



PERMIT TO OPERATE

EASTERN KERN AIR POLLUTION CONTROL DISTRICT

Administrative Office: 2700 "M" Street Suite 302, Bakersfield, CA 93301
Phone: (661) 862-5250 • Fax: (661) 862-5251 • ekapcd@co.kern.ca.us
Tehachapi Field Office: Phone: (661) 823-9264 • Fax: (661) 823-0167

PERMIT NUMBER: **0274001**

PERMIT TO OPERATE IS HEREBY GRANTED TO: **CLEAN ENERGY LNG, LLC.**

FOR EQUIPMENT LOCATED AT: **14436 CONTRACTOR ROAD, BORON**

EQUIPMENT OR PROCESS DESCRIPTION: **LIQUEFIED NATURAL GAS PRODUCTION FACILITY**

OPERATIONAL CONDITIONS LISTED BELOW.

THIS PERMIT BECOMES VOID UPON ANY CHANGE OF OWNERSHIP OR LOCATION, OR ANY ALTERATION. EQUIPMENT MODIFICATION REQUIRES AN APPLICATION FOR AUTHORITY TO CONSTRUCT.

TESTING: Permittee may be required to provide adequate sampling and testing facilities.

GLEN E. STEPHENS, P.E.
AIR POLLUTION CONTROL OFFICER

REVOCABLE: This permit does not authorize emission of air contaminants in excess of those allowed by Rules and Regulations of EKAPCD.

By: _____

For Period: 09-30-13 To 09-30-14

CONDITIONS OF APPROVAL:

Pursuant to Rule 209, "conditional approval" is hereby granted. Please be aware all conditions of approval imposed by any applicable Authority to Construct remain in effect for life of project, unless modified by application.

EQUIPMENT DESCRIPTION: Liquefied Natural Gas Production Facility, including following equipment:

A. Amine System:

1. Amine Contactor (2-T-600) 36" O.D x 63'-0"H;
2. Amine Regenerator (2-T-610) 30" O.D. x 52'-0" H;
3. 2,446 MM BTU/hr Lean/Rich Amine Exchanger (2-E-400) 22" OD x 16'-0" H;
4. 0.9 MM BTU/hr Amine Cooler (2-A-800) 18" OD x 16'0" L;
5. 2.7 MM BTU/hr Amine Reboiler (2-E-410) 24" OD x 29'-0" L;
6. 1.26 MM BTU/hr Reflux Condenser (2-A-801);
7. Amine Particulate Filter (2-F-500) 20" OD x 5';
8. Amine Charcoal Filter (2-F-510) 16" OD x 4'-0";
9. 50-hp (44-gpm) Lean Amine Circulation Pump #1 (2-P300 A);
10. 50-hp (44-gpm) Lean Amine Circulation Pump #2 (2-P300 B);
11. 7.5-hp (50-gpm) Amine Booster Pump #1 (2-P-330 A);
12. 7.5-hp (50-gpm) Amine Booster Pump #2 (2-P-330 B);

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13. 1-hp (5-gpm) Water/Amine Make-Up Pump (2-P-235);
14. 1.5-hp (1.7-gpm) Amine Reflux Pump #1 (2-P-320 A);
15. 1.5-hp (1.7-gpm) Amine Reflux Pump #2 (2-P-320 B);
16. Amine Make-Up Tank (2-T-235A) 30" OD x 8';
17. Sweet Gas After-Scrubber (2-V-110) 6'-0 x 6';
18. Amine Flash Separator (2-V-120) 42" OD x 8'; and
19. Reflux Accumulator (2-V-140) 30" OD x 5'-0" LG.

