



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQE-AN154900001-16

June 24, 2016

Troy Mckinley
Revolution Fuels, LLC
P.O. Box 746
Tooele, UT 84074

Dear Mr. Mckinley:

Re: Approval Order: New Coal to Liquids Facility
Project Number: N15490-0001

The attached document is the Approval Order for the above-referenced project. Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. The project engineer for this action is Tad Anderson, who may be reached at (801) 536-4456.

Sincerely,

Bryce C. Bird
Director

BCB:TA:kw

cc: Southeastern Utah District Health Department

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER: New Coal to Liquids Facility

Prepared By: Tad Anderson, Engineer

Phone: (801) 536-4456

Email: tdanderson@utah.gov

APPROVAL ORDER NUMBER

DAQE-AN154900001-16

Date: June 24, 2016

Revolution Fuels, LLC

Coal to Liquids Facility

Source Contact:

Troy Mckinley

Phone: (801) 633-2742

Email: mckinleyelectric@msn.com

Bryce C. Bird

Director

Abstract

Revolution Fuels, LLC (Revolution) has requested a permit for a new coal to liquids facility near Wellington, Utah. The coal to liquids facility operations will include coal handling, coal gasification, ash handling, syngas treatment, and product upgrading. The liquids produced are diesel fuel, jet fuel, liquefied petroleum gas (LPG), and naphtha with a maximum coal throughput of 750 tons per day. The proposed potential to emit emissions for this facility are as follows (in tons per year): 20.2 of PM₁₀, 20.2 of PM_{2.5} (Subset of PM₁₀), 23.42 of NO_x, 84.36 of CO, 9.2 of VOC, 1.9 of SO₂, 8.9 of combined HAP's and 295,445 of CO_{2e}.

The new coal to liquids facility is located in an attainment area for all criteria pollutants. This source is classified as a Title V area source. This source is subject to 40 CFR 60 Subparts A and Dc, Y and III, 40 CFR 63 Subparts A and ZZZZ. The estimated emissions did exceed the emissions levels in R307-410 for PM₁₀ and PM_{2.5} so modeling was conducted for PM₁₀ and PM_{2.5}. A 30-day public comment period was held.

This air quality AO authorizes the project with the following conditions and failure to comply with any of the conditions may constitute a violation of this order. This AO is issued to, and applies to the following:

Name of Permittee:

Revolution Fuels, LLC
P.O. Box 746
Tooele, UT 84074

Permitted Location:

Coal to Liquids Facility
Outside of Wellington
Carbon County, UT

UTM coordinates: 526,825 m Easting, 4,376,397 m Northing, UTM Zone 12
UTM Datum: NAD83

SIC code: 1311 (Crude Petroleum & Natural Gas)

Section I: GENERAL PROVISIONS

- I.1 All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
- I.2 The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
- I.3 Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
- I.4 All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Director or Director's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of two (2) years. [R307-401-8]
- I.5 At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]

- I.6 The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
- I.7 The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]

Section II: SPECIAL PROVISIONS

II.A The approved installations shall consist of the following equipment:

II.A.1 Coal to Liquids Facility

II.A.2 Reaction Chamber

One (1) Reaction Chamber
Pyrolysis Burner System
Three (3) burners
Capacity: 11.2 MMBtu/hr (each)
Control: Selective Catalytic Reduction on the common stack for the gasification flue gas

Gasification Burner System
Six (6) burners
Capacity: 60 MMBtu/hr (each)
Control: Selective Catalytic Reduction on the common stack for the gasification flue gas

II.A.3 Coal Handling System

Coal Hopper
Radial Stacker
Coal Crusher
Silo Day Bin
Capacity: 100 tons per hour
Coal Handling Baghouse
Two (2) Coal Lock Hoppers

