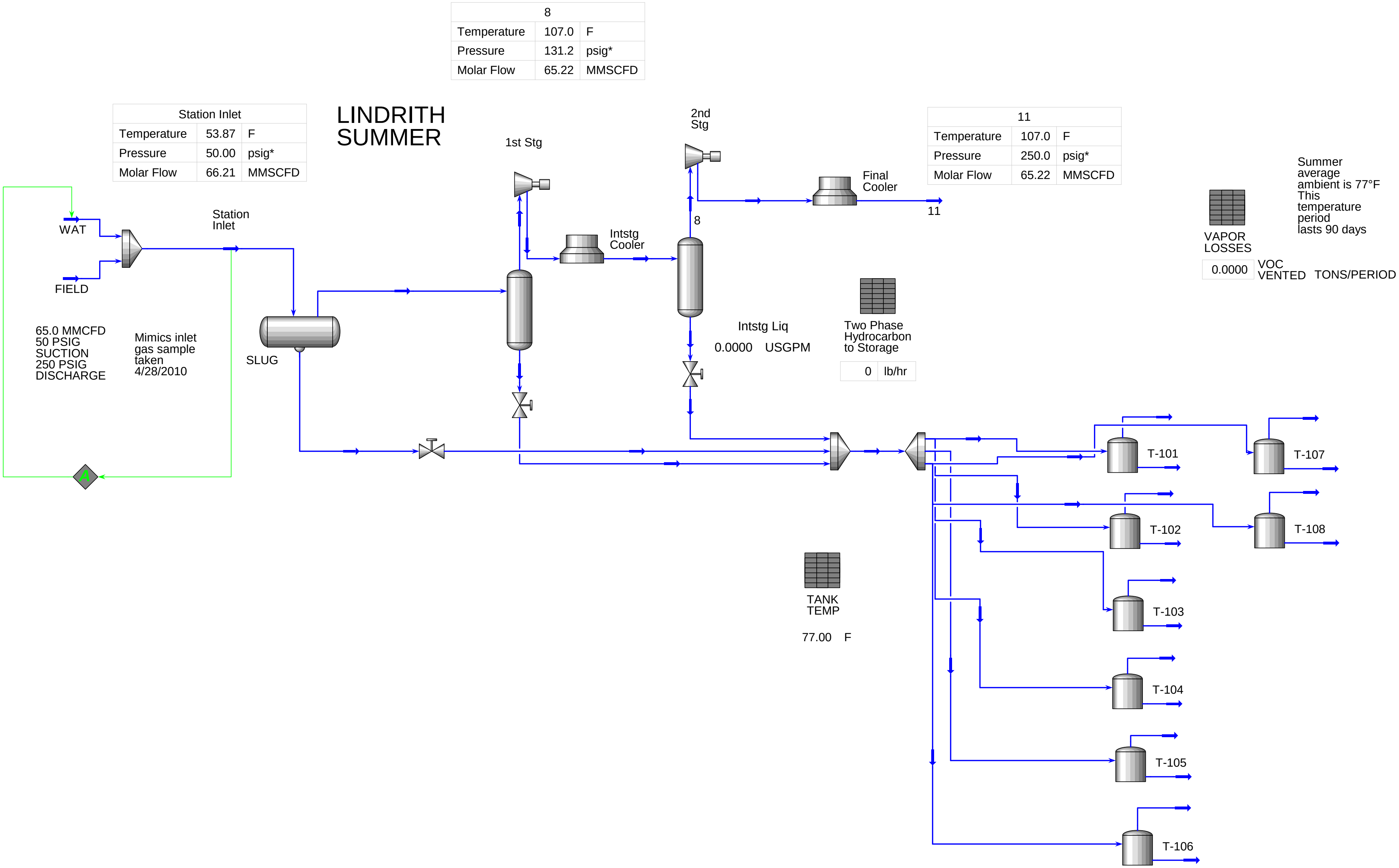
COMPONENTS	MIXED	LIGHT	HEAVY
Ecyclohexane	---	---	---
p-Xylene	---	---	---
m-Xylene	---	---	---
2-Moctane	---	---	---
o-Xylene	---	---	---
H2O	1.086e-002	60.45	8.766e-003
Methanol	---	---	---

