NOTICE OF PROPOSED ACTION
by the
State of Nevada
Division of Environmental Protection
Bureau of Air Pollution Control

PUBLIC NOTICE

Pursuant to Nevada Revised Statutes (NRS) Chapter 445B, the Nevada Administrative Code (NAC) Chapter 445B, and the Clean Air Act, the Division of Environmental Protection is issuing the following notice.

The Director received an application for a new Class II Air Quality Operating Permit AP2869-3306 from:
Fulcrum Sierra BioFuels, LLC
4900 Hopyard Road, Suite 220
Pleasanton, CA 94588

The project will be located at 3600 Peru in the Tahoe-Reno Industrial Center, Storey County, Nevada. The Director has prepared tentative determinations regarding the operating permit that, in brief, are the following:

- The new permit is for new construction and operation of a "non-hazardous waste conversion to ethanol" facility that will gasify up to 600 tons/day of feedstock and produce up to 16,311,500 gallons per year of ethanol and off-spec alcohol products. The "feedstock" will be comprised of the non-hazardous, organic component of municipal solid waste (MSW) derived from the residual materials remaining after recycling operations are performed by material recovery facilities and/or construction and demolition waste streams. The facility will convert feedstock into synthesis gas (syngas). The syngas will be converted into ethanol in an ethanol production plant.
- Emissions from the facility will not exceed 18.32 tons/year of PM_{10}, 70.79 tons/year of NOx, 18.88 tons/year of SO_2, 76.77 tons/year of VOC, 40.04 tons/year of CO, and 1.12 tons/year of H_2S.
- No adverse ambient air quality impacts are expected.

On the basis of the preliminary review of the application and supporting information review and the requirements of the NRS, the NAC and the Clean Air Act, the Director is hereby announcing his intent to issue a new Class II air quality operating permit. Persons wishing to comment upon the proposed determinations by the Director regarding this proposed action should submit their comments in writing either in person or by mail or fax within thirty (**30**) days to:

Randy Phillips
Division of Environmental Protection
Nevada Bureau of Air Pollution Control
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701
(775) 687-9362
(775) 687-6396 FAX

The application, Director's review, and other relevant information may be obtained on the Nevada Department of Environmental Protection – Bureau of Air Pollution Control website (http://ndep.nv.gov/bapc/). The application, Director's review, and other relevant information may be copied at the above address or copies may be obtained by requesting in writing at the above address. A copy of the application, Director's review, and other relevant information will be located also at the Washoe County Library located at 301 South Center Street in Reno, Nevada. Written comments or objections, will be received at the Division of Environmental Protection, above address, until close of business on **April 5, 2013**, and will be retained and considered prior to final action on the new Class II operating permit.

Please bring the foregoing notice to the attention of all persons whom you know may be interested in this matter.

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR POLLUTION CONTROL

Director's Review and Preliminary Determination of Permit Issuance
for
Fulcrum Sierra BioFuels, LLC
February 28, 2013

Fulcrum Sierra BioFuels, LLC (FSB) has submitted a new Class II application to the Nevada Division of Environmental Protection, Bureau of Air Pollution Control (NDEP-BAPC) requesting a new Class II Air Quality Operating Permit #AP2869-3306. The new permit is for new construction and operation of a "non-hazardous waste conversion to ethanol" facility that will gasify up to 600 tons/day of feedstock and produce up to 16,311,500 gallons per year of ethanol and off-spec alcohol products. The "feedstock" will be comprised of the non-hazardous, organic component of municipal solid waste (MSW) derived from the residual materials remaining after recycling operations are performed by material recovery facilities and/or construction and demolition waste streams. The facility will convert feedstock into synthesis gas (syngas). The syngas will be converted into ethanol in an ethanol production plant.

The application materials related to the new Class II operating permit was received by NDEP-BAPC on January 31, 2013. The permit application was deemed administratively complete on February 14, 2013. FSB will be located within the Tahoe-Reno Industrial Center, McCarran, in Storey County, Nevada. The FSB will be located approximately at UTM 286.10 km East by 4,377.90 km North, Zone 11 (Sections 10/11, Township 19 North, Range 22 East in Hydrographic Area 83). The Standard Industrial Classification (SIC) number for the facility is 2869 - Industrial Organic Chemicals, Not Elsewhere Classified.

As proposed, FSB will be a Class II source under the revised permit. The potential-to-emit (PTE) of each regulated air pollutant is less than the 100 ton per year threshold for major source designation. The facility will be subject to 40 CFR Part 60, Subparts A, Dc, Kb, VVa, NNN, RRR, IIII; 40 CFR Part 63, Subpart ZZZZ.

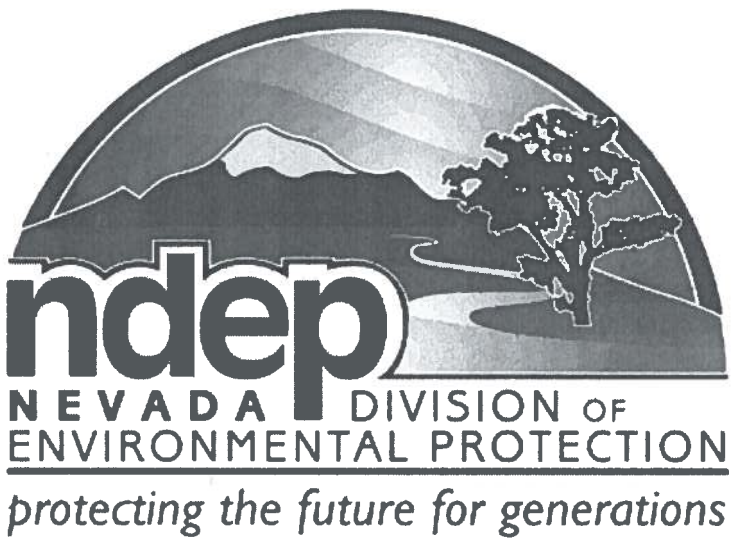
Proposed Annual Emissions

Pollutant(s)		tons/yr
PM_{10}	Particulate matter <10 microns in diameter	**18.32**
NO_x	Nitrogen Oxides	**70.79**
SO_2	Sulfur Dioxide	**18.88**
VOCs	Volatile Organic Compounds	**76.77**
CO	Carbon Monoxide	**40.04**
H_2S	Hydrogen Sulfide	**1.12**

An ambient air impact analyses was completed to support the proposed determination to issue the new Class II Operating Permit. The analysis demonstrates compliance with the Nevada and National Ambient Air Quality Standards. The ambient air quality analyses demonstrated that the emissions from the proposed source will not cause or contribute to a violation of any applicable federal or state ambient air quality standards.

NDEP-BAPC has made a preliminary determination to issue this new Class II Operating Permit. The proposed source must comply with all State and Federal air quality requirements and all conditions established within the new Class II Operating Permit.

Application
for
Class II Air Quality
Operating Permit



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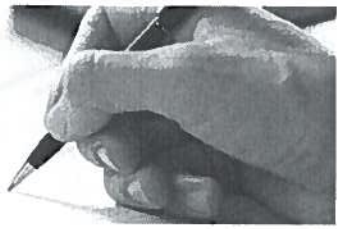

GENERAL COMPANY INFORMATION

All applicants shall complete each item or explain in the space provided why no information is needed. Please specify "N/A" (Not Applicable) if necessary. The application will be returned to the applicant if it is deemed incomplete.

1. **COMPANY NAME AND ADDRESS THAT ARE TO APPEAR ON THE OPERATING PERMIT** [NAC 445B.295.1]:

Fulcrum Sierra BioFuels, LLC
(Name)

4900 Hopyard Road, Suite 220
(Address)

Pleasanton	**California**	**94588**
(City)	(State)	(Zip Code)

2. Owner's Name and Address [NAC 445B.295.1]:

Fulcrum Sierra BioFuels, LLC
(Name)

4900 Hopyard Road, Suite 220
(Address)

Pleasanton	**California**	**94588**
(City)	(State)	(Zip Code)

3. Source Name and Mailing Address, if different from #1 [NAC 445B.295.1]:

Fulcrum Sierra BioFuels, LLC
(Name)

4900 Hopyard Road, Suite 220
(Address)

Pleasanton	**California**	**94588**
(City)	(State)	(Zip Code)

4. Physical Location of Stationary Source [NAC 445B.295.8]: (if no physical address, describe location, e.g., 4 miles south of I-80 at xx Interchange)

Tahoe-Reno Industrial Park, 3600 Peru Drive, McCarran, Nevada 89434

Township(s) **19N** Range(s) **22E** Section(s) **10E & 11W**

5. Plant Manager or Other Appropriate Contact [NAC 445B.295.1]:

Mike Nugent	**Plant Manager**
(Name)	(Title)

4900 Hopyard Rd., Suite 220
(Address)

Pleasanton	**California**	**94588**
(City)	(State)	(Zip Code)

(755) 335-6024	**(925) 730-0157**	**mnugent@fulcrum-bioenergy.com**
(Telephone #)	(FAX #)	(E-mail address)

GENERAL COMPANY INFORMATION (CONTINUED)

6. Responsible Official Name, Title and Address [NAC 445B.295.1]:

Jeanne Benedetti	**Vice President, Fulcrum Sierra BioFuels, LLC**
(Name)	(Title)

4900 Hopyard Rd., Suite 220
(Address)

Pleasanton	**California**	**94588**
(City)	(State)	(Zip Code)

(925) 224-8248	**(925) 730-0157**	**jbenedetti@fulcrum-bioenergy.com**
(Telephone #)	(FAX #)	(E-mail address)

7. If records required under the operating permit will be kept at a location other than the source, specify that location [NAC 445B.295.7].

Same (during operation, records will be kept at the facility)
(Name)

(Address)

(City)	(State)	(Zip Code)

8. This application is being submitted for the following (please check appropriate box below):
☒ A new Class II Operating Permit
☐ Renewal of a Class II Operating Permit
☐ Revision of a Class II Operating Permit

9. **Application Submittal:**
Please remove the cover page, Table of Contents and General Information page and all Attachments of the application packet. Submit the remainder of the application packet as your formal application. This should consist of, at a minimum, the Class II Application cover page, the General Company Information, and Appendices 1 through 8.

Appendix 1

EMISSION UNITS APPLICATION FORMS

List of Forms Included

Industrial Process (Feedstock Receipt and Debaling System)
Industrial Process (Feedstock Handling and Conveying System)
Industrial Process (Synthesis Gas Gasification Units)
Combustion Equipment (PO_X Preheat Burners)
Combustion Equipment (Pulse Combustor Heater (4) Units)
Combustion Equipment (Boiler)
Combustion Equipment (Ground-Level Enclosed Flare)
Industrial Process (Sulfur Removal System)
Industrial Process (Ethanol Production Plant)
Storage Tank (Ethanol Product Storage Tank)
Storage Tank (Off-Spec Ethanol Tank)
Storage Tank (A-B Ethanol Day Tanks)
Storage Tank (Methanol Storage Tank)
Storage Tank (Fusel Oil Tank)
Storage Tank (Amine Solvent Tank)
Industrial Processes (Product Loading Area)
Combustion Equipment (Loading Rack Flare)
Storage Tank (Gasoline Tank)
Storage Silo (Particulate Silo)
Combustion Equipment (Firewater Pump)
Combustion Equipment (Emergency Generator)
Industrial Processes (Cooling Tower)
Surface Area Disturbance Application Form

INDUSTRIAL PROCESS
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment: Feedstock Receipt and Debaling System (includes the following equipment: Bale Feed Conveyors, Shredder/Hammermill, Transfer Conveyor, Ferrous Materials Removal (Magnetic), Receiving Hopper/Feedstock Metering Device, Collection Screw Conveyor)

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number NA *Equip. number

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. For crushers: size output setting, check one: ☐ Primary (☐ 4")
☐ Secondary (< 4" but ☐ 1")
☐ Tertiary (< 1")

h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

i. UTM Coordinates 4,377,833 meters N; 286,236 meters E;
(Please specify NAD 27 ☐ or NAD 83 ☐) Note:

j. Basic equipment dimensions (feet): L TBD W TBD H TBD

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 25 tons/hour

b. Requested operating rate (tons per hour)* 25 tons/hr (600 ton/day)

c. Requested operating time: (time of day)*0000 to 2400

Hours per day 24 Days per year 365 Hours per year 8760

d. Batch load or charge weight (tons) (if applicable)

e. Total hours required to process batch or charge (if applicable)

f. Maximum operating rate (tons per year) 219,000 tons per year feedstock

g. Requested operating rate (tons per year)*

h. Type of material processed waste materials and/or biomass (but not including waste defined as hazardous waste under NAC § 444.843)

i. Minimum moisture content NA

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)	NA				
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other	NA				

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Baghouse	
Pollutant(s) Controlled	PM_{10}	Stack parameters are based on an initial estimate and may change upon final design.
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	0.005 gr/scf	
Stack height (feet from ground level)	56	
Stack inside diameter (feet)	2.25 ft	
Temperature (°F) at design capacity	Ambient (design max 106 + 5)	
Stack exit velocity (feet per second)	50.3 ft/sec (calculated)	
Gas volume flow rate: Actual cubic feet per minute	12,000 acfm	
Gas volume flow rate: Dry standard cubic feet per minute	10,926 scfm	

-Complete for Emissions **not** exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	NA	
Pollutant(s) Controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 1)		
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	Same as PM_{10}	Same as PM_{10}	See Appendix 4
Particulates as PM_{10}	0.47	2.05	See Appendix 4
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	NA	NA	
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])	NA	NA	
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

INDUSTRIAL PROCESS
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment: Feedstock Handling and Conveying System (includes the following equipment: Discharge of Infeed Belt Conveyor, Distribution Conveyor, Feedstock Metering Bins, Airlock Screw Conveyors)

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number NA *Equip. number

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. For crushers: size output setting, check one: ☐ Primary (□ 4")
☐ Secondary (< 4" but □ 1")
☐ Tertiary (< 1")

h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

i. UTM Coordinates 4,377,901 meters N; 286,335 meters E;
(Please specify NAD 27 ☐ or NAD 83 ☐) Note:

j. Basic equipment dimensions (feet): L TBD W TBD H TBD

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 25 ton/hr

b. Requested operating rate (tons per hour)* 25 tons/hr

c. Requested operating time: (time of day)*0000 to 2400

Hours per day 24 Days per year 365 Hours per year 8760

d. Batch load or charge weight (tons) (if applicable)

e. Total hours required to process batch or charge (if applicable)

f. Maximum operating rate (tons per year) 219,000 tons per year feedstock

g. Requested operating rate (tons per year)* 219,000 tons per year feedstock

h. Type of material processed waste materials and/or biomass (but not including waste defined as hazardous waste under NAC § 444.843)

i. Minimum moisture content NA

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)	NA				
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other	NA				

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Baghouse	
Pollutant(s) Controlled	PM_{10}	Stack parameters are based on an initial estimate and may change upon final design.
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	0.005 gr/scf	
Stack height (feet from ground level)	125 ft	
Stack inside diameter (feet)	2 ft	
Temperature (°F) at design capacity	Ambient (design max 106 + 5)	
Stack exit velocity (feet per second)	50.3 ft/sec (calculated)	
Gas volume flow rate: Actual cubic feet per minute	10,000 acfm	
Gas volume flow rate: Dry standard cubic feet per minute	9,105 scfm	

-Complete for Emissions **not** exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	NA	
Pollutant(s) Controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 1)		
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	**Potential to Emit (pounds/hour)**	**Potential to Emit (tons/year)**	**Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)**
Total Particulate Matter (PM)	Same as PM_{10}	Same as PM_{10}	See Appendix 4
Particulates as PM_{10}	0.39	1.71	See Appendix 4
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	NA	NA	
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])	NA	NA	
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment Synthesis Gas (Syngas) Gasification Unit (SGS)

b. Standard Industrial Classification (SIC) Code 2869
c. Manufacturer of equipment To be determined
d. Model number TBD Serial number NA *Equip. number TBD
e. Date equipment manufactured: 2013

f. Please check one:
☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. For crushers: size output setting, check one:
☐ Primary (□ 4")
☐ Secondary (< 4" but □ 1")
☐ Tertiary (< 1")

h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,913 meters N; 285,960 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒) (exhausts via flare)

i. Basic equipment dimensions (feet): Estimate L 90 W 90 H 80

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 25 ton/hr (600 tons/day)
b. Requested operating rate (tons per hour)* 25 ton/hr
c. Requested operating time: (time of day)*0000 to 2400
Hours per day 24 Days per year 365 Hours per year 8760
d. Batch load or charge weight (tons) (if applicable) NA
e. Total hours required to process batch or charge (if applicable) NA
f. Maximum operating rate (tons per year) 219,000 tons per year feedstock
g. Requested operating rate (tons per year)*
h. Type of material processed waste materials and/or biomass (but not including waste defined as hazardous waste under NAC § 444.843)
i. Minimum moisture content 0 weight %

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)	NA				
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other	NA				

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Flare	
Pollutant(s) Controlled	VOC	
Manufacturer	Not available	
Manufacturer's Guarantee (see Note 2)	98%	
Stack height (feet from ground level)	50 ft	Stack parameters are based on an initial estimate and may change upon final design. Temperature and Exit Velocity numbers presented indicate the temperature/rate during a flaring event on the left and during continuous operation on the right. Exhaust flow rates presented are due to pilot and continuous gas stream combustion in the flare.
Stack inside diameter (feet)	12 ft	
Temperature (°F) at design capacity	1800°	
Stack exit velocity (feet per second)	6.8 fps	
Gas volume flow rate: Actual cubic feet per minute	46,000 acfm	
Gas volume flow rate: Dry standard cubic feet per minute	8,930 dscfm	

-Complete for Emissions <u>not</u> exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	NA	
Pollutant(s) Controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 1)		
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

INDUSTRIAL PROCESS APPLICATION FORM CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	NA	NA	There are no emissions from the Synthesis Gas Gasification Unit. All vapors are routed to the site ground level enclosed flare.
Particulates as PM_{10}	NA	NA	
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	NA	NA	
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])	NA	NA	
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Attachment 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-7671q, inclusive.

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment POx Preheat Burner

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number TBD *Equip. number

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,856 meters N; 286,085 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)

i. Basic equipment dimensions (feet): L 1 W 1 H 1

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour)
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) 8.0 MMBtu/hr
(Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day 0000 to 2400

Hours per day Days per year Hours per year 2190

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage
(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	7,800 (cubic feet)	1025 Btu/scf	nil	<15 ppmv (Commercial)	Nil
*Waste Oil	NA (gallons)				
Other					

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Uncontrolled	
Pollutant(s) controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 2)		
Stack height (feet from ground level)	50	Stack parameters are based on an initial estimate and may change upon final design.
Stack inside diameter (feet)	1.0	
Temperature (°F) at design capacity	146	
Stack exit velocity (feet per second)	54.76	
Gas volume flow rate: Actual cubic feet per minute	2570	
Gas volume flow rate: Dry standard cubic feet per minute	1860	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM_{10}	All treated as PM_{10}	See Appendix 4
Particulates as PM_{10}	0.06	0.06	See Appendix 4
Sulfur Dioxide	0.01	0.01	See Appendix 4
Carbon Monoxide	0.66	0.72	See Appendix 4
Oxides of Nitrogen	0.78	0.85	See Appendix 4
Volatile Organic Compounds	0.04	0.05	See Appendix 4
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])			
N-Hexanes	1.40E-02	1.54E-02	See Appendix 4
Formaldehyde	5.85E-04	6.41E-04	See Appendix 4
Benzene	1.64E-05	1.79E-05	See Appendix 4
Toluene	2.65E-05	2.90E-05	See Appendix 4
Naphthalene	4.76E-06	5.21E-06	See Appendix 4
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment Pulse Combustor Heater (4) Units

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number TBD *Equip. number

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,849 meters N; 286,083 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)

i. Basic equipment dimensions (feet): L 20 W 6 (diam.) H

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour)
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) 17.0 MMBtu/hr each (68 total)
(Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day 0000 to 2400

Hours per day 24 Days per year 365 Hours per year 8760

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage
(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other					
Purge Gas Total for all 4	125,719 (SCFH)	539 (Btu/scf)	Nil	40.6 ppmv	Nil

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Uncontrolled	
Pollutant(s) controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 2)		
Stack height (feet from ground level)	50	Stack parameters are based on an initial estimate and may change upon final design. Exhausts through the main boiler stack, combined with boiler burner emissions. Data are for the combined stack emissions.
Stack inside diameter (feet)	4.5	
Temperature (°F) at design capacity	257	
Stack exit velocity (feet per second)	57.6	
Gas volume flow rate: Actual cubic feet per minute	54,987 acfm	
Gas volume flow rate: Dry standard cubic feet per minute	33,564 scfm wet	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM_{10}	All treated as PM_{10}	See Appendix 4
Particulates as PM_{10}	0.507	2.219	See Appendix 4
Sulfur Dioxide	0.861	3.771	Fulcrum Stream Data / Appendix 4
Carbon Monoxide	4.692	20.551	See Appendix 4
Oxides of Nitrogen	3.536	15.488	See Appendix 4
Volatile Organic Compounds	0.190	0.832	See Appendix 4
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])			
N-Hexanes	1.19E-02	5.23E-01	See Appendix 4
Formaldehyde	4.98E-03	2.18E-02	See Appendix 4
Benzene	1.39E-04	6.10E-04	See Appendix 4
Toluene	2.26E-04	9.88E-04	See Appendix 4
Naphthalene	4.05E-05	1.77E-04	See Appendix 4
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment Boiler

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment tbd

d. Model number tbd Serial number _____ *Equip. number _____

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,886 meters N; 286,196 meters E; Zone 11

i. Basic equipment dimensions (feet): L TBD W TBD H TBD

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour) _____
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) 85.4 MMBtu/hr
(Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day 0000 to 2400

Hours per day 24 Days per year 365 Hours per year 8760

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	38,300 (scf/hour)	1025.3 (Btu/scf)	Neg	5 ppmv	Neg
*Waste Oil	NA (gallons)				
Other: Purge	60,000 (scf/hour)	539 (Btu/scf)	Neg	40.6 ppmv	
Syngas Slip	53,400 (scf/hour)	271 (Btu/scf)	Neg	39.4 ppmv	

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal -								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Flue Gas Recirculation/ Low NOX Burners	
Pollutant(s) controlled	NOx	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	NA	
Stack height (feet from ground level)	50	Exhausts through the main boiler stack, with pulse combustor burner emissions. Data are for the combined stack emissions.
Stack inside diameter (feet)	4.5	
Temperature (°F) at design capacity	257	
Stack exit velocity (feet per second)	57.6	
Gas volume flow rate: Actual cubic feet per minute	54,987 acfm	
Gas volume flow rate: Dry standard cubic feet per minute	33,564 scfm wet	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Attachment 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM10	All treated as PM10	Vendor specifications
Particulates as PM_{10}	2.67	11.69	Vendor specifications
Sulfur Dioxide	0.80	3.50	Fulcrum Stream Data / Appendix 4
Carbon Monoxide	3.28	14.37	Vendor specifications
Oxides of Nitrogen	11.96	52.38	Vendor specifications
Volatile Organic Compounds	2.43	10.64	Vendor specifications
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
N-Hexanes	2.58E-01	1.13E-00	See Appendix 4
Formaldehyde	1.07E-02	4.70E-02	See Appendix 4
Benzene	3.01E-04	1.32E-03	See Appendix 4
Toluene	4.87E-04	2.13E-03	See Appendix 4
Naphthalene	8.73E-05	3.82E-04	See Appendix 4
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Attachment 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment Ground-Level Enclosed Flare

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment To be determined

d. Model number TBD Serial number TBD *Equip. number

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,901 meters N; 286,115 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)

i. Basic equipment dimensions (feet): Estimate L 12 W 12 H 50

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour) _____
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) 0.11 MMBtu/hr (pilot light); 335 MMbtu/hr (Shut-Down Scenario) (Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day _____ to _____

Hours per day_____ Days per year_____ Hours per year___

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

Note: The flare (pilot and emissions control) operates 8760 hours per year.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage
(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas (Pilot)	107 (cubic feet) (pilot light)	1025 Btu/scf	Nil	<15 ppmv (Commercial)	Nil
Other: Syngas due to shutdown High P & Low P	173(MMBtu/hr 335(MMBtu/hr)	24 (Btu/scf) 490 (Btu/scf)	Nil	0.00019 100 ppmv[1]	Nil
Other: Process Streams [2]	1.11 (MMBtu/hr)	1,623 (Btu/scf)	Nil	100 ppmv[1]	Nil
Other: Syngas due to startup	102 (MMBtu/hr)	331.5 (Btu/scf)	Nil	100 ppmv[1]	Nil

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.
*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

[1] Based on the target H2S concentration of 100 ppm for the reactor system and syngas properties.
[2] Process streams include the methanol/methyl acetate column gases vent and mole sieve discharge

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Uncontrolled	
Pollutant(s) controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	TBD	
Stack height (feet from ground level)	50 ft	Stack parameters are based on an initial estimate and may change upon final design.
Stack inside diameter (feet)	12 ft	
Temperature (°F) at design capacity	1800°F	
Stack exit velocity (feet per second)	6.8 fps	
Gas volume flow rate: Actual cubic feet per minute	46,000 acfm	
Gas volume flow rate: Dry standard cubic feet per minute	8,930 dscfm	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year) (8,760 hr/yr)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM10	All treated as PM10	See Appendix 4
Particulates as PM_{10}	6.10	0.34	See Appendix 4
Sulfur Dioxide	33.96	11.60	See Appendix 4
Carbon Monoxide	65.50	3.71	See Appendix 4
Oxides of Nitrogen	12.04	0.68	See Appendix 4
Volatile Organic Compounds	24.67	1.40	See Appendix 4
Lead	NA	NA	See Appendix 4
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

NOTE: While the annual emissions are cumulative, hourly emissions due to startup and shutdown would not occur simultaneously. Since shutdown emissions are higher than those due to startup, the hourly emission rate shown in the table above is calculated as the sum of shutdown, continuous and pilot emission rates.