II.A.4 Ash Removal System

Three (3) Vortex Coils*
Two (2) Cyclones*
*Internal to the reaction chamber

Vibrating Conveyors with Water Jackets

Ash Silo with Baghouse

II.A.5 Syngas Treatment

Gas Scrubber
Electric gas compression unit*
Amine CO₂ removal unit
Guard bed unit
Water/solution treatment unit*
*informational

- II.A.6 **Fischer Tropsch Unit**
- Two (2) activation/regeneration heaters with Low NO_x burners
Capacity: 1.12 MMBtu/hr
Capacity: 0.60 MMBtu/hr
- Four (4) FT Trains each comprised of:
Two (2) syngas filters
Two (2) Fischer-Tropsch reactors
One (1) steam drum
Two (2) coolant filters
Electric coolant circulation pumps*
*informational
- II.A.7 **Product Upgrading**
- Two (2) upgrade heaters with Low NO_x burners
Capacity: 4.85 MMBtu/hr
Capacity: 10.25 MMBtu/hr
- II.A.8 **Flare**
- 1 MMBtu/hr continuous flare pilot
- II.A.9 **Cooling Tower**
- Capacity: 10 MMBtu/hr cooling duty
- II.A.10 **Auxiliary Boiler with Low NOX burners**
- Capacity: 73.88 MMBtu/hr
- II.A.11 **Fire Pump**
- Capacity: 220 Hp
Fuel: Diesel
- II.A.12 **Emergency Generator**
- Capacity: 1,482 Hp
Fuel: Diesel
- II.A.13 **Storage Tanks**
- Liquefied Petroleum Gas pressurized bullet tank
- Naphtha fixed cone roof storage tank
Capacity: 1,853 bbl
- Diesel fixed cone roof storage tank
Capacity: 4,021 bbl
- Jet Fuel fixed cone roof storage tank
Capacity: 4,406 bbl

Off Specification fuel fixed cone roof storage tank
Capacity: 4,406 bbl

Lean Amine fixed cone roof storage tank
Capacity: 340 bbl

Amine Solvent fixed cone roof storage tank
Capacity: 214 bbl

II.B Requirements and Limitations

II.B.1 Site Wide Requirements

II.B.1.a The owner/operator shall notify the Director in writing when the installation of the equipment listed in Condition II.A of this AO have been completed and are operational. To ensure proper credit when notifying the Director, send your correspondence to the Director, attn: Compliance Section.

If installation has not been completed within 18 months from the date of this AO, the Director shall be notified in writing on the status of the construction and/or installation. At that time, the Director shall require documentation of the continuous installation of the operation and may revoke the AO. [R307-401]

II.B.1.b Visible emissions from the following emission points shall not exceed the following values:

- A. Flare and combustor - no visible emissions
- B. Crusher - 15% opacity
- C. Coal Handling Baghouse - 10% opacity
- D. Ash Removal Baghouse - 10% opacity
- E. All natural gas/syngas operated equipment - 10% opacity
- F. Paved Haul Roads - 20% opacity
- G. All other points - 20% opacity

Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-401-8]

II.B.1.c The facility shall not exceed the following production/consumption limits:

Production

- A. Liquefied petroleum gas: 37,960 barrels per rolling 12 month total
- B. Naphtha: 95,630 barrels per rolling 12 month total
- C. Diesel: 209,145 barrels per rolling 12 month total
- D. Jet fuel: 202,940 barrels per rolling 12 month total
- E. Off specification diesel and jet fuel: 135,050 barrels per rolling 12 month total

F. Ash: 57,378 tons per rolling 12 month total

Consumption

G. 273,750 tons of coal per rolling 12 month total

To determine compliance with a rolling 12-month total the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records of production shall be kept for all periods when the plant is in operation. The records of production shall be kept on a daily basis. [R307-401-8]

II.B.1.d The Emergency Generator shall be used for electricity production only during periods when electric power from the public utilities is interrupted, or for regular maintenance of the emergency equipment. The emergency generator will be limited to 500 hours of combined testing and maintenance operations per year. Records documenting all emergency equipment usage shall be kept in a log. The log will identify the date when the emergency equipment was used, the duration in hours of the event, and the reason for each equipment usage. There is no time limit on the use of emergency stationary internal combustion engine in emergency situations. [R307-401]