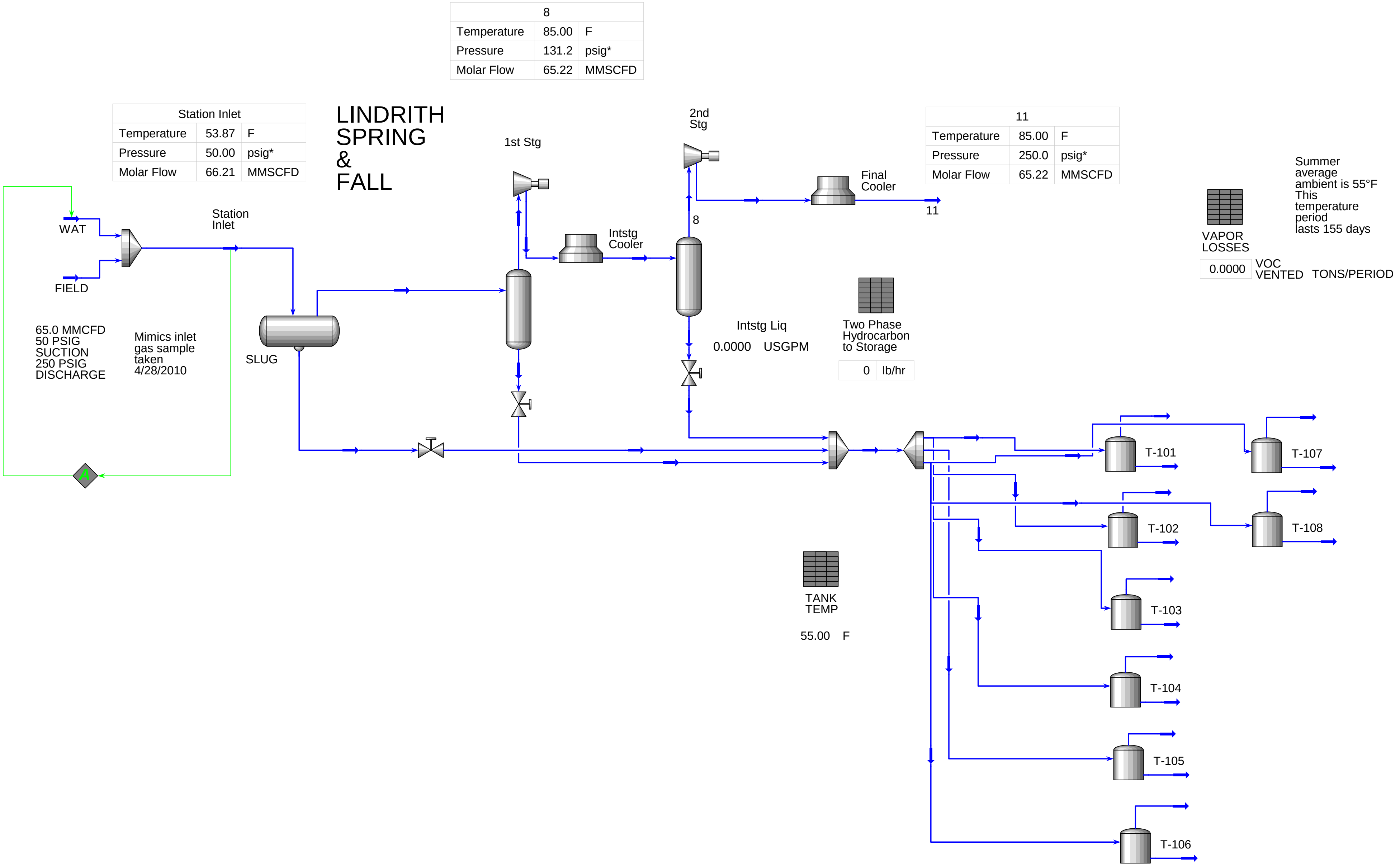


Station Inlet		
Temperature	37.35	F
Pressure	50.00	psig*
Molar Flow	65.94	MMSCFD

8		
Temperature	58.00	F
Pressure	131.2	psig*
Molar Flow	64.90	MMSCFD

11		
Temperature	58.00	F
Pressure	250.0	psig*
Molar Flow	64.90	MMSCFD


LINDRITH
SUMMER
8
Temperature 107.0 F
Pressure 131.2 psig*
Molar Flow 65.22 MMSCFD
Station Inlet
Temperature 53.87 F
Pressure 50.00 psig*
Molar Flow 66.21 MMSCFD
11
Temperature 107.0 F
Pressure 250.0 psig*
Molar Flow 65.22 MMSCFD
1st Stg
2nd Stg
Final Cooler
11
Intstg Cooler
8
WAT
FIELD
Station Inlet
SLUG
65.0 MMCFD
50 PSIG
SUCTION
250 PSIG
DISCHARGE
Mimics inlet gas sample taken 4/28/2010
Intstg Liq
0.0000 USGPM
Two Phase Hydrocarbon to Storage
0 lb/hr
Summer average ambient is 77°F This temperature period lasts 90 days
VAPOR LOSSES
0.0000 VOC VENTED TONS/PERIOD
TANK TEMP
77.00 F
A
T-101
T-102
T-103
T-104
T-105
T-106
T-107
T-108


