



LIMA ENERGY COMPANY

NATIONAL SECURITY THROUGH ENERGY INDEPENDENCE™

June 24, 2014

Docketing
Ohio Power Siting Board
c/o Public Utility Commission of Ohio
Borden Building, 12th Floor
180 East Broad Street
Columbus, OH 43266-0573

**Lima Energy Company Project
Application for Amendment Number 2
In OPSB Case Number 00-513-EL-BGN
First Amendment Case Number 04-1011-BGA
Second Amendment Case Number 14-1142-EL-BGA**

Docketing,

In accordance with Ohio Administrative Code ("OAC") Rule 4906-5-10 of the Ohio Power Siting Board ("Board") Rules, Lima Energy Company ("Lima Energy") hereby transmits one (1) original and twenty (20) copies of the enclosed Application for Amendment Number 2 to the Certificate of Environmental Compatibility and Public Need ("Application") for the Lima Energy Company Project. In this Application, Lima Energy requests approval of an increase in the gasification capacity of the Project and change in the product slate produced by the Facility once complete.

In accordance with the requirements of OAC Rule 4906-5-02(A)(3), please be advised of the following:

- a) Name and address of the Applicant:
Lima Energy Company
c/o USA Synthetic Fuel Corporation
312 Walnut Street, Suite 1600
Cincinnati, OH 45202
- b) Name and location of the Certificated facility:
Lima Energy Company
1046 South Main Street
Lima, Allen County, OH 45804-2044
- c) Applicant's Designated Representative:
Dwight N. Lockwood, PE, QEP
President
Gasification Engineering Corporation
525 Vine Street, 6th Floor
Cincinnati, OH 45202
- d) A notarized statement that the information contained in the Application is complete and correct to the best knowledge, information and belief of the Applicant is attached.



LIMA ENERGY COMPANY

NATIONAL SECURITY THROUGH ENERGY INDEPENDENCE™

After docketing, please return a time-stamped copy of the Application for our records.

Should the Ohio Power Siting Board desire further information or discussion of this submittal, please contact me at (513) 300-8583, or electronically at my email address of {GECDNL@gmail.com}.

Respectfully Submitted,

Dwight N. Lockwood, PE, QEP
Senior Advisor

Cc: Robert J. Schmidt, Jr. - Porter Wright Morris & Arthur LLP

Attachment

Lima Energy Company
Ultra Clean Synthetic Crude Production Project
Application for Amendment Number 2
To The OPSB Certificate
In OPSB Case Number 00-513-EL-BGN
And First Amendment Case Number 04-1011-BGA

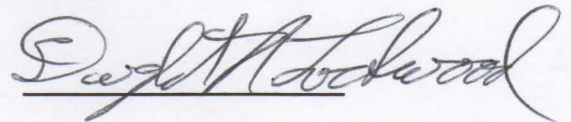
Affidavit

Case Number 14-1142-EL-BGA

STATE OF OHIO)
)SS.
HAMILTON COUNTY)

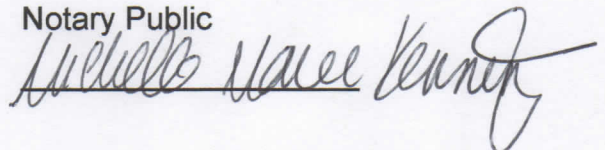
On June 24, 2014, before me, a Notary Public in and for the State and County aforesaid, personally appeared Dwight N. Lockwood, who after being duly sworn according to law, deposed and said that he is the President of Gasification Engineering Corporation an Ohio Corporation, that in such capacity he is the Designated Representative for this Project on behalf of Lima Energy Company and that he is thereby authorized to make this Affidavit; and that the information provided by the Lima Energy Company to the Ohio Power Siting Board is true and correct to the best of his knowledge, information, and belief.

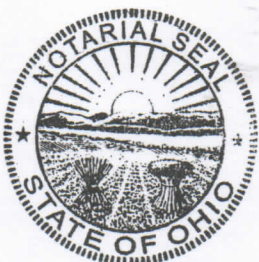
Dwight N. Lockwood



Sworn to and subscribed before me the day and year aforesaid.

Notary Public





Michelle Marie Kenning
Notary Public, State of Ohio
My Commission Expires 05-09-2018

Lima Energy Company
<p>Lima Energy Company Ultra Clean Synthetic Crude Project Application for Amendment Number 2 To The OPSB Certificate In OPSB Case Number 00-513-EL-BGN And First Amendment Case Number 04-1011-BGA</p> <p>Second Amendment Case Number 14-1142-EL-BGA</p>

Application Submittal Date: June 24, 2014

Lima Energy Company
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**Lima Energy Company
Ultra Clean Synthetic Crude Project
Application for Amendment Number 2
To The OPSB Certificate
In OPSB Case Number 00-513-EL-BGN
And First Amendment Case Number 04-1011-BGA
Second Amendment Case Number 14-1142-EL-BGA**

The following information is being provided as an Application for Amendment Number 2 to the Certificate of Environmental Compatibility and Public Need ("Application"), for the Lima Energy Company ("Lima Energy") Project. This Application to the Ohio Power Siting Board ("Board") has been prepared in accordance with Ohio Administrative Code ("OAC") Rule 4906-5-10. The purpose of the Application is to propose an increase in gasification capacity and a reconfiguration of the Facility associated with a change of product slate.

Following issuance of the original Certificate by the Board in Case No. 00-0513-EL-BGN on May 20, 2002 and a Permit to Install by Ohio EPA on March 26, 2002, the Project began construction. In 2004, due to changes in the gasification technology proposed for the Facility, Lima Energy filed an application for amendment to the original Certificate. The first amendment was approved by the Board in Case No. 04-1011-EL-BGA on November 22, 2004.

