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State of Indiana
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Dept of Environmetal Management
Office of Air Quality

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Dept. of Environmental Mgmt
Office of Air Quality

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25 January, 2018

IDEM Air Permits Administration
Attention: Incoming Application to Heath Hartley
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, IN 46204-2251

Subject: Air Emissions Source Construction Permit Application for Riverview Energy Corporation

Dear Mr. Hartley,

Please find attached for your review and consideration an application to construct a Direct Coal Hydrogenation (DCH) at a site in Spencer County, near Dale, Indiana by Riverview Energy Corporation. Two copies of the application package are being provided IDEM. Riverview requests IDEM to schedule a public meeting during the draft construction permit comment period.

Please note that the dispersion modeling protocol and modeling report have been separately submitted to Mr. Cody Jones of the IDEM Technical Support and Modeling Section.

Please contact Mr. Stephen Lang (713-753-7580) with any questions that you may have regarding this application.

Regards,

SAL

Stephen A. Lang

KBR

Chief Technical Adviser - Environmental
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Attachments

Application

to the

Indiana Department of Environmental Management

for a

Construction Permit

to build a

Direct Coal Hydrogenation Facility

to be located in

Spencer County, Near Dale, Indiana

By

Riverview Energy Corporation

Application Prepared By

KBR
601 Jefferson Ave., Houston, TX 77002

January, 2018

Contents

1. Application Overview

This air pollutant emission source construction permit application package is for a direct coal hydrogenation facility. This facility will utilize a cutting-edge approach to a technology with proven performance and reliability. It is called the Veba Combi Cracker® (VCC) technology and it is licensed in the United States by Kellogg Brown and Root (KBR).

The permit application package for this project is organized as shown on the Table of Contents. Tables have been utilized whenever feasible in order to minimize the number of forms that needed to be included. These tables have been structured to reproduce in exact order the information required by their parent forms, which we anticipate will facilitate review of this package.

Specific application elements that are best addressed as separate items are included as individual attachments to the core package. These attachments include the proposed fugitive dust control plan. The modeling protocol and related modeling information have been submitted separately from this package.

It is important to note that this fuel conversion facility is not a petroleum refinery in any sense. It does not process crude oil or petroleum or petroleum derived feedstocks. Therefore, it is not subject to NSPS and NESHAPs that are applicable to oil refineries. It does convert solid fuel (coal) into high quality ultra low sulfur diesel and naphtha boiling range products likely to be used as blend stock by fuel refiners and marketers. It is only subject to coal conversion-related regulatory packages.

Forms and Supporting Figures/Tables
All of the application forms are provided in a single attachment. Their supporting figures and tables are kept in separate, adjacent attachments for ease of review.

Emissions Summaries
The emission summaries are contained in the Forms section described above. Because of their importance, they are being described here in detail. The total emissions from each emitter and from the facility as a whole are critical for determining the applicability of different emission control requirements, ranging from Indiana's regulations to the applicability of federal New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPs). A separate attachment has been dedicated to the many tables that are needed to characterize the emissions, equipment specifications and other information needed for IDEM to complete its determinations in order to provide an enforceable, environmentally protective construction permit for this facility.

Tables 1 through 8 are the potential emissions after emission controls have been applied to the various operations that will comprise this facility. These controls include both hardware (e.g., baghouse) and work practice programs (e.g., roadway dust controls). They form the basis of this application package.

Environmental Data Sheets

The project definition has been developed by Kellogg Brown & Root, LLC (KBR) and current system design details of major emission units are captured on summary load/data sheets. These data sheets are the basis upon which the permit application emissions inventory has been generated.

BACT Determinations

The BACT determinations for this project were made using the top-down approach recommended in USEPA guidance. The determinations made for this project are addressed in this section.

Fugitive Dust Plans

This facility is required to have a fugitive dust control plan for its Coal Preparation and Processing scope under the provisions of 40 CFR 60 Subpart Y. This plan has been provided in a dedicated attachment. It includes the paving of parking areas and plant roads in areas of coal handling, with a work practices program to maintain fugitive dust control in these areas. As coal is delivered by rail only, conveyed, stacked, and reclaimed by dedicated automatic equipment without equipment traffic, fugitive losses are minimized by design. Transfer into the VCC process area's thermal drying and milling operations are also addressed in the dust control plan.

New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAPs)

Separate sections have been generated to address the applicable NSPS and NESHAPs requirements for this facility. The individual Subparts are identified and discussed in these sections.

Preventative Maintenance Plans

Every Preventative Maintenance Plan (PMP) for control equipment is similar. All PMPs require the operation and maintenance of the piece of control equipment to comply with manufacturer's recommendations for maintenance and for the operation of the device to comply with its design specifications and manufacturer's guarantee requirements/limitations. For each piece of equipment or operation that requires a PMP, the PMP will identify the job title of the individual responsible for inspecting, maintaining and repairing the subject equipment or operation, describe the item/condition to be inspected, and include an inspection schedule for the specified items/conditions. The PMP will also identify the stock replacement parts to be kept in stock and specify the number to be maintained in the site inventory to allow quick replacement.

2. Project Overview and Process Descriptions

The Applicant is currently planning to construct a fuel conversion facility at a site in Spencer County near Dale, Indiana. The facility will utilize a process technology with proven performance and reliability, called Veba Combi Cracking® (VCC), which is licensed in the United States by Kellogg Brown and Root (KBR). Table 2-1 identifies the overall DCH Facility's process blocks and attached reference block flow diagrams which are subject for this application.

Table 2-1: DCH Facility Process Blocks

Block ID	Facilities	Block Flow Diagram
1000	Coal Handling	H102-1000-EV-DWG-EV2-0001
1500	Additives Handling	H102-1500-EV-DWG-EV2-0001
2000	VCC Unit	H102-2000-EV-DWG-EV2-0001
3000	Sulfur Recovery	H102-3000-EV-DWG-EV2-0001
3000	Sulfur Recovery – Amine Recovery	H102-3000-EV-DWG-EV2-0003
3000	Sulfur Recovery – Amine Storage	H102-3000-EV-DWG-EV2-0004
4000	Offsites	H102-4000-EV-DWG-EV2-0001
5000	Residue Solidification	H102-5000-EV-DWG-EV2-0001
6000	Utilities	H102-6000-EV-DWG-EV2-0001
6500	Water Supply & Treatment	H102-6500-EV-DWG-EV2-0001
7000	Hydrogen Unit	H102-7000-EV-DWG-EV2-0001
8000	Waste Water Treatment	H102-8000-EV-DWG-EV2-0001

The following process block descriptions provide a more comprehensive overview of the interrelationships of the VCC Process Unit with its supporting Offsites and Utility infrastructure comprising the proposed DCH Facility.

2A. Process Block 1000 Description – Coal Handling

The coal handling from rail receipt to transfer into the VCC process includes the following system components, which include point and fugitive emission sources addressed in the emissions inventory:

1. Rail Car Dump Unloading Facility (Shelter Type)
2. Rail Unloading Conveyor 1 (Enclosed Pipe)
3. Conveyor 1 Transfer Station (Enclosed Structure)
   a. Transfer to Feed Conveyor 2 (Enclosed Pipe) to Stacker 1
   b. Transfer to Feed Conveyor 3 (Enclosed Pipe) to Stacker 2
4. Stacker 1 Boom Conveyor 2A (Enclosed) to Discharge Chute (for creating adjacent Stockpiles #1 & #2)
5. Coal Stockpile #1 (Radial Conical Ring)
6. Coal Stockpile #2 (Radial Conical Ring)

7. Stacker 2 Boom Conveyor 3A (Enclosed) to Discharge Chute (for creating adjacent Stockpiles #3 & #4)
8. Coal Stockpile #3 (Radial Conical Ring)
9. Coal Stockpile #4 (Radial Conical Ring)
10. Reclaimer 1 (500 ton/hr. reclaim capacity from Stockpiles #1 & #2
11. Reclaimer 1 Transfer Conveyor 4 (Enclosed) to Reclaim Transfer Structure
12. Reclaimer 2 (500 ton/hr. reclaim capacity from Stockpiles #3 & #4)
13. Reclaimer 2 Transfer Conveyor 5 (Enclosed) to Reclaim Transfer Structure
14. Transfer Station 1 Conveyor 9 to Reclaim Transfer Structure (for direct feed to VCC process from coal unloading bin)
15. Reclaim Transfer Structure (Enclosed)
16. Reclaim Transfer Conveyor 6 (Enclosed) to Milling/Drying Building
17. Milling/Drying Building – Crushed coal feed conveyor/coal feeder
18. Coal Milling & Drying System
19. Pulverized Coal Baghouse
20. Coal Hopper with Filter
21. Closed Screw Conveying to Coal-Oil Slurry Mixing – VCC Feed Stream Preparation

Overview of Coal Receipt, Handling, and Storage

Illinois Number 6 or equivalent Indiana coal will be delivered to the site by 100-car unit trains and unloaded in an enclosed building via continuous rapid unloading, a process in which bottom dump railcars unload coal into receiving hoppers located beneath the railroad tracks. The railcars are "indexed" through the unloading spot, with the unloading hopper scraper discharging to an 84-inch wide conveyor belt, which transports the coal through an elevated transfer station to one or both of the two separate transfer conveyors to the stockpiling locations. A separate conveyor is provided from the transfer station for direct coal feed to the VCC unit.

Two radial stackers are provided which have capability for continuous and independent stacking and reclaiming. Stacker/Reclaimer 1 will be used for creating and maintaining two coal stockpiles (#1A & #1B). The radial stackers/reclaimers create a conical, kidney-shaped stockpile configuration over an approximate 180 degree arc, with a vertical rise of ~100 ft. A second radial stacker/reclaimer creates stockpiles #2A & #2B, also within the coal rail loop area. The stacker/reclaimers operate without the need for any routine traffic on, across, or around the coal pile which would generate fugitive emissions.

While the unloading conveyor systems and stackers have high capacity to enable rapid unloading of the unit trains (5000 tons per hour), the reclaiming systems operate at much lower rates (500 tons per hour), i.e., to match the VCC design feed rate and intermittently provide catch-up transfer rates to the coal milling/drying operations. Reclaimer 1 and Reclaimer 2 have independent transfer conveyors to the Reclaim Transfer Station which provides redundancy in meeting the VCC design coal feed demand. A final Reclaim Transfer Conveyor exits the Reclaim Transfer Structure to deliver coal feed to the VCC Coal Milling/Dryer Building, wherein the dry pulverized coal feed is produced and screw conveyed to the VCC coal hopper and final conveying/weighing into the coal-oil slurry vessel.

Coal Preparation for VCC Unit - Coal Milling and Drying

A mill unit, a baghouse, a recycle gas blower, and a fired heater comprise the coal milling and drying unit, which pulverizes feed coal received as 30 – 40 mm sized material into a coal size range of roughly 50% less than 75 microns and maximum of 250 microns and dries the coal to a specified moisture content.

Crushed coal is fed to the coal mill where it is pulverized in a process where warm gas enters the mill bottom to heat and dry the coal. Gas carries pulverized coal particles out of the mill to the pulverized coal baghouse, while larger, heavier coal particles remain in the milling process. In the pulverized coal baghouse, solids are separated and filtered, and "dust-free" gas is sent to the recycle gas blower for circulation back to the coal mill. A fired heater, normally operated on fuel gas, generates hot flue gas used to warm the circulation gas before it enters the mill; surface and absorbed moisture evaporated from coal enters circulation gas flow. To maintain conditions above the dew point temperature in the coal baghouse, a fraction of warm gas is diverted around the mill to the baghouse and also a purge from the recirculating gas loop is used for both pressure control and to eliminate accumulated moisture.

2B. Process Block 1500 Description – Feed Additives Unit

Solid Additive Handling and Feed Preparation

A separate set of solid handling systems is required for each feed additive from receipt to storage and from storage to the VCC coal-oil slurry station dosing/mixing vessels. The fine and coarse additives are received by rail car while the sodium sulfide (Na_2S) additive is received by truck transport. Each additive is stored in a silo and must be kept free of moisture, thus nitrogen is used as carrier gas in the pneumatic conveying systems and as a storage blanket gas. Each step of the handling process is generically described below.

As fine additive may be the same material as coarse additive, i.e., only differing in size distribution, a "Fine Additive Production System" package is provided in the scope as backup for direct delivery.

Pneumatic Transport, Solid Storage, Solid Dosing

Pneumatic transport shall consist of an open loop transfer system designed for batch operation. The conveying system will transfer solid feed via unloading facilities from nitrogen-blanketed rail cars and trucks and transfer the solid to appropriate storage vessels. Carrier gas and blanketing nitrogen will be supplied as a utility at required pressures to the unloading spots. Dilute phase conveying will be employed with an option to convert to dense phase conveying with closed loop design to minimize nitrogen consumption. Solid storage will include a dust filter baghouse on top to separate nitrogen from conveyed solids. Nitrogen will also be used for pulse jet cleaning of the baghouse filters.

Solid dosing systems will consist of a rotary feeder solid weigh scale, a solid dosing master control system, and a solid screw conveyor, which will be precalibrated based on material transport rates. In normal operation, each rotary feeder will feed the solid weighing scale pot in batch mode based on the level measurements on the pot. The system will be controlled via a solid dosing master controller.

Na_2S Slurry Preparation

In addition to solid handling, a solvent mixture system is required for feed preparation of the sodium sulfide to ensure adequate mixing of Na_2S powder with the feedstock. Solvent used will be VGO from the VCC unit's vacuum tower.

From the Na_2S screw conveyor, solid Na_2S is sent, along with solvent, to the Na_2S mixing drum, which will be blanketed with low pressure nitrogen. The suspension is pumped from the Na_2S mixing drum to the coal-oil-additive premix drum for transport into the VCC process.

Coal Slurry Feed Preparation

Solvent from the VCC Unit fractionation section, including fractionator bottoms and vacuum gas oil (VGO) from the VCC Unit's vacuum column is routed to the VCC Unit's Feed Premix Drum. Coal feed from the Coal Milling and Drying section is gravity fed to the Coal Hopper and further fed for mixing to the Feed Premix Drum through the Screw Feeder; similarly, coarse additive and fine additive are gravity fed from conveyors to the Feed Premix Drum, where coal, catalyst, additive, solvent, and Na_2S are combined. All solids are passed through sieves to remove large solids and other materials prior to mixing in feed premix drum.

A control unit regulates the coal to liquid ratio in the Feed Premix Drum by setting the coal rate via the weighing system in relation to the recycled solvent flow rate. The other solid feeds will be controlled by using the related dosing screw, and their rates set as a function of coal feed rate. The recycle solvent from VGO recycle drum is routed to the Feed Premix Drum. An internal mixer is required in the Feed Premix Drum to disperse solids in the feed and to establish a stable suspension. In addition to the internal mixer, a recirculated solid slurry stream is recycled from suction of the HP Feed Pump to the Feed Premix Drum; during normal operation the vessel is filled with 50 wt% solids.

After mixing, the slurry is routed to the Feed Surge Drum (V-0102) via the Feed Premix Pump to the reactor section of the VCC unit.

2C. Process Block 2000 Description - Veba Combi Cracking (VCC) Unit

VCC technology is commercially proven, with decades of commercial operations and innovation. It is the most mature and versatile technology of its kind in the market today. VCC is the only slurry-phase hydro-cracking technology proven to convert coal to higher value distillate products. The Riverview Energy VCC Unit is designed to process a nominal 200 metric tons per hour, on a moisture and ash free basis, of run-of-mine (ROM) coal into premium ultra-low sulfur content distillate products. The VCC technology's main processing steps may be summarized as:

- Coal Feedstock & Additive Solids Handling
- Coal + Solvent Slurry Feed preparation
- Pressurization and preheating of the feed
- Liquid phase reaction (LPH: hydro-cracking & hydrogenation) and separation of the primary products
- Gas phase reaction (GPH: hydro-treating & hydrogenation) of the primary product in a trickle bed reactor and heat recovery
- GPH Reactor Effluent Separation Section
- Product Fractionation (Naphtha & Diesel)
- Recycle Gas Compression (Hydrogen & hydrocarbon)
- System depressurization and Stripping
- Makeup hydrogen compression
- Vacuum distillation of the LPH reactor unconverted material (hydrocarbon recovery)
- Solidification of the Vacuum Residue

The VCC process feedstock is a slurry of finely ground dry coal, additives, and catalyst carried in a heavy gas oil which is injected into the high pressure section of the process. After adding makeup hydrogen the feed stream is preheated by heat recovery from the reactor effluents and a fired heater. The feed mixture is converted in a cascade of multiple slurry or liquid phase hydro-cracking (LPH) reactors operated at high pressure. The LPH reactors' effluent of converted coal, additives, and the process catalyst are separated from the vaporized reaction products in a hot separator.

The hot separator vapor effluent is sent to the VCC gas phase hydro-treating (GPH) stage while the separator's bottom liquid product is further heated and fed to a vacuum flasher for additional distillate recovery. The vacuum column's bottom product is termed residue and sent to a solidification unit for shipping to offsite consumers.

The GPH stage is a single reactor vessel with catalytic beds for hydro-treating, followed by additional beds for further hydro-cracking to maximize diesel production. After leaving the GPH the effluent is cooled, condensed and separated from the non-condensable gas fraction. The stripped vapors are further processed into sweet LPG for use as process feedstock in the Complex's Hydrogen Manufacturing Unit. The separated liquids are further processed in a fractionator to produce high quality naphtha, ultra-low sulfur diesel fuel and fractionator bottoms. The bottoms are recycled back to the GPH and converted to diesel. A small portion of the bottoms is purged back to the LPH for further hydro-cracking in order to prevent buildup of poly-nuclear aromatics in the process loop and products.

The VCC Unit contains auxiliary systems including a water injection system, a sour water collection system which sends effluent to the OSBL Sulfur Recovery Plant, gas Amine Absorbers, from which rich amine will be sent to the OSBL Amine Regeneration Unit, and an Emergency De-pressure System to collect and contain solid-containing slurry material during an emergency depressurizing of the high pressure reactor systems.

2D. Process Block 3000 Description - Sulfur Recovery Unit

Due to the VCC's high pressure liquid phase hydro-cracking and gas phase hydro-treating steps, the sulfur recovery from feedstock coal is very high and in turn the sulfur content of the process products is very low. Nearly all of the feedstock coal's sulfur content is converted to hydrogen sulfide and is recovered either via the amine treating of produced gas or collection of sour water generated in the process. These recovery systems produce the feed to the Sulfur Block operations which has two parallel Sulfur Recovery Plants, each rated at 70% of expected loading to provide reliability and allow for VCC Unit turndown to 70% rate if one of the plants experience a shutdown. The amine, sour water, sulfur recovery, and product handling are described in the following narrative.

Amine Regeneration

So-called "lean amine" solution, which contains only trace amounts of H_2S after stripping, is recirculated from the Amine Regeneration Unit (ARU) to the VCC unit where it is contacted with sour gas and LPG streams in high pressure and low pressure absorbing towers. The resulting absorber bottoms streams, now as "rich amine" solutions carrying the recovered hydrogen sulfide (H_2S) and ammonia (NH3) are regenerated by medium temperature stripping, allowing concentrated processing of recovered H2S and NH3 gases in the Sulfur Recovery Plants (SRP) and the lean amine solution to be recycled.

The amine-water contacting solution is comprised of ~40% methyl diethanolamine (MDEA) in water and has extremely low vapor pressure, minimizing losses to product streams as well as fugitive emissions from processing equipment. Its use in the VCC process allows the diesel and naphtha products to meet product quality specifications as well as the VCC by-product streams used as feedstock to the Hydrogen Plants or alternatively sent to the fuel gas system, e.g., those streams internally described as "sweet", e.g., Sweet Offgas and Sweet LPG.

Rich amine from the VCC unit enters the rich amine flash drum where entrained oil is removed from the stream. The amine is then heated and sent to the amine regenerator, where the amine is reboiled by a steam exchanger to remove H_2S and ammonia (NH_3) from the solution. These overhead gases are cooled to condense water which has boiled up through the column with the H_2S and NH_3 prior being sent to the sulfur recovery plant. The recovered water is returned as reflux to the column and purged to the Sour Water system.

The lean amine from the bottom of the column is cooled against rich amine feed to the amine regenerator, then cooled further with an air cooler. After cooling, the amine stream is filtered via cartridge filters and a carbon bed absorber to remove any trace decomposition or oil contaminants before beginning another recovery cycle in the VCC unit.

Sour Water Stripping

Sour water stripping is conducted in a two stage system to first separate ammonia and then hydrogen sulfide (H_2S) from the sour water feed. This processing configuration reduces ammonia load on the Sulfur Recovery Plant (SRP) and NOx generation in the SRP's tail gas treatment unit (TGTU).

In the NH_3 Stripper, ammonia and any water containing trace H_2S remaining in the steam are stripped out. The NH_3 reboiler uses LP steam to drive stripping of the sour water, which is used either as reflux on the ammonia stripper or as internal recycle and returned to the sour water degassing drum. Overhead gas from the NH_3 stripper is cooled and the resulting gas and liquid are separated in the NH_3 reflux drum. NH_3 rich gas is liquefied to be sold as product and stored onsite.

Sour water exiting the bottom of the NH3 stripper column is sent to the H2S Stripper column with non-phenolic sour water produced in the VCC unit. The non-phenolic sour water will be sent to sour water stripping, after oils are separated out prior to preheating and entering the H_2S stripper. In the H_2S stripper column, H_2S is removed by heat application. The H_2S rich gas is quenched and any ammonia content washed out via cold stripped water, prior to leaving the top of the column. H_2S gas is let down in pressure, heated, and then jacketed prior to being sent to sulfur recovery. Bottoms are reboiled with MP steam and used for preheating feed prior surge and reuse/recycling in the VCC Unit.

A small portion of sour water, mainly from the VCC Unit's vacuum tower, contains phenolic compounds which are handled in a parallel sour water system, including tankage and stripping. The separate parallel systems (phenolic and non-phenolic) are provided to keep phenolics from concentrating in product streams from the recycling of stripped sour water to the process.

Sulfur Recovery

Acid gases containing primarily H_2S from the amine regeneration process and sour water stripping process are sent to two SRPs, which use the Claus process with tail gas treating units (TGTU) to produce elemental sulfur product. The process configuration has 2 x 70% VCC capacity SRPs to allow for shut down of one Claus unit and turndown of the VCC to a nominal 70% production rate to minimize any need for flaring of H2S/NH3 bearing gases.

In the SRP process, feed gases and are burned with sufficient air to combust 1/3 of the H2S content to promote the Claus reactions. Hot burner gases are cooled in a waste heat boiler, producing steam, before being mixed with additional acid gas and fed into the first stage of a catalytic converter. Partially converted gas from the first stage converter is cooled, removing the condensed sulfur product.

Unconverted acid gas compounds are then heated prior to entering the second stage of the converter; the effluent from the second stage is again cooled to remove condensed sulfur compounds, before the gas is reheated and sent to the third stage converter. Effluent from the third stage converter is cooled with sulfur product and sent in molten form to the sulfur pit, while unconverted gas is sent to the tail gas treating unit.

The resulting tail gas from the Claus process contains trace sulfur compounds, so the stream is partially recycled back to the SRP feed stream to recover additional sulfur. The main tail gas is heated prior to being fed to a hydrogenation reactor where all sulfur containing compounds are converted to H_2S. The stream is cooled, producing steam, and cooled further using cooling water. Produced H_2S is removed in an amine contactor, from which the remaining sweet gas is incinerated and vented to atmosphere.

Sulfur produced may contain up to ~300 ppmw H_2S, partly chemically bound as polysulfides and partly physically dissolved. Sulfur product is degassed by air injection via spargers into the liquid sulfur pit, with this purge gas stripping H_2S from the sulfur, promoting decomposition of polysulfides, and oxidizing the product to elemental sulfur. The purge gas is recycled to the SRP feed stream. The Sulfur pit contents with < 10 ppmw free H2S are pumped to the heated sulfur storage tanks for loading into railcars for shipment.

2E. Process Block 4000 Description - Offsite Facilities

The offsite facilities for the Riverview Energy Corp. complex include flares, storage tanks, and product loading operations.

Flares

Four flares service the Riverview Energy Corp. complex. No routine flaring occurs from the VCC process; each of three flares associated with VCC Unit processes will operate normally on standby, contributing minimal emissions from the burning of small quantities of pilot and purge gases.

Each flare system is comprised of a vent header from process unit, a knock out drum, a molecular (velocity) seal, and a flare tip with multiple pilots. Pilot status is monitored by thermocouple.

The High Pressure (HP) Flare and Low Pressure (LP) Flare are supported by a common derrick within the coal loop area. The HP Flare's primary purpose is to control overpressure reliefs from control and safety valves at the VCC complex, while the LP Flare primarily serves the Hydrogen Production Complex. The controlling overpressure event which acts as a flare sizing basis is major power failure at the complex. A power failure would trigger the VCC Unit's Emergency De-pressure System (EDS), which results in fast de-pressuring of VCC unit's LPH and/or GPH reactors; hot solid material and effluent from the LPH and GPH reactors are sent to the VCC Unit's Emergency De-pressure Drum, where vapor flashes off, is cooled, and is sent to the HP

Flare system with an alternative case being the shut down of hydrogen production and the short term flaring of VCC feedstock streams. The Low Pressure (LP) Flare's primary purpose is to control overpressure reliefs from control and safety valves at the complex's hydrogen production units. The hydrogen units are fed gas from the VCC Unit, supplemented by natural gas from pipeline.

The Sulfur Block Flare is supported on a dedicated derrick within the coal loop area. The Sulfur Block Flare's primary purpose is to control overpressure reliefs from control and safety valves in the complex's Sulfur Recovery Plants, Amine Regeneration Unit, Sour Water Stripping Unit, and sulfur product loading operations.

The Loading Flare is supported on a dedicated derrick adjacent to the product loading spots. The Loading Flare will control venting from the complex's loading operations for diesel, naphtha, and ammonia product.

Product Tanks

Product diesel from the VCC Unit will be stored onsite in three fixed roof type tanks and one internal floating roof type tank. One diesel storage tank is to be constructed as internal floating roof type to serve as a swing tank for naphtha service if required.

Product naphtha from the VCC Unit will be stored onsite in two internal floating roof type tanks.

Molten sulfur will be stored in a fixed roof that will be heated to maintain product at a flowable viscosity.

Product ammonia will be stored in 12 horizontal pressurized vessels.

Intermediate Tanks

Hydrogenated residue, vacuum residue, and vacuum gas oil (VGO) are intermediates associated with the VCC process, which will be stored in heated, fixed roof tanks. These materials have very low vapor pressures and need to be kept warm to maintain their liquid state.

Other Tanks

Additional tankage at the complex will contain liquids associated with utilities and auxiliary processes, including diesel fuel, slop, amines, sour waters, a variety of water treatment chemicals (sulfuric acid, caustic, etc.), as well as potable water, firefighting water, and demineralized water, and will be stored in fixed roof tanks.

Loading Operations

A loading rack servicing up to 8 railcars simultaneously will be provided for diesel and naphtha product loading at 2500 gpm each. The railcar loading system is submerged fill type to minimize vapor loads sent to the Loading Flare.

A single railcar loading spot is dedicated for loading anhydrous ammonia.

A single railcar loading spot is dedicated for loading liquid sulfur.

Two railcar loading spots are dedicated for loading solidified residue; one load spot is equipped for truck loading as a secondary means of product shipping.

2F. Process Block 5000 Description - Residue Solidification Unit

Residue from the VCC Unit Vacuum Tower bottoms will be fed directly to SANDVIK technology ROTOFORM 3000 units for solidification into pastilles. Residue will be alternatively fed to a tank, from which heated residue will be pumped to the solidification units. 1236 STPD of hydrogenated residue is solidified in 12 operating units + 4 spare units.

All heat supplied to the system to maintain the residue in flowable, liquid form will be electrically generated.

Each unit includes a prefilter, a fine filter, and a pastillator (ROTOFORMER TM) discharging residue onto a steel belt with a dedicated, under-belt water cooling system. The pastilles are of uniform hemi-spherical shape, ~ 5-6 millimeters in diameter. Given the high melting point of the residue and immediate cooling on the belt, the pastilles rapidly form a glassy coat as they travel along the ~130 foot length of the cooling belt to a discharge point. The belt cooler is enclosed and provided with an exhaust vent for a purge air stream. Four units are exhausted to a common blower and discharged to a vent above the solidification building roof to the atmosphere. A small amount of hydrocarbon is initially released from the pastilles' surface, i.e., evaporated vacuum gas oil which is dissolved in the residue. The temperature profile along the cooling belt indicates surface evaporation occurs only for approximately the first third of the belt travel length.

The belt cooling water recirculates and is never in contact with the residue product. The fully solidified pastilles, each 5-6 mm diameter, are dropped off the belt via discharge knife and conveyed to loading spots for railcar (primary), truck (secondary) or other containers such as supersacks, or bulk containers (tertiary) for shipping.

The pastilles have a significant strength and are not friable. Their handling is essentially dustless.

2G. Process Block 6000 Description - Utilities

The VCC Unit will require auxiliary systems to provide utilities to sustain the plant's process. The utility systems contributing to air emissions are detailed below; additional utility systems to be installed include raw water treatment, wastewater treatment, plant and instrument air, electrical infrastructure, etc.

A three-cell, mechanic draft cross flow cooling tower will provide cooling water for various process and utility units in the Riverview Energy Corp. complex. The cooling tower will be equipped with drift eliminators capable of achieving drift to 0.0005% of the tower's recirculation rate (~32,000 gpm). Well water from the Dale Complex will be used as cooling tower makeup supply.

A package boiler will provide 40,000 lb/hr of 650 psig/750 degree F superheated steam to meet steam demand for start-up of the complex's VCC unit. The package boiler will operate at a turndown rate of ~30% during normal plant operations.

Diesel drivers are provided for emergency operation of equipment in the case of power failure for 1) essential power demands and 2) firewater pump services.

- The essential power diesel generator set will be provided by Caterpillar and will meet EPA Tier 2 emissions standards. The diesel generator is presented as an intermittently operating source; it will be turned on for a maximum of 1-2 hours per week (i.e., 100 hrs per year as its Potential to Emit basis) for engine reliability testing and maintenance. Operation of the diesel generator in excess of this Potential to Emit period will only occur in the event of power failure.
- The diesel driven firewater pump will be provided by Caterpillar and will meet EPA Tier 2 emissions standards for this special service. The diesel driven firewater pump is presented as an intermittently operating source; it will be turned on for a maximum of 1-2 hours per week plus an additional allowance of 100 hours per year (i.e., 200 hrs per year Potential to Emit basis) for engine reliability testing and maintenance plus fire water system pressure testing and purging periods. Operation of the diesel fire water pump in excess of this Potential to Emit period will only occur in the event of a major fire event.

Plant air and instrument air will be generated onsite for use in various units within the Riverview Energy Corp. complex as a basic utility system. Air is filtered and compressed, moisture condensed and discharged from these air systems. No regulated emissions to atmosphere are generated by the plant and instrument air systems' operation.

Nitrogen will be generated onsite for use in various units within the Riverview Energy Corp. complex for purging lines and other support operations. The site's nitrogen generating unit will utilize pressure-swing adsorption (PSA) technology to produce high purity nitrogen from air. No regulated emissions to atmosphere are generated by PSA unit's operation.

2H. Process Block 6500 Description - Water Supply and Treatment

Water supply to the Riverview Energy facility is proposed to be from the Ohio River, conveyed to the site by a pipeline, as a groundwater supply does not currently appear feasible. Treatment steps will include lime softening prior use as cooling tower make-up and then removal of dissolved solids to generate boiler feed water.

The lime-softening step will require receipt and handling of either bulk quantities of dry "quicklime" or slaked-hydrated lime (Ca(OH)2). Truck receipt is currently proposed with pneumatic conveying into a storage silo. Feed from the storage silo to the water treatment system is conveyed by enclosed screw feeder line with no emissions. The storage silo PM emissions from displaced air headspace flow during truck unloading is controlled by a dust collector. No other air emissions are associated with the water treatment areas.

2I. Process Block 7000 Description - Hydrogen Production

Hydrogen supply is essential to the VCC process, as coal is predominantly carbon and the fuel conversion to liquid products is essentially a hydrogen addition or hydrogenation technology. The extent of hydrogen addition is determined by the available feedstock and desired product composition and quality. In order to maximize the flexibility of processing low cost available feeds, the hydrogen capacity must be robust. Two Hydrogen Plants, each with 105 MMSCFD of 99.9% hydrogen purity are specified for the DCH facility.

The main process steps of the Hydrogen Manufacturing Unit consist of feed preparation, i.e., desulfurization, steam methane reforming (SMR), shift conversion and hydrogen purification. The hydrogen feedstock is first mixed with recycled hydrogen. Desulfurization occurs in two process steps; first, organic sulfur compounds are converted to H2S in the presence of a hydrogenation catalyst, then H2S is adsorbed.

The desulfurized feed is mixed with process steam at an optimized steam-to-carbon ratio and superheated before entering the high temperature primary reformer furnace. A catalyst converts the mixed feed into a reformed synthesis gas containing H2, CO2, CH4, N2 and steam inside the primary reformer's tubes. CO in the reformed synthesis gas is water gas shifted to produce more hydrogen.

In the hydrogen purification unit, hydrogen is separated from the shift gas stream by pressure swing absorption (PSA) with multiple trains cycling to provide relatively constant hydrogen product flow rates. The PSA tail-gas is recycled as fuel to the reformer furnace to recover its heating value.

The primary reformer radiant section is heated by firing the PSA tail-gas from the hydrogen purification unit and by supplemental fuel gas with burners in its top section. The necessary combustion air is routed by a combustion air fan to the furnace burners after preheating against flue gas exiting unit. The gas path from the furnace includes refractory-lined ducting to a convection section where steam production and process heat recovery occur in a series of heat exchanger coils, as well as NOx reduction by a selective catalytic reduction (SCR) bed, and lastly the combustion air preheat exchanger prior being routed to the flue gas stack.

Steam generated by waste heat from the SMR reformed gas is utilized as process steam, with the excess exported for other plant needs.

2J. Process Block 8000 Description - Waste Water Treatment Unit

Wastewater generated from the DCH Project is characterized under federal and state regulations as contact, non-contact, storm water run-off, and sanitary flows. It is noted that the Dale site's industrial water supply is provided from wells adjacent to the Ohio River by pipeline and is treated prior use by Riverview for utility and process services. Potable water supply is provided from the City of Dale drinking water distribution system and used directly by Riverview with no further treatment.

The liquid effluent management scheme for the units in the DCH Project will have provisions for the segregation of liquid effluents and wastewater sources, non-contact stormwater, effluent collection, routing, treatment, and monitoring.

All process wastewater from the DCH Units is treated and combined with utility blowdowns and treated sanitary wastewater and leaves the site by pipeline for conveyance to an outfall to the Ohio River.

The design will endeavor to minimize impacts and ensure the effluent discharges are within the limits specified by the applicable State and Federal regulations incorporated into the facility NPDES permit. There are no directly applicable effluent guidelines for the DCH facility under regulations at 40 CFR 414.

<u>Contact Wastewater</u>
Contact wastewater is generally "process" wastewater or water that comes into contact with process streams, intermediate or commercial products. As process piping, vessels, etc. are considered primary containment, secondary containment is provided for potential leak sources, e.g., storage tanks and pumping locations, critical process equipment, and for general spill and emergency release protection areas.

Dedicated wastewater drain collection and conveyance systems are provided for oily, sour, and amine contaminated flows. These systems are designed as closed or water sealed systems in order to control fugitive emissions. Additional wastewater treatment equipment scope may need to be addressed as part of future FEED phase development and is not addressed in this application.

The potentially contaminated storm water runoff from the DCH process area drainage (PAD) will be routed to PAD Containment Sumps for holding and testing before release. Contaminated storm water from ACRO 2 will be routed to the wastewater treatment system as needed and become tributary to the normal dry-weather flow to the plant's Ohio River outfall. Clean storm water will be routed to the plant's clean water ditches tributary to the Norfolk Southern rail line right-of-way drainage to Little Pigeon Creek.

In the OSBL chemical handling and storage areas, Riverview uses secondary containment, curbing, and diking design concepts to enable a hold and release approach for potential spill incidents generating contact wastewater. While storm water from such areas is assumed potentially contaminated, it is normally non-contaminated and released after testing or checking into the non-contact surface drainage system tributary to the Norfolk Southern rail line right-of-way drainage to Little Pigeon Creek..

Storage Tanks / Containers Subject To Secondary Containment Design (Finalized in FEED Phase)

- Diesel
- Naphtha
- VGO
- Amine
- Sour Water
- Residue
- Sulfuric Acid
- Sodium Hydroxide
- Cooling Water Treatment Chemicals
- Boiler Feed Water & Boiler Treatment Chemicals

Non-Contact Wastewater

Non-contact wastewaters are those which normally do not come into direct contact with the facility products, raw materials or intermediate process streams, i.e., nominal utility related flows. The primary direct sources of non-contact utility wastewater discharge from the DCH Project will be:

- Filtered Water and DI Water Treatment Waste Streams
- Cooling Tower Blowdown
- Boiler Feed Water Services
- Steam Drum Blowdown
- Steam Condensate Flows, Pump Base Plate and Drains
- Steam Condensate Recovery and Steam Trap Losses
- Sample Coolers' cooling water streams
- Fire Water System Blowdowns (Purges) & Miscellaneous Uses and Losses
- Potable Water System Blowdowns (Purges)
- Utility/Industrial Water System Blowdowns

Non-contact wastewater streams will be combined with the treated wastewater streams and sent to the Ohio River Outfall.

Stormwater and Spill Control
Clean stormwater from the DCH Project's non-developed or non-industrial areas will be routed to the Riverview NPDES Outfalls tributary to Little Pigeon Creek. Miscellaneous perimeter areas of the plant are also believed to drain to Little Pigeon Creek via the Norfolk Southern rail line drainage.

Stormwaters may be differentiated within the Riverview Stormwater Pollution Prevention Plans (SWPPP) for both the construction period and the operating facility. This document addresses the expected construction period volumes and flows per a preliminary PDP Phase study conducted. Best management practices for the DCH Project's impacted areas will be established specifically during the FEED Phase in advance of construction to control sediment erosion and other potential contaminants such as fuels, lubricants, and miscellaneous chemicals used in commissioning activities. Incorporation into Riverview's larger drainage strategy and SWPPP for the site is outside of the present Project's scope.

New equipment considered for inclusion in Riverview's SPCC Plan from the DCH Project due to oil inventory from transformers and high voltage capacitors include:

- Transformers at the new Utility Substation (~ area of 60 ft x 15 ft dimension)
- Transformers at the new VCC Substation (~ area of 72 ft x 22 ft dimension)
- HV Capacitors at Utility Substation (Others TBD in FEED)

Civil works including preliminary grading and paving plans will be used to finalize stormwater drainage scope and effluent flow rates to Riverview NPDES Outfall 001.

Sanitary Wastewater
There will be sanitary wastewater generation from approximately 100 personnel at the Riverview buildings which include: Gate House, Administration, Maintenance Shops, Warehouse, Control Room / Lab Building. The flow will be collected at lift stations and conveyed to the City of Dale.

2K. DCH Facility Emission Inventory Overview

The Applicant's emission units addressed in this application and contributing to the DCH facility's emission inventory are listed in Table 2-2.

Table 2-2 : Emission Inventory Overview

DCH Facility Scope				Included in Emission Inventory						Remarks
Block	Emission Unit Number	Emission Source Description	Emission Basis	PM10/ PM2.5	NOx	CO	SO2	VOCs	HAPs	
1000	EU-1000	Coal Unloading Station	Process weight rate	YES	--	--	--	--	--	
	EU-1001	Transfer Station 1	Process weight rate	YES	--	--	--	--	--	
	EU-1002	Stacker 1 Boom Chute	Process weight rate	YES	--	--	--	--	--	
	EU-1003	Coal Pile 1A/1B	Stack and Met Data	YES	--	--	--	--	--	
	EU-1004	Stacker 2 Boom Chute	Process weight rate	YES	--	--	--	--	--	
	EU-1005	Coal Pile 2A/2B	Stack and Met Data	YES	--	--	--	--	--	
	EU-1006	Reclaim Transfer Station	Process weight rate	YES	--	--	--	--	--	
	EU-1007	Coal Dryer Heater	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-1008	Coal Drying Loop Purge	Coal Moisture	YES	--	--	--	--	--	
1500	EU-1501	Coarse Additive Storage Filter	Volumetric Displacement	YES	--	--	--	--	--	
	EU-1502	Fine Additive Storage Filter	Volumetric Displacement	YES	--	--	--	--	--	
	EU-1503	NA2S Additive Storage Filter	Volumetric Displacement	YES	--	--	--	--	--	
	EU-1504	Fine Additive Production System	Volumetric Displacement	YES	--	--	--	--	--	
2000	ghEU-2001	Feed Heater	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-2002	Treat Gas Heater	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-2003	Vac Column Feed Heater	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-2004	Fractionator Feed Heater	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-2005	Coal Handling System Filter	Volumetric Displacement	YES	--	--	--	--	--	

Table 2-2 : Emission Inventory Overview

DCH Facility Scope				Included in Emission Inventory						Remarks
Block	**Emission Unit Number**	**Emission Source Description**	**Emission Basis**	**PM10/ PM2.5**	**NOx**	**CO**	**SO2**	**VOCs**	**HAPs**	
	EU-2006	Coarse Additive Handling System Filter	Volumetric Displacement	YES	--	--	--	--	--	
	EU-2007	Fine Additive Handling System Filter	Volumetric Displacement	YES	--	--	--	--	--	
	EU-2008	Na2S Handling System Filter	Volumetric Displacement	YES	--	--	--	--	--	
3000	EU-3001	TGTU Stack A	Firing Rate	YES	YES	YES	YES	YES	YES	2 x 50% Capacity Units; Natural Gas Fuel
	EU-3002	TGTU Stack B	Firing Rate	YES	YES	YES	YES	YES	YES	
4000	EU-4001	Loading Flare	Standby Pilots & Purge	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-4002	Sulfur Block Flare	Standby Pilots & Purge	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-4003	LP Flare	Standby Pilots & Purge	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-4004	HP Flare	Standby Pilots & Purge	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
5000	EU-5001A/B/C/D	Residue Pastilators Stack 1	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts PM
	EU-5002A/B/C/D	Residue Pastilators Stack 2	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts PM
	EU-5003A/B/C/D	Residue Pastilators Stack 3	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts PM
	EU-5004A/B/C/D	Residue Pastilators Stack 4	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts PM
	EU-5005	Residue Railcar Loading	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts
	EU-5006	Residue Railcar Loading	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts
	EU-5007	Residue Rail/Truck Loading	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts
	EU-5008	Residue Rail/Truck Loading	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts
	EU-5009	Residue Bulk Container Loading	Process Weight Rate	YES	--	--	--	YES	--	Trace Amounts

Table 2-2 : Emission Inventory Overview

DCH Facility Scope				Included in Emission Inventory						Remarks
Block	Emission Unit Number	Emission Source Description	Emission Basis	PM10/ PM2.5	NOx	CO	SO2	VOCs	HAPs	
	EU-5010	Residue Rail Silo Filter	Volumetric Displacement	YES	--	--	--	YES	--	Trace Amounts
	EU-5011	Residue Swing Silo Filter	Volumetric Displacement	YES	--	--	--	YES	--	
6000	EU-6000	Package Boiler	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas Fuel
	EU-6001	Cooling Tower Cell A	Recirculation Rate	YES	--	--	--	YES	--	
	EU-6002	Cooling Tower Cell B	Recirculation Rate	YES	--	--	--	YES	--	
	EU-6003	Cooling Tower Cell C	Recirculation Rate	YES	--	--	--	YES	--	
	EU-6005	EDG Diesel Tank	Tank and Met Data	--	--	--	--	YES	--	
	EU-6006	Emergency Diesel Generator	Operating HP-Hrs	YES	YES	YES	YES	YES	YES	
	EU-6007	EDFWP Diesel Tank	Tank and Met Data	--	--	--	--	YES	--	
	EU-6008	Emergency Diesel Fire Water Pump	Operating HP-Hrs	YES	YES	YES	YES	YES	YES	
	EU-6501	Lime Silo Filter	Volumetric Displacement	YES	--	--	--	--	--	
	EU-6502	Deaerator Vent	BFW Rate	--	--	--	--	--	--	CO2 & Inerts
7000	EU-7001	Hydrogen Plant 1 Reformer	Firing Rate	YES	YES	YES	YES	YES	YES	Natural Gas and Process Tail Gas
	EU-7002	Hydrogen Plant 2 Reformer	Firing Rate	YES	YES	YES	YES	YES	YES	
	EU-7003	Hydrogen Plant 1 DA Vent	Licensor Data	--	--	YES	--	YES	YES	Methanol HAP
	EU-7004	Hydrogen Plant 2 DA Vent	Licensor Data	--	--	YES	--	YES	YES	

3. Applicable Federal New Source Performance Standards (NSPS)

Considerations for granting a permit are based upon the scope of regulatory applicability and upon the technical acceptability of the submissions under New Source Review - Prevention of Significant Deterioration (NSR-PSD) and State Implementation Plan (SIP) regulations at 40 CFR 51 & 52 et. seq. incorporated by reference by IDEM.

As noted in Section 1, the Riverview DCH facility is defined as a Fuel Conversion Facility, one of the 28 PSD Source Categories with 100 ton/yr Major Source Thresholds. See Table 3-1 for that listing. The current DCH Project emissions inventory has NOx, CO, SO2 and VOC emissions exceeding the PSD major source threshold and Green House Gase (GHG) emissions also exceed the current major source threshold of 75,000 ton/yr.

Table 3-1: PSD Source Categories with 100 TPY Major Source Thresholds	
1. Coal cleaning plants (with thermal dryers)	15. Coke oven batteries
2. Kraft pulp mills	16. Sulfur recovery plants
3. Portland cement plants	17. Carbon black plants (furnace process)
4. Primary zinc smelters	18. Primary lead smelters
5. Iron and steel mills	**19. Fuel conversion plants**
6. Primary aluminium ore reduction plants	20. Sintering plants
7. Primary copper smelters	21. Secondary metal production plants
8. Municipal incinerators capable of charging more than 250 tons of refuse per day	22. Chemical process plants
9. Hydrofluoric acid plants	23. Fossil-fuel boilers (or combination thereof) totaling more than 250
10. Sulfuric acid plants	24. Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels
11. Nitric acid plants	25. Taconite ore processing plants
12. Petroleum refineries	26. Glass fiber processing plants
13. Lime plants	27. Charcoal production plants
14. Phosphate rock processing plants	28. Fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input

Section 3 addresses the federal New Source Performance Standards (NSPS) at 40 CFR 60 et. seq., incorporated by reference by IDEM that have been identified for the Applicant's DCH facility.