B. LNG Liquefaction System:

1. Natural Gas Water Cooling Heat Exchanger (3-HE-601) 18" OD x 15'-0" L (capacity to be determined);
2. G-S Liquid Separator G/S-26-F8C 950;
3. 295 cu. ft. Moisture Adsorber Bed #1 (3-D-301) 5'-0" OD x 15'-0" H;
4. 295 cu. ft. Moisture Adsorber Bed #2 (3-D-302) 5'-0" OD x 15'-0" H;
5. 12.6 cu. ft. Adsorption Bed Dust Filter (3-F-302) 24" OD x 48" H;
6. 50 cu. ft. Regeneration Heater (3-HE-303) 30" OD x 10" L;
7. 7 cu. ft. Regeneration Gas Cooler (3-HE-306) 10" OD x 12'-0" L;
8. Regeneration Gas Separator (3-SP-305) (size to be determined); and
9. Heavy Hydrocarbon Reboiler (3-HE-502) (size to be determined).

10. Train 1:

- a. 5,000-hp Nitrogen Recycle Compressor (3-C-151) 8'-8" x 18'-0" L;
- b. 6.5 cu. ft. Compressor After Cooler (3-HE-(TBD)) 10" OD x 12"-0";
- c. Cold Turbo Expander w/ Booster (3-TBX-400) 10" OD x 8'-0" L;
- d. Warm Turbo Expander w/ Booster (3-TBX-410) 10" OD x 8'-0" L;
- e. 3.5 cu. ft. Cold Turbo Booster After Cooler (3-HE-430) 8" OD x 12'-0" L;
- f. 3.5 cu. ft. Warm Turbo Booster After Cooler (3-HE-440) 8" OD x 12'-0" L;
- g. 5-hp Compressor Lube Oil Pump #1 (3-M-301);
- h. 5-hp Compressor Lube Oil Pump #2 (3-M-301A);
- i. 3-kW Compressor Lube Oil Heater(3-H-301);
- j. 125-hp Natural Gas Chiller Compressor (3-R-1651) 7'-6" x 14'-0";
- k. 2-hp Chiller Lube Oil Pump #1 (3-M- 201);
- l. 2-hp Chiller Lube Oil Pump #2 (3-M- 201A);
- m. 2-kW Chiller Lube Oil Heater (3-H-201);
- n. 5-kW Thaw Heater (3-H-102);
- o. Cold Box (size to be determined) 10'-0" x 8'-6" x 63'-0"H;
- p. Main Heat Exchanger (3-HE-501) 42" x 83" OD x 166" L; and
- q. Fractionation Column (3-C-501) (size to be determined).

11. Train 2:

- a. 5,000-hp Nitrogen Recycle Compressor (3-C-151) 8'-8" x 18'-0" L;
- b. 6.5 cu. ft. Compressor After Cooler (3-HE-(TBD)) 10" OD x 12"-0";
- c. Cold Turbo Expander w/ Booster (3-TBX-400) 10" OD x 8'-0" L;
- d. Warm Turbo Expander w/ Booster (3-TBX-410) 10" OD x 8'-0" L;
- e. 3.5 cu. ft. Cold Turbo Booster After Cooler (3-HE-430) 8" OD x 12'-0" L;
- f. 3.5 cu. ft. Warm Turbo Booster After Cooler (3-HE-440) 8" OD x 12'-0" L;
- g. 5-hp Compressor Lube Oil Pump #1 (3-M-301);
- h. 5-hp Compressor Lube Oil Pump #2 (3-M-301A);
- i. 3-kW Compressor Lube Oil Heater(3-H-301);
- j. 125-hp Natural Gas Chiller Compressor (3-R-1651) 7'-6" x 14'-0";
- k. 2-hp Chiller Lube Oil Pump #1 (3-M- 201);
- l. 2-hp Chiller Lube Oil Pump #2 (3-M- 201A);
- m. 2-kW Chiller Lube Oil Heater (3-H-201);
- n. 5-kW Thaw Heater (3-H-102);
- o. Cold Box (size to be determined) 10'-0" x 8'-6" x 63'-0"H;

- p. Main Heat Exchanger (3-HE-501) 42" x 83" OD x 166" L; and
- q. Fractionation Column (3-C-501) (size to be determined).

C. Heavy Hydrocarbon Removal:

- 1. LP Separator (3-V-101) 4'-0" x 10'-0" L;
- 2. HP Separator (3-V-102) 5'-0" X 12'-6" L; and
- 3. 30,000 Gallon Heavy Hydrocarbon Storage Tank (3-V-103) 8'-0" OD x 24'-0" L (shared with 0274004).