Following Project finance delays associated with the recent (2007-2010) recession, and pursuant to the Board's Order issued on July 30, 2012, the Certificate, as amended in 2004, was extended until September 1, 2014. In accordance with the Order extending the Certificate, Lima Energy Company submitted an annual progress report on July 30, 2013. In both the extension request and the annual report, Lima Energy expressed its intent to reconfigure the proposed facility to alter the products produced at the Facility.

Ohio EPA issued a Permit To Install and Operate (PTIO) on April 25, 2014 for the modified Project. This Synthetic Minor (non-PSD) Permit represents the authorization by Ohio EPA to commence construction of the waste heat recovery based generating elements of the Facility, but not the planned combined cycle gas turbine ("CCGT") power generation component, an application for which will be filed separately with Ohio EPA.

4906-13-01: Project Summary and Facility Overview

For a complete discussion of the original Project please see the application submitted to the OPSB on July 24, 2000, the Certificate of Environmental Compatibility and Public Need issued May 20, 2002, the First Amendment application submitted June 22, 2004, and the OPSB approval of the First Amendment dated November 22, 2004, all of which are incorporated by reference in this Application.

The purpose of this Application is to seek approval of the reconfiguration of the proposed Facility. Although the original application described a 580MW gross electric generation facility, current plans revise the makeup of the electric power generation components of the overall Facility. The initial component of the reconfigured power plant will utilize waste heat recovery steam generation to produce electric energy, primarily for site-load purposes. The Facility, due primarily to the addition of Fischer-Tropsch (Gas-To-Liquids or GTL) technology for the production of Ultra Clean Synthetic Crude ("UCSC"), is expected to generate as much as 100MW of waste heat recovery steam turbine power in the initial phase, and perhaps 250MW with the addition of the second phase of UCSC development. There is some uncertainty regarding the final generation capacity of the waste heat recovery steam turbine due to the need to optimize the final operating parameters of the GTL and associated UCSC production process after construction and initial shake-down of the Facility. The availability of exportable quantities of electricity from the waste heat recovery steam turbine will depend on the final operating parameters for the UCSC production process.

For clarity, only one steam turbine generator is intended for the two phases of the UCSC power generation component. This generation will primarily be used for site load requirements of each respective UCSC phase. If commercially viable, any excess generation from each respective phase will be exported. Finally, in addition to the waste heat recovery steam turbine component, the Facility also plans to incorporate a combined cycle gas turbine ("CCGT") generation component. The timing of this component will depend on finalizing commercial terms for this generation capacity.

Specifically, this Application reconfigures the Facility as follows:

1. Replace the integrated gasification combined cycle ("IGCC") generation with a two-component power plant and a gasification-based gas-to-liquid (GTL) process to produce Ultra Clean Synthetic Crude (UCSC) and waste heat to electric generation.
2. The UCSC production will be implemented in two phases.
 - a. The first UCSC phase will include the first component of the power plant – a steam turbine generator (STG) with a name-plate capacity of approximately 250MW, which will utilize waste heat from both phases of the UCSC process.
 - i. The STG will be sized to utilize the waste heat from both the first and second phases of the planned UCSC production. The waste heat from energy optimization of the gasification portion of the facility and the GTL process itself, will collectively supply intermediate pressure steam to the STG.

- ii. If the electricity generated from the first UCSC phase is sufficient to warrant an export quantity from the Facility following completion of phase one, which will be determined early in the Design-Build process, an application to PJM will be initiated.
 - iii. If export from the first phase is not justified, then the decision to on whether export from the first component, and therefore the need for a PJM application, will be deferred to the second phase of UCSC production.
 - b. The second UCSC phase will add both gasification and GTL capacity, resulting in additional waste heat steam production to the STG. This will support the balance of demand for the site load, and potentially a modest quantity of electric energy for export.
3. The second power plant component can be envisioned as the third phase of the Project. This phase is the installation of a natural gas fueled 2x1 7FA size combined cycle gas turbine ("CCGT") generation unit. The CCGT portion of the power plant is expected to have a capacity of 525MW_{gross}. The CCGT generation unit is not reliant on the UCSC production at the Facility.
 4. The combined potential gross electric energy generation capacity of the completed Facility is estimated to be 775MW, comprised of 525MW CCGT and up to approximately 250MW STG. Net export, following complete installation of both components, is expected to be approximately 610MW, comprised of 510MW from the CCGT and up to 100 MW from the STG, if steam generation from UCSC production is sufficient.
 5. The two components of the power plant will be installed in the same locations approved in the original Certificate issued by the Board, as amended.
 6. The natural gas supply requirements for the two UCSC components are relatively modest, and are expected to only require service from existing capacity.
 7. New natural gas service, in the range of 81,000 decatherms per day to support the CCGT, will not be needed until the CCGT component is initiated, the timing of which will depend on market conditions.
 8. A PJM Interconnection Service Agreement (ISA) will be initiated once the scale of the combined export quantity is finalized.
 9. Interconnection with the AEP Southwest Lima Station (formerly, West Lima Substation) will be required to receive energy for start up of the first UCSC

phase. PJM has advised that it will not require any approval related to the interconnection for energy backflow purposes.

