San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

SEP 1 1 2017

Ms. Melinda Hicks
Kern Oil & Refining Co
7224 E Panama Ln
Bakersfield, CA 93307

Re: Proposed ATC / Certificate of Conformity (Significant Mod)
District Facility # S-37
Project # 1170673

Dear Ms. Hicks:

Enclosed for your review is the District's analysis of an application for Authority to Construct for the facility identified above. You requested that a Certificate of Conformity with the procedural requirements of 40 CFR Part 70 be issued with this project. The project authorizes a new compressor.

After addressing all comments made during the 30-day public notice and the 45-day EPA comment periods, the District intends to issue the Authority to Construct with a Certificate of Conformity. Please submit your comments within the 30-day public comment period, as specified in the enclosed public notice. Prior to operating with modifications authorized by the Authority to Construct, the facility must submit an application to modify the Title V permit as an administrative amendment, in accordance with District Rule 2520, Section 11.5.

If you have any questions, please contact Mr. Leonard Scandura, Permit Services Manager, at (661) 392-5500.

Thank you for your cooperation in this matter.

Sincerely,

Arnaud Marjollet
Director of Permit Services

Enclosures

cc: Tung Le, CARB (w/enclosure) via email
cc: Gerardo C. Rios, EPA (w/enclosure) via email

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San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Compressor Replacement

Facility Name:	Kern Oil and Refining Co.	Date:	August 30, 2017
Mailing Address:	7224 E Panama Ln Bakersfield, CA 93307	Engineer:	Richard Edgehill
		Lead Engineer:	Steve Davidson
Contact Person:	Melinda Hicks and Nick Diercks (Environtech)		
Telephone:	661-845-0761, 661-377-0073 #13 (direct)		
Application #(s):	S-37-4-20		
Project #:	S-1170673		
Deemed Complete:	March 28, 2017		
Facility Name:	Kern Oil and Refining Co.		
Mailing Address:	7224 E Panama Ln Bakersfield, CA 93307		

I. Proposal

Kern Oil and Refining Co. (Kern) has requested an Authority to Construct (ATC) to replace the 165 hp IC engine listed on S-37-85 serving the Platformer (S-37-4) # 2 Hydrogen Compressor with a new electrically-driven compressor (Hydrogen Booster Compressor) to be included with S-37-4 equipment. PTO S-37-85-5 will be cancelled.

Note that the new compressor will be larger than the compressor being replaced and therefore does not meet the criteria of a replacement unit in 40 CFR 51.165 (a)(1)(xxi)(A) through (D). Because emissions from the compressor are considered as new, the project triggers a Federal Major Modification. BACT and public notice are required.

Disposition of Outstanding ATCs

ATC S-37-4-19 authorized replacement of the 180 hp IC engine listed on S-37-92 serving the Platformer (S-37-4) Hydrogen Booster Compressor with an electrically-driven compressor to be to be included with S-37-4 equipment. ATC S-37-4-19 will be implemented prior to this project and serves as the base document.

ATC S-37-4-19 and PTO S-37-4-17 are included in **Attachment I**.

KOR is a major stationary source with a Title V permit. Kern received their Title V Permit on December 17, 2002. The project is a Federal Major Modification and therefore it is classified as a Title V Significant Modification pursuant to Rule 2520, Section 3.20, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. KOR must apply to administratively amend their Title V Operating Permit to include the requirements of the ATC(s) issued with this project.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (2/18/16)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standard (NSPS) (4/14/1999)
40 CFR 60	Subpart J – Standards of Performance for Petroleum Refineries Subpart GGG – Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries
Rule 4002	National Emission Standards for Hazardous Air Pollutants (NESHAPS) (5/20/2004)
40 CFR 63	Subpart CC - National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries – (Not applicable, not a major HAP source)
Rule 4101	Visible Emissions (2/17/2005)
Rule 4102	Nuisance (12/17/1992)
Rule 4201	Particulate Matter Concentration (12/17/1992)
Rule 4301	Fuel Burning Equipment (12/17/1992)
Rule 4305	Boilers, Steam Generators, and Process Heaters, Phase II (8/21/2003)
Rule 4306	Boilers, Steam Generators, and Process Heaters, Phase III (10/16/2008)
Rule 4320	Advanced Emissions Reductions Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr (Adopted 10/16/2008)
Rule 4351	Boilers, Steam Generators, and Process Heaters - RACT (8/21/2003)
Rule 4455	Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (4/20/05)
Rule 4801	Sulfur Compounds (12/17/1992)
CH&SC 41700	Health Risk Assessment
CH&SC 42301.6	School Notice

Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at 7724 E Panama Lane in Bakersfield. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

Kern operates a petroleum refining operation engaged in the production of gasoline and various petroleum distillates, including ultra-low sulfur diesel fuel.