3A. Coal Preparation and Processing Plants (40 CFR 60, Subpart Y)

Coal transfer, coal storage, and the coal crusher are regulated under "Standards of Performance Coal Preparation and Processing Plants," 40 CFR 60, Subpart Y. This regulation limits opacity coal processing and conveying equipment, coal storage systems, or coal transfer and loading

3B. Process Heaters and Boilers (40 CFR 60, Subpart Db or DC)

The boiler and most of the process heaters at this facility are subject to the requirements contained in 40 CFR 60 Subparts Db or Dc that apply to gas-fired units. The requirements contained in Subpart Db for gaseous fuel-fired units are applicable to the Feed Heater (128.4 MMBTUH) and the Fractionator Feed Heater (156.0 MMBTUH). The requirements contained in Subpart Dc for gaseous fuel-fired units are applicable to the Package Boiler (68.5 MMBTUH), the Coal Drying Heater (55.8 MMBTUH), and the Treat Gas Heater (52.8 MMBTUH). The design of this facility complies with all applicable requirements of these regulations.

3C. Internal Combustion Engines (40 CFR 60, Subpart IIII & 40 CFR 63, Subpart ZZZZ)

Stationary reciprocating internal combustion engines (RICE) will be used for emergency purposes (exclusively) at the facility (e.g., as emergency generators or to drive fire protection water pumps). Stationary RICE are subject to EPA's New Source Performance Standards for compression-ignition engines (Subpart IIII). Engines may also be subject to requirements under the RICE MACT standard (40 CFR 63, Subpart ZZZZ). The requirements that apply to stationary RICE depend on design, date of manufacture, use, fuel type, size, and whether the engines will be located at a facility that is a major source for HAPs. An estimate of emissions from the planned units is included with the facility emissions. The magnitude of estimated annual emissions from these units qualifies as insignificant activities. Once specified, Riverview Energy intends to purchase engines that comply with the applicable rules and will implement procedures to demonstrate compliance.

4. National Emission Standards for Hazardous Air Pollutants (NESHAPS)

Considerations for granting a permit are based upon the scope of regulatory applicability and upon the technical acceptability of the submissions under New Source Review - Prevention of Significant Deterioration (NSR-PSD) and State Implementation Plan (SIP) regulations at 40 CFR 51 & 52 et. seq. incorporated by reference by IDEM.

The National Emission Standards for Hazardous Air Pollutants (NESHAPs) program developed by USEPA under the federal Clean Air Act Amendments of 1990 are comprised of packages of regulatory requirements that are applicable to operations that satisfy the qualifying criteria specified for each package. The current DCH Project emissions inventory has has a single HAP exceeding the major source threshold of 10 tons per year emissions (methanol). Methanol and other identified HAP emissions are modeled as part of the IDEM Risk Assessment methodology presented in the air dispersion modeling section of this application.

Section 4 addresses the federal NESHAPs at 40 CFR 61 & 63 et. seq., incorporated by reference by IDEM that have been identified for the Applicant's DCH facility.

4A. Industrial, Commercial and Institutional Boilers and Process Heaters (40 CFR 63, Subpart DDDDD)

The following units are subject to Subpart DDDDD: the Package Boiler, the Coal Drying Heater, the Feed Heater, the Treat Gas Heater, the Vacuum Column Feed Heater, and the Fractionator Feed Heater. The applicable requirement of Subpart DDDDD is addressed for these units in this application package. The table below identifies the applicable provisions of Subpart DDDDD for each affected unit:

4B. Organic Liquids Distribution (Non-Gasoline, 40 CFR 63, Subpart EEEE)

None of the Applicant's equipment is subject to control under this NESHAP, based upon the criteria identified in Table 2 of these standards because they have neither the requisite vapor pressure nor specified HAP components in Table 1 of these standards.

<u>Storage Tanks (40 CFR 63.2343(b)(1) through (3))</u>

Tanks impacted by this NESHAP are: the Naphtha Product Tanks, Diesel Product Tanks, Diesel Product Swing Tank, the Slop Tank, and the Diesel Fuel Storage Tank. These storage tanks are subject to the requirements listed in 40 CFR 63.2343(b)(1) through (3).

<u>Transfer Racks (40 CFR 63.2343(c)(1) through (3))</u>

No transfer rack that is subject to Subpart EEEE is subject to control at the facility, based upon the criteria specified in Table 2, items 7 through 10. However, the requirements specified in 40 CFR 63.2343(c)(1) through (3) are applicable to them.

<u>Equipment Leak Components (40 CFR 63.2346(c))</u>

The pumps, valves and sampling connections in organic liquids service at this facility are addressed in 63.2346(c). None of the tanks are subject to Table 2 control requirements.

Transport Vehicles (40 CFR 63.2346(c), Table 2)

None of the racks at the Applicant's facility are subject to control requirements based upon Table 2 criteria, so this subsection is inapplicable.

5. Best Available Control Technology (BACT) Analyses

The PSD permit regulations are designed to ensure that NAAQS and the PSD air quality increments are protected. One of the requirements of the rules designed to meet this objective is the requirement to install the best available control technology (BACT) for certain pollutant emitters. This requirement is included in Federal regulations (40 CFR Part 60 series) and in the Indiana PSD provisions at 326 IAC 2-2-1(i). The key requirement of this rule is that new major stationary sources must apply BACT for pollutants that the source has the potential to emit in significant amounts.

BACT is defined in 326 IAC 2-2-1(i) as follows:

"Best available control technology" or "BACT" means an emissions limitation, including a visible emissions standard, based on the maximum degree of reduction for each regulated NSR pollutant that would be emitted from any proposed major stationary source or major modification, that the commissioner, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for the source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the pollutant. In no event shall application of BACT result in emissions of any pollutant that would exceed the emissions allowed by any applicable standard under 40 CFR Part 60 and 40 CFR Part 61. If the commissioner determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard not feasible, a design, equipment, work practice, operational standard, or combination thereof may be prescribed instead to satisfy the requirements for the application of BACT. The standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of the design, equipment, work practice, or operation and shall provide for compliance by means that achieve equivalent results.

The definition of a significant amount is provided in 326 IAC 2-2-1(ww). For Riverview Energy, these significant pollutants are PM, PM10, PM2.5, CO, VOCs, SO2, and NOx. Control technologies and practices that control PM10 and PM2.5 will also control PM. Therefore, PM, PM10 and PM2.5 are addressed together. The pollutants CO, VOC, SO2, and NOx are addressed separately, noting that CO & NOx control is inter-related, as both are associated only with combustion sources.

Greenhouse Gas (GHG) emissions sources are required to undergo a BACT analysis because the facility exceeds the applicable threshold for this facility. The GHG emissions will also be addressed separately.

5A. Best Available Control Technology Determinations – Top-Down Methodology

The BACT analysis presented in this report is based on a "top-down" approach, consistent with the draft top-down BACT guidance document issued by EPA on March 15, 1990, which is reflected in EPA's Draft New Source Review Workshop Manual (EPA 1990).

In the EPA's top-down methodology, available control technology options are identified based on knowledge of the source and previous regulatory decisions for other identical or similar sources (Step 1). If the top control alternative is technically infeasible or is otherwise rejected as inappropriate after considering site-specific impacts, it is rejected and the next most stringent alternative is then considered (Step 2). The alternatives are then ranked in descending order of control effectiveness (i.e., the "top" option is the most stringent) (Step 3). The feasibility or appropriateness of each alternative as BACT is first based on its technical feasibility. This process continues until a control alternative is determined to be achievable after weighing the economic, energy, and environmental impacts (Step 4). This alternative is then selected as BACT (Step 5).

The BACT analyses for the Applicant's facility consistently adopted the highest performing technically feasible and reasonable approaches that were found in the EPA's RACT/BACT/LAER Clearinghouse. This eliminated the need to perform relative cost analyses.

<u>Identification of Available Control Technologies</u>

To determine which control technologies or techniques were available for consideration for the proposed project, the following resources were consulted:

- EPA's Office of Air Quality Planning and Standards MACT developmental data;
- EPA Air Pollution Control Cost Manual (EPA 2002); EPA Air Pollution Control Cost Manual (EPA 2002);
- EPA's Reasonably Available Control Technology (RACT)/Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC);
- EPA white papers on GHG control measures;
- Permits for similar sources issued in other states; and
- Applicant knowledge.

The RBLC database, made available through EPA's Office of Air Quality Planning and Standards' Technology Transfer Network, lists technologies that have previously been approved as BACT. It was used as a basis for the following determinations.

5B. Fugitive Particulate Matter

Fugitive particulate matter (PM) emissions will be produced from coal unloading, coal storage, coal reclaiming, and coal processing in Process Blocks 1000 and 1500 of the DCH facility. Riverview Energy evaluated measures to control fugitive PM from these emission categories. The control options identified are shown in Table 5-1.

Table 5-1. Fugitive PM BACT Control Options

Emission Unit	Candidate Control Technologies
Coal unloading	Chemical or water dust suppression, enclosure of dump pit with baghouse
Coal piles	Wind fence, dust suppression, pile compaction, reduced drop heights, telescopic chutes
Coal handling	Wind screen, wet suppression, enclosure, fabric filter
Coal crushing	Enclosure, wet suppression, fabric filter
Roadways	Paving, reduce speed limit, sweeping, watering, good housekeeping measures, chemical suppression

<u>Coal Unloading</u>
Enclosure of the bottom dump pit in a shed with a fan exhaust to a baghouse has been selected for control of rail load-in. It is equal to or more effective than other potential BACT selections (e.g., wet suppression, wind screens), since baghouse control exceeds 99% for all particulate size ranges. Although a more conservative capture value has been assumed for emission calculation purposes, a full shed enclosure provides up to 95% capture of fugitive particulates.

<u>Coal Conveying</u>
Total enclosure of coal conveyors in tube-like enclosures eliminates virtually any PM fugitive emissions. The resultant control effectiveness exceeds partial enclosure with exhaust to a fabric filter and provides the maximum control effectiveness observed for this activity. The coal transfer stations will be provided with baghouse filter/induced draft fan systems to control ventilation of the enclosures and fugitive dust from drop chutes at the stations.

Coal Storage & Reclaiming
Coal storage pile emissions are generally controlled by the frequent application of water to the pile, by chemical suppressant application, by covering the pile (tarping), using windbreaks to reduce winds below the entrainment velocity of the material fines, or by enclosing the pile inside a building. Building enclosure is the most effective approach, but the 100 foot high , multi-acre piles planned for this facility to support its operation make building enclosure technically and economically infeasible. The use of chemical suppression is potentially infeasible, since the coal undergoes chemical reactions to form the desired end-product and a chemical suppressant could negatively impact the reaction chemistry. The application of tarps to control emissions has not historically been very effective, requires frequent tarp maintenance and can impact operating efficiency. Windbreaks alone do not assure BACT-level control of coal pile-related PM emissions.

Riverview Energy has chosen an innovative approach to reducing fugitive dust emissions from wind erosion, coal load-in and load-out by selection of BRUKS style Stacker-Reclaimer machinery. The BRUKS style stacker forms two conical, kidney-shaped adjacent piles around each unit. The nearly circular perimeter shaped piles formed around each stacker-reclaimer essentially shields reclaiming load-out activities virtually completely from wind by forming up to a 100 foot high windbreak that surrounds where pile load-out occurs.

Pile stacking load-in emissions will be controlled by low drop height from the automated stacker boom chute and loading to the inside of the pile (as much as feasible) after the initial height of 100 feet is attained. Surface area is minimized by this pile design, reducing the potential fugitive emissions compared to typical pile designs requiring heavy equipment movement and pushing of material over or around the pile. The outer pile surfaces will not be disturbed by fresh coal whenever feasible in order to avoid exposing silt to wind. Water will be applied from the boom chute around the coal flow during load-in activities to further reduce emissions.

The outer surfaces of the piles will be watered to maintain BACT control, i.e., to 10% opacity or less, consistent with Subpart Y requirements). Reclaim load-out emissions to the process equipment will be conducted inside the area enclosed by the piles, where virtually no wind will reach to entrain particulate. This pile design, in conjunction with these work practices and with sufficient water application, provides maximum control of load-in and load-out emissions (the preponderant pollutant emitting activities), as well as wind erosion.

Coal Milling and Drying
After receipt of VCC Unit's coal feedstock in the Block 1000 Coal Milling and Drying area by conveyor, fugitive PM is controlled by the enclosed systems venting to the dirty side of the coal drying loop. The drying process loop, as described in Section 2, has a baghouse for separating the coal fines feedstock from the recirculating drying loop gas. The collected fines are screw conveyed to Block 1500 for slurry feed preparation.

The purge from the clean side of the drying loop baghouse (EU-1008) is used for pressure control and to control moisture content in the loop gas which has not been otherwise condensed and recovered. This purge gas vent may have trace amounts of entrained coal fines and is not further controlled.

Roadway Fugitive Dust

Roadway dust control is most effectively controlled with either a chemical suppressant application program or by paving the roadways and implementing a pavement watering program. Of these two options, the higher average control effectiveness is maintained with a paved roadway that is watered sufficiently often to maintain low surface silt levels. Maintaining BACT-level performance with a paved roadway is dependent upon consistent implementation of the fugitive dust control program that is applied to it. Riverview Energy proposes to pave all roadways and maintain BACT-level control performance by implementing a watering program of sufficient intensity to maintain a minimum control effectiveness of 80%.

The control technologies shown in Table 5-2 were selected as BACT for the fugitive PM sources as described above.

Table 5-2. BACT for Fugitive PM

Emission Unit	Control Technology
Coal unloading	Enclosure for rail bottom dump station, exhausted to baghouse
Coal piles	Radial stacker, reduced drop heights, wet suppression
Coal conveyors	Complete enclosure during conveyance
Coal crushing	Enclosure of process in building, wetting material into slurry
Roadways	Paving, watering as needed

Cooling Tower Point Source PM

There is an additional point source PM emitter that differs from those addressed above. The mechanical draft cooling tower equipment emits particulate matter with the water vapor that escapes during operation. BACT for all ranges of PM emissions due to this phenomenon is the same: mist (drift) eliminators. Virtually every BACT determination found on the RBLC listed drift/mist eliminators as the selection. Riverview Energy proposes to include drift/mist eliminators on its cooling towers. Calculation of cooling tower performance that reflects the use of state-of- the-art drift eliminators is shown in the emission inventory tables of this application.

5C. Nitrogen Oxides

Although the VCC is the predominant nitrogen oxides (NOx) generator for this facility, over 38% of the total NOx emissions are from the hydrogen reformer. Thus, the first BACT discussion will address VCC emissions, while the second portion will address the hydrogen reformer. Due to the wide selection of potential approaches that can be taken to address nitrogen oxide reduction, an overview of potential technologies is being provided to better substantiate that each selected BACT approach is optimal.

DCH Facility Fuel Gas

All of the DCH Facility's process heater and boiler emission units fire the DCH facility fuel gas supplied from Utility Block 6000. This fuel gas is routinely natural gas and may have small amounts of VCC Unit Off-gas or LPG fractions introduced during intermittent periods. These intermittent flows are when the Hydrogen Plants cannot accept them as feedstock. The Hydrogen Plants primarily fire their process tail gas and only secondarily fire DCH fuel gas, other than at startup when only DCH fuel gas is fired.

VCC Process Combustion Sources

The combustion sources being addressed as a group in this section include: the package boiler, the coal drying heater, the feed heater, the treat gas heater, vacuum column feed heater, and the fractionator feed heater

The following subsections discuss combustion controls, post-combustion controls (i.e., add-on controls), and their applicability to one or both of the above processes. Combustion controls discussed are flue gas recirculation (FGR), staged combustion and low/ultra-low NOx burners (LNB/ULNBs). Post-combustion controls discussed are selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR).

Flue Gas Recirculation (FGR)

FGR recirculates a portion of the flue gas from the stack to the burner windbox. In the windbox, recirculated gas is mixed with combustion air prior to being fed to the burner. The recycled flue gas consists of combustion products which are inert during combustion of the fuel/air mixture. The FGR system reduces NOx emissions by two mechanisms. Primarily, the recirculated gas acts as a diluent to reduce combustion temperatures, thus suppressing the thermal NOx mechanism. To a lesser extent, FGR reduces NOx formation by lowering the oxygen concentration in the primary flame zone. The amount of recirculated flue gas is a key operating parameter influencing NOx emission rates for these systems.

An FGR system is normally used in combination with specially designed low NOx burners that are capable of sustaining a stable flame with the increased inert gas flow resulting from the use of FGR. It is noted that the mechanical systems associated with FGR, i.e., blowers ducting and dampers, increases complexity of operations, both mechanically and combustion control-wise which increases capital costs and impact reliability.

When low NOx burners and FGR are used in combination, these techniques are capable of reducing NOx emissions by 60 to 90 percent (AP-42, Section 1.4, Natural Gas Combustion).

Staged Combustion Fuel or Air
Staged combustion controls NOx by limiting the oxygen present at temperatures where NOx formation is likely and/or suppressing peak temperatures that increase NOx formation during gas combustion.

Low and Ultra-low NOx Burners
Low NOx burners (LNBs) limit NOx formation by controlling the stoichiometric and temperature profiles of the combustion process in each burner zone. The burner design of an LNB may create (1) a reduced oxygen level in the combustion zone to limit fuel NOx formation, (2) a reduced flame temperature that limits thermal NOx formation, and/or (3) a reduced residence time at peak temperature, which also limits thermal NOx formation. Typical control efficiencies for boilers employing LNB range from 40% to 85% (AP-42 Section 1.4, Natural Gas Combustion). Based upon the information in Table 1.4-1 of AP-42, LNB provides an emission rate of 0.049/lb/MMBtu. The use of ultra-low NOx burners consistently reduces the emission rate to 0.036 lb NOx /MMBtu, which represents a reduction that is equivalent to the reduction from the FGR and LNB combination (when the combination is operating at its upper level of performance).

Selective Non-Catalytic Reduction
Selective Non-Catalytic Combustion (SNCR) is a post-combustion technique that involves injecting ammonia or urea into specific temperature zone for a proper duration in the upper furnace or connective pass of a boiler or process heater. The ammonia or urea reacts with NOx in the gas to produce nitrogen and water. The chemical reaction for NO and ammonia is as follows:

$$2NO + 2NH_3 + 1/2\ O_2 \rightarrow 2N_2 + 3H_2O$$

Multiple injection locations are required within several different zones of the boiler (or process heater) to respond to variations in the boiler operating conditions. CFD modeling of combustion product flow patterns must be conducted to properly design SNCR injection systems and check that proper time and temperature regimes are present to assure reaction kinetics proceed.

Three difficulties are associated with using SNCR in the heat recovery process involve temperature, initial NOx level, and fouling. The biggest challenge in the implementation of SNCR is the effect of temperature as mentioned, which is a relatively narrow temperature range. In a boiler, there will be adequate residence time at the ideal temperatures if an appropriate steady-state operation is maintained. The required temperature window is 1,600–2,200°F (the most effective range is 1,800–2,100°F). Above these temperatures ammonia begins to react with oxygen rather than NOx (i.e., it is no longer a selective process). At even higher temperatures, more NOx will be formed from nitrogen in the reagent. Below the ideal temperature range, no reaction will occur and ammonia slip will increase, potentially leading to fouling. The Riverview Energy facility will operate at a wide range of load levels, with lower levels potentially unable to provide a furnace temperature profile that maintains the temperature range needed for effective SNCR control for sufficient residence time to achieve proper emissions control.

Even during proper operation, some ammonia will be emitted, since ammonia slip is need to assure maximum reaction occurs. Additionally, SNCR is most effective for an essentially steady operating level, because transitions between operating levels result in non-stoichiometric operation that will adversely impact control performance. USEPA estimated control performance of SNCR is 30-50% reduction without additional controls.

Selective Catalytic Reduction
Selective Catalytic Reduction (SCR) is a post-combustion technique similar to SNCR that involves injecting ammonia into flue gas in the presence of a metal-based catalyst to convert NOx emissions to elemental nitrogen and water. The catalyst allows SCR systems to operate at much lower temperatures than SNCR; typical temperatures for application of medium-temperature SCR are 575–800°F, compared to 1,600–2,200°F for SNCR. The optimum temperature range is 700–750°F (EPA 2002). Low-temperature catalyst systems operating at less than 500°F are commercially available, but tend to be most cost effective for retrofit applications where structural changes to a heater or boiler drive capital cost considerations. obtainable with different catalysts.

SCR reduction efficiencies are substantially better than SNCR, ranging from 70-90+%. Pollutant loading is a key determinant of both economic viability and achievable control efficiency, with high NOx concentrations (100 ppm, for instance) and large unit sizes normally needed to make it economically viable.

Given the low sulfur content fuel gas being fired, concern for ammonium salt formation in the SCR effluent gas path and related fouling and corrosion problems in downstream convection sections or the stack is considered negligible.

<u>Hydrogen Plant Reformers</u>

The twin hydrogen reformers have a different firing configuration and technology concerns than the more standard process heaters and boiler combustion devices utilized in the VCC, but the reformers share some key characteristics with them. Just as in the case of the process heaters, ultra-low NOx burners can be employed to control nitrogen oxide emissions during the combustion process. The high concentration of NOx in hydrogen reformer exhaust gases makes the use of SCR an economically viable proposition. The discussions for all of the control devices that have been presented for the VCC plant combustion equipment are valid for application with the hydrogen plant reformer with the exception of FGR.

FGR is rarely, if ever used for NOx control in pyrolysis furnaces such as the hydrogen plant reformers due to the high radiant flame temperatures required for the process pyrolysis reactions. Additionally, the typical high firing rates and thus large combustion product gas flows present in these large "economy of scale" sized units makes recirculation impractical.

However, catalytic reduction approaches also have potential applicability, since they are either built into the convection sections in design or applied as tail end devices that do not impact the process taking place inside the reformer.

NOx BACT Selections

VCC
The use of ULNB is selected as BACT for the boiler and process heaters because it is technically feasible and provides the highest dependable level of control performance of the available options for these units. Use of ULNB is consistent with RBLC BACT determinations for similar gas-fired boilers and process heating combustion equipment. The low NOx concentrations in these units that result from ULNB is supported as BACT in the RBLC.

Hydrogen Reformers
The design of a hydrogen reformer also allows use of ULNB. ULNB has been selected for the same reasons as above: because it is technically feasible and provides the highest dependable level of control performance of the available options for these units at the burner. However, the high concentration of NOx from this process requires additional control to achieve BACT-level performance.

The process of hydrogen production is a totally separate operation from the VCC process. The hydrogen reformer's pre-control NOx emissions are substantially higher than those from the VCC emitters, which impacts the control economics. In order to control these NOx emissions to a BACT level, the implementation of SCR is proposed. As noted above, SCR is very effective (90% is achievable and proposed here) at controlling NOx emissions. SCR is proposed as the second half of a combined BACT approach for the hydrogen reformer. This approach is further supported by multiple RBLC determinations for hydrogen reformers. It reflects the highest level of BACT control effectiveness.

5D. Greenhouse Gases

New PSD/NSR sources that have a potential to emit 75,000 tons/year or more of CO2 equivalent (CO2e) must address their GHG emissions in the NSR and PSD permitting process. Consequently, the requirement to perform a BACT analysis now applies to GHGs. For PSD purposes, GHGs are classified as a single air pollutant that is defined as the aggregate group of the following six gases: CO2, nitrous oxide (N2O), methane (CH4), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. A small quantity of GHG emissions will be from insignificant activities.

The RBLC database ws supplemented with the following resources to identify CO2 control options:

- EPA white papers on GHG control measures for the iron and steel industry,
- Technical reports from engineering studies associated with the power industry, and
- GHG Mitigation Strategies Database
- KBR In-house BACT Assessments for NSR Permitting

Green House Gas Control Options

In regard to end-of-pipe technologies, amine solvent based CO2 removal systems offer the greatest emissions reduction potential (> 85%) and are considered technically feasible; however, implementation of such technologies and linkage with available sequestration options such as geological containment is shown to be economically infeasible. Additionally, such systems are unproven at world scale facilities such as Riverview's, which have multiple types of emission sources from which to collect and control GHG. Application of other developing end-of-pipe technologies for carbon-capture and sequestration (CCS) are similarly challenged and as a category, end-of-pipe controls cannot be selected as BACT at the Riverview site, leaving smaller-scale mitigation techniques to be chosen by the selection methodology.

Riverview will implement some inherently lower-emitting practices from its proposed burner and convection section designs in in the VCC process heaters and boiler, and in the Hydrogen Plant's pyrolysis furnaces. These base-case or built in conservation approaches represent site-wide source control approach to BACT.

Note: In regard to the use of *"lower GHG emitting fuel"* EPA has recognized that the initial list of control options for a BACT analysis does not need to include *"clean fuel"* options that would fundamentally redefine the source. Such options include those that would require a permit applicant to switch to a primary fuel type (i.e., coal, natural gas, or biomass) other than the type of fuel that an applicant proposes to use for its primary combustion process. Following this issue is the consideration that when a permit applicant has incorporated a particular fuel into one aspect of the project design (such as startup or auxiliary applications), this suggests that a fuel is *"available"* to a permit applicant. In such circumstances, greater utilization of a fuel that the applicant is already proposing to use in some aspect of the project design should be listed as an option in Step 1 unless it can be demonstrated that such an option would disrupt the applicant's basic business purpose for the proposed facility.

For furnaces and boilers, the EPA's RACT/BACT/LAER Clearinghouse (RBLC) database was first investigated to check for any GHG related permit conditions on record. The RBLC only identifies proper combustion operation and maintenance as BACT controls for GHG without much elaboration or definition of net annualized cost effectiveness. Add-on controls and other potential end-of pipe technologies have not yet been adopted, however, as they are considered emerging technologies, identification is made as being "available".

Note: Under EPA's GHG Permitting Guidance, a control technology is "available" if it has a potential for practical application to the emissions unit and the regulated pollutant under evaluation. Thus, even technologies that are in the initial stages of full development and deployment for an industry, such as CCS, can be considered "available" as that term is used for the specific purposes of a BACT analysis under the PSD program

The available GHG control technologies for the Riverview Project are listed in Table 5-1.

Table 5-1: Available GHG BACT

GHG Reduction Opportunities	Practice	Sub-category Practice	Description	Potential GHG Reductions / Energy Savings / Impacts
Source Control	Use of Low-Carbon Content Fuel	Fuel Oils GHG > natural gas GHG .> synthetic natural gas GHG.	Gaseous fuels (natural gas or high-hydrogen plant tail gas) contain less carbon, and thus have lower CO2 potential, than liquid or solid fuels.	Dependent on % reduction of carbon in fuel.
Energy Efficiency	Burner Tune-ups	Flame Pattern Inspection	Peep Windows or infrared camera so done without introducing tramp air.	< percentage point improvement for well operated sources
		CO Monitoring	Done at arch to identify burnout problems	
		O2 Trim Control	Done at arch to control excess air at burners but bias with CO to assure complete combustion	O2 levels are prime indicator of firing efficiency, however site specifics may dictate higher levels for safety or capturing convection section efficiency.
	Instrumen-tation	Fuel Composition Analyses	Continuous GC or GC-MS analyses	Highest accuracy of fuel carbon definition by continuous speciation
		Fuel Temperature	Fuel Flow Compensation	Continuous compensation of metering improves overall metering accuracy
		Fuel Pressure	Fuel Flow Compensation	
		Fuel Density	Fuel Flow Compensation Cross Check	
		Fuel Calorimeter	Heat Release Backup to Composition Analyses	Cross check on heat release and fuel composition analyses
		Fuel Flow	Compensated metering	Accurate fuel firing and GHG accounting and Air to Fuel ratio control
		Heater Arch O_2 & CO Monitoring	Process heater radiant section exit analyses on continuous basis	Process firing control

Table 5-1: Available GHG BACT

GHG Reduction Opportunities	Practice	Sub-category Practice	Description	Potential GHG Reductions / Energy Savings / Impacts
		Stack Temperature Monitoring	Maximum temperature limits indirectly limit GHGs by promoting Heat Recovery	Every 35 °F drop in exhaust gas temp results in ~ 1% increase in thermal efficiency. (w/Temp datum = 77 °F) Most economically attractive when flue gas temps are > 650 °F.
		Stack CO Monitoring	Arch vs Stack analyses show tramp air infiltration	Energy efficiency . CO Trim Control to ensure optimal combustion
		Stack O_2 Monitoring	Arch vs Stack analyses show tramp air infiltration	Energy efficiency
		Stack Flow Monitoring	Direct measurement for CEMS	Crosscheck on fuel flow measurement and Method 19 Flow Determination
		Stack CO_2 CEMS	Direct Measurement of CO_2	Accounting GHG-CO2 Fraction
	Advanced Process Control	Distributed Control System (DCS) Support	The DCS will host and/or forward GHG related data and calculations to other data servers or systems.	The DCS can make flow meter compensation calculations; provide interface for reporting, recordkeeping, and reporting functions.
	Combustion Air / Draft Management	Burner Management System (BMS)	While considered a safety related system, BMS monitoring and control functions can provide indication of combustion status.	Crosscheck for optimizing combustion efficiency.
		Damper Controls	Ganged damper actuators (jack shaft assemblies)	Consistent damper operations and control of excess combustion air
		Mechanical Draft Design	Replace Natural Draft Design with Forced Draft and/or Induced Draft Blowers/Fans	Manage O2 Levels ; Reduce Stack Temperatures otherwise needed in Natural Draft / Tall Stack Sources
		Blower / Fan Driver Variable Speed Drive	Reduce energy demand	Dependent upon service requirements
	Combustion Radiant Zone Management	Burner & Firebox Sealing & Insulation	Assure controlled, even burner firing	Optimize fuel usage and heat transfer
		Refractory Coatings	Increase emissivity of refractory to reduce firing rates, provide consistent energy flux to process tubes	Emerging technology, may not have sustained impact due to severe operating conditions
	Convection Section / Stack / End of Stack Heat Recovery	Add / Revise Process Coils	Verify scope with Process Licensor	Pressure drops and heat integration
		Add / Revise Fuel Preheat	Heat Recovery Dependent upon fuel mass rate	Pressure drops and heat integration
		Add / Revise Air Preheat Coils or External APH	Heat Recovery Dependent upon combustion air mass rate and temperature limits	Pressure drops; Heat integration may cause NOx impacts
		Add / Revise Utility Coils	Heat Recovery Dependent upon water/steam mass rate	Pressure drops and heat integration
		Stack Gas Condensing Heat Exchanger	Condensing heat exchanger tfor recovery of waste heat to preheat boiler makeup water. Higher recovery of sensible heat, more capture of latent heat (from condensation of water vapor in exhaust) than conventional economizer. Added benefit of removal of PM, acid gas, and heavy metals.	Realize approach to HHV versus LHV of fuel: CHX can achieve boiler efficiency >90%, direct savings in fuel cost ~10%, increase proces heater efficiencies; toxic removal capability similar to that of scrubbing. Payback time ~18 mo.
	Steam System Upgrades	Insulation Study	Thermal Infrared Survey to spot inconsistent insulation	Reduce Boiler steam demand
		Steam Trap Program	Provide consistent application of steam trap types across site	Mis-applied / used traps cause excess steam / condensate losses

Table 5-1: Available GHG BACT

GHG Reduction Opportunities	Practice	Sub-category Practice	Description	Potential GHG Reductions / Energy Savings / Impacts
		Condensate Recovery	Increase Condensate Recovery across site; no sewering	Original design may have been under much different economic drivers.
		Boiler Feed Water Pumps Driver Variable Speed Drives	Reduce energy demand	Dependent upon service requirements
		Minimize direct let-down between steam levels	Promote energy recovery between steam levels with back pressure or extraction turbines	Check with calibrated steam meters and balances
		Minimize Venting	All steam energy recovered	Visual indications may be noted.
End of Pipe Control	Green Chemistry	Flue Gas CO_2 Reaction / Chemical Recovery	Flue gas scrubbing with reactive chemicals (example sodium hydroxide used to form sodium carbonate)	Limited by market / uses for product
	Carbon Capture & Storage (CCS)	Solvent Absorption, Recovery, Compression, Transport, & Sequestration	Absorbing solution (nominal amine or other chemical / physical solvent) is contacted with source emission gas, subsequently regenerated to release CO_2, which is compressed for transport and ultimate sequestration.	Very high recovery 85-90+% possible based upon source CO2 concentration. Application at large scale is limited by costs associated with equipment sizing and energy costs for process steps.
Maintenance	Preventive Maintenance	PM and Calibration on Instumentation	Preventative maintenace practices on fuel gas flowmeters, analyzers, etc. to assure good operational monitoring and control	Comparatively minor cost to benefit.
		PM on Burners	Routine burner tip inspections and cleanings	Based upon experience, increased reliability and steady operations
		PM on Mechanical Components	Routine inspections, monitoring, refurbishment, and cleanings	Based upon experience, increased reliability and steady operations

Source Control

Use of lower carbon content fuels is considered technically feasible as the DCH facility is using natural gas as fuel gas. Hydrogen is only produced for process use, though some excess production may be fired on an intermittent basis.

Energy Efficiency

Use of energy efficiency practices and sub-practices identified in Table 5-1 are considered technically feasible but some may be limited in application by site economics, e.g., no home for low grade heat recovered and secondary impacts such as increased NOx emissions for air preheat practices. While many of these practices may be technically feasible, they are best applied in an integrated manner for maximum benefit.

Proposed best practices for the DCH Project include:

- Proper fuel measuring instrumentation
- Burners and draft control, insulation, and heater sealing
- Proper sealing of convection section utility coils

End-of Pipe Control

Use of Green chemistry options are considered technically feasible but are severely limited by available market and scale of applications not matching the Riverview Project's CO2 emissions inventory.

Use of Carbon Capture and Storage (CCS) technologies are considered technically feasible, though application of capture technologies at large industrial scale has yet to be fully demonstrated.

Maintenance
Maintenance of equipment and instrumentation is considered technically feasible in minimizing GHG.

Rank According to Effectiveness

Table 5-2 provides ranking of GHG control options considered in the BACT Analysis.

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
1	End of Pipe Control	Carbon Capture & Storage (CCS)	Solvent Absorption, Recovery, Compression, Transport,	Full industrial scale application of CCS has not been proven; equipment scale	High energy consumption for flue gas collection, cooling and dehydration, raising gas	178 $/ton NACE Value is at multiples of potential cost threshold of reasonableness

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
		80 – 90+ %	& Sequestration	issues impact design margins and thus total costs. Transport pipeline must be routed on public and private right-of ways Sequestration wells must be located in secure locations, and granted Governmental access rights.	pressure to absorber operating pressures, and final compression to supercritical (dense phase) conditions for pipeline transport. Estimated significant MWe demand versus present site expected usage	per US EPA (60-90 $/ton). Capital investment out of proportion to project costs.
2	End of Pipe Control	Green Chemistry 10-100+% (Future)	Flue Gas CO2 Reaction / Chemical Recovery	Emerging technologies may use CO2 at near atmospheric pressure. Market for products not present at sufficient scale	Life cycle considerations wherein CO2 is released from products such as bio-fuels may negate favorability	Assumed >100 $/ton NACE Value. Low cost CO2 supply is not presently sufficient driving force for adoption of applications. No proposed projects within Spencer County region.
3	Source Control	Use of Low-Carbon Content Fuel	Fuel Oils GHG > natural gas GHG .> synthetic	Multi-fuel firing burners must be upgraded for full gas firing operations.	Positive environmental impacts from conversion of liquid (RFO) to	Highly effective << 100 $/ton NACE Value incorporated into Revamp

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
		30-80%	natural gas GHG.	Convection section coils may need revision to address new mass flow rates.	gas fuels, for GHG, SO2, NOx, PM, & trace HAPS (metals)	scope Associated costs of liquid fuels (storage tanks, fuel line recirculation, burner steam atomization) are avoided.
4	Energy Efficiency	Burner Tune-ups < 1%	Flame Pattern Inspection	Open ports affect firing stability, use peep windows. Metal tube temperatures are monitored which may indicate irregular flames or problems	None. May be supplemented by thermography of furnace walls for units that are being taken down for retubing or other maintenance to find repair/sealing opportunities. .	192 $/ton NACE Value for extensive.instrumentation approach. Cost effectiveness improvement by multi-plexing analyzers and revising shelter scope for multiple sources
			CO Monitoring O2 Trim Control	Currently accomplished via non-specific Infrared type Combustibles analyzer arch. Large size of heater radiant zone is problematic. Monitoring at arch or in convection zone most practical.	Calibration of process instrumentation is less rigorous than for CEMS instruments.	Laser based instrumentation capable of scanning across furnace radiant section is being considered but is expensive and has unknown reliability.

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
		Instrume n-tation < 1%	Fuel Composition Analyses	GC currently used for fuel gas composition	BACT Monitoring - Fuel carbon content metric	Correlation with density may be used as backup
			Fuel Temperature	Currently used on fuel gas	GHG Inventory Basis	Data available for meter compensation within DCS. Restriction Orifice's sizing and flow calibration basis must be revisited for post-revamp fuels
			Fuel Pressure	Currently used on fuel gas	GHG Inventory Basis	
			Fuel Density	Currently used on fuel gas	GHG Inventory Basis	
			Fuel Calorimeter	None.	GHG Inventory Basis	Separate calorimeter redundant to GC data used to derive heating values. Unnecessary costs for operation and maintenenance.
			Fuel Flow	Restriction Orifice with differential pressure monitoring currently used. Orifice plate's sizing and flow calibration basis must be appropriate for base case fuel conditions and properly	GHG Inventory Basis Flow bias impacts emission inventory. Note that flow metering is not in heater control loop.	Data available for meter compensation within DCS. Orifice plate sizing and pressure monitoring instruments' calibration being addressed as units are revamped or replaced by new

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
				compensated for other conditions		metering skids
			Heater Arch O2 & CO Monitoring	CO currently indicated via non-specific Infrared type Combustibles analyzer extracting sample at arch location. Single point extractive system problematic if not in representative location.	Indication of fired source performance. Calibration of process instrumentation is less rigorous than for CEMS instruments.	Cost of specific compound analyzers. heater sample point monitoring location may be conducted via field testing and/or by CFD modeling to check gas mixing.
			Stack Temperature Monitoring	None. Currently used	BACT Monitoring Parameter	None
			Stack CO Monitoring	None.	Scope associated with burner performance.	Instrumentation Costs
			Stack O2 Monitoring	None.	Scope associated with burner performance and CO2 CEMS concentration correction.	Instrumentation Costs
			Stack Flow Monitoring	Large stack diameters	In-situ monitoring versus fuel combustion basis Method 19	Minimal Calibration & Maintenance

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
			Stack CO2 CEMS	Direct monitoring versus fuel combustion basis options	BACT Monitoring Parameter	Cost of operation and maintenance
		Advanced Process Control (APC) < 1%	Distributed Control System (DCS) Support	Input/Output data handling for archiving and calculations must be programmed properly.	Automation via DCS promotes consistency of data handling tasks, such as flow meter compensation and associated GHG recordkeeping and reporting	116 $/ton NACE Value for APC and draft management combined approach. Cost of programming and additional signal input and data point storage and upkeep.
		Combustion Air / Draft Management < 2%	Burner Management System (BMS)	Automation via DCS requires full instrumentation	Maintains approach to optimum firing performance	Expense may not be justified for energy conservation alone.
			Damper Controls	Consistent operation – ganged jackshaft design	Tighter control of air to fuel ratio, more stable operations	Cost of mechanical component maintenance
			Air Preheat	Heat Recovery Dependent upon combustion air mass rate and temperature limits	Heat exchanger pressure drops require additional energy input for flows; Higher than ambient combustion air temperatures cause increased NOx emissions.	Energy and maintenance costs locked in for source, i.e., fan power

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
			Mechanical Draft Design	Ambient versus hot operating temperatures for application. Fan/blower bearings and lube system require upgrading for higher temperature applications Natural draft design requires high stack.	Natural draft provides low operating cost. Mechanical draft may enable more stable burner operations and flame shape.	Energy, operation and maintenance costs.
			Blower / Fan Driver Variable Speed Drive	Reliability for large voltage and power applications	Lower driver operating costs if variable loads must be followed	Energy savings minimized by steady state operations may not cover capital costs
		Combustion Radiant Zone Management < 1%	Burner & Firebox Sealing & Insulation	Best corrected during pre-planned furnace outage.	Impacts dependent on burner location	Limited opportunity for application while operating
			Refractory Coatings	Short term gains only, ~ 3 months sustained performance	Emissivity improvement had minor effect on attaining target tube temperatures, small firing difference	Limited success. Judged to be of limited economic value
		Convection Section / Stack / End of	Add / Revise Process Coils	Gas side pressure drops 0.2- 0.5 inches H2O. Licensor warranty issues.	Pressure drop energy costs tradeoff with heat savings	80 $/ton NACE Value. Energy costs tradeoff are

Table 5-2: Ranking of GHG Control Options Effectiveness						
Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
		Stack Heat Recovery < 2%				minimal if low pressure drop changes made.
			Add / Revise Fuel Preheat	Gas side pressure drops 0.2- 0.5 inches H2O.. Fuel mass may not be large enough to carry significant heat load	Pressure drop energy costs tradeoff with heat savings	Energy costs tradeoff are minimal if low pressure drop changes made.
			Add / Revise Air Preheat Coils or External APH	Gas side pressure drops 0.2- 0.5 inches H2O.. Combustion air side mechanical design for high pressure drops and temperatures. Equipment occupies more space.	Pressure drop energy costs tradeoff with heat savings	Energy costs tradeoff are minimal if low pressure drop changes made.
			Add / Revise Utility Coils	Gas side pressure drops. Steam / BFW mass	Pressure drop energy costs tradeoff with heat savings Stack gas exhaust at less than 300 °F Application considered least intrusive to original heater design purpose as economizers are at end of	116 $/ton NACE Value for Energy costs tradeoff are minimal if low pressure drop changes made.

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
					convection section	
			Stack Gas Condensing Heat Exchanger	Gas side pressure drops. Home for heat recovered.	Pressure drop energy costs tradeoff with heat savings Stack gas exhaust at less than 150 °F Energy costs tradeoff	Capital and operating costs
		Steam System Upgrades ~ 2% attainable without significant secondary impacts	Insulation Study	None. Currently implemented, though seasonal interests per steam balance	None	182 $/ton NACE Value for Economizers to raise BFW temperature 30-35 °F to claim 2% Fuel efficiency improvement
			Steam Trap Program	None. Recovery currently implemented across site.	Steam traps are properly sized and condensate substantially recovered	None
			Condensate Recovery	None. Currently Implemented > 90% recovery.	None	Some flows are too small for economic recovery such as DPG
			Boiler Feed Water Pumps Driver Variable	Reliability for large voltage and power applications	Less impact expected with consistent near design operations such as ethylene plant	Energy, operation and maintenance costs not significantly reduced

Table 5-2: Ranking of GHG Control Options Effectiveness

Rank	GHG Reduction Opportunities	Practice & % Control Effectiveness	Sub-category Practice	Technical Considerations	Energy or Environmental Considerations	Economic Considerations
			Speed Drives			
			Minimize direct let-down between steam levels	None. Currently implemented via DCS Advanced Proces Control Application to maximize steam turbine flows and minimize electric demands.	None	None
			Minimize Venting	May be no home for LP steam	Cost of lost LP steam minimal	Cost of lost LP steam recovery uneconomic.
5	Maintenance	Preventive Maintenance <1%	PM and Calibration on Instrumentation	Technical support labor Instruments not part of control loops may get lower priority	None	36 $/ton NACE Value for site-wide PM approach of monitoring for problems and instrument calibration Labor cost
			PM on Burners	Leave equipment alone if no apparent issues	None	Labor cost
			PM on Mechanical Components	Technical support labor	None	Labor / vendor supplier costs

Evaluate the Most Effective Controls

CCS is the top ranked means of GHG control on the basis of percent pollutant removed, however its technical considerations, energy usage, and economic impacts are significant obstacles to its application. Assuring the reliability of the VCC process heaters and boiler and the Hydrogen plant Pyrolysis furnaces, which operate at small differences from atmospheric pressure (inches of water gauge) is essential and they must be protected from being tripped by pressure surges for safety and overall plant production assurance.

It is noted that the energy-intensive Carbon Removal System (CRS) process of flue gas treatment requires significant new utilities to be constructed to sustain its operation. A new large cooling tower much larger than the DCH Facility's presently scoped tower would require additional makeup water supply and would be a contributing source of particulate matter and other regulated pollutants to the site emissions inventory. Additionally in an "all electric" driver case, high continuous electrical load would be created, estimated at multiples of the present electrical load expected at the Riverview site.

While there are potential areas of cost reduction or energy efficiency for the Base Case CRS, these are not seen as driving cost effectiveness to approach the EPA's 60-90 $/ton threshold range of acceptable cost.

CCS cannot currently be justified as present day BACT and should be eliminated from further consideration.

The second ranked control option, Green Chemistry, is seen to have significant future control potential, especially if flue gas may be handled and CO2 recovered from it or utilized at near atmospheric pressures, eliminating the most costly and energy intensive unit operations from CCS systems. Emerging technologies such as algae based bio-fuels, direct catalytic synthesis of acetic acid from CH4 and CO2 at low temperatures, and membrane bioreactor production of acetic acid from CO2 and H2, e.g., using BR-446 (genus Acetobacterium) will be of continuing interest in developing relevant CO2 sinks. It is noted that CO2 use in "green chemistry" applications such as producing bio-fuels may be considered temporary sequestration as the carbon content will be released upon fuel usage. As with all emerging technology, these options are severely constrained in moving from research to pilot, to demonstration, and to full scale application due to a combination of current day technical and economic factors. Green Chemistry cannot be justified as present day BACT and should be eliminated from further consideration.

The third ranked option, use of low carbon content fuel is currently used at the site given use of utility natural gas supply.

The remaining control measures identified generically as energy efficiency, and maintenance, yield much lower GHG reductions than end-of-pipe or source controls. Though these options are far less energy-intensive and a very small fraction of the cost of CCS, they must be addressed in a coordinated manner so as not to create internal conflicts. To the degree that they can be integrated, they would be considered practical BACT which could be adopted or incorporated in any new fired eqiupment designs. As such, an evaluation of their energy, environmental, and economic impacts of the proposed measures is not deemed necessary for an application. These options will approach if not come in under the EPA's 60-90 $/ton threshold of acceptable cost for GHG control, and are considered best applied on a site-wide basis.

The use of low carbon content natural gas fuel and the adoption of integrated control measures identified generically as energy efficiency, and maintenance would be considered practical BACT for the Riverview DCH Project.

General Measures
Systems to monitor and track the performance of critical equipment and processes in the plant can help optimize plant operation. Using process information management systems, scientific research on the behavior of any type of machinery and equipment can be efficiently conducted, as could energy efficiency studies and other critical industrial cost saving measures such as predictive maintenance.

Scheduled preventive maintenance and rotation of redundant equipment helps minimize equipment downtime and optimize process operation. Training programs and good housekeeping programs help decrease energy consumption throughout the plant.

General measures for energy efficiency optimization, like using a process information management system, scheduled preventive maintenance, and training programs are all feasible options for the proposed Riverview Energy facility.

Summary of Energy Efficiency Measures
The energy efficiency measures that were identified to be technically feasible include energy efficient equipment design, coal moisture control, and other general measures discussed above. Additionally, a process information management system will be integrated into plant operations to monitor and track equipment performance, production, and power consumption, as well as to predict and schedule preventive maintenance on critical equipment. A process information system tracks the

performance of critical equipment and processes in the plant to help optimize plant operation.