D. LNG Storage, Boil-Off Compressor, and Regeneration Gas Compressor:

- 1. 1.5 MM Gallon LNG Storage Tank (4-TK-1) 88'-6" OD x 51'-0" H (shared with Permit 0274007);
- 2. 3.42 MM Btu/hr Preheater (4-E-6) 18" OD x 10'-0";
- 3. 0.1370 MM Btu/hr C2/C3 Aftercooler (4-E-8);
- 4. 200-hp (0.795 MM SCFD) Boil-Off /Flash Gas Compressor #1 (4-C -2 A);
- 5. 150-hp Boil-off/ Flash Gas Compressor # 2 (4-C-2 B);
- 6. 200-hp (0.795 MM SCFD) Boil-Off /Flash Gas Compressor #3 (4-C-3 A);
- 7. 150-hp Boil- Off/ Flash Gas Compressor #4 4-C- 3B;
- 8. 5-hp Boil-Off /Flash Gas Compressor Oil Pump #1 (4-P-4 A);
- 9. 5-hp Boil-Off /Flash Gas Compressor Oil Pump #2 (4-P-4 B);
- 10. 5-hp Boil-off/ Flash Gas Compressor Oil Pump #3 (4-P-5 A);
- 11. 5-hp Boil-Off/ Flash Gas Compressor Oil Pump #4 (4-P-5 B);
- 12. 25-hp (3.6 MM SCFD) Regeneration Gas Compressor (4-C -4);
- 13. 5-kW Regeneration Gas Heater #1 (4-E-9); and
- 14. 15-hp (100-gpm) Trailer Unloading LNG Pump (4-P-6).

OPERATIONAL CONDITIONS:

- 1. Liquefied natural gas (LNG) storage vessel shall be gas tight and vent to vapor recovery system or to flare. (Rule 210.1 BACT Requirement)
- 2. Permittee shall establish an inspection and maintenance program consistent with District Rules 414.1 and 414.5, and requirements described below. Where there are differences in the requirements, the more stringent requirement shall apply. (Rules 414.1, 414.5, 419 and 210.1 BACT Requirement)
 - a. All accessible pumps, compressors and pressure relief devices (pressure relief valves or rupture disks) shall be audio-visually inspected once during every eight-hour operating period.
 - b. All accessible valves, fittings, pressure relief devices (PRDs), hatches, pumps, compressors, etc. shall be inspected quarterly using a leak detection device such as a Foxboro OVA 108 calibrated for methane.
 - c. All inaccessible components shall be inspected annually using a leak detection device calibrated for methane.
 - d. Gas leak for all components shall be defined as follows:
VOC concentration greater than 100 ppmv as methane, as determined by EPA Method 21, or equivalent
 - e. Inspection frequency for accessible components, except pumps and compressors, may change to quarterly if all accessible components at the facility have operated for five consecutive quarters with no leaks.
 - f. All leaks over 100-ppmv shall be repaired within one calendar day.
 - g. Any leak over 100-ppmv detected by District inspection(s) in any 24-hour period shall constitute a violation of this Authority to Construct (ATC)/Permit to Operate (PTO).
- 3. The following component count shall be utilized to determine fugitive emissions:

Valves	Gas	550
Compressor Seals	Gas	4
Connectors	All	610
Pressure Relief Valve	Gas	69
Open-ended Lines	All	5
- 4. Equipment shall be maintained according to manufacturer's specifications to ensure compliance with emissions limitations. (Rules 210.1 and 209)

5. Compliance with all operational conditions shall be verified by appropriate record keeping, including records of operational data needed to demonstrate compliance. Such records shall be kept on site in readily available format. (Rule 210.1)
6. No emission resulting from use of this equipment shall cause injury, detriment, nuisance, annoyance to or endanger comfort, repose, health, or safety of any considerable number of persons or public. (Rule 419 and CH&SC Sec 41700)
7. The District shall be notified of any breakdown conditions in accordance with Rule 111 (Equipment Breakdown). (Rule 111)
8. Clean Energy shall consult with the Kern County Roads Department regarding improvements necessary to Gephart Road. Any requirements for improvements to Gephart Road required by the Road Department shall be completed prior to implementation of this Authority to Construct (ATC) and ATC No. 0274007. (Rule 208.2)