INDUSTRIAL PROCESS
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ Check here if this is an alternative operating scenario

Section 1 - Equipment Description

a. Type of equipment Sulfur Removal System
b. Standard Industrial Classification (SIC) Code 2869
c. Manufacturer of equipment TBD
d. Model number TBD Serial number TBD *Equip. number
e. Date equipment manufactured: 2013
f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)
g. For crushers: size output setting, check one: ☐ Primary (□ 4")
☐ Secondary (< 4" but □ 1")
☐ Tertiary (< 1")
h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)
i. UTM Coordinates 4,377,943 meters N; 285,923 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)
j. Basic equipment dimensions (feet): L TBD W TBD H TBD

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 0.075 tons/hr
b. Requested operating rate (tons per hour)* 0.075 tons/hr
c. Requested operating time: (time of day)* 0000 to 2400
Hours per day 24 Days per year 365 Hours per year 8760
d. Batch load or charge weight (tons) NA
e. Total hours required to process batch or charge NA
f. Maximum operating rate (tons per year) 657 tons/yr
g. Requested operating rate (tons per year)*
h. Type of material processed $CO_2/H2_S$ by-product gas stream
i. Minimum moisture content NA

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other					

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								
	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS APPLICATION FORM CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Sulfur Removal Unit Absorber	
Pollutant(s) Controlled	H_2S	
Manufacturer	NA	
Manufacturer's Guarantee (see Note 2)	99.9%	
Stack height (feet from ground level)	50	Stack parameters are based on an initial estimate and may change upon final design.
Stack inside diameter (feet)	2.0	
Temperature (°F) at design capacity	130	
Stack exit velocity (fps)	34.6	
Gas volume flow rate: Actual cubic feet per minute	6532	
Gas volume flow rate: Dry standard cubic feet per minute	4846	

NOTE: The Sulfur Unit Regenerator Exhaust consists of moist air only, and is not included on this form. Please see the redline permit for stack parameters.

-Complete for Emissions **not** exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	NA	
Pollutant(s) Controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 1)		
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	NA	NA	
Particulates as PM_{10}	NA	NA	
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	0.82	3.60	Data From Merichem: See Appendix 4
Lead	NA	NA	
Hydrogen Sulfide	0.26	1.12	Mass Balance – 99.9% H2S control efficiency
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-7671q, inclusive.

INDUSTRIAL PROCESS
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment: Ethanol Production Plant

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment NA

d. Model number NA Serial number NA *Equip. number

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. For crushers: size output setting, check one: ☐ Primary (□ 4")
☐ Secondary (< 4" but □ 1")
☐ Tertiary (< 1")

h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

i. UTM Coordinates 4,377,913 meters N; 285,960 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒) (exhaust via flare)

j. Basic equipment dimensions (feet): Estimate L 300 W 75 H 100

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 16,311,500 gallons / 12 month period

b. Requested operating rate (tons per hour)*

c. Requested operating time: (time of day)* 0000 to 2400

Hours per day 24 Days per year 365 Hours per year 8760

d. Batch load or charge weight (tons) (if applicable) NA

e. Total hours required to process batch or charge (if applicable) NA

f. Maximum operating rate (tons per year) 16,311,500 gallons / year of ethanol production

g. Requested operating rate (tons per year)* 16,311,500 gallons / year of ethanol production

h. Type of material processed Syngas

i. Minimum moisture content NA

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)	NA				
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other	NA				

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Flare [1]	Sulfur Removal System [2]
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	98%	
Stack height (feet from ground level)	50 ft	
Stack inside diameter (feet)	12 ft	
Temperature (°F) at design capacity	1800°F	
Stack exit velocity (feet per second)	6.8 fps	
Gas volume flow rate: (acfm)	46,000 acfm	
Gas volume flow rate: (dscfm)	8,930 dscfm	

[1] The following vent streams from the Ethanol Production Plant are controlled by the flare: Distillation System, Purge Stream, Molecular Sieve Regeneration Vent

[2] The CO2 absorption/removal system exhaust is controlled by the Sulfur Removal System which is described on its own set of forms

-Complete for Emissions **not** exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Uncontrolled (Fugitives)	
Pollutant(s) Controlled	VOC	
Manufacturer	Not Applicable	
Manufacturer's Guarantee (see Note 1)	Not Applicable	
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	NA	NA	
Particulates as PM_{10}	NA	NA	
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	13.43 (fugitives)	58.84 (fugitives)	See Appendix 4 *"Controlled flare Emissions"*
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])	NA	NA	
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored Ethanol Product Storage Tank

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 32 Shell diameter (feet) 45

Liquid height (feet) 31 Average liquid height (feet) 16

Volume (gallons) 280,000

f. Paint characteristics:
Shell color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Shell condition New

g. Roof color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☐ Cone ☐ Dome ☐ External floating roof ☒ Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒ welded ☐ riveted

Primary rim seal: ☐ vapor-mounted ☐ liquid-mounted ☐ mechanical shoe

Secondary seal: ☐ weather shield ☐ rim-mounted ☐ none

Roof type: ☐ pontoon ☐ double deck

Roof fittings: ☒ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells
☐ slotted guidepole/sample wells ☒ vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Secondary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Roof fittings: ☐ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg
☐ unslotted guide pole wells ☐ slotted guidepole/sample wells
☐ vacuum breaker ☐ column wells (# of columns _____)
☐ Ladder wells ☐ stub drains

k. True vapor pressure of liquid (psia) 2.32 PSI at 100F .

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 16,311,500
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Internal Floating Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	100	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK

APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}			
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds	0.023	0.10	Estimated from TANKS program
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored Off-Spec Ethanol Tank

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 32 Shell diameter (feet) 25

Liquid height (feet) 31 Average liquid height (feet) 16

Volume (gallons) 83,000

f. Paint characteristics:
Shell color/shade (please check one) ☒White/white ☐Aluminum/specular ☐Aluminum/diffuse ☐Gray/light ☐Gray/medium ☐Red/primer

Shell condition New

g. Roof color/shade (please check one) ☒White/white ☐Aluminum/specular ☐Aluminum/diffuse ☐Gray/light ☐Gray/medium ☐Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☐Cone ☐Dome ☐External floating roof ☒Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒welded ☐riveted

Primary rim seal: ☐vapor-mounted ☐liquid-mounted ☐mechanical shoe

Secondary seal: ☐weather shield ☐rim-mounted ☐none

Roof type: ☐pontoon ☐double deck

Roof fittings: ☒access hatch ☐gauge-float well ☐gauge-hatch/sample well ☐rim vent ☐roof drains ☐roof leg ☐unslotted guide pole wells ☐slotted guidepole/sample wells ☒vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐resilient foam-filled ☐wiper seals ☐other (please specify)
Secondary seal: ☐resilient foam-filled ☐wiper seals ☐other (please specify)
Roof fittings: ☐access hatch ☐gauge-float well ☐gauge-hatch/sample well ☐rim vent ☐roof drains ☐roof leg ☐unslotted guide pole wells ☐slotted guidepole/sample wells ☐vacuum breaker ☐column wells (# of columns _____) ☐Ladder wells ☐stub drains

k. True vapor pressure of liquid (psia) 2.32 PSI at 100F .

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 370,000
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Internal Floating Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	100	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}			
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds	0.015	0.07	Estimated from TANKS program
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored A-B Ethanol Day Tanks

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 24 Shell diameter (feet) 21

Liquid height (feet) 23 Average liquid height (feet) 18

Volume (gallons) 39,300

f. Paint characteristics:
Shell color/shade (please check one)
☒ White/white ☐ Aluminum/specular ☐ Aluminum/diffuse ☐ Gray/light ☐ Gray/medium ☐ Red/primer

Shell condition New

g. Roof color/shade (please check one)
☒ White/white ☐ Aluminum/specular ☐ Aluminum/diffuse ☐ Gray/light ☐ Gray/medium ☐ Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☐ Cone ☐ Dome ☐ External floating roof ☒ Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒ welded ☐ riveted

Primary rim seal: ☐ vapor-mounted ☐ liquid-mounted ☐ mechanical shoe

Secondary seal: ☐ weather shield ☐ rim-mounted ☐ none

Roof type: ☐ pontoon ☐ double deck

Roof fittings: ☒ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well ☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells ☐ slotted guidepole/sample wells ☒ vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Secondary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Roof fittings: ☐ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well ☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells ☐ slotted guidepole/sample wells ☐ vacuum breaker ☐ column wells (# of columns _____) ☐ Ladder wells ☐ stub drains

k. True vapor pressure of liquid (psia) 2.32 PSI at 100F .

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 8,155,750
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Internal Floating Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	100	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK

APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}			
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds	0.021	0.09	Estimated from TANKS program, Each Tank
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored Methanol Storage Tanks (1 tank)

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 16 Shell diameter (feet) 13

Liquid height (feet) 15 Average liquid height (feet) 8

Volume (gallons) 7,500

f. Paint characteristics:
Shell color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Shell condition New

g. Roof color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☐ Cone ☐ Dome ☐ External floating roof ☒ Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒ welded ☐ riveted

Primary rim seal: ☐ vapor-mounted ☐ liquid-mounted ☐ mechanical shoe

Secondary seal: ☐ weather shield ☐ rim-mounted ☐ none

Roof type: ☐ pontoon ☐ double deck

Roof fittings: ☒ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells
☐ slotted guidepole/sample wells ☒ vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Secondary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Roof fittings: ☐ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg
☐ unslotted guide pole wells ☐ slotted guidepole/sample wells
☐ vacuum breaker ☐ column wells (# of columns _____)
☐ Ladder wells ☐ stub drains

k. True vapor pressure of liquid (psia) 4.61 PSI at 100F 6.8 PSIA at 115 °F.

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 160,000
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Internal Floating Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	100	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK

APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}			
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds	0.023	0.10	Estimated from TANKS program
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored Fusel Oil Tank

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 24 Shell diameter (feet) 13

Liquid height (feet) 23 Average liquid height (feet) 7

Volume (gallons) 15,000

f. Paint characteristics:
Shell color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Shell condition New

g. Roof color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☐ Cone ☐ Dome ☐ External floating roof ☒ Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒ welded ☐ riveted

Primary rim seal: ☐ vapor-mounted ☐ liquid-mounted ☐ mechanical shoe

Secondary seal: ☐ weather shield ☐ rim-mounted ☐ none

Roof type: ☐ pontoon ☐ double deck

Roof fittings: ☒ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells
☐ slotted guidepole/sample wells ☒ vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Secondary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Roof fittings: ☐ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg
☐ unslotted guide pole wells ☐ slotted guidepole/sample wells
☐ vacuum breaker ☐ column wells (# of columns _____)
☐ Ladder wells ☐ stub drains

k. True vapor pressure of liquid (psia) 4.3 PSIA at 50.76 °F .

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 108,000
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Internal Floating Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	115	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK

APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}			
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds	0.014	0.06	Estimated from TANKS program
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored Amine Solvent

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 32 Shell diameter (feet) 15

Liquid height (feet) 30 Average liquid height (feet) 15

Volume (gallons) 39,000

f. Paint characteristics:
Shell color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Shell condition New

g. Roof color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☒ Cone ☐ Dome ☐ External floating roof ☐ Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒ welded ☐ riveted

Primary rim seal: ☐ vapor-mounted ☐ liquid-mounted ☐ mechanical shoe

Secondary seal: ☐ weather shield ☐ rim-mounted ☐ none

Roof type: ☐ pontoon ☐ double deck

Roof fittings: ☒ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells
☐ slotted guidepole/sample wells ☒ vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Secondary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Roof fittings: ☐ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg
☐ unslotted guide pole wells ☐ slotted guidepole/sample wells
☐ vacuum breaker ☐ column wells (# of columns _____)
☐ Ladder wells ☐ stub drains

k. True vapor pressure of liquid (psia) 2.32 PSI at 100F .

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 140,000
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Cone Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	100	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK

APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}			
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds	0.004	0.02	Estimated from TANKS program
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

INDUSTRIAL PROCESS
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment Product Loading Area (Tanker trucks and railcars)

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number TBD *Equip. number

e. Date equipment manufactured: 2012

f. Please check one:
☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. For crushers: size output setting, check one:
☐ Primary (□ 4")
☐ Secondary (< 4" but □ 1")
☐ Tertiary (< 1")

h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

i. UTM Coordinates 4,377,913 meters N; 285,960 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒) (exhaust via flare)

j. Basic equipment dimensions (feet): Estimate L 12 W 12 H 50

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 16,311,500 gallons / year

b. Requested operating rate (tons per hour)*

c. Requested operating time: (time of day)* 0000 to 2400

Hours per day 5 Days per year 365 Hours per year 1825

d. Batch load or charge weight (tons) (if applicable) NA

e. Total hours required to process batch or charge (if applicable) NA

f. Maximum operating rate (tons per year) 16,311,500 gallons / year

g. Requested operating rate (tons per year)* 16,311,500 gallons / year

h. Type of material processed Liquid alcohol products (ethanol)

i. Minimum moisture content NA

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)	NA				
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other	NA				

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Vapor Balance System	Flare
Pollutant(s) Controlled	VOC	VOC
Manufacturer	Not Available	TBD
Manufacturer's Guarantee (see Note 2)	85%	98%
Stack height (feet from ground level)	NA	15
Stack inside diameter (feet)	NA	0.17
Temperature (°F) at design capacity	Ambient	1800°F
Stack exit velocity (feet per second)	NA	42.5
Gas volume flow rate: (acfm)	NA	57.9 acfm
Gas volume flow rate: (dcfm)	NA	11.2 scfm

NOTE: Stack parameters are based on an initial estimate and may change upon final design.
Temperature and Exit Velocity numbers presented indicate the temperature/rate during a flaring event on the left and during continuous operation

-Complete for Emissions **not** exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	None (Fugitive Equipment Leaks)	
Pollutant(s) Controlled	VOC	
Manufacturer	Not Available	
Manufacturer's Guarantee (see Note 1)	None	
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

INDUSTRIAL PROCESS APPLICATION FORM CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	NA	NA	There are no direct emissions from the Product Loading Area. All fugitive VOC vapors are controlled with a closed vent system and the Loading Flare.
Particulates as PM_{10}	NA	NA	
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	0.0	0.0	
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])	NA	NA	
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Attachment 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-7671q, inclusive.

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS III OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Type of equipment Loading Rack Flare

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment To be determined

d. Model number TBD Serial number TBD *Equip. number _____

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,971 meters N; 285,900 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)

i. Basic equipment dimensions (feet): Estimate L 12 W 12 H 15

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour) _____
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) 1.05 MMBtu/hr (pilot light); 1.23 MMbtu/hr
(Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day 0000 to 2400

Hours per day _____ Days per year _____ Hours per year 906

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

Note: The flare (pilot and emissions control) operates 906 hours per year, only during loading operations.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage
(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas (Pilot)	1,027 (cubic feet)	1025 (Btu/scf)	Nil	<15 ppmv (Commercial)	Nil
Loading Vent VOCs	2,916 (cubic feet) (truck vapors)	62.01 (Btu/scf)	Nil	Nil	Nil

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.
*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

COMBUSTION EQUIPMENT

APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Uncontrolled	
Pollutant(s) controlled	VOC	
Manufacturer	Callidus	
Manufacturer's Guarantee (see Note 2)	TBD	
Stack height (feet from ground level)	15.0	Stack parameters are based on an initial estimate and may change upon final design.
Stack inside diameter (feet)	0.17	
Temperature (°F) at design capacity	1800	
Stack exit velocity (feet per second)	42.5	
Gas volume flow rate: Actual cubic feet per minute	57.9	
Gas volume flow rate: Dry standard cubic feet per minute	11.2	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year) (8,760 hr/yr)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM10	All treated as PM10	See Appendix 4
Particulates as PM_{10}	0.027	0.01	See Appendix 4
Sulfur Dioxide	0	0	See Appendix 4
Carbon Monoxide	0.400	0.18	See Appendix 4
Oxides of Nitrogen	0.132	0.06	See Appendix 4
Volatile Organic Compounds	0.147	0.12	See Appendix 4
Lead	NA	NA	See Appendix 4
Hydrogen Sulfide	NA	NA	See Appendix 4
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

LIQUID STORAGE TANK
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ **Check here if this is an alternative operating scenario**

Section 1 - Equipment Description

a. Manufacturer of tank TBD

b. SIC Code 2869 c. Liquid Stored Gasoline Tank

d. Date of installation TBD

e. Tank Dimensions:

Shell height (feet) 16 Shell diameter (feet) 14

Liquid height (feet) 15 Average liquid height (feet) 8

Volume (gallons) 9,000

f. Paint characteristics:
Shell color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Shell condition New

g. Roof color/shade (please check one)
☒ White/white ☐ Aluminum/specular
☐ Aluminum/diffuse ☐ Gray/light
☐ Gray/medium ☐ Red/primer

Roof condition New

h. Roof characteristics:

Type (please check one):

☐ Cone ☐ Dome ☐ External floating roof ☒ Internal floating roof

For cone or dome roof, specify height (feet) NA

For cone roof, specify slope (ft/ft) NA

For dome roof, specify radius (feet) NA

i. Tank construction: ☒ welded ☐ riveted

Primary rim seal: ☐ vapor-mounted ☐ liquid-mounted ☐ mechanical shoe

Secondary seal: ☐ weather shield ☐ rim-mounted ☐ none

Roof type: ☐ pontoon ☐ double deck

Roof fittings: ☒ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg ☐ unslotted guide pole wells
☐ slotted guidepole/sample wells ☒ vacuum breaker

j. For internal floating roof, please complete the following:

Primary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Secondary seal: ☐ resilient foam-filled ☐ wiper seals ☐ other (please specify)
Roof fittings: ☐ access hatch ☐ gauge-float well ☐ gauge-hatch/sample well
☐ rim vent ☐ roof drains ☐ roof leg
☐ unslotted guide pole wells ☐ slotted guidepole/sample wells
☐ vacuum breaker ☐ column wells (# of columns _____)
☐ Ladder wells ☐ stub drains

k. True vapor pressure of liquid (psia) 2.32 PSI at 100F .

l. Reid vapor pressure of liquid (psi) Not Applicable (ASTM-D323-06)

Section 2 - Operating Parameters

a. Maximum throughput (gallons per year) 265,500
b. Method of filling (submerged fill) Submerged Fill

Section 3 - Reserved

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, internal floating roof, no control, etc.)

	Control #1	Control #2
Type of Control:	Internal Floating Roof	
Pollutant(s) Controlled	VOC	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 1)	NA	
Stack height (feet from ground level)	NA	
Stack inside diameter (feet)	NA	
Temperature (°F) at design capacity	100	
Stack exit velocity (feet per second)	NA	
Gas volume flow rate in cubic feet/minute (actual flow rate)	NA	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

LIQUID STORAGE TANK

APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	NA	NA	
Particulates as PM_{10}	NA	NA	
Sulfur Dioxide	NA	NA	
Carbon Monoxide	NA	NA	
Oxides of Nitrogen	NA	NA	
Volatile Organic Compounds	0.153	0.67	Estimated from TANKS program
Lead	NA	NA	
Hydrogen Sulfide	NA	NA	
Hazardous Air Pollutants (Specify Each Pollutant[1])	NA	NA	
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

STORAGE SILO
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ Check here if this is an alternative operating scenario

Section 1 - Equipment Description

a. Type of equipment Particulate Silo

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number _____ *Equip. number _____

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,870 meters N; 286,010 meters E; Zone 11

i. Basic equipment dimensions (feet): L 12 W 12 H 40

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design storage capacity (tons) 30

b. Maximum loading rate (tons per hour) 0.23 Loading time (hours to fill) Continuous

c. *Requested loading rate (tons per hour): 0.23

*Hours per day 24 Days per year 365 Hours per year 8,760

d. Maximum unloading rate (tons per hour) 11.25

e. Method of unloading (screw auger, etc.) TBD

f. Continuous or batch discharge Continuous unloading, Batch Loading

g. Requested unloading rate (tons per hour) 11.25

Requested unloading rate (tons per year) 1,971

h. Requested unloading time: Hours per day 2 Time of day 0000 to 8,760

Hours per day 2 Days per year 88 Hours per year 176

i. Material type processed (lime, cement, flyash, etc.) Waste particulate matter

*Note: Please complete if other than the maximum loading rate (tons per hour), and/or the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

Section 3 –Reserved

STORAGE SILO
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment (this section *must* be completed)
-Complete for emissions exhausting through a silo stack, chimney or vent during silo loading process: (baghouse, wet scrubber, cyclone, no control, etc.)

	Control #1	Control #2
Type of Control: (See Note 1)	Baghouse	
Pollutant(s) Controlled	PM_{10}	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	0.01 grains/dscf	
Stack height (feet from ground level)	61	Stack parameters are based on an initial estimate and may change upon final design.
Stack inside diameter (feet)	0.80	
Temperature (°F) at design capacity	Ambient	
Stack exit velocity (feet per second)	49	
Gas volume flow rate: Actual cubic feet per minute	1,500	
Gas volume flow rate: Dry standard cubic feet per minute	1,276	

-Complete for emissions exhausting through a silo stack, chimney or vent during silo unloading process: (baghouse, wet scrubber, cyclone, no control, etc.)

	Control #1	Control #2
Type of Control: (See Note 1)	Baghouse	
Pollutant(s) Controlled	PM_{10}	
Manufacturer	TBD	
Manufacturer's Guarantee (see Note 2)	0.01 gr/dscf	
Stack height (feet from ground level)	61	Stack parameters are based on an initial estimate and may change upon final design. Unloaded material is wet, and would not have emissions.
Stack inside diameter (feet)	0.8	
Temperature (°F) at design capacity	Ambient	
Stack exit velocity (feet per second)	49	
Gas volume flow rate: Actual cubic feet per minute	1,500	
Gas volume flow rate: Dry standard cubic feet per minute	1,276	

Note 1: Specify "uncontrolled" if no pollution control device is installed).
Note 2: Manufacture's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Attachment 4.

STORAGE SILO
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment (continued)

-Complete for emissions not exhausting through a stack during silo unloading process: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control: (See Note 1)	N/A	
Pollutant(s) Controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 2)		
Stack height (feet from ground level)		
Stack inside diameter (feet)		
Temperature (°F) at design capacity		
Stack exit velocity (feet per second)		
Gas volume flow rate in cubic feet/minute (actual flow rate)		

Note 1: Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacture's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Attachment 4.

STORAGE SILO
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits - Silo Loading

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM_{10}	All treated as PM_{10}	See Appendix 4
Particulates as PM_{10}	0.11	0.01	See Appendix 4
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds			
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Attachment 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive.