10. Feedstock materials for UCSC production are petroleum coke (“petcoke”), coal, renewable biomass. Lima Energy has entered into an agreement with the adjacent refinery for receipt of petcoke, which will be delivered to the UCSC production facility, predominantly via conveyor. Additional quantities of petcoke, as well as coal and renewable biomass, will be received by rail or truck. Petcoke, and potentially coal, will be stored in the main feedstock storage building, while other feedstock components will be received into silos for proportional blending into other feedstock.
11. Carbon Dioxide (CO₂) routinely captured during the manufacture of the UCSC product will be compressed, dried, and sold to a third party at an on-site custody transfer metering point. This third party intends to utilize the CO₂ in Enhanced Oil Recovery (EOR) in central and eastern Ohio Oil fields.

The third party also anticipates, as a supplemental strategy to EOR for the management and sequester of the CO₂, injecting a portion of the CO₂ into the Mt Simon Sandstone, generally located west of Lima. The Mt. Simon is a deep geologic formation of sufficient area, depth, and thickness to have sufficient capacity and characteristic for carbon sequestration and storage on the scale required for this facility.

12. The two phases of the UCSC process which provides steam to the first power plant component, the STG, will be comprised of the following main processes and elements:
 - a. Four slurry fed entrained flow gasifiers.
 - b. Four air separation units (“ASU”) for high purity (99.6v%) oxygen production for the gasification units. Their oxygen output will be sufficient to support the gasification units as well as other processes in the facility that require oxygen.
 - c. Nitrogen production, commensurate with oxygen production, will be available for plant operation, maintenance, and safety considerations.
 - d. The industrial gas Argon may also be produced for commercial sale, as part of the second phase of the UCSC production.
 - e. Two trains of synthetic gas purification processes, physically sized to facilitate logistical transport of process columns.
 - f. GTL conversion units producing as much as 28,000 barrels per day of Ultra Clean Synthetic Crude (“UCSC”).

- g. One feed preparation unit for each gasifier.
 - h. An auxiliary boiler will provide steam for gasifier startup, but is not currently intended to operate on a continuous basis.
 - i. Construction of an approximate 1-mile pole supported transmission line between the Facility and Southwest Lima Station, with capacity for multiple circuits to support both components of power generation. The voltage will be established in consultation with AEP, but is expected to be 138kV.
 - j. Rail infrastructure for feedstock deliveries and shipment of co-products.
 - k. Feedstock Storage building for approximately 70,000 short tons of petcoke and/or coal, erected on the existing foundation, installed during the earlier construction period.
 - l. Pumps for delivery of Ultra Clean Synthetic Crude to the adjacent refinery will be provided for delivery via pipeline.
 - m. CO₂ compression and drying, and appropriate delivery by custody transfer meter and equipment.
 - n. Conveyor delivery of petroleum coke from the refinery into the facility storage system.
 - o. A Zero Liquid Discharge ("ZLD") process to treat process water for recycle and reuse, which will maximize water conservation and reuse throughout the Facility. The water management design will maximize collection and reuse, including of storm water, of water within the Facility to minimize wastewater flow to the City of Lima POTW. Lima Energy will obtain any necessary industrial wastewater pretreatment permit from the city of Lima.
 - p. A thermal oxidizer and flare combination in an enclosed stack, is planned for further air emission controls.
13. The UCSC power component is currently being planned for implementation in two phases, as noted above. However, if authorized by investors during construction of the first phase, Lima Energy may initiate construction of the second UCSC phase concurrent with the first. Each phase will comprise roughly half of the capacities of each process element; and will be designed for operation as commercially independent units. That is, the first phase would benefit from, but does not rely on, the second phase to be commercially viable.

The reconfiguration of the Facility as proposed in this Application is not anticipated to materially increase any adverse impacts associated with the Facility. The changes associated with the proposed reconfiguration, and associated equipment selection, are as follows:

1. No substantive change in general lay-out of Facility.
2. No substantive change in air emissions, assuming the CCGT component is implemented. By itself, the UCSC portion of the Facility does not have major air emission sources, does not trigger PSD under USEPA regulations, and is considered synthetic minor emission source by Ohio EPA. The Permit To Install and Operate (PTIO) was issued final on April 25th, 2014.
3. No substantive change in fugitive emissions. Potential fugitive emissions from feedstock handling, though not significant are readily controlled within Ohio EPA requirements, by enclosed handling and transfer equipment, and storage structures.
4. No substantive change in gas purification requirements. Synthetic gas purification will include a selective solvent acid gas removal technology that, as with the IGCC, will involve deep sulfur removal from the synthesis gas. This is necessary to protect the catalyst of the UCSC manufacturing process.
5. The reconfigured Facility will also have Air Separation Units (“ASU”), which do not typically have adverse impacts. ASUs will produce high purity (~99.6%) oxygen primarily for gasification but also the sulfur recovery process. Nitrogen production, commensurate with oxygen production, will be available for plant operation and purging for safe maintenance. Argon gas may also be produced for commercial sale, most likely from the second phase of UCSC.
6. No substantive change in facility noise levels are expected compared to Facility approved in original Certificate.
7. No change in synthetic aggregate production is planned. Synthetic Aggregate has been demonstrated to be viable as a component of cement and road paving. Lima Energy intends to sell it commercially for road and potentially other applications.
8. Three UCSC storage tanks are planned to facilitate daily product testing prior to pipeline transfer to the adjacent refinery. One additional tank is planned as a solvent de-inventory storage during maintenance of the AGR process unit. These storage tanks will have containment and do not typically have adverse

environmental impacts. Other tanks and chemical handling will also have appropriate containment.