II.B.1.e The owner/operator shall use only natural gas or syngas as fuel for all heaters and boilers and diesel fuel for emergency equipment. [R307-401-8]

II.B.1.f The auxiliary boiler shall be limited to 500 hours of operation per rolling 12 month total. Records documenting operation shall be kept in a log. The log will identify the date when the auxiliary boiler was used and the duration in hours. [R307-401]

II.B.1.g The owner/operator shall not exceed 4 start ups and 4 shutdowns on a rolling 12 month period. Records documenting all start ups and shutdowns shall be kept in a log. The log will identify the date when the start up/shutdown occurred, the duration in hours of the emergency flare operation. [R307-401]

II.B.2 Reaction Chamber/Pyrolysis Vessel

II.B.2.a Emissions to the atmosphere from the indicated emission points shall not exceed the following rates and concentrations.

Source: Gasification Flue Gas Exhaust Stack (Reaction Chamber/Pyrolysis operations)

| Pollutant | lb/hr |
|-----------------|-------|
| NO _x | 3.67 |
| CO | 14.68 |

[R307-401-8]

II.B.2.a.1 Stack testing to show compliance with the emission limitations stated in the above condition shall be performed as specified below:

A. Testing

Test Emissions Point
Gasification Flue Gas Exhaust Stack (Reaction Chamber/Pyrolysis operations)

| Pollutant | Frequency |
|-----------------|-----------|
| NO _x | #, ## |
| CO | #, ## |

B. Testing Status

Initial compliance testing is required. The initial test date shall be performed as soon as possible and in no case later than 180 days after the startup of a new emission source. A compliance test is required on the modified emission point that has an emission rate limit.

Compliance test at least annually subsequent to the initial compliance test. The Director may require testing at any time.

C. Notification

The Director shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted to DAQ when the testing notification is submitted to the Director. The source test protocol shall be approved by the Director prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, stack to be tested, and procedures to be used. A pretest conference shall be held, if directed by the Director.

D. Sample Location

The emission point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other methods as approved by the Director. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location.

E. Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2, Method 19 or other EPA approved methods acceptable to the Director.

F. NO_x

40 CFR 60, Appendix A, Method 7, 7A, 7B, 7C, 7D or 7E, or other EPA approved methods acceptable to the Director.

G. CO

40 CFR 60, Appendix A, Method 10, or other EPA approved methods acceptable to the Director.

H. Calculations

To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors determined by the Director, to give the results in the specified units of the emission limitation.

[R307-401-8]

II.B.2.a.2 New Source Operation

For a new source/emission point, the production rate during all compliance testing shall be no less than 90% of the production rate listed in this AO. If the maximum AO allowable production rate has not been achieved at the time of the test, the following procedure shall be followed:

- 1) Testing shall be at no less than 90% of the production rate achieved to date.
- 2) If the test is passed, the new maximum allowable production rate shall be 110% of the tested achieved rate, but not more than the maximum allowable production rate. This new allowable maximum production rate shall remain in effect until successfully tested at a higher rate.
- 3) The owner/operator shall request a higher production rate when necessary. Testing at no less than 90% of the higher rate shall be conducted. A new maximum production rate (110% of the new rate) will then be allowed if the test is successful. This process may be repeated until the maximum AO production rate is achieved.