CO2 Transportation and Sequestration

No matter which CO2 capture technology is used, to take credit for the reduced CO2 emissions, the captured CO2 must either be reused (onsite or sold) or liquefied, transported, and "permanently" stored. Pipelines are the most common method of transporting large amounts of CO2 over long distances. The CO2 must be compressed to very high pressures for pipeline transportation, which requires considerable energy consumption. Water must also be eliminated from CO2 pipeline systems to avoid the formation of carbonic acid, which is extremely corrosive to carbon steel pipe. In addition to compressors at the source, booster compressors may be needed along the length of the pipeline. The pipelines must also be monitored for leaks and overpressure to avoid release of the captured CO2.

The oldest long-distance CO2 pipeline in the United States is the 225 km Canyon Reef Carriers Pipeline (in Texas), which began service in 1972 for enhanced oil recovery in regional oil fields (Parfomak and Folger 2007). Thirteen other large CO2 pipelines constructed since then, mostly in the Western United States, have expanded the CO2 pipeline network for enhanced oil recovery. Many smaller CO2 pipelines connect sources with specific customers. However, there are no existing CO2 pipelines within 500 miles of the planned Riverview Energy facility.

DOE is currently exploring several CO2 storage options in the United States. These include storage in geological formations like exhausted oil and gas fields and saline formations, liquid storage under the ocean, solid storage in the form of solid carbonates, and terrestrial sequestration. Of these options, geologic storage, particularly saline formations, offers the most potential for CO2 storage. Globally, only four commercial CCS facilities are sequestering captured CO2 into deep geologic formations and applying a suite of technologies to monitor and verify that the CO2 remains sequestered (DOE 2010b).

While projects to transport and store CO2 are starting to be funded and developed, transportation and storage of CO2 from the Riverview Energy plant is not feasible in the near future due to the lack of adequate CO2 pipeline and storage infrastructure.

Summary of Carbon Capture and Sequestration Options

Pre-combustion capture and oxy-combustion are not technically feasible for this application. Of the available technologies presented above for the post-combustion capture of CO2, only solvent-based capture processes have been used commercially.

All the other technologies require either high CO2 concentration or high partial pressures. Currently, several solvent-based capture processes are available for lower capacity industrial level applications, but they have not yet been demonstrated at the scale required for the purposes of GHG emissions mitigation at a typical power plant or commercial facility. Consequently, there is considerable uncertainty associated with capacities at volumes necessary for commercial deployment. Many projects are in the planning stages for demonstration scale-up, including the Alstom chilled ammonia process and several amine-based processes [e.g., Fluor (Econamine), ABB/Lummus, Mitsubishi Heavy Industries, HTC Purenergy, Aker Clean Carbon, Cansolv et al.] (Simmonds et al. 2002). In addition, a variety of processes employing solvents, sorbents, and membranes are at varying stages of development.

The key technical challenges for CCS are summarized below:

- Energy Impact: A significant amount of auxiliary power is required to operate currently available CO2 capture technologies. A large quantity of energy is required to regenerate the solvent in commercially available CO2 capture technologies (approximately 1,550–3,000 Btu/lb of CO2 removed). To enable storage, significant power is required to compress the captured CO2 to typical pipeline levels (1,500– 2,200 psia depending on storage scheme and location).
- Environmental Impact: Although CCS offers environmental benefits by reducing GHG emissions, it does not minimize emissions without other impacts to the environment.
- For an absorption-based CO2 capture process, which is the prevalent commercially available CO2 capture technology, the solvent can enter the environment through four pathways, which include entrainment in the treated gas, reclaimer waste, fugitive emissions, and accidental release.
- Flue Gas Contaminants: Constituents in the flue gas, particularly sulfur, can contaminate CO2 capture technologies, leading to increased operational expenses.
- Water Use: A significant amount of water use is required for CO2 capture and compression cooling.
- Transportation and Storage: Transporting captured CO2 in relatively limited quantities is possible by truck, rail, and ship, but moving large quantities of CO2 requires a dedicated pipeline network. There are very few existing CO2 pipelines in the United States and none within 500 miles of the proposed facility. Large-scale CO2 storage projects associated with enhanced oil recovery are currently in operation in the United States, but CO2 storage in geologic formations has not been demonstrated on a commercial scale.

- Cost Effectiveness: Recent studies conducted by the National Energy Technology Laboratory (NETL) show that current technologies are expensive and energy intensive. DOE-funded studies conducted by NETL estimate the typical cost of CCS in coal-fired power plants to range from $50 to $75/ton of CO2 avoided depending on technology. Cost estimates for Integrated Gasification Combined Cycle plants ranged from $35 to $46/ton of CO2 avoided (DOE 2008). The Interagency Task Force on CCS, established in 2010, reports CO2 capture costs of $55–$104/ton of CO2 avoided (Simmonds et al. 2002) for power plants. A more recent analysis of the techno-economic data for CO2 capture from power generation by the IEA, based on estimates published over the last 5 years in major engineering studies for about 50 CO2 capture installations at power plants, found that CO2 capture costs ranged from $36 to $116/ton of CO2 avoided (IEA 2011). However, these costs cover only capture and compression but not transportation and storage. While the transportation and storage cost is often cited at the flat figure of $4–$9/ton CO2 removed, studies conducted by the NETL on estimating CO2 transport, storage, and monitoring costs indicated that this is only true for pipeline lengths of less than 100 miles (DOE 2010a). Their studies showed that T&S avoided costs increase almost linearly with pipeline length and can range from $10 to $65/ton of CO2 avoided (in 2007$) for pipeline lengths of 100–500 miles.

For these reasons, existing CO2 capture technologies and CO2 pipeline and storage infrastructure in the United States will need be improved before CCS becomes a viable option. In addition, the substantial energy required to pump CO2 for a long distance will result in substantial criteria pollutant emissions, which have a much more substantial and direct effect upon health and welfare than the CO2.

5E. Sulfur Dioxide

Sulfur dioxide (SO2) emissions from the VCC are predominantly from the Sulfur Recovery Plant Tail Gas Treatment Unit (TGTU) and the Sulfur Block Flare. The emissions from the TGTU are for a generic Claus unit with 95% SO2 reduction, which is consistent with the NSPS emission limit for sulfur oxides enumerated for oil refineries at 40 CFR 60.104(2)(i) of 250ppm @ 0% excess air for an SO2 emissions concentration leaving a refinery sulfur recovery unit. However, it appears that a sulfur recovery level of 99.8% for the Riverview fuel conversion plant is achievable and would reflect BACT per TCEQ reference. This has been calculated as equivalent to ~150 ppm SO2 emission concentration and has been used as the BACT-level performance benchmark to inventory the TGTU emissions for this permit application.

As with all of the other flares at this facility (except as noted above) the Sulfur Block Flare is in place as a safety device that operates during process upset conditions (except for the pilot, which is continuously operating). There is no SO2 control equipment that can be used to achieve the dual goals of safety and emissions reduction that is more effective. Flaring is BACT for SO2 emission control in this application.

5F. Volatile Organic Compounds

There are three primary sources of volatile organic compound (VOC) emissions at the Applicant's facility: fugitive emissions leaks, the hydrogen reformers, and the hydrogen deaerators. The hydrogen reformers and deaerators are both part of the hydrogen plant, which consists of twin process trains that are identically equipped. These three primary VOC sources are addressed below.

<u>Fugitive Emission Leaks</u>
The overwhelmingly predominant source of volatile organic compound emissions at this facility will be fugitive emission leaks from pumps, valves, flanges, seals and the other equipment. Both federal and state guidance establish that control of these leaks is best attained with a Leak Detection and Repair (LDAR) program. However, LDAR programs differ greatly in their depth and scope, since they are frequently used either to control HAP emissions to a MACT level or VOC emissions to a BACT (or LAER) level. In addition, different industrial categories have their own unique requirements (i.e., 40 CFR Subpart VVa, etc.) for LDAR. Since this facility is not in any of the industrial categories addressed by these standards, a general approach has been employed using TCEQ references.

The generation of a BACT-level program to address leaks has been simplified by a guidance document that was generated by the Texas Council Environmental Conservation (TCEQ) entitled, "Air Permit Guidance for Chemical Sources: Equipment Leak Fugitives". This guidance, expands upon the information provided in USEPA's "Protocol for Equipment Leak Emissions Estimates" (EPA 453/R-95-017, November 1995) and "Preferred and Alternate Methods for Estimating Fugitive Emissions from Equipment Leaks" (STAPPA/ALAPCO/EPA, November 1996) have been used to define and quantify the emissions reductions from a BACT-level LDAR program. None of the streams associated with the operations of this facility are known to qualify for any NESHAP-related LDAR program, so only NSPS criteria must be addressed. Further, this location is in NAAQS attainment status for ozone, so LAER is not required. Thus, a 10,000 ppm VOC threshold is the BACT criterion that is the basis of the LDAR program.

KBR has estimated the total number of fittings, valves and other items that will be present at the facility utilizing factored counts from representative process flow diagrams for the VCC configuration. These estimates are provided on attachments. Emission reductions for the proposed level of LDAR program are based upon these component estimates. The emission reductions that result from this approach have been identified for each equipment category and are accounted in the facility emission summaries in this permit application. These reductions are consistent with the aforementioned guidance document information.

Hydrogen Plant Sources

This hydrogen plant is similar in all respects to the hydrogen plants used at refineries to produce ultra-low sulfur diesel (ULSD) fuel. Both the hydrogen reformers and the hydrogen deaerators emit VOC. A comprehensive review of the USEPA's RACT/BACT/LAER Clearinghouse (RBLC) for both hydrogen reformers and deaerators produced very limited results. These results indicate that the current BACT level of control for VOC emissions from these sources is as follows:

Hydrogen Reformer Furnace Vent Stacks: Proper design, operation and good engineering practices

Deaerators: None

Riverview Energy proposes proper design, operation and good engineering practices for the hydrogen reformer and for the deaerator as BACT for these sources. Proper operation will be defined as adherence to manufacturer's published operating and maintenance requirements.

5G. Carbon Monoxide

CO primarily results from incomplete combustion, except in cases where a non-combustion chemical reaction occurs. All of the CO emissions from the flare pilots and VCC plant equipment are due to combustion. The hydrogen reformers generate approximately two-thirds of the total CO emission footprint for this facility because CO is a byproduct of the reformer process chemistry and of combustion. The VCC plant CO emissions all result from combustion.

There is no control equipment to address CO from combustion. The accepted BACT-level approach is to optimize combustion efficiency, since combustion-generated CO is the result of incomplete combustion. Combustion efficiency will be optimized by utilizing state-of-the-art automated combustion systems in conjunction with the ULNBs that have previously been described, good engineering practice and manufacturer-specified maintenance. This approach is consistent with the most stringent RBLC determinations that were identified for similar equipment.

5H. Summary of BACT Determination

A summary table compilation of the BACT determinations that have been described in this section has been included as Table 5-3, below. It addresses all of the determination categories, with the exception of particulate matter (PM), since PM was tabulated individually due to its complexity.

Table 5-3 : Summary of BACT Determinations

Pollutant	Emission Unit	Control Options	BACT Selection
NOx	All VCC units in Note 1	Flue gas recirculation Staged combustion Low-NOx burners (LNB) Ultra-low NOx burners (ULNB) Selective non-catalytic combustion Hot-side SCR Tail-end SCR	ULNB
	Hydrogen reformer	As above for VCC units	ULNB, See Note 2
Greenhouse Gases	Plantwide	Energy efficiency Carbon sequestration	Energy efficiency
SO2	Tail gas treatment unit	flaring (Note 3)	Flare
VOC	Fugitive Emission Leaks Hydrogen reformer	leak detection and repair (LDAR) SCR (described previously) good operating practice good engineering practice proper design	LDAR (Note 4) All listed
CO	All VCC units in Note 1	automated combustion systems ULNB Good engineering practice Manufacturer-specified maintenance	All listed (optimze comb. eff.)
	All flare pilots	As above for VCC units	All listed for VCC
	Hydrogen reformer	As above for VCC units	All listed for VCC
PM	All PM emissions are separately tabulated		

NOTES:
1) Package boiler, coal drying heater, feed heater, treat gas heater, fractionator feed heater, vacuum column heater
2) The hydrogen reformer will have SCR that controls other criteria pollutants and SCR will also reduce NOx.
3) Flare control was selected because it is the most effective control approach
4) Various LDAR program levels are in the regulations. The one chosen was for BACT from NSPS.

6. Modeling Results Summary

An air dispersion modeling analysis was conducted as part of this air permit application to predict ambient concentrations of criteria pollutants and hazardous air pollutants, as well as address potential visibility impacts resulting from the proposed DCH facility. Details of the modeling are presented in the attached modeling report and protocol. and the quantitative modeling results for criteria pollutants is provided in the report's Table 2-1, presented below as Table 6-1.

In regard to de-minimus or significant impact level (SIL) screening values, the following results are noted:

- All modeled annual impacts are below the applicable SIL values, i.e., those forNO2, SO2, and PM2.5
- The modeled 24-hr impacts for SO2 and PM10 are below their applicable SIL values, while only PM2.5 exceeded its 24-hr SIL value.
- The modeled 8-hr impacts for CO are below its applicable SIL value.
- The modeled 3-hr impacts for SO2 are below its applicable SIL value.
- The modeled 1-hr impacts for CO is below its applicable SIL value, while those for NO2 and SO2 exceeded their applicable SIL values.

Given that impacts below SIL values are the basis for no further analysis or assessment, only short term impacts from 24-hr PM2.5 and 1-hour impacts from NO2 and SO2 emissions are required by IDEM guidance to be further addressed. First, the significant impact area (SIA) was determined for each pollutant. The SIA was then used to determine the necessity of acquiring and modeling regional non-project, off-site emission sources not represented by the background air quality data.

As modeling results show, the distances and directions to significant impacts are very proximate to the Riverview property fence line, especially for the impacts associated with PM2.5. Given these very short distances to the SIA's and the isolation of the proposed DCH project sources relative to other regional emission sources, the likelihood of overlapping and cumulative impacts from any regional sources is highly unlikely. Therefore, no additional modeling of off-site source inventory Is considered necessary.

In regard to modeled project impacts versus National Ambient Air Quality Standards (NAAQS) plus background concentrations, all results were well within the NAAQS. Additionally, consumption of PSD Class II Increments ranged from only 2-15%.

In regard to screening for potential toxicological impacts, see the modeling report's Attachment O, presented below as Table 6-2 following IDEM guidance which shows no expected impacts.

In regard to screening for visibility impacts, emissions were modeled following EPA guidance with their VISCREEN software and showed no expected impacts.

The modeling analyses for criteria pollutants, hazardous air pollutants, and visibility impacts are found to support a finding of minimal impact from the proposed DCH facility emissions on local air quality.

Table 6-1
(Modeling Report Table 2-1: Summary of Modeling Results

Pollutant	Averaging Period	Rank	Modeled Ground-level Conc. (µg/m3)	Significant Impact Level (SIL) (µg/m3)	Modeled vs SIL	Background Conc. (µg/m3)	Modeled + Background Impact (µg/m3)	NAAQS (µg/m3)	Estimated Impact vs NAAQS	PSD Class II Increment (µg/m3)	Modeled vs PSD Increment
NO_2	Annual	H1H	0.6990	1	69.9%	16.9	17.60	100	17.6%	25	3%
	1-hr	H1H	19.3073	7.5	257.4%	-	-	-	-	-	-
		H8H	11.2806	-	-	73.95	85.23	188.6	45.2%	-	-
SO_2	Annual	H1H	0.5107	1	51.1%	4.2	4.71	80	5.9%	20	3%
	1-hr	H1H	14.8503	7.8	190.4%	-	-	-	-	-	-
		H4H	10.5071	-	-	53.7	64.21	196.2	32.7%	91	12%
	3-hr	H1H	9.8166	25	39.3%	-	-	-	-	-	-
		H2H	9.1701	-	-	37.7	46.87	1300	3.6%	512	2%
	24-hr	H1H	3.8977	5	78.0%	-	-	-	-	-	-
		H2H	3.4629	-	-	16.3	19.76	362	5.4%	-	-
$PM_{2.5}$	Annual	H1H	0.2562	0.3	85.4%	9.5	9.76	12	81.3%	4	6%
	24-hr	H1H	1.4252	1.2	118.8%	-	-	-	-	-	-
		H2H	1.3683	-	-	-	-	-	-	9	15%
		H8H	1.1252	-	-	22	23.13	35	66.1%	-	-
PM_{10}	24-hr	H1H	1.7812	5	35.6%	-	-	-	-	-	-
		H6H	1.4234	-	-	33.7	35.12	150	23.4%	30	5%
CO	1-hr	H1H	20.9654	2000	1.0%	-	-	-	-	-	-
		H2H	19.2304	-	-	3396.8	3416.03	40000	8.5%	-	-
	8-hr	H1H	13.4179	500	2.7%	-	-	-	-	-	-
		H2H	12.3979	-	-	2022.8	2035.20	10000	20.4%	-	-

Table 6-2

(Modeling Report Attachment O - Toxicological Screening Analysis for HAPs, Hydrogen Sulfide and Ammonia)

		Acute		Chronic							
Pollutant	**CAS Number**	**Modeled 24-Hour Conc (µg/m3)**	**24-hour MRL (ug/m3)**	**Modeled Annual Conc (ug/m3)**	**Cancer URF, $(ug/m3)^{-1}$**	**Source**	**Cancer Risk**	**Non-Cancer Chronic RfC, ug/m3**	**Source of IDEM RfC**	**Hazard Quotient (HQ)**	**Target Organs / Inhalation Critical Effects**
Methanol	67561	8.2957		1.31				**20000.00**	IRIS	6.57E-05	
Hexane	110543	1.2214	**2100**	0.15				**700.00**	IRIS	2.15E-04	Neurological (PNS)
Formaldehyde	50000	0.0055	**49**	0.0008	1.3E-05	IRIS	1.06E-08	**9.80**	ATSDR	8.34E-05	Respiratory system
Toluene	108883	1.2379	**3700**	0.15				**5000.00**	IRIS	3.05E-05	Neurological (CNS)
Benzene	71432	0.4621	**160**	0.06	7.8E-06	IRIS	4.44E-07	**30.00**	IRIS	1.90E-03	*Inhalation Carcinogen*
Nickel	7440020	0.0002	**---**	2.29E-05	2.4E-04	IRIS	5.49E-09	**0.20**	ATSDR	1.14E-04	*Inhalation Carcinogen*
Ammonia	7664417	11.7695	**1200**	1.86				**100.00**	IRIS	1.86E-02	*Pulmonary, Respiratory system*
H2S	7783064	0.2594	**280**	0.03				**2.00**	IRIS	1.69E-02	*Nasal passages*
Xylenes	1330207	1.5515	**4300**	0.19				**100.00**	IRIS	1.91E-03	*Neurological (CNS)*
Phenol	108952	0.0165		0.002				**200.00**	CAL	1.02E-05	*Respiratory system, Liver, Kidneys*
o-Cresol (2-Methylphenol)	95487	0.0330		0.004				**175.00**	Region 9	2.32E-05	
m-, p-Cresols	1319773	0.0165		0.002				**600.00**	CAL	3.39E-06	
				Cumulative Cancer Risk =			**4.60E-07**	**Total Hazard Index (HI) =**		**0.0399**	
				IDEM compliance metric =			< 1E-06			< 1	

RESERVED PAGE

Attachment A. IDEM Air Permit Application Forms

AIR PERMIT APPLICATION COVER SHEET

State Form 50639 (R4 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this cover sheet is to obtain the core information needed to process the air permit application. This cover sheet is required for all air permit applications submitted to IDEM, OAQ. Place this cover sheet on top of all subsequent forms and attachments that encompass your air permit application packet.
- Submit the completed air permit application packet, including all forms and attachments, to **IDEM Air Permits Administration** using the address in the upper right hand corner of this page.
- IDEM will send a bill to collect the filing fee and any other applicable fees.
- Detailed instructions for this form are available on the Air Permit Application Forms website.

FOR OFFICE USE ONLY

PERMIT NUMBER: ___ – ___ – ___

DATE APPLICATION WAS RECEIVED:

Received
State of Indiana SN-1

JAN 25 2018 JB

Dept of Environmental Management
Office of Air Quality

1. Tax ID Number:

PART A: Purpose of Application

Part A identifies the purpose of this air permit application. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.

2. Source / Company Name: Riverview Energy Corporation

3. Plant ID: –

4. Billing Address: 15 E Putnam Ave, Suite# 210

City: Greenwich **State:** CT **ZIP Code:** 06830 –

5. Permit Level: ☐ Exemption ☐ Registration ☐ SSOA ☐ MSOP ☐ FESOP ☒ TVOP ☐ PBR

6. Application Summary: *Check all that apply. Multiple permit numbers may be assigned as needed based on the choices selected below.*

☒ Initial Permit ☐ Renewal of Operating Permit ☐ Asphalt General Permit
☐ Review Request ☐ Revocation of Operating Permit ☐ Alternate Emission Factor Request
☐ Interim Approval ☐ Relocation of Portable Source ☐ Acid Deposition (Phase II)
☐ Site Closure ☐ Emission Reduction Credit Registry

☐ Transition (between permit levels) *From:* *To:*

☐ Administrative Amendment: ☐ *Company Name Change* ☐ *Change of Responsible Official*
☐ *Correction to Non-Technical Information* ☐ *Notice Only Change*
☐ *Other (specify):*

☐ Modification: ☐ *New Emission Unit or Control Device* ☐ *Modified Emission Unit or Control Device*
☐ *New Applicable Permit Requirement* ☐ *Change to Applicability of a Permit Requirement*
☐ *Prevention of Significant Deterioration* ☐ *Emission Offset* ☐ *MACT Preconstruction Review*
☐ *Minor Source Modification* ☐ *Significant Source Modification*
☐ *Minor Permit Modification* ☐ *Significant Permit Modification*
☐ *Other (specify):*

7. Is this an application for an initial construction and/or operating permit for a **"Greenfield" Source**? ☒ Yes ☐ No

8. Is this an application for construction of a new emissions unit at an **Existing Source**? ☐ Yes ☒ No

Continued on Next Page

PART B: Pre-Application Meeting

Part B specifies whether a meeting was held or is being requested to discuss the permit application.

9. Was a meeting held between the company and IDEM prior to submitting this application to discuss the details of the project?

☐ No ☒ Yes: *Date:* 10/25/2017

10. Would you like to schedule a meeting with IDEM management and your permit writer to discuss the details of this project?

☒ No ☐ Yes: *Proposed Date for Meeting:*

PART C: Confidential Business Information

Part C identifies permit applications that require special care to ensure that confidential business information is kept separate from the public file.

Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in the Indiana Administrative Code (IAC). To ensure that your information remains confidential, refer to the IDEM, OAQ information regarding submittal of confidential business information. For more information on confidentiality for certain types of business information, please review IDEM's Nonrule Policy Document Air-031-NPD regarding Emission Data.

11. Is any of the information contained within this application being claimed as **Confidential Business Information**?

☒ No ☐ Yes

PART D: Certification Of Truth, Accuracy, and Completeness

Part D is the official certification that the information contained within the air permit application packet is truthful, accurate, and complete. Any air permit application packet that we receive without a signed certification will be deemed incomplete and may result in denial of the permit.

For a Part 70 Operating Permit (TVOP) or a Source Specific Operating Agreement (SSOA), a "responsible official" as defined in 326 IAC 2-7-1(34) must certify the air permit application. For all other applicants, this person is an "authorized Individual" as defined in 326 IAC 2-1.1-1(1).

☒ *I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.*

Gregory Merle
Name *(typed)*

President
Title

Signature

1-25-18
Date

OAQ AIR PERMIT APPLICATION – FORMS CHECKLIST

State Form 51607 (R5 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Pe s Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this checklist is to help the applicant and IDEM, OAQ ensure that the air permit application packet is administratively complete. This checklist is a required form.
- Check the appropriate box indicating whether each application form is applicable for the current permit application. The source must submit only those forms pertinent to the current permit application.
- Place this checklist between the cover sheet and all subsequent forms and attachments that encompass your air permit application packet.

Part A: General Source Data

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☒ Y ☐ N	COVER	Application Cover Sheet	50639	Include for every application, modification, and renewal, including source specific operating agreements (SSOA).
☒ Y ☐ N	CHECKLIST	Forms Checklist	51607	Include for every application, modification, and renewal, including SSOA.
☒ Y ☐ N	GSD-01	Basic Source Level Information	50640	Include for every application, modification, and renewal, including SSOA.
☒ Y ☐ N	GSD-02	Plant Layout Diagram	51605	Include for every new source application, and modification.
☒ Y ☐ N	GSD-03	Process Flow Diagram	51599	Include one for every process covered by the application.
☒ Y ☐ N	GSD-04	Stack / Vent Information	51606	Include for every new source application, and modification.
☒ Y ☐ N	GSD-05	Emissions Unit Information	51610	Include for every process covered by the application.
☒ Y ☐ N	GSD-06	Particulate Emissions Summary	51612	Include if the process has particulate emissions (PM).
☒ Y ☐ N	GSD-07	Criteria Pollutant Emissions Summary	51602	Include if the process has criteria pollutant emissions.
☒ Y ☐ N	GSD-08	HAP Emissions Summary	51604	Include if the process has hazardous air pollutant emissions (HAP).
☐ Y ☒ N	GSD-09	Summary of Additional Information	51611	Include if the additional information is included.
☒ Y ☐ N	GSD-10	Insignificant Activities	51596	Include if there are unpermitted insignificant activities.
☐ Y ☒ N	GSD-11	Alternative Operating Scenario	51601	Include if an AOS is requested.
☐ Y ☒ N	GSD-12	Affidavit of Nonapplicability	51600	Include if the standard notification requirements do not apply.
☒ Y ☐ N	GSD-13	Affidavit of Applicability	51603	Include if the standard notification requirements apply.
☒ Y ☐ N	GSD-14	Owners and Occupants Notified	51609	Include if the standard notification requirements apply.
☒ Y ☐ N	GSD-15	Government Officials Notified	51608	Include if the standard notification requirements apply.
☐ Y ☒ N	RENEWAL	Renewal Checklist	51755	Include with every operating permit renewal packet.

Continued on Next Page

Part B: Process Information

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	AEF-01	Alternate Emission Factor Request	51860	Submit if you are requesting to use an emission factor other than AP-42.
☐ Y ☒ N	PI-01	Miscellaneous Processes	52534	Include one form for each process for which there is not a specific PI form.
☒ Y ☐ N	PI-02A	Combustion Unit Summary	52535	Include one form to summarize all combustion units *(unless SSOA)*.
☒ Y ☐ N	PI-02B	*Combustion:* Boilers, Process Heaters, & Furnaces	52536	Include one form for each boiler, process heater, or furnace *(unless SSOA)*.
☒ Y ☐ N	PI-02C	*Combustion:* Turbines & Internal Combustion Engines	52537	Include one form for each turbine or internal combustion engine *(unless SSOA)*.
☐ Y ☒ N	PI-02D	*Combustion:* Incinerators & Combustors	52538	Include one form for each incinerator or combustor *(unless SSOA)*.
☐ Y ☒ N	PI-02E	*Combustion:* Kilns	52539	Include one form for each kiln *(unless SSOA)*.
☒ Y ☐ N	PI-02F	*Combustion:* Fuel Use	52540	Include one form for each combustion unit *(unless SSOA)*.
☒ Y ☐ N	PI-02G	*Combustion:* Emission Factors	52541	Include one form for each combustion unit *(unless SSOA)*.
☒ Y ☐ N	PI-02H	*Combustion:* Federal Rule Applicability	52542	Include one form for each combustion unit *(unless SSOA)*.
☒ Y ☐ N	PI-03	Storage and Handling of Bulk Material	52543	Include if the process involves the storage and handling of bulk materials.
☐ Y ☒ N	PI-04	Asphalt Plants	52544	Include for each asphalt plant process (*unless general permit*).
☐ Y ☒ N	PI-05	Brick / Clay Products	52545	Include for each brick and/or clay products process.
☐ Y ☒ N	PI-06	Electroplating Operations	52546	Include for each electroplating process.
☐ Y ☒ N	PI-07	Welding Operations	52547	Include for each welding process.
☐ Y ☒ N	PI-08	Concrete Batchers	52548	Include for each concrete batcher *(unless SSOA)*.
☐ Y ☒ N	PI-09	Degreasing	52549	Include for each degreasing process *(unless SSOA)*.
☐ Y ☒ N	PI-10	Dry Cleaners	52550	Include for each dry cleaning process
☐ Y ☒ N	PI-11	Foundry Operations	52551	Include for each foundry process
☐ Y ☒ N	PI-12	Grain Elevators	52552	Include for each grain elevator *(unless SSOA)*.
☐ Y ☒ N	PI-13	Lime Manufacturing	52553	Include for each lime manufacturing process.
☒ Y ☐ N	PI-14	Liquid Organic Compound Storage	52554 (doc)	Include if the process involves the storage of liquid organic compounds.
☐ Y ☒ N	PI-14ALT	Alternate version of Liquid Organic Compound Storage	52555 (xls)	Include if the process involves the storage of liquid organic compounds and there are several storage vessels.
☐ Y ☒ N	PI-15	Portland Cement Manufacturing	52556	Include for each Portland cement manufacturing process.
☐ Y ☒ N	PI-16	Reinforced Plastics & Composites	52557	Include for each reinforced plastics and composites process.

Continued on Next Page

Part B: Process Information

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	PI-17	Blasting Operations	52558	Include for each blasting process *(unless SSOA)*.
☒ Y ☐ N	PI-18	Mineral Processing	52559	Include if the process involves mineral processing *(unless SSOA)*.
☐ Y ☒ N	PI-19	Surface Coating & Printing Operations	52560	Include for each surface coating or printing process *(unless SSOA)*.
☐ Y ☒ N	PI-20	Woodworking / Plastic Machining	52561	Include for each woodworking or plastic machining process *(unless SSOA)*.
☐ Y ☒ N	PI-21	Site Remediation	52570	Include for each soil remediation process.
☐ Y ☒ N	PI-22	Ethanol Plants ***(Under Development)***	None	Include for each ethanol plant.

Part C: Control Equipment

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☒ Y ☐ N	CE-01	Control Equipment Summary	51904	Include if add-on control equipment will be used for the process.
☒ Y ☐ N	CE-02	Particulates – Baghouse / Fabric Filter	51953	Include for each baghouse or fabric filter.
☐ Y ☒ N	CE-03	Particulates – Cyclone	52620	Include for each cyclone.
☐ Y ☒ N	CE-04	Particulates – Electrostatic Precipitator	52621	Include for each electrostatic precipitator.
☐ Y ☒ N	CE-05	Particulates – Wet Collector / Scrubber / Absorber	52622	Include for each wet collector, scrubber, or absorber.
☒ Y ☐ N	CE-06	Organics – Flare / Oxidizer / Incinerator	52623	Include for each flare, oxidizer, or incinerator.
☐ Y ☒ N	CE-07	Organics – Adsorbers	52624	Include for each adsorber.
☐ Y ☒ N	CE-08	Organics – Condenser	52625	Include for each condenser.
☐ Y ☒ N	CE-09	Reduction Technology	52626	Include for each control device using reduction technology (e.g., SCR, SNCR).
☐ Y ☒ N	CE-10	Miscellaneous Control Equipment	52436	Include one form for equipment for which there is not a specific CE form.

Continued on Next Page

Part D: Compliance Determination for Part 70 Sources

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	CD-01	Emissions Unit Compliance Status	51861	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-02	Compliance Plan by Applicable Requirement	51862	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-03	Compliance Plan by Emissions Unit	51863	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-04	Compliance Schedule and Certification	51864	Include for every Title V application, including modifications and renewal.
☐ Y ☒ N	FED-03	Compliance Assurance Monitoring	53377	Include for every Title V application, including modifications.

Part E: Best Available Control Technology

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☒ Y ☐ N	BACT-01	Analysis of Best Available Control Technology	None	Include for every BACT application.
☒ Y ☐ N	BACT-01a	Background Search: Existing BACT Determinations	None	Include for every BACT application.
☒ Y ☐ N	BACT-01b	Cost/Economic Impact Analysis	None	Include for every BACT application.
☒ Y ☐ N	BACT-02	Summary of Best Available Control Technology	None	Include for every BACT application.
☒ Y ☐ N	PSD / EO-01	PSD / Emission Offset Checklist	None	Include for every PSD application and every NSR application that requires emission offsets.

Part F: Emission Credit Registry

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	EC-01	Generation of Emission Credits	51783	Include if the modification results in emission reductions.
☐ Y ☒ N	EC-02	Transfer of Emission Credits	51784	Submit whenever registered emission credits are transferred.
☐ Y ☒ N	EC-03	Use of Emission Credits	51785	Include if the modification requires the use of emission credits for offsets.
☐ Y ☒ N	EC-04	Emission Credit Request	51906	Submit if you are looking for emission credits for offsets.

Continued on Next Page

Part G: Plantwide Applicability Limits

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	PAL-01	Actuals Plantwide Applicability Limit	52451	Include if the modification results in emission reductions.
☐ Y ☒ N	PAL-02	Revised Plantwide Applicability Limit	52452	Submit whenever registered emission credits are transferred.
☐ Y ☒ N	PAL-03	Plantwide Applicability Limit Renewal	52453	Include if the modification requires the use of emission credits for offsets.
☐ Y ☒ N	PAL-04	Request for Termination of Plantwide Applicability Limit	52454	Submit if you are looking for emission credits for offsets.

Part H: Air Toxics

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	FED-01	Summary of Federal Requirements – NSPS & NESHAP	53512	Include for each 40 CFR Part 60 NSPS, 40 CFR Part 61 NESHAP, and 40 CFR Part 63 NESHAP applicable to the process.
☒ Y ☐ N	FED-02	MACT Pre-Construction Review	51905	Include if constructing or modifying a process subject to a Part 63 NESHAP.
☐ Y ☒ N	No Form ID	MACT Initial Notification	None	This form is available on the U.S. EPA website. Completed notifications should be submitted to the IDEM Compliance Branch.

Part I: Special Permits

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	INTERIM	Interim Approval	None	Submit if you are applying for interim operating approval.
☐ Y ☒ N	ASPHALT	Asphalt General Permit	None	Submit if you are applying for or modifying an asphalt plant general permit.
☐ Y ☒ N	NOXBTP	NO_X Budget Permit	None	Submit if you are a power plant or if you have opted in to the NO_X budget trading program.
☐ Y ☒ N	ACIDRAIN	Phase 2 Acid Rain Permit	None	Submit if you are applying for, modifying, or renewing a Phase 2 Acid Rain permit.

Continued on Next Page

Part J: Source Specific Operating Agreements (SSOA)

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	OA-01	Summary of Application and Existing Agreements	53438	Submit if you are applying for or modifying a Source Specific Operating Agreement.
☐ Y ☒ N	OA-02	Industrial / Commercial Surface Coating Operations -OR- Graphic Arts Operations (326 IAC 2-9-2.5)	53439	Submit if you are applying for or modifying a SSOA for industrial or commercial surface coating operations not subject to 326 IAC 8-2; or graphic arts operations not subject to 326 IAC 8-5-5.
☐ Y ☒ N	OA-03	Surface Coating or Graphic Arts Operations (326 IAC 2-9-3)	53440	Submit if you are applying for or modifying a SSOA for surface coating or graphic arts operations.
☐ Y ☒ N	OA-04	Woodworking Operations (326 IAC 2-9-4)	53441	Submit if you are applying for or modifying a SSOA for woodworking operations.
☐ Y ☒ N	OA-05	Abrasive Cleaning Operations (326 IAC 2-9-5)	53442	Submit if you are applying for or modifying a SSOA for abrasive cleaning operations.
☐ Y ☒ N	OA-06	Grain Elevators (326 IAC 2-9-6)	53443	Submit if you are applying for or modifying a SSOA for grain elevators.
☐ Y ☒ N	OA-07	Sand And Gravel Plants (326 IAC 2-9-7)	53444	Submit if you are applying for or modifying a SSOA for sand and gravel plants.
☐ Y ☒ N	OA-08	Crushed Stone Processing Plants (326 IAC 2-9-8)	53445	Submit if you are applying for or modifying a SSOA for crushed stone processing plants.
☐ Y ☒ N	OA-09	Ready-Mix Concrete Batch Plants (326 IAC 2-9-9)	53446	Submit if you are applying for or modifying a SSOA for ready-mix concrete batch plants.
☐ Y ☒ N	OA-10	Coal Mines And Coal Preparation Plants (326 IAC 2-9-10)	53447	Submit if you are applying for or modifying a SSOA for coal mines and coal preparation plants.
☐ Y ☒ N	OA-11	Automobile Refinishing Operations (326 IAC 2-9-11)	53448	Submit if you are applying for or modifying a SSOA for automobile refinishing operations.
☐ Y ☒ N	OA-12	Degreasing Operations (326 IAC 2-9-12)	53449	Submit if you are applying for or modifying a SSOA for degreasing operations.
☐ Y ☒ N	OA-13	External Combustion Sources (326 IAC 2-9-13)	53450	Submit if you are applying for or modifying a SSOA for external combustion sources.
☐ Y ☒ N	OA-14	Internal Combustion Sources (326 IAC 2-9-14)	53451	Submit if you are applying for or modifying a SSOA for internal combustion sources.

OAQ GENERAL SOURCE DATA APPLICATION
GSD-01: Basic Source Level Information
State Form 50640 (R5 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:
- The purpose of GSD-01 is to provide essential information about the entire source of air pollutant emissions. GSD-01 is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

PART A: Source / Company Location Information

1. **Source / Company Name**: Riverview Energy Corporation
2. **Plant ID**: –
3. **Location Address**: 4704 East County Road 2000 North
   City: Dale **State**: IN **ZIP Code**: 47523 –
4. **County Name**: Spencer
5. **Township Name**: Carter
6. **Geographic Coordinates**:
   Latitude: 38.18 degrees N **Longitude**: 86.97 degrees W
7. **Universal Transferal Mercadum Coordinates** *(if known)*:
   Zone: 16S **Horizontal**: 502220m E **Vertical**: 4226392m N
8. **Adjacent States**: Is the source located within 50 miles of an adjacent state?
   ☐ No ☒ Yes – *Indicate Adjacent State(s)*: ☐ Illinois (IL) ☐ Michigan (MI) ☐ Ohio (OH) ☒ Kentucky (KY)
9. **Attainment Area Designation**: Is the source located within a non-attainment area for any of the criteria air pollutants?
   ☒ No ☐ Yes – *Indicate Nonattainment Pollutant(s)*: ☐ CO ☐ Pb ☐ NO_x ☐ O_3 ☐ PM ☐ PM_{10} ☐ $PM_{2.5}$ ☐ SO_2
10. **Portable / Stationary**: Is this a portable or stationary source? ☐ Portable ☒ Stationary

PART B: Source Summary

11. **Company Internet Address** *(optional)*:
12. **Company Name History**: Has this source operated under any other name(s)?
    ☒ No ☐ Yes – *Provide information regarding past company names in Part I, Company Name History.*
13. **Portable Source Location History**: Will the location of the portable source be changing in the near future?
    ☒ Not Applicable ☐ No ☐ Yes – *Complete Part J, Portable Source Location History, and Part K, Request to Change Location of Portable Source.*
14. **Existing Approvals**: Have any exemptions, registrations, or permits been issued to this source?
    ☒ No ☐ Yes – *List these permits and their corresponding emissions units in Part M, Existing Approvals.*
15. **Unpermitted Emissions Units**: Does this source have any unpermitted emissions units?
    ☒ No ☐ Yes – *List all unpermitted emissions units in Part N, Unpermitted Emissions Units.*
16. **New Source Review**: Is this source proposing to construct or modify any emissions units?
    ☐ No ☒ Yes – *List all proposed new construction in Part O, New or Modified Emissions Units.*
17. **Risk Management Plan**: Has this source submitted a Risk Management Plan?
    ☒ Not Required ☐ No ☐ Yes → Date submitted: EPA Facility Identifier: – –

Continued on Next Page

PART C: Source Contact Information

IDEM will send the original, signed permit decision to the person identified in this section. This person MUST be an employee of the permitted source.

18. Name of Source Contact Person: Gregory Merle

19. Title *(optional)*: President

20. Mailing Address: 15 E Putnam Ave, Suite# 210

City: Greenwich | **State**: CT | **ZIP Code**: 06830 –

21. Electronic Mail Address *(optional)*: Greg.Merle@RiverviewEnergy.com

22. Telephone Number: (203) 979 – 3993 | **23. Facsimile Number** *(optional)*: ( ) –

PART D: Authorized Individual/Responsible Official Information

IDEM will send a copy of the permit decision to the person indicated in this section, if the Authorized Individual or Responsible Official is different from the Source Contact specified in Part C.

24. Name of Authorized Individual or Responsible Official:

25. Title:

26. Mailing Address:

City: | **State**: | **ZIP Code**: –

27. Telephone Number: ( ) – | **28. Facsimile Number** *(optional)*: ( ) –

29. Request to Change the Authorized Individual or Responsible Official: Is the source officially requesting to change the person designated as the Authorized Individual or Responsible Official in the official documents issued by IDEM, OAQ? *The permit may list the title of the Authorized Individual or Responsible Official in lieu of a specific name.*

☐ No ☐ Yes – ***Change Responsible Official to:***

PART E: Owner Information

30. Company Name of Owner: Riverview Energy

31. Name of Owner Contact Person: Gregory Merle

32. Mailing Address: 15 E Putnam Ave, Suite# 210

City: Greenwich | **State**: CT | **ZIP Code**: 06830 –

33. Telephone Number: (203) 979 – 3993 | **34. Facsimile Number** *(optional)*: ( ) –

34. Operator: Does the "Owner" company also operate the source to which this application applies?

☐ No – *Proceed to Part F below.* ☒ Yes – *Enter "SAME AS OWNER" on line 35 and proceed to Part G below.*

PART F: Operator Information

35. Company Name of Operator:

36. Name of Operator Contact Person:

37. Mailing Address:

City: | **State**: | **ZIP Code**: –

38. Telephone Number: ( ) – | **39. Facsimile Number** *(optional)*: ( ) –

Continued on Next Page

PART G: Agent Information

40. **Company Name of Agent**: KBR

41. **Type of Agent**: ☒ Environmental Consultant ☐ Attorney ☐ Other (specify):

42. **Name of Agent Contact Person**: Stephen A. Lang

43. **Mailing Address**: 601 Jefferson St

City: Houston | **State**: TX | **ZIP Code**: 77002 –

44. **Electronic Mail Address** *(optional)*: Stephen.Lang@kbr.com

45. **Telephone Number**: (713) 753 – 7580 | 46. **Facsimile Number** *(optional)*: ( ) –

47. **Request for Follow-up**: Does the "Agent" wish to receive a copy of the preliminary findings during the public notice period (if applicable) and a copy of the final determination? ☐ No ☒ Yes

PART H: Local Library Information

48. **Date application packet was filed with the local library**:

49. **Name of Library**: 1. Lincoln Heritage Public Library, and
2. Chrisney Library

50. **Name of Librarian** *(optional)*:

51. **Mailing Address**: 1. Lincoln Library: 105 North Wallace Street,
2. Chrisney Library: 228 North Street

City: 1. Lincoln Library: Dale, IN 47523
2. Chrisney LIbrary: Chrisney, IN 47611 | **State**: IN | **ZIP Code**: 47523 –

52. **Internet Address** *(optional)*:

53. **Electronic Mail Address** *(optional)*:

54. **Telephone Number**: ( ) – | 55. **Facsimile Number** *(optional)*: ( ) –

PART I: Company Name History *(if applicable)*

Complete this section only if the source has previously operated under a legal name that is different from the name listed above in Section A.

56. Legal Name of Company	57. Dates of Use
Riverview Energy Corporation (CURRENT)	11/12/14 to
Clean Coal Refining Corporation NOTE: Name change preceded any source operations in IN. Included for completeness only.	10/22/08 to 11/12/2014
	to
	to
	to
	to
	to
	to
	to
	to

58. **Company Name Change Request**: Is the source officially requesting to change the legal name that will be printed on all official documents issued by IDEM, OAQ?

☒ No ☐ Yes – ***Change Company Name to***:

Continued on Next Page

Continued on Next Page

PART J: Portable Source Location History *(if applicable)*

Complete this section only if the source is portable and the location has changed since the previous permit was issued. The current location of the source should be listed in Section A.

59. Plant ID	60. Location of the Portable Source	61. Dates at this Location
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to

PART K: Request to Change Location of Portable Source *(if applicable)*

Complete this section to request a change of location for a portable source.

62. Current Location:		
Address:		
City:	**State**:	**ZIP Code**: –
County Name:		
63. New Location:		
Address:		
City:	**State**:	**ZIP Code**: –
County Name:		

Continued on Next Page

PART L: Source Process Description

Complete this section to summarize the main processes at the source.

64. Process Description	65. Products	66. SIC Code	67. NAICS Code
Veba Combi Cracker (VCC)	Diesel abd Naphtha Fuel	2999	3241999

PART M: Existing Approvals *(if applicable)*

Complete this section to summarize the approvals issued to the source since issuance of the main operating permit.

68. Permit ID	69. Emissions Unit IDs	70. Expiration Date
NA		

PART N: Unpermitted Emissions Units *(if applicable)*

Complete this section only if the source has emission units that are not listed in any permit issued by IDEM, OAQ.

71. Emissions Unit ID	72. Type of Emissions Unit	73. Actual Dates		
		Began Construction	Completed Construction	Began Operation

PART O: New or Modified Emissions Units *(if applicable)*

Complete this section only if the source is proposing to add new emission units or modify existing emission units.