9. Facilities will be provided to allow rail or truck loading of synthetic aggregate, UCSC, and elemental sulfur. These facilities are not expected to have any adverse environmental impacts.
10. Approximately 12 MGD of raw make-up water is anticipated to be required, once both power generation components (i.e. the STG and CCGT) are operational. This raw water requirement is similar to the water requirements of the earlier IGCC. While the City of Lima previously certified its ability to supply this quantity of raw water, it has since constructed and commissioned a 5 billion gallon reservoir expansion, enabling it to readily support this Facility as well as other uses the City anticipates.
11. The need for a PJM Interconnect Service Agreement is not anticipated, at least until the implementation of the second UCSC phase, though it will be necessary for the construction of the CCGT. To the extent an interconnection agreement is required for the Facility, Lima Energy will initiate such an agreement when it is determined that export capacity from the first component is feasible, and prior to commencing construction of the second component (CCGT) of power generation.

Discussion of Process Changes from Original Certificate, as amended.

1. If constructed as proposed in this Application, Facility wide water consumption associated with both the gasification technology and both components of the planned power generation at the Facility will not materially change. The Water Supply Contract with the City of Lima currently guarantees the availability of up to 12 MGD for the Facility. Since this agreement was executed, the City of Lima constructed a new five billion gallon reservoir and pumping capacity to expand its ability to serve its customers and community growth.
2. The entrained flow technology proposed in this Application uses a finely ground carbonaceous material that is injected into the gasification reactor under pressure. The entrained flow technology, as the name implies, includes fine particles being entrained in the synthesis gas as it leaves the gasification section of the unit. When the exiting gas is cooled, the particulate is retained in the quench water or filter system as the synthetic gas exits for further processing.
3. When constructed as proposed in this Application, Vitriified Frit (a.k.a. Synthetic Aggregate or slag) will be formed during the high temperature gasification reactions, and removed from slagging gasifiers in a similar

manner. The production of this vitrified frit will not materially change from the original Facility configuration and is generally the same regardless of gasification technology. The glassy silica matrix material is non-leaching and inert and has commercial applications allowing for its sale rather than disposal. Facilities will be provided to load rail cars or trucks for shipment of this material to customers.

4. Once the synthetic gas leaves the gasification process, there are no significant differences in gas purification and use compared to Facility approved in the original certificate. Therefore, there are no differences in expected air emissions from the Facility. The gasification technology is, itself, not an emission source. Moreover, other than the liquid product, the entire process is essentially a closed system without primary stack or vent.
5. The catalytic GTL conversion processes requires deep sulfur removal from the raw synthesis gas which will require the addition of an acid gas removal process, which is a proven technology, and which selectively removes sulfur constituents to the low ppb range. This unit also selectively captures the CO₂, produced during the water-gas-shift reaction. This is the CO₂ that will be compressed, dried, and sold at a custody transfer metering point. The addition of this unit to the Facility will not increase impacts and may, in fact, reduce them.
6. Changes in noise emissions associated with this reconfiguration are not anticipated. Though the homes that were immediately adjacent to the facility no longer exist, and were replaced by the Ohio Energy and Advance Manufacturing Center ("OEAMC"), the Facility design will meet the original noise abatement criteria.

Section-by-Section discussion below is provided for completeness, and to highlight areas from the original application that require revision due to the reconfiguration and product changes being proposed.

4906-13-01 (A)(1): General Purpose

Although the original application described a 580MW gross electric generation facility, current plans revise the make up of the electric power generation components of the overall Facility. The initial component of the reconfigured power plant will utilize waste heat recovery steam generation to produce electric energy, primarily for site-load purposes. The Facility, due primarily to the addition of Fischer-Tropsch (Gas-To-Liquids or GTL) technology for the production of Ultra Clean Synthetic Crude ("UCSC"), is expected to generate between 50 and 100MW of waste heat recovery steam turbine power in the initial phase of UCSC development. This will be used for site load requirements and

any excess exported if commercially justified. The second phase of UCSC production will expand waste heat steam generation to approximately 250MW. There is some uncertainty regarding the final generation capacity of the waste heat recovery steam turbine due to the need to optimize the final operating parameters of the GTL and associated UCSC production process after construction and initial shake-down of the Facility. The availability of exportable quantities of electricity from the waste heat recovery steam turbine will depend on the final operating parameters for the UCSC production process.

With site load requirements for both phases of UCSC production expected to approximately 150MW, only minimal export is currently anticipated. As the plant design progresses and further information is developed on the ultimate generation capability of the STG from the waste heat steam recovery from the UCSC process, and if the potential for export (from the waste heat recovery based generation) becomes apparent, Lima Energy will apply to PJM for an interconnection agreement.

All of the UCSC production has been sold to the adjacent refinery under a 10-year renewable agreement and will typically be delivered to it by pipeline. The first UCSC phase is expected to produce approximately 9,500 barrels per day ("BPD"). The second UCSC phase is expected to at least double that of the first phase.