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ Check here if this is an alternative operating scenario

Section 1 - Equipment Description

a. Type of equipment Firewater Pump

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number _____ *Equip. number _____

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,889 meters N; 286,293 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)

i. Basic equipment dimensions (feet): L TBD W TBD H TBD

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour) 399 hp
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) _____
(Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day 0000 to 2400

Hours per day 24 Days per year 21 Hours per year 100

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
Diesel	15.3 (gallons)	138,000	Neg	15 ppmw	Neg
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other					

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	None	
Pollutant(s) controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 2)		
Stack height (feet from ground level)	20	
Stack inside diameter (feet)	0.33	
Temperature (°F) at design capacity	1,000	
Stack exit velocity (feet per second)	286.62	
Gas volume flow rate: Actual cubic feet per minute	1,471	
Gas volume flow rate: Dry standard cubic feet per minute	441	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM10	All treated as PM10	See Appendix 4
Particulates as PM_{10}	0.87	0.04	See Appendix 4
Sulfur Dioxide	0.004	0.00	See Appendix 4
Carbon Monoxide	2.65	0.13	See Appendix 4
Oxides of Nitrogen	12.32	0.62	See Appendix 4
Volatile Organic Compounds	0.91	0.046	See Appendix 4
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
N-Hexanes			No Emission Factor
Formaldehyde	3.30E-03	1.65E-04	See Appendix 4
Acetaldehyde	2.14E-03	1.07E-04	See Appendix 4
Benzene	2.61E-03	1.30E-04	See Appendix 4
Toluene	1.14E-03	5.71E-05	See Appendix 4
Ethylbenzene			No Emission Factor
Xylenes	7.96E-04	3.98E-05	See Appendix 4
Other Regulated Pollutants (Specify[2])			

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

COMBUSTION EQUIPMENT
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ Check here if this is an alternative operating scenario

Section 1 - Equipment Description

a. Type of equipment Emergency Generator

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment TBD

d. Model number TBD Serial number _____ *Equip. number _____

e. Date equipment manufactured: 2013

f. Please check one: ☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

h. UTM Coordinates 4,377,931 meters N; 286,075 meters E; Zone 11
(Please specify NAD 27 ☐ or NAD 83 ☒)

i. Basic equipment dimensions (feet): L TBD W TBD H TBD

* The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. **Maximum** design horsepower **OUTPUT** (horsepower per hour) 1,000 kW (1490 hp)
(Please provide for internal combustion engines only)

b. **Maximum** design heat **INPUT** (million Btu per hour) _____
(Please provide for all combustion units except for internal combustion engines)

c. *Requested operating time: time of day 0000 to 2400

Hours per day 24 Days per year 21 Hours per year 100

*Note: Please complete if other than the maximum hours of operation (24 hours per day, 8760 hours per year), are being requested. The permit will be limited to these values.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btu's)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
Diesel	68.5 (gallons)	138,000	Neg	15 ppmw	Neg
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other					

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters. This section *must* be completed.

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	None	
Pollutant(s) controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 2)		
Stack height (feet from ground level)	20	
Stack inside diameter (feet)	0.33	
Temperature (°F) at design capacity	1,000	
Stack exit velocity (feet per second)	286.62	
Gas volume flow rate: Actual cubic feet per minute	1,471	
Gas volume flow rate: Dry standard cubic feet per minute	441	

Note 1: (Specify "uncontrolled" if no pollution control device is installed).

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Appendix 4.

COMBUSTION EQUIPMENT
APPLICATION FORM
CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)	All treated as PM10	All treated as PM10	
Particulates as PM_{10}	0.44	0.02	See Appendix 4
Sulfur Dioxide	0.01	0.00	See Appendix 4
Carbon Monoxide	7.69	0.38	See Appendix 4
Oxides of Nitrogen	14.19	0.71	See Appendix 4
Volatile Organic Compounds	0.84	0.04	See Appendix 4
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Formaldehyde	7.41E-04	3.70E-05	See Appendix 4
Acetaldehyde	2.37E-04	1.18E-05	See Appendix 4
Benzene	7.28E-03	3.64E-04	See Appendix 4
Toluene	2.64E-03	1.32E-04	See Appendix 4
Acrolein	7.40E-05	3.70E-06	See Appendix 4
Xylenes	1.81E-03	9.06E-05	See Appendix 4

*Note: Alternative emissions limitations (lb/MMBtu, ppm, grains/dscf) may be requested by the applicant. If alternative emissions limitations are requested, please clearly describe the units in column 2 of Section 5 above.

[1]A list of Hazardous Air Pollutants is contained in Appendix 4.

[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-8671q, inclusive

INDUSTRIAL PROCESS
APPLICATION FORM
CLASS II OPERATING PERMIT

☐ Check here if this is an alternative operating scenario

Section 1 - Equipment Description

a. Type of equipment Cooling Tower

b. Standard Industrial Classification (SIC) Code 2869

c. Manufacturer of equipment tbd

d. Model number tbd Serial number _____ *Equip. number _____

e. Date equipment manufactured: 2013

f. Please check one:
☐ Temporary (At the same location for less than 12 months)
☒ Stationary (At the same location for more than 12 months)

g. For crushers: size output setting, check one:
☐ Primary (< 4")
☐ Secondary (> 4" but < 1")
☐ Tertiary (< 1")

h. Please check if portable: ☐ Portable (transportable or movable within the confines of the stationary source)

i. UTM Coordinates 4,377,934 meters N; 286,114 meters E; Zone 11

j. Basic equipment dimensions (feet): L 60 W 35 H 35

*The equipment number is the facility's own numbering system for this piece of equipment.

Section 2 - Design Rate/Operating Parameters

a. Maximum design capacity (tons per hour) 775 ton/hour (3,100 gallons/min)

b. Requested operating rate (tons per hour)* _____

c. Requested operating time: (time of day)* 0000 to 2400

Hours per day 24 Days per year 365 Hours per year 8760

d. Batch load or charge weight (tons) NA

e. Total hours required to process batch or charge _____

f. Maximum operating rate (tons per year) 6.79 MM ton/year Circulation Rate

g. Requested operating rate (tons per year)* _____

h. Type of material processed _____

i. Minimum moisture content _____

*Note: Please complete if other than the maximum design capacity (tons per hour and tons per year) and/or the maximum hours of operation (24 hours per day, 8760 hours per year) are being requested. The permit will be limited to these values.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 3 - Fuel Usage

(This section only applies to fuel consumed/combusted within the process unit. Fuels consumed/combusted in combustion units are to be listed on the Combustion Equipment Application Form.)

Type of Fuel	Amount Used Per Hour	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)
Oil- Specify Type(s)					
	NA (gallons)				
	NA (gallons)				
Gasoline	NA (gallons)				
Propane	NA (cubic feet)				
Natural Gas	NA (cubic feet)				
*Waste Oil	NA (gallons)				
Other					

Type of Fuel	Amount Used Per Hour (tons)	Heat Content (specify in Btus)	Ash Content (% by weight)	Sulfur Content (% by weight)	Trace Elements (% by weight)	Percent moisture	Percent volatile matter	Percent fixed carbon
Coal - Specify Type(s)								
	NA							

If more than one type of fuel is combusted, under this operating scenario please specify primary fuel and percentage on a maximum hourly and annual basis (if fuel blending is the primary fuel, identify percentages of each fuel blended). Attach additional information to this form if necessary.

*Firing of waste oil will require multi metals test to insure fuel is non-hazardous.

INDUSTRIAL PROCESS
APPLICATION FORM
CONTINUED

Section 4 - Pollution Control Equipment/Exhaust Stack Parameters (this section *must* be completed)

-Complete for emissions exhausting through a stack, chimney or vent: (baghouse, wet scrubber, cyclone, low NO_x burner, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)	Drift Eliminators	
Pollutant(s) Controlled	PM_{10} $PM_{2.5}$	
Manufacturer	Not Available	
Manufacturer's Guarantee (see Note 2)	0.001% Drift rate	
Stack height (feet from ground level)	35	
Stack inside diameter (feet)	25	
Temperature (°F) at design capacity	120	
Stack exit velocity (feet per second)	32	
Gas volume flow rate: Actual cubic feet per minute	942,000	
Gas volume flow rate: Dry standard cubic feet per minute	TBD	

-Complete for Emissions **not** exhausting through a stack, chimney or vent: (water sprays, fogging water sprays, pneumatic fogging system, high moisture ore, no control, etc.)

	Control #1	Control #2
Type of Control (See Note 1)		
Pollutant(s) Controlled		
Manufacturer		
Manufacturer's Guarantee (see Note 1)		
Note: Indicate the specific point(s) of emission control application for this emission unit. This must be provided as part of the process flow diagram as required in section 7 of the General Information section of the application form.		

Note 1: Specify "uncontrolled" if no pollution control device is installed.

Note 2: Manufacturer's guarantee of control efficiency must be attached to this form if the control efficiency claimed is greater than the control efficiency ratings provided in the Bureau of Air Pollution Control's Emissions Control Technology - Control Efficiency Ratings provided in Attachment 4.

INDUSTRIAL PROCESS APPLICATION FORM CONTINUED

Section 5 - Requested Emission Limits

Pollutant	Potential to Emit (*pounds/hour)	Potential to Emit (tons/year)	Calculation (including reference) on Which Emissions Information is Based (attach supporting information if necessary)
Total Particulate Matter (PM)			
Particulates as PM_{10}	0.0123	0.0537	See Appendix 4
Sulfur Dioxide			
Carbon Monoxide			
Oxides of Nitrogen			
Volatile Organic Compounds			
Lead			
Hydrogen Sulfide			
Hazardous Air Pollutants (Specify Each Pollutant[1])			
Other Regulated Pollutants (Specify[2])			

[1]A list of Hazardous Air Pollutants is contained in Attachment 4.
[2]Other Regulated Pollutants include any Class I or Class II substance subject to a standard adopted pursuant to 42 U.S.C. SS 7671-7671q, inclusive.

SURFACE AREA DISTURBANCE
APPLICATION FORM
CLASS III OPERATING PERMIT

1. Project Name Fulcrum Sierra BioFuels, Inc.

2. Surface Area Disturbance Location:

   Overall disturbance location description:

   Township 19N ; Range 22E ; Section(s) 10 and 11 ;

   Township ; Range ; Section(s) ;

   Township ; Range ; Section(s) ;

   Township ; Range ; Section(s) ;

   Township ; Range ; Section(s) ;

   Township ; Range ; Section(s) ;

   Township ; Range ; Section(s) ;

   Township ; Range ; Section(s) ;

3. Indicate the total number of acres to be disturbed for the project 22.77 acres

4. Nevada Administrative Code 445B.22037 requires fugitive dust to be controlled (regardless of the size or amount of acreage disturbed), and requires an ongoing program, using best practical methods, to prevent particulate matter from becoming airborne. All activities which have the potential to adversely affect the local air quality must implement all appropriate measures to limit controllable emissions. Appropriate measures for dust control may consist of a phased approach to acreage disturbance rather than disturbing the entire area all at once; using wet suppression through such application methods as water trucks or water sprays systems to control wind blown dust; the application of soil binding agents or chemical surfactant to roadways and areas of disturbed soil; as well as the use of wind-break or wind-limiting fencing designed to limit wind erosion of soils.

5. Dust Control Plan (please visit http://ndep.nv.gov/bapc for additional information regarding dust control plans).

   a. For Pahrump Valley, please include a dust control plan in Appendix 6 if the total number of acres to be disturbed listed in 3 above equals or exceeds 5 acres.

   b. Please include a dust control plan in Appendix 6 if the total number of acres to be disturbed in number 3 above equals or exceeds 20 acres (except for Pahrump Valley in a above).

   The dust control measures discussed in 4 above should be considered in the preparation of the required dust control plan. The acceptance of the dust control plan by the Bureau of Air Quality does not limit the permit holder's need to control fugitive dust from the disturbance and its related activities, nor from putting into effect an ongoing program for using the best practical methods of dust control.

Appendix 2

INSIGNIFICANT ACTIVITY INFORMATION FORM

Section 1 - List All Emission Units that are Insignificant Activities Pursuant to NAC 445B.288.2(a) through (h) (see Attachment 2 for regulation).

Emission Unit	Exemption Regulation (Example - NAC 445B.288.2(b))	Reason Exemption Applies
Diesel Storage Tank <10,000 gallons	NAC 445B.288.2(d)	<40,000 gallons
Diesel Storage Tank <1,000 gallons collocated with the Emergency Generator	NAC 445B.288.2(d)	<40,000 gallons
Diesel Storage Tank <1,000 gallons collocated with the Firewater Pump	NAC 445B.288.2(d)	<40,000 gallons

Section 2 - List All Emission Units Proposed as Insignificant Activities Pursuant to List Approved by the Director (see Attachment 1 - List of Approved Insignificant Activities)

Emission Unit	Reason Exemption Applies
200 ton/day Oxygen Production Plant	**No Emissions**
Waste Water Treatment System – Enclosed System	**No Emissions**
Sulfur Removal Regeneration Unit – Aqueous Process	**No Emissions**

Section 3 - List All Emission Units Proposed as Insignificant Activities and Not Otherwise Listed in Section 1 or Section 2 (NAC 445B.288.4). Proposed insignificant activities from this Section must be submitted, under separate cover, to the Director for his approval. The submittal must include a sufficient description of the emission unit(s), all emissions calculations, and references.

Emission Unit

Section 4 -Emissions Calculations - Insignificant Emission Units/Activities

Calculate the maximum uncontrolled emissions for insignificant activities listed under Sections 1 through 3. Emissions calculations must be based on the maximum design throughput, maximum design production rate, maximum design heat input rate value, no controls, and 8760 hours per year of operation, unless otherwise indicated in NAC 445B.288.2 or on the list of approved insignificant activities provided in Attachment 1. No consideration for emissions reduction from pollution controls or limits on the hours of operation or other operational constraints may be allowed unless otherwise approved by the Director or as indicated in NAC 445B.288.3 or on the list provided in Attachment 1.

Appendix 3

FACILITY-WIDE POTENTIAL TO EMIT TABLES

TABLE 1

FACILITY-WIDE (STATIONARY SOURCE) POTENTIAL TO EMIT POUNDS/HOUR AND TONS/YEAR

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)
Total Particulate Matter (PM)	**All treated as PM_{10}**	**All treated as PM_{10}**
Particulates as PM_{10}	**11.54**	**18.32**
Sulfur Dioxide	**35.65**	**18.88**
Carbon Monoxide	**84.87**	**40.04**
Oxides of Nitrogen	**54.95**	**70.79**
Volatile Organic Compounds	**43.77**	**76.77**
Lead		
Hazardous Air Pollutants (Specify Each Pollutant)		
n-Hexane	**0.284**	**1.20**
Formaldehyde	**0.016**	**0.050**
Acetaldehyde	**0.002**	**<0.001**
Ethylbenzene		
Benzene	**0.010**	**0.002**
Toluene	**0.004**	**0.002**
Naphthalene	**<0.001**	**<0.001**
Xylenes	**0.003**	**<0.001**
Acrolein	**<0.001**	**<0.001**
H_2S	**0.26**	**1.12**

TABLE 2

INSIGNIFICANT ACTIVITIES
POTENTIAL TO EMIT
POUNDS/HOUR AND TONS/YEAR

Insignificant Activity	Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)
N/A	N/A	N/A	N/A

Appendix 4

DETAILED EMISSIONS CALCULATIONS

Calculation Table of Contents

EMISSIONS SUMMARY

Annual Emissions (TPY)

Source Description	Criteria Pollutants						HAPs								CO2e		
	NO_x	CO	PM/PM_{10}	SO_2	VOC	H2S	N-Hexanes	Formaldehyd	Acetaldehyde	Benzene	Toluene	Naphthalene	Xylenes	Acrolein	Total	Fossil - Based	Biogenic - Based
FeedstockProcessing	–	–	2.05	–	–	–	–	–	–	–	–	–	–	–			
Feedstock Handling	–		1.71	–	–	–	–	–	–	–	–	–	–	–			
Pulse Combustor	15.49	20.55	2.22	3.77	0.83	–	0.523	0.022	–	6.10E-04	9.88E-04	1.77E-04	–	–	53,763.53	14,702.22	39,061.32
POx Preheater	0.85	0.72	0.06	0.01	0.05		0.015	6.41E-04		1.79E-05	2.90E-05	5.21E-06			1,022.80	1,022.80	
Boiler Vendor Data	52.38	14.37	11.69	3.50	10.64	–	0.660	0.028	–	7.70E-04	0.001	2.24E-04	–	–	60,180.19	30,875.45	29,304.74
Firewater Pump	0.62	0.13	0.04	2.12E-04	0.05	–	–	1.65E-04	1.07E-04	1.30E-04	5.71E-05	–	3.98E-05	–	17.28	17.28	
Emergency Generator	0.71	0.38	0.02	7.11E-04	0.04	–	–	3.70E-05	1.18E-05	3.64E-04	1.32E-04	–	9.06E-05	3.70E-06	77.36	77.36	
Truck Loading	0.06	0.18	0.01	–	0.12	–	–	–	–	–	–	–	–	–	55.83	55.85	0.07
Storage Tank Emissions	–	–	–	–	1.20	–	–	–	–	–	–	–	–	–			
Evap Cooling Tower			0.05														
Sulfur Removal Unit Vent	–	–	–	–	3.60	1.12	–	–	–	–	–	–	–	–	139,370.92	38,048.26	101,322.66
Ethanol Synthesis and Purification Fugitives	–	–	–	–	58.84	–	–	–	–	–	–	–	–	–			
Flare	0.68	3.71	0.34	11.60	1.40	–	–	–	–	–	–	–	–	–	2,116.11	618.85	1,497.26
Particulate Silo	–	–	0.11	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	**70.79**	**40.04**	**18.32**	**18.88**	**76.77**	**1.12**	**1.199**	**0.050**	**1.19E-04**	**0.002**	**0.002**	**4.06E-04**	**1.30E-04**	**3.70E-06**	**256,604.02**	**85,418.07**	**171,186.04**

Fraction of biogenic-based carbon in feedstock/ syngas = 0.727

Hourly Emissions (lb/hr)

Source Description	Criteria Pollutants						HAPs							
	NO_x	CO	PM/PM_{10}	SO_2	VOC	H2S	N-Hexanes	Formaldehyd	Acetaldehyde	Benzene	Toluene	Naphthalene	Xylenes	Acrolein
Feedstock Processing	–	–	0.47	–	–	–	–	–	–	–	–	–	–	–
Feedstock Handling	–	–	0.39	–	–	–	–	–	–	–	–	–	–	–
Pulse Combustor	3.54	4.69	0.51	0.86	0.19	–	0.119	0.005	–	1.39E-04	2.26E-04	4.05E-05	–	–
POx Preheater	0.78	0.66	0.06	0.00	0.04		0.014	5.85E-04		1.64E-05	2.65E-05	4.76E-06		
Boiler Vendor Data	11.96	3.28	2.67	0.80	2.43	–	0.151	0.006	–	1.76E-04	2.85E-04	5.11E-05	–	–
Firewater Pump	12.32	2.65	0.87	0.00	0.91	–	–	0.003	0.002	0.003	0.001	–	7.96E-04	–
Emergency Generator	14.19	7.69	0.44	0.01	0.84	–	–	7.41E-04	2.37E-04	0.007	0.003	–	0.002	7.40E-05
Truck Loading	0.13	0.40	0.03	–	0.15	–	–	–	–	–	–	–	–	–
Storage Tank Emissions	–	–	–	–	0.27	–	–	–	–	–	–	–	–	–
Evap Cooling Tower					0.01									
Sulfur Removal Unit Vent	–	–	–	–	0.82	0.26	–	–	–	–	–	–	–	–
Ethanol Synthesis and Purification Fugitives	–	–	–	–	13.43	–	–	–	–	–	–	–	–	–
Flare	12.04	65.50	6.10	33.96	24.67	–	–	–	–	–	–	–	–	–
Particulate Silo	–	–	0.01	–	–	–	–	–	–	–	–	–	–	–
Total	**54.95**	**84.87**	**11.54**	**35.65**	**43.77**	**0.26**	**0.284**	**0.016**	**0.002**	**0.010**	**0.004**	**9.63E-05**	**0.003**	**7.40E-05**

DUST COLLECTION FROM FEEDSTOCK HANDLING AND PROCESSING SYSTEM

Assumptions:

Feedstock Processing:

Receipt and Debaling: Material is transferred by conveyor twice. It is moved once to the debaler system, then to the receiving hopper/feedstock metering device. The system has a capacity of 18 ton/hour.

Filter Outlet Loading: 0.005 gr/scf
Based on 12,000 acfm (10,926 scfm)

Handling and Conveying: Material is transferred on the feedstock infeed belt conveyor to the distribution conveyor to the feedstock metering bins (3 bins). Up to 432 tons/day handled through the system.

Feedstock Handling

Handling emissions calculated using expected emissions from fabric filter dust collectors and exhaust flows of fabric filters. One fabric filter on the Receipt and Debaling system and 2 identical units (one primary on-line and one spare)

Filter Outlet Loading: 0.005 gr/scf
Emissions are calculated for two separate baghouses, based on 10000 acfm (9105 scfm)

Feedstock Processing

$$\frac{10926 \text{ cu ft}}{\text{min}} \left| \frac{0.005 \text{ grains}}{\text{cu ft}} \right| \frac{1 \text{ lb}}{7000 \text{ grains}} \left| \frac{60 \text{ min}}{\text{hr}} \right. = \begin{array}{l} 0.47 \text{ lb/hr} \\ 2.05 \text{ tpy} \end{array}$$

Feedstock Handling

$$\frac{9105 \text{ cu ft}}{\text{min}} \left| \frac{0.005 \text{ grains}}{\text{cu ft}} \right| \frac{1 \text{ lb}}{7000 \text{ grains}} \left| \frac{60 \text{ min}}{\text{hr}} \right. = \begin{array}{l} 0.39 \text{ lb/hr} \\ 1.71 \text{ tpy} \end{array}$$

POX PREHEAT BURNER EMISSION CALCULATIONS

Emission Source: POx Preheater Unit
Source Type: Natural Gas Fired Burner

Burner Heat Input: 8.0 MMBtu/hr (nominal design)
7.8E-03 MMscf/hr (based on 1,025.3 Btu/scf, average natural gas HHV)
2,190 hours/year to atmosphere
Number of Trains (burners): 1 burners

	Pollutant	Factor lb/MMscf	Per Burner Maximum lbs/hr[1]	Per Burner Annual tons/yr[2]	Total - All Burners Maximum lbs/hr[1]	Total - All Burners Annual tons/yr[2]	Source of Factor
CRITERIA	NO_x	100.00	0.78	0.85	0.780	0.854	AP-42, Table 1.4-1, 7/98
	CO	84.00	0.66	0.72	0.655	0.718	AP-42, Table 1.4-1, 7/98
	TSP=PM_{10}=$PM_{2.5}$	7.60	0.06	0.06	0.059	0.065	AP-42, Table 1.4-2, 7/98
	SO_2	0.60	0.00	0.01	0.005	0.005	AP-42, Table 1.4-2, 7/98
	VOC	5.50	0.04	0.05	0.043	0.047	AP-42, Table 1.4-2, 7/98
HAZARDOUS AIR POLLUTANTS	N-Hexanes	1.80E+00	1.40E-02	1.54E-02	1.40E-02	1.54E-02	AP-42, Table 1.4-3, 7/98
	Formaldehyde	7.50E-02	5.85E-04	6.41E-04	5.85E-04	6.41E-04	AP-42, Table 1.4-3, 7/98
	Benzene	2.10E-03	1.64E-05	1.79E-05	1.64E-05	1.79E-05	AP-42, Table 1.4-3, 7/98
	Toluene	3.40E-03	2.65E-05	2.90E-05	2.65E-05	2.90E-05	AP-42, Table 1.4-3, 7/98
	Naphthalene	6.10E-04	4.76E-06	5.21E-06	4.76E-06	5.21E-06	AP-42, Table 1.4-3, 7/98
	Total HAP		1.468E-02	1.607E-02	1.47E-02	1.61E-02	

Notes:

The preheater vents directly to the atmosphere approximately.