S-37-4

This Platformer Unit (S-37-4) receives hydro-treated petroleum naphtha as feed. The feed is routed through a series of heaters and catalysts. The feed must be reheated between each catalytic reactor since the overall reaction in each vessel is endothermic. After the last reactor, the hydrogen is allowed to flash off from the product in a separator vessel. The product is identified as platformate and is utilized in other refinery processes in the production of gasoline and other petroleum products.

Proposed Modification

The 165 hp IC engine serving the Platformer #2 Hydrogen Compressor (listed under S-36-85) will be replaced with a new electrically-driven compressor. PTO S-37-85-5 will be cancelled. The proposed compressor and associated fugitive emissions will be included with the S-37-4 equipment.

V. Equipment Listing

Pre-Project Equipment Description:

~~S-37-85-5: 165 BHP INGERSOLL-RAND MODEL 6JVG NATURAL GAS-FIRED IC ENGINE EQUIPPED WITH 3-WAY CATALYST SERVING THE #2 HYDROGEN COMPRESSOR - MIDDLE, AT THE PLATFORMER UNIT (#S-37-4)~~ – TO BE CANCELLED

ATC S-37-4-19: MODIFICATION OF PLATFORMER UNIT INCLUDING SEPARATOR, ADSORBER, 3 REACTORS, 4 FT. DIA. STABILIZER TOWER, ACCUMULATORS, 29.3 MMBTU/HR CHARGE HEATER #1 WITH ZEECO GLSF-12 LOW NOX BURNERS, 17.9 MMBTU/HR CHARGE HEATER #2 WITH ZEECO GLSF-12 LOW NOX BURNERS, AND 11.9 MMBTU/HR CHARGE HEATER #3 WITH ZEECO GLSF-10 LOW NOX BURNERS: REPLACE COMPRESSOR AND ENGINE LISTED ON PERMIT S-37-92 WITH ELECTRICAL POWERED COMPRESSOR

Proposed Modification:

S-37-4-20: MODIFICATION OF PLATFORMER UNIT INCLUDING SEPARATOR, ADSORBER, 3 REACTORS, 4 FT. DIA. STABILIZER TOWER, ACCUMULATORS, 29.3 MMBTU/HR CHARGE HEATER #1 WITH ZEECO GLSF-12 LOW NOX BURNERS, 17.9 MMBTU/HR CHARGE HEATER #2 WITH ZEECO GLSF-12 LOW NOX BURNERS, AND 11.9 MMBTU/HR CHARGE HEATER #3 WITH ZEECO GLSF-10 LOW NOX BURNERS: REPLACE ENGINE POWERING THE # 2 HYDROGEN COMPRESSOR (LISTED ON S-37-85) WITH AN ELECTRIC MOTOR-POWERED COMPRESSOR (HYDROGEN BOOSTER COMPRESSOR)

Post Project Equipment Description:

S-37-4-20: PLATFORMER UNIT INCLUDING SEPARATOR, ADSORBER, 3 REACTORS, 4 FT. DIA. STABILIZER TOWER, ACCUMULATORS, 29.3 MMBTU/HR CHARGE HEATER #1 WITH ZEECO GLSF-12 LOW NOX BURNERS, 17.9 MMBTU/HR CHARGE HEATER #2 WITH ZEECO GLSF-12 LOW NOX BURNERS, AND 11.9 MMBTU/HR CHARGE HEATER #3 WITH ZEECO GLSF-10 LOW NOX BURNERS AND ASSOCIATED PIPING, COMPONENTS, AND COMPRESSORS

VI. Emission Control Technology Evaluation

Fugitive component counts are expected to decrease with the installation of the electric compressor. VOC emissions from fugitive components are and will continue to be minimized with an inspection, maintenance, and repair program consistent with applicable District Rule 4455.

VII. General Calculations

A. Assumptions

- Facility will operate 24 hours per day, 7 days per week, and 52 weeks per year.
- There will be no change in combustion emissions associated with permits S-37-4 and there.
- S-37-4 heaters are not being modified therefore NSR requirements of BACT, offsets, and public notice are not applicable to the heater. No calculations will be performed for the S-37-4 heaters. VOC emissions from the heaters will be stated for inclusion in the PAS emissions profiles.
- Fugitive emissions calculations below are for the entire permit unit S-37-4.
- Pre-project control efficiencies for fugitive emissions for evaluation of Baseline Emissions (BE) are assumed be the ratio emissions factors obtained using EPA Correlation Equations for refineries with Rule 4455 leak thresholds divided by Refinery Average Emissions Factors (conservatively assumed to be uncontrolled emissions). Additional details are provided in the Baseline Emissions section below.