STATE OF CALIFORNIA AIR TOXICS HOT SPOTS REQUIREMENTS:

Facility shall comply with California Health and Safety Code Sections 44300 through 44384. (Rule 208.1)

COMPLIANCE TESTING REQUIREMENTS:

Should inspection reveal conditions indicative of non-compliance, compliance with hourly and concentration emission limits for VOC shall be verified pursuant to Rule 108.1 and EKAPCD Guidelines for Compliance Testing, within 45 days of District request.

EMISSION LIMITS:

Emissions rate of each air contaminant from this unit shall not exceed following limits:

<u>Volatile Organic Compounds (VOC):</u>	0.56 lb/hr
	13.38 lb/day
	2.44 ton/yr

(Emissions limits established pursuant to Rule 210.1, unless otherwise noted.)

Compliance with maximum daily emission limits shall be verified by source operator (with appropriate operational data and record keeping to document maximum daily emission rate) each day source is operated and such documentation of compliance shall be retained and made readily available to District for period of three years. (Rules 209 and 210.1)



PERMIT TO OPERATE

EASTERN KERN AIR POLLUTION CONTROL DISTRICT

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PERMIT NUMBER: **0274006**

PERMIT TO OPERATE IS HEREBY GRANTED TO: **CLEAN ENERGY LNG, LLC**

FOR EQUIPMENT LOCATED AT: **14436 CONTRACTOR ROAD, BORON**

EQUIPMENT OR PROCESS DESCRIPTION: **FLARE**

OPERATIONAL CONDITIONS LISTED BELOW.

THIS PERMIT BECOMES VOID UPON ANY CHANGE OF OWNERSHIP OR LOCATION, OR ANY ALTERATION. EQUIPMENT MODIFICATION REQUIRES AN APPLICATION FOR AUTHORITY TO CONSTRUCT.

TESTING: Permittee may be required to provide adequate sampling and testing facilities.

GLEN E. STEPHENS, P.E.
AIR POLLUTION CONTROL OFFICER

REVOCABLE: This permit does not authorize emission of air contaminants in excess of those allowed by Rules and Regulations of EKAPCD.

By:  _____

For Period: 09-30-13 To 09-30-14

CONDITIONS OF APPROVAL:

Pursuant to Rule 209, "conditional approval" is hereby granted. Please be aware all conditions of approval imposed by any applicable Authority to Construct remain in effect for life of project, unless modified by application.

EQUIPMENT DESCRIPTION: Flare, including following equipment:

- A. 66.0-MMBtu/hr flare with 25.0 ft. high, 1.0 ft. diameter stack pilot light fired on natural gas liquefied petroleum gas, or propane; and
- B. 3 hp pump.

OPERATIONAL CONDITIONS:

1. Flare shall be equipped with automatic re-ignition system. (Rule 210.1 BACT Requirement)
2. Flare shall be equipped with following: pilot light and non-condensable gas volumetric flow meter. (Rule 210.1)
3. Air assist or steam assist shall be utilized to assure smokeless flare. (Rule 210.1 BACT Requirement)
4. Visible emissions from flare after it has reached normal operating temperature shall not equal or exceed 5% opacity or Ringelmann No. ¼ for more than 5 minutes in any two hour period. (Rule 210.1 BACT Requirement)
5. Exhaust gas particulate matter concentration shall not exceed 0.1 grains/ft³ of gas at standard conditions. (Rule 404.1)

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6. Only natural gas shall be used to fire flare pilot flame. (Rule 210.1)
7. Gas to flare shall not exceed 56,000 standard cubic feet per hour (scfh). (Rule 210.1)
8. Equipment shall be maintained according to manufacturer's specifications (or KCAPCD - approved "industry-wide" standards and procedures) to ensure compliance with emissions limitations. (Rule 210.1 and Rule 209)
9. Compliance with all operational conditions shall be verified by appropriate record keeping, including records of operational data needed to demonstrate compliance. Such records shall be kept on site in readily available format. (Rule 209)
10. No emission resulting from use of this equipment shall cause injury, detriment, nuisance, annoyance to or endanger comfort, repose, health or safety of any considerable number of persons or public. (Rule 419 and CH&SC 41700)