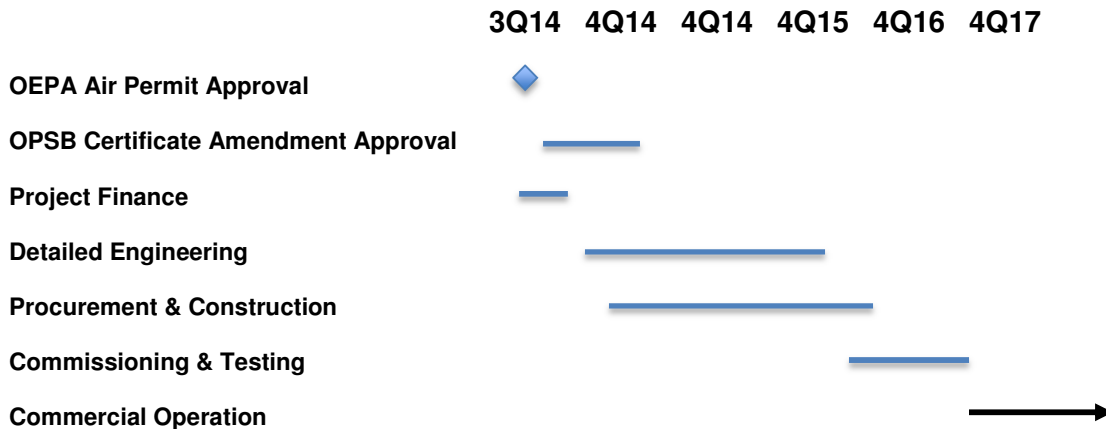
4906-13-01 (A)(2): Facility Description

The original application described a "fixed bed" gasification technology, and the first amendment changed that to wet slurry entrained flow. The two UCSC increments of the current project will also utilize slurry based entrained flow technology. The feedstock for the Facility will not take the form of large solid fuel briquettes or pellets as proposed for the original Facility.. Rather, solid carbonaceous feedstock, such as petroleum coke ("petcoke"), coal, and renewable biomass, will be finely ground for injection into the gasifiers. Four slurry-fed gasifiers, instead of fixed-bed units as proposed in the original application, will produce the synthetic gas to feed the GTL conversion trains. Mercury and other volatile metals and contaminants will be removed in beds of activated carbon.

The water-gas-shift reaction will be utilized to adjust the hydrogen to carbon monoxide ratio ($H_2:CO$) ratio of the synthesis gas for use in the GTL process. The CO_2 generated in this process operation is captured, compressed and dried for custody/ownership transfer to a third party for beneficial use. If necessary, a portion of the shifted hydrogen will be separated and used for hydrotreating any heavy waxy portions of the raw Fischer-Tropsch Process ("FT") product (a.k.a. Gas-To-Liquid or GTL product), in order to conform to product specifications.

4906-13-01 (A)(5): Proposed Schedule

Project finance is anticipated in the early third quarter 2014, and Commercial Operation planned for 24-30 months later in late 2016 or early 2017.



Lima Energy undertook removal of existing foundation and infrastructure, beginning in October 2012. By August 2013, approximately 170,000 tons of concrete at the former Lima Locomotive Works Site had been removed, crushed and stockpiled for reuse on site. An estimated 15,000 tons of foundation and infrastructure material in and on the ground is estimated to remain and also require removal. The stone will be reused on site to grade and level it, a process that will include strategically located engineered fill for anticipated foundation design. Foundations for heavy load process equipment, are expected to be designed with piles extending to bedrock.

Lima Energy has engaged Gasification Engineering Corporation (“GEC”) to provide Engineering, Procurement, and Construction contractor services, to design and build the Facility. Lima Energy is also engaging GEC to provide Operation and Maintenance services for the Facility.

GEC engaged Kokosing Construction Company (“Kokosing”), headquartered in Westerville, Ohio, in June 2013 to provide Design-Build general contracting services to design and construct the main Lima Energy Facility. Kokosing will engage an engineering firm to assist with the Design-Build based project. Kokosing has graded most of the site and begun preliminary engineering and planning for implementation of the project.

As stipulated in the original Certificate, a kick-off meeting with Board Staff will be scheduled prior to Kokosing mobilizing for ongoing activity at the site. When Kokosing prepares to mobilize for the major construction activity, Lima Energy will provide documents and schedule a kick-off meeting with Board Staff. This will be coordinated with Board Staff as stipulated in the original Certificate. A

24-month construction schedule followed by 4-6 months of commissioning and start-up activity is currently anticipated.

4906-13-02: Statement of Need

The Statement of Need in the original application still applies. Regulatory pressures on power generation increasingly favor alternative generation (e.g. waste heat recovery) and natural gas fueled combined cycle (“CCGT”). As the utility industry considers curtailment of older coal based generating stations, we believe that replacement generation will be predominately fulfilled by CCGT units. Although the initial component of this Facility will be waste heat recovery steam turbine generation, the major component of power generation is planned as a CCGT in the range of 500 MW_{net}.

(B)(1): Proposed Facility

(e) Water Requirements

The reconfiguration and product change, and the steam turbine based generation portion of the two power components, is expected to result in water utilization in the range of 12 MGD once both components of power generation are operational. Approximately 8 MGD are reflected in cooling tower losses, and 3.5 MGD is anticipated for process requirements. Approximately 0.5 MGD are allocated for wastewater disposal in the City of Lima POTW, via an Industrial Pre-Treatment Permit issued by the City.

- Some steam is required for gasification, and boiler feed water is needed for the water gas shift reaction and GTL process cooling. Optimized water and steam management will serve most of this duty. Intermediate pressure steam, generated through cooling the highly exothermic GTL reaction, is well suited to steam turbine power generation.
- The Water Supply Agreement with the City of Lima assures adequate water supply for the Project. The City of Lima completed and commissioned a new five (5) billion gallon reservoir to enhance their ability of serve customers and accommodate future growth.
- Lima Energy plans to treat and reuse much, if not all, process water generated at the facility. A “Zero Liquid Discharge” unit is part of the plant design. However, a modest amount of wastewater discharge to City of Lima POTW may be necessary. As engineering and construction progress, a industrial pretreatment permit application will be submitted to the City. This application is not required by regulation,

until 180 days before operations, but will be submitted well before that after detailed design is progressed.