8
Temperature 85.00 F
Pressure 131.2 psig*
Molar Flow 65.22 MMSCFD
Station Inlet
Temperature 53.87 F
Pressure 50.00 psig*
Molar Flow 66.21 MMSCFD
LINDRITH SPRING & FALL
1st Stg
2nd Stg
11
Temperature 85.00 F
Pressure 250.0 psig*
Molar Flow 65.22 MMSCFD
Final Cooler
Intstg Cooler
WAT
FIELD
Station Inlet
8
11
Summer average ambient is 55°F This temperature period lasts 155 days
VAPOR LOSSES
0.0000 VOC VENTED TONS/PERIOD
SLUG
65.0 MMCFD 50 PSIG SUCTION 250 PSIG DISCHARGE
Mimics inlet gas sample taken 4/28/2010
Intstg Liq
0.0000 USGPM
Two Phase Hydrocarbon to Storage
0 lb/hr
A
T-101
T-107
T-102
T-108
T-103
T-104
T-105
T-106
TANK TEMP
55.00 F

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

Identification

User Identification:	Lindrith CS
City:	
State:	NM
Company:	Enterprise
Type of Tank:	Horizontal Tank
Description:	Lindrith CS TK- / 450 bbl tank 12.75' diameter x 20' tall

Tank Dimensions

Shell Length (ft):	20.00
Diameter (ft):	12.75
Volume (gallons):	18,900.00
Turnovers:	5.56
Net Throughput(gal/yr):	105,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

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

Lindrith CS - Horizontal Tank

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
Gasoline (RVP 7)	All	67.36	53.93	80.79	59.23	4.0400	3.0751	5.2361	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3

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

Lindrith CS - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	4,401.0851
Vapor Space Volume (cu ft):	1,626.4495
Vapor Density (lb/cu ft):	0.0486
Vapor Space Expansion Factor:	0.3610
Vented Vapor Saturation Factor:	0.4228
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,626.4495
Tank Diameter (ft):	12.7500
Effective Diameter (ft):	18.0233
Vapor Space Outage (ft):	6.3750
Tank Shell Length (ft):	20.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0486
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3610
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	2.1610
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	3.0751
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2361
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4228
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.0400
Vapor Space Outage (ft):	6.3750
Working Losses (lb):	686.7932
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.0400
Annual Net Throughput (gal/yr.):	105,000.0000
Annual Turnovers:	5.5556
Turnover Factor:	1.0000
Tank Diameter (ft):	12.7500
Working Loss Product Factor:	1.0000
Total Losses (lb):	5,087.8783

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

Emissions Report for: Annual

Lindrith CS - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 7)	686.79	4,401.09	5,087.88

Truck Loading

Enterprise Field Services LLC **Emissions Calculations**
Lindrith Compressor Station **Truck Loading**
Part 71 Renewal Application Update **Source ID No.: TLOAD**

Operating Parameters

Loading Rate	20,000	bbls/yr	
	840,000	gallon/yr	
	16,800	gal/hr	(Assume one 400 tank per hour)
Vapor MW	33.76		AspenTech Condensate Analysis
Temp	85	F	Assumed Average
	544	R	
TVP	11.46	psia	@37.8C
Saturation factor	0.6		
Loading Loss	5.32	lb/Mgal	

AP-42 Calculation:	L= 12.46*S*P*M/T
L	Loading Losses (lb/1000)
S	Saturation Factor
P	True Vapor Pressure
M	Molecular weight of vapor
T	Temperature

Estimated Emissions (NonSpeciated)

89.32	lb/hr	Gal/hr / 1000 x L
2.23	tpy	Gal/yr / 1000 x L / 2000 lb/ton

Speciated Truck Loading Emissions (Vapor Phase)