74. Emissions Unit ID	75. NEW	76. MOD	77. Type of Emissions Unit	78. Estimated Dates		
				Begin Construction	Complete Construction	Begin Operation
See Table 17	X		See Table 17 for all information			

OAQ GENERAL SOURCE DATA APPLICATION
GSD-02: Plant Layout Diagram

State Form 51605 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-02 is to provide a diagram of the entire plant site. This form and a Plant Layout diagram are required for all air permit applications. If you do not provide the necessary information, applicable to your source, the application process may be stopped.
- IDEM, OAQ has provided detailed instructions for this form and an example of a basic plant layout diagram on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Basic Plant Layout

Part A provides IDEM, OAQ with the appropriate information about all buildings and access-limiting features in and around the plant site. **Please use this table as a checklist.** You must provide scaled drawings, with the actual scale shown. All dimensions and units must be clearly indicated with a brief explanation of what is being shown. Include the following (*All measurements should be given in feet.*):

1. ☒ Building Location and Dimensions		
2. ☒ Property Lines and Access-Limiting Features		
3. ☒ Surrounding Building Location and Dimensions		
4. ☒ Distances to Property Lines and Access-Limiting Features		
5. ☒ UTM Location Coordinates	6. ☒ Compass (pointing North)	7. ☒ Scale

Part B: Stack Information

Part B provides IDEM, OAQ with the appropriate information about all stacks, roof monitors, control devices, and process vents at the plant site. **Please use this table as a checklist.** You must show the location of all applicable emission points and include all relevant stack and emissions unit identification numbers for each. In addition, you will need to identify each of these emission points under "Stack Identification" on form GSD-04, Stack/Vent Information. Include the following (*All measurements should be in feet.*):

8. ☒ Exhaust Stacks		
9. ☒ Process Vents		
10. ☒ Roof Monitors	☐ *No Roof Monitors*	
11. ☒ Control Devices	☐ *No Control Devices*	
12. ☒ Interior Vents	☐ *No Interior Vents*	☒ Doors and Windows *(for processes vented inside a building)*

Part C: Roadway Information

Part C provides IDEM, OAQ with the appropriate information about the roadways in and around the plant site. **Please use this table as a checklist.** Include the following (*All measurements should be in feet.*):

13. ☐ Adjacent Roadways	☒ Interior Roadways
14. ☒ Roadway Surface Description (gravel, dirt, paved, etc.)	
15. ☒ Number of Lanes	*See Fugitive Dust Control Plan

Continued on Next Page

Part D: Source Building Information

This table provides detailed information about each building at the plant site that is part of the source. If additional space is needed, you may make a copy of this table. *(All measurements should be given in feet.)*

16. Building ID	**17. Building Description**	**18. Building Dimensions**			**19. Distance & direction to the nearest property line or access limiting feature** (feet & compass coordinate)	**20. Distance & direction to the nearest residence** (feet & compass coordinate)
		Length (feet)	**Width** (feet)	**Height** (feet)		
See Table 10						

Continued on Next Page

Part E: Surrounding Building / Residence Information

This table provides detailed information about each building or residence surrounding the plant site. If additional space is needed, you may make a copy of this table. *(All measurements should be given in feet.)*

21. Surrounding Building / Residence Description	**22. Surrounding Building / Residence Property Dimensions**			**23. Distance & direction to the nearest property line or access limiting feature** (feet & compass coordinate)	**24. Building ID of nearest building on the plant site**	**25. Distance & direction to the nearest building on the plant site** (feet & compass coordinate)
	Length (feet)	**Width** (feet)	**Height** (feet)			
See Table 10						

Continued on Next Page

Part F: Plant Layout Diagram

This space provides a place for a hand drawn plant layout diagram. It is **optional** to use this space to create your plant layout, but you must include the diagram with your application. If you choose to submit the plant layout in a different format, state "plant layout attached" in the space provided, and submit the information with your completed application. IDEM, OAQ has provided an example of a basic plant layout diagram on the Air Permit Applications Forms website.

See Plant Layout Diagram

OAQ GENERAL SOURCE DATA APPLICATION
GSD-03: Process Flow Diagram
State Form 51599 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-03 is to provide a checklist for identifying the information to be included on each Process Flow diagram.
- Complete this form and submit a process flow diagram for each process included in your air permit application.
- IDEM, OAQ has provided detailed instructions for this form and an example of a basic process flow diagram on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Process Flow Diagram

Part A provides basic information to understanding the nature of the process. Please use this table as a checklist to indicate that you have included the following items on your process flow diagram (*All throughputs should be given in pounds per hour.*):

1. ☒ **Process Description:** VCC
2. ☒ Process Equipment
3. ☒ Raw Material Input
4. ☒ Process Throughput
5. ☒ Additions ☐ Deletions ☐ Modifications

Use the space below to briefly explain the impacts of the additional equipment, the reason for removing any equipment, and/or the reason for the proposed modification. (*If additional space is needed, please attach a separate sheet with the information and indicate in the space below that additional information is attached.*)

N/A Initial construction application

Part B: Process Operation Schedule

Part B indicates the actual (or estimated actual) hours of operation for the process.

6. ☒ Process Operation Schedule 24 Hours per Day 7 Days per Week 52 Weeks Per Year
7. **Scheduled Downtime:** Use the space below to include as much information as is known about scheduled periods of downtime for this process. (*If additional space is needed, please attach a separate sheet with the information and indicate in the space below that additional information is attached.*)

Part C: Emissions Point Information

Part C provides information about each potential outlet of air pollutant emissions to the atmosphere. Please use this table as a checklist to indicate that you have included the following items on your process flow diagram (*All throughputs should be given in pounds per hour.*):

8. ☒ Stack / Vent Information
9. ☒ Pollutants Emitted
10. ☒ Air Pollution Control

Continued on Next Page

Part D: Process Flow Diagram

This space provides a place for a hand drawn process flow diagram. It is **optional** to use this space to create your process flow diagram, but you must include the diagram with your application. If you choose to submit the process flow diagram in a different format, state "process flow diagram attached" in the space provided, and submit the information with your completed application. IDEM, OAQ has provided an example of a basic process flow diagram on the Air Permit Applications Forms website.

See Process Flow Diagrams

OAQ GENERAL SOURCE DATA APPLICATION
GSD-04: Stack / Vent Information
State Form 51606 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
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Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
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NOTES:

- The purpose of this form is to provide basic information about each stack or vent that has the potential to emit air pollutants. If you do not provide enough information to adequately describe each process vent and/or stack, the application process may be stopped. This form is required for all air permit applications.
- Detailed instructions for this form are available online on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Stack / Vent Information

This table provides detailed information about each stack or vent through which air pollutants could be released into the atmosphere. If an air stream is vented inside a building, the vent does not need to be listed on this form. If additional space is needed, you may make a copy of this form.

1. Stack / Vent ID	2. Type (V H W O)	3. Shape (C R O)	4. Outlet Dimensions (feet)	5. Height (feet)	6. Maximum Outlet Flow Rate (acfm)	7. Outlet Gas Temperature (Degrees F)	8. Related Stacks / Vents (B P O)
See Table 11							

OAQ GENERAL SOURCE DATA APPLICATION
GSD-05: Emissions Unit Information

State Form 51610 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide basic information about each emissions unit that has the potential to emit air pollutants. This form is required for all air permit applications.
- Detailed instructions for this form are available online on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Emissions Unit Information

This table provides detailed information about each emissions unit that has the potential to emit air pollutants to the atmosphere. Accurate information is needed to determine the total potential to emit. If you do not provide enough information to adequately describe each emissions unit, the application process may be stopped. If additional space is needed, you may make a copy of this form.

1. Unit ID	2. Model Number	3. Serial Number	4. Description	5. Manufacturer	6. Installation Date	7. Maximum Capacity	8. Stack / Vent ID
See Table 12							

OAQ GENERAL SOURCE DATA APPLICATION
GSD-06: Particulate Emissions Summary
State Form 51612 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide basic information about each source of particulate emissions. This form is required for all air permit applications.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Particulate Matter Emissions

Part A provides a summary of the type and amount of particulate emissions at the source. The state rules on particulate emissions are found in Title 326 of the Indiana Administrative Code, Article 6, Particulate Rules. If you do not provide enough information to adequately describe each source of particulate emissions, the application process may be stopped. If additional space is needed, you may make a copy of this table.

Emissions Point		Potential To Emit (tons per year)						
1. ID	2. Description	3. PM	4. PM-10	5. PM-2.5	6. TSP	7. Fugitive Dust	8. Fugitive PM	9. HAP PM
See Table 13								

Continued on Next Page

Part B: Control of Particulate Emissions

Part C gathers information about how each source of particulate emissions is controlled. If you do not provide enough information to adequately describe how each source of particulate emissions is controlled, the application process may be stopped. If additional space is needed, you may make a copy of this table.

10. Emissions Point ID	11. Control Measure	12. Control Measure Description	13. Control Plan
See Table 13	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______
	☐ No Control ☐ Dust Suppression ☐ Other: ______		☐ Yes ☐ No Date Submitted: ______

Air Permitting Rules 326 IAC 6-4 and 326 IAC 6-5 require fugitive dust to be controlled as needed to prevent dust from visibly crossing property lines. Parts C and D summarize sources of fugitive particulate emissions from process operations and unpaved roads.

PART C: Fugitive Dust *(if applicable)*

Part C identifies measures implemented for controlling fugitive particulate emissions from process operations and unpaved roads.

14. **Dust Control Plans**: *Check all that apply.*			15. **Control Measures:**
☒ Conveying:	☐ Wet	☒ Dry	See fugitive dust control plan section
☒ Stock Piles:	☐ Open	☐ Covered	See fugitive dust control plan section
☐ Unpaved Roads: *Watered?*	☐ Yes	☒ No	
☒ Other *(specify)*: Paved roads			See fugitive dust control plan section
☐ Other *(specify)*:			
☐ Other *(specify)*:			

PART D: Vehicular Traffic on Unpaved Roads *(if applicable)*

Part D gathers information on vehicular traffic patterns when the site contains unpaved roads. All data should be provided assuming peak hours of vehicular traffic. Two one-way trips equal one round trip. For external traffic (vehicles entering and leaving the property lines), the distance from the plant to the property line is the one-way trip distance.

16. Average Silt Content of Unpaved Roads: NA

17. Vehicle Description	18. Max. No. round trips at peak hours (trips/hr)	19. Distance of one-way trip (miles/trip)	20. Max. vehicle speed (mph)	21. Max. gross vehicle weight *(fully loaded)* (tons)	22. Tare weight (tons)	23. No. of wheels on vehicle (wheels)
NA						

OAQ GENERAL SOURCE DATA APPLICATION
GSD-07: Criteria Pollutant Emissions Summary
State Form 51602 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:
- The purpose of this form is to provide the actual and potential emissions of each criteria pollutant emitted from the source. This form is required for all air permit applications.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Unit Emissions Summary

Part A provides the actual and potential emissions of each criteria pollutant emitted from each emissions unit. If you do not provide enough information to adequately describe the emissions from each emissions unit, the application process may be stopped.

1. Unit ID	2. Stack / Vent ID	3. Criteria Pollutant	4. Actual Emissions		5. Potential To Emit	
			Standard Units	Tons Per Year	Standard Units	Tons Per Year
See Table 14						

Continued on Next Page

Part B: Pollutant Emissions Summary

Part B provides the total actual and potential emissions of each criteria pollutant emitted from the source (including all emissions units and fugitive emissions at the source). If you do not provide enough information to adequately describe the total source emissions, the application process may be stopped.

6. Criteria Pollutant	7. Actual Emissions		8. Potential To Emit	
	Standard Units	Tons Per Year	Standard Units	Tons Per Year
Carbon Monoxide (CO)	See Table 14			
Lead (Pb)				
Nitrogen Oxides (NO_X)				
Particulate Matter (PM)				
Particulate Matter less than 10μm (PM_{10})				
Particulate Matter less than 2.5μm ($PM_{2.5}$)				
Sulfur Dioxide (SO_2)				
Volatile Organic Compounds (VOC)				
Other *(specify)*:				

Part C: Fugitive VOC Emissions *(if applicable)*

Part C summarizes the sources of fugitive VOC emissions at the source and estimates VOC emissions from these emission points. Complete this table if you are required to provide fugitive emissions data pursuant to 326 IAC 2-2 or 326 IAC 2-3.

9. Fugitive Emissions Source	10. Emission Factor (lb/hr)	11. Number Leaking	12. Uncontrolled Potential To Emit	
			Pounds Per Hour	Tons Per Year
Compressor Seals	See Table 14			
Flanges				
Open-Ended Lines				
Pressure Relief Seals				
Pump Seals				
Sampling Connections				
Valves				
Other *(specify)*:				

OAQ GENERAL SOURCE DATA APPLICATION
GSD-08: Hazardous Air Pollutant Emissions Summary

State Form 51604 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide the actual and potential emissions of each hazardous air pollutant emitted from the source. This form is required for all air permit applications.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Unit Emissions Summary

Part A provides the actual and potential emissions of each hazardous air pollutant emitted from each emissions unit. If you do not provide enough information to adequately describe the emissions from each emissions unit, the application process may be stopped.

1. Unit ID	2. Stack / Vent ID	3. Hazardous Air Pollutant	4. CAS Number	5. Actual Emissions		6. Potential To Emit	
				Standard Units	Tons Per Year	Standard Units	Tons Per Year
	See Table 15						

Continued on Next Page

Part B: Pollutant Emissions Summary

Part B provides the total actual and potential emissions of each hazardous air pollutant emitted from the source (including all emissions units and fugitive emissions at the source). If you do not provide enough information to adequately describe the total source emissions, the application process may be stopped.

7. Hazardous Air Pollutant	8. CAS Number	9. Actual Emissions		10. Potential To Emit	
		Standard Units	Tons Per Year	Standard Units	Tons Per Year
See Table 15					

Part C: Fugitive HAP Emissions *(if applicable)*

Part C summarizes the sources of fugitive HAP emissions at the source and estimates HAP emissions from these emission points. Complete this table if you are required to provide fugitive emissions data pursuant to 326 IAC 2-2 or 326 IAC 2-3.

11. Fugitive Emissions Source	12. Hazardous Air Pollutant	13. Emission Factor (lb/hr)	14. Number Leaking	15. Uncontrolled Potential To Emit	
				Pounds Per Hour	Tons Per Year
Compressor Seals	See Table 15				
Flanges					
Open-Ended Lines					
Pressure Relief Seals					
Pump Seals					
Sampling Connections					
Valves					
Other *(specify)*:					

OAQ GENERAL SOURCE DATA APPLICATION
GSD-10: Insignificant Activities
State Form 51596 (R4 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:
- The purpose of this form is to identify all trivial and insignificant activities in operation at the source. This form is required for all air permit applications.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Trivial Activities (Optional)

Part A identifies all trivial activities in operation at the source as defined in 326 IAC 2-7-1(40). **Please use this table as a checklist.** Check each item and sub-item that applies. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Trivial Activity	Citation (326 IAC)
		2-7-1(40)(A)
See Table 16	1. Any activity or emission unit:	
	☐ not regulated by a NESHAP, with potential uncontrolled emissions are equal to or less than one (1) pound per day on an emission unit basis for any single HAP or combination of HAPs; and	
	☐ for which the potential uncontrolled emissions meet the exemption levels specified in the following:	
	☐ For lead and lead compounds measured as elemental lead (Pb), potential uncontrolled emissions that are equal to or less than one (1) pound per day	
	☐ For carbon monoxide (CO), potential uncontrolled emissions that are equal to or less than one (1) pound per day	
	☐ For sulfur dioxide (SO_2), potential uncontrolled emissions that are equal to or less than one (1) pound per day	
	☐ For volatile organic compounds (VOC), potential uncontrolled emissions that are equal to or less than one (1) pound per day	
	☐ For nitrogen oxides (NO_X), potential uncontrolled emissions that are equal to or less than one (1) pound per day	
	☐ For particulate matter with an aerodynamic diameter less than or equal to ten (10) micrometers (PM_{10}), potential uncontrolled emissions that are equal to or less than one (1) pound per day	2-7-1(40)(B)
	2. Water related activities including:	
	☐ Production of hot water for on-site personal use not related to any industrial or production process	
	☒ Water treatment activities used to provide potable and process water for the plant, excluding any activities associated with wastewater treatment	
	☒ Steam traps, vents, leaks and safety relief valves	
	☒ Cooling ponds	
	☐ Laundry operations using only water solutions of bleach or detergents	
	☒ Demineralized water tanks and demineralizer vents	
	☒ Boiler water treatment operations, not including cooling towers	
	☒ Oxygen scavenging (de-aeration) of water	
	☐ Steam cleaning operations and steam sterilizers	
	☒ Pressure washing of equipment	
	☐ Water jet cutting operations	

Continued on Next Page

Part A: Trivial Activities (continued)

Part A identifies all trivial activities in operation at the source as defined in 326 IAC 2-7-1(40). **Please use this table as a checklist.** Check each item and sub-item that applies. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Trivial Activity	Citation (326 IAC)
See Table 16	3. Combustion activities including the following:	2-7-1(40)(C)
	☐ Portable electrical generators that can be moved by hand from one location to another. "Moved by hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device	
	☒ Combustion emissions from propulsion of mobile sources	
	☒ Fuel use related to food preparation for on-site consumption	
	☒ Tobacco smoking rooms and areas	
	☐ Blacksmith forges	
	☒ Indoor and outdoor kerosene heaters	
	4. Activities related to ventilation, venting equipment and refrigeration, including the following:	2-7-1(40)(D)
	☒ Ventilation exhaust, central chiller water systems, refrigeration and air conditioning equipment, not related to any industrial or production process, including natural draft hoods or ventilating systems that do not remove air pollutants	
	☒ Stack and vents from plumbing traps used to prevent the discharge of sewer gases, handling domestic sewage only, excluding those at wastewater treatment plants or those handling any industrial waste	
	☒ Vents from continuous emissions monitors and other analyzers	
	☒ Natural gas pressure regulator vents, excluding venting at oil and gas production facilities	
	☒ Air vents from air compressors	
	☒ Vents for air cooling of electric motors provided the air does not commingle with regulated air pollutants	
	☐ Vents from equipment used to air blow water from cooled plastics strands or sheets	
	5. Activities related to routine fabrication, maintenance and repair of buildings, structures, equipment or vehicles at the source where air emissions from those activities would not be associated with any commercial production process including the following:	2-7-1(40)(E)
	☒ Activities associated with the repair and maintenance of paved and unpaved roads, including paving or sealing, or both, of parking lots and roadways	
	☒ Painting, including interior and exterior painting of buildings, and solvent use, excluding degreasing operations utilizing halogenated organic solvents	
	☒ Brazing, soldering, or welding operations and associated equipment	
	☐ Portable blast-cleaning equipment with enclosures	
	☐ Blast-cleaning equipment using water as the suspension agent and associated equipment	
	☒ Batteries and battery charging stations, except at battery manufacturing plants	
	☒ Lubrication, including hand-held spray can lubrication, dipping metal parts into lubricating oil, and manual or automated addition of cutting oil in machining operations	
	☒ Non-asbestos insulation installation or removal	
	☒ Tarring, retarring and repair of building roofs	
	☐ Bead blasting of heater tubes	
	☒ Instrument air dryer and filter maintenance	
	☒ Manual tank gauging	
	☐ Open tumblers associated with deburring operations in maintenance shops	

Continued on Next Page

Part A: Trivial Activities (continued)

Part A is intended to identify all trivial activities in operation at the source as defined in 326 IAC 2-7-1(40). **Please use this table as a checklist.** Check each item and sub-item that applies. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Trivial Activity	Citation (326 IAC)
See Table 16	6. Activities performed using hand-held equipment including the following:	2-7-1(40)(F)
	☒ Application of hot melt adhesives with no VOC in the adhesive formulation	
	☒ Cutting, excluding cutting torches; ☐ Buffing; ☒ Grinding; ☒ Sanding	
	☒ Machining wood, metal, or plastic; ☐ Carving; ☒ Polishing; ☒ Sawing	
	☒ Turning wood, metal, or plastic; ☒ Drilling; ☒ Routing; ☒ Surface grinding	
	7. Housekeeping and janitorial activities and supplies including the following:	2-7-1(40)(G)
	☒ Vacuum cleaning systems used exclusively for housekeeping or custodial activities, or both	
	☐ Steam cleaning activities	
	☒ Rest rooms and associated cleanup operations and supplies	
	☒ Alkaline or phosphate cleaners and associated equipment	
	☒ Mobile floor sweepers and floor scrubbers	
	☐ Pest control fumigation	
	8. Office related activities including the following:	2-7-1(40)(H)
	☒ Office supplies and equipment	
	☒ Photocopying equipment and associated supplies	
	☒ Paper shredding	
	☐ Blueprint machines, photographic equipment, and associated supplies	
	9. Lawn care and landscape maintenance activities and equipment, including the storage, spraying or application of insecticides, pesticides and herbicides	2-7-1(40)(I)
	10. Storage equipment and activities including:	2-7-1(40)(J)
	☒ Pressurized storage tanks and associated piping for the following:	
	☐ Acetylene; ☐ Inorganic compounds; ☒ Natural gas	
	☒ Anhydrous ammonia; ☒ Liquid petroleum gas (LPG); ☐ Nitrogen dioxide	
	☐ Carbon Monoxide; ☐ Liquid natural gas (LNG) (propane); ☐ Sulfur dioxide	
	☐ Chlorine	
	☒ Storage tanks, vessels, and containers holding or storing liquid substances that do not contain any VOC or HAP	
	☐ Storage tanks, reservoirs, and pumping and handling equipment of any size containing soap, wax, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized	
	☒ Storage of drums containing maintenance raw materials	
	☒ Storage of the following:	
	☐ Castings	
	☐ Lance rods	
	☒ Any non-HAP containing material in solid form stored in a sealed or covered container	
	☒ Portable containers used for the collection, storage, or disposal of materials provided the container capacity is equal to or less than forty-six hundredths (0.46) cubic meters and the container is closed except when the material is added or removed	

Continued on Next Page

Part A: Trivial Activities (continued)

Part A identifies to identify all trivial activities in operation at the source as defined in 326 IAC 2-7-1(40). **Please use this table as a checklist.** Check each item and sub-item that applies. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Trivial Activity	Citation (326 IAC)
See Table 16	11. Emergency and standby equipment including:	2-7-1(40)(K)
	☐ Emergency (backup) electrical generators at residential locations, such as dormitories, prisons and hospitals.	
	☐ Safety and emergency equipment, except engine driven fire pumps, including fire suppression systems and emergency road flares.	
	☒ Process safety relief devices installed solely for the purpose of minimizing injury to persons or damage to equipment which could result from abnormal process operating conditions, including the following:	
	☒ Explosion relief vents, diaphragms or panels ☒ Rupture discs ☒ Safety relief valves	
	☐ Activities and equipment associated with on-site medical care not otherwise specifically regulated	
	☐ Vacuum producing devices for the purpose of removing potential accidental releases	
	12. Sampling and testing equipment and activities including the following:	2-7-1(40)(L)
	☒ Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis	
	☐ Hydraulic and hydrostatic testing equipment	
	☐ Ground water monitoring wells and associated sample collection equipment	
	☐ Environmental chambers not using hazardous air pollutant (HAP) gases	
	☐ Shock chambers	
	☐ Humidity chambers	
	☐ Solar simulators	
	☒ Sampling activities including	
	☒ Sampling of waste ☐ Glove box sampling, charging, and packaging	
	☒ Instrument air dryers and distribution	
	13. Use of consumer products and equipment where the product or equipment is used at a source in the same manner as normal consumer use and is not associated with any production process	2-7-1(40)(M)
	14. Equipment and activities related to the handling, treating, and processing of animals including:	2-7-1(40)(N)
	☐ Equipment used exclusively to slaughter animals, but not including the following: Rendering cookers, Boilers, Heating plants, Incinerators, and/or Electrical power generating equipment	
	☐ Veterinary operating rooms	
	15. Activities generating limited amounts of fugitive dust including:	2-7-1(40)(O)
	☐ Fugitive emissions related to movement of passenger vehicles, provided the emissions are not counted for applicability purposes under 326 IAC 2-7-1(22)(B), and any required fugitive dust control plan or its equivalent is submitted	
	☐ Soil boring	
	☒ Road salting and sanding	

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Part A: Trivial Activities (continued)

Part A identifies all trivial activities in operation at the source as defined in 326 IAC 2-7-1(40). **Please use this table as a checklist.** Check each item and sub-item that applies. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Trivial Activity	Citation (326 IAC)
See Table 16	16. Activities associated with production including the following:	2-7-1(40)(P)
	☐ Closed, non-vented, tumblers used for cleaning or deburring metal products without abrasive blasting	
	☒ Electrical resistance welding	
	☐ CO_2 lasers, used only on metals and other materials which do not emit HAPs in the process	
	☐ Laser trimmers which do not produce fugitive emissions and are equipped with dust collection devices such as bag filter, cyclone, or equivalent device	
	☒ Application equipment for hot melt adhesives with no VOC in the adhesive formulation	
	☐ Drop hammers or hydraulic presses for forging or metalworking	
	☒ Air compressors and pneumatically operated equipment, including hand tools	
	☒ Compressor or pump lubrication and seal oil systems	
	☐ Equipment used to mix and package soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized	
	☐ Equipment for washing or drying fabricated glass or metal products, if no VOCs or HAPs are used in the process, and no gas, oil or solid fuel is burned	
	☐ Handling of solid steel, including coils and slabs, excluding scrap burning, scarfing, and charging into steel making furnaces and vessels	
	17. Miscellaneous equipment, but not emissions associated with the process for which the equipment is used, and activities including the following:	2-7-1(40)(Q)
	☒ Equipment used for surface coating, painting, dipping or spraying operation, except those that will emit VOCs or HAPs	
	☐ Condensate drains for natural gas and landfill gas	
	☐ Electric or steam heated drying ovens and autoclaves, including only the heating emissions and not any associated process emissions	
	☐ Salt baths using nonvolatile salts including caustic solutions that do not result in emissions of any regulated air pollutants	
	☐ Ozone generators	
	☐ Portable dust collectors	
	☐ Scrubber systems circulating water based solutions of inorganic salts or bases which are installed to be available for response to emergency situations	
	☐ Soil borrow pits	
	☒ Manual loading and unloading operations	
	☐ Purging of refrigeration devices using a combination of nitrogen and CFC-22 (R-22) as pressure test media	
	☒ Construction and demolition operations	
	☐ Mechanical equipment gear boxes and vents which are isolated from process materials	
	☐ Non-volatile mold release waxes and agents	

Continued on Next Page

Part B: Insignificant Activities

Part B identifies all insignificant activities in operation at the source as defined in 326 IAC 2-7-1(21)(G). **Please use this table as a checklist.** Indicate which activities are present by checking the appropriate box. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Insignificant Activity	Citation (326 IAC)
See Table 16	18. Combustion related activities, including the following:	2-7-1(21)(G)(i)
	☒ Space heaters, process heaters, or boilers using the following fuels	
	☒ Natural gas-fired combustion sources with heat input equal to or less than ten million (10,000,000) Btu per hour	
	☐ Propane or liquified petroleum gas, or butane-fired combustion sources with heat input equal to or less than six million (6,000,000) Btu per hour	
	☒ Fuel oil-fired combustion sources with heat input equal to or less than two million (2,000,000) Btu per hour and firing fuel containing less than five-tenths percent (0.5%) sulfur by weight	
	☐ Wood-fired combustion sources with heat input equal to or less than one million (1,000,000) Btu per hour and not burning wood refuse, treated wood or chemically contaminated wood	
	☒ Equipment powered by diesel fuel fired or natural gas fired internal combustion engines of capacity equal to or less than five hundred thousand (500,000) Btu/hour, except where total capacity of equipment operated by one stationary source exceeds two million (2,000,000) Btu/hour	
	☒ Combustion source flame safety purging on startup	
	19. Fuel dispensing activities, including the following:	2-7-1(21)(G)(ii)
	☐ A gasoline fuel transfer dispensing operation handling less than or equal to one thousand three hundred (1,300) gallons per day and filling storage tanks having a capacity equal to or less than ten thousand five hundred (10,500) gallons. Such storage tanks may be in a fixed location or on mobile equipment	
	☐ A petroleum fuel, other than gasoline, dispensing facility, having a storage tank capacity less than or equal to ten thousand five hundred (10,500) gallons, and dispensing three thousand five hundred (3,500) gallons per day or less	
	20. The following VOC and HAP storage containers:	2-7-1(21)(G)(iii)
	☒ Storage tanks with capacity less than or equal to one thousand (1,000) gallons and annual throughputs less than twelve thousand (12,000) gallons	
	☒ Vessels storing the following:	
	☒ Hydraulic oils ☒ Lubricating oils ☐ Machining oils ☐ Machining fluids	
	21. Refractory storage not requiring air pollution control equipment	2-7-1(21)(G)(iv)
	22. Equipment used exclusively for the following	2-7-1(21)(G)(v)
	☐ Packaging the following: ☐ Greases ☐ Lubricants	
	☐ Filling drums, pails or other packaging containers with the following:	
	☐ Greases ☐ Lubricating oils ☐ Waxes	

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Part B: Insignificant Activities (continued)

Part B identifies all insignificant activities in operation at the source as defined in 326 IAC 2-7-1(21)(G). **Please use this table as a checklist.** Indicate which activities are present by checking the appropriate box. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Insignificant Activity	Citation (326 IAC)
See Table 16	23. Production related activities, including the following:	2-7-1(21)(G)(vi)
	☐ Application of the following as temporary protective coatings:	
	☐ Greases ☐ Lubricants ☐ Nonvolatile materials ☐ Oils	
	☐ Machining where an aqueous cutting coolant continuously floods the machining interface	
	☐ Degreasing operations that do not exceed one hundred forty-five (145) gallons per twelve (12) months, except if subject to 326 IAC 20-6	
	☒ Cleaners and solvents characterized as follows where the use of which, for all cleaners and solvents combined, does not exceed one hundred forty-five (145) gallons per twelve (12) months	
	☒ Having a vapor pressure equal to or less than two kilo Pascals (2.0 kPa) (fifteen millimeters of mercury (15 mm Hg) or three-tenths pound per square inch (0.3 psi)) measured at thirty-eight degrees Centigrade (38°C) (one hundred degrees Fahrenheit (100°F))	
	☒ Having a vapor pressure equal to or less than seven-tenths kilo Pascals (0.7 kPa) (five millimeters of mercury (5 mm Hg) or one-tenth pound per square inch (0.1 psi)) measured at twenty degrees Centigrade (20°C) (sixty-eight degrees Fahrenheit (68°F))	
	☐ The following equipment related to manufacturing activities not resulting in the emission of HAPs:	
	☐ Brazing equipment ☐ Cutting torches ☐ Soldering equipment ☐ Welding equipment	
	☒ Closed loop heating and cooling systems	
	☐ Infared cure equipment	
	☐ Exposure chambers (towers or columns) for curing of ultraviolet inks and ultra-violet coatings where heat is the intended discharge	
	☐ Any of the following structural steel and bridge fabrication activities:	
	☐ Cutting two hundred thousand (200,000) linear feet or less of one (1) inch plate or equivalent	
	☐ Using eighty (80) tons or less of welding consumables	
	24. Activities associated with the following recovery systems:	2-7-1(21)(G)(vii)
	☐ Rolling oil recovery systems	
	☐ Groundwater oil recovery wells	
	25. Solvent recycling systems with batch capacity less than or equal to one hundred (100) gallons	2-7-1(21)(G)(viii)

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Part B: Insignificant Activities (continued)

Part B is intended to identify all insignificant activities in operation at the source as defined in 326 IAC 2-7-1(21)(G). **Please use this table as a checklist.** Indicate which activities are present by checking the appropriate box. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Insignificant Activity	Citation (326 IAC)
See Table 16	26. Water-based activities, including the following:	2-7-1(21)(G)(ix)
	☐ Activities associated with the treatment of wastewater streams with an oil and grease content less than or equal to one percent (1%) by volume	
	☐ Water runoff ponds for petroleum coke-cutting and coke storage piles	
	☐ Activities associated with the transportation and treatment of sanitary sewage, provided discharge to the treatment plant is under the control of the owner/operator, that is, an on-site sewage treatment facility	
	☐ Any operation using aqueous solutions containing less than one percent (1%) by weight of VOCs excluding HAPs	
	☐ Water based adhesives that are less than or equal to five percent (5%) by volume of VOCs excluding HAPs	
	☐ Noncontact cooling tower systems with either of the following:	
	☐ Natural draft cooling towers not regulated under a NESHAP	
	☐ Forced and induced draft cooling tower systems not regulated under a NESHAP	
	☐ Quenching operations used with heat treating processes	
	27. Repair activities, including the following:	2-7-1(21)(G)(x)
	☒ Replacement or repair of electrostatic precipitators, bags in baghouses and filters in other air filtration equipment	
	☒ Heat exchanger cleaning and repair	
	☒ Process vessel degassing and cleaning to prepare for internal repairs	
	28. Trimmers that do not produce fugitive emissions and that are equipped with a dust collection or trim material recovery device, such as a bag filter or cyclone	2-7-1(21)(G)(xi)
	29. Stockpiled soils from soil remediation activities that are covered and waiting transport for disposal	2-7-1(21)(G)(xii)
	30. Paved and unpaved roads and parking lots with public access	2-7-1(21)(G)(xiii)
	31. Conveyors as follows:	2-7-1(21)(G)(xiv)
	☐ Covered conveyors for solid raw material, including the following:	
	☐ Coal or coke conveying of less than or equal to three hundred sixty (360) tons per day	
	☐ Limestone conveying of less than or equal to seven thousand two hundred (7,200) tons per day for sources other than mineral processing plants constructed after August 31, 1983	
	☐ Uncovered coal or coke conveying of less than or equal to one hundred twenty (120) tons per day	
	☒ Underground conveyors	
	☐ Enclosed systems for conveying plastic raw materials and plastic finished goods	
x	32. Coal bunker and coal scale exhausts and associated dust collector vents	2-7-1(21)(G)(xv)
	33. Asbestos abatement projects regulated by 326 IAC 14-10	2-7-1(21)(G)(xvi)

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Part B: Insignificant Activities (continued)

Part B is intended to identify all insignificant activities in operation at the source as defined in 326 IAC 2-7-1(21)(G). **Please use this table as a checklist.** Indicate which activities are present by checking the appropriate box. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Insignificant Activity	Citation (326 IAC)
See Table 16	34. Routine maintenance and repair of buildings, structures, or vehicles at the source where air emissions from those activities would not be associated with any production process, including the following:	2-7-1(21)(G)(xvii)
	☒ Purging of gas lines ☒ Purging of vessels	
	35. Flue gas conditioning systems and associated chemicals such as the following:	2-7-1(21)(G)(xviii)
	☐ Sodium sulfate ☒ Ammonia ☐ Sulfur trioxide.	
	36. Equipment used to collect any material that might be released during a malfunction, process upset, or spill cleanup, including the following:	2-7-1(21)(G)(xix)
	☐ Catch tanks ☐ Temporary liquid separators ☒ Tanks ☒ Fluid handling equipment	
	37. Blowdown for the following:	2-7-1(21)(G)(xx)
	☐ Sight glass ☒ Boiler ☐ Compressors ☐ Pumps ☒ Cooling tower	
	38. Furnaces used for melting metals other than beryllium with a brim full capacity of less than or equal to four hundred fifty (450) cubic inches by volume	2-7-1(21)(G)(xxi)
	39. Activities associated with emergencies, including the following:	2-7-1(21)(G)(xxii)
	☒ On-site fire training approved by the IDEM	
	☐ Emergency generators as follows:	
	☐ Gasoline generators not exceeding one hundred ten (110) horsepower	
	☐ Diesel generators not exceeding one thousand six hundred (1,600) horsepower	
	☐ Natural gas turbines or reciprocating engines not exceeding sixteen thousand (16,000) horsepower	
	☒ Stationary fire pump engines	
	40. Grinding and machining operations controlled with fabric filters, scrubbers, mist collectors, wet collectors and electrostatic precipitators with a design grain loading of less than or equal to three one-hundredths grains per actual cubic foot (0.03 gr/acf) and a gas flow rate less than or equal to four thousand actual cubic feet per minute (4,000 acf/min), including the following:	2-7-1(21)(G)(xxiii)
	☐ Deburring ☐ Polishing ☐ Pneumatic conveying ☐ Buffing ☐ Abrasive blasting ☐ Woodworking operations	
**	41. Purge double block and bleed valves	2-7-1(21)(G)(xxiv)
	42. Filter or coalescer media changeout	2-7-1(21)(G)(xxv)
	43. Vents from ash transport systems not operated at positive pressure	2-7-1(21)(G)(xxvi)
	44. Mold release agents using low volatile products (vapor pressure less than or equal to two kilo Pascals (2kPa) measured at thirty-eight degrees Centigrade (38°C)	2-7-1(21)(G)(xxvii)
	45. Farm operations	2-7-1(21)(G)(xviii)

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Part B: Insignificant Activities (continued)

Part B identifies all insignificant activities in operation at the source as defined in 326 IAC 2-7-1(21)(G). **Please use this table as a checklist.** Indicate which activities are present by checking the appropriate box. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Insignificant Activity	Citation (326 IAC)
See Table 16	46. Woodworking equipment controlled by a baghouse provided that the following criteria are met:	2-7-1(21)(G)(xxix)
	☐ The baghouse does not exhaust to the atmosphere greater than one hundred twenty-five thousand (125,000) cubic feet per minute	
	☐ The baghouse does not emit particulate matter with a diameter less than ten (10) microns in excess of three-thousandths grains per dry standard cubic feet (0.003 gr/dscf) of outlet air	
	☐ Opacity from the baghouse does not exceed ten percent (10%)	
	☐ The baghouse is in operation at all times the woodworking equipment is in use	
	☐ Visible emissions from the baghouse are observed daily using procedures in accordance with 40 CFR 60, Appendix A, Method 22 and normal or abnormal emissions are recorded. In the event abnormal emissions are observed for greater than six (6) minutes in duration, the following shall occur:	
	☐ The baghouse shall be inspected	
	☐ Corrective actions, such as replacing or reseating bags, are initiated, when necessary	
	☐ The baghouse is inspected quarterly when vented to the atmosphere	
	☐ The owner or operator keeps the following records:	
	☐ Records documenting the date when the baghouse redirected indoors or to the atmosphere	
	☐ Quarterly inspection reports, when vented to the atmosphere	
	☐ Visible observation reports	
	☐ Records of corrective actions	
	47. Woodworking equipment controlled by a baghouse provided that the following criteria are met:	2-7-1(21)(G)(xxx)
	☐ The baghouse does not exhaust to the atmosphere greater than forty thousand (40,000) cubic feet per minute	
	☐ The baghouse does not emit particulate matter with a diameter less than ten (10) microns in excess of one-hundredth grains per dry standard cubic feet (0.01 gr/dscf) of outlet air	
	☐ Opacity from the baghouse does not exceed ten percent (10%)	
	☐ The baghouse is in operation at all times the woodworking equipment is in use	
	☐ Visible emissions from the baghouse are observed daily using procedures in accordance with 40 CFR 60, Appendix A, Method 22 and normal or abnormal emissions are recorded. In the event abnormal emissions are observed for greater than six (6) minutes in duration, the following shall occur:	
	☐ The baghouse shall be inspected	
	☐ Corrective actions, such as replacing or reseating bags, are initiated, when necessary	
	☐ The baghouse is inspected quarterly when vented to the atmosphere	
	☐ The owner or operator keeps the following records:	
	☐ Records documenting the date when the baghouse redirected indoors or to the atmosphere	
	☐ Quarterly inspection reports, when vented to the atmosphere	
	☐ Visible observation reports	
	☐ Records of corrective actions	

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Part C: Insignificant Laboratory, Research, and Educational Activities

Part C identifies insignificant activities in operation at the source as defined in 326 IAC 2-7-1(21), paragraph (D), (E), or (F). **Please use this table as a checklist.** Indicate which activities are present by checking the appropriate box. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Unit ID	Description of Insignificant Activity
See Table 16	48. ☐ Emissions from a laboratory as defined in 2-7-1(21)(D).
	49. ☐ Emissions from research and development activities as defined in 2-7-1(21)(E).
	50. ☐ Emissions from educational and teaching activities as defined in 2-7-1(21)(F).

Part D: Other Insignificant Activities

Part D identifies all other insignificant activities in operation at the source (as defined in 326 IAC 2-7-1(21), paragraphs (A) and (B) as those activities with potential uncontrolled emissions equal to or less than the thresholds listed below) that are not identified above in Parts A, B, or C. If applicable, provide the Emissions Unit Identification number that corresponds to the Plant Layout and Process Flow diagrams.

Carbon Monoxide (CO) ≤ 25 lb/day	Particulate Matter with aerodynamic diameter ≤ 10μm (PM_{10}) ≤ 5 lbs/hr or 25 lb/day
Lead (Pb) ≤ 0.6 ton/yr or 3.29 lb/day	Sulfur Dioxide (SO_2) ≤ 5 lbs/hr or 25 lb/day
Nitrogen Oxides (NO_x) ≤ 5 lbs/hr or 25 lb/day	Volatile Organic Compounds (VOC) ≤ 3 lbs/hr or 15 lb/day

51. **Other Insignificant Activities**: Identify any "other activities", and provide a brief description.

Unit ID	Description of Other Activity

Continued on Next Page

Part E: Insignificant Activities with HAP Emissions

Part D identifies all insignificant activities in operation at the source (as defined in 326 IAC 2-7-1(21)(C)) that have the potential to emit hazardous air pollutants (HAP). These activities may or may not be identified above in Parts A, B, or D. **Activities listed in Part C above, need not be listed in this section.** Indicate which type of "Insignificant HAP Activities" are present by checking the appropriate box, and provide a brief description.

52. **Individual HAP Emissions:**
Identify any emissions unit, not regulated by a NESHAP, emitting greater than 1 pound per day but less than 5 pounds per day or 1 ton per year of a single HAP.

Emissions Unit	HAP	Brief Description	Applicable Requirements
See Table 16			

53. **Combination HAP Emissions:**
Identify any emissions unit, not regulated by a NESHAP, emitting greater than 1 pound per day but less than 12.5 pounds per day or 2.5 ton per year of a combination of HAPs.

Emissions Unit	HAPs	Brief Description	Applicable Requirements

Continued on Next Page

Part E: Specifically Regulated Insignificant Activities

Part E identifies all specifically regulated insignificant activities. Examples of specifically regulated activities that may have insignificant emissions include boilers, process heaters, any activity regulated under a federal rule such as MACT or BACT, etc. If you are not sure if an emissions unit would be considered a specifically regulated insignificant activity, contact the Air Permit Reviewer of the Day for additional guidance.

54. Unit ID	55. Stack / Vent ID	56. Pollutant	57. Actual Emissions		58. Potential to Emit		59. Citation
			Standard Units	Tons Per Year	Standard Units	Tons Per Year	
See Table 16							

OAQ GENERAL SOURCE DATA APPLICATION
GSD-13: Affidavit of Applicability
State Form 51603 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-13 is to certify that the requirement to notify adjacent landowners and occupants is applicable to the source of air pollutant emissions.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

PART A: Affidavit Of Applicability

Complete this form to certify that the requirement to notify adjacent landowners and occupants pursuant to Indiana Code (IC) 13-15-8 is applicable to the source of air pollutant emissions. This form must be notarized by a public notary.

Gregory Merle, being first duly sworn upon oath, deposes and says:

1. I live in Fairfield County, State of Connecticut, and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.
2. I hold the position of President for Riverview Energy Corporation (permit applicant's or facility's name).
3. By virtue of my position with Riverview Energy Corporation (permit applicant's name), I am authorized to make the representation contained in this affidavit on behalf of the facility.

I understand that the notice requirements of Ind. Code §13-15-8 applies to Riverview Energy Corporation permit applicant's or facility's name) for purposes of the accompanying permit application.

5. As required by Indiana Code § 13-15-8, the permit applicant will send written notice to adjacent landowners not more than ten (10) days after submission of the accompanying application for an Air Pollution Source Construction Permit (briefly describe type of permit application) filed on behalf of Riverview Energy Corporation (permit applicant's or facility's name).

6. **Further Affiant Saith Not.**

☒ I affirm under the penalty for perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Gregory Merle
Name *(typed)*

President
Title

Signature

1-25-18
Date

STATE OF Connecticut

COUNTY OF Fairfield

PART B: Notarization

This section must be completed by a Public Notary.

Before me a notary Public in and for said County and State, personally appeared Gregory Merle, and being first duly sworn by me upon oath, says that the fact stated in the foregoing instrument are true. Signed and sealed this 25th of January, 20__

Printed: Joyce Weidner My Commission Expires: 5/31/2024

Residence of Indiana County Marion

NOTARY PUBLIC STATE OF [illegible]

OAQ GENERAL SOURCE DATA APPLICATION
GSD-14: Owners and Occupants Notified

State Form 51609 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:
- The purpose of GSD-14 is to identify adjacent landowners and occupants that are to be notified that an air permit application has been submitted.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Owners And Occupants Notified

Use this table to identify adjacent landowners and occupants that you have notified of your intent to construct pursuant to Indiana Code (IC) 13-15-8. If you need additional space, you may make copies of this form.

1. Owner / Occupant Name: Roger L. Payne | **2. Date Notified:**
3. Address: 4130 East CR 2100 North
City: Dale | **State:** IN | **ZIP Code:** 47523 –
4. Electronic Mail: | **5. Telephone Number:** (812) 937 - 4834
6. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Owner / Occupant Name: Gene and Lola Michel | **Date Notified:**
Address: P.O. Box 318
City: Santa Claus | **State:** IN | **ZIP Code:** 47579–
Electronic Mail: | **Telephone Number:** ( ) -
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Owner / Occupant Name: Myron Pugh | **Date Notified:**
Address: 779 South Thompson Drive
City: Paoli | **State:** IN | **ZIP Code:** 47454 –
Electronic Mail: | **Telephone Number:** ( ) -
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Owner / Occupant Name: Hoosier Energy Rural Electric Cooperative | **Date Notified:**
Address: P.O. Box 908
City: Bloomington | **State:** IN | **ZIP Code:** 47402 – 0908
Electronic Mail: jsouders@hepn.com | **Telephone Number:** (812) 876 - 0294
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Owner / Occupant Name: Winkler, Inc. | **Date Notified:**
Address: P.O. Box 68
City: Dale | **State:** IN | **ZIP Code:** 47523–
Electronic Mail: | **Telephone Number:** (812) 937 - 4421
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

OAQ GENERAL SOURCE DATA APPLICATION
GSD-14: Owners and Occupants Notified

State Form 51609 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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www.IN.gov/idem

NOTES:

- The purpose of GSD-14 is to identify adjacent landowners and occupants that are to be notified that an air permit application has been submitted.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
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Owners And Occupants Notified

Use this table to identify adjacent landowners and occupants that you have notified of your intent to construct pursuant to Indiana Code (IC) 13-15-8. If you need additional space, you may make copies of this form.

1. Owner / Occupant Name: Larry J Gries		**2. Date Notified:**
3. Address: 20520 North Gries Road		
City: Dale	**State:** IN	**ZIP Code:** 47523
4. Electronic Mail:	**5. Telephone Number:** (812) 630 - 2905	
6. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Sylvester Gries		**Date Notified:**
Address: 20670 North CR 515 East		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Robert and Ruth Gaesser		**Date Notified:**
Address: 20861 N CR 500 E		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
Electronic Mail:	**Telephone Number:** (812) 937 - 2754	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Alyssa and Sean Sermersheim		**Date Notified:**
Address: 20569 N CR 500 E		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Charles and Janice Gogel		**Date Notified:**
Address: 3209 Leslie Drive		
City: Jasper	**State:** IN	**ZIP Code:** 47546 –
Electronic Mail:	**Telephone Number:** (812) 482 - 9080	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		

OAQ GENERAL SOURCE DATA APPLICATION
GSD-14: Owners and Occupants Notified
State Form 51609 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-14 is to identify adjacent landowners and occupants that are to be notified that an air permit application has been submitted.
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Owners And Occupants Notified

Use this table to identify adjacent landowners and occupants that you have notified of your intent to construct pursuant to Indiana Code (IC) 13-15-8. If you need additional space, you may make copies of this form.

