Section III – Other Technologies

(This is an emerging technology which has been in operation with an air quality permit, however does not yet qualify as LAER)

Source Type: **Major/LAER**

Application Nos.: **635309-13**

Equipment Category: **Boiler**

Equipment Subcategory: **Boiler, Refinery Gas Fired**

Date: **TBD**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Babcock and Wilcox	B. MODEL: EDFM180-165	
C. DESCRIPTION: Two boilers fired on refinery fuel gas, natural gas, and process gas from fume scrubber. Boilers equipped with a low NOx burner and with approximately 10% of flue gas recirculated into the burners, resulting in reduced flame temperature and reduced NOx formation. For post-combustion NOx control, each boiler will be equipped with a Selective Catalytic Reduction (SCR) Unit.		
D. FUNCTION: Each boiler is operated independently to meet the steam demand of the facilities, producing 385,000 lbs per hour of steam at a temperature of 700 °F and pressure of 600 psig (Maximum Continuous Rating (MCR)).		
E. SIZE/DIMENSIONS/CAPACITY: Each boiler produces 385,000 lbs/hr of steam at 700°F and 600 psig.		
COMBUSTION SOURCES		
F. MAXIMUM HEAT INPUT: 520.4 MMBtu/hr each boiler, 1040.8 MMBtu/hr total		
G. BURNER INFORMATION		

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
John Zink (model no. ECOjet) Low NOx burner	260.2 MMBtu/hr	2 (per boiler)

H. PRIMARY FUEL: Refinery gas	I. OTHER FUEL: Natural gas and process gas	
J. OPERATING SCHEDULE: 24 HRS/DAY	7 DAYS/WEEK	52 WKS/YR
K. EQUIPMENT COST: N/A		
L. EQUIPMENT INFORMATION COMMENTS: The boilers will not be equipped with CO Catalysts for control of CO emissions, as use of such devices would result in additional particulate matter formation, due to formation of ammonium sulfate, from the oxidation of sulfur (SO_2 to SO_3) and subsequent reaction of ammonia.		

2. COMPANY INFORMATION

A. COMPANY: Tesoro Refining and Marketing CO, LLC	B. FAC ID: 800436
C. ADDRESS: 2101 E. Pacific Coast Highway CITY: Wilmington STATE: CA ZIP: 90744	D. NAICS CODE: 2911
E. CONTACT PERSON: Shawn Chanh Tieu	F. TITLE: Senior Env. Engineer
G. PHONE NO.: (310) 847 - 5274	H. EMAIL: CMTieu@Marathonpetroleum.com

3. PERMIT INFORMATION

A. AGENCY: South Coast AQMD	B. APPLICATION TYPE: NEW CONSTRUCTION
C. SCAQMD ENGINEER: Rafik Beshai	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 10/26/23	PC NO.: 635309 and 635310
PO ISSUANCE DATE.: N/A	PO NO: N/A
E. START-UP DATE: 11/16/2025	
F. OPERATIONAL TIME: > 6 months	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx		SOx	CO		PM OR PM_{10}	AMMONIA
BACT Limit		2.5 PPMV	3.0 PPMV		27 PPMV	35 PPMV		5 PPMV
Averaging Time		30 days	24 hours		30 days	24 hours		1 hour
Correction		3% O_2, dry			3% O_2, dry			3% O_2, dry

B. OTHER BACT REQUIREMENTS: N/A

C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology

D. EMISSION INFORMATION COMMENTS: Per permit conditions A99.22 through A99.25, the NOx and CO emission limits listed in Section 4.A shall not apply during boiler commissioning, startup, and shutdown periods.

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Umicore	B. MODEL: DNX

C. DESCRIPTION: The SCR units use aqueous ammonia at a concentration of 30%, by weight. SCR catalyst is supplied by Umicore. The SCR catalyst has a honeycomb structure of Titanium-Vanadium-Tungsten (Ti-V-W) as the active material and aqueous ammonia as the reducing agent. Pressurized horizontal tank uses nitrogen as a blanket gas. Guaranteed NOx 3.0 ppmv @ 3% O_2 (24-hour average) and 2.5 ppmv @ 3% O_2 (30-day average). Guaranteed NH_3 Slip: 5 ppmv @ 3% O_2 (1-hour average).