STATE OF CALIFORNIA AIR TOXICS HOT SPOTS REQUIREMENTS:

Facility shall comply with California Health and Safety Code Sections 44300 through 44384. (Rule 208.1)

COMPLIANCE TESTING REQUIREMENTS:

Should non-compliance be suspected, compliance with emission limitations shall be demonstrated pursuant to Rule 108.1 within 60 days of District request or initial use of equipment.

EMISSION LIMITS:

Emissions rate of each air contaminant from this unit shall not exceed following limits:

Particulate Matter (PM₁₀):

1.10 lb/hr
26.45 lb/day
0.37 ton/yr

Sulfur Oxides (SO_x as SO₂):

0.12 lb/hr
2.88 lb/day
0.04 ton/yr

Oxides of Nitrogen (NO₂):

0.06 lb/MMScf (Rule 210.1 BACT Rqmt.)
2.01 lb/hr
48.15 lb/day
0.67 ton/yr

Volatile Organic Compounds (VOC):
(as defined in Rule 210.1)

0.44 lb/hr
10.61 lb/day
0.15 ton/yr

Carbon Monoxide:

2.54 lb/hr
60.98 lb/day
0.85 ton/yr

(Emissions limits established pursuant to Rule 210.1, unless otherwise noted.)

Compliance with maximum daily emission limits shall be verified by source operator (with appropriate operational data and record keeping to document maximum daily emission rate) each day source is operated and such documentation of compliance shall be retained and made readily available to District for period of three years. (Rules 209 and 210.1)



PERMIT TO OPERATE

EASTERN KERN AIR POLLUTION CONTROL DISTRICT

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PERMIT NUMBER: **0274007**

PERMIT TO OPERATE IS HEREBY GRANTED TO: **CLEAN ENERGY LNG, LLC.**

FOR EQUIPMENT LOCATED AT: **14436 CONTRACTOR ROAD, BORON**

EQUIPMENT OR PROCESS DESCRIPTION: **LIQUEFIED NATURAL GAS STORAGE & UNLOADING OPERATION**

OPERATIONAL CONDITIONS LISTED BELOW.

THIS PERMIT BECOMES VOID UPON ANY CHANGE OF OWNERSHIP OR LOCATION, OR ANY ALTERATION. EQUIPMENT MODIFICATION REQUIRES AN APPLICATION FOR AUTHORITY TO CONSTRUCT.

TESTING: Permittee may be required to provide adequate sampling and testing facilities.

GLEN E. STEPHENS, P.E.
AIR POLLUTION CONTROL OFFICER

REVOCABLE: This permit does not authorize emission of air contaminants in excess of those allowed by Rules and Regulations of EKAPCD.

By: _____

For Period: 09-30-13 To 09-30-14

CONDITIONS OF APPROVAL:

Pursuant to Rule 209, "conditional approval" is hereby granted. Please be aware all conditions of approval imposed by any applicable Authority to Construct remain in effect for life of project, unless modified by application.

EQUIPMENT DESCRIPTION: Liquefied Natural Gas Storage and Unloading Operation, including following equipment:

- A. 1.5-Million Gallon LNG Storage Tank (4-TK-1) 88'-6" OD x 51'-0" H (shared with Permit 0274001);
- B. 30-hp (350-gpm) LNG Transfer Pump #1 (4-P-1);
- C. 30-hp (350-gpm) LNG Transfer Pump #2 (4-P-2); and
- D. 30-hp (350-gpm) LNG Transfer Pump #3 (4-P-3).