(B)(2): Major Equipment

Gasifiers

The gasification process will utilize slurry fed, entrained flow technology, rather than the fixed bed technology previously planned. Four gasifiers will comprise the two UCSC increments of waste heat recovery power generation, utilizing waste heat recovery steam turbine generation.

As the facility will be designed, and has been permitted by Ohio EPA, to process petroleum coke, coal, and renewables, their moisture and ash content will be accounted for in the design. As received quantities of petcoke or coal may be as high as 3000 short tons per day per gasifier, the Facility will be designed to process up to ten percent (10%) of the feedstock as renewable biomass to provide operational flexibility.

Air Separation Unit (ASU)

High-purity (99.6v%) oxygen production will be required for gasification processes. The ASU will also provide nitrogen for use within the process operations as well as to purge and inert the processes during shut-downs and maintenance outages. Each ASU will require approximately 30MW of electricity and the ASU's represent the majority of the site load requirements.

Fischer-Tropsch Process ("FT") {also known as Gas-To-Liquid or GTL}

The catalytic FT process converts hydrogen rich synthetic gas into paraffinic hydrocarbon liquid. Long chain, even waxy, molecules typically predominate, but the composition depends on the operating conditions of the reaction process. These conditions can be adjusted to achieve the desired UCSC specification, without further processing. Unreacted constituents and light ends will be removed and returned to the process for removal or reprocessing. Multiple reactors may be operated in series or parallel within this process, to achieve the desired production of UCSC. The highly exothermic chemical reaction occurs within the reaction zone, and the reaction is cooled by boiler feed water circulating around the reaction zone within the reactor. The intermediate pressure steam produced is typically used for steam turbine power generation.

CO₂ Compression – Drying and Custody Transfer

Carbon Dioxide (CO₂) is produced as a result of the water-gas-shift reaction, and removed from the synthesis gas in the acid gas removal process. This captured CO₂ will be compressed, dried, and sold to a third party for use in Enhanced Oil

Recovery (“EOR”) in eastern Ohio or potentially injected for storage and sequestration in the region around Lima.

The UCSC component is expected to ultimately produce approximately 16,000 short tons per day of CO₂ (~14,500 metric tons per day, or 259,000 mcf per day, or 7.3 million Nm³ per day).

Feed Preparation

The facility will be designed to process approximately 9000 tons per day of feedstock . The milled feed will be conveyed under pressure into the gasifier system.

Depending on the specific gasifier design, limestone or other material will be added to the feed to facilitate effective operation of the gasification process.

Biomass may be added to the feed. This material will have separate milling preparation and will be added to the gasifier feed system on an energy content proportional basis.

4906-13-03: Site Alternative Analysis

Neither the gasification technology nor the GTL technology selection affects the site alternative analysis. The steam turbine and switchyard capacity for the electric power generation remain unchanged. The natural gas fueled combined cycle component of power generation is expected to be added to the facility during construction of the UCSC component, but its actual timing depends on commercial arrangements. However, the location of the combined cycle unit in the original certificate is being reserved for the natural gas fueled combined cycle component.

4906-13-04: Technical Data

The gasification technology and reconfiguration of the facility to produce UCSC does not materially change:

- (A) Site Technical Data; or
- (B) Layout Technical Data
- (C) Equipment Technical Data is modified as follows:
 - (C)(1) Material Handling

Text in the original application, referring to refuse derived fuel (RDF) or briquettes or pellets, is no longer applicable; and

(C)(2) Gasifiers

As previously noted, the gasifiers will be an entrained flow technology, rather than a fixed bed technology. In these, the pulverized feed is conveyed into the gasifier under pressure. The chemical conversion of solid feed materials to synthetic gas is similar in all slagging gasifier technologies and the resulting synthesis gas will be similar in composition to that described in the origin application.

(C)(3) Air Separation Unit

As noted earlier, each ASU will produce high-purity oxygen for the gasification process. Nitrogen will also be produced, and used primarily for various process system operations and inerting certain process units, and purging units during shutdowns to enable safe maintenance.