D. SIZE/DIMENSIONS/CAPACITY: Catalyst volume and weight are 681.5 ft^3 and13,620 lbs, respectively.

E. CONTROL EQUIPMENT PERMIT INFORMATION:

APPLICATION NO.: 635311 and 635312 PC ISSUANCE DATE: 11/3/23

PO NO.: N/A PO ISSUANCE DATE: N/A

F. REQUIRED CONTROL EFFICIENCIES: N/A

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	___%	___%	___%
NOx	___%	___%	___%
SOx	___%	___%	___%
CO	___%	___%	___%
PM	___%	___%	___%
PM_{10}	___%	___%	___%
INORGANIC	___%	___%	___%

G. CONTROL TECHNOLOGY COMMENTS: The operator shall install and maintain CEMS to measure CO and NOx. Catalyst life is 6 years.

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: N/A

B. DATE(S) OF SOURCE TEST:

C. COLLECTION EFFICIENCY METHOD:

D. COLLECTION EFFICIENCY PARAMETERS:

E. SOURCE TEST/PERFORMANCE DATA:

F. TEST OPERATING PARAMETERS AND CONDITIONS:

G. TEST METHODS (SPECIFY AGENCY):

H. MONITORING AND TESTING REQUIREMENTS:

I. DEMONSTRATION OF COMPLIANCE COMMENTS:

7. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT: 011605	B. CCAT:	C. APPLICATION TYPE CODE: 10	
D. RECLAIM FAC? YES ☒ NO ☐	E. TITLE V FAC: YES ☒ NO ☐	F. SOURCE TEST ID(S):	
G. SCAQMD SOURCE SPECIFIC RULES: 1109.1			
H. HEALTH RISK FOR PERMIT UNIT			
H1. MICR:	H2. MICR DATE:	H3. CANCER BURDEN:	H4. CB DATE:
H5: HIA:	H6. HIA DATE:	H7. HIC:	H8. HIC DATE:

Section III – Other Technologies

(This is an emerging technology which has been in operation with an air quality permit, however does not yet qualify as LAER)

Source Type: **Minor**

Application No.: **656210**

Equipment Category: **Digester Gas (Biogas) Conditioning and Upgrading System**

Equipment Subcategory: **Digester Gas Treatment Unit**

Date: **TBD**

1. EQUIPMENT INFORMATION		
A. MANUFACTURER: Anaergia	B. MODEL: BUG 1200	
C. DESCRIPTION: Biogas conditioning and upgrading system including two hydrogen sulfide (H_2S) removal vessels, lead and lag configuration, each containing approximately 19,800 pounds of FerroSorp media.		
D. FUNCTION: Biogas conditioning and upgrading system transforming raw biogas into renewable natural gas.		
E. SIZE/DIMENSIONS/CAPACITY: 1,200 SCFM		
COMBUSTION SOURCES		
F. MAXIMUM HEAT INPUT: N/A		
G. BURNER INFORMATION:		
TYPE	INDIVIDUAL HEAT INPUT	NUMBER
N/A	N/A	N/A
H. PRIMARY FUEL: N/A	I. OTHER FUEL: N/A	
J. OPERATING SCHEDULE: 24 HRS/DAY 7 DAYS/WEEK 52 WKS/YR		
K. EQUIPMENT COST: N/A		
L. EQUIPMENT INFORMATION COMMENTS: N/A		

2. COMPANY INFORMATION	
A. COMPANY: Riverside Bioenergy Facility LLC	B. FAC ID: 205524
C. ADDRESS: 5950 Acorn St CITY: Riverside STATE: CA ZIP: 92504	D. NAICS CODE: 22132
E. CONTACT PERSON: Jeremy Metts	F. TITLE: Managing Director
G. PHONE NO.: 520-461-4027	H. EMAIL: jeremy.metts@anaergia.com