	Aspen Analysis	VOC Aspen Analysis	VOC Normalized		
Component	Mass Fraction	Mass Fraction	Mass Fraction	lb/hr	tpy
Nitrogen	0.0008				
CO2	0.0089				
Methane	0.1857				
Ethane	0.1969				
Propane	0.2589	0.2589	0.43	38.36	0.96
i-Butane	0.069	0.069	0.11	10.22	0.26
n-Butane	0.1131	0.1131	0.19	16.76	0.42
i-Pentane	0.0481	0.0481	0.08	7.13	0.18
n-Pentane	0.0376	0.0376	0.06	5.57	0.14
n-Hexane	0.0135	0.0135	0.02	2.00	0.05
n-Heptane	0.0142	0.0142	0.02	2.10	0.05
n-Octane	0.0027	0.0027	0.00	0.40	0.01
Cyclopentane	0.0031	0.0031	0.01	0.46	0.01
Benzene	0.002	0.002	0.00	0.30	0.01
Cyclohexane	0.0064	0.0064	0.01	0.95	0.02
2-Mhexane	0.0297	0.0297	0.05	4.40	0.11
25-Mhexane	0.0028	0.0028	0.00	0.41	0.01
Toluene	0.0017	0.0017	0.00	0.25	0.01
H2O	0.0047				
Total	1.00	0.60	1.00	89.32	2.23
Total VOC	0.60	0.60	1.00	89.32	2.23
Total HAP	0.02	0.02	0.04	3.50	0.09

Notes:

1. The speciated truck emissions are based on the AspenTech Condensate analysis (vapor phase) mass fractions. The vapor mass fraction analysis was normalized by deleting all non-VOC components.

loading operation, resulting in high levels of vapor generation and loss. If the turbulence is great enough, liquid droplets will be entrained in the vented vapors.

A second method of loading is submerged loading. Two types are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The recent loading history of a cargo carrier is just as important a factor in loading losses as the method of loading. If the carrier has carried a nonvolatile liquid such as fuel oil, or has just been cleaned, it will contain vapor-free air. If it has just carried gasoline and has not been vented, the air in the carrier tank will contain volatile organic vapors, which will be expelled during the loading operation along with newly generated vapors.

Cargo carriers are sometimes designated to transport only one product, and in such cases are practicing "dedicated service". Dedicated gasoline cargo tanks return to a loading terminal containing air fully or partially saturated with vapor from the previous load. Cargo tanks may also be "switch loaded" with various products, so that a nonvolatile product being loaded may expel the vapors remaining from a previous load of a volatile product such as gasoline. These circumstances vary with the type of cargo tank and with the ownership of the carrier, the petroleum liquids being transported, geographic location, and season of the year.

One control measure for vapors displaced during liquid loading is called "vapor balance service", in which the cargo tank retrieves the vapors displaced during product unloading at bulk plants or service stations and transports the vapors back to the loading terminal. Figure 5.2-5 shows a tank truck in vapor balance service filling a service station underground tank and taking on displaced gasoline vapors for return to the terminal. A cargo tank returning to a bulk terminal in vapor balance service normally 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 nonvapor balance, or "normal", service. Vapor balance service is usually not practiced with marine vessels, although some vessels practice emission control by means of vapor transfer within their own cargo tanks during ballasting operations, discussed below.

Emissions from loading petroleum liquid can be estimated (with a probable error of ±30 percent)[4] using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \tag{1}$$

where:

L_L = loading loss, pounds per 1000 gallons (lb/10^3 gal) of liquid loaded

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Figure 7.1-5, Figure 7.1-6, and Table 7.1-2)
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Table 7.1-2)
T = temperature of bulk liquid loaded, °R (°F + 460)