B. Emission Factors

S-37-85 (to be cancelled)

- The fugitive emissions from the compressors are calculated using California Implementation Guidelines for Estimating Mass Emissions of fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB Table IV-3a: CAPCOA -Revised 1995 EPA Protocol Refinery Correlation Equations. (see **Attachment II**)

IC engine Baseline Emissions calculation

Pre-Project Emission Factors				
Pollutant	ppmv (@ 15% O_2)	lb/hp-hr	lb/scf	Source
VOC	250	0.002292	0.0003155	Current Permits

S-37-85-4 (heaters)

VOC: 0.0055 lb/MMBtu (current permit)

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Current PTO S-37-4-19

Fugitive Emissions

Daily VOC emissions: 99.9 lb-VOC/day
Annual VOC Emissions: 36,467 lb-VOC/year

S-37-4 heater VOC emissions

0.0055 lb/MMBtu x 60 MMbtu/hr x 24 hr/day = 7.9 lb/day (2,891 lb/yr)

Total VOC emission from '-4:

99.9 (fugitives) + 7.9 (combustion) = 107.8 lb VOC/day

36,467 (fugitives) + 2,891 (combustion) = 39,358 lb VOC/yr

S-37-85 (to be cancelled):

Full-Time Engine/Compressor

Emissions (S-37-85)											
	(lb/hp-hr)	x	(hp)	X	(hr/day)	=	(lb/day)	x	(day/year)	=	(lb/year)
NO_x	0.000659	x	165	X	24	=	2.6	x	365	=	949
SO_x	0.0000208	x	165	X	24	=	0.1	x	365	=	37
PM_{10}	0.0001410	x	165	X	24	=	0.6	x	365	=	219
CO	0.03208	x	165	X	24	=	127.0	x	365	=	46,355
VOC	0.002292	x	165	X	24	=	9.1	x	365	=	3,322

Daily Fugitive VOC emissions: 2.4 lb-VOC/day (**Attachment II**)

Annual Fugitive VOC Emissions: 866 lb-VOC/year

2. Post Project Potential to Emit (PE2)

S-37-4

Fugitive Emissions from new compressor: 1.8 lb/day, 647 lb/yr (**Attachment II**)

Fugitive Emissions

	VOC
Daily	99.9 + 1.8 = 101.7
Annual	36,467 + 647 = 37,114

S-37-4 heater VOC emissions

0.0055 lb/MMBtu x 60 MMbtu/hr x 24 hr/day = 7.9 lb/day (2,891 lb/yr)

Total VOC emission from '-4:

101.7 (fugitives) + 7.9 (combustion) = 109.6 lb/day

37,114 (fugitives) + 2,891 (combustion) = 40,005 lb/yr

Emissions Profiles are included in **Attachment III**.

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Facility-wide VOC emissions exceed both the offset threshold for VOC's (20,000 lb VOC/ yr) and the Major Source threshold for VOC's (20,000 lb VOC/ yr). No other pollutants are emitted by this project; therefore, SSPE1 calculations for these pollutants are not necessary.

Facility-wide VOC emissions exceed both the offset threshold for VOC's (20,000 lb VOC/ yr) and the Major Source threshold for VOC's (20,000 lb VOC/ yr). No other pollutants are emitted by this project; therefore, SSPE1 calculations for these pollutants are not necessary.

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

Facility-wide VOC emissions exceed both the offset threshold for VOC's (20,000 lb VOC/ yr) and the Major Source threshold for VOC's (20,000 lb VOC/ yr). No other pollutants are emitted by this project; therefore, SSPE2 calculations for these pollutants are not necessary.

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

This source concedes that it is an existing Major Source for VOC emissions and will remain a Major Source for VOC. No change in other pollutants are proposed or expected as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore the PSD Major Source threshold is 100 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO2	VOC	SO2	CO	PM	PM10
Estimated Facility PE* before Project Increase				443*		
PSD Major Source Thresholds	100	100	100	100	100	100
PSD Major Source ? (Y/N)	N	N	N	Y	N	N

* SSPE Calculator

As shown above, the facility is an existing PSD major source for at least one pollutant.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the QNEC, and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

As the new compressor has only fugitive emissions, the baseline fugitive VOC emissions will be calculated for the equipment removed, S-37-85.

S-37-4

The facility is proposing to replace a compressor with a new compressor (new emissions unit); therefore BE = 0 for the new compressor.