1. Owner / Occupant Name: Rebecca & Grandersen & Charity James		**2. Date Notified:**
3. Address: 20333 N CR 500 E		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
4. Electronic Mail:	**5. Telephone Number:** ( ) -	
6. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Town of Dale		**Date Notified:**
Address: P.O. Box 117 103 South Wallace Street		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
Electronic Mail:	**Telephone Number:** 812) 937 - 2086	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Vernon Geiss		**Date Notified:**
Address: 7233 Old Vincennes Road		
City: Floyd Knobs	**State:** IN	**ZIP Code:** 47119 –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Tempel Land & Livestock LLC		**Date Notified:**
Address: 3805 E CR 2000 N		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
Electronic Mail:	**Telephone Number:** (812) 499 - 7862	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Gerald and Geraldine Brenner		**Date Notified:**
Address: 4487 E CR 2000 N		
City: Dale	**State:** IN	**ZIP Code:** 47523 –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		

OAQ GENERAL SOURCE DATA APPLICATION
GSD-14: Owners and Occupants Notified

State Form 51609 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Facsimile Number: (317) 232-6749
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NOTES:

- The purpose of GSD-14 is to identify adjacent landowners and occupants that are to be notified that an air permit application has been submitted.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Owners And Occupants Notified		
Use this table to identify adjacent landowners and occupants that you have notified of your intent to construct pursuant to Indiana Code (IC) 13-15-8. If you need additional space, you may make copies of this form.		
1. Owner / Occupant Name: Nicholas Gerlach		**2. Date Notified:**
3. Address: 4405 E CR 2000 North		
City: Dale	**State:** IN	**ZIP Code:** 47523-
4. Electronic Mail:	**5. Telephone Number:** (~~812~~) ~~937-2753~~	
6. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Roger Wilson		**Date Notified:**
Address: 4443 East CR 2000 N		
City: Dale	**State:** In	**ZIP Code:** 47523-
Electronic Mail:	**Telephone Number:** (812) 937-2753	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Virlee Waninger		**Date Notified:**
Address: 4381 E CR 2000 N		
City: Dale	**State:** IN	**ZIP Code:** -
Electronic Mail:	**Telephone Number:** (812) 937-4325	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Leander Tempel		**Date Notified:**
Address: 4327 E CR 2000 N		
City: Dale	**State:** IN	**ZIP Code:** 47523-
Electronic Mail:	**Telephone Number:** (812) 499 - 7862	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Dennis Forler and Roger Forler		**Date Notified:**
Address: P.O. Box 465		
City: Santa Claus	**State:** IN	**ZIP Code:** 47579-
Electronic Mail: rogerforler@gmail.com	**Telephone Number:** (812) 639-1001	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		

OAQ GENERAL SOURCE DATA APPLICATION
GSD-14: Owners and Occupants Notified

State Form 51609 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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NOTES:

- The purpose of GSD-14 is to identify adjacent landowners and occupants that are to be notified that an air permit application has been submitted.
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Owners And Occupants Notified

Use this table to identify adjacent landowners and occupants that you have notified of your intent to construct pursuant to Indiana Code (IC) 13-15-8. If you need additional space, you may make copies of this form.

1. Owner / Occupant Name: I - 64 Realty LLC		**2. Date Notified:**
3. Address: 602 Orchard Lane		
City: Huntingburg	**State:** IN	**ZIP Code:** 47642–
4. Electronic Mail: jimkulbeth@fwc.com	**5. Telephone Number:** (812) 309-0371	
6. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Aneopam, Inc		**Date Notified:**
Address: 1339 N Washington St		
City: Dale	**State:** IN	**ZIP Code:** 47325–
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name: Servus Inc		**Date Notified:**
Address: 4201 Mannheim Rd Ste A		
City: Jasper	**State:** IN	**ZIP Code:** 47546– 9628
Electronic Mail: cmeyer@brsidal.net	**Telephone Number:** (812)634 - 5031	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name:		**Date Notified:**
Address:		
City:	**State:**	**ZIP Code:** –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☐ Standard Mail ☐ Other *(specify)*:		
Owner / Occupant Name:		**Date Notified:**
Address:		
City:	**State:**	**ZIP Code:** –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☐ Standard Mail ☐ Other *(specify)*:		

OAQ GENERAL SOURCE DATA APPLICATION
GSD-15: Government Officials Notified

State Form 51608 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-15 is to identify local government officials that are to be notified that an air permit application has been submitted.
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Government Officials Notified

Use this table to identify local government officials that should be notified pursuant to Indiana Code (IC) 13-15-3-1 that an air permit application has been submitted. If you need additional space, you may make copies of this form.

1. Name: Ray Streigel | **2. Date Notified:**
3. Title: President, Dale Town Council
4. Address: Dale Town Hall 103 South Wallace Street P.O. Box 117
City: Dale | **State:** IN | **ZIP Code:** 47523 –
5. Electronic Mail: | **6. Telephone Number:** (812) 937- 4781
7. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Name: James Seiler | **Date Notified:**
Title: President, Spencer County Board of Commissioners
Address: 2351 North Orchard Road
City: Rockport | **State:** IN | **ZIP Code:** 47635
Electronic Mail: | **Telephone Number:** (812)686 - 3102
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Name: Al Logsdon | **Date Notified:**
Title: Commissioner, Spencer County Board of Commissioners
Address: P.O. Box 733
City: Santa Claus | **State:** IN | **ZIP Code:** 47579 –
Electronic Mail: | **Telephone Number:** (812) 686 - 1289
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

Name: Tom Brown | **Date Notified:**
Title: Commissioner, Spencer County Board of Commissioners
Address: 6378 East CR 700 N
City: Grandview | **State:** IN | **ZIP Code:** 47615 –
Electronic Mail: | **Telephone Number:** (812)362 - 8302
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:

OAQ GENERAL SOURCE DATA APPLICATION
GSD-15: Government Officials Notified

State Form 51608 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
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NOTES:

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Government Officials Notified

Use this table to identify local government officials that should be notified pursuant to Indiana Code (IC) 13-15-3-1 that an air permit application has been submitted. If you need additional space, you may make copies of this form.

1. Name: Gay Ann Harney		**2. Date Notified:**
3. Title: Mayor of Rockport, IN		
4. Address: Rockport City Hall 426 Main Street		
City: Rockport	**State:** IN	**ZIP Code:** 47635 -
5. Electronic Mail:	**6. Telephone Number:** (812)649 - 2242	
7. Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Name: Jack Kroeger		**Date Notified:**
Title: Spencer County Council		
Address: P.O. Box 668		
City: Santa Claus	**State:** IN	**ZIP Code:** 47579 -
Electronic Mail:	**Telephone Number:** (812) 544 - 2762	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Name: Cindy Morrison		**Date Notified:**
Title: Dale, Indiana Clerk Treasurer		
Address: Dale Town Hall P.O. Box 117		
City: Dale	**State:** IN	**ZIP Code:** 47523-
Electronic Mail:	**Telephone Number:** (812) 937 - 2086	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		
Name: Jefferson Lindsey		**Date Notified:**
Title: Spencer County Attorney		
Address: 217 Main Street		
City: Rockport	**State:** IN	**ZIP Code:** 47635-
Electronic Mail:	**Telephone Number:** (812)649 - 4571	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☒ Standard Mail ☐ Other *(specify)*:		

OAQ GENERAL SOURCE DATA APPLICATION
GSD-15: Government Officials Notified

State Form 51608 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Indianapolis, IN 46204-2251
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Toll Free: 1-800-451-6027 x30178 (within Indiana)
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Government Officials Notified		
Use this table to identify local government officials that should be notified pursuant to Indiana Code (IC) 13-15-3-1 that an air permit application has been submitted. If you need additional space, you may make copies of this form.		
1. Name:		**2. Date Notified:**
3. Title:		
4. Address:		
City:	**State:**	**ZIP Code:** –
5. Electronic Mail:	**6. Telephone Number:** ( ) -	
7. Method of Notification: ☐ Telephone ☐ Electronic Mail ☐ Standard Mail ☐ Other *(specify)*:		
Name:		**Date Notified:**
Title:		
Address:		
City:	**State:**	**ZIP Code:** –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☐ Standard Mail ☐ Other *(specify)*:		
Name:		**Date Notified:**
Title:		
Address:		
City:	**State:**	**ZIP Code:** –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☐ Standard Mail ☐ Other *(specify)*:		
Name:		**Date Notified:**
Title:		
Address:		
City:	**State:**	**ZIP Code:** –
Electronic Mail:	**Telephone Number:** ( ) -	
Method of Notification: ☐ Telephone ☐ Electronic Mail ☐ Standard Mail ☐ Other *(specify)*:		

OAQ CONTROL EQUIPMENT APPLICATION
CE-01: Control Equipment Summary
State Form 51904 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CE-01 is to summarize all of the equipment used to control emissions. This is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

Summary of Control Equipment

This table summarizes all of the equipment used to control air pollutant emissions. The identification numbers listed on this form should correspond to the emissions unit identified on the Plant Layout diagram and Process Flow diagram.

1. Control Equipment ID	2. Control Equipment Description	3. Pollutant Controlled	4. Emission Unit ID	5. Stack / Vent ID	6. Applicable Rule
See Table 17					

OAQ CONTROL EQUIPMENT APPLICATION
CE-02: Particulate Control – Baghouse / Fabric Filter

State Form 51953 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CE-02 is to identify all the parameters that describe the baghouse or fabric filter. This is a required form.
- Complete this form once for each baghouse or fabric filter (or once for each set of identical baghouses or fabric filters).
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the particulate control device and describes its physical properties.

1. **Control Equipment ID:** See Table 18
2. **Installation Date:**
3. **Bags or Cartridges?** ☐ Bags ☐ Cartridges
4. **Filter Material:**
5. **Number of Bags/Cartridges per Compartment:**
6. **Number of Compartments:**
7. **Mode of Operation:** ☐ Intermittent ☐ Periodic ☐ Continuous
8. **Cleaning Method:** ☐ Shaking ☐ Reverse Pulse ☐ Reverse Air ☐ Jet Pulse
9. **Cleaning Cycle / Frequency** *(specify units)*:
10. **Is a bag leak detector installed on this device?** ☐ Yes ☐ No
11. **Type / Description of Bag Leak Detector:** ☐ Positive Pressure ☐ Negative Pressure
12. **Air to Cloth Ratio** *(Ex: 1.3 : 1.0)*: :
13. Is **Lime Injection** used on this device? ☐ Yes ☐ No
14. Is **Carbon Injection** used on this device? ☐ Yes ☐ No

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream. Appropriate units must be included if the standard units are not used. For each applicable parameter, provide the inlet and outlet values or provide the differential value.

	A. Units	B. Inlet	C. Outlet	D. Differential
15. Gas Stream Flow Rate				
16. Gas Stream Temperature	°F			
17. Gas Stream Pressure	inches of water			to
18. Moisture Content	%			
19. Particle Size Range	micrometers			to
20. Lime Injection Rate *(if applicable)*	lb/hr			
21. Carbon Injection Rate *(if applicable)*	lb/hr			
22. Other *(specify)*:				

Continued on Next Page

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	23. Units	24. Inlet	25. Outlet	26. Efficiency *(%)*: Capture	Control
☐ **a.** Lead (Pb)	See Table 18				
☐ **b.** Hazardous Air Pollutant (HAP) *(specify)*:					
☐ **c.** Particulate Matter (PM)					
☐ **d.** Particulate Matter less than 10μm (PM_{10})					
☐ **e.** Particulate Matter less than 2.5μm ($PM_{2.5}$)					
☐ **f.** Other Pollutant *(specify)*:					

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

27. Item(s) Monitored:				
28. Monitoring Frequency:				
29. Item(s) Recorded:				
30. Record Keeping Frequency:				
31. Pollutant(s) Tested:				
32. Test Method(s):				
33. Testing Frequency:				

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

34. Do you have a Preventive Maintenance Plan (PMP)?

☐ No PMP is needed. ☐ Yes – the following items are identified on the PMP:

- ☐ **A.** Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
- ☐ **B.** Description of the items or conditions that will be inspected.
- ☐ **C.** Schedule for inspection of items or conditions described above.
- ☐ **D.** Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

PART F: Determination of Integral Control

Part F provides explanation to determine whether the control device should be considered integral to the process.

35. Has IDEM already made an integral control determination for this device? ☐ No ☐ Yes
If "Yes", provide the following:

Permit Number:	**Issuance Date:**	**Determination:** ☐ Integral ☐ Not Integral

36. Is this device integral to the process? ☐ No ☐ Yes
If "Yes", provide the reason(s) why the device is integral.

OAQ CONTROL EQUIPMENT APPLICATION
CE-06: Organics – Flare / Oxidizer / Incinerator
State Form 52623 (R / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CE-06 is to identify all the parameters that describe the oxidizer or incinerator. This is a required form.
- Complete this form once for each oxidizer or incinerator (or once for each set of identical oxidizers or incinerators).
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the control device and describes its physical properties.

1. **Control Equipment ID:** See Table 19
2. **Installation Date:**
3. **Incineration Method:** ☒ Flare ☐ Thermal Oxidizer ☐ Catalytic Oxidizer ☐ Other *(specify)*:
4. **Residence Time** *(specify units)*:
5. **Hood Static Pressure** *(specify units)*: *Negative Pressure?* ☐ Yes ☐ No
6. **Bed Temperature at the Flame Zone:** °F
7. **Fuel Used:** ☐ Not Applicable ☒ Natural Gas Only ☐ Other – *Attach completed PI-02F form.*
8. Is the **Gas Stream used as Overfire Air?** ☐ No ☐ Yes: *Combustion Unit ID:*
9. **Location of Flame** *(flares only)*: ☐ Ground Level ☒ Other *(specify elevation and units of measure)*: 150.00 ft.
10. Are **Flame Arrestors** used? *(flares only)* ☐ No ☒ Yes
11. Are **Steam Jets** used? *(flares only)* ☒ No ☐ Yes
12. **How is the flare used?** *(flares only)* ☒ Emergency only ☐ Normal Operation ☐ Other *(specify)*:
13. **Catalyst Material:** ☐ None ☐ Specify: ☐ *Not Applicable*
14. **Number of Catalyst Beds:**
15. Is the **Catalyst Cleaned** and reused on-site? ☐ Yes ☐ No ☐ *Not Applicable*
16. Is a **Heat Exchanger** used to recover heat on this device? ☐ Yes ☐ No ☐ *Not Applicable*
17. **Heat Exchanger Type:** ☐ Recuperator ☐ Regenerator ☐ Other *(specify)*:

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream.

	A. Units	B. Inlet	C. Outlet	D. Differential
18. **Organic Vapor Concentration** *(by volume)*	ppmv			
19. **Gas Stream Flow Rate**	ACFM			
20. **Moisture Content**	%			
21. **Heat Content** *(for Flares)*	%			
22. **Excess Oxygen** *(for Oxidizers)*	%			
23. **Particle Size Range**	micrometers			to
24. **Other** *(specify)*:				

Continued on Next Page

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	25. Units	26. Inlet	27. Outlet	28. Efficiency *(%)*: Capture	Control
☐ **a.** Carbon Monoxide (CO)	See Table 19				
☐ **b.** Hazardous Air Pollutant (HAP) *(specify)*:					
☐ **c.** Particulate Matter (PM)					
☐ **d.** Particulate Matter less than 10μm (PM_{10})					
☐ **e.** Particulate Matter less than 2.5μm ($PM_{2.5}$)					
☐ **f.** Volatile Organic Compounds (VOC)					
☐ **g.** Other Pollutant *(specify)*:					

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

29. Item(s) Monitored:				
30. Monitoring Frequency:				
31. Item(s) Recorded:				
32. Record Keeping Frequency:				
33. Pollutant(s) Tested:				
34. Test Method(s):				
35. Testing Frequency:				

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

36. Do you have a Preventive Maintenance Plan (PMP)?

☐ No PMP is needed. ☐ Yes – the following items are identified on the PMP:

- ☐ **A.** Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
- ☐ **B.** Description of the items or conditions that will be inspected.
- ☐ **C.** Schedule for inspection of items or conditions described above.
- ☐ **D.** Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

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OAQ PROCESS INFORMATION APPLICATION
PI-02A: Combustion Unit Summary

State Form 52535 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to summarize all of the combustion process units.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

Form ID	Form Title	Guidance on when to submit the form
PI-02A	Combustion Unit Summary	Complete once for each application.
PI-02B	Boilers & Process Heaters	Complete once for each boiler or process heater.
PI-02C	Turbines & Internal Combustion Engines	Complete once for each turbine or internal combustion engine.
PI-02D	Incinerators & Combustors	Complete once for each incinerator or combustor.
PI-02E	Kilns	Complete once for each kiln.
PI-02F	Fuel Use	Complete once for each emissions unit that burns fuel **other than natural gas**.
PI-02G	Emission Factors	Complete once for each emissions unit.
PI-02H	Federal Rule Applicability	Complete once for each emissions unit.

Summary of Combustion Units

This table summarizes all the combustion units at the source. If there are multiple combustion units that are identical in nature, capacity, and use, you may use one row to summarize the identical units.

1. Combustion Unit Type	2. Number of Identical Units	3. Unit ID(s)	4. Date of Installation or Modification *(actual or anticipated)*	5. Heat Input Rate of each unit *(MMBtu/hr)*	6. Emergency / Back-Up Unit?
See Table 20					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No

OAQ PROCESS INFORMATION APPLICATION
PI-02B: Combustion – Boilers, Process Heaters & Furnaces

State Form 52536 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
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Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to specify details that pertain only to boilers, process heaters and furnaces.
- For the purposes of this form, a process heater is any combustion unit that provides heat directly or indirectly to the process.
- Complete one PI-02B form for each emissions unit. If there are multiple emission units that are identical in nature, capacity, and use, you may use one PI-02B form to summarize the units.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Process Unit Details

Part A specifies operating information that is unique to boilers, process heaters and furnaces. Definitions and additional explanation of terminology are included in the instructions for this form.

1. Unit ID: See Table 20

2. Type of Combustion Unit

☐ Boiler:	☐ Industrial Boiler ☐ Institutional Boiler	☐ Commercial Boiler ☐ Horseshoe Boiler
☐ Process Heater:	☐ Dutch Oven ☐ Fuel Cell	☐ Drying Oven ☐ Space Heater
☐ Furnace:	☐ Crucible ☐ Cupola ☐ Electric Induction ☐ Open Hearth, Oxygen Lanced ☐ Reverberatory	☐ Crucible Pot ☐ Electric Arc ☐ Open Hearth ☐ Pot ☐ Sweat

3. Combustion Process

☐ Cyclone Burner	☐ Fluidized Bed – *Circulating*	☐ Fluidized Bed – *Bubbling*
☐ Overfeed Stoker / Traveling Grate	☐ Pulverized – *Dry Bottom*	☐ Pulverized – *Wet Bottom*
☐ Spreader Stoker	☐ Underfeed Stoker	☐ Other *(specify)*: _____

4. Heat Transfer Method: ☐ Watertube ☐ Firetube ☐ Cast Iron

5. Transfer Surface Arrangement *(check all that apply)*: ☐ Horizontal ☐ Straight ☐ Vertical ☐ Bent Tube

6. Firing Configuration:

☐ Cyclone	☐ Fluidized Bed Combustor	☐ Front Wall
☐ Horizontally Opposed	☐ Normal	☐ Stoker
☐ Suspension	☐ Tangential	

7. Heat Transfer Method *(process heaters only)*: ☐ Direct ☐ Indirect

8. Fuel Used: ☐ Natural Gas Only ☐ Other – *Attach completed PI-02F.*

Continued on Next Page

PART B: Emission Controls and Limitations

Part B identifies control technology, control techniques or other process limitations that impact air emissions.

9. Add-On Control Technology: *Identify all control technologies used for this process. Attach completed CE-01 (unless "none").*

- ☐ None
- ☐ Baghouse / Fabric Filter – *Attach CE-02.*
- ☐ Electrostatic Precipitator – *Attach CE-04.*
- ☐ NO_X Reduction – *Attach CE-09.*
- ☐ Cyclone – *Attach CE-03.*
- ☐ Absorption / Wet Collector / Scrubber – *Attach CE-05.*
- ☐ Other *(specify)*: – *Attach CE-10.*

10. Control Techniques: *Identify all control techniques used for this process.*

- ☐ None *(explain)*:
- ☐ Ammonia Injection
- ☐ Burners Out Of Service
- ☐ Flyash Reinjection
- ☐ Low Excess Air
- ☐ Reburn
- ☐ Staged Combustion
- ☐ Biased Burner Firing
- ☐ Duct Injection
- ☐ Furnace Injection
- ☐ Low NO_X Burners
- ☐ Reduced Air Preheat
- ☐ Other *(specify)*:
- ☐ Burning Oil / Water Emulsions
- ☐ Flue Gas Recirculation
- ☐ Load Reduction
- ☐ Overfire Air
- ☐ Spray Drying

– *Attach completed GSD-09.*

11. Process Limitations / Additional Information: *Identify any acceptable process limitations. Attach additional information if necessary.*

PART C: Previously Installed Boilers

Part C identifies all boilers that were installed prior to submitting this application.

12. Are there any **Previously Installed Boilers** present at this source?

☒ No – Proceed to Part D.

☐ Yes → ☐ Information attached. ☐ Information is contained in operating permit:

PART D: Furnace Details

Part D identifies details that pertain only to furnaces. If there are no furnaces identified with this application, completion of this table is not required.

13. Material Melted:

14. Maximum Melt Rate *(specify units)*:

15. Flux Type: ☐ MSDS attached.

16. Flux Amount *(specify units)*:

17. Oven Throughput Material:

OAQ PROCESS INFORMATION APPLICATION
PI-02C: Combustion – Turbines & Reciprocating Internal Combustion Engines

State Form 52537 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to specify details that pertain only to turbines and internal combustion engines.
- Complete one PI-02C form for each emissions unit. If there are multiple emission units that are identical in nature, capacity, and use, you may use one PI-02C form to summarize the units.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Process Unit Details	
Part A specifies operating information that is unique to turbines and reciprocating internal combustion engines. Definitions and additional explanation of terminology are included in the instructions for this form.	
1. Unit ID: See Table 20	
2. Type of Combustion Unit	
☐ Turbine:	☐ Simple Cycle ☐ Regenerative Cycle ☐ Cogeneration ☐ Combined Cycle
☐ Reciprocating Internal Combustion Engine:	☐ 2-stroke lean-burn ☐ 4-stroke lean-burn ☐ 4-stroke rich-burn
3. Combustion Process:	☐ Diffusion Flame Combustion ☐ Lean-Premix Staged Combustion
4. Ignition Type:	☐ Spark ☐ Compression
5. Power Output:	horsepower (hp) megawatts (MW)
6. Duty Cycle:	hours per year (hr/yr)
7. Fuel Used:	☐ Natural Gas Only ☐ Other – *Attach completed PI-02F.*
8. Does this combustion unit supply power to an emergency generator?	☐ Yes ☐ No

This space was intentionally left blank.

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PART B: Emission Controls and Limitations

Part B identifies control technology, control techniques or other process limitations that impact air emissions.

9. Add-On Control Technology: *Identify all control technologies used for this process. Attach completed CE-01 (unless "none").*

- ☐ None
- ☐ Catalytic Oxidation – *Attach CE-06*
- ☐ Other *(specify)*:
- ☐ NO_X Reduction – *Attach CE-09*
- – *Attach CE-10.*

10. Control Techniques: *Identify all control techniques used for this process.*

- ☐ None *(explain)*:
- ☐ Air-To-Fuel Ratio Adjustments
- ☐ Boiling Point adjusted to 10% and 90%
- ☐ Charge Cooling
- ☐ Derating
- ☐ Exhaust Gas Recirculation
- ☐ Fuel Injection Pressure
- ☐ Injection Timing Retard
- ☐ Lean Combustion
- ☐ Oil Consumption Control
- ☐ Rapid Spill Nozzles
- ☐ Two Stage Lean / Lean Combustion
- ☐ Water/Fuel Emulsions
- ☐ Other *(specify)*:
- ☐ Aromatic Content Increase
- ☐ Cetane Number
- ☐ Combustion Chamber Modifications
- ☐ Electronic Timing & Metering
- ☐ Fuel Additives
- ☐ Injection Rate Control
- ☐ Injector Nozzle Geometry
- ☐ Low Sulfur Content Fuel
- ☐ Pre-ignition Chamber Combustion
- ☐ Turbocharging
- ☐ Two Stage Rich / Lean Combustion
- ☐ Water / Steam Injection
- – *Attach completed GSD-09.*

11. Process Limitations / Additional Information: *Identify any acceptable process limitations. Attach additional information if necessary.*

OAQ PROCESS INFORMATION APPLICATION
PI-02F: Combustion – Fuel Use

State Form 52540 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to identify each fuel that will be used in the combustion unit. Definitions and additional explanation of terminology are included in the instructions for this form.
- Complete one form PI-02F for each combustion unit. If the unit has any capability of using a fuel, even if on a backup or intermittent basis, complete the applicable section. Using a fuel that is not specified in the permit is a violation of the permit.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Process Unit Identification

1. Unit ID: See Table 20

PART B: Gaseous Fuels

Part B identifies the gaseous fuels that will be used in the combustion unit.

2. Fuel Type:	3. Percent of Fuel Use *(by volume)*	4. Primary or Secondary Fuel?	5. Component Percentages:	6. Heating Value:
☐ Natural Gas		☐ Primary ☐ Secondary	Sulfur:	*(Btu/ft^3)*
☐ Liquefied Petroleum Gas ☐ *Commercial- Propane* ☐ *Engine Fuel Propane (HD-5)* ☐ *Commercial- Butane*		☐ Primary ☐ Secondary	Sulfur: Butane: Propane:	*(Btu/ft^3)*
☐ Process Gas *		☐ Primary ☐ Secondary	Sulfur:	*(Btu/ft^3)*
☐ Landfill Gas *		☐ Primary ☐ Secondary	Sulfur:	*(Btu/ft^3)*
☐ Other *(specify)*:		☐ Primary ☐ Secondary	: :	*(Btu/ft^3)*

* Indicate the source of the process or landfill gas:

Continued on Next Page

PART C: Liquid Fuels

Part C identifies the liquid fuels that will be used in the combustion unit.

7. Fuel Type:	8. Percent of Fuel Use *(by volume)*	9. Primary or Secondary Fuel?	10. Component Percentages:	11. Heating Value:	12. Percent Heat:
☐ Residual Fuel Oil ☐ *No. 5 – Heavy* ☐ *No. 5 – Light* ☐ *No. 6 (Bunker C)*	See Table 20	☐ Primary ☐ Secondary	Sulfur:	*(Btu/gal)*	
☐ Distillate Fuel Oil ☐ *No. 1* ☐ *No. 2 (Diesel)* ☐ *No. 4*		☐ Primary ☐ Secondary	Sulfur:	*(Btu/gal)*	
☐ Gasoline		☐ Primary ☐ Secondary	Sulfur:	*(Btu/gal)*	
☐ Waste Oil		☐ Primary ☐ Secondary	Sulfur: Ash: Lead Chlorine:	*(Btu/gal)*	
☐ Liquid Waste *		☐ Primary ☐ Secondary	Sulfur: Fluorine: Chlorine:	*(Btu/gal)*	
☐ Other *(specify)*:		☐ Primary ☐ Secondary	: :	*(Btu/gal)*	

* RCRA alpha-numeric codes for Special or Hazardous Waste to be Burned:

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PART D1: Solid Fuels – Coal

Part D1 identifies all variations of coal that will be used in the combustion unit.

13. Fuel Type:	14. Percent of Fuel Use *(by volume)*	15. Primary or Secondary Fuel?	16. Component Percentages:	17. Heating Value:	18. Basis:
☐ Anthracite Coal ☐ *Anthracite* ☐ *Culm*	See Table 20	☐ Primary ☐ Secondary	Sulfur: Ash: Moisture:	*(Btu/lb)*	☐ Dry ☐ Moist
☐ Bituminous Coal		☐ Primary ☐ Secondary	Sulfur: Ash: Moisture:	*(Btu/lb)*	☐ Dry ☐ Moist
☐ Sub-bituminous Coal		☐ Primary ☐ Secondary	Sulfur: Ash: Moisture:	*(Btu/lb)*	☐ Dry ☐ Moist
☐ Lignite Coal		☐ Primary ☐ Secondary	Sulfur: Ash: Moisture:	*(Btu/lb)*	☐ Dry ☐ Moist
☐ Coke		☐ Primary ☐ Secondary	Sulfur: Ash: Moisture:	*(Btu/lb)*	☐ Dry ☐ Moist
☐ Other Coal *(specify)*:		☐ Primary ☐ Secondary	Sulfur: Ash: Moisture:	*(Btu/gal)*	☐ Dry ☐ Moist

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PART D2: Other Solid Fuels

Part D2 identifies the solid fuels, other than coal, that will be used in the combustion unit.

19. Fuel Type:	20. Percent of Fuel Use (by volume)	21. Primary or Secondary Fuel?	22. Component Percentages:	23. Heating Value:	24. Percent Heat:
☐ Wood or Wood Waste ☐ *Wood Only* ☐ *Wood Residue Only* ☐ *Wood and Wood Residue*	See Table 20	☐ Primary ☐ Secondary	Moisture:	*(Btu/ton)*	
☐ Tires or Tire Derived Fuel ☐ *Whole Tires* ☐ *Tire Derived Fuel*		☐ Primary ☐ Secondary	Sulfur: Chromium: Chlorine:	*(Btu/lb)*	
☐ Bagasse		☐ Primary ☐ Secondary	Ash: Moisture:	*(Btu/lb)*	
☐ Solid Waste *		☐ Primary ☐ Secondary	: :	*(Btu/lb)*	
☐ Other *(specify)*:		☐ Primary ☐ Secondary	: :	*(Btu/lb)*	

*RCRA alpha-numeric codes for Special or Hazardous Waste to be Burned:

PART E: Fuel Consumption Limitations

Use the space provided to specify any fuel consumption limitations that are acceptable for the combustion unit.

OAQ PROCESS INFORMATION APPLICATION
PI-02G: Combustion – Emission Factors

State Form 52541 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to specify the emission factors used to calculate potential to emit from the combustion unit.
- Complete one PI-02G form for each emissions unit. If there are multiple emission units that are identical in nature, capacity, and use, you may use one PI-02G form to summarize the units.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

Emission Factors

This table identifies all emission factors used to calculate air emissions from the combustion unit.

1. Unit ID: See Table 20

2. Air Pollutant:	**3. Emission Factor** value	units	**4. Source of Emission Factor** *(if not using AP-42, include calculations)*
Carbon Monoxide (CO)			☐ AP-42 ☐ Other ☐ N/A
Lead (Pb)			☐ AP-42 ☐ Other ☐ N/A
Hazardous Air Pollutant (HAP) *(specify)*:			☐ AP-42 ☐ Other ☐ N/A
Nitrogen Oxides (NO_X)			☐ AP-42 ☐ Other ☐ N/A
Mercury (Hg)			☐ AP-42 ☐ Other ☐ N/A
Particulate Matter (PM)			☐ AP-42 ☐ Other ☐ N/A
Particulate Matter less than 10μm (PM_{10})			☐ AP-42 ☐ Other ☐ N/A
Particulate Matter less than 2.5μm ($PM_{2.5}$)			☐ AP-42 ☐ Other ☐ N/A
Sulfur Dioxide (SO_2)			☐ AP-42 ☐ Other ☐ N/A
Volatile Organic Compounds (VOC)			☐ AP-42 ☐ Other ☐ N/A
Other *(specify)*:			☐ AP-42 ☐ Other ☐ N/A
Other *(specify)*:			☐ AP-42 ☐ Other ☐ N/A
Other *(specify)*:			☐ AP-42 ☐ Other ☐ N/A

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OAQ PROCESS INFORMATION APPLICATION
PI-02H: Combustion – Federal Rule Applicability
State Form 52542 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to identify any federal rules that apply to the emission unit.
- Complete one PI-02H form for each emissions unit. If there are multiple emission units that are identical in nature, capacity, and use, you may use one PI-02H form to summarize the units.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

Federal Rule Applicability

This table identifies any federal rules that apply to the process.

1. Is a **New Source Performance Standard (NSPS)** applicable to this source? ☒ Yes ☐ No *If yes, attach a completed FED-01 for each rule that applies.*		2. Unit IDs
☐ 40 CFR Part 60, Subpart Cb	Large Municipal Waste Combustors *(constructed before 9/20/1994)*	
☐ 40 CFR Part 60, Subpart Ce	Hospital/Medical/Infectious Waste Incinerators	
☐ 40 CFR Part 60, Subpart D	Fossil-Fuel-Fired Steam Generators *(constructed after 8/17/1971)*	
☐ 40 CFR Part 60, Subpart Da	Electric Utility Steam Generating Units *(constructed after 9/18/1978)*	
☒ 40 CFR Part 60, Subpart Db	Industrial-Commercial-Institutional Generating Units	EU-2001/4, EU-7001/2
☒ 40 CFR Part 60, Subpart Dc	Small Industrial-Commercial-Institutional Generating Units	EU-6000, EU-2002/3
☐ 40 CFR Part 60, Subpart E	Incinerators	
☐ 40 CFR Part 60, Subpart Ea	Municipal Waste Combustors *(constructed after 12/20/1989 and before 9/20/1994)*	
☐ 40 CFR Part 60, Subpart Eb	Large Municipal Waste Combustors *(constructed after 9/20/1994 or modified / reconstructed after 6/19/1996)*	
☐ 40 CFR Part 60, Subpart Ec	Hospital/Medical/Infectious Waste Incinerators *(constructed after 6/20/1996)*	
☐ 40 CFR Part 60, Subpart O	Sewage Treatment Plants *(sludge burners)*	
☒ 40 CFR Part 60, Subpart Y	Coal Preparation Plants	EU-1003/5/6/7
☐ 40 CFR Part 60, Subpart GG	Stationary Gas Turbines	
☐ 40 CFR Part 60, Subpart AAA	New Residential Wood Heaters	
☐ 40 CFR Part 60, Subpart AAAA	Small Municipal Waste Combustion Units *(constructed after 8/30/1999 or modified / reconstructed after 6/6/2001)*	
☐ 40 CFR Part 60, Subpart BBBB	Small Municipal Waste Combustion Units *(constructed on or before 8/30/1999)*	
☐ 40 CFR Part 60, Subpart CCCC	Commercial and Industrial Solid Waste Incineration Units *(constructed after 11/30/1999 or modified / reconstructed after 6/1/2001)*	
☐ 40 CFR Part 60, Subpart DDDD	Commercial and Industrial Solid Waste Incineration Units *(constructed on or before 11/30/1999)*	
☐ 40 CFR Part 60, Subpart KKKK	Stationary Combustion Turbines	

Continued on Next Page

Federal Rule Applicability *(continued)*

This table identifies any federal rules that apply to the process.

3. Is a **National Emission Standard for Hazardous Air Pollutants (NESHAP)** applicable to this source? *If yes, attach a completed FED-01 for each rule that applies.*	☐ Yes ☐ No	4. **Unit IDs**
☐ 40 CFR Part 63, Subpart MM	Combustion Sources at Kraft, Soda, and Sulfite Pulp & Paper Mills	
☐ 40 CFR Part 63, Subpart EEE	Hazardous Waste Combustion	
☐ 40 CFR Part 63, Subpart YYYY	Stationary Combustion Turbines	
☒ 40 CFR Part 63, Subpart ZZZZ	Reciprocating Internal Combustion Engines (RICE)	EU-6006/8
☒ 40 CFR Part 63, Subpart DDDDD	Industrial, Commercial, and Institutional Boilers and Process Heaters	EU-6000, EU-2001/2/3/4, EU-7001/2

5. **Non-Applicability Determination**: *Provide an explanation if the process unit appears subject to a rule (based on the rule title or the source category), but the rule will not apply.*

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OAQ PROCESS INFORMATION APPLICATION
PI-03: Storage & Handling of Bulk Material

State Form 52543 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to obtain detailed information about the storage and handling of bulk materials. Complete one form for each process (or group of identical processes). Use additional forms if necessary. This is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Storage & Handing Information

Part A identifies all process units associated with storage and handling process for bulk materials. If there are multiple process units that are identical in nature, capacity, and use, you may use one form to summarize the data.

1. Equipment / Component Type	2. Unit ID	3. Number of Identical Units	4. Installation Date *(see instructions)*	5. Material Handled/ Stored	6. Maximum Materials Throughput Rate *(tons/year)*
See Table 21					

7. Add-On Control Technology: *Identify all control technologies used for this unit, and attach completed CE-01 (unless "none").*

☐ None
☐ Baghouse / Fabric Filter – *Attach CE-02.*
☐ Electrostatic Precipitator – *Attach CE-04.*
☐ Adsorber – *Attach CE-07.*
☐ Cyclone – *Attach CE-03.*
☐ Absorption / Wet Collector / Scrubber – *Attach CE-05.*
☐ Other *(specify)*: – *Attach CE-10.*

8. Control Techniques: *Identify any other air emission control options used for the process.*

9. Process Limitations / Additional Information: *Identify any acceptable process limitations. Attach additional information if necessary.*

Continued on next page

PART B: Process Material Information

Part B summarizes the process material information. Provide the information in the items below for each material stored and/or handled in this process.

10. Material Handled/Stored *(from table above)*	**11. Method of Handling**	**12. Type of Storage**	**13. Storage Capacity** *(tons)*	**14. Pile Acreage**	**15. Silt Content** *(% by weight)*	**16. Moisture Content** *(% by weight)*
See Table 21						

PART C: Emission Factors

Part C identifies all emission factors used to calculate air emissions from the process units listed on this form.

17. Process Equipment & ID *(complete for all units listed in Part A of this form)*	**18. Air Pollutant**	**19. Emission Factor**		**20. Source of Emission Factor** *(if not using AP-42, include calculations)*	
		value	*units*		
	PM			☐ AP-42	☐ Other
	PM-10			☐ AP-42	☐ Other
				☐ AP-42	☐ Other
				☐ AP-42	☐ Other

PART D: Federal Rule Applicability

Part D identifies any federal rules that apply to the process.

21. Is a **New Source Performance Standard (NSPS)** applicable to this source? ☐ Yes ☐ No
If yes, attach a completed FED-01 for each rule that applies.

☐ 40 CFR Part 60, Subpart CC	Glass Manufacturing Plants
☐ 40 CFR Part 60, Subpart DD	Grain Elevators
☐ 40 CFR Part 60, Subpart HH	Lime Manufacturing Plants
☐ 40 CFR Part 60, Subpart LL	Metallic Mineral Processing Plants
☐ 40 CFR Part 60, Subpart UU	Asphalt Processing and Asphalt Roofing Manufacture
☐ 40 CFR Part 60, Subpart OOO	Non-Metallic Mineral Processing Plants
☐ 40 CFR Part 60, Subpart UUU	Calciners and Dryers in Mineral Industries

22. Is a **National Emission Standard for Hazardous Air Pollutants (NESHAP)** applicable to this source? *If yes, attach a completed FED-01 for each rule that applies.* ☐ Yes ☐ No

☐ 40 CFR Part 61, Subpart _____ *(Specify)*:

☐ 40 CFR Part 63, Subpart _____ *(Specify)*:

23. Non-Applicability Determination: Provide an explanation if the process unit appears subject to a rule (based on the rule title or the source category), but the rule will not apply.

PI-14: Volatile Organic Liquid Compound Storage

State Form 52554 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to obtain detailed information about all tanks larger than 250 gallons that are used to store volatile organic liquid compounds. Duplicate this form as necessary.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Tank Identification

Part A identifies and describes the tank. Duplicate this form as necessary to include all applicable tanks.

1. **Tank/Unit ID**: See Table 22
2. **Installation Date**: *(actual or anticipated)*
3. **Tank Location**:
4. **Tank Type**
   - ☐ Fixed Roof, Cone
   - ☐ Fixed Roof, Dome
   - ☐ Other *(specify)*:
   - ☐ External Floating Roof, Domed
   - ☐ External Floating Roof, Not Domed
   - ☐ Internal Floating Roof
   - ☐ Variable Vapor Space
   - ☐ Pressure Tank
5. Is the tank **Above Ground?** ☐ Yes ☐ No
6. **Tank Orientation**: ☐ Horizontal ☐ Vertical
7. **Tank Color**:
8. **Materials Stored**: *(include MSDS)*
9. **True Vapor Pressure** (PVA): pounds per square inch *(psi at 20°C)*
10. **Vapor Molecular Weight** (Mv): gallons *(b/lbmole)*
11. **Annual Throughput**: gallons per year *(gal/yr)*
12. **Venting Method**:
13. **Filling Method**: ☐ Submerged ☐ Not Submerged ☐ Other *(specify)*:

PART B: Emission Controls and Limitations

Part B identifies control technology, control techniques or other process limitations that impact air emissions.

14. **Add-On Control Technology**: *Identify all control technologies used for this unit, and attach completed CE-01 (unless "none").*
    ☐ None ☐ Other *(specify)*: *– Attach CE-10.*
15. **Control Techniques**: *Identify all control techniques used for this process.*
    ☐ None ☐ Flare ☐ Vapor Recovery System *– Attach GSD-09.*
    ☐ Other *(specify)*:
16. **Process Limitations / Additional Information**: *Identify any acceptable process limitations. Attach additional information if necessary.*

Continued on Next Page

PART C: Information Specific to Tank Type

Part C identifies the physical properties of the tank.

17. Tank Diameter (D):	See Table 22		
18. Tank Height (Hs):	feet (*ft*)		
19. Tank Volume / Capacity (V):	gallons (*gal*)	cubic feet (*ft³*)	
20. Maximum Liquid Height (Hlx):	feet (ft)		
21. External Floating Roof: *Complete only if applicable.*			
a. Average Liquid Density (Wl):	pounds per gallon (*lb/gal*)		
b. Roof Type:	☐ Pontoon Floating Roof	☐ Double Deck Floating Roof	
c. Tank Construction:	☐ Welded	☐ Riveted	
d. Primary Rim Seal:	☐ Vapor Mounted	☐ Liquid Mounted	☐ Mechanical Shoe
e. Secondary Rim Seal:	☐ Weather Shield	☐ Rim Mounted	☐ None
22. Internal Floating Roof: *Complete only if applicable.*			
a. Average Liquid Density (Wl):	pounds per gallon (*lb/gal*)		
b. Roof Type	☐ Double Deck Floating Roof	☐ Other: *(specify)*	
c. Self-supported fixed roof	☐ Yes	☐ No	
d. Number of columns supporting the fixed roof			
e. Deck Construction:	☐ Welded	☐ Riveted	☐ Bolted
f. Primary Rim Seal:	☐ Vapor Mounted	☐ Liquid Mounted	
g. Is there a Secondary Rim Seal?	☐ Yes	☐ No	
23. Variable Vapor Space: *Complete only if applicable.*			
a. Volume of liquid pumped into the system (V1):	gallons per year (*gal/yr*)		
b. Volume expansion capacity of system (V2):	gallons (*gal*)		
c. Number of Transfers Into the System (N2)	per year (*/yr*)		

PART D: Emission Factors

Part D identifies all emission factors used to calculate air emissions from the storage tank.

24. Air Pollutant:	**25. Emission Factor**		**26. Source of Emission Factor** *(if not using AP-42, include calculations)*
	value	*units*	
Hazardous Air Pollutant (HAP): *(specify)*:			☐ AP-42 ☐ Other ☐ N/A
Volatile Organic Compounds (VOC)			☐ AP-42 ☐ Other ☐ N/A
Other *(specify)*:			☐ AP-42 ☐ Other
Other *(specify)*:			☐ AP-42 ☐ Other

Continued on Next Page

PART E: Federal Rule Applicability

Part E identifies any federal rules that apply to the process.

27. Is a **New Source Performance Standard (NSPS)** applicable to this source? ☐ Yes ☐ No *If yes, attach a completed FED-01 for each rule that applies.*		**28. Unit ID:**
☐ 40 CFR Part 60, Subpart K	Petroleum Liquid Storage Vessels (constructed after 6/11/1973 and before 5/19/1978)	
☐ 40 CFR Part 60, Subpart Ka	Petroleum Liquid Storage Vessels (constructed after 5/18/1978 and before 7/23/1984)	
☐ 40 CFR Part 60, Subpart Kb	Volatile Organic Liquid Storage Vessels, Including Petroleum Liquid Storage (constructed after 7/23/1984)	
☐ 40 CFR Part 60, Subpart VV	Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry	
☐ 40 CFR Part 60, Subpart GGG	Equipment Leaks of VOC in Petroleum Refineries	
☐ 40 CFR Part 60, Subpart KKK	Equipment Leaks of VOC from On-Shore Natural Gas Processing Plants	
29. Is a **National Emission Standard for Hazardous Air Pollutants (NESHAP)** applicable to this source? *If yes, attach a completed FED-01 for each rule that applies.* ☐ Yes ☐ No		**30. Unit ID:**
☐ 40 CFR Part 61, Subpart J	Equipment Leaks (Fugitive Emission Sources) of Benzene	
☐ 40 CFR Part 61, Subpart V	Equipment Leaks (Fugitive Emission Sources)	
☐ 40 CFR Part 61, Subpart Y	Benzene Emissions from Benzene Storage Vessels	
☐ 40 CFR Part 63, Subpart R	Gasoline Distribution (Bulk Gasoline Terminals and Pipeline Breakout Stations)	
☐ 40 CFR Part 63, Subpart CC	Petroleum Refineries	
☐ 40 CFR Part 63, Subpart HHH	Natural Gas Transmission and Storage	
☐ 40 CFR Part 63, Subpart EEEE	Organic Liquids Distribution (non-gasoline)	

31. Non-Applicability Determination: *Provide an explanation if the process unit appears subject to a rule (based on the rule title or the source category), but the rule will not apply.*

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OAQ PROCESS INFORMATION APPLICATION
PI-18: Mineral Processing
State Form 52559 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to obtain detailed information about non-metallic mineral processes such as sand and gravel processes, stone quarries, stone processing plants, and slag and kish handing plants. Complete one form for each process material, and duplicate this form as necessary for additional process materials. This is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Mineral Process Information

Part A identifies the details pertaining to the mineral processing equipment, including conveyors, screens, crushers, etc.

1. Type of Process Material: ☒ Non-Metallic Minerals ☐ Metallic Minerals

2. Equipment / Process Unit	3. Number of Identical Units	4. Unit ID	5. Installation Date	6. Open / Enclosed?	7. Maximum Capacity *(tons/hr)*	8. Actual Capacity *(tons/hr)*
See Table 23				☐ Open ☐ Enclosed		
				☐ Open ☐ Enclosed		
				☐ Open ☐ Enclosed		
				☐ Open ☐ Enclosed		
				☐ Open ☐ Enclosed		
				☐ Open ☐ Enclosed		

PART B: Dryer Details

Part B identifies the details pertaining to the dryer.

9. Dryer Type:	10. Unit ID	11. Installation Date	12. Plate Perforation Diameter / Mesh Size *(inches or mm)*	13. Volume Capacity *(ft^3)*	14. Heat Capacity *(mmBtu/hr)*	15. Fuel Used
						☐ Natural Gas Only ☐ Other – *Attach PI-02F*
						☐ Natural Gas Only ☐ Other – *Attach PI-02F*
						☐ Natural Gas Only ☐ Other – *Attach PI-02F*
						☐ Natural Gas Only ☐ Other – *Attach PI-02F*

Continued on next page

PART C: Storage and Handling of Materials

Part C identifies the details pertaining to aggregate storage and handling.