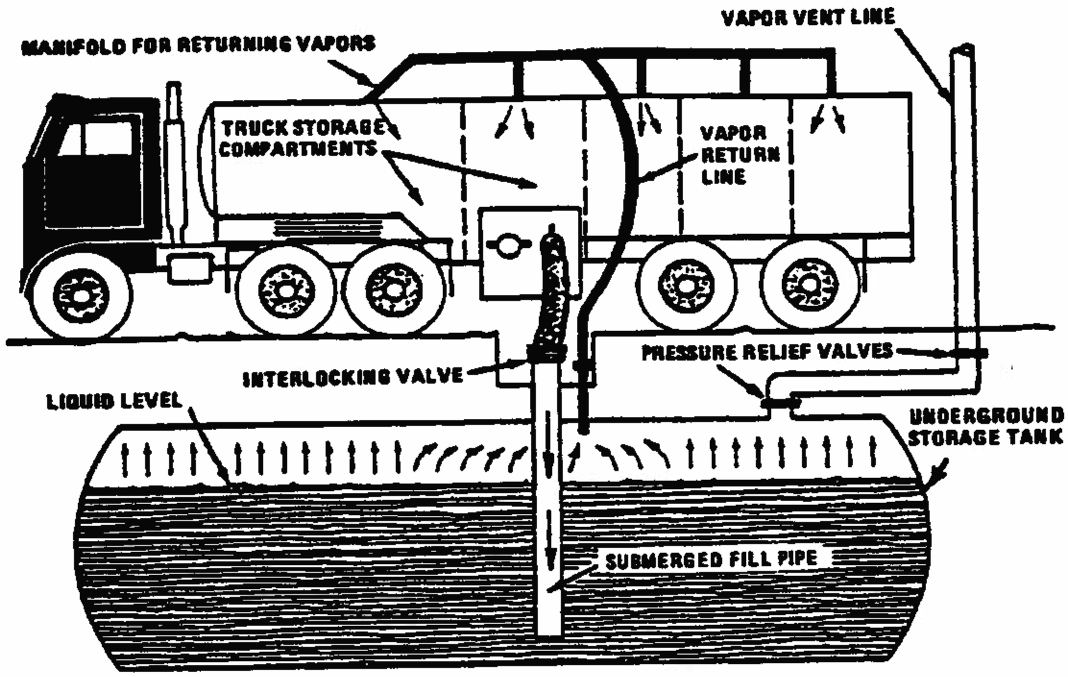


Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

Fugitives

Enterprise Field Services LLC — **Emissions Calculations**

Lindrith Compressor Station — **Fugitive Emissions**

Part 71 Renewal Application Update — **Source ID No.: FUGVOC**

Operating Parameters

Annual Operation: 8,760 hrs/yr

Pollutant	CAS No.	Stream Composition (Wt%)		Emissions	
		Gas	Light Oil	Average[1] (lbs/hr)	Annual[2] (tons/yr)
Volatile Organic Compounds (VOC)		21.71%	100.00%	0.756	3.310
Benzene	00071-43-2	0.065%		0.001	0.004
n-Hexane	00110-54-3	0.498%		0.007	0.031

(1) Calculated as:
Gas Comp. (wt%) **X** Total Gas Service Emissions (lbs/hr) **+** Lt Oil Composition (wt%) X Total Lt Oil Service Emisisons (lbs/hr)

(2) Calculated as: Average Emissions (lbs/hr) X Annual Operation (hrs/yr) ÷ 2,000 lbs/ton

Component Type	Service	Number of Components[1]	Emission Factors[2]		Hourly Emissions[3] (lbs/hr)
			(kg/hr/source)	(lbs/hr/source)	
Valves	Gas	100	4.5E-03	9.9E-03	0.992
	Light Oil	50	2.5E-03	5.5E-03	0.276
Pump Seals	Gas	0	2.4E-03	5.3E-03	0.000
	Light Oil	2	1.3E-02	2.9E-02	0.057
Other Equipment	Gas	10	8.8E-03	1.9E-02	0.194
	Light Oil	5	7.5E-03	1.7E-02	0.083
Connectors	Gas	50	2.0E-04	4.4E-04	0.022
	Light Oil	25	2.1E-04	4.6E-04	0.012
Flanges	Gas	200	3.9E-04	8.6E-04	0.172
	Light Oil	100	1.1E-04	2.4E-04	0.024
Open-Ended Lines	Gas	5	2.0E-03	4.4E-03	0.022
	Light Oil	0	1.4E-03	3.1E-03	0.000
Totals	Gas	365			1.40
	Light Oil	182			0.45

(1) Number of components is a conservative estimate based on similar installations.

(2) Source: 1995 Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017); Table 2-4. Oil and Gas Production Operations Average Emission Factors (kg/hr/source factors converted to lbs/hr/source by multiplying by 2.20462 lbs/kg)

(3) Calculated as: Number of components **X** Emission Factor (lbs/hr/source)

Enterprise Field Services LLC
Lindrith Compressor Station
Part 71 Renewal Application Update

April 2010 Gas Analysis

Meter Number:	--	**Flow Pressure:**	57
Meter Name:	Lindrith Inlet	**Flow Temp:**	57
Location:		**H20, Lb/MMCF:**	--
Sample Date:	4/28/2010	**H2S, ppmmol:**	--
File name, TCD	Lindrith Inlet.run	**Type:**	Spot
File name, FID	Lindrith Inlet.run	**Pulled by:**	Dennis Bird