S-37-85

Actual source test data **(Attachment IV)** indicated that VOC emissions were less than 25 ppmv @ 15% O2 (current BACT Guideline 3.3.12, **Attachment V**). Therefore, the unit is a Clean Emissions Unit. Therefore, Baseline Emissions (BE) are equal to the Potential to Emit calculated above adjusted to the BACT emissions limit of 25 ppmv @ 15% O_2.

BE: 25 ppmv @ 15% O_2/250 ppmv @ 15% O_2 x 3,322 lb/yr = 332 lb/yr

Fugitive Emissions

Applicant has demonstrated that the Rule 4455 leak thresholds, when used in the EPA Correlation Equations for refineries, represent 95% control over the Refinery Average Emissions Factors for valves. The Refinery Average Emissions factors are considered to be a conservative (low) estimate of uncontrolled emissions i.e. the Average Factors include some (implicit) I&M control efficiency (7/14/17 email).

A sample calculation for valves using the Rule 4455 minimum leak detection limit is shown below.

Correlation equation emission limit for valves:

2.27E-06(SV)^ 0.747 kg/hr

Refinery Average Emissions Factor for gas valve:

0.0268 kg/hr/source

Control Efficiency

[1 - (2.27E-06(400)^0.747/0.0268)] x 100

[1 – 0.000199/0.0268] = 99.3 %

The results of calculations for connectors, pumps, and compressors are listed in the table below.

Component	Refinery Average Emission Factor, kg/hr/source	Correlation Equation Emission Limit, kg/hr/source	Control Efficiency, %
Gas Valves	2.68 E-02	1.99 E-04	99.3
Liquid Valves	1.09 E-02	1.19 E-04	98.9
Gas Connectors	2.5 E-04	1.26 E-04	49.7
Liquid Connectors	2.5 E-04	7.56 E-05	69.8
Pumps	1.14 E-01	2.42 E-03	97.9
Compressors	6.36 E-01	7.33 E-04	99.9

As indicated in the table above, valves, pumps, and compressors are clean emissions units for VOC and BE = PE1.

BE = HAE, which is assumed to be zero, for the other components.

Components	Control Efficiency, %	BE
Gas Valves	99.3	PE1 = 161 lb/yr
Liquid Valves	98.9	
Gas Connectors	49.7	HAE = 0
Liquid Connectors	69.8	
Pumps	97.9	PE1 = 0
Compressors (others)*	99.9	HAE = 0
Total		161 lb/yr

*No "others" Refinery Average Emissions Factor, BE assumed to be HAE

Therefore, BE = PE1 = 161 lb/yr for S-37-85 fugitive emissions.

7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is a major source for NOx, CO, and VOCs, the project's PE2 is compared to the SB 288 Major Modification Thresholds in the following table in order to determine if the SB 288 Major Modification calculation is required.

SB 288 Major Modification Thresholds			
Pollutant	**Project PE2 (lb/year)**	**Threshold (lb/year)**	**SB 288 Major Modification Calculation Required?**
NO_x	0	50,000	No
SO_x	0	80,000	No
PM_{10}	0	30,000	No
VOC	37,114 (fugitive emissions only)	50,000	No

Since none of the SB 288 Major Modification Thresholds are surpassed with this project, this project does not constitute an SB 288 Major Modification.

8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

The determination of Federal Major Modification is based on a two-step test. For the first step, only the emission *increases* are counted. Emission decreases may not cancel out the increases for this determination.

Step 1

For new emissions units, the increase in emissions is equal to the PE2 for each new unit included in this project.

Federal Major Modification Thresholds for Emission Increases			
Pollutant	**Total Emissions Increases (lb/yr)**	**Thresholds (lb/yr)**	**Federal Major Modification?**
NO_x*	0	0	No
VOC*	647 (fugitive emissions from new compressor)	0	Yes
PM_{10}	0	30,000	No
$PM_{2.5}$	0	20,000	No
SO_x	0	80,000	No

*If there is any emission increases in NO_x or VOC, this project is a Federal Major Modification and no further analysis is required.

Since there is an increase in VOC emissions, this project constitutes a Federal Major Modification. Federal Offset quantities are calculated below.

Federal Offset Quantities:

The Federal offset quantity is only calculated only for the pollutants for which the project is a Federal Major Modification. The Federal offset quantity is the sum of the annual emission changes for all new and modified emission units in a project calculated as the potential to emit after the modification (PE2) minus the actual emissions (AE) during the baseline period for each emission unit times the applicable federal offset ratio. There are no special calculations performed for units covered by an SLC.