[1] Maximum Hourly Emission Rate (Lbs/Hr) = (Emission Factor, Lb/MMscf) * (Heat Input, MMscf/hr)

[2] Annual Emission Rate (Tons/Yr) = (Max Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 Lbs/Ton) * Percent of operating time when venting to the stack occurs. Hours of Operation Per Year = 2190 based on original spreadsheet.

	Factor		CO2 e	CO2e
Greenhouse Gases	kg/mmBtu	lb/hour	lb/hour	ton/year
CO2	53.02	933	933	1021.80144
Methane	0.001	0.018	0.3696	0.404712
N2O	0.0001	0.002	0.5456	0.597432
Total				1023

PULSE COMBUSTORS (4 UNITS)

Emission Source: Pulse Combustors (4 units)
Source Type: Syngas/Purge Gas Stream
536 Btu/scf LHV

Burner Heat Input	17.0	MMBtu/hr (nominal design)
	0.1269	MMscf/hr (based on feed gas Btu/scf, LHV)
	8,760	hours/year to atmosphere
Number of Trains (burners)	4	burners

	Pollutant	AP-42 Factor lb/MMscf	Syngas Factor lb/MMBtu	Per Burner Maximum lbs/hr[1]	Per Burner Annual tons/yr[2]	Total - All Burners Maximum lbs/hr[1]	Total - All Burners Annual tons/yr[2]	Source of Factor
CRITERIA	NO_x	~~100.00~~	0.052	0.88	3.87	3.536	15.488	Vendor Specifications
	CO	~~84.00~~	0.069	1.17	5.14	4.692	20.551	Vendor Specifications
	$TSP=PM_{10}=PM_{2.5}$	7.60	0.0075	0.127	0.55	0.507	2.219	AP-42, Table 1.4-2, 7/98
	SO_2			0.215	0.94	0.861	3.771	lb/hour by Fulcrum Stream Flows
	VOC	~~5.50~~	~~5.50~~	0.05	0.21	0.190	0.832	lb/hour by Vendor
HAZARDOUS AIR POLLUTANTS	N-Hexanes	1.80E+00	1.76E-03	2.99E-02	1.31E-01	1.19E-01	5.23E-01	AP-42, Table 1.4-3, 7/98
	Formaldehyde	7.50E-02	7.32E-05	1.24E-03	5.45E-03	4.98E-03	2.18E-02	AP-42, Table 1.4-3, 7/98
	Benzene	2.10E-03	2.05E-06	3.48E-05	1.53E-04	1.39E-04	6.10E-04	AP-42, Table 1.4-3, 7/98
	Toluene	3.40E-03	3.32E-06	5.64E-05	2.47E-04	2.26E-04	9.88E-04	AP-42, Table 1.4-3, 7/98
	Naphthalene	6.10E-04	5.95E-07	1.01E-05	4.43E-05	4.05E-05	1.77E-04	AP-42, Table 1.4-3, 7/98
	Total HAP			3.120E-02	1.37E-01	1.25E-01	5.47E-01	

Notes:

The preheaters vent directly to the atmosphere.

[1] Maximum Hourly Emission Rate (Lbs/Hr) = (Emission Factor, Lb/MMscf) * (Heat Input, MMscf/hr)

[2] Annual Emission Rate (Tons/Yr) = (Max Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 Lbs/Ton) * Percent of operating time when venting to the stack occurs. Hours of Operation Per Year = 2190 based on original spreadsheet.

	Factor		CO2 e	CO2e
Greenhouse Gases	kg/mmBtu	lb/hour	lb/hour	ton/year
CO2	0.00	0	12267	53729.46
Methane	0.001	0.150	3.1416	13.76
N2O	0.0001	0.015	4.6376	20.31
Total			12,274.78	53,763.53

Calculation by Fulcrum Stream Flows

BOILER EMISSION HAP CALCULATIONS

Emission Source: Boiler
Source Type: Syngas & Natural Gas Fired HAP Emissions

Boiler Heat Input 85.4 MMBtu/hr

Annual Hours of Operation 8,760 hours/year

	Pollutant	Factor lb/MMBtu	Avg. lbs/hr[1]	Total tons/yr[2]	Source of Factor
CRITERIA	NO_x	Criteria Pollutant Emissions Calculated in Boiler Normal & Standby Spreadsheet			
	CO				
	$TSP=PM_{10}=PM_{2.5}$				
	SO_2				
	VOC				Calculated from Btu Adjutsment
HAZARDOUS AIR POLLUTANTS	N-Hexanes	1.76E-03	1.51E-01	6.60E-01	AP-42, Table 1.4-3, 7/98
	Formaldehyde	7.35E-05	6.28E-03	2.75E-02	AP-42, Table 1.4-3, 7/98
	Benzene	2.06E-06	1.76E-04	7.70E-04	AP-42, Table 1.4-3, 7/98
	Toluene	3.33E-06	2.85E-04	1.25E-03	AP-42, Table 1.4-3, 7/98
	Naphthalene	5.98E-07	5.11E-05	2.24E-04	AP-42, Table 1.4-3, 7/98
	Total HAP		1.57E-01	6.90E-01	

BOILER CO2 CALCULATIONS

Boiler Operation 8760.0 hr/yr Biogenic 72.70%
85.4 MMBtu/hour

CO2 Emissions	lb/ hr	ton/ yr
Boiler Exhaust	13,730.00	60,137
NG Portion	4,527.00	19,828
Biogenic	6,690.58	29,305
Fossil	7,039.42	30,833

		CO2e	
Methane	0.18788	17.28	Methane and N2O emissions based on natural gas factors
N2O	0.018788	25.51	and heat content.

Exhaust Data from Aspen Model X-Cat Rev 20A 10-23-12
This data excludes the pulse combuster flue gas which is accounted for separately in this worksheet (see Pulse Combusters tab)
NG Portion Data obtained from Lee Rich combustion calculations of 1690 lb/ hr of Natural gas fired in the boiler

BOILER VENDOR DATA

Boiler Vendor Data provided by INDECK - November 9, 2012 Correspondence

Vendor Data			
Components	**lb/hour**	**ton/year**	
		8,760	**hours per year**
Particulate	2.67	11.69	
SO2	0.80	3.50	SO2 Based on Fulcrum Stream Flows
CO	3.28	14.37	
VOC	2.43	10.64	
Nox as NO2	11.96	52.38	

STARTUP FLARE EMISSIONS

Assumptions:

Plant Startup – Occurs when syngas is directed to the flare during startup operations. A generation rate of 19,130.9 lb/hr is the assumed rate as it will be necessary to have syngas quickly available when starting up downstream equipment. The total time duration in this operation mode is estimated as 10 hours per start-up event and 4 events per year. It is expected that the actual feedstock charge rate will be reduced when possible; however initial calculations will be based on these values.

10 hours per event represents the syngas generation startup hours during which syngas is directed to the flare before entering the reactor loop. The startup sequence will take an extended period of time and once the syngas begins to feed to the reactor loop via the syngas blower and compressors it will not be directed to the flare. Thus, while the complete plant startup time may be longer, syngas is sent directly to the flare for only a portion of the statup duration. A similar operation for the POx is used. Its startup time is expected to be shorter than the gasifiers but for these calculations, the same startup time is assumed.

Resulting basis:

19,131	lb/hr
10	hours/event
4	events/yr

1. Assume STP conditions (20°C, 1 atm) which give a molar specific volume of 385 ft^3/lbmol.

2. Syngas = 331.5 Btu/ft^3 at STP and average MW of 24.04 lb/lbmol.

3. Emission factors CO, NOx, and VOC based on AP-42 Table 13.5-1.

4. PM10 emission factor based on AP-42 Table 13.5-1. Assume soot value of lightly smoking flare (40 µg/L). Using ~~243.7~~ 331.5 Btu/ft^3 and conversion factors yields:

$$\frac{40\ PM_{10}}{l\ (exh)} \left| \frac{g}{1.00E+06\ \mu g} \right| \frac{lb}{453.6\ g} \left| \frac{28.3\ (exh}{ft^3} \right| \frac{1E+06\ u}{MMBtu} \left| \frac{4.58\ scf\ (exhaust)}{scf\ (fuel\ gas)} \right| \frac{Gas}{331.5\ Btu} = 0.0345\ lb\ PM_{10}/MMBtu$$

5. SO2 emission factor based on H2S and COS in flared gas

0.032428	mole percent H2S
0.005912	mole percent COS
0.03834	mole percent S in flared gas

0.192257 lb SO2/MMBtu

1a. Maximum average hourly quantity flared during generation event:

$$\frac{19,131\ lb\ syngas}{hr} \left| \frac{lbmol}{24\ lb\ syngas} \right| \frac{385\ scf}{lbmol} \left| \frac{331.5\ Btu}{scf\ syngas} \right| \frac{MMBtu}{1E+06\ Btu} = 102\ MMBtu/hr$$

1b. Maximum annual quantity flared for generation events:

$$\frac{102\ MMBtu}{1\ hr} \left| \frac{4\ events}{year} \right| \frac{10\ hr}{event} = 4063\ MMBtu/yr$$

		NO_x	CO	PM_{10}	SO_2	VOC	CO2e
Emission factor	lb/MMBtu	0.068	0.37	0.034	0.19	0.14	253.34
Hourly potential to emit	lb/hr	6.91	37.58	3.50	19.53	14.22	25731
Annual potential to emit	tons/yr	0.138	0.752	0.07	0.391	0.284	515

PLANT SHUTDOWN FLARE EMISSIONS

Assumptions:

1. **Plant Shutdown** - occurs when plant running at full capacity needs to be stopped and all equipment purged.
2. Flare gases from 2 sources. **(a) Syngas Gasification equipment (Shown in Items 3 - 8 below), and (b) High pressure equipment letdown (Shown in Items 9 below) and combined totals (in Item 10 below).**
3. (a) Syngas Gasification - occurs when feedstock charging is stopped and syngas is allowed to deplete from system.
   Based on the Heat and Material Balance, Rev 0D, approximately 22,645 lb/hr X 3 gasifiers X 15/60 hours to vent =16,984 lbs of syngas is sent to the flare to deplete system after feeding of feedstock material is stopped.
   Assume 12 annual flaring events for this source.
   Assume syngas is exhausted in 15 minutes (based on pressure letdown curve)
4. Assume STP conditions (20°C, 1 atm) which give a molar specific volume of 385 ft^3/lbmol.
5. Syngas = 243.7 Btu/scf and average MW of 19.2 lb/lb-mol. Based on Latest Material Balance, Rev 0D, stream 2004
6. Emission factors CO, NOx, and VOC are based on AP-42 Table 13.5-1.
7. PM10 emission factor based on AP-42 Table 13.5-1. See 'Startup' emissions tab for calculation of 0.026 lb/MMBtu.
8. Low Pressure SO_2 emission factor for (a) syngas gasification based on Aspen model feed syngas stream composition containing H_2S concentration of 0.11 mass %. Data from Heat & Material Balance Rev 0D, Stream No. 2004.

scf	1E+06 Btu	lbmol	19.24 lb syngas	0.0912 lb S	64 lb SO_2/lbmol SO_2	=	0.37 lb SO_2/MMBtu
244 Btu	MMBtu	385 scf	lbmol	100 lb syngas	32 lb S/lbmol S		

(a) Maximum hourly quantity flared from syngas generation during low-pressure shutdown event:

16,984 lb syngas	lbmol	385 scf	244 Btu		MMBtu	min	=	83.9 MMBtu/15-min or hour
min	19 lb	lbmol	scf	1E+06	Btu	hr		63.9 MMBtu/event

(b) Maximum annual quantity flared from syngas generation for low-pressure shutdown events:

83.9 MMBtu	12 events			=	1006.43 MMBtu/yr
event	year				

		NO_x	CO	PM_{10}	SO_2	VOC	CO2e
Emission factor	lb/MMBtu	0.068	0.37	0.034	0.37	0.14	117.49
Hourly potential to emit	lb/hr	5.70	31.03	2.89	31.37	11.74	9854
Annual potential to emit	tons/yr	3.42E-02	1.86E-01	1.74E-02	1.88E-01	7.05E-02	59

9. High Pressure SO_2 emission factor for (b) High pressure equipment letdown is based on the target H_2S concentration of 100 ppmv for the reactor system and syngas properties. Note, ppmv may also be expressed as a molar ratio for STP. We use Stream 5032 of the H&MB for this calculation, HHV - 490 Btu/SCF and MW - 16.82 lb/lb-mole

scf	1E+06 Btu	lbmol	100 lbmol H_2S	32 lb S	64 lb SO_2/lbmol SO_2	=	0.03 lb SO_2/MMBtu
490 Btu	MMBtu	385 scf	1E+06 lbmol syngas	lbmol H_2S	32 lb S/lbmol SO_2		

High pressure letdown of equipment containing syngas.
System contains ~ 30,664 lbs of syngas per "Syngas Reactor Loop Depressurization" sheet, May 2012.
Assume 12 full system pressure letdown flaring events per year.
Flare emissions based on calculated flare time of 120 minutes

(a) Maximum hourly quantity flared from high pressure letdown during shutdown event:

30,864 lb	lbmol	385 scf	490 Btu		MMBtu	60 min	=	173 MMBtu/hr
120 min	16.6 lb	lbmol	scf	1.00E+06	Btu	hr		

(b) Maximum annual quantity flared from high pressure letdown during shutdown event:

173 MMBtu	12 events	120 min	hr	=	4154	MMBtu/yr
hr	year	event	60 min			

		NO_x	CO	PM_{10}	SO_2	VOC	CO2e
Emission factor	lb/MMBtu	0.068	0.37	0.034	0.03	0.14	117.49
Hourly potential to emit	lb/hr	11.77	64.04	5.97	5.67	24.23	20335
Annual potential to emit	tons/yr	0.14	0.77	0.07	0.07	0.29	244

10. Purification Section Emissions - System is vented to the flare during/after liquid removal from vessels for a period of 12 hours, 4 times/year.
Estimated quantity of vapor in the vessels is 21, 661 cubic feet. Assume all vapor is ethanol @ 46 lb/lb-mol, 12,800 Btu/lb.

(a) Maximum average hourly quantity flared from system venting to flare during shutdown event:
21,661 scf/12 hr X 46 lb/lb mol/385 scf/lb-mol X 12,800 Btu/lb = 2.79 MMBtu.hr
(b) Maximum annual quantity flared from system venting to flare during shutdown event:
2.79 MM Btu/hr X 12 hr X 4 events 134 MMBtu/yr

		NO_x	CO	PM_{10}	SO_2	VOC	CO2e
Emission factor	lb/MMBtu	0.068	0.37	0.034	0.03	0.14	117.49
Hourly potential to emit	lb/hr	0.19	1.03	0.10	0.09	0.39	327.33
Annual potential to emit	tons/yr	0.005	0.025	0.002	0.002	0.009	7.867

11. Summary of Emissions from Syngas Gasification Equipment (a) and High Pressure Equipment Letdown (b)

Cumulative Emissions from Shutdown Scenarios							
		NO_x	CO	PM_{10}	SO_2	VOC	CO2e
Hourly potential to emit	lb/hr	11.96	65.07	6.06	31.46	24.62	20662
Annual potential to emit	tons/yr	0.18	0.98	0.09	0.26	0.37	311

CONTINUOUS FLARE EMISSIONS

Assumptions:

1. Assume STP conditions (20°C, 1 atm) which give a molar specific volume of 385 ft^3/lbmol.
2. Emission factors CO, NOx, and VOC are based on AP-42 Table 13.5-1.
3. PM_{10} emission factor based on AP-42 Table 13.5-1. See 'Startup' emissions tab for calculation of 0.026 lb/MMBtu.
4. SO2 emissions from continuous Gases to Flare as described below.
   Flared SO2 emissions assume a flare combustion effectiveness of 0.99 for all sulfur bearing compounds.
5. Continuous streams to the flare are:
   (a) Methanol/Methyl Acetate Column Gases to Flare (H&MB Stream 6042A)
   SO2 emission rate = 0.0393 lb-mole/hour = 2.49 lb/hour
   (b) Mole sieve discharge stream sulfur content based on 100 ppmv sulfur in mole selve discharge
   SO2 emission rate = 100 ppmv(S) X 554 scfh = 0.00912 lb/hour
6. Btu values calculated based on heats of combustion.

MeOH/Me Acet Col Gases to Flare	2018	Btu/scf	x	131	scfh	=	264,332	Btu/hr
Mole sieve discharge	1,530	Btu/scf	x	554	scfh	=	847,620	Btu/hr
Average	**1623**	Btu/scf	**Total:**	**685**	**scfh**		**1,111,952**	**Btu/hr**

Emissions Due to the Continuous Vent Streams

		NO_x	CO	PM_{10}	SO_2*	VOC	CO2e
Emission factor	lb/MMBtu	0.068	0.37	0.034	N/A	0.14	253.34
Hourly emissions (MeOH/MeAcet Col)	lb/hr	0.02	0.10	0.01	2.49	0.04	
Hourly emissions (Mole Sieve)	lb/hr	0.06	0.31	0.03	0.01	0.12	
Total Hourly emissions	lb/hr	0.08	0.41	0.04	2.50	0.16	282
Annual potential to emit	tons/yr	0.33	1.80	0.17	10.95	0.68	1234

*SO2 emissions factor is based on sulfur content of feed streams

FLARE PILOT AND TOTAL FLARE EMISSIONS

Assumptions:
Pilot emissions based on 8760 hr/yr.
Pilot Natural Gas Rate: 107.3 cu ft/hr
= 0.110 MMBtu/hr
Emission factors CO, NOx, and VOC based on AP-42 Table 13.5-1.
PM10 emission factor conservatively based on AP-42 Table 13.5-1. Assume soot value of lightly smoking flare (40 µg/L). Using 1025.3 Btu/ft3 and conversion factors yields 0.026 lb/MMBtu for PM10.

$$\frac{40\ \mu g}{l\ (exh)} \left| \frac{ft^3}{1025\ Btu} \right| \frac{g}{1E+06\ \mu g} \left| \frac{lb}{453.6\ g} \right| \frac{28.3\ l}{ft^3} \left| \frac{1E+06\ Btu}{MMBtu} \right| \frac{10.6\ scf\ (exhaust)}{scf\ (nat\ gas)} = 0.026\ lb\ PM10/MMBtu$$

Flare exhaust rate conversion from SCFM to ACFM

$$\frac{11{,}065\ scf}{min} \left| \frac{2{,}260\ R\ (act)}{528\ R\ (std)} \right| \frac{14.69\ psi\ (std)}{12.5\ psi\ (local)} = 55659\ ACFM$$

SO2 emission factor is based on AP-42 Table 1.4-2.

Pilot Emissions

		NOx	CO	PM10	SO2	VOC	CO2e
Emission factor	lb/MMBtu	0.068	0.370	0.026	0.001	0.140	117.49
Emission Rate	lb/hr	0.007	0.041	0.003	0.000	0.015	12.924
Emission Rate	tpy	0.033	0.178	0.012	0.000	0.067	57

Total Flare Emissions (Continuous, Pilot, Startup and Shutdown)

Maximum Hourly Emission Rate - lb/hr					
Source	NOx	CO	PM10	SO2	VOC
Start-up	6.91	37.58	3.50	19.53	14.22
Shutdown	11.96	65.07	6.0638	31.46	24.62
Pilot	0.01	0.04	0.0028	0.00	0.02
Continuous Streams	0.07	0.39	0.0300	2.50	0.03
Total	12.04	65.50	6.10	33.96	24.67
Total for Modeling Hourly					

Annual Emission Rate - tpy							Fossil	Biogen
Source	NOx	CO	PM10	SO2	VOC	CO2e	0.273	0.727
Startup	0.14	0.75	0.07	0.39	0.28	515	140	374
Shutdown	0.18	0.98	0.09	0.26	0.37	311	85	226
Pilot	0.03	0.18	0.01	0.00	0.07	57	57	
Continuous Streams	0.33	1.80	0.17	10.95	0.68	1234	337	897
Total	0.68	3.71	0.34	11.60	1.40	2116	619	1497

Note: While the annual emissions are cumulative, hourly emissions due to startup and shutdown would not occur simultaneously. Since shutdown emissions are higher than those due to startup, the hourly emission rate shown in the table above is conservatively calculated as the sum of shutdown, continuous and pilot emission rates.

SULFUR RECOVERY CO2 VENT

Assumptions:

For H2S emissions

CO2 Reject Gas Flow rate from H&M B in Report 000.225.25003, Rev 0D:

SCFM = 4846 from H&M B Stream 5026 "Pivot Case"

H_2S removal efficiency to 10 ppmv guaranteed by Vendor.

STP volume is 385 scf/lbmol.

H_2S in the vent from the Unit: 4846 scfm X 10/1000000 X 34 lb/lbmole/385 scf/lbmol X 60 =

Hourly H_2S Emissions (lb/hr) = 0.26 lb/hr

Annual H_2S Emissions (ton/yr) = Hourly H_2S Emissions (lb/hr) * 8760 (hr/yr) * 1 ton/2000 lb

1.12 tons/yr

For VOC emissions

Preliminary UOP data indicate 0.0003 mole% C3H8 in vent gas; 807 lb-mole/hr.

Hourly VOC Emissions (lb/hr)= 0.107 lb/hr

Annual VOC Emissions (ton/yr)= 0.467 tons/yr

*From Merichem Hourly VOC= 0.82 lb/hr = 3.6 tons/yr

***NOTE:** As manufacturer data is more conservative, the manufacturer data (Merichem) was used.

Greenhouse Gas : CO2 from Vent Stack		
36508.7	lb/ hr	HP CO2 Vent Stream
6256.14	lb/ hr	LP CO2 Vent Stream
10945	lb/ hr	Process CO2 Requirements
31,820	lb/ hr	CO2 Vent to ATM
139,371	ton/ yr	CO2 Emissions
from Aspen Model X-Cat Rev20A 10/23/12		

ETHANOL PLANT FUGITIVE VOC EMISSIONS

Component estimate	Plant Areas
Type of Component	50, 60, and 80
Valves in gas service	240
Valves in light liquid	699
Pump seals	14
Compressor seals	2
Pressure relief valves	17
Connectors	509
Sampling connectors	35

Assumptions:
Use SOCMI emission factors in same manner as original permit application.
Number of components based on current process (P&ID) information.
Pressure relief devices denoted as zero for the fugitive emission calculation as all relief devices vented to flare.
Average VOC concentrations taken from existing permit application.
Added 10% to Total VOC for one stream in Units 50 & 80 and Flare system that have not been characterized.

Type of Component	Number of components	Emission Factor (kg/hr)	Average VOC concentration in stream (wt %)	Total Emissions (kg/hr)
Valves in gas service	240	0.00597	86	1.232
Valves in light liquid	699	0.00403	86	2.423
Pump seals	14	0.0199	86	0.240
Compressor seals	2	0.228	86	0.392
Pressure relief valves[1]	0	0.104	86	0.000
Connectors	509	0.00183	86	0.801
Sampling connectors	35	0.015	86	0.452

TOTAL (kg/hr)	**5.54**
Assume 10% additional VOC for balance of Plant	**6.09**
Hourly potential to emit (lb/hr)	**13.43**
Annual potential to emit (tons/yr)	**58.84**

Total emissions (kg/hr)
# of components x Emission factor (kg/hr) x Average VOC conc (wt. %) = Total emissions (kg/hr)

[1]All relief valves discharge to the flare.