16. Material Size & Specification	17. Type of Storage	18. Storage Capacity *(tons)*	19. Unit ID	20. Installation Date	21. Storage Open or Totally Enclosed/ Covered?
See Table 23					☐ Open ☐ Enclosed ☐ Covered
					☐ Open ☐ Enclosed ☐ Covered
					☐ Open ☐ Enclosed ☐ Covered
					☐ Open ☐ Enclosed ☐ Covered

PART D: Emission Factors

Part D identifies all emission factors used to calculate air emissions from the process units listed on this form. Use the PI-02 forms to provide the applicable information for the dryers.

22. Process Unit *(& ID, if applicable)*	23. Air Pollutant	24. Emission Factor		25. Source of Emission Factor *(if not using AP-42, include calculations)*
		value	units	
	PM			☐ AP-42 ☐ Other
	PM-10			☐ AP-42 ☐ Other
	NO_X			☐ AP-42 ☐ Other
	CO			☐ AP-42 ☐ Other
	Metals			☐ AP-42 ☐ Other
	Organics			☐ AP-42 ☐ Other
	Other *(specify)*:			☐ AP-42 ☐ Other
	Other *(specify)*:			☐ AP-42 ☐ Other

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PART E: Emission Controls and Limitations

Part E identifies the control technologies, techniques, and other process limitations corresponding to each process. Use the PI-02 forms to provide the applicable information for the dryers.

26. Add-On Control Technology: *Identify all control technologies used for this unit, and attach completed CE-01 (unless "none").*

Storage	Handling
☐ None	☐ None
☐ Baghouse / Fabric Filter – *Attach CE-02.*	☐ Baghouse / Fabric Filter – *Attach CE-02.*
☐ Cyclone – *Attach CE-03.*	☐ Cyclone – *Attach CE-03.*
☐ Electrostatic Precipitator – *Attach CE-04.*	☐ Electrostatic Precipitator – *Attach CE-04.*
☐ Other *(specify)*: *Attach CE-10.*	☐ Other *(specify)*: *Attach CE-10.*

27. Control Techniques: *Identify all control techniques used for this process.*

Storage	Handling

28. Process Limitations / Additional Information:
Identify any acceptable process limitations. Attach additional information if necessary.

Storage	Handling

PART F: Federal Rule Applicability

Part F identifies any federal rules that apply to the process. Use the PI-02 forms to provide the applicable information for the dryers.

29. Is a **New Source Performance Standard (NSPS)** applicable to this source? ☐ Yes ☐ No
If yes, attach a completed FED-01 for each rule that applies.

- ☐ 40 CFR Part 60, Subpart OOO — Non-Metallic Mineral Processing Plants
- ☐ 40 CFR Part 60, Subpart UUU — Calciners and Dryers in Mineral Industries
- ☐ 40 CFR Part 60, Subpart _____ *(Specify)*

30. Is a **National Emission Standard for Hazardous Air Pollutants (NESHAP)** applicable to this source? *If yes, attach a completed FED-01 for each rule that applies.* ☐ Yes ☐ No

- ☐ 40 CFR Part 61, Subpart _____ *(Specify)*
- ☐ 40 CFR Part 63, Subpart _____ *(Specify)*

31. Non-Applicability Determination: Provide an explanation if the process unit appears subject to a rule (based on the rule title or the source category), but the rule will not apply.

OAQ FEDERAL RULE INCORPORATION APPLICATION
FED-02: MACT Pre-Construction Review
State Form 51905 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide a standardized way for sources to request MACT preconstruction approval per 40 CFR 63.5.
- This is a required form for sources subject to the MACT pre-construction review requirements in 40 CFR 63.5.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record.

Part A: General Information

Part A identifies the applicable MACT standard and affected source, and determines whether 40 CFR Section 63.5 of the General Provisions is applicable to the affected source.

1. MACT Subpart Letter: EEEE for Organic Liquids Distribution (Non-Gasoline), and DDDDD (Industrial, Commercial and Institutional Boilers,and Process Heaters)

MACT Source Category Name:

2. Affected Source(s): EEEE: Naphtha Product Tanks, Diesel Product Tanks, Diesel Product Swing Tank, Slop Tank, Diesel Fuel Storage Tanks

DDDDD: Package Boiler, Coal Drying Heater, Feed Heater, Treat GAs Heater, Vacuum Column Feed Heater, and Fractionatonator Feed Heater

3. Will the proposed construction be a major source of HAP emissions? ☒ Yes ☐ No

Part B: Emissions Unit Information

Part B identifies those emissions units that are part of the affected source and will be constructed or reconstructed:

4. Unit ID:	**5. HAP Name or Type of HAP**	**6. Quantity of HAP Emitted** *(specify units)*	
		Actual Emissions	**Potential To Emit**
See Table 24			

Part C: Compliance Methods for New Affected Sources

Part C identifies the compliance method chosen for each new affected source.

7. Unit ID:	8. Compliance Method Description	9. Control Efficiency (%)
See Table 24		

Part D: Compliance Methods for Reconstructed Affected Sources

Part D identifies the compliance method chosen for each reconstructed affected source.

10. Unit ID:	11. Description of Current Compliance Method	12. Description of Proposed Compliance Method	13. Control Efficiency (%)
NA			

Attachment B. IDEM Air Permit Application Associated Tables

Table 1. Preliminary Summary of Riverview Energy Facilitywide Potential Emissions

Controlled PTE Emissions

Category	NOx		CO		SO2		TSP		PM10		PM2.5		VOC/NMHC		Lead		CO2		Total CO2e		HAPs	
	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
Veba Combi Cracker Process	27.98	122.49	18.15	79.44	26.86	117.64	3.91	17.14	3.83	16.80	3.72	16.31	112.51	66.11	2.40E-04	1.05E-03	58433	255937	58629	256794	15.71	5.82
Emergency Equipment	42.65	2.58	2.35	0.14	0.63	0.04	1.07	0.06	1.07	0.06	1.07	0.06	0.86	0.05	0.00	0.00	3898	238	3934	241	0.39	0.04
Support Facilities	11.34	49.68	38.06	166.73	0.56	2.44	10.11	44.32	10.11	44.32	10.11	44.32	16.42	71.94	0.00	0.00	451256	1976503	451823	1978988	5.90	25.82
Additive Handling	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.16	0.12	0.16	0.12	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal Handling	2.23	9.78	2.01	8.80	0.10	0.44	25.09	16.67	14.50	11.68	4.50	5.84	0.30	1.32	0.00	0.00	6505	28490	6518	28549	0.10	0.45
Paved Roadways	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.35	0.02	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions Potential	84.20	184.53	60.57	255.12	28.15	120.56	40.39	78.71	29.66	73.09	19.53	66.70	130.09	139.42	2.67E-04	1.17E-03	520091	2261168	520904	2264572	22.10	32.14

Notes

1. Diesel firewater pump operation is 200 hours per year
2. Emergency Diesel Generator operations is 100 hours per year
3. All process related equipment are assumed to operate for 8760 hours annually
4. Hydrogen plant emission information has been provided by an outside vendor, based upon vendor's initial conceptual approach. Discussion regarding hydrogen plant design are not finalized.
5. Although Hydrogen Reformers are planned to be sized up to 70% of maximum VCC process facility production, maximum pollutant output is limited by VCC facility. Thus, emissions potential is based upon the required hydrogen at 100% VCC facility production capacity.
6. CO2e includes CO2. They are separately listed to establish that Greenhouse Gas (GHG) impacts have been determined for the spectrum of GHG generating species.
7. All non-cooling tower particulates emissions are assumed to be fine particulate matter. Thus TSP = PM10 = PM2.5
8. Emissions estimates utilize AP-42 emission factors extensively. These factors provide conservatively high emissions estimates that will be refined with vendor information as it becomes available.
9. Smokeless flaring is assumed
10. Diesel fuel is USLD
11. Because a fugitive dust control plan is required by regulation for this facility, potential emissions are determined with the proposed plan in place. Details of plan performance are provided elsewhere in this application package
12. Particulate emissions from the hydrogen reformers are uncontrolled in the table. A baghouse will likely be required to satisfy BACT requirements.
13. Fugitive VOC emissions from valves, flanges, etc. are separately quantified. They will be addressed in the context of the LDAR program.

Table 2 Itemized Riverview Energy Facilitywide Potential Emissions (Preliminary)

Unit ID	Category	Annual Operating Hours	Unit Rating (Firing on HHV Basis unless noted otherwise)	NOx		CO		SO2		TSP		PM10		PM2.5		VOC/NMHC		Lead		CO2		Total CO2e		HAPs		Other Compounds		
				(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	Species	(lb/hr)	(tons/yr)
	Veba Combi Cracker Process																											
EU-2001	Feed Heater	8760	128.4 MMBtu/hr	2.470	10.800	2.470	10.800	0.229	1.002	0.963	4.218	0.963	4.218	0.963	4.218	0.693	3.037	0.000	0.000	14967.5	65557.4	14998.7	65694.3	0.238	1.041	Metals	0.005	0.024
EU-2002	Treat Gas Heater	8760	52.8 MMBtu/hr	2.112	9.251	1.901	8.326	0.094	0.412	0.396	1.734	0.396	1.734	0.396	1.734	0.285	1.249	0.000	0.000	6154.8	26958.2	6167.7	27014.5	0.098	0.428	Metals	0.002	0.010
EU-2003	Vac Column Feed Heater	8760	9 MMBtu/hr	0.360	1.577	0.324	1.419	0.016	0.070	0.067	0.296	0.067	0.296	0.067	0.296	0.049	0.213	0.000	0.000	1049.1	4595.1	1051.3	4604.7	0.017	0.073	Metals	0.000	0.002
EU-2004	Fractionator Feed Heater	8760	156 MMBtu/hr	6.240	27.331	5.616	24.598	0.278	1.217	1.170	5.125	1.170	5.125	1.170	5.125	0.842	3.690	0.000	0.000	18184.8	79649.2	18222.7	79815.5	0.289	1.265	Metals	0.007	0.029
EU-3001	Sulfur Recovery Unit Tail Gas Treatm	8760	37.68 MMBtu/hr	6.782	29.705	1.319	5.775	12.507	54.780	0.278	1.216	0.278	1.216	0.278	1.216	0.203	0.890	0.000	0.000	4607.0	20178.7	4616.2	20218.9	0.070	0.305	Metals	0.002	0.007
																										Sulfuric Acid Mist	0.600	1.940
EU-3002	Sulfur Recovery Unit Tail Gas Treatm	8760	37.68 MMBtu/hr	6.782	29.705	1.319	5.775	12.507	54.780	0.278	1.216	0.278	1.216	0.278	1.216	0.203	0.890	0.000	0.000	4607.0	20178.7	4616.2	20218.9	0.070	0.305	Metals	0.002	0.007
																										Sulfuric Acid Mist	0.600	1.940
EU-4004	HP Flare (non-assisted)	8760	70 scfh gas per pilot 6649 scfh purge gas	0.440	1.930	2.400	10.510	0.010	0.050	0.050	0.240	0.050	0.240	0.050	0.240	0.040	0.160	0.000	0.000	819.0	3588.0	886.0	3881.0	0.000	0.000	N/A	N/A	N/A
EU-4002	Sulfur Block Flare	8760	70 scfh gas per pilot gas 683 scfh purge gas	0.060	0.250	0.310	1.340	1.100	4.800	0.010	0.030	0.010	0.030	0.010	0.030	0.020	0.070	0.000	0.000	103.0	452.0	112.0	489.0	0.000	0.000	N/A	N/A	N/A
EU-4001	Loading Flare	278	Naphtha loading at 20000 gpm for 93.9 hrs per year + Uncontrolled Diesel Loading at 20000 gpm for 183.6 hr per year	0.014	0.030	0.040	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.685	5.603	0.000	0.000	13.8	60.4	14.9	65.4	14.532	0.683	N/A	N/A	N/A
EU-6000	Package Boiler	8760	68.5 MMBtu/hr	2.720	11.914	2.448	10.722	0.121	0.531	0.510	2.234	0.510	2.234	0.510	2.234	0.367	1.608	0.000	0.000	7926.7	34718.8	7943.2	34791.3	0.126	0.551	Metals	0.003	0.013
EU-6001/2/3	Cooling Tower (three cells)	8760	32,000 gpm	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.834	0.112	0.492	0.000	0.002	1.282	5.614	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	Ammonia	0.125	0.549
																										Chlorine as HOCl	1.200	5.220
EU-5001a-04d	Residue Solidification Units	8760	51.5 tons/hr (total operation)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.196	18.376	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	N/A	N/A	N/A
	Storage Tanks	8760	All storage tanks combined	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.756	3.310	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
	Fugitives	8760	VCC Process and Product Storage and Handling Areas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.886	21.402	0.000	0.000	0.0	0.0	0.0	0.0	0.268	1.172	0.000	0.000	0.000
	Emergency Equipment																											
EU-6006	Emergency Diesel Generator	100	2000 kWe	33.640	1.680	1.850	0.090	0.490	0.030	0.840	0.040	0.840	0.040	0.840	0.040	0.680	0.030	0.000	0.000	3028.0	151.0	3056.0	153.0	0.041	0.002	N/A	N/A	N/A
EU-6008	Emergency Diesel FireWater Pump	200	750 bhp	9.010	0.900	0.500	0.050	0.140	0.010	0.230	0.020	0.230	0.020	0.230	0.020	0.180	0.020	0.000	0.000	870.0	87.0	878.0	87.8	0.353	0.040	N/A	N/A	N/A
	Support Facilities																											
EU-7001	Hydrogen Plant 1 Reformer	8760	838.6 MMBtu/hr	5.451	23.875	16.772	73.462	0.273	1.197	5.032	22.038	5.032	22.038	5.032	22.038	5.032	22.038	0.000	0.000	224972.1	985377.6	225176.1	986271.5	0.000	0.000	Ammonia	0.061	0.267
EU-7002	Hydrogen Plant 2 Reformer	8760	838.6 MMBtu/hr per unit	5.451	23.875	16.772	73.462	0.273	1.197	5.032	22.038	5.032	22.038	5.032	22.038	5.032	22.038	0.000	0.000	224972.1	985377.6	225176.1	986271.5	0.000	0.000	Ammonia	0.061	0.267
EU-7003	Hydrogen Plant 1 Dearator Vent	8760	2628.36 acfm (Emissions are @100% VCC facility output)	0.000	0.000	1.060	4.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.160	13.850	0.000	0.000	246.5	1080.0	292.5	1282.0	2.950	12.910	Ammonia	3.920	17.170
																										Acetic acid	0.040	0.180
EU-7004	Hydrogen Plant 2 Dearator Vent	8760	2628.36 acfm (Emissions are @100% VCC facility output)	0.000	0.000	1.060	4.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.160	13.850	0.000	0.000	246.5	1080.0	292.5	1282.0	2.950	12.910	Ammonia	3.920	17.170
																										Acetic acid	0.040	0.180
EU-4003	LP Flare	8760	70 scfh gas per pilot TBD scfh purge gas	0.440	1.930	2.400	10.510	0.010	0.050	0.050	0.240	0.050	0.240	0.050	0.240	0.040	0.160	0.000	0.000	819.0	3588.0	886.0	3881.0	0.000	0.000	N/A	N/A	N/A
	Coal Handling System																											
EU-1000	Coal Unloading Station	850	5000 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.358	0.152	0.268	0.114	0.007	0.003	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1001	Transfer Station 1	850	5000 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1002	Stacker 1 Boom Chute	850	5000 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	2.751	1.169	2.064	0.877	0.052	0.022	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1003	Coal Pile 1A/1B	850	5000 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	8.855	3.764	4.427	1.882	1.771	0.753	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1004	Stacker 2 Boom Chute	850	5000 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	2.751	1.169	2.064	0.877	0.052	0.022	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1005	Coal Pile 2A/2B	850	500 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	8.855	3.764	4.427	1.882	1.771	0.753	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1006	Reclaim Transfer Station	8760	500 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.550	2.410	0.413	1.807	0.011	0.046	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1007	Coal Dryer Heater	8760	55.8 MMBtu/hr	2.232	9.776	2.009	8.799	0.100	0.436	0.418	1.833	0.418	1.833	0.418	1.833	0.301	1.320	0.000	0.000	6504.5	28489.9	6518.1	28549.4	0.103	0.452	Metals	0.002	0.010
EU-1008	Coal Drying Loop Purge (N2 + H2O Va	8760	300 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.549	2.405	0.418	2.405	0.418	2.405	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
	Additive Handling																											
EU-1501	Coarse Additive Storage Filter	965.5	20 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.019	0.039	0.019	0.039	0.019	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	4.19E-05	2.00E-05	0.000	0.000	0.000
EU-1502	Fine Additive Storage Filter	1438.8	20 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.028	0.039	0.028	0.039	0.028	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	4.19E-05	2.00E-05	0.000	0.000	0.000
EU-1503	NA2S Additive Storage Filter	67.6	10 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.001	0.020	0.001	0.020	0.001	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1504	Fine Additive Production System	8760	20 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.034	0.008	0.034	0.008	0.034	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	8.27E-06	3.62E-05	0.000	0.000	0.000
EU-2005	Coal Handling System Filter	8760	258.4 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.0053	0.023	0.0053	0.023	0.0053	0.023	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-2006	Coarse Additive Handling System Filt	8760	2.2 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.023	0.005	0.023	0.005	0.023	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	5.55E-06	2.40E-05	0.000	0.000	0.000
EU-2007	Fine Additive Handling System Filter	8760	3.28 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.034	0.008	0.034	0.008	0.034	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	8.27E-06	3.60E-05	0.000	0.000	0.000
EU-2008	Na2S Handling System Filter	8760	0.077 ton/hr	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.001	0.004	0.001	0.004	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000

Table 3 Paved Roadway Particulate Emissions Summary

Controlled PTE Emissions

PROJECT DEFINITION AND BASIS OF CALCULATIONS

ITEM

1 The vehicle weight used in the calculations are:
- Truck (Sami Tractor Trailer) 40 tons
- Cars = 2 tons
- Other vehicle type = tons

2 Each trip on a plant road is a one-way traverse.

3 Plant roads are assumed to be two-laned with a total width of 20 ft.

4 Annual facility operating schedule is 365 days per year, 24 hours per day

Fraction of Annual Operating period with no rail availability 0.05

5 Average plant roadway speed is assumed to be 25 mph

6 All paved road emission calculations are based on AP-42, Section 13.2.1 "Paved Roads"

7 Emission Factor (E) for Uncontrolled Emissions is estimated from the Formula 4 in AP-42, Section 13.2.1; E = k*(sL^0.91)*(W^1.02)*(1-P/4N), where units of E are same as k

where, k = particle size multiplier for the paved road equation are taken from AP-42, Section 13.2.1, Table 13.2.1-1

sL = silt loading values taken from AP-42, Section 13.2.1, Tables 13.2.1-2 (for Public Roads) and 13.2.1-3 (for Industrial Roads)

P = number of "wet" days with at least 0.01 inches of precipitation per year at this location is sourced from AP-42, Secton 13.2.1, Figure 13.2.2-1

N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly); For this site = 120 days

PAVED ROAD EMISSIONS SUMMARY

ROAD SEGMENT	Road Segment Description			Uncontrolled Potential Emissions			Control Efficiency	Controlled Potential Emissions		
	Travel Length	Width	Area	PM2.5	PM10	PM30 / TSP		PM2.5	PM10	PM30 / TSP
	ft	ft	ft2	tpy	tpy	tpy	%	tpy	tpy	tpy
Road 2-1 Na2S Unloading	2133	20	42651	0.00030	0.00125	0.00650	0	0.00030	0.00125	0.00650
Road 2-2 Aniline	1640	20	32808	0.00000	0.00001	0.00007	0	0.00000	0.00001	0.00007
Road 2-3 DMDS	1640	20	32808	0.00001	0.00003	0.00015	0	0.00001	0.00003	0.00015
Road 2-4 Amine Make-up	1804	20	36089	0.00009	0.00037	0.00194	0	0.00009	0.00037	0.00194
Road 2-5 Ammonia Loading	2953	20	59055	0.00074	0.00305	0.01589	0	0.00074	0.00305	0.01589
Road 2-6 Molten Sulfur Loading	984	20	19685	0.00003	0.00014	0.00072	0	0.00003	0.00014	0.00072
Road 2-7 Residue Loading	984	20	19685	0.00023	0.00096	0.00499	0	0.00023	0.00096	0.00499
Road 1-1 Sulfuric Acid Unloading	820	20	16404	0.00036	0.00147	0.00765	0	0.00036	0.00147	0.00765
Road 1-2 Caustic Unloading	820	20	16404	0.00036	0.00147	0.00765	0	0.00036	0.00147	0.00765
Road 1-3 Boiler Feed WaterTreatment Chemicals Unloadi	820	20	16404	0.00036	0.00147	0.00765	0	0.00036	0.00147	0.00765
Road 1-4 Diesel Fuel Unloading	820	20	16404	0.00036	0.00147	0.00765	0	0.00036	0.00147	0.00765
Road 1-5 Lime Unloading	1312	20	26247	0.00057	0.00235	0.01224	0	0.00057	0.00235	0.01224
Road 1-6 Water Treatment Chemicals Unloading	1312	20	26247	0.00057	0.00235	0.01224	0	0.00057	0.00235	0.01224
Road 1-7 Lime Sludge Loading	1312	20	26247	0.00057	0.00235	0.01224	0	0.00057	0.00235	0.01224
Road 1-8 Wastewater Treatment Chemicals Unloading	1640	20	32808	0.00071	0.00294	0.01530	0	0.00071	0.00294	0.01530
Road 1-9 Wastewater Treatment Biosludge Loading	1640	20	32808	0.00071	0.00294	0.01530	0	0.00071	0.00294	0.01530
Road 1-10 Employee Cars	656	20	13123	0.01052	0.04349	0.22656	0	0.01052	0.04349	0.22656
TOTAL =				0.02	0.07	0.35		0.02	0.07	0.35

PAVED ROAD EMISSIONS CALCULATIONS

Road ID	Plant Block	Activity Description	Service	Vehicles per day	Vehicles Per year	Fraction of Annual Operating Period	Remarks	Site Entrance / Exit	Destination in Plant
Road 2-1	1500	Na2S Unloading	Regular		34	1		North Entry Gate 2	VCC Unit
Road 2-2	2000	Aniline	Regular		0.5	1	1 Truck every two years	North Entry Gate 2	VCC Unit
Road 2-3	2000	DMDS	Regular		1	1	2 Trucks every two years	North Entry Gate 2	VCC Unit
Road 2-4	3000	Amine Make-up	Regular		12	1	During start-up and make-up once a month	North Entry Gate 2	Sulfur Recovery Unit
Road 2-5	4000	Ammonia Loading	Regular	5	60	1		North Entry Gate 2	Ammonia Loading Area
Road 2-6	4000	Molten Sulfur Loading	Emergency	9	164.25	0.05	Only when rail loading is not available	North Entry Gate 2	Sulfur Recovery Unit
Road 2-7	5000	Residue Loading	Emergency	62	1131.5	0.05	Only when rail loading is not available	North Entry Gate 2	Residue Loading Area
Road 1-1	6000	Sulfuric Acid Unloading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Warehouse
Road 1-2	6000	Caustic Unloading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Warehouse
Road 1-3	6000	Boiler Feed WaterTreatment Chemicals Unload	Regular		52	2	1 Truck every week default	South Entry Gate 1	Warehouse
Road 1-4	6000	Diesel Fuel Unloading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Warehouse
Road 1-5	6500	Lime Unloading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Water Treatment Unit
Road 1-6	6500	Water Treatment Chemicals Unloading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Water Treatment Unit
Road 1-7	6500	Lime Sludge Loading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Water Treatment Unit
Road 1-8	6500	Wastewater Treatment Chemicals Unloading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Wastewater Treatment Unit
Road 1-9	6500	Wastewater Treatment Biosludge Loading	Regular		52	2	1 Truck every week default	South Entry Gate 1	Wastewater Treatment Unit
Road 1-10	6500	Employee Cars	Regular	112	40880	2	112 employees per car per day	South Entry Gate 1	Admin Building

Road ID	Road Segment Description					Silt Loading (sL)	Daily Traffic Summary		Vehicle Kilometers Traveled (VKT)	Mean Vehicle Weigth in Segment (W)	Particle Size Multiplier (k) (from AP42 Table 13.2.1-1)			Number of Wet Days with ≥ 0.01 in precip. (P)	Number of days in Averaging Period (N)	Uncontrolled Potential Emissions			Control Technique	Control Efficiency	Controlled Potential Emissions		
	Length per trip	Length per trip	Width	Area	Surface Description		Trucks	Cars			PM2.5	PM10	PM30 / TSP			PM2.5	PM10	PM30 / TSP			PM2.5	PM10	PM30 / TSP
	m	ft	ft	ft2		g/m2	trips/yr	trips/yr	VKT/yr	tons	g/VKT	g/VKT	g/VKT	days	days	tons/yr	tons/yr	tons/yr			tons/yr	tons/yr	tons/yr
Road 2-1	650	2133	20	42651	Paved	1.05	68		44	40	0.15	0.62	3.23	120	365	0.0003	0.0012	0.0065	None	0%	0.00030	0.00125	0.00650
Road 2-2	500	1640	20	32808	Paved	1.05	1		1	40	0.15	0.62	3.23	120	365	0.0000	0.0000	0.0001	None	0%	0.00000	0.00001	0.00007
Road 2-3	500	1640	20	32808	Paved	1.05	2		1	40	0.15	0.62	3.23	120	365	0.0000	0.0000	0.0001	None	0%	0.00001	0.00003	0.00015
Road 2-4	550	1804	20	36089	Paved	1.05	24		13	40	0.15	0.62	3.23	120	365	0.0001	0.0004	0.0019	None	0%	0.00009	0.00037	0.00194
Road 2-5	900	2953	20	59055	Paved	1.05	120		108	40	0.15	0.62	3.23	120	365	0.0007	0.0030	0.0159	None	0%	0.00074	0.00305	0.01589
Road 2-6	300	984	20	19685	Paved	1.05	16		5	40	0.15	0.62	3.23	120	365	0.0000	0.0001	0.0007	None	0%	0.00003	0.00014	0.00072
Road 2-7	300	984	20	19685	Paved	1.05	113		34	40	0.15	0.62	3.23	120	365	0.0002	0.0010	0.0050	None	0%	0.00023	0.00096	0.00499
Road 1-1	250	820	20	16404	Paved	1.05	208		52	40	0.15	0.62	3.23	120	365	0.0004	0.0015	0.0076	None	0%	0.00036	0.00147	0.00765
Road 1-2	250	820	20	16404	Paved	1.05	208		52	40	0.15	0.62	3.23	120	365	0.0004	0.0015	0.0076	None	0%	0.00036	0.00147	0.00765
Road 1-3	250	820	20	16404	Paved	1.05	208		52	40	0.15	0.62	3.23	120	365	0.0004	0.0015	0.0076	None	0%	0.00036	0.00147	0.00765
Road 1-4	250	820	20	16404	Paved	1.05	208		52	40	0.15	0.62	3.23	120	365	0.0004	0.0015	0.0076	None	0%	0.00036	0.00147	0.00765
Road 1-5	400	1312	20	26247	Paved	1.05	208		83	40	0.15	0.62	3.23	120	365	0.0006	0.0023	0.0122	None	0%	0.00057	0.00235	0.01224
Road 1-6	400	1312	20	26247	Paved	1.05	208		83	40	0.15	0.62	3.23	120	365	0.0006	0.0023	0.0122	None	0%	0.00057	0.00235	0.01224
Road 1-7	400	1312	20	26247	Paved	1.05	208		83	40	0.15	0.62	3.23	120	365	0.0006	0.0023	0.0122	None	0%	0.00057	0.00235	0.01224
Road 1-8	500	1640	20	32808	Paved	1.05	208		104	40	0.15	0.62	3.23	120	365	0.0007	0.0029	0.0153	None	0%	0.00071	0.00294	0.01530
Road 1-9	500	1640	20	32808	Paved	1.05	208		104	40	0.15	0.62	3.23	120	365	0.0007	0.0029	0.0153	None	0%	0.00071	0.00294	0.01530
Road 1-10	200	656	20	13123	Paved	1.05		163520	32704	2	0.15	0.62	3.23	120	365	0.0105	0.0435	0.2266	None	0%	0.01052	0.04349	0.22656
															Total =	0.02	0.07	0.35			0.02	0.07	0.35

From AP-42 Table 13.2.1-2 for Paved Public Roads

Period	Category, g/m2	Seasonal Factor	Prorated, g/m2
Spring Summer Fall	0.6	0.75	1.05
Winter	2.4	0.25	

Table 4 – Paved Roadway Particulate Emissions Summary

Species: PM-10

Please see table 3 for the PM-10 emissions.

Table 5 – Paved Roadway Particulate Emissions Summary

Species: TSP

Please see table 3 for the TSP emissions.

Table 6. Storage Pile Particulate Emissions Summary
Controlled PTE Emissions

Table 6a: Storage Pile PM2.5 Emissions

Emission Unit Designation	Emission Unit Description: Name	Material Stored	Material Density (lb/cu.ft.)	Storage Type	Parameters per Storage Pile: Pile Base Diameter (ft)	Theoretical Single Pile Height (ft)	Storage Pile Surface Area (acres)	Actual Maximum Pile Ht. (ft)	Number of Storage Piles	Maximum Hourly Throughput (tph)	Emissions Parameters: Max. Load-in Wind Speed (mph)	Max. Load-out Wind Speed (mph)	Silt Content (%)	Moisture Content (%)	Uncontrolled Emission Factors for Pile Load-in & Load-out: Load-in (lb $PM_{2.5}$/ton)	Load-out (lb $PM_{2.5}$/ton)	Wind Erosion Uncontrolled $PM_{2.5}$ Emission Factor (lb/acre/year)	Emission Control Information: Control Description	Effectiveness (%)	Load-in Emissions: Hourly $PM_{2.5}$ (lb/hr)	Annual $PM_{2.5}$ (tons/yr)	Load-out Emissions: Hourly $PM_{2.5}$ (lb/hr)	Annual $PM_{2.5}$ (tons/yr)	Wind Erosion Annual Emissions $PM_{2.5}$ (tons/yr)
~~SP-1,2~~ EU-1003	Coal storage pile	Illinois basin coal	50	live	693	100	19.08	100.00	1	220	48	0	2.2	4.5	0.00389	0.00000	1.45	loading - wet suppression storage - wet suppression	80.00 80.00	0.17	0.750	0.000	0.000	0.003
~~SP-3,4~~ EU-1005	Coal storage pile	Illinois basin coal	50	live	693	100	19.08	100.00	1	220	48	0	2.2	4.5	0.00389	0.00000	1.45	loading - wet suppression storage - wet suppression	80.00 80.00	0.17	0.750	0.000	0.000	0.003
																		Total Hourly Emissions (lb/hr.)		0.342		0.000		
																		Total Annual Emissions (tons/yr.)			1.500		0.000	0.006
																		Overall Total of Annual Pile Working and Wind Erosion Emissions (tpy) =						1.505

Table 6b: Storage Pile PM10 Emissions

Emission Unit Designation	Emission Unit Description: Name	Material Stored	Material Density (lb/cu.ft.)	Storage Type	Parameters per Storage Pile: Pile Base Diameter (ft)	Theoretical Single Pile Height (ft)	Storage Pile Surface Area (acres)	Actual Maximum Pile Ht. (ft)	Number of Storage Piles	Maximum Hourly Throughput (tph)	Emissions Parameters: Max. Load-in Wind Speed (mph)	Max. Load-out Wind Speed (mph)	Silt Content (%)	Moisture Content (%)	Uncontrolled Emission Factors for Pile Load-in & Load-out: Load-in (lb PM_{10}/ton)	Load-out (lb PM_{10}/ton)	Wind Erosion Uncontrolled PM_{10} Emission Factor (lb/acre/year)	Emission Control Information: Control Description	Effectiveness (%)	Load-in Emissions: Hourly PM_{10} (lb/hr)	Annual PM_{10} (tons/yr)	Load-out Emissions: Hourly PM_{10} (lb/hr)	Annual PM_{10} (tons/yr)	Wind Erosion Annual Emissions PM_{10} (tons/yr)
~~SP-1,2~~ EU-1003	Coal storage pile	Illinois basin coal	50	live	693	100	19.08	100.00	1	220	48	0	2.2	4.5	0.00973	0.00000	3.63	loading - wet suppression storage - wet	80.00 80.00	0.43	1.875	0.000	0.000	0.007
~~SP-3,4~~ EU-1005	Coal storage pile	Illinois basin coal	50	live	693	100	19.08	100.00	1	220	48	0	2.2	4.5	0.00973	0.00000	3.63	loading - wet suppression storage - wet suppression	80.00 80.00	0.43	1.875	0.000	0.000	0.007
																		Total Hourly Emissions (lb/hr.)		0.856		0.000		
																		Total Annual Emissions (tons/yr.)			3.750		0.000	0.014
																		Overall Total of Annual Pile Working and Wind Erosion Emissions (tpy) =						3.763

Table 6c: Storage Pile TSP Emissions

Emission Unit Designation	Emission Unit Description: Name	Material Stored	Material Density (lb/cu.ft.)	Storage Type	Parameters per Storage Pile: Pile Base Diameter (ft)	Theoretical Single Pile Height (ft)	Storage Pile Surface Area (acres)	Actual Maximum Pile Ht. (ft)	Number of Storage Piles	Maximum Hourly Throughput (tph)	Emissions Parameters: Max. Load-in Wind Speed (mph)	Max. Load-out Wind Speed (mph)	Silt Content (%)	Moisture Content (%)	Uncontrolled Emission Factors for Pile Load-in & Load-out: Load-in (lb TSP/ton)	Load-out (lb TSP/ton)	Wind Erosion Uncontrolled TSP Emission Factor (lb/acre/year)	Emission Control Information: Control Description	Effectiveness (%)	Load-in Emissions: Hourly TSP (lb/hr)	Annual TSP (tons/yr)	Load-out Emissions: Hourly TSP (lb/hr)	Annual TSP (tons/yr)	Wind Erosion Annual Emissions TSP (tons/yr)
~~SP-1,2~~ EU-1003	Coal storage pile	Illinois basin coal	50	live	693	100	19.08	100.00	1	220	48	0	2.2	4.5	0.01946	0.00000	7.25	loading - wet suppression storage - wet suppression	80.00 80.00	0.86	3.750	0.000	0.000	0.014
~~SP-3,4~~ EU-1005	Coal storage pile	Illinois basin coal	50	live	693	100	19.08	100.00	1	220	48	0	2.2	4.5	0.01946	0.00000	7.25	loading - wet suppression storage - wet suppression	80.00 80.00	0.86	3.750	0.000	0.000	0.014
																		Total Hourly Emissions (lb/hr.)		1.712		0.000		
																		Total Annual Emissions (tons/yr.)			7.499		0.000	0.028
																		Overall Total of Annual Pile Working and Wind Erosion Emissions (tpy) =						7.527

NOTES:

1. Average coal density of bituminous coal is taken from Table D.9 of the Air Pollution Engineering Manual (AP-40), Second Edition
2. The load-out operations to the process are conducted in a protected area (due to its location surrounded by the 100 ft. high coal piles), so the load-out wind velocity (mph) = 0
3. The information required to utilize the wind erosion algorithms utilized in AP-42 Chapter 13, Section 13.2.5 is unavailable. The technical approach used is more conservative. It utilizes the maximum wind speed recorded for Terre Haute (NOAA Climatological Data for April, 2015)
4. Maximum ambient wind speed is taken from the NOAA climatological data for Terrre Haute, IN. It is applicable to load-in operations. Load-in wind speed (mph) = 48
5. Material throughput is based upon maximum theoretical process output.
6. Estimated silt content (2.2%) is from Table 13.2.4-1 of AP-42 for as-received coal.
7. Moisture content (4.5%) is taken from Table 13.2.4-1 of AP-42 for as-received coal.
8. Although the potential emissions from pile working are expressed as hourly values, loadout is not a continuous process. Only longer term values (e.g., annual) are representative.
9. Annual schedule (hrs/yr): 8760
10. Coal storage piles have a 35 degree angle of repose.
11. Pile work area has negligible wind erosion emissions (AP-42, Section 13.2.5, page 13.2.5-9 at *Step 2*).
12. Pile working emission factors are determined using the equation 13.2.4.3(1) in Chapter 13.2.4 of AP-42.
13. Particle size multiplier (k) used is 0.20 for $PM_{2.5}$, 0.50 for PM_{10} and 1.0 for TSP.
14. The emission factor employed to determine pile wind erosion is extracted from Table 11.9.4 of AP-42.
15. The control efficiency for wet suppression is based upon the assumption that the outer (wind-exposed pile surfaces are controlled with a chemical suppressant. The wind-exposed pile surfaces are not disturbed unless rail deliveries are interrupted because pile working is performed inside the area enclosed by the twin piles.
16. Pile surface area is conservatively estimated using a conical pile model of the volume of material stored, with its base area of the specified diameter.

Table 7. Additive Handling
Controlled PTE Emissions

Unit Designation	Emission Source Description	Design Capacity	Annual Operating Hours	Particulate (TSP/ PM10/ PM2.5) Emissions Summary	
				lb/hr	tpy
EU-1501	Coarse Additive Storage Filter	20 ton/hr	966	0.039	0.019
EU-1502	Fine Additive Storage Filter	20 ton/hr	1439	0.039	0.028
EU-1503	NA2S Additive Storage Filter	10 ton/hr	68	0.020	0.001
EU-1504	Fine Additive Production System	20 ton/hr	8760	0.008	0.034
EU-2005	Coal Handling System Filter	258.4 ton/hr	8760	0.0053	0.023
EU-2006	Coarse Additive Handling System Filter	2.2 ton/hr	8760	0.005	0.023
EU-2007	Fine Additive Handling System Filter	3.28 ton/hr	8760	0.008	0.034
EU-2008	Na2S Handling System Filter	0.077 ton/hr	8760	0.001	0.004
		Total Potential Emissions =		0.124	0.165

NOTES

1 These units are package units. The baghouses are intrinsic to their operation and reclaim process material for use.

2 Emissions are based upon a baghouse outlet concentration of 0.003 gr/dscf

3 It is conservatively assumed that TSP = PM10 = PM2.5 emissions, since they all are releaaased through a baghouse.

4 Annual operating hours for process feed equipment = **8760**

5 Annual operating hours for feeds to storage silos are based upon storage capacity and usage rate at VCC design.

Table 8: Coal Handling Emisisons
Controlled PTE

Unit ID	UNIT DESCRIPTION	FROM	TO	AIR POLLUTION CONTROL(S)	Nominal Capacity ton/hr	Max Potential Throughput ton/hr	Annual Operations hrs/yr	Reference Source for Uncontrolled Emission Factors	Maximum Annual TSP Controlled Emissions: Uncontrolled Emission Factor lb/ton	Emission Factor Adjustment Design Element	Primary Design Control Effectiveness fraction	Maximum Potential Hourly Uncontrolled Emissions: TSP lb/hr	Scaling Factor applied to EF for PM10 fraction	PM10 lb/hr	Scaling Factor applied to EF for PM2.5 fraction	PM2.5 lb/hr	Maximum Potential Hourly Controlled Emissions: Emission Control Description	Control Efficiency fraction	TSP lb/hr	PM10 lb/hr	PM2.5 lb/hr	Maximum Potential Hourly Controlled: TSP tpy	PM10 tpy	PM2.5 tpy
EU-1000	Coal Unloading Station																							
					2750	5000	850	AP-42 Table 11.9-4	0.028	Dump shed total enclosure	0.75	35.00	0.75	26.250	0.019	0.6650	Baghouse	0.995	0.1750	0.13	0.00	0.074	0.056	0.001
	Coal Drop Point 1	Unloading Chute 1	Unloading Hopper 1	Enclosure	2750	5000	850	AP-42 Table 11.9-4	0.028	Dump shed total enclosure	0.75	35.00	0.75	26.250	0.019	0.6650	Baghouse	0.995	0.1750	0.13	0.00	0.074	0.056	0.001
	(Continuous Unloading)	Unloading Chute 2	Unloading Hopper 2	Enclosure	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.000
		Unloading Hopper 1	Drag Flight Feeder 1	Enclosure w/ water Spray Dust Suppression	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.000
		Unloading Hopper 2	Drag Flight Feeder 2	Enclosure w/ water Spray Dust Suppression	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.000
		Drag Flight Feeder 1	Take-away Conveyor Belt 1	Water Spray Suppression System	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.000
		Drag Flight Feeder 2	Take-away Conveyor Belt 2	Water Spray Suppression System	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.000
		Take-away Conveyor Belt 1	Transfer Station	Enclosure	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.000
		Take-away Conveyor Belt 2	Transfer Station	Enclosure																				
					2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.00001
EU-1001	Transfer Station 1	Conveyor 1	Stacker 1 Boom	Enclosure	2750	5000	850	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.35	0.75	0.263	0.019	0.0067	Baghouse	0.995	0.0018	0.00	0.00	0.001	0.001	0.00001
		Conveyor 2	Stacker 2 Boom	Enclosure	500	500	1440	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.04	0.75	0.026	0.019	0.0007	Baghouse	0.995	0.0002	0.00	0.00	0.000	0.000	0.00000
		Conveyor 9	Reclaim Transfer Station	Baghouse Filter																				
					2750	5000	850	AP-42 Table 13.2.4	0.0011	Water Spray on Shroud	0.5	2.75	0.75	2.063	0.019	0.0523	NA	0.000	2.7500	2.06	0.05	1.169	0.877	0.022
EU-1002	Stacker 1 Boom Chute	Stacker 1 Boom	Stacker 1 Chute to Coal Piles 1A & 1B	Water Spray Suppression System	2750	5000	FromTable 6 for emissions from Coal Pile												0.86	0.43	0.17	3.764	1.882	0.753
EU-1003		Coal Piles 1A & 1B	Coal Pile Fugitive Dust to Atmosphere	Water Spray Suppression System (runoff to Coal Pile Pond)																				
					2750	5000	850	AP-42 Table 13.2.4	0.0011	Water Spray on Shroud	0.5	2.75	0.75	2.063	0.019	0.0523	NA	0.000	2.7500	2.06	0.05	1.169	0.877	0.022
EU-1004	Stacker 2 Boom Chute	Stacker 2 Boom	Stacker 2 Chute to Coal Piles 2A & 2B	Water Spray Suppression System	2750	5000	FromTable 6 for emissions from Coal Pile												0.86	0.43	0.17	3.764	1.882	0.753
EU-1005		Coal Piles 2A & 2B	Coal Pile Fugitive Dust to Atmosphere	Water Spray Suppression System (runoff to Coal Pile Pond)																				
					500	500	8760	AP-42 Table 13.2.4	0.0011	None	0	0.55	0.75	0.413	0.019	0.0105	NA	0.000	0.5500	0.41	0.01	2.409	1.807	0.046
EU-1006	Reclaiming	Coalpiles 1A & 1B Reclaimer 1	Reclaim Conveyor 6	Enclosure	500	500	0	AP-42 Table 13.2.4	0.0011	None	0	0.55	0.75	0.413	0.019	0.0105	NA	0.000	0.5500	0.41	0.01	0.000	0.000	0.000
		Coalpiles 2A & 2B Reclaimer 2	Reclaim Conveyor 7	Enclosure	500	500	8760	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.04	0.75	0.026	0.019	0.0007	Baghouse	0.995	0.0002	0.00	0.00	0.001	0.001	0.000
		Reclaim Conveyor 6	Reclaim Transfer Station	Baghouse Filter	500	500	0	AP-42 Table 11.9-4	0.007	Total Enclosure	0.99	0.04	0.75	0.026	0.019	0.0007	Baghouse	0.995	0.0002	0.00	0.00	0.000	0.000	0.000
		Reclaim Conveyor 7	Reclaim Transfer Station	Baghouse Filter	NA	NA	NA																	
EU-1007	Coal Dryer Heater	NA	NA	Fired Heater to Heat Coal Drying Loop Gas	500	500	8760										Baghouse	0.995	0.55	0.55	0.55	2.405	2.405	2.405
EU-1008	Coal Drying Loop	Reclaim Transfer Station	Coal Mill and Pulverizer	Coal Dryer Baghouse Used to Direct Fines to Process														Sums =	9.232	6.632	1.025	14.834	9.845	4.003