VOC **Federal Offset Ratio** **1.5**

Permit No.	Actual Emissions (lb/year)	Potential Emissions (lb/year)	Emissions Change (lb/yr)
S-37-4	0	647	647
			0
			0
			0
		Net Emission Change (lb/year):	647
		Federal Offset Quantity: (NEC * 1.5)	971

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- NO2 (as a primary pollutant)
- SO2 (as a primary pollutant)
- CO
- PM
- PM10
- Sulfuric acid mist
- Hydrogen sulfide (H2S)
- Total reduced sulfur (inlcuding H2S)
- Reduced sulfur compounds

I. Project Location Relative to Class 1 Area

As demonstrated in the "PSD Major Source Determination" Section above, the facility was determined to be a existing PSD Major Source. Because the project is not located within 10 km (6.2 miles) of a Class 1 area – modeling of the emission increase is not required to determine if the project is subject to the requirements of Rule 2410.

II. Project Emission Increase – Significance Determination

a. Evaluation of Calculated Post-project Potential to Emit for New or Modified Emissions Units vs PSD Significant Emission Increase Thresholds

As a screening tool, the post-project potential to emit from all new and modified units is compared to the PSD significant emission increase thresholds, and if the total potentials to emit from all new and modified units are below the applicable thresholds, no futher PSD analysis is needed.

PSD Significant Emission Increase Determination: Potential to Emit (tons/year)					
	NO_2	SO_2	CO	PM	PM_{10}
Total PE from New and Modified Units*	0	0	0	0	0
PSD Significant Emission Increase Thresholds	40	40	100	25	15
PSD Significant Emission Increase?	N	N	N	N	N

*Combustion equipment not being modified

As demonstrated above, because the post-project total potentials to emit from all new and modified emission units are below the PSD significant emission increase thresholds, this project is not subject to the requirements of Rule 2410 and no further discussion is required.

10. Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - BE, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
BE = Baseline Emissions (per Rule 2201) for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.6 in the evaluation above, quarterly PE2 and quarterly BE can be calculated as follows:

Quarterly Net Emissions Change (QNEC) (lbs/year)	
	VOC
ATC S-37-4-19	39,358
ATC S-37-4-20	40,005
Emissions Increase	647
QNEC = ΔPE/4	161.75

VIII. Compliance Determination

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or

d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As seen in Section VII.C.2 above, the applicant is proposing to install a new electrical compressor with a PE of 1.8 lb/day for VOC. BACT is not triggered for VOCs for new emissions unit purposes.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

c. Modification of emissions units – AIPE > 2 lb/day

As discussed in Section I above, there are no modified emissions units associated with this project. Therefore, BACT is not triggered.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project constitutes a Federal Major Modification for VOCs. Therefore, BACT is triggered for VOCs for all emission units showing an emissions increase (fugitive emissions VOCs).

2. BACT Guideline

BACT Guidelines 7.7.2 and 7.7.3, apply to the electrical compressors (See **Attachment V**).

Petroleum Refining - Valves & Connectors
Petroleum Refining - Pump and Compressor Seals

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see **Attachment VI**), BACT has been satisfied with the following:

VOC:	Leak defined as a reading of methane in excess of 100 ppmv above background when measure per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455 and Leak defined as a reading of methane in excess of 500 ppmv above background when measure per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455

B. Offsets

1. Offset Applicability

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table.

Offset Determination (lb/year)					
	NO_X	SO_X	PM_{10}	CO	VOC
SSPE2					>20,000
Offset Thresholds					20,000
Offsets calculations required?					Yes

2. Quantity of Offsets Required

As seen above, the SSPE2 is greater than the offset thresholds for all criteria pollutants. However, this project only results in an VOC emission. Therefore offset calculations for VOCs will be required for this project.

The quantity of offsets in pounds per year for VOC is calculated as follows for sources with an SSPE1 less than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) = $(\Sigma[PE2 - BE] + ICCE) \times DOR$, for all new or modified emissions units in the project,

Where,
PE2 = Post Project Potential to Emit, (lb/year)
BE = Baseline Emissions, (lb/year)

ICCE = Increase in Cargo Carrier Emissions, (lb/year)
DOR = Distance Offset Ratio, determined pursuant to Section 4.8

BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, Located at a Major Source.

otherwise,
BE = HAE

S-37-4 New Compressor

The compressor is a new emissions unit and therefore BE = 0.

PE2 = 0 lb/yr for S-37-85

Applicant has not provided HAE information on '-85 fugitive emissions and has agreed to assume that it is zero for offset purposes.