STORAGE TANK EMISSIONS

EU ID	Stored Liquid	Chemical Profile Used in Tanks 4.09d	Shell Height	Shell Dia.	Liquid Height	Avg. Liq. Ht.	True Vapor Pressure	Temp.	Color	Storage Capacity	Tank Type	Liquid Bulk Temp	Net Throughput	Uncontrolled Annual VOC Emissions		
			ft	ft	Ft	Ft	psia	°F		gallons		°F	gallons	lbs/hr	lbs/yr	tons/yr
S 2.021	Product Storage Tank	Ethanol	32	45	31	16	2.32	100	white	280,000	Int. Flt	50.76	16,311,500	0.02	200.64	0.10
S 2.022	Off-Spec Storage Tank	Ethanol	32	25	31	16	2.32	100	white	83,000	Int. Flt	115	370,000	0.02	132.93	0.07
S 2.023	Day Storage Tank #1	Ethanol	24	21	23	18	2.32	100	white	39,300	Int. Flt	115	8,155,750	0.02	183.44	0.09
S 2.024	Day Storage Tank #2	Ethanol	24	21	23	18	2.32	100	white	39,300	Int. Flt	115	8,155,750	0.02	183.44	0.09
S 2.025	Methanol Storage Tank	Methanol	16	13	15	8	4.61	100	white	7,500	Int. Flt	50.76	160,000	0.02	195.01	0.10
S 2.026	Fusel Oil Storage Tank	Fusel Oil	24	13	23	7	4.3	115	white	15,000	Int. Flt	50.76	108,000	0.01	122.28	0.06
S 2.027	Solvent Storage Tank	Amine	32	15	30	15	3.32	100	white	39,000	Fxd. Rf	50.76	140,000	0.00	31.14	0.02
S 2.030	Gasoline Storage Tank	Gasoline	16	14	15	8	2.32	100	white	9,000	Int. Flt	50.76	265,500	0.15	1341.95	0.67
													Total Yearly Emissions	0.27	2,390.83	1.20

TRUCK LOADING EMISSION CALCULATIONS

Basis

Throughput	16,311,500.00	gallons/year
Loading Time	906.2	hours/year
Loading Rate	18000	gallons/hr
Loading Rate	59.3	tons/hr

From AP-42, Page 5.2-4, the loading loss emission factor is:

LL = 12.46 SPM/T * (1 - eff/100)
Annual Emission Rate VOC (Tons/Yr) = (Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 Lbs/Ton)

LL = loading loss, pounds per 1000 gallons of liquid loaded
S = saturation factor
P = true vapor pressure of liquid loaded, pounds per square inch absolute
M = molecular weight of vapors, pounds per pound mole
T = temperature in degrees R
eff = efficiency of controls (capture and control)

Emission Calculations

S =	1	Based on AP-42, Table 5.2-1
P =	0.619	psia (based on ethanol)
M =	46	lb/lb-mole for EtOH
T =	521	degrees R (at 60.55 degrees F from TANKS program)
eff =	99%	assumes 99% BACT VOC vapor destruction system

LL = 0.00681 lbs per 1000 gallons of liquid loaded.

Emissions Controlled by Vapor Combustor

111.08	lbs/yr
0.12	lbs/hr
0.06	tons/yr

Emissions from Vapor Combustor

Pilot Emissions from natural gas				
NOx Emissions @0.06 lb/MM Btu	64.88 lb/yr	0.072 lb/hr	0.03 ton/yr	AP - 42 Table 13.5-1
CO Emissions @ 0.37 lb/MM Btu	353 lb/yr	0.390 lb/hr	0.18 ton/yr	AP - 42 Table 13.5-1
VOC Emissions @ 0.140 lb/MM Btu	133.6 lb/yr	0.147 lb/hr	0.07 ton/yr	AP - 42 Table 13.5-1
Particulate Emissions @ 0.026 lb/MM Btu	24.81 lb/yr	0.027 lb/hr	0.01 ton/yr	From

Emissions from Vapor Combustion

Heat Input to Combustor	0.18 MM Btu/hr			
Loading Hours per year	906.2 hours/year			
NOx Emissions @0.06 lb/MM Btu	54.37 lb/yr	0.060 lb/hr	0.03 ton/yr	Per supplier
CO Emissions @ 0.01 lb/MM Btu	9.062 lb/yr	0.010 lb/hr	0.00 ton/yr	Per supplier

Pilot + Vapor Combustion Emissions

NOx Emissions	0.132 lb/hr	0.06 ton/yr
CO Emissions	0.400 lb/hr	0.18 ton/yr
VOC Emissions	0.147 lb/hr	0.12 ton/yr
Particulate Emissions	0.027 lb/hr	0.01 ton/yr

Submitted by Lee Rich Sept 7 2012 BMac Sep20 2012

Supplemental Natural Gas

Supplemental natural gas for combustion =	17.12	scfm	1027.2	scfh
Heating Value of natural gas	1025	Btu/scf HHV		
Heat Release when burning natural gas	17,548	Btu/min	1.053	MMBtu/hour
Base hours of loading for emissions calculations	906.2	hrs, See cell D9 for calculated hours		
Minutes of combustion per year	54,372	min		
Heat Release per year	954.114007	MM Btu/yr		

Truck Vapors

Calculated HHV of vapors in truck based on Fluor loading flare data sheet	62.01	Btu/scf
Flowrate of truck vapors when loading at 300 gpm	48.6	SCFM
Hourly Flow Rate	2916	scfh
Heat Release of truck vapors	3013.686	Btu/min
Heat Release of truck vapors	180,821	Btu/hr
MM Btu/yr of heat release from truck vapors	163.86	MMBtu/yr
Total BTU/hour	**1.2337012**	**MMBtu/hour**

Greenhouse Gas Emissions from Vapor (ethanol) Feed				
Fuel use =	1.23370116	Mmbtu/year		
CO2 =	185.7559163 @	68.44 kg/Mmbtu		
Methane	0.182390379 @	0.003		
N2O	0.547171138 @	6E-04		
Total CO2e	**186.49**	**lb/year**	**0.093**	**ton/yr**
Biogenic	135.57	0.73	0.068	
Fossil	50.91	0.27	0.025	

Greenhouse Gas Emissions Natural Gas Pilot					
Based on annual fuel use and emission factors in 40 CFR 98 Table C-1. -					
Fuel use =	954	Mmbtu/yr	Nat gas	MMBtu/scf	1025
CO2	55.7723	ton/year	55.77	ton/year of CO2e	
CH4	0.00105	ton/year	0.02	ton/year of CO2e	
N2O	0.00011	ton/year	0.03	ton/year of CO2e	
Total Annual CO2e emissions			**55.83**	**ton/year of CO2e**	

Stack Dia	0.17	Feet
Exit	42.5	Ft/sec
Temperature	1800	F
Volume	57.88	acfm
	11.204	scfm

FIREWATER PUMP EMISSION CALCULATIONS

Emission Source:	Firewater Pump
Source Type:	Diesel Fired Industrial Engine
Rated Engine Capacity	399 Horsepower
BSCF	7000 Btu/hp-hr
Annual Hours of Operation	100 hours/year
Fuel Use	15.30 gal/hr

	Pollutant	Factor lb/MMBtu	Avg. lbs/hr[1A]	Total tons/yr[2]	Source of Factor
CRITERIA	NO_x	4.41E+00	12.32	0.62	AP-42, Table 3.3-1, 10/96
	CO	9.50E-01	2.65	0.13	AP-42, Table 3.3-1, 10/96
	TSP=PM_{10}=$PM_{2.5}$	3.10E-01	0.87	0.04	AP-42, Table 3.3-1, 10/96
	SO_2	1.52E-03	0.004	0.0002	AP-42, Table 3.4-1, 10/96
	VOC	3.28E-01	0.91	0.046	AP-42, Table 3.3-1, 10/96[3]
	HAP Pollutant	**lb/MMBtu**	**lbs/hr[1A]**	**tons/yr[2]**	
HAZARDOUS AIR POLLUTANTS	N-Hexanes	–	–	–	No emission factor
	Formaldehyde	1.18E-03	3.30E-03	1.65E-04	AP-42, Table 3.3-2, 10/96
	Acetaldehyde	7.67E-04	2.14E-03	1.07E-04	AP-42, Table 3.3-2, 10/96
	Benzene	9.33E-04	2.61E-03	1.30E-04	AP-42, Table 3.3-2, 10/96
	Toluene	4.09E-04	1.14E-03	5.71E-05	AP-42, Table 3.3-2, 10/96
	Xylenes	2.85E-04	7.96E-04	3.98E-05	AP-42, Table 3.3-2, 10/96
	Total HAP		9.98E-03	4.99E-04	

Notes:

[1A] Hourly Emission Rate (Lbs/Hr) = (Emission Factor, Lb/MMBtu) * (Engine Capacity, HP) * (Engine Heat Input, Btu/HP-Hr) * (1 MMBtu/10^6 Btu)

[2] Annual Emission Rate (Tons/Yr) = (Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 Lbs/Ton), assume 100 hours of operation per year for testing purposes.

Greenhouse Gas Emissions Based on annual fuel use and emission factors in 40 CFR 98 Table C-1. -					
Fuel use =	1530	gallons	#2 Diesel	MMBtu/gal =	0.138
CO2	17.2165456	ton/year	17.2165456	ton/year of CO2e	
CH4	0.00069835	ton/year	0.01466526	ton/year of CO2e	
N2O	0.00013967	ton/year	0.04469412	ton/year of CO2e	
Total Annual CO2e emissions			**17**	**ton/year of CO2e**	

EMERGENCY GENERATOR EMISSION CALCULATIONS

Emission Source: Emergency Generator
Source Type: Diesel Fired Industrial Engine

Rated Engine Capacity	9.4	MM Btu/hr
BSCF	7000	Btu/hp-hr
Annual Hours of Operation	100	hours/year
Fuel Use	68.52	gal/hr

	Pollutant	Emission Factor	Units	Avg. lbs/hr[1]	Total tons/yr[2]	Source of Factor
CRITERIA	NO_x	4.80	g/Hp-hr	14.19	0.71	40 CFR Part 60 §60.4205(c)
	CO	2.60	g/Hp-hr	7.69	0.38	40 CFR Part 60 §60.4205(c)
	$TSP=PM_{10}=PM_{2.5}$	0.15	g/Hp-hr	0.44	0.02	40 CFR Part 60 §60.4205(c)
	SO_2	1.52E-03	lb/MMBtu	0.01	0.001	AP-42, Table 3.4-1, 10/96
	VOC[3]	9.00E-02	lb/MMBtu	0.84	0.04	AP-42, Table 3.4-1, 10/96
HAZARDOUS AIR POLLUTANTS	Formaldehyde	7.89E-05	lb/MMBtu	7.41E-04	3.70E-05	AP-42, Table 3.4-3, 10/96
	Acetaldehyde	2.52E-05	lb/MMBtu	2.37E-04	1.18E-05	AP-42, Table 3.4-3, 10/96
	Benzene	7.76E-04	lb/MMBtu	7.28E-03	3.64E-04	AP-42, Table 3.4-3, 10/96
	Toluene	2.81E-04	lb/MMBtu	2.64E-03	1.32E-04	AP-42, Table 3.4-3, 10/96
	Acrolein	7.88E-06	lb/MMBtu	7.40E-05	3.70E-06	AP-42, Table 3.4-3, 10/96
	Xylenes	1.93E-04	lb/MMBtu	1.81E-03	9.06E-05	AP-42, Table 3.4-3, 10/96
	Total HAP			1.28E-02	6.39E-04	

Notes:

AP-42 Emission Factors: Hourly Emission Rate (Lbs/Hr) = (Emission Factor, Lb/MM Btu) * (6.85 gal/hr * 137,000 Btu/gal)

[1] 40 CFR Part 60 Subpart IIII Emission Factors: Hourly Emission Rate (Lbs/Hr) = (Emission Factor, g/Hp=hr) / (453.6g/lb) / (7,000 Btu/Hp-hr) * (10^6) * (68.5 gal/hr * 137,000 Btu/gal)

[2] Annual Emission Rate (Tons/Yr) = (Hourly Emission Rate, Lbs/Hr) * (Hour of Operation Per Year, Hr/Yr) / (2,000 lbs/Ton)

[3] AP-42 Factor is provided for TOC. No specific factor is provided for VOC. According to AP-42, Table 3.4-1, Note f "Based on data from 1 engine, TOC is by weight 9% methane and 91% nonmethane." Assume that all nonmenthane emissions are VOC's.

Greenhouse Gas Emissions
Based on annual fuel use and emission factors in 40 CFR 98 Table C-1. -

Fuel use =	6852	gallons	#2 Diesel	MMBtu/gal =	0.138
CO2	77.0984089	ton/year	77.09840892	ton/year of CO2e	
CH4	0.0031273	ton/year	0.065673334	ton/year of CO2e	
N2O	0.00062546	ton/year	0.200147303	ton/year of CO2e	
Total Annual CO2e emissions			**77**	**ton/year of CO2e**	

EVAPORATIVE COOLING TOWER EMISSION CALCULATIONS

Emission Source: Evaporative Cooling Tower
Source Type: Particulate Emissions from Drift

Cooling Tower Circulation Rate:	3100	gpm	
	1,550,682	lb/hr	775 ton/hour
Total Dissolved Solids (TDS)	790	ppm	
Annual Hours of Operation	8760	hours/year	
Drift	0.001	%	

Particulate Emissions	1.23E-02	lb/hr
	5.37E-02	ton/yr

PARTICULATE SILO EMISSION CALCULATIONS

Emission Source:	Particulate Silo	
Source Type:	Storage Silo	
Emission Factor:	0.01	gr/dscf
Loading Rate:	1,276	scf/min
Annual Hours of Operation	176	hours/year

Pollutant	Emission Factor	Units	Avg. lbs/hr[1]	Total tons/yr[2]	Source of Factor
TSP=PM_{10}=$PM_{2.5}$	0.01	gr/dscf	0.11	0.01	Manufacturer Specifications

NOTES: [1]Hourly Emission Rate (lb/hr) = (Emission Factor, gr/dscf) * (Loading Rate, 1,276 scf/min) * (60 min/hr) * (1/7,000 gr/lb)
[2]Annual Emission Rate (ton/yr) = (Hourly Emission Rate, lb/hr) * Annual Hours of Operation, hr/yr) * (1/2,000 lb/ton)

Appendix 5

EMISSIONS CAP

Please Attach Emission Cap Information

☒ **Please Check if not applicable**

Appendix 6

NARRATIVE DESCRIPTION

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PROCESS FLOW DIAGRAM

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PLOT PLAN

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MAP

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DUST CONTROL PLAN

6.0 Project Description

A *Class II Air Quality Operating Permit to Construct* ("***Air Permit***") is being requested by Fulcrum Sierra BioFuels, LLC ("***Sierra BioFuels***") from the Nevada Division of Environmental Protection, Bureau of Air Pollution Control ("***NDEP-BAPC***"). The Air Permit is for construction and operation of a waste-to-ethanol facility (the "***Facility***") for the production of ethanol from municipal solid waste ("***MSW***") feedstock ("***Feedstock***"). The Project is located at 3600 Peru Drive within the Tahoe-Reno Industrial Center, in McCarran, Storey County, Nevada (the "***Site***").

6.1 Project Overview

The Facility will convert non-hazardous feedstock into synthesis gas (syngas) using a single syngas generation system. The syngas will be used as feedstock to the ethanol reactor production , and as a source of fuel for the production of steam at the Facility. Figure 6-1 depicts the process flow block diagram for the Facility.

The feedstock will be comprised of the organic component of MSW and/or construction and demolition waste streams derived from the residual materials remaining after recycling operations are performed by material recovery facilities. The bulk of MSW processing to prepare Feedstock for gasification is located at an off-site facility. Sierra BioFuels will construct, own, and operate this off-site MSW processing facility, which will be permitted separately. This off-site MSW Processing facility extracts the non-hazardous components of MSW delivered from Waste Management and Waste Connections. Thus, the Feedstock composition remains unchanged and is delivered in wrapped bales to the Facility, whereupon it may be temporarily stored, before being de-baled, shredded, and fed into the gasifier. The single gasifier Feedstock usage is estimated to be 600 tons per 24 hours and 219,000 tons per 12-month rolling period.

From the shredders, the Feedstock is then fed to a feed bin that supplies a single gasifier. The gasification process is a two-step combination of steam reforming followed by partial oxidization. The steam reformer operates in a fluidized bed that is indirectly heated by an in-situ heater. To ensure high carbon conversion, downstream of the steam reformer is another fluidized bed vessel, a carbon trim cell. The carbon trim cell operates with oxygen in a sub-stoichiometric mode to gasify residual carbon to carbon monoxide ("***CO***"). The products from the carbon trim cell pass through a cyclone to drop out the entrained particulate materials. The particulates are discharged from the cyclone and are cooled then conveyed to storage prior to disposal. The syngas from the first and second stage gasifiers are combined along with oxygen, steam and co-product alcohols for additional generation of syngas in a partial oxidation unit ("***POx***"). Within the POx these co-products are gasified along with any residual methane. From the POx, the syngas is mixed with a cool recycle syngas stream prior to entering a waste heat steam generator ("***WHSG***"). In the WHSG, the syngas is further cooled while generating steam for process use. After the WHSG the cooled syngas passes through a venturi scrubber where the syngas is further cleaned of acid gases and residual particulates.

After the syngas leaves the scrubber most of the syngas is compressed to an intermediate pressure for further processing. Excess syngas, as a slip stream that is not compressed, passes through an amine absorber for removal of hydrogen sulfide ("***H_2S***") and is then used as fuel for the steam boiler. The balance of the syngas requires compression to an intermediate pressure before traversing a series of guard beds that remove any trace contaminants that could potentially impact the downstream catalyst. The guard beds are properly maintained, removed, and recycled by the bed provider. Next, the syngas is further compressed, combined with recycle syngas, and then enters the solvent system that removes carbon dioxide ("***CO_2***") and H_2S. This removed CO_2 and H_2S stream is further processed through a sulfur removal system. The sulfur removal system uses a redox absorption process to remove hydrogen sulfide to produce sulfur slurry that will be filtered to reduce the water content and the sulfur will either be sold or disposed of in accordance with all applicable regulations.

The conditioned syngas is compressed to a slightly higher pressure prior to entering the alcohol synthesis loop, where a catalytic reactor converts syngas into alcohols, principally ethanol. Within the ethanol synthesis loop, excess CO_2 , methane, and other syngas constituents (purge gas, see next paragraph) are removed to maintain the proper synthesis gas composition. The alcohol product is then cooled and absorbed into water for the first stage of the purification area, which removes excess water and any other impurities via several distillation columns before being sent to above-ground storage tanks. The tanks are internal, floating roof tanks that are located in a diked area designed to provide the required secondary

containment. The ethanol product is denatured and loaded into trucks for shipment to market. The truck loading facility includes a separate flare for handling vapors generated during the loading process.

The purge gas is routed to a hydrogen recovery unit where hydrogen is removed and recovered back into the syngas going to the reactor. The balance of the purge gas is used in a steam boiler to produce renewable steam energy for powering a steam turbine compressor and for process heating.

6.2 Project Emission Units and Process Systems

Summarized below are the proposed permitted emission units as well as the process systems that the units have been grouped into.

Table 6-1 Project Emission Units

Emission Unit	Description
System 1	**Feedstock Processing**
	Feedstock Receipt and Debaling System: Design rate 25 tons per hour and 219,000 tons per year with baghouse control.
S2.001, S2.002, S2.003, S2.004, S2.005	Emission Units: Infeed Belt Conveyor. Distribution Conveyor. Materials Conveyor. Materials Metering Bins. Airlock Screw Conveyors.
System 2	**Feedstock Storage and Handling**
	Feedstock Handling and Conveying System: Design rate 25 tons per hour and 219,000 tons per year with baghouse control.
S2.006, S2.007, S2.008, S2.009, S2.010	Emission Units: Walking Floor Conveyor. Scalping Conveyor. Materials Conveyor. Materials Metering Bins. Airlock Screw Conveyors.
System 3	**Synthesis Gasification (Syngas) Units**
S2.011	Syngas gasifier: Design rate of 600 tons per 24 hours and 219,000 tons per 12-month rolling period with Enclosed Flare control.
System 4	**Partial Oxidation (POx) Unit Heater**
S2.012	8.0 MMBtu/hour Natural Gas Fired Heater for the Partial Oxidation process
System 5	**Pulse Combustor Heaters**
S2.013	Four separate heaters, fired on syngas stream, vented through main Boiler Stack (System 6)
System 6	**Boiler**
S2.014	Natural Gas, Purge Gas and Syngas fueled Boiler, vented through the main Boiler Stack: Design rating 146 MMBtu/hour
System 7	**Ground Level Enclosed Flare**
S2.015	Ground Level Enclosed Flare: Controlled units/processes gasification train and Ethanol Production Plant.
System 8	**Sulfur Removal System**
S2.016	Sulfur removal system: Design rate of 0.075 tons per hour and 657 tons per year.
System 9	**Ethanol Production Plant**
	Ethanol production with a design rate of 16,311,500 gallons per 12-month period.
PF1.001 S2.017, S2.018, S2.019, S2.020	Emissions Units: Recalculated total fugitive VOC emissions from equipment components. CO2/H2S Removal System. Ethanol Catalytic Reactor. 2 or 3 Stage Distillation System. Molecular Sieve Regeneration System.

Emission Unit	Description
System 10	**Ethanol Product Storage Tank**
S2.021	Internal floating roof 280,000 gallon Ethanol Product Storage Tank.
System 11	**Off-Spec Storage Tank**
S2.022	Internal floating roof 83,000 gallon Off-Spec Product Storage Tank
System 12	**Intermediate Product and Byproduct Storage Tanks**
	Storage Tanks
S2.023, S2.024 S2.025, S2.026, S2.027	Emissions Units: Two internal floating roof 39,300 gallon Ethanol Product Storage Tanks. Internal floating roof 7,500 gallon Methanol Storage Tank. Internal floating roof 15,000 gallon Fusel Oil Storage Tank. Cone roof 39,000 gallon Amine Solvent Storage Tank.
System 13	**Tank Truck Loading Rack and Flare**
	Product loading to tanker trucks or tanker rail cars with flare controls.
S2.028, S2.029	Emissions Units: Product Loading to Tanker Trucks or Tanker Rail Cars. Loading Flare.
System 14	**Gasoline Storage Tank**
S2.030	Internal floating roof 9,000 gallon Gasoline Storage Tank.
System 15	**Particulate Silo**
	Continuous unloading, batch loading 30 ton Particulate Silo: Design Rate of 11.25 tons per hour and 1,971 tons per year.
PF1.002, S2.031	Emissions Units: Process fugitives. Particulate Silo.
System 16	**Diesel Firewater Pump**
S2.032	399 Hp Diesel Firewater Pump Engine.
System 17	**Emergency Diesel Generator**
S2.033	1000 kW (1490 BHP) Emergency Diesel Generator
System 18	**Mechanical Draft Cooling Tower**
S2.034	Cooling tower for general process cooling and power generation steam cycle: Design Circulation Rate 775 tons per hour (3,100 gal/min) and 6.79 MMtons per year.

6.3 Regulatory Applicability – New Source Performance Standards (NSPS)

NSPS Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

Subpart Db is applicable to each steam generating unit for which construction, modification, or reconstruction is commenced after June 19, 1984 and that has a maximum design heat input capacity of 29 MW (100 million British thermal units per hour ("***MMBtu/hr***")) or more.

Subpart Db applies to the proposed syngas and natural gas fired boiler Sierra BioFuels. The sulfur dioxide ("SO_2") emission limit is 0.20 lb/MMBtu for units combusting natural gas and any other fuel that is not specifically listed (40 CFR 60.42b(k)(1)). The nitrogen oxide ("***NOx***") emission rates are limited to 0.10 lb/MMBtu for a low-heat release rate boiler and 0.20 lb/MMBtu for a high-heat release rate boiler. (40 CFR 60.44b(a). Sierra BioFuels has determined that the proposed boiler is a high heat-release rate boiler. There is no particulate matter emission limit for units firing only natural gas and no specified standards limit for units firing syngas. A 24-hour initial test for SO2 emissions is required (subject to clarification regarding fuel quality), and a 30-day compliance test is required for NOx emissions. Sierra BioFuels will comply with the initial notification requirements of 40 CFR 60.49b(a), submittal of the performance data in 40 CFR 60.49b(b) and monitor and maintain records of NOx emissions and fuel use as required in 40 CFR 60.49b.

NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

NSPS Subpart Kb applies to new tanks storing volatile organic liquids if the tank is larger than 40,000 gallons and the stored material has a vapor pressure greater than 3.5 kilopascals ("***kPa***") or if the tank is between 20,000 and 40,000 gallons and has a maximum true vapor pressure greater than 15 kPA.

Due to the vapor pressure and tank size of the ethanol storage tank, Subpart Kb applies only to the following Sierra BioFuels storage tanks:

- Two 39,300 gallon, net working capacity, Day Tanks.
- One 83,000 gallon, net working capacity, Off-spec Product Tank.
- One 280,000 gallon, net working capacity, Ethanol product Storage Tank
- One new 39,000 gallon solvent storage tank

Sierra BioFuels' affected tanks will comply with § 60.112(b)(3) by having a floating roof design to minimize vapor emissions. Sierra BioFuels will also comply with the periodic inspection and repair requirements (§ 60.113(b)) as well as all appropriate monitoring, testing, and reporting requirements. The flare will meet the requirements of 40 CFR 60.18.