3. PERMIT INFORMATION

A. AGENCY: South Coast AQMD

B. APPLICATION TYPE: NEW CONSTRUCTION

C. SCAQMD ENGINEER: Tony Liu

D. PERMIT INFORMATION: P/C ISSUANCE DATE: 11/25/25

P/O NO.: N/A P/O ISSUANCE DATE: N/A

E. START-UP DATE: N/A

F. OPERATIONAL TIME: N/A

4. EMISSION INFORMATION

A. EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx	SOx	CO	PM OR PM10	INORGANIC (H_2S)
Limit			*			2.0 PPMV*
Averaging Time						
Correction						

B. OTHER REQUIREMENTS: *Permit condition #14 - The measured H_2S concentration shall not exceed 2.0 ppmv at the outlet of the tail gas carbon adsorber (See page 5, 10.D).

C. BASIS OF THE DETERMINATION: Other (add comment)

Technology has been under construction with an active air quality permit.

D. EMISSION INFORMATION COMMENTS: Emission calculations indicate that uncontrolled emissions of VOC, NOx, SOx, CO, PM/PM10, and inorganic compounds are anticipated to be less than one pound per day. An emission limit of 2 ppmv for hydrogen sulfide was imposed to satisfy CAAQS odor threshold. Emission limits are subject to change pending source testing of the equipment and completion of the engineering evaluation associated with the conversion from Permit to Construct to Permit to Operate.

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Anaergia

B. MODEL: BUG 1200

C. DESCRIPTION: In the proposed biogas conditioning and upgrading system, multiple control technologies are used to ensure gas quality and regulatory compliance. Hydrogen sulfide removal is achieved through vessels in a leadlag- configuration containing FerroSorp media, with both vessels operated to maximize treatment efficiency and ensure continuous removal capacity. VOC and siloxane removal vessels, containing activated carbon media, also operate in a leadlag- configuration, providing consistent purification and protecting downstream equipment. The VOC and siloxane removal vessels are also equipped with a particulate filter. An oil removal carbon adsorber, which is also equipped with a particulate filter, captures trace hydrocarbons and lubricants present in the gas stream, preventing fouling of upgrading equipment and ensuring reliable operation. Finally, a single vessel- tail gas treatment unit with an activated carbon media vessel (and an additional one as standby) manages residual emissions from the upgrading process, ensuring environmental compliance and minimizing atmospheric releases.

D. SIZE/DIMENSIONS/CAPACITY:

E. CONTROL EQUIPMENT PERMIT INFORMATION:

APPLICATION NO.: PC ISSUANCE DATE: N/A

PO NO.: PO ISSUANCE DATE: N/A

F. REQUIRED CONTROL EFFICIENCIES:

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	___%	___%	___%
NOx	___%	___%	___%
SOx	___%	___%	___%
CO	___%	___%	___%
PM	___%	___%	___%
PM10	___%	___%	___%
INORGANIC	___%	___%	___%

G. CONTROL TECHNOLOGY COMMENTS: N/A

6. DEMONSTRATION OF COMPLIANCE

A.	COMPLIANCE DEMONSTRATED BY: Source test and monitoring once the proposed equipment is constructed and in operation.
B.	DATE(S) OF SOURCE TEST: TBD
C.	COLLECTION EFFICIENCY METHOD: N/A
D.	COLLECTION EFFICIENCY PARAMETERS: N/A
E.	SOURCE TEST/PERFORMANCE DATA: TBD
F.	TEST OPERATING PARAMETERS AND CONDITIONS: N/A
G.	TEST METHODS (SPECIFY AGENCY): N/A
H.	MONITORING AND TESTING REQUIREMENTS: Monthly monitoring required for concentration of total sulfur at the tail gas carbon adsorber.
I.	DEMONSTRATION OF COMPLIANCE COMMENTS: N/A

7. ADDITIONAL SOUTH COAST AQMD REFERENCE DATA

A. BCAT: 354950	B. CCAT:	C. APPLICATION TYPE CODE: 10
D. RECLAIM FAC? YES ☐ NO ☒	E. TITLE V FAC: YES ☐ NO ☒	F. SOURCE TEST ID(S): -

G. SOUTH COAST AQMD SOURCE SPECIFIC RULES: Rule 431.1 (Rule 431.1 is not applicable to the upgrading system but would apply to any downstream equipment burning the product gas as fuel.)