	PE2	BE
New Compressor	647	0 (BE)
'-85 IC engine	0	332 (Adjusted PE1 to BACT Limit)
'-85 fugitive emissions	0	161
Total	647	493

Offsets Required (lb/year) = Σ[PE2 – BE] x DOR
= (647 – 493) x 1.5
= 231lb VOC/yr

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly offsets required (lb/qtr) = (231 lb VOC/year) ÷ (4 quarters/year)
= 57.75 lb/qtr

As shown in the calculation above, the quarterly amount of offsets required for this project, when evenly distributed to each quarter, results in fractional pounds of offsets being required each quarter. Since offsets are required to be withdrawn as whole pounds, the quarterly amounts of offsets need to be adjusted to ensure the quarterly values sum to the total annual amount of offsets required.

To adjust the quarterly amount of offsets required, the fractional amount of offsets required in each quarter will be summed and redistributed to each quarter based on the number of days in each quarter. The redistribution is based on the Quarter 1 having the

fewest days and the Quarters 3 and 4 having the most days. The redistribution method is summarized in the following table:

Redistribution of Required Quarterly Offsets (where X is the annual amount of offsets, and X ÷ 4 = Y.z)				
Value of z	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**
.0	Y	Y	Y	Y
.25	Y	Y	Y	Y+1
.5	Y	Y	Y+1	Y+1
.75	Y	Y+1	Y+1	Y+1

Therefore, the appropriate quarterly emissions to be offset are as follows:

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total Annual
57	58	58	58	231

The applicant has stated that the facility plans to use ERC certificate S-4809-1 to offset the increases in VOC emissions associated with this project. The above certificate has available quarterly VOC credits as follows:

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
ERC # S-4809-1	1,000	1,000	1,000	1,000

As seen above, the facility has sufficient credits to fully offset the quarterly NOx emissions increases associated with this project.

Proposed Rule 2201 (offset) Conditions:

- {GC# 4447 - edited} Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 57 lb, 2nd quarter - 58 lb, 3rd quarter - 58 lb, and fourth quarter – 58 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.8 (as amended 4/21/11) for the ERC specified below. [District Rule 2201]

- ERC Certificate Number S-4809-1 (or a certificate split from this certificate) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

As demonstrated in the calculation above, the amount of offsets is zero. Therefore, offsets will not be required for this project.

C. Public Notification

1. Applicability

Public noticing is required for:
a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
c. Any project which results in the offset thresholds being surpassed,
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
e. Any project which results in a Title V significant permit modification

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in Section VII.C.7, this project does not constitute an SB 288 Major Modification or a Federal Major Modification; therefore, public noticing for Federal Major Modification purposes is not required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. As seen in Section VII.C.2 above, this project does not include a new emissions unit which has daily emissions greater than 100 lb/day for any pollutant, therefore public noticing for PE > 100 lb/day purposes is not required.

c. Offset Threshold

The following table compares the pre-project SSPE1 with the post-project SSPE2 in order to determine if any offset thresholds have been surpassed.

Offset Threshold				
Pollutant	**SSPE1 (lb/yr)**	**SSPE2 (lb/yr)**	**Offset Levels (lb/yr)**	**Public Notice Required?**
VOC	>20,000	>20,000	20,000	No

Since the SSPE2 does not surpass the offset threshold levels, public noticing is not triggered for this project.

d) SSIPE > 20,000 lb/yr

The SSIPE (NEC) is calculated and shown as follows:

SSIPE= SSPE2 – SSPE1

Stationary Source Increase in Permitted Emissions (SSIPE)			
Pollutant	**SSPE2 (lb/yr)**	**SSPE1 (lb/yr)**	**SSIPE (lb/yr)**
VOC	>20,000	>20,000	647

As shown in the above table, the SSIPE for this project [exceeds/does not exceed] the 20,000 lb/yr public notice threshold.

Therefore, public noticing is not required for SSIPE purposes.

e. Title V Significant Permit Modification

As shown in the Discussion of Rule 2520 below, this project does constitute a Title V Significant Modification. Therefore, public noticing for Title V Significant Modifications is required for this project.

2. Public Notice Action

As discussed above, this project is a Title V Significant Modification. Therefore, public notice will be required for this project.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

Fugitive emissions from the new electrical compressor are included in the DEL for the '-4 permit unit. The DEL is stated in the form of maximum fugitive VOC emissions per day

Proposed Rule 2201 (DEL) Conditions:

S-37-4

VOC emission rate from fugitive components the emissions units listed on this permit shall not exceed 101.7 lb/day. [District Rule 2201] Y

E. Compliance Assurance

1. Source Testing

No change to the source testing is necessary.

2. Monitoring

No change to the monitoring requirements is necessary.