Table 9. GSD-01 Basic Source Level Information

Part O: New or Modified Emission Units

74. Emission Unit ID	75. New	76. Old	77. Type of Emissions Unit	78. Estimated Dates Begin Construction	Complete Construction	Begin operation
EU-1000	X	NA	Coal Unloading Station	1Q2021	1Q2023	3Q2023
EU-1001	X	NA	Transfer Station 1	1Q2021	1Q2023	3Q2023
EU-1002	X	NA	Stacker 1 Boom Chute	1Q2021	1Q2023	3Q2023
EU-1003	X	NA	Coal Pile 1A/1B	1Q2021	1Q2023	3Q2023
EU-1004	X	NA	Stacker 2 Boom Chute	1Q2021	1Q2023	3Q2023
EU-1005	X	NA	Coal Pile 2A/2B	1Q2021	1Q2023	3Q2023
EU-1006	X	NA	Reclaim Transfer Station	1Q2021	1Q2023	3Q2023
EU-1007	X	NA	Coal Dryer Heater	1Q2021	1Q2023	3Q2023
EU-1008	X	NA	Coal Drying Loop Purge (N2 + H2O Vapor)	1Q2021	1Q2023	3Q2023
EU-1501	X	NA	Coarse Additive Storage Filter	1Q2021	1Q2023	3Q2023
EU-1502	X	NA	Fine Additive Storage Filter	1Q2021	1Q2023	3Q2023
EU-1503	X	NA	NA2S Additive Storage Filter	1Q2021	1Q2023	3Q2023
EU-1504	X	NA	Fine Additive Production System	1Q2021	1Q2023	3Q2023
EU-2001	X	NA	Feed Heater	1Q2021	1Q2023	3Q2023
EU-2002	X	NA	Treat Gas Heater	1Q2021	1Q2023	3Q2023
EU-2003	X	NA	Vacuum Column Feed Heater	1Q2021	1Q2023	3Q2023
EU-2004	X	NA	Fractionator Feed Heater	1Q2021	1Q2023	3Q2023
EU-2005	X	NA	Coal Handling System Filter	1Q2021	1Q2023	3Q2023
EU-2006	X	NA	Coarse Additive Handling System Filter	1Q2021	1Q2023	3Q2023
EU-2007	X	NA	Fine Additive Handling System Filter	1Q2021	1Q2023	3Q2023
EU-2008	X	NA	Na2S Handling System Filter	1Q2021	1Q2023	3Q2023
EU-3001	X	NA	TGTU Stack A	1Q2021	1Q2023	3Q2023
EU-3002	X	NA	TGTU Stack B	1Q2021	1Q2023	3Q2023
EU-4001	X	NA	Loading Flare (8 loading spots naphtha service; each at 2500 gpm)	1Q2021	1Q2023	3Q2023
EU-4002	X	NA	Sulfur Block Flare	1Q2021	1Q2023	3Q2023
EU-4003	X	NA	LP Flare	1Q2021	1Q2023	3Q2023
EU-4004	X	NA	HP Flare	1Q2021	1Q2023	3Q2023
EU-5001A/B/C/D	X	NA	Residue Pastilators Stack1	1Q2021	1Q2023	3Q2023
EU-5002A/B/C/D	X	NA	Residue Pastilators Stack2	1Q2021	1Q2023	3Q2023
EU-5003A/B/C/D	X	NA	Residue Pastilators Stack3	1Q2021	1Q2023	3Q2023
EU-5004A/B/C/D	X	NA	Residue Pastilators Stack4	1Q2021	1Q2023	3Q2023
EU-5005	X	NA	Residue Railcar Loading	1Q2021	1Q2023	3Q2023
EU-5006	X	NA	Residue Railcar Loading	1Q2021	1Q2023	3Q2023
EU-5007	X	NA	Residue Rail/Truck Loading	1Q2021	1Q2023	3Q2023
EU-5008	X	NA	Residue Rail/Truck Loading	1Q2021	1Q2023	3Q2023
EU-5009	X	NA	Residue Bulk Container Loading	1Q2021	1Q2023	3Q2023
EU-5010	X	NA	Residue Rail Silo Filter	1Q2021	1Q2023	3Q2023
EU-5011	X	NA	Residue Swing Silo Filter	1Q2021	1Q2023	3Q2023
EU-6000	X	NA	Package Boiler	1Q2021	1Q2023	3Q2023
EU-6001	X	NA	Cooling Tower Cell A	1Q2021	1Q2023	3Q2023
EU-6002	X	NA	Cooling Tower Cell B	1Q2021	1Q2023	3Q2023
EU-6003	X	NA	Cooling Tower Cell C	1Q2021	1Q2023	3Q2023
EU-6005	X	NA	EDG Diesel Tank	1Q2021	1Q2023	3Q2023
EU-6006	X	NA	Emergency Diesel Generator	1Q2021	1Q2023	3Q2023
EU-6007	X	NA	EDFWP Diesel Tank	1Q2021	1Q2023	3Q2023
EU-6008	X	NA	Emergency Diesel FireWater Pump	1Q2021	1Q2023	3Q2023
EU-6501	X	NA	Lime Silo Filter	1Q2021	1Q2023	3Q2023
EU-6502	X	NA	Deaerator Vent	1Q2021	1Q2023	3Q2023
EU-7001	X	NA	Hydrogen Plant 1 Reformer	1Q2021	1Q2023	3Q2023
EU-7002	X	NA	Hydrogen Plant 2 Reformer	1Q2021	1Q2023	3Q2023
EU-7003	X	NA	Hydrogen Plant 1 DA Vent	1Q2021	1Q2023	3Q2023
EU-7004	X	NA	Hydrogen Plant 2 DA Vent	1Q2021	1Q2023	3Q2023

Table 10. GSD-02 Plant Layout Diagram
Part A Source Building Information

16. Building ID	17. Building Description	18. Building Dimensions			19. Distance & direction to the nearest property line or access limiting feature			20. Distance & Direction to the nearest residence (feet & compass coordinate)			
		Length (ft)	Width (ft)	Height (ft)	Distace (ft)	Compass Coordinate (East)	Compass Coordinate (North)	Building ID	Compass Coordinate (East)	Compass Coordinate (North)	Distace (ft)
B1	Admin Building	131.2	196.8	25	145	502588	4225656	Residence at E County Rd 2000 N	502477	4225479	209
B2	Control Room	295.2	147.6	30	64	502327	4227066	Transportation Department Building	502498	4227138	186
B3	Maintenance Workshop	164	98.4	40	266	502560	4225777	Residence at E County Rd 2000 N	502477	4225479	309
B4	Laboratory and Analytical Building	131.2	82	30	58	502389	4227072	Transportation Department Building	502498	4227138	127
B5	Warehouse/Storage	131.2	131.2	40	208	502559	4225719	Residence at E County Rd 2000 N	502477	4225479	254
	Storage Tanks and Silos (Circular Cross-Section)	Diameter (ft)									
B6	Naphtha Product Tank 1	160.1		47.9	407	502225	4226190	Residence at E County Rd 2000 N	502342	4225470	729
B7	Naphtha Product Tank 2	160.1		47.9	332	502150	4226190	Buress Trucking 1296 N Washington St	501481	4226280	675
B8	Diesel Product Tank 1	160.1		47.9	332	502150	4226114	Residence at E County Rd 2000 N	502342	4225470	672
B9	Diesel Product Tank 2	160.1		47.9	407	502225	4226114	Residence at E County Rd 2000 N	502342	4225470	655
B10	Diesel Product Tank 3	160.1		47.9	482	502301	4226114	Residence at E County Rd 2000 N	502342	4225470	645
B11	Diesel Product Swing Tank	160.1		47.9	482	502301	4226190	Residence at E County Rd 2000 N	502342	4225470	721
B12	Molten Sulfur Tank 1	42.7		47.9	297	502116	4226652	Baymont Inn and Suites, Dale	501810	4226820	349
B13	Molten Sulfur Tank 2	42.7		47.9	297	502116	4226671	Baymont Inn and Suites, Dale	501810	4226820	340
B14	Residue Surge Tank (VR LPH) 1	69.9		47.9	349	502167	4226778	Baymont Inn and Suites, Dale	501810	4226820	359
B15	Residue Surge Tank (VR LPH) 2	69.9		47.9	351	502193	4226778	Residence on County Rd 2100N	502076	4227133	374
B16	Residue Feed Tank	69.9		47.9	351	502219	4226778	Residence on County Rd 2100N	502076	4227133	383
B17	VGO Tank 1	69.9		47.9	236	502325	4226893	Transportation Department Building	502498	4227138	300
B18	VGO Tank 2	69.9		47.9	236	502357	4226893	Transportation Department Building	502498	4227138	282
B19	Slop Tank	160.1		40	522	502341	4226190	Residence at E County Rd 2000 N	502342	4225470	720
B20	Diesel Fuel Storage Tank	21.3		16.1	80	501898	4226431	Baymont Inn and Suites, Dale	501810	4226820	398
B21	Non-Phenolic Sour Water Storage Tank 1	80.1		47.9	325	502143	4226725	Baymont Inn and Suites, Dale	501810	4226820	346
B22	Non-Phenolic Sour Water Storage Tank 2	80.1		47.9	360	502178	4226725	Baymont Inn and Suites, Dale	501810	4226820	380
B23	Non-Phenolic Sour Water Storage Tank 3	80.1		47.9	395	502213	4226725	Baymont Inn and Suites, Dale	501810	4226820	414
B24	Phenolic Sour Water Storage Tank	21.3		24	290	502108	4226725	Baymont Inn and Suites, Dale	501810	4226820	313
B25	Stripped Non-Phenolic Sour Water Surge Tank	80.1		47.9	299	502117	4226783	Baymont Inn and Suites, Dale	501810	4226820	309
B26	Stripped Phenolic Sour Water Surge Tank	21.3		16.1	290	502108	4226763	Baymont Inn and Suites, Dale	501810	4226820	304
B27	Amine Surge/Deinventory Tank	25.9		16.1	377	502195	4226684	Baymont Inn and Suites, Dale	501810	4226820	409
B28	Fresh Amine Tank	25.9		16.1	407	502225	4226684	Baymont Inn and Suites, Dale	501810	4226820	437
B29	Water Trt Sulfuric Acid Tank	7.9		16.1	558	502552	4226069	Residence at E County Rd 2000 N	502477	4225479	595
B30	Water Trt Caustic Tank	7.9		16.1	558	502575	4226069	Residence at E County Rd 2000 N	502477	4225479	598
B31	Potable Water Storage Tank	15.1		16.1	256	502451	4226873	Residence at E County Rd 2000 N	502477	4225479	451
B32	Demin Water Storage Tank	85		40	241	502417	4226889	Residence at E County Rd 2000 N	502477	4225479	451
B33	Soda Ash Mix Tank	37		40	226	502417	4226889	Transportation Department Building	502498	4227138	262
B34	Fine Additive Storage Silo	30		100	325	502318	4226533	Building south of Winkler	502763	4226879	563
B35	Coarse Additive Storage Silo	26		100	345	502298	4226533	Baymont Inn and Suites, Dale	501810	4226820	566
B36	Sodium Sulfide Additive Storage Silo	10		35	305	502338	4226533	Building south of Winkler	502763	4226879	548

Table 10. GSD-02 Plant Layout Diagram
Part B Surrounding Building / Residence Information

21. Surrounding Building / Residence Description	22. Surrounding Building / Residence Property Dimensions			23. Distance & direction to the nearest property line or access limiting feature (feet & compass coordinate)			24. Building ID of nearest building on the plant site	25. Distance & direction to the nearest building on the plant site (feet & compass coordinate)		
	Length (ft)	Width (ft)	Height (ft)	Distance (Feet)	Compass Coordinate (East)	Compass Coordinate (North)		Compass Coordinate (East)	Compass Coordinate (North)	Distance (Feet)
Baymont Inn and Suites, Dale	228	69	NA	8.5	501810	4226820	Stripped Phenolic Sour Water Surge Tank	502108	4226763	304
Motel 6, Dale	184	52	NA	740	501604	4226866	Stripped Phenolic Sour Water Surge Tank	502108	4226763	515
Taylor Oil	79	45	NA	606	501643	4226866	Stripped Phenolic Sour Water Surge Tank	502108	4226763	476
Chuckles 23	102	25	NA	537	501665	4226945	Stripped Phenolic Sour Water Surge Tank	502108	4226763	479
Residence on County Rd 2100N	76	31	NA	75	502076	4227133	Control Room	502327	4227066	260
Transportation Department Building	166	58	NA	1025	502498	4227138	Laboratory and Analytical Building	502389	4227072	127
Universal Package Building	286	66	NA	956	502585	4227401	Laboratory and Analytical Building	502389	4227072	383
Sexton Inc	233	77	NA	1078	502707	4227491	Laboratory and Analytical Building	502389	4227072	526
Chrome Dome Store	60	47	NA	133	502601	4227178	Laboratory and Analytical Building	502389	4227072	237
Winkler Commercial Refrigeration	350	190	NA	341	502807	4227049	Laboratory and Analytical Building	502389	4227072	419
Building south of Winkler	103	96	NA	360	502763	4226879	Soda Ash Mix Tank	502417	4226889	346
Boilermakers Union Building	182	92	NA	1353	503074	4227057	Soda Ash Mix Tank	502417	4226889	678
Residence at 20042 N County Rd 500 E	49	40	NA	860	503431	4226978	Soda Ash Mix Tank	502417	4226889	1018
Residence at 20359-20375 N County Rd 500 E	54	46	NA	79	503480	4226541	Water Trt Caustic Tank	502575	4226069	1021
Residence on N County Rd 500 E	56	48	NA	598	503636	4226422	Water Trt Caustic Tank	502575	4226069	1118
Residence on N County Rd 500 E	69	49	NA	365	503568	4226000	Water Trt Caustic Tank	502575	4226069	995
Residence at 20000 N County Rd 500 E	42	32	NA	57	503404	4225570	Admin Building	502588	4225656	821
Residence at E County Rd 2000 N	60	32	NA	231	502607	4225431	Admin Building	502588	4225656	226
Residence at E County Rd 2000 N	80	40	NA	70	502477	4225479	Admin Building	502588	4225656	209
Residence at E County Rd 2000 N	68	34	NA	85	502342	4225470	Admin Building	502588	4225656	308
Residence at E County Rd 2000 N	76	53	NA	512	502435	4225343	Admin Building	502588	4225656	348
Buress Trucking 1296 N Washington St	50	23	NA	188	501740	4225551	Diesel Product Tank 1	502150	4226114	696
Deny's, Dale	203	77	NA	992	501481	4226280	Diesel Fuel Storage Tank	501898	4226431	443
Wendy's, Dale	95	55	NA	2240	501122	4226251	Diesel Fuel Storage Tank	501898	4226431	797
	79	37	NA	2227	501135	4226296	Diesel Fuel Storage Tank	501898	4226431	775

Table 11. GSD-04 Stack / Vent Information

1. Stack / vent ID	2. Type	3. Shape	4. Outlet Dimensions	5. Height	6. Maximum Outlet Flow Rate	7. Outlet Gas Temperature	8. Related Stacks / Vents
	(V H W O)	(C R O)	(feet)	(feet)	(acfm)	(Degrees F)	(B P O)
EU-1000	V	C	TBD	40	TBD	Ambient	NA
EU-1001	V	C	TBD	50	TBD	Ambient	NA
EU-1002	H	NA	TBD	100	TBD	Ambient	NA
EU-1003	Stockpile	NA	693	100	9697.6	Ambient	NA
EU-1004	H	NA	TBD	100	TBD	Ambient	NA
EU-1005	Stockpile	NA	693	100	9697.6	Ambient	NA
EU-1006	V	C	TBD	40	TBD	Ambient	NA
EU-1007	V	C	3	150	21273	525	NA
EU-1008	V	C	TBD	40	27917	220	NA
EU-1501	V	C	1	115	1668	120	NA
EU-1502	V	C	1	115	1668	120	NA
EU-1503	V	C	0.67	75	834	120	NA
EU-1504	V	C	TBD	TBD	TBD	Ambient	NA
EU-2001	V	C	5.25	200	48885	525	NA
EU-2002	V	C	3.17	200	17676	405	NA
EU-2003	V	C	1.58	200	4416	800	NA
EU-2004	V	C	5.50	200	53051	420	NA
EU-2005	V	C	TBD	TBD	TBD	Ambient	NA
EU-2006	V	C	0.33	115	221	120	NA
EU-2007	V	C	0.5	115	329	120	NA
EU-2008	V	C	0.17	75	39	120	NA
EU-3001	V	C	3	200	18894	529	NA
EU-3002	V	C	3	200	18894	529	NA
EU-4001	V	C	1.17	150	3	70	NA
EU-4002	V	C	2.5	150	11	70	NA
EU-4003	V	C	On Hold	150	On Hold	On Hold	NA
EU-4004	V	C	8	150	111	70	NA
EU-5001A/B/C/D	V	C	2	50	8000	500	NA
EU-5002A/B/C/D	V	C	2	50	8000	500	NA
EU-5003A/B/C/D	V	C	2	50	8000	500	NA
EU-5004A/B/C/D	V	C	2	50	8000	500	NA
EU-5005	V	C	TBD	TBD	TBD	Ambient	NA
EU-5006	V	C	TBD	TBD	TBD	Ambient	NA
EU-5007	V	C	TBD	TBD	TBD	Ambient	NA
EU-5008	V	C	TBD	TBD	TBD	Ambient	NA
EU-5009	V	C	TBD	TBD	TBD	Ambient	NA
EU-5010	V	C	TBD	TBD	TBD	Ambient	NA
EU-5011	V	C	TBD	TBD	TBD	Ambient	NA
EU-6000	V	C	3.5	100	30300	400	NA
EU-6001	V	C	21	76	545586	110	NA
EU-6002	V	C	21	76	545586	110	NA
EU-6003	V	C	21	76	545586	110	NA
EU-6005	NA	NA	NA	NA	NA	NA	NA
EU-6006	V	C	1	16	15234.8	770	NA
EU-6007	NA	NA	NA	NA	NA	NA	NA
EU-6008	V	C	1	16	15234.8	770	NA
EU-6501	V	C	TBD	TBD	TBD	Ambient	NA
EU-6502	V	C	TBD	TBD	TBD	Ambient	NA
EU-7001	V	C	11.25	110	258504	319	NA
EU-7002	V	C	11.25	110	258504	319	NA
EU-7003	V	C	1.67	45	1877.4	224	NA
EU-7004	V	C	1.67	45	1877.4	224	NA

Table 12. GSD-05 Emissions Unit Information

1. Unit ID	2. Model Number	3. Serial Number	4. Description	5. Manufacturer	6. Installation Date	7. Maximum Capacity (MMBtu/hr-HHV or as indicated)	8. Stack / Vent ID
EU-1000	TBD	TBD	Coal Unloading Station	TBD	1Q2021	5000 ton/hr	EU-1000
EU-1001	TBD	TBD	Transfer Station 1	TBD	1Q2021	5000 ton/hr	EU-1001
EU-1002	TBD	TBD	Stacker 1 Boom Chute	TBD	1Q2021	5000 ton/hr	EU-1002
EU-1003	TBD	TBD	Coal Pile 1A/1B	TBD	1Q2021	93010 tons	EU-1003
EU-1004	TBD	TBD	Stacker 2 Boom Chute	TBD	1Q2021	5000 ton/hr	EU-1004
EU-1005	TBD	TBD	Coal Pile 2A/2B	TBD	1Q2021	93010 tons	EU-1005
EU-1006	TBD	TBD	Reclaim Transfer Station	TBD	1Q2021	500 ton/hr	EU-1006
EU-1007	TBD	TBD	Coal Dryer Heater	TBD	1Q2021	55.8	EU-1007
EU-1008	TBD	TBD	Coal Drying Loop Purge (N2 + H2O Vapor)	TBD	1Q2021	NA	EU-1008
EU-1501	TBD	TBD	Coarse Additive Storage Filter	TBD	1Q2021	20 ton/hr	EU-1501
EU-1502	TBD	TBD	Fine Additive Storage Filter	TBD	1Q2021	20 ton/hr	EU-1502
EU-1503	TBD	TBD	NA2S Additive Storage Filter	TBD	1Q2021	10 ton/hr	EU-1503
EU-1504	TBD	TBD	Fine Additive Production System	TBD	1Q2021	20 ton/hr	EU-1504
EU-2001	TBD	TBD	Feed Heater	TBD	1Q2021	128.4	EU-2001
EU-2002	TBD	TBD	Treat Gas Heater	TBD	1Q2021	52.8	EU-2002
EU-2003	TBD	TBD	Vacuum Column Feed Heater	TBD	1Q2021	9	EU-2003
EU-2004	TBD	TBD	Fractionator Feed Heater	TBD	1Q2021	156	EU-2004
EU-2005	TBD	TBD	Coal Handling System Filter	TBD	1Q2021	300 ton/hr	EU-2005
EU-2006	TBD	TBD	Coarse Additive Handling System Filter	TBD	1Q2021	2.2 ton/hr	EU-2006
EU-2007	TBD	TBD	Fine Additive Handling System Filter	TBD	1Q2021	3.28 ton/hr	EU-2007
EU-2008	TBD	TBD	Na2S Handling System Filter	TBD	1Q2021	0.077 ton/hr	EU-2008
EU-3001	TBD	TBD	TGTU Stack A	TBD	1Q2021	21.4	EU-3001
EU-3002	TBD	TBD	TGTU Stack B	TBD	1Q2021	21.4	EU-3002
EU-4001	TBD	TBD	Loading Flare (8 loading spots naphtha service; each at 2500 gpm)	TBD	1Q2021	99.5 (LHV)	EU-4001
EU-4002	TBD	TBD	Sulfur Block Flare	TBD	1Q2021	100.6 (LHV)	EU-4002
EU-4003	TBD	TBD	LP Flare	TBD	1Q2021	8550 (LHV)	EU-4003
EU-4004	TBD	TBD	HP Flare	TBD	1Q2021	3377 (LHV)	EU-4004
EU-5001A/B/C/D	TBD	TBD	Residue Pastilators Stack1	TBD	1Q2021	12.9 ton/hr	EU-5001A/B/C/D
EU-5002A/B/C/D	TBD	TBD	Residue Pastilators Stack2	TBD	1Q2021	12.9 ton/hr	EU-5002A/B/C/D
EU-5003A/B/C/D	TBD	TBD	Residue Pastilators Stack3	TBD	1Q2021	12.9 ton/hr	EU-5003A/B/C/D
EU-5004A/B/C/D	TBD	TBD	Residue Pastilators Stack4	TBD	1Q2021	12.9 ton/hr	EU-5004A/B/C/D
EU-5005	TBD	TBD	Residue Railcar Loading	TBD	1Q2021	40 ton/hr	EU-5005
EU-5006	TBD	TBD	Residue Railcar Loading	TBD	1Q2021	40 ton/hr	EU-5006
EU-5007	TBD	TBD	Residue Rail/Truck Loading	TBD	1Q2021	40 ton/hr	EU-5007
EU-5008	TBD	TBD	Residue Rail/Truck Loading	TBD	1Q2021	40 ton/hr	EU-5008
EU-5009	TBD	TBD	Residue Bulk Container Loading	TBD	1Q2021	10 ton/hr	EU-5009
EU-5010	TBD	TBD	Residue Rail Silo Filter	TBD	1Q2021	51.5 ton/hr	EU-5010
EU-5011	TBD	TBD	Residue Swing Silo Filter	TBD	1Q2021	51.5 ton/hr	EU-5011
EU-6000	TBD	TBD	Package Boiler	TBD	1Q2021	68.5	EU-6000
EU-6001	TBD	TBD	Cooling Tower Cell A	TBD	1Q2021	32,000 gpm	EU-6001
EU-6002	TBD	TBD	Cooling Tower Cell B	TBD	1Q2021	cirulation rate	EU-6002
EU-6003	TBD	TBD	Cooling Tower Cell C	TBD	1Q2021	for CT	EU-6003
EU-6005	TBD	TBD	EDG Diesel Tank	TBD	1Q2021	13890 gal/yr	EU-6005
EU-6006	TBD	TBD	Emergency Diesel Generator	TBD	1Q2021	17.86	EU-6006
EU-6007	TBD	TBD	EDFWP Diesel Tank	TBD	1Q2021	7984 gal/yr	EU-6007
EU-6008	TBD	TBD	Emergency Diesel FireWater Pump	TBD	1Q2021	5.14	EU-6008
EU-6501	TBD	TBD	Lime Silo Filter	TBD	1Q2021	TBD	EU-6501
EU-6502	TBD	TBD	Deaerator Vent	TBD	1Q2021	NA	EU-6502
EU-7001	TBD	TBD	Hydrogen Plant 1 Reformer	TBD	1Q2021	838.6	EU-7001
EU-7002	TBD	TBD	Hydrogen Plant 2 Reformer	TBD	1Q2021	838.6	EU-7002
EU-7003	TBD	TBD	Hydrogen Plant 1 DA Vent	TBD	1Q2021	2628.36 acfm	EU-7003
EU-7004	TBD	TBD	Hydrogen Plant 2 DA Vent	TBD	1Q2021	2628.36 acfm	EU-7004

Table 13. GSD-06 Particulate Emissions Summary

Table 13a. Part A: Particulate Emissions Summary

Emission Point		Potential To Emit (tons per year)						
1. Unit ID	2. Description	3. PM	4. PM-10	5. PM-2.5	6. TSP	7. Fugitive Dust	8. Fugitive PM	9. HAP PM
EU-1000	Coal Unloading Station	0.152	0.114	0.003	0.152			
EU-1001	Transfer Station 1	0.002	0.001	0	0.002			
EU-1002	Stacker 1 Boom Chute	1.169	0.877	0.022	1.169			
EU-1003	Coal Pile 1A/1B	3.7635	1.8815	0.7525	3.7635			
EU-1004	Stacker 2 Boom Chute	1.169	0.877	0.022	1.169			
EU-1005	Coal Pile 2A/2B	3.7635	1.8815	0.7525	3.7635			
EU-1006	Reclaim Transfer Station	2.41	1.807	0.046	2.41			
EU-1007	Coal Dryer Heater	1.835	1.835	1.835	1.835			
EU-1008	Coal Drying Loop Purge (N2 + H2O Vapor)	2.405	2.405	2.405	2.405			
EU-1501	Coarse Additive Storage Filter	0.019	0.019	0.019	0.019			
EU-1502	Fine Additive Storage Filter	0.028	0.028	0.028	0.028			
EU-1503	NA2S Additive Storage Filter	0.001	0.001	0.001	0.001			
EU-1504	Fine Additive Production System	0.034	0.034	0.034	0.034			
EU-2001	Feed Heater	4.218	4.218	4.218	4.218			
EU-2002	Treat Gas Heater	1.74	1.74	1.74	1.74			
EU-2003	Vacuum Column Feed Heater	0.3	0.3	0.3	0.3			
EU-2004	Fractionator Feed Heater	5.12	5.12	5.12	5.12			
EU-2005	Coal Handling System Filter	0.023	0.023	0.023	0.023			
EU-2006	Coarse Additive Handling System Filter	0.023	0.023	0.023	0.023			
EU-2007	Fine Additive Handling System Filter	0.034	0.034	0.034	0.034			
EU-2008	Na2S Handling System Filter	0.004	0.004	0.004	0.004			
EU-3001	TGTU Stack A	1.216	1.216	1.216	1.216			
EU-3002	TGTU Stack B	1.216	1.216	1.216	1.216			
EU-4001	Loading Flare (8 loading spots naphtha service; each at 2500 gpm)	0.007	0.007	0.007	0.007			
EU-4002	Sulfur Block Flare	0.03	0.03	0.03	0.03	See Fugitive Dust Plan		
EU-4003	LP Flare	0.24	0.24	0.24	0.24			
EU-4004	HP Flare	0.235	0.235	0.235	0.235			
EU-5001A/B/C/D	Residue Pastilators Stack1	Trace	Trace	Trace	Trace			
EU-5002A/B/C/D	Residue Pastilators Stack2	Trace	Trace	Trace	Trace			
EU-5003A/B/C/D	Residue Pastilators Stack3	Trace	Trace	Trace	Trace			
EU-5004A/B/C/D	Residue Pastilators Stack4	Trace	Trace	Trace	Trace			
EU-5005	Residue Railcar Loading	Trace	Trace	Trace	Trace			
EU-5006	Residue Railcar Loading	Trace	Trace	Trace	Trace			
EU-5007	Residue Rail/Truck Loading	Trace	Trace	Trace	Trace			
EU-5008	Residue Rail/Truck Loading	Trace	Trace	Trace	Trace			
EU-5009	Residue Bulk Container Loading	Trace	Trace	Trace	Trace			
EU-5010	Residue Rail Silo Filter	Trace	Trace	Trace	Trace			
EU-5011	Residue Swing Silo Filter	Trace	Trace	Trace	Trace			
EU-6000	Package Boiler	2.234	2.234	2.234	2.234			
EU-6001	Cooling Tower Cell A	0.278	0.165	0.0006	0.278			
EU-6002	Cooling Tower Cell B	0.278	0.165	0.0006	0.278			
EU-6003	Cooling Tower Cell C	0.278	0.165	0.0006	0.278			
EU-6005	EDG Diesel Tank	NA	NA	NA	NA			
EU-6006	Emergency Diesel Generator	0.0461	0.0461	0.0461	0.0461			
EU-6007	EDFWP Diesel Tank	NA	NA	NA	NA			
EU-6008	Emergency Diesel FireWater Pump	0.0247	0.0247	0.0247	0.0247			
EU-6501	Lime Silo Filter	TBD	TBD	TBD	TBD			
EU-6502	Deaerator Vent	NA	NA	NA	NA			
EU-7001	Hydrogen Plant 1 Reformer	22.04	22.04	22.04	22.04			
EU-7002	Hydrogen Plant 2 Reformer	22.04	22.04	22.04	22.04			
EU-7003	Hydrogen Plant 1 DA Vent	NA	NA	NA	NA			
EU-7004	Hydrogen Plant 2 DA Vent	NA	NA	NA	NA			

Table 13. GSD-06 Particulate Emissions Summary

Table 13b. Part B: Control of Particulate Emissions

10. Unit ID	11. Control Measures	12. Control Measures Description	13. Control Plan
EU-1000	Baghouse		
EU-1001	Baghouse		
EU-1002	Water spray on chute		
EU-1003	Wetting		
EU-1004	Water spray on chute		
EU-1005	Wetting		
EU-1006	Baghouse		
EU-1007	NA	NA	
EU-1008	Baghouse	Moisture vent with trace PM	
EU-1501			
EU-1502	Baghouse	Solid storage shall be provided with dust filters on the top to separate nitrogen from the solid.	
EU-1503			
EU-1504			
EU-2001	NA	NA	
EU-2002	NA	NA	
EU-2003	NA	NA	
EU-2004	NA	NA	
EU-2005			
EU-2006	Baghouse	Solid handling systems shall be provided with dust filters to separate nitrogen from the solid.	
EU-2007			
EU-2008			
EU-3001	NA	NA	
EU-3002	NA	NA	
EU-4001	NA	NA	
EU-4002	NA	NA	
EU-4003	NA	NA	Yes. Fugitive dust plan .
EU-4004	NA	NA	
EU-5001A/B/C/D	NA	NA	
EU-5002A/B/C/D	NA	NA	
EU-5003A/B/C/D	NA	NA	
EU-5004A/B/C/D	NA	NA	
EU-5005	NA	NA	
EU-5006	NA	NA	
EU-5007	NA	NA	
EU-5008	NA	NA	
EU-5009	NA	NA	
EU-5010	Baghouse	Baghouse	
EU-5011	Baghouse	Baghouse	
EU-6000	NA	NA	
EU-6001			
EU-6002	Drift Eliminators	Drift eliminators are capable of achieving drift to 0.0005% of the cooling tower's recirculation rate.	
EU-6003			
EU-6005	NA	NA	
EU-6006	NA	NA	
EU-6007	NA	NA	
EU-6008	NA	NA	
EU-6501	Baghouse	Baghouse	
EU-6502	NA	NA	
EU-7001	NA	NA	
EU-7002	NA	NA	
EU-7003	NA	NA	
EU-7004	NA	NA	

Table 14 GSD-07 Criteria Pollutant Emissions Summary - Potential To Emit

		Criteria Pollutants - Potential to Emit																												
Unit ID	Stack ID	NOx		CO		SO2		TSP		PM10		PM2.5		VOC/NMHC		Lead		CO2		Total CO2e		HAPs		Other Compounds		
		(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	Species	(lb/hr)	(tons/yr)
EU-2001	EU-2001	2.470	10.800	2.470	10.800	0.229	1.002	0.963	4.218	0.963	4.218	0.963	4.218	0.693	3.037	0.000	0.000	14967.5	65557.4	14998.7	65694.3	0.238	1.041	Metals	0.005	0.024
EU-2002	EU-2002	2.112	9.251	1.901	8.326	0.094	0.412	0.396	1.734	0.396	1.734	0.396	1.734	0.285	1.249	0.000	0.000	6154.8	26958.2	6167.7	27014.5	0.098	0.428	Metals	0.002	0.010
EU-2003	EU-2003	0.360	1.577	0.324	1.419	0.016	0.070	0.067	0.296	0.067	0.296	0.067	0.296	0.049	0.213	0.000	0.000	1049.1	4595.1	1051.3	4604.7	0.017	0.073	Metals	0.000	0.002
EU-2004	EU-2004	6.240	27.331	5.616	24.598	0.278	1.217	1.170	5.125	1.170	5.125	1.170	5.125	0.842	3.690	0.000	0.000	18184.8	79649.2	18222.7	79815.5	0.289	1.265	Metals	0.007	0.029
EU-3001	EU-3001	6.782	29.705	1.319	5.775	12.507	54.780	0.278	1.216	0.278	1.216	0.278	1.216	0.203	0.890	0.000	0.000	4607.0	20178.7	4616.2	20218.9	0.070	0.305	Metals	0.002	0.007
																								Sulfuric Acid Mist	0.600	1.940
EU-3002	EU-3002	6.782	29.705	1.319	5.775	12.507	54.780	0.278	1.216	0.278	1.216	0.278	1.216	0.203	0.890	0.000	0.000	4607.0	20178.7	4616.2	20218.9	0.070	0.305	Metals	0.002	0.007
																								Sulfuric Acid Mist	0.600	1.940
EU-4004	EU-4004	0.440	1.930	2.400	10.510	0.010	0.050	0.050	0.240	0.050	0.240	0.050	0.240	0.040	0.160	0.000	0.000	819.0	3588.0	886.0	3881.0	0.000	0.000	N/A	N/A	N/A
EU-4002	EU-4002	0.060	0.250	0.310	1.340	1.100	4.800	0.010	0.030	0.010	0.030	0.010	0.030	0.020	0.070	0.000	0.000	103.0	452.0	112.0	489.0	0.000	0.000	N/A	N/A	N/A
EU-4001	EU-4001	0.014	0.030	0.040	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.685	5.603	0.000	0.000	13.8	60.4	14.9	65.4	14.532	0.683	N/A	N/A	N/A
EU-6000	EU-6000	2.720	11.914	2.448	10.722	0.121	0.531	0.510	2.234	0.510	2.234	0.510	2.234	0.367	1.608	0.000	0.000	7926.7	34718.8	7943.2	34791.3	0.126	0.551	Metals	0.003	0.013
EU-6001/2/3	EU-6001/2/3	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.834	0.112	0.492	0.000	0.002	1.282	5.614	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	Ammonia	0.125	0.549
																								Chlorine as HOCl	1.200	5.220
EU-5001a-04d	EU-5001a-04d	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.196	18.376	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	N/A	N/A	N/A
EU-6006	EU-6006	33.640	1.680	1.850	0.090	0.490	0.030	0.840	0.040	0.840	0.040	0.840	0.040	0.680	0.030	0.000	0.000	3028.0	151.0	3056.0	153.0	0.041	0.002	N/A	N/A	N/A
EU-6008	EU-6008	9.010	0.900	0.500	0.050	0.140	0.010	0.230	0.020	0.230	0.020	0.230	0.020	0.180	0.020	0.000	0.000	870.0	87.0	878.0	87.8	0.353	0.040	N/A	N/A	N/A
EU-7001	EU-7001	5.451	23.875	16.772	73.462	0.273	1.197	5.032	22.038	5.032	22.038	5.032	22.038	5.032	22.038	0.000	0.000	224972.1	985377.6	225176.1	986271.5	0.000	0.000	Ammonia	0.061	0.267
EU-7002	EU-7002	5.451	23.875	16.772	73.462	0.273	1.197	5.032	22.038	5.032	22.038	5.032	22.038	5.032	22.038	0.000	0.000	224972.1	985377.6	225176.1	986271.5	0.000	0.000	Ammonia	0.061	0.267
EU-7003	EU-7003	0.000	0.000	1.060	4.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.160	13.850	0.000	0.000	246.5	1080.0	292.5	1282.0	2.950	12.910	Ammonia	3.920	17.170
																								Acetic acid	0.040	0.180
EU-7004	EU-7004	0.000	0.000	1.060	4.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.160	13.850	0.000	0.000	246.5	1080.0	292.5	1282.0	2.950	12.910	Ammonia	3.920	17.170
																								Acetic acid	0.040	0.180
EU-4003	EU-4003	0.440	1.930	2.400	10.510	0.010	0.050	0.050	0.240	0.050	0.240	0.050	0.240	0.040	0.160	0.000	0.000	819.0	3588.0	886.0	3881.0	0.000	0.000	N/A	N/A	N/A
EU-1000	EU-1000	0.000	0.000	0.000	0.000	0.000	0.000	0.358	0.152	0.268	0.114	0.007	0.003	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1001	EU-1001	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1002	EU-1002	0.000	0.000	0.000	0.000	0.000	0.000	2.751	1.169	2.064	0.877	0.052	0.022	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1003	EU-1003	0.000	0.000	0.000	0.000	0.000	0.000	8.855	3.764	4.427	1.882	1.771	0.753	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1004	EU-1004	0.000	0.000	0.000	0.000	0.000	0.000	2.751	1.169	2.064	0.877	0.052	0.022	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1005	EU-1005	0.000	0.000	0.000	0.000	0.000	0.000	8.855	3.764	4.427	1.882	1.771	0.753	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1006	EU-1006	0.000	0.000	0.000	0.000	0.000	0.000	0.550	2.410	0.413	1.807	0.011	0.046	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1007	EU-1007	2.232	9.776	2.009	8.799	0.100	0.436	0.418	1.833	0.418	1.833	0.418	1.833	0.301	1.320	0.000	0.000	6504.5	28489.9	6518.1	28549.4	0.103	0.452	Metals	0.002	0.010
EU-1008	EU-1008	0.000	0.000	0.000	0.000	0.000	0.000	0.549	2.405	0.418	2.405	0.418	2.405	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1501	EU-1501	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.019	0.039	0.019	0.039	0.019	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	4.19E-05	2.00E-05	0.000	0.000	0.000
EU-1502	EU-1502	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.028	0.039	0.028	0.039	0.028	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	4.19E-05	2.00E-05	0.000	0.000	0.000
EU-1503	EU-1503	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.001	0.020	0.001	0.020	0.001	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-1504	EU-1504	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.034	0.008	0.034	0.008	0.034	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	8.27E-06	3.62E-05	0.000	0.000	0.000
EU-2005	EU-2005	0.000	0.000	0.000	0.000	0.000	0.000	0.0053	0.023	0.0053	0.023	0.0053	0.023	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000
EU-2006	EU-2006	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.023	0.005	0.023	0.005	0.023	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	5.55E-06	2.40E-05	0.000	0.000	0.000
EU-2007	EU-2007	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.034	0.008	0.034	0.008	0.034	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	8.27E-06	3.60E-05	0.000	0.000	0.000
EU-2008	EU-2008	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.001	0.004	0.001	0.004	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.000	0.000	0.000	0.000	0.000

Notes

1. Diesel firewater pump operation is 200 hours per year
2. Emergency Diesel Generator operations is 100 hours per year
3. All process related equipment are assumed to operate for 8760 hours annually
4. Hydrogen plant emission information has been provided by an outside vendor, based upon vendor's initial conceptual approach. Discussion regarding hydrogen plant design are not finalized.
5. Although Hydrogen Reformers are planned to be sized up to 70% of maximum VCC process facility production, maximum pollutant emissions are limited by VCC facility.
   The potential emissions are invariant, since maximum pollutant putput is limited by the VCC facility and the hydrogen plant is an auxiliary operation.
   Thus, emissions potential is based upon the required hydrogen at 100% VCC facility production capacity.
6. CO2e includes CO2. They are separately listed to establish that Greenhouse Gas (GHG) impacts have been determined for the spectrum of GHG generating species. The 40 CFR Part 98 Global Warming Potentials (GWPs) have been used to determine CO2e.
7. All non-cooling tower particulates emissions are assumed to be fine particulate matter. Thus TSP = PM10 = PM2.5
8. Emissions estimates utilize AP-42 emission factors extensively. These factors provide conservatively high emissions estimates that will be refined with vendor information as it becomes available.
9. Smokeless flaring is assumed
10. Diesel fuel is USLD
11. Storage tank emissions were determined using TANKS 4.09d. The results are provided elsewhere in this application.

Table 15 GSD-08 Hazardous Air Pollutants Summary

Table 15a. Part A: Unit Emissions Summary

1. Unit ID	2. Stack / Vent ID		3. Hazardous Air Pollutant	4. CAS Number	5. Actual Emissions		6. Potential to Emit	
					Standard Unit	Tons per Year	Standard Unit, lb/hr	Tons per Year
EU-1007	EU-1007	Coal Dryer Heater	Total HAPs	NA	TBD	TBD	1.03E-01	0.45
			n-Hexane	110543			9.86E-02	0.432
			Formaldehyde	50000			4.11E-03	0.018
			Toluene	108883			1.86E-04	8.15E-04
			Benzene	71432			1.15E-04	5.04E-04
			Nickel	7440020			1.15E-04	5.04E-04
EU-1501	EU-1501	Coarse Additive Storage Filter	Total HAPs are manganese compounds	NA	TBD	TBD	4.19E-05	2.00E-05
EU-1502	EU-1502	Fine Additive Storage Filter	Total HAPs are manganese compounds	NA	TBD	TBD	4.19E-05	2.00E-05
EU-1504	EU-1504	Fine Additive Production System	Total HAPs are manganese compounds	NA	TBD	TBD	8.27E-06	3.62E-05
EU-2001	EU-2001	Feed Heater	Total HAPs	NA	TBD	TBD	2.38E-01	1.04
			n-Hexane	110543			2.27E-01	0.992
			Formaldehyde	50000			9.44E-03	4.13E-02
			Toluene	108883			4.28E-04	1.87E-03
			Benzene	71432			2.64E-04	1.16E-03
			Nickel	7440020			2.64E-04	1.16E-03
EU-2002	EU-2002	Treat Gas Heater	Total HAPs	NA	TBD	TBD	9.78E-02	0.43
			n-Hexane	110543			9.33E-02	0.48
			Formaldehyde	50000			3.89E-03	0.017
			Toluene	108883			1.76E-04	7.72E-04
			Benzene	71432			1.09E-04	4.77E-04
			Nickel	7440020			1.09E-04	4.77E-04
EU-2003	EU-2003	Vacuum Column Feed Heater	Total HAPs	NA	TBD	TBD	1.67E-02	0.07
			n-Hexane	110543			1.59E-02	0.0698
			Formaldehyde	50000			6.64E-04	2.91E-03
			Toluene	108883			3.01E-05	1.32E-04
			Benzene	71432			1.86E-05	8.14E-05
			Nickel	7440020			1.86E-05	8.14E-05
EU-2004	EU-2004	Fractionator Feed Heater	Total HAPs	NA	TBD	TBD	0.29	1.26
			n-Hexane	110543			0.28	1.21
			Formaldehyde	50000			1.50E-02	5.02E-02
			Toluene	108883			5.20E-04	2.28E-03
			Benzene	71432			3.21E-04	1.41E-03
			Nickel	7440020			3.21E-04	1.41E-03
EU-2006	EU-2006	Coarse Additive Handling System Filter	Total HAPs are manganese compounds	NA	TBD	TBD	5.55E-06	0.000024
EU-2007	EU-2007	Fine Additive Handling System Filter	Total HAPs are manganese compounds	NA	TBD	TBD	8.27E-06	0.000036
EU-3001	EU-3001	TGTU Stack A	Total HAPs	NA	TBD	TBD	0.07	0.31
			n-Hexane	110543			0.07	0.291
			Formaldehyde	50000			2.77E-03	0.01213371
			Toluene	108883			1.26E-04	5.50E-04
			Benzene	71432			7.76E-05	3.40E-04
			Nickel	7440020			7.76E-05	3.40E-04
EU-3002	EU-3002	TGTU Stack B	Total HAPs	NA	TBD	TBD	0.07	0.31
			n-Hexane	110543			0.07	0.291
			Formaldehyde	50000			2.77E-03	0.01213371
			Toluene	108883			1.26E-04	5.50E-04
			Benzene	71432			7.76E-05	3.40E-04
			Nickel	7440020			7.76E-05	3.40E-04
EU-4001	EU-4001	Loading Flare (8 loading spots naphtha service; each at 2500 gpm)	Total HAPs	NA	TBD	TBD	14.532	0.683
			Benzene	71432			1.48	0.07
			Toluene	108883			3.947	0.185
			Xylenes	1330207			4.934	0.232
			Phenols	108952			0.049	0.002
			o-cresol	95487			0.118	0.006
			m+p-cresol	1319773			0.049	0.002
			n-hexane	110543			3.947	0.185

Table 15 GSD-08 Hazardous Air Pollutants Summary

Table 15a. Part A: Unit Emissions Summary

1. Unit ID	2. Stack / Vent ID		3. Hazardous Air Pollutant	4. CAS Number	5. Actual Emissions		6. Potential to Emit	
					Standard Unit	Tons per Year	Standard Unit, lb/hr	Tons per Year
EU-6000	EU-6000	Package Boiler	Total HAPs	NA	TBD	TBD	0.127	0.555
			n-Hexane	110543			0.12	0.526
			Formaldehyde	50000			0.005	0.022
			Toluene	108883			2.27E-04	9.93E-04
			Benzene	71432			1.40E-04	6.13E-04
			Nickel	7440020			1.40E-04	6.13E-04
EU-6006	EU-6006	Emergency Diesel Generator	Total HAPs		TBD	TBD	0.041	0.002
EU-6008	EU-6008	Emergency Diesel FireWater Pump	Total HAPs		TBD	TBD	0.353	0.04
EU-7003	EU-7003	Hydrogen Plant 1 DA Vent	Methanol	67561	TBD	TBD	2.95	12.19
EU-7004	EU-7004	Hydrogen Plant 2 DA Vent	Methanol	67561	TBD	TBD	2.95	12.19
FUGVCC	FUGVCC	VCC Process Unit	Benzene	71432	TBD	TBD	0.02	0.11
			Toluene	108883			0.07	0.29
			Xylenes	1330207			0.08	0.36
			Phenols	108952			0.00	0.00
			o-cresol	95487			0.00	0.01
			m+p-cresol	1319773			0.00	0.00
			n-hexane	110543			0.07	0.29
FUGPRD	FUGPRD	Product Storage and Handling	Benzene	71432	TBD	TBD	0.00	0.01
			Toluene	108883			0.01	0.03
			Xylenes	1330207			0.01	0.03
			Phenols	108952			0.00	0.00
			o-cresol	95487			0.00	0.00
			m+p-cresol	1319773			0.00	0.00
			n-hexane	110543			0.01	0.03

Table 15b. Part B: Pollutant Emissions Summary

7. Hazardous Air Pollutant	8. CAS Number	9. Actual Emissions		10. Potential to Emit	
		Standard Unit	Tons per Year	Standard Unit, lb/hr	Tons per Year
Hexane (-n)	110543	TBD	TBD	4.98	4.79
Formaldehyde	50000	TBD	TBD	0.04	0.18
Toluene	108883	TBD	TBD	4.02	0.51
Benzene	71432	TBD	TBD	1.51	0.19
Nickel	7440020	TBD	TBD	0.001	0.005
Xylenes	1330207	TBD	TBD	5.02	0.63
Phenol	108952	TBD	TBD	0.05	0.01
o-Cresol	95487	TBD	TBD	0.12	0.02
m-, p-Cresols	1319773	TBD	TBD	0.05	0.01
Methanol	67561	TBD	TBD	5.9	24.38

Table 15c. Part C: Fugitive HAPs Emissions

11. Fugitive Emission Source	12. Hazardous Air Pollutant	13. Emission Factor	14. Number Leaking	15. Uncontrolled Potential to Emit	
				Pounds per hour	Tons per year
Compressor Seals	*See attachments H102-2000-EV-CAL-EV2-0001, H102-4000-EV-CAL-EV2-0002		4	*See attachments H102-2000-EV-CAL-EV2-0001, H102-4000-EV-CAL-EV2-0002	
Flanges			1177		
Open-Ended Lines			94		
Pressure Relief Seals			109		
Pump Seals			41		
Sampling Connections			213		
Valves			222		
Other (specify): - Drains			213		

KBR

FUGITIVE AIR EMISSION INVENTORY CALCULATIONS

					Rev:	A	0	1	2	3	4
JOB NO.:	H102	DOC. NO.:	H102-2000-EV-CAL-EV2-0001		Date:	8-Jan-18	15-Jan-18	23-Jan-18			
CLIENT:	Riverview Energy Corporation	SUBJECT:	Piping and Equipment Fugitives		By:	RN	RN	RN			
PROJECT:	DCH Facility	BASIS:	Reference & PFD Factored Equipment		Check:	SAL	SAL	SAL			
LOCATION:	Dale, IN				Appr.:	---	---	---			
UNIT:	VCC				Purpose:	IFI	IFI	IFI			
UNIT No.	2000										