H. HEALTH RISK FOR PERMIT UNIT

H1. MICR: N/A	H2. MICR DATE: N/A	H3. CANCER BURDEN: N/A	H4. CB DATE: N/A
H5: HIA: 2.44×10^{-7}	H6. HIA DATE: 2/12/25	H7. HIC: 8.32×10^{-7}	H8. HIC DATE: 2/12/25

(1)(C) Equipment Description:

Digester Gas (Biogas) Conditioning and Upgrading System, Anaergia, Model No. BUG 1200, 1,200 SCFM Capacity, Consisting of:

1. Digester Gas Header
2. One (1) Moisture Separator
3. Two (2) Multi-stage Biogas Centrifugal Blowers, One as Standby
4. One (1) Recuperative Shell-and-tube Heat Exchanger
5. One (1) Air-cooled Heat Exchanger
6. One (1) Condenser Shell-and-tube Heat Exchanger, with Common Glycol Chiller, One (1) Moisture Separator
7. One (1) Glycol Chiller, Common to Item Nos. 6, 10.C.i, and 11.D (Referenced as Common Glycol Chiller)
8. Two (2) Hydrogen Sulfide (H2S) Removal Vessels, Lead and Lag Configuration, Each Containing Approximately 19,800 Pounds of FerroSorp Media
9. Two (2) Volatile Organic Compound (VOC) and Siloxane Removal Vessels, Lead and Lag Configuration, Each Containing Approximately 14,000 Pounds of Granular Activated Carbon Media, with a Particulate Filter
10. Biogas Upgrading System, Consisting of:
    - A. One (1) Air Cooler, Common to Item Nos. 10.B.iii, 10.B.iv, 11.B, and 11.C (Referenced as Common Air Cooler)
    - B. Feed Compressor Skid, Consisting of:
        - i. One (1) Two-stage Variable Frequency Drive Compressor, Rotary Screw Type, Oil-flooded and Water-cooled, with an Oil-gas Separator and Pressure Relief Valve
        - ii. One (1) Recuperative Shell-and-coil Heat Exchanger
        - iii. One (1) Compressor Oil Cooler, with Common Air Cooler
        - iv. One (1) Compressor Gas Aftercooler, with Common Air Cooler
    - C. High Pressure Conditioning Skid, Consisting of:
        - i. One (1) High Pressure Condenser Shell-and-tube Heat Exchanger with Common Glycol Chiller and Pressure Relief Valve
        - ii. One (1) Moisture Separator, with a Coalescing Filter
        - iii. One (1) Oil Removal Carbon Adsorber, Containing Approximately 150 Pounds of Granular Activated Carbon Media, with a Particulate Filter
        - iv. Membrane Separation Racks, Consisting of Up to Twenty-five (25) Hollow Fiber Membranes, 3-stage Arrangement, Recycling Permeate from Stage 2 Membrane and Retentate from Stage 3 Membrane to Biogas Upgrading System Compressor (Item 10.B.i), with Flow Meters, Transmitters, Pressure Relief Valves, Sampling Taps, and Biomethane and CO2 Recycle Valves to Digester Gas Header (Item 1) and Gas Analyzers
    - D. Two (2) Carbon Adsorbers, Tail Gas (Stage 2 Permeate) Treatment, One as Standby, Each Containing Approximately 1,650 Pounds of Granular Activated Carbon Media
    - E. Tail Gas Exhaust Stack, Vertical Discharge, 8” Dia. × 30’-0” H., without a Rain Cap
11. Product Gas (RNG) Compressor Skid, Consisting of:
    - A. One (1) Multi-stage Biogas Compressor, Reciprocating Type, Air- and Water-cooled.
    - B. One (1) Compressor Gas Aftercooler, with Common Air Cooler.
    - C. One (1) Compressor Gas Intercooler, with Common Air Cooler.
    - D. One (1) Compressor Gas Trim-cooler, with Common Glycol Chiller.