3. Recordkeeping

The following new recordkeeping condition will be added to the proposed ATC:

39. Permit holder shall maintain accurate component count and resultant emissions from the Booster and #2 Hydrogen Compressors according to California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB Table IV-3a: CAPCOA -Revised 1995 EPA Protocol Refinery Correlation Equations. [District Rule 2201] Y

4. Reporting

No change to the reporting requirements is necessary.

F. Ambient Air Quality Analysis (AAQA)

An AAQA shall be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The project results in a decrease in VOC emissions. There is no AAQA for VOCs. Therefore, an AAQA is not required.

G. Compliance Certification

Section 4.15.2 of this Rule requires the owner of a new Major Source or a source undergoing a Federal Major Modification to demonstrate to the satisfaction of the District that all other Major Sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As discussed in Section VIII above, this facility is a new major source and this project does constitute a Federal Major Modification, therefore this requirement is applicable. Kern's compliance certification is included in **Attachment VII**.

H. Alternate Siting Analysis

The current project occurs at an existing facility. The applicant proposes to install a new compressor.

Since the compressor will be used at the same location, the existing site will result in the least possible impact from the project. Alternative sites would involve the relocation and/or construction of various support structures on a much greater scale, and would therefore result in a much greater impact.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. Section 3.29 defines a significant permit modification as a "permit amendment that does not qualify as a minor permit modification or administrative amendment."

The project is Federal Major Modification and therefore is also a Title V Significant Modification. As discussed above, the facility has applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The Title V Compliance Certification form is included in **Attachment VII**.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60. Three NSPS Subparts are applicable to the project. Each of the relevant subparts is identified below.

Subpart Ja - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007

The new compressor drive shaft will vent to flare S-37-7 (fuel gas combustion device). However the flare is not being modified as indicated by the underlined wording of the subpart below.

§60.100a Applicability, designation of affected facility, and reconstruction.

(a) The provisions of this subpart apply to the following affected facilities in petroleum refineries: fluid catalytic cracking units (FCCU), fluid coking units (FCU), delayed coking units, fuel gas combustion devices (including process heaters), flares and sulfur recovery plants. The sulfur recovery plant need not be physically located within the boundaries of a petroleum refinery to be an affected facility, provided it processes gases produced within a petroleum refinery.
(b) Except for flares and delayed coking units, the provisions of this subpart apply only to affected facilities under paragraph (a) of this section which either commence construction, modification or reconstruction after May 14, 2007, or elect to comply with the provisions of this subpart in lieu of complying with the provisions in subpart J of this part. For flares, the provisions of this subpart apply only to flares which commence construction, modification or reconstruction after June 24,

2008. For the purposes of this subpart, a modification to a flare commences when a project that includes any of the activities in paragraphs (c)(1) or (2) of this section is commenced.

(c) For all affected facilities other than flares, the provisions in §60.14 regarding modification apply. As provided in §60.14(f), the special provisions set forth under this subpart shall supersede the provisions in §60.14 with respect to flares. For the purposes of this subpart, a modification to a flare occurs as provided in paragraphs (c)(1) or (2) of this section.

(1) Any new piping from a refinery process unit, including ancillary equipment, or a fuel gas system is physically connected to the flare (*e.g.*, for direct emergency relief or some form of continuous or intermittent venting).

(2) A flare is physically altered to increase the flow capacity of the flare.

(d) For purposes of this subpart, under §60.15, the "fixed capital cost of the new components" includes the fixed capital cost of all depreciable components which are or will be replaced pursuant to all continuous programs of component replacement which are commenced within any 2-year period following the relevant applicability date specified in paragraph (b) of this section.

[73 FR 35867, June 24, 2008, as amended at 77 FR 56464, Sep. 12, 2012; 80 FR 75230, Dec. 1, 2015]

In regards to Ja, the new compressor would not be considered an "affected facility" under Subpart Ja. The compressor replacement does not require a "new connection" to the flare as the new compressor will serve in the same capacity. Therefore, the existing flare is not being modified.

Subpart GGGa- Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006

The replacement compressor is an "affected unit" and subject to the Subpart. The facility is currently in compliance with Subpart GGGa (VVa). Note that because the compressor drive shaft vents to flare S-37-7, which is a closed vent system as it meets the requirements of 40 CFR 60.18, 40 CFR 60.482-3a(i) stated below is satisfied. Compliance with the subpart is expected.

§60.482-3a Standards: Compressors.

(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of VOC to the atmosphere, except as provided in §60.482-1a(c) and paragraphs (h), (i), and (j) of this section.

(b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure; or

(2) Equipped with a barrier fluid system degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a control device that complies with the requirements of §60.482-10a; or

(3) Equipped with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere.