NSPS Subpart VVa – Standards of Performance for Equipment Leaks of volatile organic compounds ("***VOC***") in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006

Subpart VVa applies to "process units" in the synthetic organic chemical manufacturing industry ("***SOCMI***") that commences construction, reconstruction, or modification after November 7, 2006. SOCMI is defined in § 60.481 as the industry that produces any of the chemicals listed in § 60.489, which includes ethanol. Sierra BioFuels will develop and follow a Leak Detection and Repair ("***LDAR***") program for any equipment that processes gas or liquids in VOC service.

NSPS Subpart NNN – Standards of Performance for VOC Emissions from Synthetic Organic Chemical Manufacturing Industry Distillation Operations

Subpart NNN applies to vent streams from distillation operations at process units that produce ethanol and requires that the total organic compounds ("***TOC***") content of the vent stream (not including methane or ethane) be reduced by 98 weight percent. (40 CFR 60.662(a).)

The vent streams will be ducted to the flare, content in the vent streams from the distillation operations are reduced by 98%.

NSPS Subpart RRR – Standards of Performance for VOC Emissions from Synthetic Organic Chemical Manufacturing Industry Reactor Processes

Subpart RRR applies to vent streams from reactor processes at process units that produce chemicals listed in 60.707, including ethanol. However, the vent streams generated by the ethanol plant reactor will be routed to a distillation unit subject to Subpart NNN.

Under § 60.700(c)(5) the Facility is exempt from all provisions of Subpart RRR except for the requirement to submit a process design description as part of the initial report. This description will be submitted as part of the initial notification and will be retained for the life of the process.

NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

Per 40 CFR 60.4200(a)(2) , the provisions of Subpart IIII apply to owners, and operators of stationary compression ignition ("***CI***") internal combustion engines ("***ICE***") that commence construction after July 11, 2005 where the stationary CI ICE are:

(i) Manufactured after April 1, 2006 and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association ("***NFPA***") fire pump engine after July 1, 2006.

The emergency generator and firewater pump engine are CI ICE and will commence construction after 2007. The provisions of Subpart IIII will apply to the emergency generator and a firewater pump.

As currently planned the emergency generator will comply with the emission standards for new nonroad CI engines in §60.4202(a)(2) as specified in 60.4205(b)

The firewater pump will comply with the emission standards specified in Table 4 of Subpart IIII as required in 60.4205(c).

The fuel oil will meet the specifications in accord with 60.4207. The facility will install a non-resettable hour meter on each engine prior to startup in accord with 60.4209(a). The engines will be operated in accord with the manufacturer's procedures as required in 60.4211.(a). A notification of startup is not required as provided for the proposed engines, as provided in 60.4214(b).

Boiler MACT (40 CFR 63 Subpart JJJJJJ) for Area Sources – Sierra BioFuels' proposed syngas and natural gas-fired boiler does not combust any solid fuels or solid waste materials. The unit qualifies as a gas-fired boiler and is exempt under 63.11195(e) from regulation under this subpart.

6.4 Regulatory Applicability – Exemption from NSPS Subpart AAAA – Standards of Performance for Municipal Solid Waste Combustors.

Based on the design of the system, Sierra BioFuels has determined that this regulation is not applicable to the proposed activities and equipment. The details of that determination is included here.

6.4.1 Relationship Between the Non-Hazardous Secondary Materials Rule and NSPS Subpart AAAA

NSPS Subpart AAAA, which regulates municipal solid waste combustion units, was promulgated pursuant to Section 129 of the Clean Air Act (CAA). Recently, due to uncertainties regarding what constitutes "solid waste," EPA promulgated regulations clarifying that certain intermediate fuels that have been adequately processed to remove contaminants, such as syngas, are not considered "solid waste." According to EPA, sources that combust these types of fuels are subject to separate CAA standards (*e.g.*, Section 112), not the Section 129 standards.

Background

Section 129 was added by the 1990 amendments to the CAA, and intended to address emissions from solid waste incineration units. The term "solid waste incineration unit" is defined, in pertinent part, to mean "a distinct operating unit of any facility which combusts any solid waste material from . . . the general public (including single and multiple residences, hotels, and motels)." 42 U.S.C. § 7429(g)(1). Section 129 further states that the term "solid waste" shall have the meaning "established by [EPA] pursuant to the Solid Waste Disposal Act [also referred to as RCRA]." *Id.* § 7429(g)(6).

Section 129 identifies three types of solid waste: industrial, commercial, and municipal. The statute also establishes separate deadlines for regulating solid waste incineration units depending on the volume and type of solid waste combusted. *Id.* § 7429(a)(1)(A)-€. Section 129 defines "municipal waste," but only for

purposes of distinguishing between municipal, industrial, and commercial solid waste. *Id.* § 7429(g)(5). In order to be subject to the Section 129 standards, the combustion unit must be combusting some form of "solid waste."

The Subpart AAAA standards were promulgated pursuant to EPA's obligations under Section 129. *See* 65 Fed. Reg. 76,350, 76,351 (Dec. 6, 2000) (in the final rule establishing Subpart AAAA, under the "Pollutants Regulated by the NSPS" subheading, EPA recites the requirements of Section 129). Subpart AAAA applies to municipal waste combustion units that "combust[] solid, liquid, or gasified municipal *solid waste* . . . ." 40 C.F.R. § 60.1465 (emphasis added). Thus—in accordance with Section 129—to be subject to Subpart AAAA, the combustion unit must be combusting some form of "solid waste."

Non-Hazardous Secondary Materials Rule

In 2011, due to uncertainties regarding what constitutes "solid waste," EPA promulgated regulations clarifying that certain intermediate fuels, such as syngas, are not considered "solid waste." 76 Fed. Reg. 15,455 (Mar. 21, 2011) ("Non-Hazardous Secondary Materials Rule"). Although the specific purpose of the rule was to clarify whether sources were subject to the Section 129 standards applicable to solid waste incineration units combusting commercial or industrial waste ("CISWI rule") or the National Emission Standards for Hazardous Air Pollutants for industrial, commercial, and institutional boilers ("Boiler MACT"), the rule more broadly clarifies what a "solid waste" is for purposes of Section 129 applicability. Under the Non-Hazardous Secondary Materials Rule, "traditional" fuels and fuels comparable to "traditional" fuels that are legitimately used as fuels are *not* considered "solid waste" and, as a result, are *not* subject to the Section 129 standards. In the preamble to the Non-Hazardous Secondary Materials Rule, EPA used syngas as an example of the types of legitimate fuels that are not "solid waste":

> Fuel or ingredient products that result from the processing of discarded non-hazardous secondary materials and that meet the legitimacy criteria as discussed below are not solid wastes. Because the resulting fuel/ingredient products are, in effect, reclaimed or extracted products from a recycling process, EPA considers such materials to be "new" products that have not been discarded and therefore are not solid wastes.
>
> . . .
>
> Synthesis gas (or syngas as it is commonly referred) produced from the gasification of solid waste is another material that can also meet the requirements of a fuel product produced from the processing of discarded non-hazardous secondary materials, provided the syngas has been adequately processed to remove contaminants.

76 Fed. Reg. at 15,537-38.

In EPA's determination, most non-hazardous secondary materials burned in combustion units are defined as solid wastes under RCRA. However, this rule provides exceptions to that determination. Each of the listed non-hazardous secondary materials, including the syngas described above, are not solid waste when used *legitimately* (emphasis added) as a fuel or an ingredient in a combustion unit.

> This provision-40 CFR 241.3(d)-codifies the legitimacy criteria for fuels and ingredients. In order to be considered a non-waste fuel, non-hazardous secondary materials used as a fuel in combustion units must meet the legitimacy criteria codified in §241.3(d)(1). To meet the fuel legitimacy criteria, the non-hazardous secondary material must be managed as a valuable commodity, have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy, and contain contaminants at levels comparable to or lower than those in traditional fuels which the combustion unit is designed to burn.
>
> In order to be considered a non-waste ingredient, non-hazardous secondary materials used as an ingredient in combustion units must meet the legitimacy criteria codified in §241.3(d)(2). To meet the ingredient legitimacy criteria, the non-hazardous secondary material must be managed as a valuable commodity, provide a useful contribution to the production or manufacturing process, be

used to produce a valuable product or intermediate, and must result in products that contain contaminants at levels that are comparable to or lower than those found in traditional products that are manufactured without the non-hazardous secondary material.

Therefore, boilers that combust syngas that has been adequately processed to remove contaminants are *not* subject to Section 129 standards (*e.g.*, NSPS Subpart AAAA). Instead, they are subject to other applicable CAA standards, such as NSPS that are not derived from Section 129 (*e.g.*, NSPS Subpart D) or Section 112 standards. Notably, gas-fired boilers are exempt from the area source Section 112 Boiler MACT. 40 C.F.R. § 63.11195(e).

6.4.2 Applicability of NSPS, Subpart AAAA to Project Sierra

NSPS Subpart AAAA applies to municipal waste combustion units that "combusts" solid, liquid, or gasified municipal *solid waste* . . . ." 40 C.F.R. § 60.1465 (emphasis added). Subpart AAAA does not apply to Project Sierra because the synthesis fuel gas ("syngas") the boiler will combust is not "solid waste" as defined by EPA's recent solid-waste identification rule. *See* 76 Fed. Reg. 15,455 (Mar. 21, 2011) ("Non-Hazardous Secondary Materials Rule").

In the preamble to the Non-Hazardous Secondary Materials Rule, EPA used syngas as an example of the types of legitimate fuels that are not "solid waste":

> "Fuel or ingredient products that result from the processing of discarded non-hazardous secondary materials and that meet the legitimacy criteria as discussed below are not solid wastes. Because the resulting fuel/ingredient products are, in effect, reclaimed or extracted products from a recycling process, EPA considers such materials to be "new" products that have not been discarded and therefore are not solid wastes."

At Sierra BioFuels, the syngas qualifies as a "new" product because it has been adequately processed to remove contaminants, and meets the legitimacy criteria as a fuel. See 40 C.F.R. § 241.3(d)(1).

The Non-Hazardous Secondary Materials Rule exempts from the definition of "solid waste" both: (1) "traditional" fuels; and (2) comparable fuels that are legitimately used as fuel. The syngas at Sierra BioFuels qualifies as both.

EPA's regulations define "traditional" fuels to include synthetic fuel. The syngas at Sierra BioFuels is a "synthetic fuel," as it derived from biomass and waste. *See* 40 C.F.R. § 241.2. Although "synthetic fuel"—as defined by the regulations—refers only to fossil-fuel derived "synthetic fuel," the list of "traditional" fuels is not meant to be exhaustive. *Id.* Because syngas is produced as a fuel and not discarded after its production, it should similarly be treated as a "traditional" fuel and, as a consequence, not considered "solid waste."

Here, the syngas qualifies as a "new" product because it has been adequately processed to remove contaminants, and meets the legitimacy criteria.

All three of the legitimacy criteria are met in this instance because the syngas at Sierra BioFuels: (1) will be managed as a valuable commodity (the syngas will be managed similar to natural gas); (2) will have a meaningful heating value and will be used as a fuel in a combustion unit that recovers energy (materials with an energy value greater than 5,000 Btu/lb automatically satisfy this requirement); and (3) will contain contaminants at levels comparable to or less than those in traditional fuels which the combustion unit is designed to burn. *See* 40 C.F.R. § 241.3(d)(1).

Regarding the third criteria, while the rule requires comparison of contaminants prior to combustion, EPA also considers the emissions profile of the secondary material in deciding whether the material is "solid waste." *See, e.g.,* Letter from James R. Berlow, U.S. EPA, Director, Program Implementation and Information Division, Office of Solid Waste and Emergency Response, to Fadi K. Mourad, P.E., Director, Environmental Affairs, DTE Energy Services, Inc., at 4 (Mar. 16, 2012) (finding the comparable fuels exemption to be appropriate even though the secondary material had more nitrogen than coal because the emissions profiles would be similar).

Here, the appropriate comparable fuel is natural gas because the boiler is capable of burning both natural gas and syngas. The only contaminants in the syngas at Sierra BioFuels present at higher levels prior to combustion are nitrogen, carbon monoxide, and the constituents that will create SO_2 when combusted

(*e.g.*, carbonyl-sulfide, dimethyl-sulfide, organic sulfur). The emissions profiles of the syngas and natural gas at the boiler, however, demonstrate that they are comparable fuels.

Although there is more nitrogen present in the syngas prior to combustion, the NO_x emissions profile, assuming 8,760 hours of operation, is *identical* for both the syngas and natural gas.

Carbon monoxide—as a carbon compound—is being burned for fuel, which aligns with the aim of the comparable fuels exclusion to ensure that the non-hazardous secondary material is not being "burned for discard." 76 Fed. Reg. at 80,470. Further, carbon monoxide is a combustion-related pollutant. To the extent the combustion of carbon monoxide results in increased VOC emissions, the VOC emissions profile of the syngas and natural gas is still comparable on a tons per year basis.

Finally, while the syngas results in greater SO_2 and TSP emissions, the amount of annual SO_2 and TSP emissions are negligible, especially when compared to other "traditional" fuels. At the very least, the two fuels are "comparable" and, therefore, the syngas is not a "solid waste."

In sum, the boiler will not combust "solid waste" because the syngas is either a "traditional" fuel or qualifies for the comparable fuels exclusion in EPA's recent Non-Hazardous Secondary Materials Rule.

6.5 Evaluation of Greenhouse Gas Emissions Related to Permitting

On June 3, 2010, EPA promulgated the final Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Tailoring Rule. 75 Fed. Reg. 31,514 (***"Tailoring Rule"***). The Tailoring Rule set permit applicability thresholds for GHG emissions for new and existing facilities under the PSD and Title V programs. In March 2011, in response to public comment and a petition, EPA proposed to defer inclusion of biogenic CO_2 emissions when determining whether a stationary source meets the relevant PSD and Title V applicability thresholds. 76 Fed. Reg. 15,249 (Mar. 21, 2011). The three-year deferral was intended to allow EPA to conduct a detailed examination of the science associated with biogenic CO_2 emissions from stationary sources.

The deferral for biogenic CO_2 was finalized in July 2011, and is effective until July 21, 2014. 76 Fed. Reg. 43,490, 43,507 (July 20, 2011) (***"Final Rule"***). In the Final Rule, EPA defined "biogenic CO_2 emissions" broadly as "emissions of CO_2 from a stationary source directly resulting from the ***combustion or decomposition*** of biologically-based materials other than fossil fuels and mineral sources of carbon." 76 Fed. Reg. at 43,493 (emphasis added). EPA then provided a non-exhaustive list of examples of biogenic CO_2 emissions:

- CO_2 generated from the biological decomposition of waste in landfills, wastewater treatment or manure management processes;
- CO_2 from the combustion of biogas collected from biological decomposition of waste in landfills, wastewater treatment or manure management processes;
- CO_2 from fermentation during ethanol production or other industrial fermentation processes;
- CO_2 from combustion of the biological fraction of municipal solid waste or biosolids;
- CO_2 from combustion of the biological fraction of tire-derived fuel; and
- CO_2 derived from combustion of biological material, including all types of wood and wood waste, forest residue, and agricultural material

Id.

EPA also provided a table exemplifying the types of facilities that would be affected by the rule, arranged by category. EPA was careful to note that the list was "not intended to be exhaustive, but rather . . . a guide for readers regarding facilities likely to be affected by this action." 76 Fed. Reg. at 43,490. Under the category "fermentation processes," EPA included facilities associated with the North American Industry Classification System (NAICS) code 325193. NAICS code 325193 encompasses more than just fermentation processes, however, and includes all facilities "primarily engaged in manufacturing nonpotable ethyl alcohol."

In the response to comments document, EPA confirmed that all biogenic CO_2 emissions from ethanol manufacturing plants (*e.g.*, those associated with NAICS code 325193)—and not just the fermenting processes—are within the scope of the biogenic CO_2 deferral. Specifically, EPA addressed the following comment:

Commenter 0056.1 stated that "biogenic activities" should encompass everything from fermentation processes to the combustion of renewable fuels, including ***ethanol manufacturing***, biodiesel production, and other alternative production based on biomass feedstocks.

U.S. EPA, *Deferral for CO_2 Emissions from Bioenergy and Other Biogenic Sources under the PSD and Title V Programs: Summary of Public Comments and Responses*, at 27 (June 28, 2011) (emphasis added). In response, EPA stated:

EPA agrees that the activities described by the commenter represent activities that result in biogenic CO_2 emissions, as provided in the definition of "biogenic CO_2 emissions" in the preamble of the proposal. The definition includes CO_2 from combustion or decomposition of biologically-based materials, including CO_2 from fermentation during ethanol production and CO_2 derived from combustion of biological material, including all types of wood and wood waste, forest residue, and agricultural material.

Id. Accordingly, all CO_2 emissions from biogenic activities at a source fall within the scope of the biogenic CO_2 deferral, and should not be included when determining whether a stationary source meets the relevant PSD and Title V applicability thresholds.

At the Facility, emissions from the biogenic portion of the MSW used in the Feedstock, qualifies for the deferral under the Tailoring Rule. Sierra BioFuels has reviewed the contents of the expected (annualized) waste stream, and determined that approximately 72.7 percent of the carbon in the waste stream is biogenic, as shown in Table 6-2. Therefore 72.7 percent of the CO_2 emissions from any combustion sources that use syngas (purge stream or slip stream) is biogenic and therefore is deferred from being used to trigger PSD and Title V applicability thresholds. The data in Appendix 4 provide a summary of CO_2 emissions from these sources, and show that the total non-biogenic portion of the emitted CO_2, including all the CO_2 emitted from natural gas firing, is 85,962 ton/year (See Page 4-2 in Appendix 4). Using these data the non-biogenic GHG emissions for the Facility are less than 100,000 ton/year and therefore the PSD permitting program is not triggered under this application.

Table 6-2 – Sierra BioFuels Feedstock Specifications

Fulcrum Feedstock Specifications Jan 2013

			Per Day		Feedstock											
Incoming Material	Feedstock (% of Total)		553.72 Ton Test (Tons)	Pounds	Biogenic Fraction	Biogenic (Tons)	Non Biogenic (Tons)	Wet %	Dry Tons	Dry Carbon Fraction	Dry Carbon Tons	Dry Carbon %	Dry Carbon %	Biogenic	Fossil
EOF (Dry Engineered Organic Fuel)															
Mixed Paper/Fiber	31.15%		172.46	344,917	1	172.459	0	0.05	163.836	0.434	71.10	13.99%	13.99%	0.13993	0
Mixed Plastic	18.22%		100.90	201,810	0	0	100.905	0	100.905	0.812	81.75	12.15%	12.15%	0	0.12153
PVC (Light Packaging)	0.21%		1.16	2,298	0	0	1.14911	0.02	1.12612	0.452	0.51	0.10%	0.10%	0	0.001
Wood Waste	23.63%		130.84	261,677	1	130.839	0	0.2	104.671	0.495	51.81	10.20%	10.20%	0.10196	0
Rubber (Light 25%)	0.47%		2.61	5,220	0	0	2.61012	0.02	2.55792	0.78	2.00	0.39%	0.39%	0	0.00393
Textiles/Fabric	12.95%		71.68	143,359	1	71.6794	0	0.1	64.5115	0.55	35.48	6.98%	6.98%	0.06982	0
EOF (Wet Engineered Organic Fuel)															
Food Waste	0.03%		0.18	354	1	0.17714	0	0.7	0.05314	0.48	0.03	0.01%	0.01%	5E-05	0
Green/Yard Waste	0.01%		0.065	129	1	0.06469	0	0.8	0.02587	0.478	0.01	0.00%	0.00%	2.4E-05	0
Recyclable/Recoverable Materials						0	0								
Mixed Ferrous	0.05%		0.272	543	1	0.27171	0	0.03	0.26356	0.045	0.01	0.00%	0.00%	2.3E-05	0
Mixed Non-Ferrous	0.01%		0.056	111	1	0.05551	0	0.03	0.05385	0.045	0.00	0.00%	0.00%	4.8E-06	0
OCC	11.63%		64.42	128,848	1	64.4242	0	0.05	61.203	0.44	26.93	5.30%	5.30%	0.05299	0
PETE	0.38%		2.13	4,251	0	0	2.12528	0.02	2.08278	0.823	1.30	0.26%	0.26%	0	0.00255
HDPE (Colored)	0.40%		2.20	4,397	0	0	2.19857	0.02	2.1546	0.852	1.84	0.36%	0.36%	0	0.00361
HDPE (Natural)	0.40%		2.20	4,397	0	0	2.19857	0.02	2.1546	0.852	1.84	0.36%	0.36%	0	0.00361
Residue Materials															
Inerts (Rock, Concrete, Gravel)	0.03%		0.15	294	1	0.14724	0	0	0.14724	0	0.00	0.00%	0.00%		
E-Waste	0.43%		2.37	4,739	0	0	2.36961	0	2.36961	0.2	0.47	0.09%	0.09%		0.00093
Rubber (Heavy 75%)	0.01%		0.041	82	0	0	0.0412	0.02	0.04037	0.78	0.03	0.01%	0.01%		6.2E-05
Total	100.00%		553.72	1,107,440		440.117	113.603		508.157		255.11	50.203%	50.203%	0.36481	0.13723
					% of Tot.	79%	21%						100.00%	72.67%	27.33%

Table 6-3 Project Emission Unit List

ID	Unit or Operation Description
S2.001	MSW Feedstock Preparation Feed Hopper
S2.002	Walking Floor Conveyor
S2.003	Scalping Conveyor
S2.004	Materials Conveyor
S2.005	Shredder/Hammermill
S2.006	Walking Floor Conveyor
S2.007	Scalping Conveyor
S2.008	Materials Conveyor
S2.009	Materials Metering Bins
S2.010	Airlock Screw Conveyors
S2.011	Syngas Gasification Unit
S2.012	Partial Oxidation Unit Heater
S2.013	Four (4) Pulse Combustor Heaters
S2.014	146 MMBtu/hr Package Boiler – Natural gas and syngas fired.
S2.015	Ground Level Enclosed Flare with 0.31 MMBtu/hr Natural Gas Fired Pilot Light
S2.016	Sulfur Removal Packed Absorption Unit
PF1.001	Fugitive emissions from valves, pumps, compressors, sampling connections associated with the Ethanol Production Plant
S2.017	CO2/H2S Absorption/Removal System
S2.018	Ethanol Catalytic Reactor
S2.019	2 or 3 Stage Distillation System
S2.020	Molecular Sieve Regeneration System
S2.021	280,000 Gallon Ethanol Storage Tank
S2.022	83,000 Off-Spec Storage Tank
S2.023	39,300 Gallon Ethanol Day Tank (A)
S2.024	39,300 Gallon Ethanol Day Tank (B)
S2.025	7,500 Gallon Methanol Storage Tank
S2.026	15,000 gallon Fusel Oil Storage Tank
S2.027	39,000 Gallon Solvent Storage Tank
S2.028	Product Loading to Tanker Trucks or Tanker Rail Cars
S2.029	Tank Truck Loading Rack Flare
S2.030	9,000 Gallon Gasoline Storage Tank
S2.031	Particulate silo loaded by augur, wet materials
S2.032	399 Hp Diesel Firewater Pump Engine
S2.033	1,000 kW (1,490Hp) Diesel Emergency Generator
S2.034	Mechanical Draft Cooling Tower

6.6 Surface Area Disturbance Fugitive Dust Control Plan

The total surface area disturbance for the Site is estimated at 22.77 acres. Nevada Administrative Code 445B.22037 requires fugitive dust to be controlled, and requires an ongoing program, using the Best Practical Methods to prevent particulate matter from becoming airborne on a 7-day/24-hour/day basis. The measures indicated below comprise the Fugitive Dust Control Plan for the Site. The measures identified will be employed as needed and are subject to change as site conditions direct.