Component	Mol%	MolWt	Mol% x MW	Wt%
Carbon Dioxide	0.4879	44.0	0.21	1.03%
Hydrogen Sulfide	0.0000	34.0	0.00	0.00%
Nitrogen	0.6416	28.0	0.18	0.86%
Methane	80.7843	16.0	12.96	62.25%
Ethane	9.7943	30.1	2.95	14.15%
Propane	4.6660	44.1	2.06	9.88%
Isobutane	0.8009	58.1	0.47	2.24%
n-Butane	1.2840	58.1	0.75	3.58%
Isopentane	0.4379	72.2	0.32	1.52%
n-Pentane	0.3499	72.2	0.25	1.21%
Cyclopentane	0.0259	70.1	0.02	0.09%
n-Hexane	0.1203	86.2	0.10	0.50%
Cyclohexane	0.0564	84.2	0.05	0.23%
Other Hexanes	0.2785	86.2000	0.24	1.15%
Heptanes	0.1469	100.2000	0.15	0.71%
Methylcyclohexane	0.0415	98.2	0.04	0.20%
2,2,4 Trimethylpentane	0.0000	114.2	0.00	0.00%
Benzene	0.0172	78.1	0.01	0.06%
Toluene	0.0199	92.1	0.02	0.09%
Ethylbenzene	0.0007	106.2	0.00	0.00%
Xylenes	0.0009	106.2	0.00	0.00%
C8+ Heavies	0.0450	114.2300	0.05	0.25%
Total	**100.0000**		20.82	**100.00%**
	VOC Wt%			21.71%

Maintenance, Startup, and Shutdown

Maintanence, Startup, and Shutdown Emissions

Pollutant	CAS No.	Stream Composition (Wt%)	Emissions	
		Gas	Hourly (lb/hr)	Annual (tons/yr)
Volatile Organic Compounds (VOC)		21.71%	119.25	23.85
Benzene	00071-43-2	0.06%	0.35	0.07
n-Hexane	00110-54-3	0.50%	2.74	0.55

Gas Molecular Weight:	20.82	lb/lb/mol
Gas Constant	379	scf/lb-mol

Component Type	Blowdown		Hourly lb/hr	Annual tpy
	scf/hr	MMscf/yr		
Total Natural Gas Blown Down for MSS	10,000	4.0	549.26	109.85

Notes
(1) MSS emissions include gas blowdown for maintenance, startups, and shutdowns.