Figure 4-6 Preliminary Water Balance

Demand Estimate 12.0 MGD

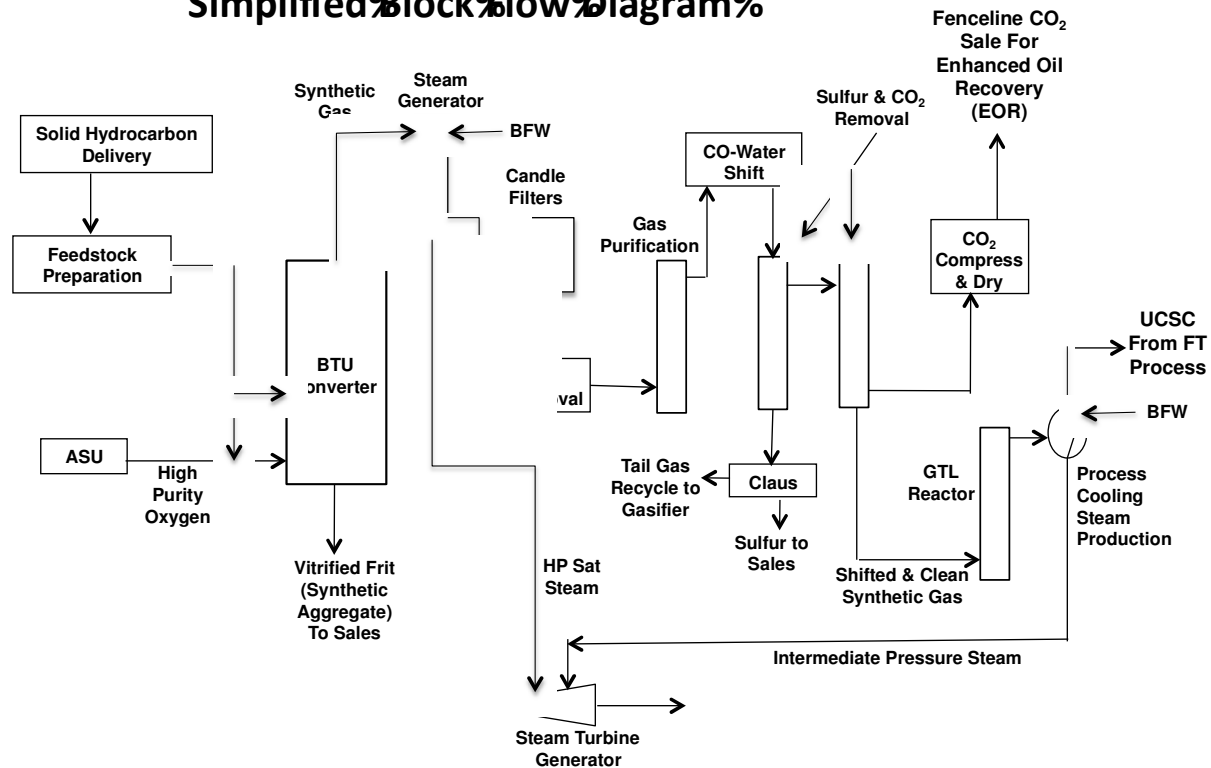
Major Uses

- Gasification & Process 3.5 MGD
- Evaporation Losses & Misc. 8.0 MGD
- Waste Water 0.5 MGD

Totals 12.0 MGD = 11.5 MGD + 0.5 MGD

Figure 4 – 7

**Lima Energy Company
Ultra Clean Synthetic Crude Production Facility
Simplified Block Flow Diagram**



4906-13-05: Finance Data

The combined UCSC production and associated waste heat recovery based power generation component of the facility is projected to cost in the range of \$1600 million in direct capital cost. The first phase of UCSC production, including the waste heat recovery steam turbine generation and CO₂ compression, is projected to cost approximately one-quarter of this amount, and is the object of the initial financing that is currently in progress. The second phase of the UCSC component, and the CCGT component, will be funded separately. The capital cost of the CCGT component is projected to be in the range of \$1200 per kW.

4906-13-06: Environmental Data

The technology and scope change does not affect the projected emissions from the facility and is not expected to change or increase the environmental impacts of the Project. Although Lima Energy began construction under a valid air permit to construct (PTI), changes in the scale and scope of the facility and evolution of regulatory requirements, required Lima Energy to seek a revised PTIO from Ohio EPA. Application for a Permit To Install and Operate was filed in on October 11, 2013, and issued on April 25th, 2014.

Importantly, owing to the “closed” nature of the facility, without primary stack or vent, and the management of the carbon dioxide produced by the facility, the Facility qualified as a “synthetic minor” emission source and did not require a Prevention of Significant Deterioration (PSD) permit.

4906-13-07: Social – Ecologic Data

The gasifier technology and plant capacity changes do not affect social or ecologic information.

Appendix 1: Correspondence from Regulatory Agencies

The Ohio Power Siting Board approved a 30-month extension of the “Certificate of Need and Environmental Compatibility”, effective until September 1, 2014 by which time the facility is expected to have resumed a continuous course of construction. The facility filed a progress report in July 2013, as required by the extension order.

Appendix 2: Review of Stipulated Conditions

OPSB Staff and Lima Energy discussed several aspects of the proposed facility and its construction process. The results of those discussions became “Stipulated Conditions” in the original Certificate. Below, we summarize these “Conditions, and offer comments as to the current status of each.

- 1) **The facility to be installed at the preferred site:** This condition remains unchanged.
- 2) **The Applicant shall use equipment described in the original application:** This Amendment request describes certain new equipment for much of the facility, though the basic support infrastructure is not affected.
- 3) **The Applicant shall use mitigative measures described in the original application, unless modified by conditions of the certificate or other permits:** As described earlier, this Amendment alters the equipment and nature of the facility and materially reduces the nature of the air permit requirements for the Facility.
- 4) **The Applicant shall not commence construction of the project until the Interconnection Agreement with AEP is signed:** PJM has replaced AEP as the RTO, this condition will be met with PJM and not AEP. This condition should be deferred until the Project proceeds with the CCGT power generation component.
- 5) **Prior to “site preparation” activities, occurring before commencement of construction, Applicant will hold planning and oversight meetings with Staff:** This was completed in 2005, and the conditions of that meeting have been fulfilled. A new planning and oversight meeting will be scheduled with staff, prior to recommencing site preparation and construction activities.
- 6) **Prior to “site preparation” activities, the planning and oversight meeting with staff shall also cover environmental and construction storm water permit requirements:** This was completed in 2005, and the conditions of that meeting have been fulfilled. The environmental consideration (e.g. erosion and runoff control and Ohio EPA NPDES General Permit for Construction Activities compliance) have been addressed. The disturbed land is sufficiently remote from property lines to make erosion and runoff generally a non-issue. Discussion of these issues will be included in the planned oversight meeting.
- 7) **During site preparation, Applicant shall inspect the site on a regular basis to ensure erosion and runoff control measures are properly maintained:** This requirement has also been fulfilled, and necessity for significant ongoing measures has not materialized. The current contractor understands this requirement and is experienced in meeting these requirements.
- 8) **During initial site preparation Applicant shall maintain grass cover, or other mitigating measure, on disturbed soil:** Applicant will continue to meet this condition.