6.6.1 Best Practical Methods

- ☑ Use of water trucks to spray water on disturbed areas on a regular basis
- ☑ Pre-watering of areas to be disturbed (including all unpaved onsite roads and staging areas)
- ☑ Graveling of roadways, storage areas and staging areas
- ☑ Posting and limiting vehicle speeds to 10-15 miles per hour
- ☑ Use of wind fences to reduce wind impacts
- ☑ Cessation of all operations when winds make fugitive dust control difficult
- ☑ Fencing or berming to prevent unauthorized access to disturbed areas.
- ☑ Application of water sprays on material storage piles on a regular basis
- ☑ Covering material storage piles with tarpaulin or geo-textiles; tenting
- ☑ Use of overhead water spray rack or water hoses to water down uncovered trucks transporting processed materials prior to leaving Project boundaries.
- ☑ Track-out controls
  - ☑ Graveled entrance and exit areas
  - ☑ Street Sweeping
- ☑ Other
- ☑ Subcontractors: Any and all subcontractors (including truck drivers) informed of their responsibilities for the control of fugitive dust while they are on the project site (including haul roads to and from the site). In addition, they will be advised of the best practical methods for controlling their fugitive dust as well as keeping off adjacent areas not covered by the project's permit.
- ☑ Training of construction equipment operators to recognize fugitive dust generation and having the authority to shut down operations until water truck arrives and sprays water on the disturbed areas
- ☑ Equipment Operator and/or Responsible Official has read and understands the requirements in the Project's Surface Area Disturbance Permit and Plan

☐ Other Applicable BPM: _____

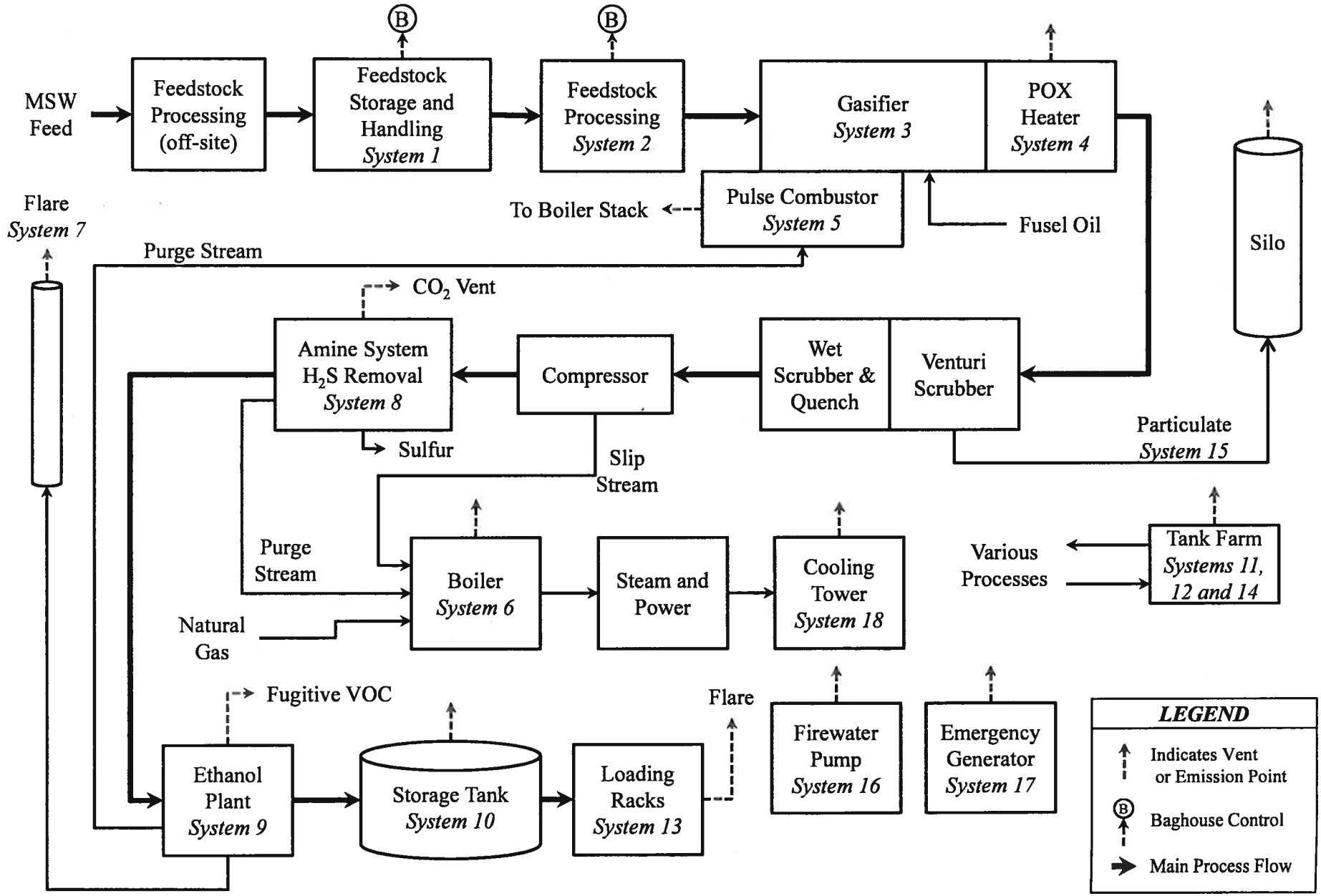
☐ Other Applicable BPM: _____

6.6.2 Recordkeeping and Notification

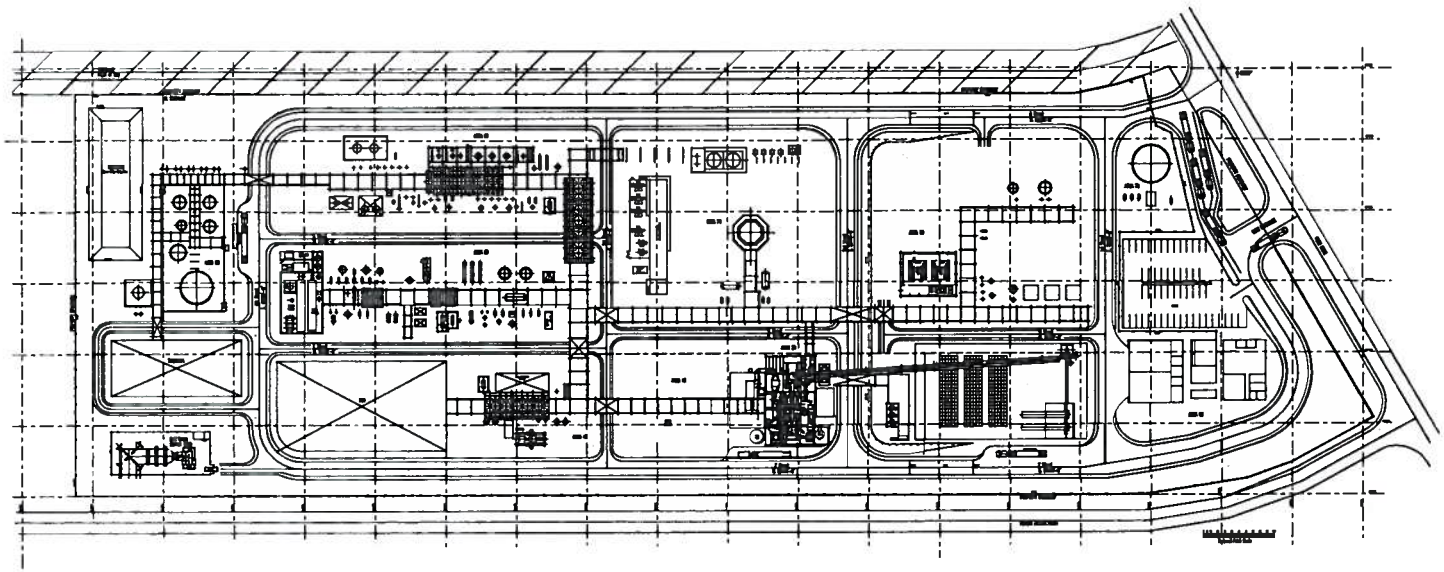
Records of equipment operational information (used for fugitive dust suppression) are kept at the site. Records include (but are not limited to) number of trucks used for dust/emission suppression, truck capacity, hours of operation and quantity of water used.

Should the Site conditions cause a suspected opacity exceedance, the Site's Responsible Official will be notified and make any necessary notifications to the NDEP-BAPC.

FULCRUM SIERRA
BLOCK PROCESS FLOW DIAGRAM



AREA	DESCRIPTION
00	COMMON
10	FEEDSTOCK PROCESSING
20	GASIFICATION
40	SYNGAS PREPARATION
50	ALCOHOL SYNTHESIS
60	ALCOHOL PURIFICATION
70	UTILITIES
80	OFFSITES
90	BUILDINGS



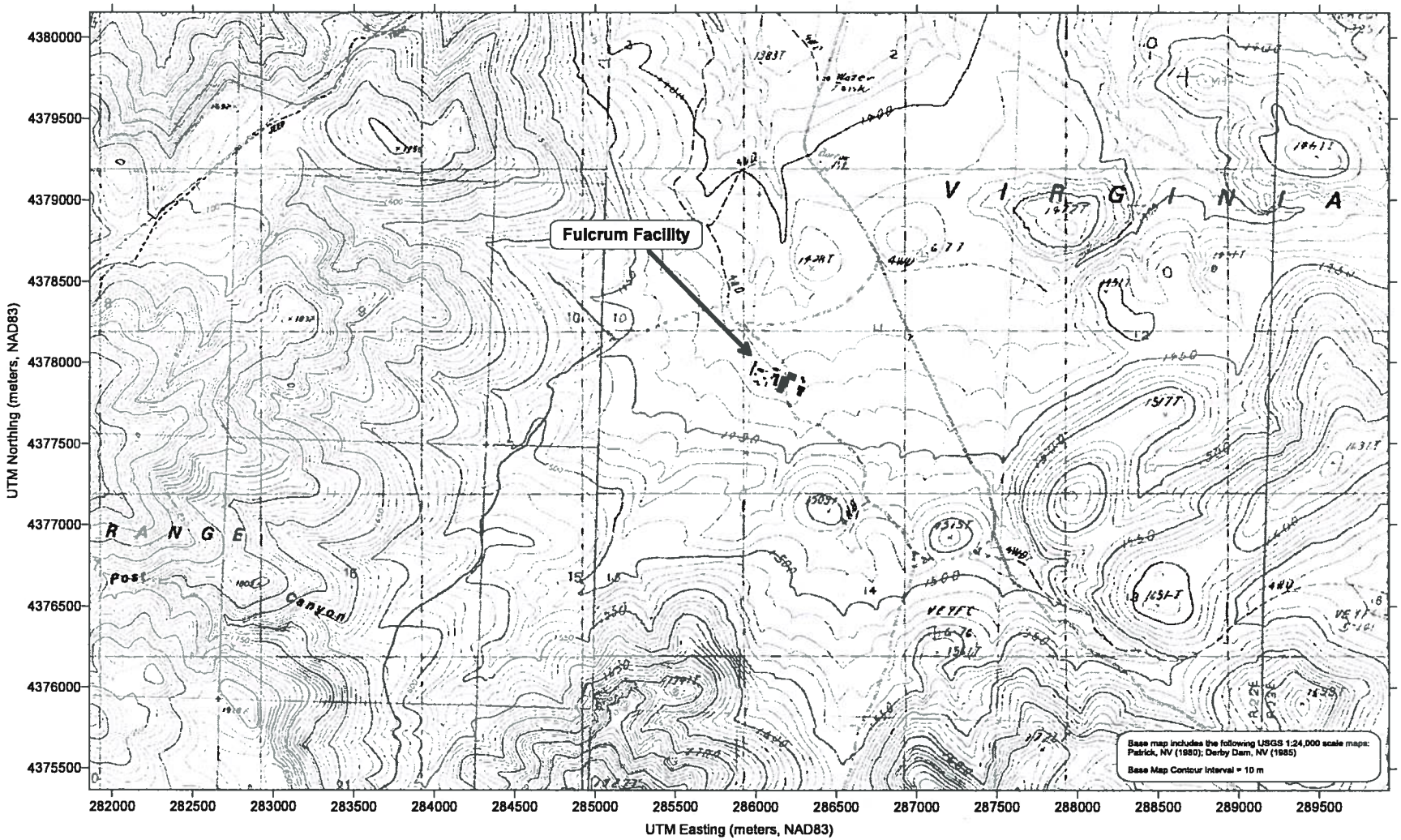
Fulcrum BIOENERGY

SIERRA BIOFUELS PLANT
OVERALL SITE PLAN

as noted

00-250-0001-sfered

00-250-0001



FULCRUM SIERRA BIOFUELS, LLC TAHOE-RENO INDUSTRIAL PARK, MCCARRAN, NV	LOCAL MAP
Date: 02/05/2010	

Appendix 7

ENVIRONMENTAL EVALUATION AND DISPERSION MODELING FILES

7.1 Air Quality Setting

7.1.1 Geography/Topography

Fulcrum Sierra BioFuels, LLC's (Fulcrum) facility is located at 3600 Peru Drive in the Tahoe-Reno Industrial Center, McCarran, Story County, Nevada, approximately 12 miles east of Sparks. The facility is located in complex terrain east of the Sierra Nevada Mountain Range which extends north and south along the California-Nevada border. Clark Mountain peaks at 7,198 feet elevation to the southwest of the site.

7.2.1 Climatology

The climate is considered semi-arid with frequent periods of low humidity. Precipitation averages 7.8 inches per year mostly during the winter months. Daily and seasonal temperatures vary widely, from 48°F to 24°F during the winter and between 92°F and 54° in the summer. Figure 7-1 contains a wind rose (2009-2010) which illustrates wind direction and wind speed frequency distributions, representing data that are used in the dispersion modeling analysis. As shown, the prevailing winds are predominantly from the west sector, however, a secondary prevailing wind direction is from the northeast.

7.3.1 Existing Air Quality

The federal government has set standards, specifically the National Ambient Air Quality Standards (NAAQS), for ambient concentrations of six "criteria" pollutants to protect human health. These health-based standards represent a threshold below which health impacts are not expected. The pollutants include ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead. This analysis also addresses the Nevada state standards for hydrogen sulfide (H_2S). Lead is not included as part of this analysis. An area with ambient air concentrations below the NAAQS levels is said to be "in attainment." The number of exceedances allowed depends on the pollutant considered and the averaging time, but is typically only once per year for short-term standards. The region of Nevada has been designated "in attainment" of the NAAQS for all criteria pollutants. Attainment status of $PM_{2.5}$ has not yet been determined.

The Nevada Division of Environment Protection - Bureau of Air Pollution Control (NBAPC) have also adopted the Nevada Ambient Air Quality Standards (AAQS) for the criteria pollutants. According to the NBAPC's *General Air Dispersion Modeling Guidelines, Revision December 2010*, air quality impacts for minor sources are to be compared with the AAQS and NAAQS as defined in NAC 445B.22097. All of the AAQS criteria are either equal to or more stringent than the NAAQS identified. Thus, the analysis presented in this report compares the predicted concentrations to the AAQS. It should be noted that the NBAPC have not yet adopted standards for 24-hour and annual $PM_{2.5}$, nor 1-hour NO_2 or SO_2 standards. Table 7-1 summarizes the AAQS and NAAQS defined in NAC445B.22097. The pollutants with short-term standards are those with short-term health effects, and those with long-term averaging times reflect those with long-term health effects. Several air pollutants have standards over multiple averaging times.

Table 7-1 Nevada State Ambient Air Quality Standards (NAC 445B.22097)

Air Pollutant	AAQS[1]	NAAQS[2]
Carbon Monoxide		
1-hour average	35 ppm (40,500 µg/m^3)	35 ppm (40 mg/m^3)
8-hour average <5,000 ft above MSL	9 ppm (10,500 µg/m^3)	9 ppm (10 mg/m^3)
8-hour average >5,000 ft above MSL	6 ppm (7,000 µg/m^3)	—
Lead		
Quarterly average	1.5 µg/m^3	1.5 µg/m^3
Nitrogen Dioxide		
Annual average	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)
Particulate Matter (PM_{10})		
24-hour average	150 µg/m^3	150 µg/m^3
Annual average	50 µg/m^3	50 µg/m^3
Ozone		
1-hour average	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)
1-hour average (Lake Tahoe Basin)	0.1 ppm (195 µg/m^3)	—
Sulfur Dioxide		
3-hour average	0.5 ppm (1,300 µg/m^3)	0.5 ppm (1,300 µg/m^3)
24-hour average	0.14 ppm (365 µg/m^3)	0.14 ppm (365 µg/m^3)
Annual average	0.03 ppm (80 µg/m^3)	0.03 ppm (80 µg/m^3)
Hydrogen Sulfide		
1-hour average	0.08 ppm (112 µg/m^3)	—

1 The AAQS are never to be exceeded.
2 The 1-, 3-, 8-, and 24-hour averages cannot be exceeded more than once per year.

The NBAPC provided background concentrations for CO, PM_{10}, NO_2 and SO_2, including a recommended value of 0.0 µg/m^3 for both 1-hour and 8-hour CO. Background concentrations of NO_2 and SO_2 were obtained from the Tracy Power Plant and PM_{10} concentrations were obtained from the Lehman Caves which is within the Great Basin National Park. Background data were not supplied for 1-hour concentrations of H2S, therefore a value of 0.0 µg/m^3 was assumed. Table 7-2 summarizes background pollutant concentrations used for the analysis.

Table 7-2 Maximum Background Pollutant Concentrations

Pollutant	Averaging Period	Monitoring Station	Monitored Concentration (µg/m^3)
			2005
Nitrogen Dioxide	Annual	Tracy Power Plant	16
Carbon Monoxide	1 hour	N/A[1]	0
	8 hour	N/A[1]	0
Sulfur Dioxide	3 hour	Tracy Power Plant	26.0
	24 hour	Tracy Power Plant	10.0
	Annual	Tracy Power Plant	4.0
Particulate Matter (PM_{10})	24 hour	Lehman Caves, Great Basin National Park	10.2
	Annual	Lehman Caves, Great Basin National Park	9
Hydrogen Sulfide	1-hour	N/A[2]	0

1 The NBAPC recommended a value of 0.0 µg/m^3 for this pollutant and averaging time.
2 The NBAPC did not supply a background value for H_2S, therefore, a value of 0.0 µg/m^3 was assumed.

7.2 Air Quality Impact Analysis

An air quality impact assessment has been performed to estimate maximum off-site concentrations of CO, NO_2, PM_{10}, SO_2, and H_2S. The analysis was performed to demonstrate that the operations of Fulcrum will not cause or add to an exceedance of any Nevada Ambient Standards. The impact analysis was performed for both short-term and long-term averaging times.

7.2.1 Air Quality Modeling Methodology

The dispersion modeling was performed using the AERMOD modeling system developed by the American Meteorological Society/Environmental Protections Agency Regulatory Model Improvement Committee (AERMIC). AERMOD incorporates air dispersion for both surface and elevated sources and for areas with either simple and/or complex terrain. The AERMOD modeling system includes two other regulatory components, which include a meteorological data preprocessor, AERMET, and a terrain data preprocessor, AERMAP.

For this analysis, the two years of meteorological data (2010 and 2011) used in the modeling were processed and supplied by NDEP/NBAPC (2010 and 2011) The Tracy meteorological data was processed using Reno National Weather Service surface and upper air data for the two-year period. Figure 7-1 depicts the annual wind speed and wind direction pattern (the "wind rose") for the data.

A receptor grid was generated in locations surrounding the Facility as depicted in Figure 7-2. Receptors were placed at 25-meter increments along the property boundary and out to a distance of approximately 100 meters, at 50-meter increments to a distance of greater than 500 meters, at 100-meter increments to a distance of 1,000 meters, and at 250-meter increments out to a distance of approximately 5,000 meters (5 kilometers). Figure 7-2 illustrates the receptor grid used. Receptor elevations were obtained from USGS national elevation data (NEDs). As part of the AERMOD modeling system, AERMAP (version 11103) was run to calculate receptor elevations and terrain maximum heights for each modeled receptor. Regulatory default technical options were selected for AERMOD modeling. These regulatory default options are found in the AERMOD User's Manual[1]. They include stack tip downwash and a routine for processing concentrations averages during calm winds and when there are missing data.

The AERMOD dispersion model can simulate the transport of emissions from multiple sources including point sources, area sources, and volume sources. The model requires specific inputs for each source type. Air emissions sources for this analysis have been characterized as point sources (stacks). For point sources, the model requires the input of the source location, stack base elevation, stack height, stack inner diameter, stack gas exit velocity, and stack-gas exit temperature. Source locations were identified using the Universal Transverse Mercator (UTM) coordinate system (NAD 83). Stack parameters are summarized below in Table 7-3 and the locations are depicted in Figure 7-3.

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1 USEPA, *User's Guide For the AMS/EPA Regulatory Model AERMOD, EPA-454/B-03-001, September 2004*

Table 7-3 Stack Parameters

Stack Description	UTM Coordinates		Stack Base Elevation	Stack Height	Stack Inner Diameter	Stack Gas Exit Temperature	Stack Gas Exit Velocity
	X east	Y north	(m)	(m)	(m)	(K)	(m/s)
Feedstock Processing Receipt/De-baling Baghouse	286236	4377837	1429	17.07	0.69	283.18	15.33
Feedstock Handling and Conveying Baghouse	286118	4377874	1429	38.10	0.61	283.18	16.17
POX Preheater	286092	4377895	1429	15.24	.3048	336.48	16.69
Boiler Stack[1]	286102	4377882	1429	15.24	1.37	398.18	17.56
Diesel Firewater Pump	286293	4377889	1429	6.10	0.10	810.96	87.36
Diesel Emergency Generator	286073	4377939	1429	6.10	0.10	810.96	87.36
Truck Loading Rack	285905	4378013	1429	4.57	0.05	1255.4	12.95
Evaporative Cooling Tower[2]	286116 286127	4377974 4377970	1429	10.67 10.67	7.62 7.62	322.07 322.07	9.75 9.75
Sulfur Removal Unit Vent	285928	4377980	1429	15.24	0.61	3.27.62	14.22
Flare	286125	4377937	1429	15.24	3.66	1255.40	2.07

1 The boiler stack emits emissions from the boiler and the pulse combustor.

2 The cooling tower was modeled as two cooling tower cells.

The U.S. Environmental Protection Agency (USEPA) provides specific guidance[2] to determine whether or not a structure (building) potentially affects pollutant dispersion from a nearby emission source. The guidance states that, if a structure is located within a certain distance from the emissions sources (stack), downwash effects on the dispersion of stack emissions must be considered. A Good Engineering Practice (GEP) stack height is defined as the height at which nearby building downwash effects are not expected to influence plume behavior.

A GEP analysis is performed for two reasons. First, GEP guidance states that, in the modeling analysis, credit cannot be taken for a height greater than the GEP stack height. Second, if a stack is shorter than the GEP formula height, building downwash must be considered when modeling emissions from that stack. The GEP stack height is defined as the greater of the GEP formula height (defined below) and 213 feet (65 meters.) It is the maximum height for which credit can be taken in the modeling analysis, although a higher stack could be built.

The GEP formula height is defined as:

$H_s = H_b + 1.5\ L_b$

where:

H_s = GEP formula height

H_b = building height

L_b = the lesser building dimension of the height or projected width

The Building Profile Input Program Prime (BPIP Prime), a software program, calculates the GEP formula heights and direction-specific building dimensions for input into the AERMOD model. BPIP Prime requires the input of building/structure corner coordinates and point source coordinates and heights. The UTM coordinate system was used to identify source and building/structure locations. The AERMOD model uses BPIP Prime outputs as input for calculating the aerodynamic building downwash from multiple buildings. Figure 7-3 illustrates the location of the point sources and nearby buildings/structures in relation to the property boundary.

2 40 CFR Part 51 Appendix W, November 2005.

Emissions from criteria pollutants were developed for each pollutant. Annual average and maximum hourly emission rates are summarized in Tables 7-4 and 7-5, respectively. Maximum hourly emissions were used to represent operations for pollutants with 1-hour, 3-hour, 8-hour and 24-hour average standards. The 24-hour flare emission rates have been adjusted to account for 10 hours of start-up and 14 hours of normal operations.