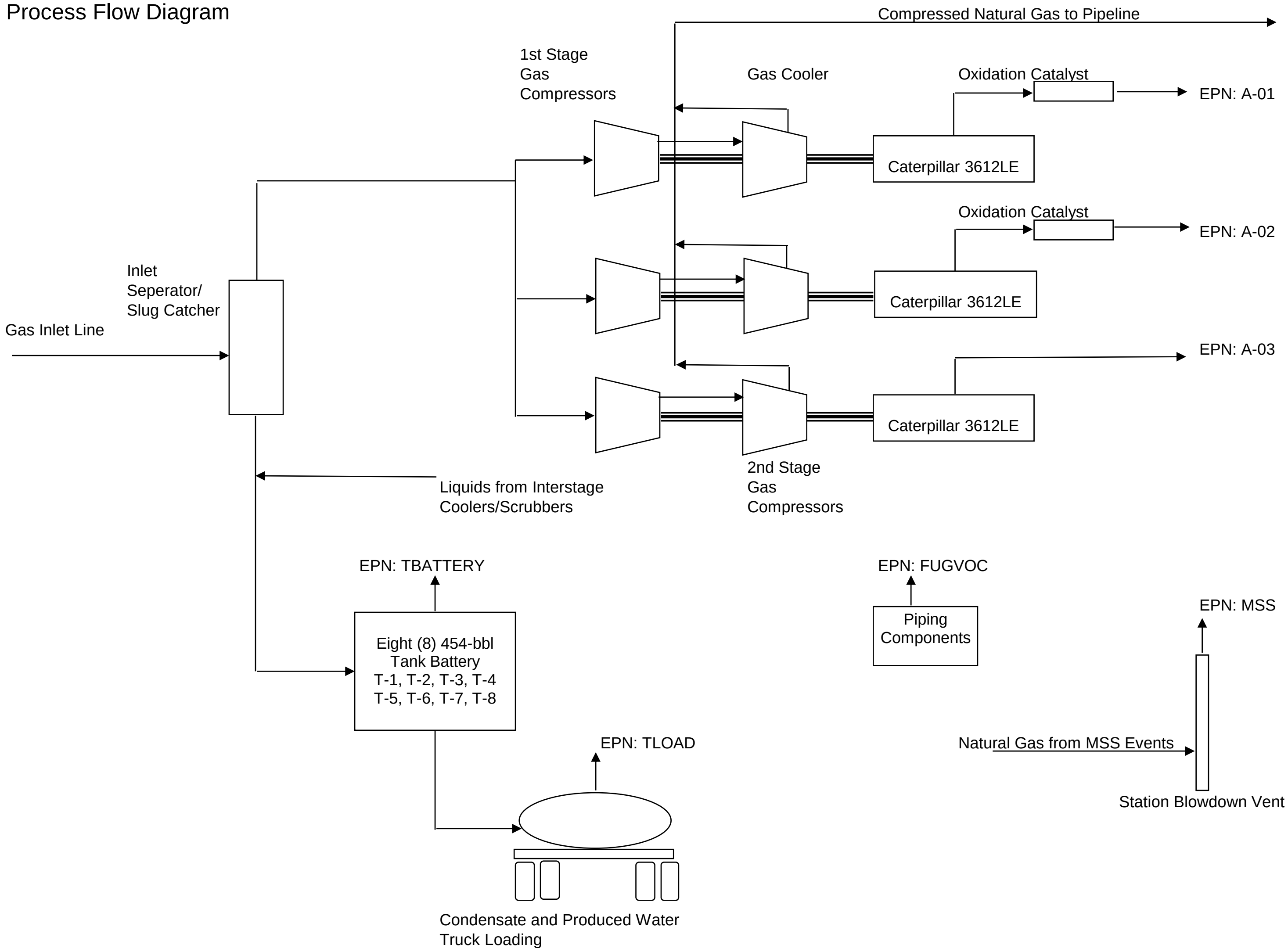
APPENDIX B

Process Flow Diagram

Enterprise Field Services

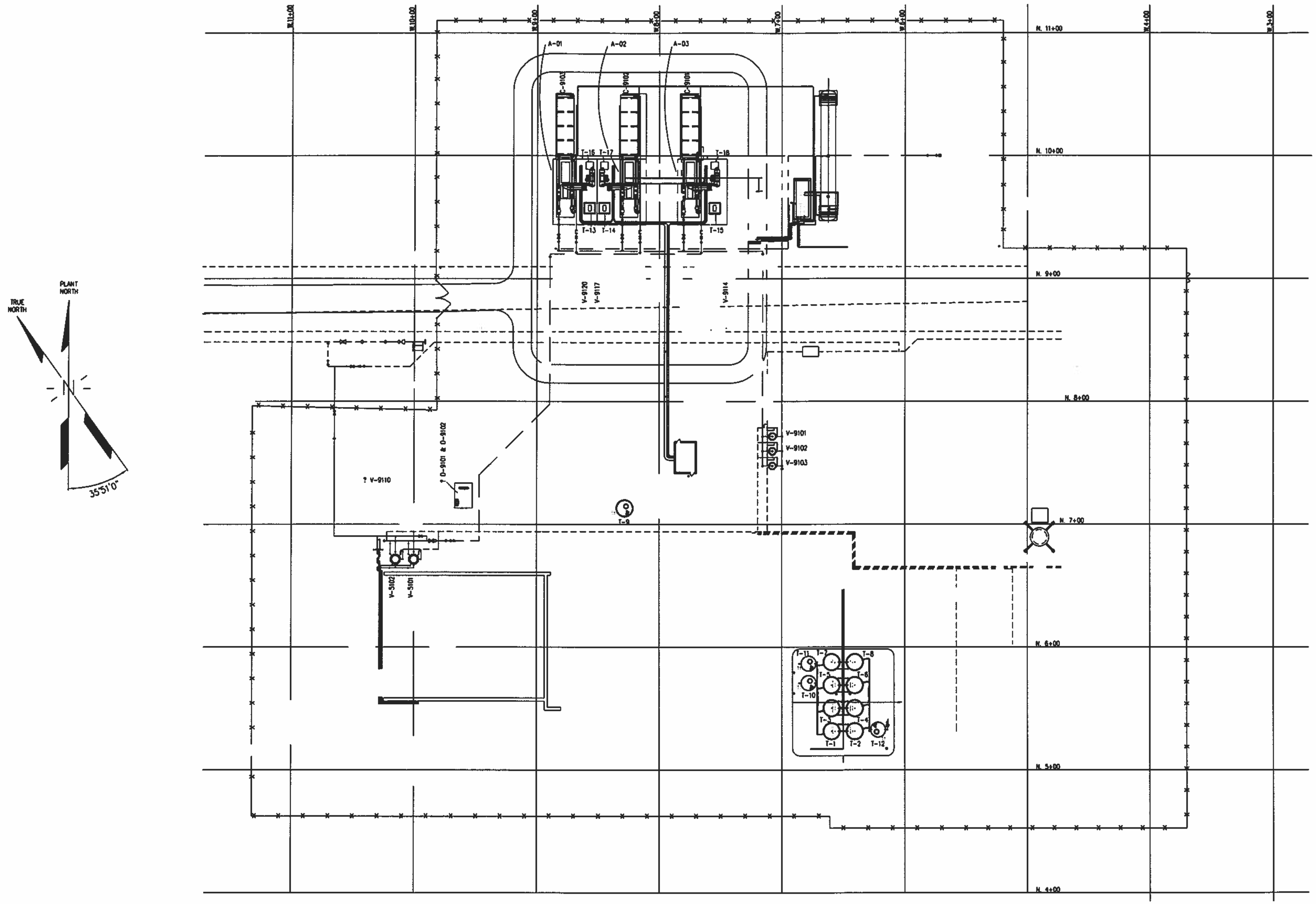
Lindrith Compressor Station
Part 71 Renewal Application Update