Existing Source Operation

For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three (3) years. [R307-401-8]

II.B.3 **Fugitive Emissions**

II.B.3.a The vibrating conveyors for the ash removal operation shall be covered and routed to a baghouse. [R307-401-8]

II.B.3.b The coal handling, radial stacker conveyor shall be covered and fugitive emissions shall be controlled by water sprays. The coal handling crushing, conveying and drop points shall be covered and controlled by a baghouse. [R307-401-8]

II.B.3.c The haul road shall be paved and shall be water flushed, sprayed clean or swept as dry conditions warrant or as determined necessary by the Director in order to meet the opacity requirement listed in this AO. [R307-401-8]

II.B.4 **Flare Requirements**

II.B.4.a All exhaust gas/vapors from startup, shutdown and upset conditions shall be routed to the flare operating with a continuous pilot. [R307-401]

II.B.5 **Leak Detection And Repair Requirements**

II.B.5.a The owner/operator shall conduct a leak detection inspection for each valve(s), flange(s) or other connection, pump(s), compressor(s), pressure relief device(s) or other vent(s), process drain(s), open-ended valve(s), pump seal(s), compressor seal(s), and access door seal(s) or other seal containing or contacting a process stream with hydrocarbons that is associated with each of the approved emission unit listed in Section II: Special Provisions. The Fischer-Tropsch unit, hydro processing units and distillation process units are subject to 40 CFR 60 subpart GGGa which regulates fugitive VOC's is emissions and exempt from II.B.5 requirements.

Leak detection inspections shall be conducted according to the following schedule:

- A. No later than 90 days after startup or 180 days from the date of this AO, and
- B. At least once every 12 months after the initial leak detection inspection.

[R307-401-8]

II.B.5.b Inspections shall be conducted in one of two ways;

- 1. An analyzer that meets U.S. EPA Method 21, 40 CFR Part 60, Appendix A
- 2. An optical gas imaging instrument as defined in 40 CFR 60.18(g)(4)

The optical gas imaging instrument must meet requirements specified in 40 CFR 60.18(i)(3).

Any emissions detected with an optical gas imaging instrument shall be considered a leak in need of repair unless the owner/operator evaluates the leak with an analyzer meeting U.S. EPA Method 21, 40 CFR Part 60 and the analyzer reading is less than 500 ppmv. A reading of 500 ppmv or greater shall be considered a leak in need of repair.

Emissions detected from tank gauging, load-out operations, venting of pneumatics, properly operating pressure relief valves, or other maintenance activities shall not be considered leaks.
[R307-401-8]

II.B.5.c The owner/operator is exempt from inspecting a valve, flange or other connection, pump or compressor, pressure relief device, process drain, open-ended valve, pump or compressor seal system degassing vent, accumulator vessel vent, agitator seal, or access door seal under any of the following circumstances:

- A. the contacting process stream only contains glycol, amine, methanol, or produced water,
- B. monitoring could not occur without elevating the monitoring personnel more than six feet above a supported surface or without the assistance of a wheeled scissor-lift or hydraulic type scaffold,
- C. monitoring could not occur without exposing monitoring personnel to an immediate danger as a consequence of completing monitoring, or
- D. the item to be inspected is buried, insulated in a manner that prevents access to the components by a monitor probe, or obstructed by equipment or piping that prevents access to the components by a monitor probe.

[R307-401-8]

II.B.5.d If a leak is detected at any time, the owner/operator shall attempt to repair the leak no later than 5 calendar days after detection. Repair of the leak shall be completed no later than 15 calendar days after detection, unless parts are unavailable or unless repair is technically infeasible without a shutdown. The owner/operator shall inspect the repaired leak no later than 15 calendar days after the leak was repaired to verify that it is no longer leaking.

If replacement parts are unavailable, the replacement parts must be ordered no later than 5 calendar days after detection, and the leak must be repaired no later than 15 calendar days after receipt of the replacement parts.