OPERATIONAL CONDITIONS:

- 1. LNG Storage tank storage tank shall be connected to volatile organic compound (VOC) vapor control system. (Rule 210.1)
- 2. Tank volume shall not exceed 1,500,000-gallons without prior District approval. (Rule 210.1)
- 3. LNG Storage tank shall be vented only through vapor control system. (Rule 210.1)
- 4. All piping, fittings, regulators, and valves shall be gas-tight. (Rule 210.1)

5. No emission shall cause injury, detriment, nuisance, or annoyance to or endanger comfort, repose, health, or safety of any persons or have natural tendency to cause injury or damage to business or property. (Rule 419 and CH&SC Sec 41700)
6. Equipment shall be maintained and operated in accordance with manufacturer's specifications to ensure compliance with emission limitations. (Rules 209 and 210.1)
7. Operation shall have no liquid leaks.
8. Liquid leak for all components shall be defined as follows: three drops per minute or excess of 10,000 ppmv as methane.
9. Unloading line connections to trucks shall be leak tested and determined leak free prior to full use. (Rule 210.1 BACT Requirement)
10. Permittee shall establish an inspection and maintenance program consistent with District Rules 414.1 and 414.5, and requirements described below. Where there are differences in the requirements, the more stringent requirement shall apply. (Rules 414.1, 414.5, 419 and 210.1 BACT Requirement)
 - a. All accessible pumps, compressors and pressure relief devices (pressure relief valves or rupture disks) shall be audio-visually inspected once during every eight-hour operating period.
 - b. All accessible valves, fittings, pressure relief devices (PRDs), hatches, pumps, compressors, etc. shall be inspected quarterly using a leak detection device such as a Foxboro OVA 108 calibrated for methane.
 - c. All inaccessible components shall be inspected annually using a leak detection device calibrated for methane.
 - d. Gas leak for all components shall be defined as follows:
VOC concentration greater than 100 ppmv as methane, as determined by EPA Method 21, or equivalent.
 - e. Inspection frequency for accessible components, except pumps and compressors, may change to quarterly if all accessible components at the facility have operated for five consecutive quarters with no leaks.
 - f. All leaks over 100-ppmv shall be repaired within one calendar day.
 - g. Any leak over 100-ppmv detected by District inspection(s) in any 24-hour period shall constitute a violation of this Authority to Construct (ATC)/Permit to Operate (PTO).
11. Equipment shall be maintained according to manufacturer's specifications to ensure compliance with emissions limitations. (Rules 210.1 and 209)
12. Compliance with all operational conditions shall be verified by appropriate record keeping, including records of operational data needed to demonstrate compliance. Such records shall be kept on site in readily available format. (Rule 210.1)
13. No emission resulting from use of this equipment shall cause injury, detriment, nuisance, annoyance to or endanger comfort, repose, health, or safety of any considerable number of persons or public. (Rule 419 and CH&SC Sec 41700)
14. The District shall be notified of any breakdown conditions in accordance with Rule 111 (Equipment Breakdown). (Rule 111)
15. Clean Energy shall consult with the Kern County Roads Department regarding improvements necessary to Gephart Road. Any requirements for improvements to Gephart Road required by the Road Department shall be completed prior to implementation of this Authority to Construct (ATC) and ATC No. 0274001. (Rule 208.2)

STATE OF CALIFORNIA AIR TOXICS HOT SPOTS REQUIREMENTS:

Facility shall comply with California Health and Safety Code Sections 44300 through 44384. (Rule 208.1)

COMPLIANCE TESTING REQUIREMENTS:

Should inspection reveal conditions indicative of non-compliance, compliance with hourly concentration emission limits for VOC shall be verified pursuant to Rule 108.1 and EKAPCD Guidelines for Compliance Testing, within 45 days of District request.

EMISSION LIMITS:

Emissions rate of each air contaminant from this unit shall not exceed following limits:

<u>Volatile Organic Compounds (VOC):</u>	0.004	lb/hr
	0.09	lb/day
	0.02	ton/yr

(Emissions limits established pursuant to Rule 210.1, unless otherwise noted.)

Compliance with maximum daily emission limits shall be verified by source operator (with appropriate operational data and record keeping to document maximum daily emission rate) each day source is operated and such documentation of compliance shall be retained and made readily available to District for period of three years. (Rules 209 and 210.1)