(c) The barrier fluid system shall be in heavy liquid service or shall not be in VOC service.

(d) Each barrier fluid system as described in paragraph (a) shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm.

(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(f) If the sensor indicates failure of the seal system, the barrier system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482-9a.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section, if it is equipped with a closed vent system to capture and transport leakage from the compressor drive shaft back to a process or fuel gas system or to a control device that complies with the requirements of §60.482-10a, except as provided in paragraph (i) of this section.

(i) Any compressor that is designated, as described in §60.486a(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is demonstrated to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the methods specified in §60.485a(c); and

(2) Is tested for compliance with paragraph (i)(1) of this section initially upon designation, annually, and at other times requested by the Administrator.

(j) Any existing reciprocating compressor in a process unit which becomes an affected facility under provisions of §60.14 or §60.15 is exempt from paragraphs (a) through (e) and (h) of this section, provided the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance with the provisions of paragraphs (a) through (e) and (h) of this section.

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§60.482-4a Standards: Pressure relief devices in gas/vapor service.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63. However, no subparts of 40 CFR Part 61 or 40 CFR Part 63 apply to the equipment in this project.

Rule 4101 Visible Emissions

Rule 4101 states that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity). The compressor is electrical (no fuel combustion), visible emissions are not expected to exceed Ringelmann 1 or 20% opacity. Also, based on past inspections of the facility continued compliance is expected.

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected.

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

As demonstrated above, there are no increases in emissions associated with this project, therefore a health risk assessment is not necessary and no further risk analysis is required.

Rule 4301 Fuel Burning Equipment (12/17/92)

This rule specifies maximum emission rates for NOx (as NO2) 140 lb/hr, SOx (as SO2) 200 lb/hr, and total combustion air contaminant emissions from fuel burning equipment (defined as total PM in Rule 1020) 10 lb/hr. This rule also limits combustion contaminants to $\leq$ 0.1 gr/scf. According to Table 1.4-2, footnote c of AP-42 (July 1998), all PM emissions from natural gas combustion are less than 1 μm in diameter. Since the permit allows only gas as a fuel, it is reasonable to assume that the total PM emissions from the new heaters are equal to the PM10 emissions.

The equipment on these permits is currently in compliance with this Rule. The modifications associated with this project are not expected to alter the combustion of this equipment. Therefore, compliance with this rule is expected.

District Rule 4305 Boilers, Steam Generators and Process Heaters – Phase 2

These units are natural gas-fired with a maximum heat input greater than 5 MMBtu/hr. Pursuant to Section 2.0 of District Rule 4305, the units are subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters – Phase 2.*

In addition, these units are also subject to District Rule 4306, *Boilers, Steam Generators and Process Heaters – Phase 3.*

Since the emissions limits of District Rule 4306 and all other requirements are equivalent or more stringent than District Rule 4305 requirements, compliance with District Rule 4306 requirements will satisfy the requirements of District Rule 4305.

District Rule 4306 Boilers, Steam Generators and Process Heaters – Phase 3

This rule limits NOx and CO emissions from boilers, steam generators, and process heaters rated greater than 5 MMBtu/hr. The units are currently in compliance with the requirement of this rule. The modifications associated with this project are not expected to alter the combustion of this equipment. Therefore, continued compliance with this rule is expected.

District Rule 4320 Advance Emission Reduction Options for Boilers, Steam Generators and Process Heaters Greater than 5 MMBtu/hr

This rule limits NOx, CO, SO2 and PM10 emissions from boilers, steam generators and process heaters rated greater than 5 MMBtu/hr. This rule also provides a compliance option of payment of fees in proportion to the actual amount of NOx emitted over the previous year.

The units in this project are all rated at greater than 5 MMBtu/hr heat input and are subject to this rule.

Kern pays annual emissions fee to the District and comply with the particulate matter control requirements in Section 5.4.

Therefore, continued compliance with District Rule 4320 requirements is expected.

District Rule 4351 Boilers, Steam Generators and Process Heaters – Phase 1

This rule applies to boilers, steam generators, and process heaters at NOx Major Sources that are not located west of Interstate 5 in Fresno, Kings, or Kern counties. The emission limits, monitoring provisions, and testing requirements of this rule are satisfied when the unit is operated in compliance with Rule 4306. Therefore, compliance with this rule is expected.

Rule 4455 Components at Petroleum Refineries, Gas Liquid Processing Facilities, and Chemical Plants (4/20/2005)

This rule requires periodic inspection of fugitive components and expedient repair of leaking components at refineries and chemical plants. The new and existing fugitive components are