If repair is technically infeasible without a shutdown, the leak must be repaired by the end of the next shutdown. If a shutdown is required to repair a leak, the shutdown must occur no later than 6 months after the detection of the leak unless the owner/operator demonstrates that emissions generated from the shutdown are greater than the fugitive emissions likely to result from delay of repair. [R307-401-8]

II.B.5.e Records of inspections and leak detection and repair shall include the following:

- A. inspection date;
- B. person's name conducting the inspection;
- C. any component, that is not exempt under II.B.5.c, that is not inspected and the reason it was not inspected;
- D. identification of any component that was determined to be leaking;
- E. all records shall be maintained for optical gas imaging instrument as per 40 CFR 60.18(i)(4)(vi);
- F. date of the first attempt to repair a leaking component;
- G. any component with a delayed repair;
- H. delayed repair reason;
 - 1. for unavailable parts:
 - i. date of ordering a replacement component, and
 - ii. date the replacement component was received,
 - 2. for a shutdown:
 - i. reason the repair is technically infeasible,
 - ii. shutdown date,
 - iii. emission estimates of the shutdown and the repair if the delay is longer than 6 months;
- I. corrective action taken;
- J. date corrective action was completed;
- K. date the component was verified to no longer be leaking;
- L. records of each component exempt under II.B.5.c, including:
 - 1. component type and
 - 2. qualifying exemption description.

[R307-401-8]

Section III: APPLICABLE FEDERAL REQUIREMENTS

In addition to the requirements of this AO, all applicable provisions of the following federal programs have been found to apply to this installation. This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

NSPS (Part 60), A: General Provisions

NSPS (Part 60), Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

NSPS (Part 60), Y: Standards of Performance for Coal Preparation and Processing Plants

NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

MACT (Part 63), A: General Provisions

MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

PERMIT HISTORY

This AO is based on the following documents:

| | |
|-----------------|---|
| Incorporates | Additional Information dated July 21, 2015 |
| Is Derived From | NOI dated May 8, 2015 |
| Incorporates | Additional Information dated September 17, 2015 |
| Incorporates | Additional Information dated October 27, 2015 |
| Incorporates | Additional Information dated November 12, 2015 |

ADMINISTRATIVE CODING

The following information is for UDAQ internal classification use only:

Carbon County

CDS B

MACT (Part 63), Attainment Area, NSPS (Part 60)

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

| | |
|-------------------|---|
| 40 CFR | Title 40 of the Code of Federal Regulations |
| AO | Approval Order |
| BACT | Best Available Control Technology |
| CAA | Clean Air Act |
| CAAA | Clean Air Act Amendments |
| CDS | Classification Data System (used by EPA to classify sources by size/type) |
| CEM | Continuous emissions monitor |
| CEMS | Continuous emissions monitoring system |
| CFR | Code of Federal Regulations |
| CMS | Continuous monitoring system |
| CO | Carbon monoxide |
| CO ₂ | Carbon Dioxide |
| CO ₂ e | Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1 |
| COM | Continuous opacity monitor |
| DAQ/UDAQ | Division of Air Quality |
| DAQE | This is a document tracking code for internal UDAQ use |
| EPA | Environmental Protection Agency |
| FDCP | Fugitive dust control plan |
| GHG | Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i) |
| GWP | Global Warming Potential - 40 CFR Part 86.1818-12(a) |
| HAP or HAPs | Hazardous air pollutant(s) |
| ITA | Intent to Approve |
| LB/HR | Pounds per hour |
| MACT | Maximum Achievable Control Technology |
| MMBTU | Million British Thermal Units |
| NAA | Nonattainment Area |
| NAAQS | National Ambient Air Quality Standards |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NOI | Notice of Intent |
| NO _x | Oxides of nitrogen |
| NSPS | New Source Performance Standard |
| NSR | New Source Review |
| PM ₁₀ | Particulate matter less than 10 microns in size |
| PM _{2.5} | Particulate matter less than 2.5 microns in size |
| PSD | Prevention of Significant Deterioration |
| PTE | Potential to Emit |
| R307 | Rules Series 307 |
| R307-401 | Rules Series 307 - Section 401 |
| SO ₂ | Sulfur dioxide |
| Title IV | Title IV of the Clean Air Act |
| Title V | Title V of the Clean Air Act |
| TPY | Tons per year |
| UAC | Utah Administrative Code |
| VOC | Volatile organic compounds |