Table 7-4 Annual Emission Rates

Stack Description	NO_x (g/s)	CO (g/s)	PM_{10} (g/s)	SO_2 (g/s)	H_2S (g/s)
Feedstock Processing Receipt/De-baling Baghouse	-	-	5.90E-02	-	-
Feedstock Handling and Conveying Baghouse	-	-	4.92E-02	-	-
Pulse Combustor[1]	4.46E-01	5.91E-01	6.39E-02	1.08E-01	-
POx Preheater	2.46E-02	2.06E-02	1.87E-03	1.47E-04	-
Boiler Stack[1]	1.51E+00	4.13E-01	3.36E-01	1.01E-01	-
Diesel Firewater Pump	1.77E-02	3.82E-03	1.25E-03	6.09E-06	-
Diesel Emergency Generator	2.04E-02	1.11E-02	6.38E-04	2.05E-05	-
Truck Loading Rack	1.72E-03	5.21E-03	3.57E-04	-	-
Evaporative Cooling Tower[2]	-	-	1.54E-03	-	-
Sulfur Removal Unit Vent	-	-	-	-	3.22E-02
Flare	1.96E-02	1.07E-01	9.78E-03	3.34E-01	-

1 The pulse combustor and the boiler stack emissions were added together for release from the boiler stack.
2 The cooling tower was modeled as two cooling tower cells. Emissions were divided into two for modeling purposes.

Table 7-5 Short-Term Emission Rates

Stack Description	NO_x (g/s)	CO (g/s)	PM_{10} (g/s)	SO_2 (g/s)	H_2S (g/s)
Feedstock Processing Receipt/De-baling Baghouse	-	-	5.90E-02	-	-
Feedstock Handling and Conveying Baghouse	-	-	4.92E-02	-	-
Pulse Combustor[1]	4.46E-01	5.91E-01	6.39E-02	1.08E-01	-
POx Preheater	9.83E-02	8.26E-02	7.47E-03	5.90E-04	-
Boiler Stack[1]	1.51E+00	4.13E-01	3.36E-01	1.01E-01	-
Diesel Firewater Pump	1.55E+00	3.34E-01	1.09E-01	5.33E-04	-
Diesel Emergency Generator	1.79E+00	9.68E-01	5.59E-02	1.79E-03	-
Truck Loading Rack	1.66E-02	5.03E-02	3.45E-03	-	-
Evaporative Cooling Tower[2]	-	-	1.55E-03	-	-
Sulfur Removal Unit Vent	-	-	-	-	3.28E-02
Flare	1.52E+00	8.25E+00	2.08E-01	3-hour 4.28E+00[3] 24-hour 2.51E+00[4]	-

1 The pulse combustor and the boiler stack emissions were added together for release from the boiler stack.
2 The cooling tower was modeled as two cooling tower cells. Emissions were divided into two for modeling purposes.
3 3-hour SO_2 emissions based on maximum flare start-up operations.
4 24-hour PM_{10} and SO_2 emission rates are based on a 10-hour flare start-up and 14 hours of normal operations

7.2.2 Air Quality Modeling Results

To illustrate compliance with the Nevada Standards, maximum modeled concentrations of CO, NO_2, PM_{10}, and SO_2 have been added to representative monitored background concentrations. Maximum predicted values are used to compare with the annual standards Table 7-6 summarizes total pollutant concentrations and shows no exceedances of the Nevada Standards. Figure 7-4 illustrates the locations of maximum pollutant concentrations.

CO Impacts. Impacts from CO emissions were assessed for both 1- and 8-hour averaging periods. Modeling was performed using short-term emissions rates summarized in Table 7-5. The highest modeled 1-hour CO concentration is 1,168 $\mu g/m^3$ and occurs along the property boundary just south of the boiler stack at UTM coordinate 286,106m E, 4,377,810m N. The maximum 8-hour concentration of 756 $\mu g/m^3$ and occurred at UTM coordinate 286,108, 4,377,822. Concentrations include background.

NO_2 Impacts. Impacts from NO_x emissions were assessed for an annual averaging period. The annual emissions rates used for this analysis are summarized in Table 7-4. For the purposes of this analysis, it was assumed that all NO_x is converted into NO_2. The highest modeled annual concentration, including background, is 25 $\mu g/m^3$ and occurred along the property boundary to the southeast of the boiler and the feedstock handling at UTM coordinate 286,155m E, 4,377,805m N.

PM_{10} Impacts. Impacts from PM_{10} emissions were assessed for both 24-hour and annual averaging periods. Annual emissions rates are from Table 7-4 and emission rates used for the 24-hour average modeling were from Table 7-5. The highest modeled 24-hour PM_{10} concentration, including background, is 56 $\mu g/m^3$ and is located along the property boundary to the south of the boiler and the feedstock handling at UTM coordinate 286,108m E, 4,377,822m N. The maximum annual PM_{10} concentration of 11$\mu g/m^3$ (including background) occurred along the property boundary to the southwest of the boiler and the feedstock handling at UTM coordinate 286,155m E, 4,377,805m N.

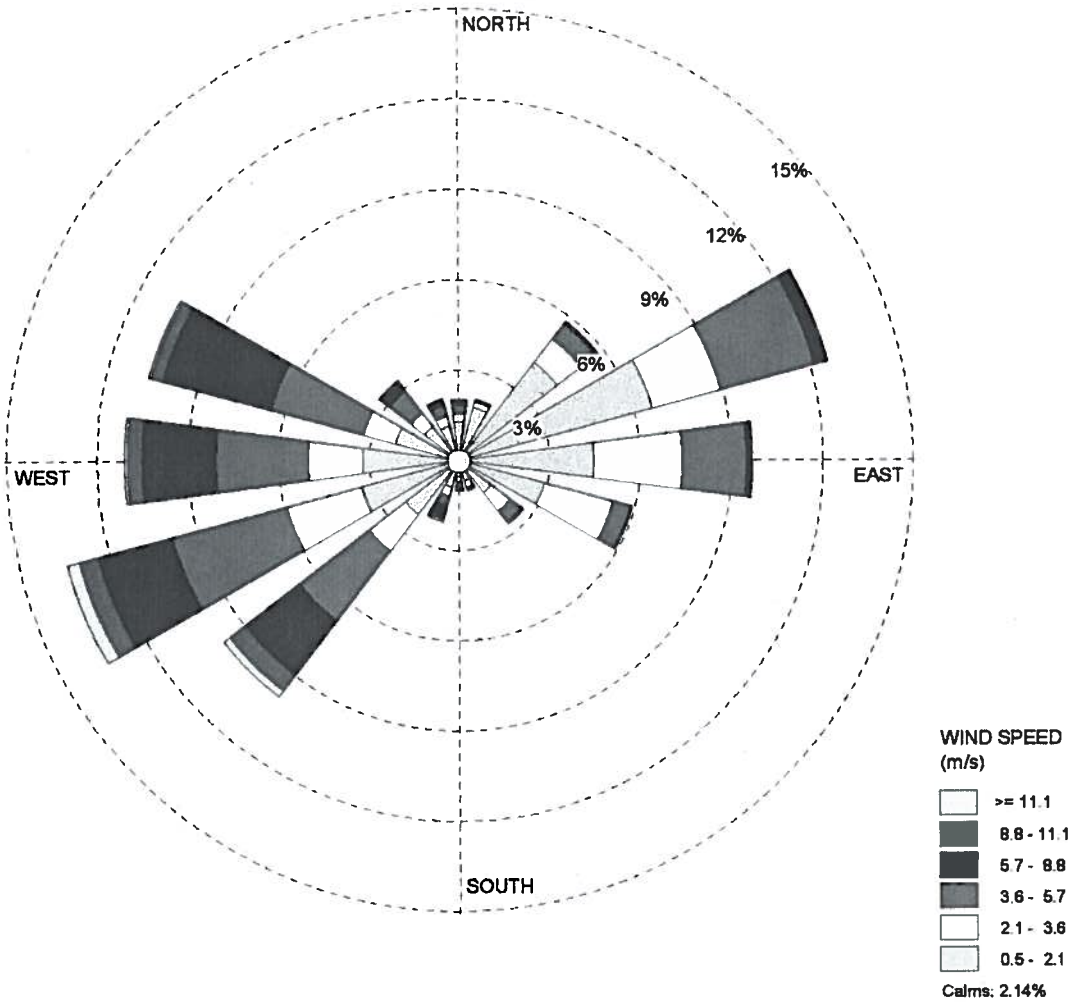
SO_2 Impacts. Impacts from SO_x emissions were assessed for 3-hour, 24-hour, and annual averaging periods. All concentrations include background. Short-term modeling (3 - and 24-hour) was performed using emission rates in Table 7-5. The highest modeled ambient 3-hour SO_2 concentration is 374 $\mu g/m^3$ located at UTM coordinate 286,108m E, 4,377,822m N along the property boundary to the south of the boiler and the feedstock handling. The highest 24-hour average SO2 concentration, with background is 108$\mu g/m^3$ at UTM coordinate 286,108, 4,377,822. Annual average modeling was performed using emissions in Table 7-4. The highest annual average concentration of SO_2 is 5 $\mu g/m^3$ and occurred at UTM coordinate 286,108m E, 4,377,822m N along the property boundary south of the boiler and feedstock handling. Maximum hourly H_2S concentration of 9 $\mu g/m^3$ is located approximately 500 meters to the south of the facility boundary. The UTM coordinate is 285,900m E, 4,377,400 m N. This represents less than 10 percent of the AAQS.

Table 7-6 ***Maximum Modeled Pollutant Concentrations***

Pollutant	Maximum Modeled Concentrations	Background Concentrations	Maximum Total Concentration	Nevada Standard	
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	% of Standard
CO					
1-Hour	1,168	0.0	1,168	40,500	3
8-Hour	756	0.0	756	10,000	8
NO_2					
Annual	9	16	25	100	25
PM_{10}					
24-Hour	46	10	56	150	37
Annual	2	9	11	50	22
SO_2					
3-Hour	348	26	374	1,300	29
24-Hour	98	10	108	365	30
Annual	1	4	5	80	6
H_2S					
1-Hour	9	0.0	9	112	8

WIND ROSE PLOT
Sparks, NV

DISPLAY
Wind Speed
Direction (blowing from)



COMMENTS	DATA PERIOD	COMPANY NAME	
Fulcrum Sierra BioFuels, LLC 2009 - 2010	**Start Date: 1/1/2009 - 00:00** **End Date: 12/31/2010 - 23:00**	**ERM**	
		MODELER **vjh**	
	CALM WINDS **2.14%**	TOTAL COUNT **17299 hrs.**	
	AVG WIND SPEED **3.18 m/s**	DATE **11/13/2012**	PROJECT NO

WRPLOT View - Lakes Environmental Software

Figure 7-1

2009-2010 Wind Rose
Fulcrum Sierra BioFuels, LLC
Sparks, Nevada

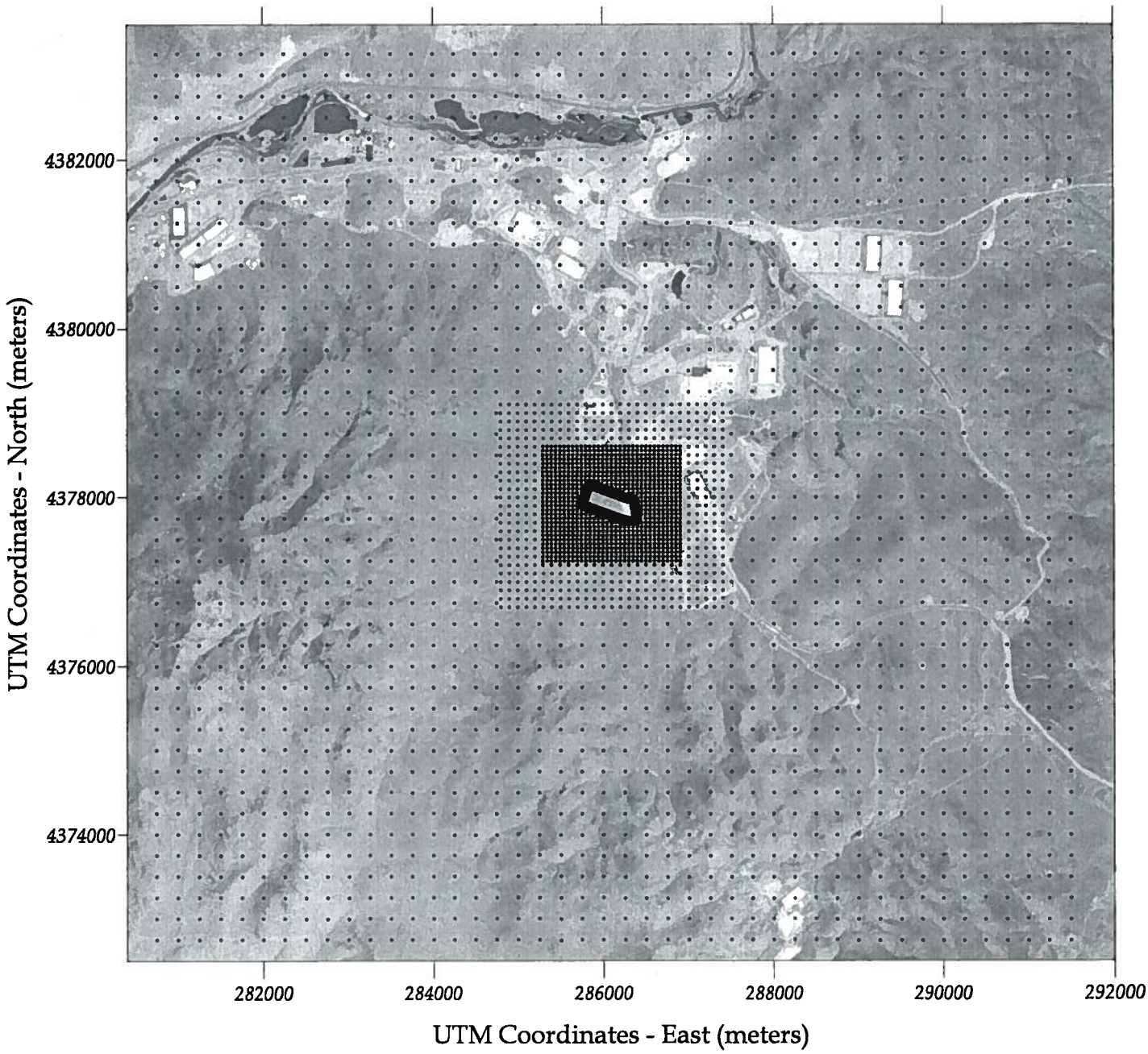


Figure 7-2

Receptor Grid
Fulcrum Sierra BioFuels, LLC
Sparks, Nevada

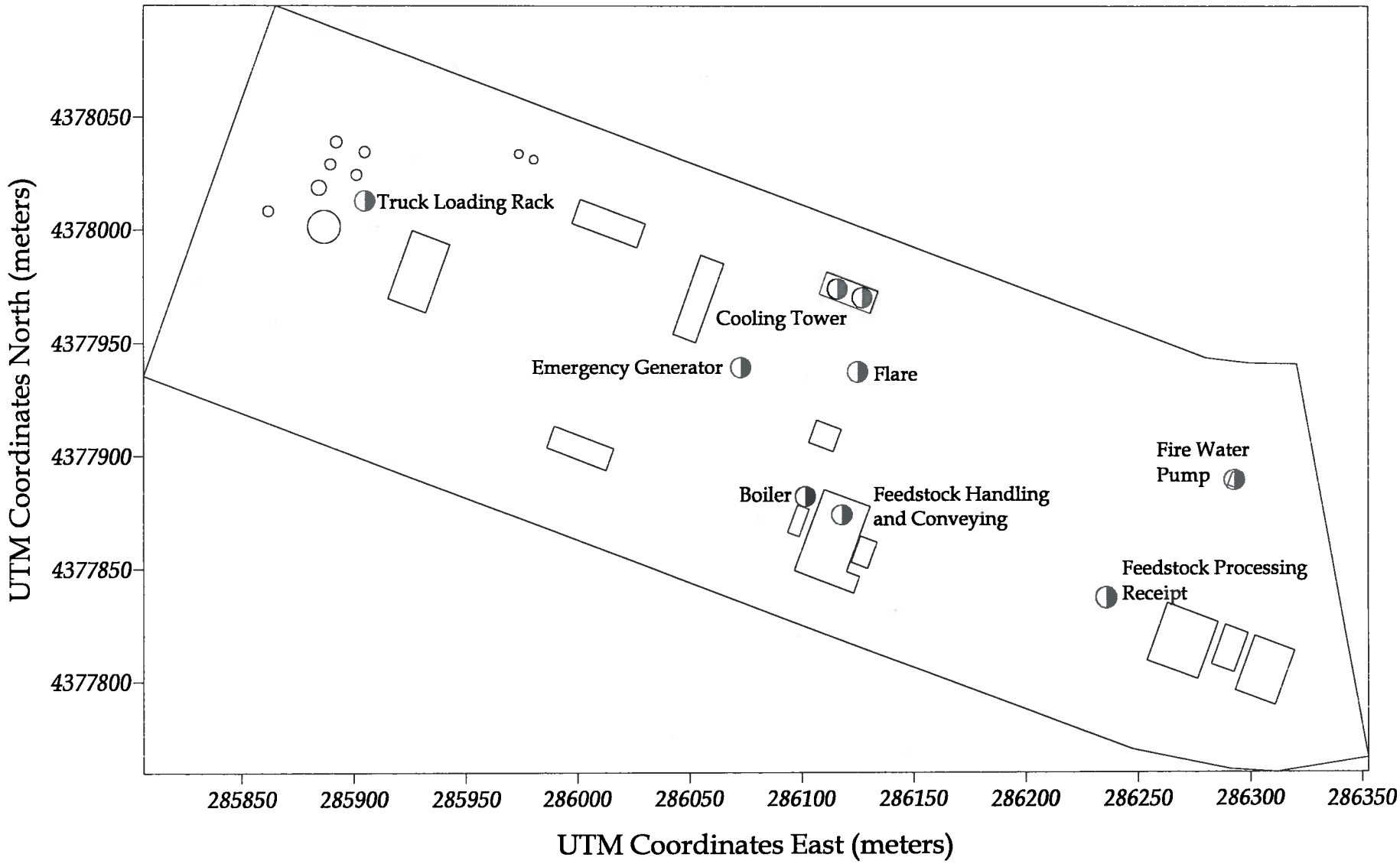


Figure 7-3

Building/Structures and Source Locations
Fulcrum Sierra BioFuels, LLC
Sparks, Nevada

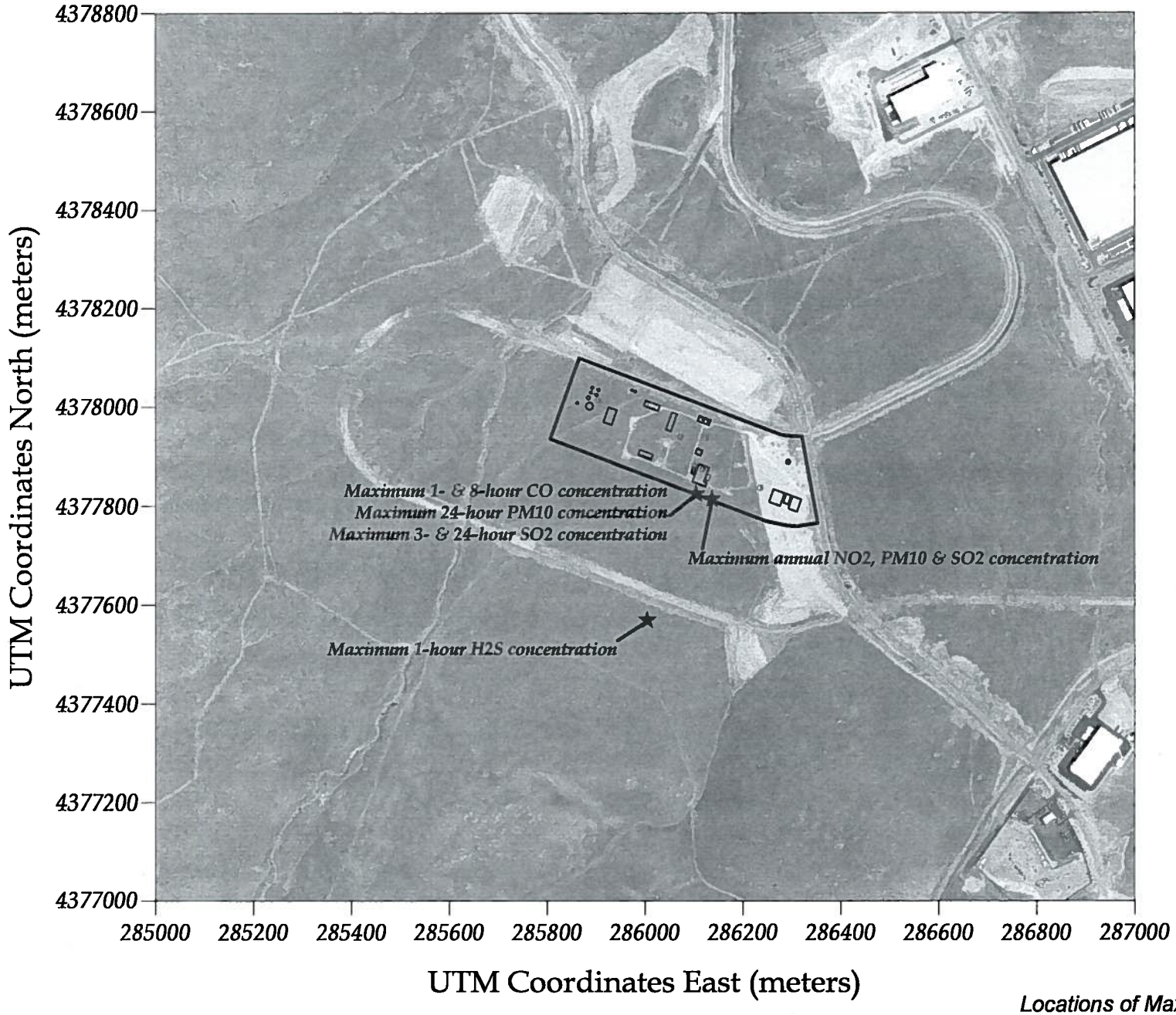


Figure 7-4

Locations of Maximum Impacts
Fulcrum Sierra BioFuels, LLC
Sparks, Nevada

Appendix 8

APPLICATION CERTIFICATION

APPLICATION CERTIFICATION

Certification of application content consisting of the following:
(Please check each of the appropriate boxes to indicate the information provided in your application submittal)

General Company Information
☒General Company Information Form

Emission Unit Application Forms (Appendix 1)
☒Industrial Process Application Form(s)
☒Combustion Equipment Application Form(s)
☒Storage Silos Application Form(s)
☒Liquid Storage Tank Application Form(s)
☒Surface Area Disturbance Form(s)

Insignificant Emissions Unit Information (Appendix 2)
☒Insignificant Emissions Unit Information Form(s)

Facility-Wide Potential To Emit Tables (Appendix 3)
☒Table 1 - Facility-Wide Potential To Emit
☒Table 2 - Insignificant Activities Potential To Emit

Detailed Emissions Calculations (Appendix 4)
☒Detailed Emissions Calculations Provided

Emissions Cap Information (Appendix 5)
☒Emissions Cap Information Provided

Process Narrative, Process Flow Diagram, Plot Plan, Map, Dust Control Plan (Appendix 6)
☒Process Narrative Provided
☒Flow Diagram Provided
☒Plot Plan Provided
☒Map Provided
☒Dust Control Plan Provided

Dispersion Modeling Files (Appendix 7)
☒Dispersion Modeling Provided

Application Certification (Appendix 8)
☒ Application Certification

PLEASE NOTE THE FOLLOWING REQUIREMENTS WHICH APPLY TO PERMIT APPLICANTS DURING THE APPLICATION PROCESS:

A. A permit applicant must submit supplementary facts or corrected information upon discovery [NAC 445B.297.1(b)].

B. A permit applicant is required to provide any additional information which the Director requests in writing within the time specified in the Director's request [NAC 445B.297.1(c)].

C. Submission of fraudulent data or other information may result in prosecution for an alleged criminal offense (NRS 445B.470).

CERTIFICATION: I certify that, based on information and belief formed after reasonable inquiry, the statements contained in this application are true, accurate and complete.

Signature of Responsible Official

Jeanne Benedetti, Vice President
Print or Type Name and Title

January 30th, 2013
Date