- 9) **Applicant and staff shall conduct preconstruction conference:** There is no change to this condition and this conference is still anticipated.
- 10) **Prior to pre-construction conference Applicant to provide plan for erosion control and storm water management to Staff:** Applicant will continue to meet this condition.
- 11) **Prior to construction Applicant shall obtain necessary permits:** Applicant will continue to meet this condition. The PTIO from Ohio EPA has been issued, and City of Lima building permits are planned where appropriate.
- 12) **Applicant to provide copies of all permits and approvals to Staff:** Applicant will continue to meet this condition..
- 13) **Prior to construction Applicant to ensure required filings for electric power gas transmission interconnections, as well as water supply and discharge routes, are made and copies provided to Staff:** The Project will not require natural gas supply until the CCGT component of power generation is implemented. Similarly, a PJM Interconnection Service Agreement (ISA) is not needed until the construction of the CCGT component of power generation. As such, this condition should be deferred until the CCGT construction. Also, if export of waste heat recovery based power generation is expected, Lima Energy will obtain a PJM ISA . The water supply and disposal routings are, by contract, the responsibility of the City of Lima. Lima Energy will however make the route information available to the Staff, if and when it is available.
- 14) **Applicant to consult with the City of Lima regarding site access and mitigation of vehicle and pedestrian traffic impacts during construction:** City of Lima completed construction of a grade separation at Vine Street, which was supported by the Project, and has eliminated one rail spur at South Main Street. Applicant will coordinate with City when mobilization for construction is scheduled, and when plans for the rail spur crossings of Main Street into the facility are developed.
- 15) **Prior to construction of permanent crossings Applicant shall consult with the City of Lima and Staff for appropriate access and entrance plans:** Kokosing is currently developing plans for coordination with the railroads. Applicant will conduct all necessary discussions with Board Staff and the City.
- 16) **Applicant shall install and maintain erosion controls and rainfall runoff management during construction:** Compliance with this condition is ongoing.

- 17) **Applicant shall reseed disturbed soil during construction:** Applicant will comply with all required elements of Ohio EPA's general permits for management of construction storm water, and will work with Board Staff during the course of construction. At completion of construction, appropriate landscaping will be installed.
- 18) **Applicant shall monitor site for debris and hazardous materials and ensure timely remedy and disposal:** Compliance with this condition is ongoing.
- 19) **Applicant shall ensure all disposal of waste materials complies with relevant regulations:** Compliance with this condition is ongoing.
- 20) **Applicant shall design final landscaping with consideration of aesthetics and noise mitigation, especially of adjacent homes:** Compliance with this condition is intended. It is noted that the homes that raised this condition have been removed and a private commercial building are being constructed in its place.
- 21) **Applicant shall design and install fire protection system for the generating station per NFPA:** Compliance with this condition is intended.
- 22) **Applicant shall coordinate emergency preparedness during construction and operation to assure timely response:** Compliance with this condition is intended. City approval of building permits includes conformity with NFPA. Information and coordinating meetings with local public safety and emergency response agencies is intended.
- 23) **Construction and ongoing maintenance of natural gas handling system shall conform to state and federal laws:** This condition should be deferred until construction of the natural gas fueled CCGT.
- 24) **Applicant to assure adequate line pressure in natural gas pipeline:** This condition should be deferred until the CCGT component of power generation is constructed.
- 25) **Applicant shall provide appropriate containment for chemical and oil storage:** Compliance with this condition is intended.
- 26) **Applicant shall maintain noise levels of power generating facility described levels:** Compliance with this condition is intended for both steam turbine and CCGT components of the planned power generation facility.

- 27) **Applicant shall provide information to Staff as it is developed:** Compliance with this condition is intended.
- 28) **At least 30 days prior to pre-construction conference, Applicant shall provided one set of specified design and planning documents related to the power generating facility:** Conformity to this condition is intended, but should be deferred until the CCGT component of the power generating facility is constructed.
- 29) **Certificate will become invalid within five years, absent a continuous course of construction:** Certificate was extended by the Board until September 1, 2014

Appendix 3: Additional Conditions in First Amendment

This amendment was initiated due to the gasification technology change, from fixe bed to wet slurry entrained flow.

- (A) **Applicant shall design and install appropriate containment for the “Slurry Storage Tanks”:** Compliance with this condition is expected. In addition to these tanks, the UCSC product will be produced into tanks for testing prior to shipment. Containment for these tanks, and any others, will also be provided.
- (B) **Applicant shall update the interconnect agreement with PJM, specifically due to the larger steam turbine generator anticipated:** This condition is should be deferred until the CCGT component of power generation is constructed. If the separate waste heat recovery steam turbine generator is determined to be of sufficient capacity to export energy, a PJM ISA will be obtained.

Appendix 4: Additional Information Known to Applicant

The Facility will need to temporarily backflow electric energy during start up. Owing to the approximate 30MW load of one ASU, and other plant utility requirements, the preliminary estimate of this start up load is approximately 50MW. The Applicant will therefore require an interconnection with AEP’s Southwest Lima Station, which will include the already planned “pole route” across the Husky Energy Refinery to the SWL Station. PJM has advised that they do not need to be consulted for this interconnection. Applicant also notes that AEP has upgraded the SWL Station to 345kV, while retaining the original 138kV capability and which we believe would be the level exported to Applicant.

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Summary: Application for Amendment 2 to Lima Energy Center Certificate of Environmental Compatibility and Public Need electronically filed by Mr. Robert J Schmidt on behalf of Lima Energy Company