Process Flow Diagram



APPENDIX C

Plot Plan



Lindrith Compressor Station

Equipement Environmental Identification

Permit ID	Optional ID	Description	Size	Emission Controls
A-01	Unit 9103	Caterpillar 3612	3267 hp	Catalytic Oxidation System
A-02	Unit 9102	Caterpillar 3612	3267 hp	Catalytic Oxidation System
A-03	Unit 9101	Caterpillar 3612	3267 hp	None
T-1	T-1	Water Storage	454 bbl	None
T-2	T-2	Water Storage	454 bbl	None
T-3	T-3	Water Storage	454 bbl	None
T-4	T-4	Condensate / Producted Water Storage	454 bbl	None
T-5	T-5	Producted Water Storage	454 bbl	None
T-6	T-6	Producted Water Storage	454 bbl	None
T-7	T-7	Producted Water Storage	454 bbl	None
T-8	T-8	Producted Water Storage	454 bbl	None
T-9	T-9	Compressor Skid Drain Sump Tank	120 bbl	None
T-10	T-10	Water Separation Tank	120 bbl	None
T-11	T-11	Water Separation Tank	120 bbl	None
T-12	T-12	Water Separation Tank	120 bbl	None
T-13	T-13	Lube Oil Storage	500 gal	None
T-14	T-14	Lube Oil Storage	500 gal	None
T-15	T-15	Lube Oil Storage	500 gal	None
T-16	T-16	Ambitrol Storage	500 gal	None
T-17	T-17	Ambitrol Storage	500 gal	None
T-18	T-18	Ambitrol Storage	500 gal	None

REV.	DATE	REVISION	BY	CHK'D	ENGR.	REV.	DATE	REVISION	BY	CHK'D	ENGR.
9	05/03/10	REVISED DRAWING FOR ENVIRONMENTAL DEPT.	DB			4	09/07/95	REVISED FOR CONSTRUCTION	HMN	LDH	
8	03/18/10	REMOVED TANKS AND LEADER	LB			3	08/15/95	REVISED FOR CONSTRUCTION	JMF	LDH	
7	12/11/08	ADDED CONDENSATE & WATER STORAGE-ISSUED FOR CONSTRUCTION	RB		RB	2	07/27/95	REVISED FOR CONSTRUCTION	JMF	LDH	
6	01/17/06	PROPOSED LAYOUT FOR VRU	FJP		AB	1	06/06/95	REVISED FOR CONSTRUCTION	JMF	DRM	
5		REVISED FOR DEHYDRATION MODIFICATION	JMF			0	05/17/95	ISSUED FOR CONSTRUCTION	DRM		

NOTES:

ENTERPRISE FIELD SERVICES LLC

ENTERPRISE

LINDRITH STATION PLOT PLAN

LINDRITH STATION RIO ARRIBA, NM

DRAWN: JMF DATE: 08/17/94

JA NO. 2357.04R
FILE NAME LD-01-P0011
AFE NO.
SCALE 1"=40'
BASE NO. 15403
DWG. NO. LD-01-P0011 9