LINE | REV

PROJECT DEFINITION

SHADING LEGEND:	ENTRY	LINKED	CALC	GOAL SEEK	CHECK	SUM

UTM Coordinates for Process Unit		
Perimeter	Easting (m)	Northing (m)
Corner 1		
Corner 2		
Corner 3		
Corner 4		
Corner 5		
Corner 6		
Corner 7		
Corner 8		

Revision History

A Initial Setup for Checking
0 T&C PFD Basis, MatBal Streams Aggregated
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1 **Emissions Summary**

Emission Factor Set Used :	TCEQ-Refining

Fugitive Emission Source	Service	Em. Factor kg/hr	Equipment Counts	Uncontrolled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Primary Equipment Design Control Efficiency %	Secondary LDAR Program Control Efficiency %	Overall Fugitive Control Efficiency %	Contingency %	Controlled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Remarks
Valves	Gas	0.0268	3	0.08	0.70	0.18	0.78	0	97	97	50%	0.04163	0.36470	0.09178	0.40200	Streams with vapor pressure less than 0.002 psia @ 68 degF are excluded from fugitive evaluations
	Light Liquid	0.0109	32	0.35	3.05	0.77	3.36	0	97	97	50%	0.01045	0.09155	0.02304	0.10092	Final valve counts have most uncertainty until P&ID's are available in later engineering phases.
	Heavy Liquid	0.0109	153	1.67	14.59	3.67	16.08	0	97	97	50%	0.04997	0.43772	0.11016	0.48250	
Pumps (Includes Vessel Agitators)	Light Liquid	0.1139	18	2.05	17.95	4.52	19.79	80	85	97	0%	0.07424	0.65037	0.16368	0.71690	Double Mechanical Seals per API Seal Plans provided on all LL & HL pumps due to process conditions
	Heavy Liquid	0.0209	19	0.40	3.47	0.87	3.83	80	0	80	0%	0.12291	1.07667	0.27096	1.18681	
Flanges / Connectors	All	0.00025	1036	0.26	2.26	0.57	2.50	0	30	30	25%	0.30599	2.68044	0.67458	2.95465	Reactor and other large vessel flanges are welded due to high process pressures
Pressure Relief Valves	Gas	0.3500	19	6.65	58.25	14.66	64.21	100	97	100	15%	0.00000	0.00000	0.00000	0.00000	
	Liquids	0.3500	90	31.50	275.94	69.44	304.17	100	0	100	15%	0.00000	0.00000	0.00000	0.00000	
Compressors	All	1.3990	1	1.40	12.26	3.08	13.51	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Venting controlled by flare
Open-Ended Lines/Valves	All	0.00510	90	0.46	4.02	1.01	4.43	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Capped, blinded, or double block primary design.
Sampling Connections	All	0.03300	205	6.77	59.26	14.91	65.32	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Closed loop system designs used
Connectors - Miscellaneous	All	0.00025	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
Drains	All	0.02917	205	5.98	52.38	13.18	57.74	50	50	75	15%	1.49479	13.09438	3.29542	14.43393	50% of Drains are hardpiped with 100% control efficiency (entered as Secondary Efficiency)
Others		0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Gas/Vapor	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Liquid	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
	Totals =		1871	57.55	504.14	126.88	555.72					2.100	18.396	4.630	20.278	

2 **Speciated Emissions Summary**

Compound	Fugitive	gram/s	kg/hr	MT/yr	lb/hr	ton/yr	Contingency %	gram/s	kg/hr	MT/yr	lb/hr	ton/yr
Benzene	HAP	0.0025	0.009	0.079	0.020	0.087	25%	0.0031	0.011	0.099	0.025	0.109
Toluene	HAP	0.0067	0.024	0.211	0.053	0.233		0.0084	0.030	0.264	0.066	0.291
Xylenes	HAP	0.0084	0.030	0.264	0.067	0.291		0.0105	0.038	0.330	0.083	0.364
Phenols	HAP	0.0001	0.000	0.003	0.001	0.003		0.0001	0.000	0.003	0.001	0.004
o-cresol	HAP	0.0002	0.001	0.006	0.002	0.007		0.0003	0.001	0.008	0.002	0.009
m+p-cresol	HAP	0.0001	0.000	0.003	0.001	0.003		0.0001	0.000	0.003	0.001	0.004
n-hexane	HAP	0.0067	0.024	0.211	0.053	0.232		0.0083	0.030	0.263	0.066	0.290
Sum =	HAP	0.025	0.089	0.777	0.196	0.856		0.031	0.111	0.971	0.244	1.071

KBR

FUGITIVE AIR EMISSION INVENTORY CALCULATIONS

JOB NO.:	H102	DOC. NO.:	H102-4000-EV-CAL-EV2-0002	Rev:	A	0	1	2	3	4
CLIENT:	Riverview Energy Corporation	SUBJECT:	Piping and Equipment Fugitives	Date:	8-Jan-18	23-Jan-18				
PROJECT:	DCH Facility	BASIS:	Reference & PFD Factored Equipment	By:	RN	RN				
LOCATION:	Dale, IN			Check:	SAL	SAL				
UNIT:	Offsites Product Storage and Handling			Appr.:	---	---				
UNIT No.	4000			Purpose:	IFI	IFI				

LINE | REV | PROJECT DEFINITION

SHADING LEGEND: ENTRY | LINKED | CALC | GOAL SEEK | CHECK | SUM

Revision History

A Initial Setup for Checking
0 T&C PFD Basis, MatBal Streams Aggregated
1
2
3
4

UTM Coordinates for Process Unit		
Perimeter	Easting (m)	Northing (m)
Corner 1		
Corner 2		
Corner 3		
Corner 4		
Corner 5		
Corner 6		
Corner 7		
Corner 8		

TABLE OF CONTENTS

1 Emissions Summary

Emission Factor Set Used : TCEQ-Refining

Fugitive Emission Source	Service	Em. Factor kg/hr	Equipment Counts	Uncontrolled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Primary Equipment Design Control Efficiency %	Secondary LDAR Program Control Efficiency %	Overall Fugitive Control Efficiency %	Contingency %	Controlled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Remarks
Valves	Gas	0.0268	0	0.00	0.00	0.00	0.00	0	97	97	50%	0.00000	0.00000	0.00000	0.00000	Streams with vapor pressure less than 0.002 psia @ 68 degF are excluded from fugitive evaluations
	Light Liquid	0.0109	34	0.37	3.24	0.82	3.57	0	97	97	50%	0.01110	0.09727	0.02448	0.10722	Final valve counts have most uncertainty until P&ID's are available in later engineering phases.
	Heavy Liquid	0.0109	0	0.00	0.00	0.00	0.00	0	97	97	50%	0.00000	0.00000	0.00000	0.00000	
Pumps	Light Liquid	0.1139	4	0.46	3.99	1.00	4.40	80	85	97	0%	0.01492	0.13067	0.03289	0.14404	Double Mechanical Seals per API Seal Plans provided on all LL & HL pumps due to process conditions
(Includes Vessel Agitators)	Heavy Liquid	0.0209	0	0.00	0.00	0.00	0.00	80	0	80	0%	0.00000	0.00000	0.00000	0.00000	
Flanges / Connectors	All	0.00025	141	0.04	0.31	0.08	0.34	0	30	30	25%	0.03209	0.28110	0.07074	0.30986	Reactor and other large vessel flanges are welded due to high process pressures
Pressure Relief Valves	Gas	0.3500	0	0.00	0.00	0.00	0.00	100	97	100	15%	0.00000	0.00000	0.00000	0.00000	
	Liquids	0.3500	0	0.00	0.00	0.00	0.00	100	0	100	15%	0.00000	0.00000	0.00000	0.00000	
Compressors	All	1.3990	3	4.20	36.77	9.25	40.53	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Venting controlled by flare
Open-Ended Lines/Valves	All	0.00510	4	0.02	0.18	0.04	0.20	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Capped, blinded, or double block primary design.
Sampling Connections	All	0.03300	8	0.26	2.31	0.58	2.55	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Closed loop system designs used
Connectors - Miscellaneous	All	0.00025	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
Drains	All	0.02917	8	0.23	2.04	0.51	2.25	50	50	75	15%	0.05833	0.51100	0.12860	0.56328	50% of Drains are hardpiped with 100% control efficiency (entered as Secondary Efficiency)
Others		0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Gas/Vapor	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Liquid	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
		Totals =	202	5.58	48.84	12.29	53.84					0.116	1.020	0.257	1.124	

2 Speciated Emissions Summary

Compound	Fugitive	gram/s	kg/hr	MT/yr	lb/hr	ton/yr	Contingency %	gram/s	kg/hr	MT/yr	lb/hr	ton/yr
Benzene	HAP	0.0002	0.001	0.007	0.002	0.008		0.0003	0.001	0.009	0.002	0.010
Toluene	HAP	0.0006	0.002	0.020	0.005	0.022		0.0008	0.003	0.025	0.006	0.027
Xylenes	HAP	0.0008	0.003	0.025	0.006	0.027		0.0010	0.004	0.031	0.008	0.034
Phenols	HAP	0.0000	0.000	0.000	0.000	0.000		0.0000	0.000	0.000	0.000	0.000
o-cresol	HAP	0.0000	0.000	0.001	0.000	0.001	25%	0.0000	0.000	0.001	0.000	0.001
m+p-cresol	HAP	0.0000	0.000	0.000	0.000	0.000		0.0000	0.000	0.000	0.000	0.000
n-hexane	HAP	0.0006	0.002	0.020	0.005	0.022		0.0008	0.003	0.025	0.006	0.027
Sum =	HAP	0.002	0.008	0.073	0.018	0.081		0.003	0.010	0.092	0.023	0.101

Table 19. CE-06. Organics - Flare/Oxidizer/Incinerator

Table 19a. Part A. Identification and Description of Control Equipment

1.Control Equipment ID:	2.Installation Date:	3.Incineration Method:	4.Residence Time	5.Hood Static Pressure	6.Bed Temperature at the Flame Zone	7.Fuel Used:	8.Is the Gas Stream used as Overfire Air?	9.Location of Flame	10.Are Flame Arrestors used?	11.Are Steam Jets used?	12.How is the flare used?	13.Catalyst Material:	14.Number of Catalyst Beds:	15.Is the Catalyst Cleaned and reused on-site?	16.Is a Heat Exchanger used	17.Heat Exchanger Type:
EU-4004	1Q2021	Flare	NA	NA	NA	Natural Gas Only	No	NA	No	No	Safety Relief	None	NA	NA	No	NA
EU-4002	1Q2021	Flare	NA	NA	NA	Natural Gas Only	No	NA	No	No	Safety Relief	None	NA	NA	No	NA
EU-4001	1Q2021	Flare	NA	NA	NA	Natural Gas Only	No	NA	No	No	Safety Relief	None	NA	NA	No	NA

Table 19b. Operational Parameters

1.Control Equipment ID:	18.Organic Vapor Concentration *(%)*	19.Gas Stream Flow Rate	20.Moisture Content	21.Heat Content *(for Flares) MMBtu/hr*	22.Excess Oxygen *(for Oxidizers)*	23.Particle Size Range	24.Other *(specify)*:
EU-4004	2	6649.4 scfh	NA	6.70551	NA	<2.5 um	NA
EU-4002	2	683.4 scfh	NA	0.68931	NA	<2.5 um	NA
EU-4001	2	154 scfh	NA	0.1554	NA	<2.5 um	NA

Table 19c. Part C. Pollutant Concentrations

1.Control Equipment ID:	Pollutant	Units	26. Inlet	27. Outlet	28. Efficiency *(%)*:
EU-4004	VOC	lb/hr	1.8	0.036	98
	PM	lb/hr	2.7	0.054	98
	CO	lb/hr	120	2.4	98
	NO_x	lb/hr	22.05	0.441	98
	SO_2	lb/hr	0.6	0.012	98
EU-4002	VOC	lb/hr	0.75	0.015	98
	PM	lb/hr	0.35	0.007	98
	CO	lb/hr	15.3	0.306	98
	NO_x	lb/hr	2.8	0.056	98
	SO_2	lb/hr	54.75	1.095	98
EU-4001	VOC	lb/hr	4944.7	98.685	98
	PM	lb/hr	0.1	0.002	98
	CO	lb/hr	2212.4	44.248	98
	NO_x	lb/hr	406.6	8.132	98

Table 19d. Parts D and E

1.Control Equipment ID:	29.Item(s) Monitored:	30.Monitoring Frequency:	31.Item(s) Recorded:	32.Record Keeping Frequency:	33.Pollutant(s) Tested:	34.Test Method(s):	35.Testing Frequency:	36. Do you have a Preventive Maintenance Plan (PMP)?
EU-4004	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
EU-4002	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
EU-4001	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Table 16. GSD-10 Insignificant Activities

* This table identifies for the listed sources which pollutants are emitted in trivial amounts. A number of these emitters have significant potential emissions of other criteria pollutants.
* X denotes insignificant/exempt , "NA" represents Not Applicable

Emission Unit	Description	PM10/ PM2.5	NOx	CO	SO2	VOCs	HAPs	Lead
EU-1000	Coal Unloading Station	X	NA	NA	NA	NA	X	X
EU-1001	Transfer Station 1	X	NA	NA	NA	NA	X	X
EU-1002	Stacker 1 Boom Chute	X	NA	NA	NA	NA	X	X
EU-1003	Coal Pile 1A/1B	X	NA	NA	NA	NA	X	X
EU-1004	Stacker 2 Boom Chute	X	NA	NA	NA	NA	X	X
EU-1005	Coal Pile 2A/2B	X	NA	NA	NA	NA	X	X
EU-1006	Reclaim Transfer Station	X	NA	NA	NA	NA	X	NA
EU-1007	Coal Dryer Heater	X	--	--	X	X	X	X
EU-1008	Coal Drying Loop Purge (N2 + H2O Vapor)	X	NA	NA	NA	NA	NA	NA
EU-1501	Coarse Additive Storage Filter	X	NA	NA	NA	NA	X	NA
EU-1502	Fine Additive Storage Filter	X	NA	NA	NA	NA	X	NA
EU-1503	NA2S Additive Storage Filter	X	NA	NA	NA	NA	NA	NA
EU-1504	Fine Additive Production System	X	NA	NA	NA	NA	X	NA
EU-2001	Feed Heater	X	--	--	X	X	X	X
EU-2002	Treat Gas Heater	X	--	--	X	X	X	X
EU-2003	Vacuum Column Feed Heater	X	X	X	X	X	X	X
EU-2004	Fractionator Feed Heater	X	--	--	X	X	X	X
EU-2005	Coal Handling System Filter	X	NA	NA	NA	NA	X	X
EU-2006	Coarse Additive Handling System Filter	X	NA	NA	NA	NA	X	NA
EU-2007	Fine Additive Handling System Filter	X	NA	NA	NA	NA	X	NA
EU-2008	Na2S Handling System Filter	X	NA	NA	NA	NA	NA	NA
EU-3001	TGTU Stack A	X	--	--	--	X	X	X
EU-3002	TGTU Stack B	X	--	--	--	X	X	X
EU-4001	Loading Flare (8 loading spots naphtha service; each at 2500 gpm)	X	X	X	X	X	X	X
EU-4002	Sulfur Block Flare	X	X	X	X	X	X	X
EU-4003	LP Flare	X	X	X	X	X	X	X
EU-4004	HP Flare	X	X	X	X	X	X	NA
EU-5001A/B/C/D	Residue Pastilators Stack1	X	NA	NA	NA	X	X	NA
EU-5002A/B/C/D	Residue Pastilators Stack2	X	NA	NA	NA	X	X	NA
EU-5003A/B/C/D	Residue Pastilators Stack3	X	NA	NA	NA	X	X	NA
EU-5004A/B/C/D	Residue Pastilators Stack4	X	NA	NA	NA	X	X	NA
EU-5005	Residue Railcar Loading	X	NA	NA	NA	X	X	NA
EU-5006	Residue Railcar Loading	X	NA	NA	NA	X	X	NA
EU-5007	Residue Rail/Truck Loading	X	NA	NA	NA	X	X	NA
EU-5008	Residue Rail/Truck Loading	X	NA	NA	NA	X	X	NA
EU-5009	Residue Bulk Container Loading	X	NA	NA	NA	X	X	NA
EU-5010	Residue Rail Silo Filter	X	NA	NA	NA	X	X	NA
EU-5011	Residue Swing Silo Filter	X	NA	NA	NA	X	X	NA
EU-6000	Package Boiler	--	--	--	--	X	X	X
EU-6001	Cooling Tower Cell A	X	NA	NA	NA	X	NA	NA
EU-6002	Cooling Tower Cell B	X	NA	NA	NA	X	NA	NA
EU-6003	Cooling Tower Cell C	X	NA	NA	NA	X	NA	NA
EU-6005	EDG Diesel Tank	NA	NA	NA	NA	X	NA	NA
EU-6006	Emergency Diesel Generator	X	--	--	X	X	X	X
EU-6007	EDFWP Diesel Tank	NA	NA	NA	NA	X	NA	NA
EU-6008	Emergency Diesel FireWater Pump	X	--	--	X	X	X	X
EU-6501	Lime Silo Filter	X	NA	NA	NA	NA	NA	NA
EU-6502	Deaerator Vent	NA	NA	NA	NA	NA	NA	NA
EU-7001	Hydrogen Plant 1 Reformer	--	--	--	--	--	X	X
EU-7002	Hydrogen Plant 2 Reformer	--	--	--	--	--	X	X
EU-7003	Hydrogen Plant 1 DA Vent	NA	NA	--	NA	--	--	NA
EU-7004	Hydrogen Plant 2 DA Vent	NA	NA	--	NA	--	--	NA

Table 17. CE-01 Control Equipment Summary

Summary of Control Equiment

1. Control Equipment ID	2. Control Equipment Description	3. Pollutant Controlled	4. Emission Unit ID	5. Stack / Vent ID	6. Applicable Rule
EU-1000	Baghouse	PM	EU-1000	EU-1000	40 CFR 60 Part Y 60.254
EU-1001	Baghouse	PM	EU-1001	EU-1001	40 CFR 60 Part Y 60.254
EU-1002	NA	---	---	---	---
EU-1003	NA	---	---	---	---
EU-1004	NA	---	---	---	---
EU-1005	NA	---	---	---	---
EU-1006	Baghouse	PM	EU-1006	EU-1006	40 CFR 60 Part Y 60.254
EU-1007	NA	---	---	---	---
EU-1008	Baghouse	PM	EU-1008	EU-1008	40 CFR 60 Part Y 60.254
EU-1501	Baghouse	PM, HAPs	EU-1501	EU-1501	---
EU-1502	Baghouse	PM, HAPs	EU-1502	EU-1502	---
EU-1503	Baghouse	PM, HAPs	EU-1503	EU-1503	---
EU-1504	Baghouse	PM, HAPs	EU-1504	EU-1504	---
EU-2001	NA	---	---	---	---
EU-2002	NA	---	---	---	---
EU-2003	NA	---	---	---	---
EU-2004	NA	---	---	---	---
EU-2005	Baghouse	PM	EU-2005	EU-2005	40 CFR 60 Part Y 60.254
EU-2006	Baghouse	PM, HAPs	EU-2006	EU-2006	---
EU-2007	Baghouse	PM, HAPs	EU-2007	EU-2007	---
EU-2008	Baghouse	PM, HAPs	EU-2008	EU-2008	---
EU-3001	NA	---	---	---	---
EU-3002	NA	---	---	---	---
EU-4001	NA	---	---	---	---
EU-4002	NA	---	---	---	---
EU-4003	NA	---	---	---	---
EU-4004	NA	---	---	---	---
EU-5001A/B/C/D	NA	---	---	---	---
EU-5002A/B/C/D	NA	---	---	---	---
EU-5003A/B/C/D	NA	---	---	---	---
EU-5004A/B/C/D	NA	---	---	---	---
EU-5005	NA	---	---	---	---
EU-5006	NA	---	---	---	---
EU-5007	NA	---	---	---	---
EU-5008	NA	---	---	---	---
EU-5009	NA	---	---	---	---
EU-5010	Baghouse	PM	EU-5010	EU-5010	---
EU-5011	Baghouse	PM	EU-5011	EU-5011	---
EU-6000	NA	---	---	---	---
EU-6001	Drift Eliminators	PM	EU-6001	EU-6001	---
EU-6002	Drift Eliminators	PM	EU-6002	EU-6002	---
EU-6003	Drift Eliminators	PM	EU-6003	EU-6003	---
EU-6005	NA	---	---	---	---
EU-6006	NA	---	---	---	---
EU-6007	NA	---	---	---	---
EU-6008	NA	---	---	---	---
EU-6501	Baghouse	PM	EU-6501	EU-6501	---
EU-6502	NA	---	---	---	---
EU-7001	SCR	NOx	EU-7001	EU-7001	---
EU-7002	SCR	NOx	EU-7002	EU-7002	---
EU-7003	NA	---	---	---	---
EU-7004	NA	---	---	---	---

Table 18. CE-02 Particulate Control - Baghouse / Fabric Filter

Table 18a. Part A: Identification and Description of Control Equipment

1. Control Equipment ID		2. Installation Date	3. Bags or Cartridges?	4. Filter Material	5. Number of bags per Compartment	6. Number of Compartments
EU-1000		1Q2021	Bags	TBD	TBD	TBD
EU-1001		1Q2021	Bags	TBD	TBD	TBD
EU-1006		1Q2021	Bags	TBD	TBD	TBD
EU-1008		1Q2021	Bags	TBD	TBD	TBD
EU-1501	Used for material recovery, not a control device	1Q2021	Bags	TBD	TBD	TBD
EU-1502		1Q2021	Bags	TBD	TBD	TBD
EU-1503		1Q2021	Bags	TBD	TBD	TBD
EU-1504		1Q2021	Bags	TBD	TBD	TBD
EU-2005		1Q2021	Bags	TBD	TBD	TBD
EU-2006	Used for material recovery, not a control device	1Q2021	Bags	TBD	TBD	TBD
EU-2007		1Q2021	Bags	TBD	TBD	TBD
EU-2008		1Q2021	Bags	TBD	TBD	TBD
EU-5010		1Q2021	Bags	TBD	TBD	TBD
EU-5011		1Q2021	Bags	TBD	TBD	TBD
EU-6501		1Q2021	Bags	TBD	TBD	TBD

Table 18a. Part A: Identification and Description of Control Equipment

1. Control Equipment ID	7. Mode of Operation	8. Cleanign Method	9. Cleaning Cycle / Frequency	10. Is a bag leak detector installed on a device	11. Type / Description of Bag Leak Detector	12. Air to Cloth Ratio	13. Is Lime inkection used on this device	14. Is Carbon Injection used on this device
EU-1000	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1001	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1006	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1008	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1501	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1502	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1503	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-1504	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-2005	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-2006	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-2007	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-2008	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-5010	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-5011	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No
EU-6501	Continuous	Reverse Pulse	As Needed	Yes	TBD	TBD	No	No

Table 18b. Part B: Operational Parameters

1. Control Equipment ID	15. Gas Stream Flow Rate acfm	16. Gas Stream Temperature deg F	17. Gas Stream Pressure	18. Moisture	19. Particle Size Range Inlet	19. Particle Size Range Outlet	20. Lime Injection Rate (if applicable)	21. Carbon Injection Rate (if applicable)	22. Other (specify):
EU-1000	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1001	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1006	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1008	27916.6	220	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1501	1668	120	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1502	1668	120	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1503	834	120	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-1504	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-2005	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-2006	221	120	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-2007	329	120	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-2008	39	120	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-5010	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-5011	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA
EU-6501	TBD	Ambient	TBD	0	≤ 2.5 microns	≤ 2.5 microns	NA	NA	NA

Table 18c. Part C: Pollutant Concentrations

1. Control Equipment ID	Pollutant Potential to Emit (tons per year)				26. Capture Efficiency (%)	26. Control Efficiency (%)
	PM	PM10	PM2.5	HAPs		
EU-1000	0.152	0.114	0.003	NA	100	99.5
EU-1001	0.002	0.001	0.000	NA	100	99.5
EU-1006	2.410	1.807	0.046	NA	100	99.5
EU-1008	2.405	2.405	2.405	NA	100	99.5
EU-1501	0.019	0.019	0.019	2.00E-05	100	99.5
EU-1502	0.028	0.028	0.028	2.00E-05	100	99.5
EU-1503	0.001	0.001	0.001	NA	100	99.5
EU-1504	0.034	0.034	0.034	3.62E-05	100	99.5
EU-2005	0.023	0.023	0.023	NA	100	99.5
EU-2006	0.023	0.023	0.023	2.40E-05	100	99.5
EU-2007	0.034	0.034	0.034	0.000	100	99.5
EU-2008	0.004	0.004	0.004	NA	100	99.5
EU-5010	Trace	Trace	Trace	NA	100	99.5
EU-5011	Trace	Trace	Trace	NA	100	99.5
EU-6501	TBD	TBD	TBD	NA	100	99.5

Table 18d. Parts D, E, F

1. Control Equipment ID	27. Item(s) Monitored	28. Monitoring Frequency	29. Item(s) Recorded:	30. Record Keeping Frequency:	31. Pollutant(s) Tested:	32. Test Method(s)	33. Testing Frequency:	34. Do you have a Preventive Maintenance Plan (PMP)	35. Has IDEM already made an integral determination for this device?	36. Is this device integral to the process?
EU-1000	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1001	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1006	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1008	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1501	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1502	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1503	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-1504	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-2005	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-2006	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-2007	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-2008	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-5010	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-5011	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes
EU-6501	Pressure	Continuous	Delta P	Continuous	PM	Method 5	Every 5 years	No - in development	No	Yes

Table 20. PI-02 Combustion

Table 20a. Summary of Combustion Units

1. Combustion Unit Type	2. Number of Identical Units	3. Unit ID(s)	4. Date of Installation or Modification	5. Heat input rate of each unit (MMBtu/hr)	6. Emergency Back-Up Unit?
Coal Dryer Heater	1	EU-1007	1Q2021	55.8	No
Feed Heater	1	EU-2001	1Q2021	128.4	No
Treat Gas Heater	1	EU-2002	1Q2021	52.8	No
Vacuum Column Feed Heater	1	EU-2003	1Q2021	9	No
Fractionator Feed Heater	1	EU-2004	1Q2021	156	No
Package Boiler	1	EU-6000	1Q2021	68.5	No
Emergency Diesel Generator	1	EU-6006	1Q2021	17.86	Yes
Emergency Diesel FireWater Pump	1	EU-6008	1Q2021	5.14	Yes
Hydrogen Plant 1 Reformer	1	EU-7001	1Q2021	838.6	No
Hydrogen Plant 2 Reformer	1	EU-7002	1Q2021	838.6	No

Table 20b. PI-02B: Combustion - Boilers, Process Heaters & Furnaces

Part A: Process Unit Details

Part B: Emission Controls and Limitation

1. Unit ID	2. Unit Type	3. Combustion Process	4. Heat Transfer Method	5. Transfer Surface Arrangement	6. Firing Configuration	7. Heat Transfer Method	8. Fuel Used	9. Add-On Control Technology	10. Control Techniques
EU-1007	Coal Dryer Heater	Gas Combustion	Radiant and Convection Sections	Horizontal	Up-fired	Indirect	Natural Gas	None	Ultra Low NOx Burners
EU-2001	Feed Heater	Gas Combustion		Horizontal	Up-fired	Indirect	Natural Gas	None	Ultra Low NOx Burners
EU-2002	Treat Gas Heater	Gas Combustion		Horizontal	Up-fired	Indirect	Natural Gas	None	Ultra Low NOx Burners
EU-2003	Vacuum Column Feed Heater	Gas Combustion		Horizontal	Up-fired	Indirect	Natural Gas	None	Ultra Low NOx Burners
EU-2004	Fractionator Feed Heater	Gas Combustion		Horizontal	Up-fired	Indirect	Natural Gas	None	Ultra Low NOx Burners
EU-6000	Package Boiler	Gas Combustion	Watertube	Horizontal	Horizontal	NA	Natural Gas	None	Ultra Low NOx Burners
EU-7001	Hydrogen Plant 1 Reformer	Gas Combustion	Radiant and Convection Sections	Horizontal	Down-fired	Indirect	Process Tail Gas supplemented by Natural Gas	Yes	Selective Catalytic Reduction (SCR)
EU-7002	Hydrogen Plant 2 Reformer	Gas Combustion		Horizontal	Down-fired	Indirect	Process Tail Gas supplemented by Natural Gas	Yes	Selective Catalytic Reduction (SCR)

Table 20c. PI-02C: Combustion - Turbines & Reciprocating Internal Combustion Engines

1. Unit ID	2. Type of Combustion Unit	3. Combustion Process	4. Ignition Type	5. Power Output	6. Duty Cycle (hr/yr)	7. Fuel Used	8. Supply power to an emergency generator?
EU-6006	RICE	TBD	Compression	2800 BHP	100	Diesel Fuel	Yes
EU-6008	RICE	TBD	Compression	750 BHP	200	Diesel Fuel	Yes

Table 20c. PI-02F: Combustion - Fuel Use

Part A, Part B, Part C

1. Unit ID	2. Fuel Type	3. Percent of Fuel Use	4. Primary or Secondary Fuel?	5. Component Percentages	6. Heating Value (Btu/scf)
EU-1007	Natural Gas	100%	Primary	Sulfur: 10ppmv	909
EU-2001	Natural Gas	100%	Primary	Sulfur: 10ppmv	909
EU-2002	Natural Gas	100%	Primary	Sulfur: 10ppmv	909
EU-2003	Natural Gas	100%	Primary	Sulfur: 10ppmv	909
EU-2004	Natural Gas	100%	Primary	Sulfur: 10ppmv	909
EU-6000	Natural Gas	100%	Primary	Sulfur: 10ppmv	909
EU-7001	Process Tail Gas	81.5%	Primary	Sulfur: 0	251
	Natural Gas	18.5% (100% during Start up)	Secondary	Sulfur: 10 ppmv	909
EU-7002	Process Tail Gas	81.5%	Primary	Sulfur: 0	251
	Natural Gas	18.5% (100% during Start up)	Secondary	Sulfur: 10 ppmv	909

Table 20c. PI-02F: Combustion - Fuel Use Continued

1. Unit ID	7. Fuel Type	8. Percent of Fuel Use	9. Primary or Secondary Fuel?	10. Component Percentages	11. Heating Value (Btu/gal)	12. Percent Heat:
EU-6006	Diesel Fuel	100%	Primary	Sulfur: 0.05wt%	137030	100%
EU-6008	Diesel Fuel	100%	Primary	Sulfur: 0.05wt%	137030	100%

Table 20d. PI-02G: Combustion - Fuel Use
Emission Factor

1. Unit ID	2. Air Pollutant	3. Emission Factor (lb/MMBtu HHV)	4. Source of Emission Factor
EU-1007	VOC	0.0054	AP42
	PM	0.0075	AP42
	PM10	0.0075	AP42
	PM2.5	0.0075	AP42
	CO	0.036	Performance Bid Specification
	NOx	0.04	
	SO2	0.0018	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42
EU-2001	VOC	0.0054	AP42
	PM	0.0075	AP42
	PM10	0.0075	AP42
	PM2.5	0.0075	AP42
	CO	0.036	Performance Bid Specification
	NOx	0.04	
	SO2	0.018	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42
EU-2002	VOC	0.0054	AP42
	PM	0.0075	AP42
	PM10	0.0075	AP42
	PM2.5	0.0075	AP42
	CO	0.036	Performance Bid Specification
	NOx	0.04	
	SO2	0.018	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42
EU-2003	VOC	0.0054	AP42
	PM	0.0075	AP42
	PM10	0.0075	AP42
	PM2.5	0.0075	AP42
	CO	0.036	Performance Bid Specification
	NOx	0.04	
	SO2	0.018	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42

Table 20d. PI-02G: Combustion - Fuel Use Continued

1. Unit ID	2. Air Pollutant	3. Emission Factor (lb/MMBtu HHV)	4. Source of Emission Factor
EU-2004	VOC	0.0054	AP42
	PM	0.0075	AP42
	PM10	0.0075	AP42
	PM2.5	0.0075	AP42
	CO	0.036	Performance Bid Specification
	NOx	0.04	
	SO2	0.018	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42
EU-6000	VOC	0.0054	AP42
	PM	0.0075	AP42
	PM10	0.0075	AP42
	PM2.5	0.0075	AP42
	CO	0.036	Performance Bid Specification
	NOx	0.04	
	SO2	0.018	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42
EU-7001	VOC	0.006	Performance Bid Specification
	PM	0.006	
	PM10	0.006	
	PM2.5	0.006	
	CO	0.02	
	NOx	0.007	
	SO2	3.26E-04	
	Ammonia	10 ppmvd	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42
EU-7002	VOC	0.006	Performance Bid Specification
	PM	0.006	
	PM10	0.006	
	PM2.5	0.006	
	CO	0.02	
	NOx	0.007	
	SO2	3.26E-04	
	Ammonia	10 ppmvd	
	Pb	4.90E-07	AP42
	HAPs	0.0019	AP42

Table 21. PI-03 Storage & Handling of Bulk Material

Date of installation for the listed equipment is expected to be 1Q2021

.ble 21a. Part A: Storage & Handling Information

1. Equipment/ Component Type	2. Unit ID	3. Number of Identical Units	4. Installation Date	5. Material Handled/Stored	6. Maximum Materials Throughput Rate	7. Add on Control Technology	8. Control Technique	9. Process Limitations/ Additional Information
Coarse Additive Handling System	EU-~~1001~~ 1501	0	~~3/1/2016~~	Coarse Additive	20 ton/hr	Baghouse	NA	Refer to Emissions Summary Table for Handling Information
Fine Additive Handling System	EU-~~1002~~ 1502	0	~~3/1/2016~~	Fine Additive	20 ton/hr	Baghouse	NA	
Coal Handling System	EU-~~1003~~ 2005	0	~~3/1/2016~~	Dried Coal	258.4 ton/hr	Baghouse	NA	
Na2S Handling System	EU-~~1005~~ 1503	0	~~3/1/2016~~	Sodium Sulfide additive	10 ton/hr	Baghouse	NA	
Fine Additive Handling System	EU-~~1007~~ 2007	0	~~3/1/2016~~	VCC Fine Additive	3.28 ton/hr	Baghouse	NA	
Coarse Additve Handling System	EU-~~1006~~ 2006	0	~~3/1/2016~~	VCC Coarse Additive	2.2046 ton/hr	Baghouse	NA	
Na2S Handling System	EU-~~1009~~ 2008	0	~~3/1/2016~~	Sodium Sulfide additive	.077161 ton/hr	Baghouse	NA	
Fine Additive Production System	EU-1504	0	1Q2021	Fine additives	3.28 ton/hr	Baghouse	NA	

Table 21b. Part B: Process Material Information

10. Material Handled/Stored	11. Method of Handling	12. Type of Storage	13. Storage Capacity	14. Pile Acreage	15. Silt Content	16. Moisture Content
Coarse Additive	Rail Transport to storage vessel	Silo	TBD	NA	100 % 20-450 um	0
Fine Additive	Rail transport to storage vessel	Silo	TBD	NA	100 % 20-450 um	0
Dried Coal	Continuous rapid unloading from 100 car unit trains to hoppers	Stockpile	TBD	38.16	2.20%	4.50%
Sodium Sulfide additive	Truck transport to storage vessel	Silo	TBD	NA	100 % 20-450 um	0
VCC Fine Additive	Rail Transport to storage vessel and to process	Silo	TBD	NA	100 % 20-450 um	0
VCC Coarse Additive	Rail Transport to storage vessel	Silo	TBD	NA	100 % 20-450 um	0
Sodium Sulfide additive	Truck transport to storage vessel	Silo	TBD	NA	100 % 20-450 um	0

Table 21c. Part C: Emission Factors / **Table 21d. Part D. Federal Rule Applicability**

17. Process Equipment & ID	18. Air Pollutant	19. Emission Factor	20. Source of Emission Factor	21. NSPS Applicability	22. NESHAP Applicability	23. Non-Applicability Determination
EU-~~1001~~ 1501	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA
EU-~~1002~~ 1502	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA
EU-~~1003~~ 2005	PM 2.5	1.45 lb/acre/year	AP-42	No	No	NA
	PM-10	3.63 lb/acre/year	AP-42	No	No	NA
EU-~~1005~~ 1503	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA
EU-~~1007~~ 2007	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA
EU-~~1006~~ 2006	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA
EU-~~1009~~ 2008	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA
EU-1504	PM	.003 gr/dscf	AP-42	No	No	NA
	PM-10	.003 gr/dscf	AP-42	No	No	NA

Table 22. PI-14 Volatile Organic Liquid Compound Storage

Parts A through E: Note this table is a comprehensive list, non organic storage is also included below

1. Tank/ Unit ID	2. Installation Date	3. Tank Location: UTM EASTING COORDINATE (m)	3. Tank Location: UTM NORTHING COORDINATE (m)	4. Tank Type:	5. Above ground?	6. Tank Orientation	7. Tank Color	8. Materials Stored	9. True Vapor Pressure	10. Vapor Molecular Weight	11. Annual Throughput (gal/yr)	12. Venting Method	13. Filling Method	14. Add-On Control Technology
T1	1Q2021	502225	4226190	IFR	Yes	Vertical	Default	Naphtha Product Tank 1	2.03 psia at 100 degF	91.5	4,629,879	TBD	Submerged	None
T2	1Q2021	502150	4226190	IFR	Yes	Vertical	Default	Naphtha Product Tank 2	2.03 psia at 100 degF	91.5	4,629,879	TBD	Submerged	None
T3	1Q2021	502150	4226114	Fixed Roof	Yes	Vertical	Default	Diesel Product Tank 1	0.002 psia at 100 degF	198.7	4,525,796	Conservation Vent	Submerged	None
T4	1Q2021	502225	4226114	Fixed Roof	Yes	Vertical	Default	Diesel Product Tank 2	0.002 psia at 100 degF	198.7	4,525,796	Conservation Vent	Submerged	None
T5	1Q2021	502301	4226114	Fixed Roof	Yes	Vertical	Default	Diesel Product Tank 3	0.002 psia at 100 degF	198.7	4,525,796	Conservation Vent	Submerged	None
T6	1Q2021	502301	4226190	IFR	Yes	Vertical	Default	Diesel Product Swing Tank	0.002 psia at 100 degF	198.7	4,525,796	Conservation Vent	Submerged	None
T7	1Q2021	502116	4226652	Fixed Roof	Yes	Vertical	Default	Molten Sulfur 1	TBD	TBD	342,367	Conservation Vent	Submerged	None
T8	1Q2021	502116	4226671	Fixed Roof	Yes	Vertical	Default	Molten Sulfur 2	TBD	TBD	342,367	Conservation Vent	Submerged	None
T9	1Q2021	501954	4226698	NA	Yes	Pressurized Horizontal	Default	Ammonia Product Storage Bullets	TBD	17.03	36,720	Closed	Submerged	None
T10	1Q2021	502167	4226778	Fixed Roof	Yes	Vertical	Default	Residue Surge Tank (VR LPH) 1	TBD	386.7	926,980	VENT TO ATM Temp = 505 F Heavy Material	Submerged	None
T11	1Q2021	502193	4226778	Fixed Roof	Yes	Vertical	Default	Residue Surge Tank (VR LPH) 2	TBD	386.7	926,980	VENT TO ATM Temp = 505 F Heavy Material	Submerged	None
T12	1Q2021	502219	4226778	Fixed Roof	Yes	Vertical	Default	Residue Feed Tank	TBD	386.7	926,980	VENT TO ATM Temp = 505 F Heavy Material	Submerged	None
T13	1Q2021	502325	4226893	Fixed Roof	Yes	Vertical	Default	VGO Tank 1	0.001 pisa at 300 degF	386.7	926,980	VENT TO ATM Temp = 505 F Heavy Material	Submerged	None
T14	1Q2021	502357	4226893	Fixed Roof	Yes	Vertical	Default	VGO Tank 2	0.001 pisa at 300 degF	386.7	926,980	VENT TO ATM Temp = 505 F Heavy Material	Submerged	None
T15	1Q2021	502548	4226789	NA	Yes	Pressurized Horizontal	Default	LPG Storage Bullets	TBD	TBD	48,872	TBD	Submerged	None
T16	1Q2021	502341	4226190	Fixed Roof	Yes	Vertical	Default	Slop Tank	TBD	TBD	4,195,581	Vent to Flare	Submerged	None
T17	1Q2021	501898	4226431	Fixed Roof	Yes	Vertical	Default	Diesel Fuel Storage Tank	TBD	198.7	23,775	Vent to ATM	Submerged	None
T18	1Q2021	502143	4226725	Fixed Roof	Yes	Vertical	Default	Non-Phenolic Sour Water Storage Tank 1	TBD	18.01	1,268,026	Vent to flare	Submerged	None

Table 22. PI-14 Volatile Organic Liquid Compound Storage

Parts A through E: Note this table is a comprehensive list, non organic storage is also included below

1. Tank/ Unit ID	15. Control Techniques	16. Process Limitations/Additional Information	17. Tank Diameter: (ft)	18. Tank Height: (ft)	19. Tank Volume / Capacity:	20. Maximum Liquid Height:	21. External Floating Roof: Complete only if applicable.	22. Internal Floating Roof	23. Variable Vapor Space	24. Air Pollutant	25. Emission Factor	26. EF Source	27/28. NSPS?	29/30 NESHAP?	31. Applicability Determination
T1	IFR	TANKS 4.0.9d DEFAULTS Applied - Primary Seal: Vapor-Mounted, Secondary Seal: None; Deck Type: Welded, Deck Fitting Category: Typical. 2 tanks listed at size and construction details given. Tank turnovers represents total production through single tank	160.1	47.9	4,629,879	N/A	NA	Dome	TBD	n-Hexane, Benzene, Toluene, Xylenes, Phenol, o-Cresol, m-, p-Cresols	Emission Factor values from EPA's Tanks 4.0.9 used	AP 42	NA	40 CFR 63.2343(b)	NA
T2	IFR	NA	160.1	47.9	4,629,879	N/A	NA	Dome	TBD						
T3	IFR	3 OF 4 Diesel Tanks are fixed roof. 1 OF 4 Diesel Tanks as IFR, for use as swing tank in naphtha service - SEE LINE BELOW. 2 tanks listed at size and construction details given. Tank turnovers respresents is total production through single tank.	160.1	47.9	4,525,796	46.9	NA	NA	NA						
T4	NA	NA	160.1	47.9	4,525,796	46.9	NA	NA	NA	Product Diesel	Emission Factor values from EPA's Tanks 4.0.9 used	AP 42	NA	40 CFR 63.2343(b)	NA
T5	NA	NA	160.1	47.9	4,525,796	46.9	NA	NA	NA						
T6	IFR	Primary Seal: Vapor-Mounted, Secondary Seal: None; Deck Type: Welded, Deck Fitting Category: Typical	160.1	47.9	4,525,796	N/A	NA	Dome	TBD	n-Hexane, Benzene, Toluene, Xylenes, Phenol, o-Cresol, m-, p-Cresols	Emission Factor values from EPA's Tanks 4.0.9 used	AP 42	NA	40 CFR 63.2343(b)	NA
T7	NA	NA	42.7	47.9	342,367	46.9	NA	NA	N						
T8	NA	NA	42.7	47.9	342,367	46.9	NA	NA	N						
T9	NA	NA	10.8	69.2	36,720	N/A	NA	NA	NA						
T10	None	NA	69.9	47.9	926,980	46.9	NA	NA	NA	Hydrogen Residue	7.3 E-7 lb benzene/ton asphalt loaded	AP 42	NA	NA	NA
T11	None	NA	69.9	47.9	926,980	46.9	NA	NA	NA						
T12	None	NA	69.9	47.9	926,980	46.9	NA	NA	NA		7.3 E-7 lb benzene/ton asphalt loaded	AP 42	NA	NA	NA
T13	None	NA	69.9	47.9	926,980	46.9	NA	NA	NA	VCC VGO	7.3 E-7 lb benzene/ton asphalt loaded	AP 42	NA	NA	NA
T14	None	NA	69.9	47.9	926,980	46.9	NA	NA	NA						
T15	NA	Pressurized vessels	10.8	83.7	48,872	N/A	NA	NA	NA						
T16	NA	NA	160.1	40	4,195,581	39	NA	NA	NA						
T17	None	NA	21.3	16.1	23,775	15.1	NA	NA	NA	Hexane (-n), Benzene, Toluene, Ethylbenzene, Xylene (-m)	Emission Factor values from EPA's Tanks 4.0.9 used	AP 42	NA	40 CFR 63.2343(b)	NA
T18	Flare	NA	80.1	47.9	1,268,026	46.9	NA	NA	NA						

Table 22. PI-14 Volatile Organic Liquid Compound Storage

Parts A through E: Note this table is a comprehensive list, non organic storage is also included below

1. Tank/ Unit ID	2. Installation Date	3. Tank Location: UTM EASTING COORDINATE (m)	3. Tank Location: UTM NORTHING COORDINATE (m)	4. Tank Type:	5. Above ground?	6. Tank Orientation	7. Tank Color	8. Materials Stored	9. True Vapor Pressure	10. Vapor Molecular Weight	11. Annual Throughput (gal/yr)	12. Venting Method	13. Filling Method	14. Add-On Control Technology
T19	1Q2021	502178	4226725	Fixed Roof	Yes	Vertical	Default	Non-Phenolic Sour Water Storage Tank 2	TBD	18.01	1,268,026	Vent to flare	Submerged	None
T20	1Q2021	502213	4226725	Fixed Roof	Yes	Vertical	Default	Non-Phenolic Sour Water Storage Tank 3	TBD	18.01	1,268,026	Vent to flare	Submerged	None
T21	1Q2021	502108	4226725	Fixed Roof	Yes	Vertical	Default	Phenolic Sour Water Storage Tank	TBD	18.01	40,947	Vent to flare	Submerged	None
T22	1Q2021	502117	4226783	Fixed Roof	Yes	Vertical	Default	Stripped Non-Phenolic Sour Water Surge Tank	TBD	18.01	1,268,026	Vent to ATM. < 10 ppm H2S, < 10 ppm NH3; Conservation Vent. Head space concentration based on Henry's Law.	Submerged	None
T23	1Q2021	502108	4226763	Fixed Roof	Yes	Vertical	Default	Stripped Phenolic Sour Water Surge Tank	TBD	18.01	13,737	Vent to ATM. < 10 ppm H2S, < 10 ppm NH3; Conservation Vent. Head space concentration based on Henry's Law.	Submerged	None
T24	1Q2021	502195	4226684	Fixed Roof	Yes	Vertical	Default	Amine Surge/Deinventory Tank	0.01 psia at 100 degF	18	63,943	Vent to flare	Submerged	None
T25	1Q2021	502225	4226684	Fixed Roof	Yes	Vertical	Default	Fresh Amine Tank	0.01 psia at 100 degF	18	63,943	Vent to ATM as Lean Amine	Submerged	None
T26	1Q2021	502210	4226665	Fixed Roof	Yes	Horizontal	Default	Amine Containment Tank	0.01 psia at 100 degF	18	793	Vent to ATM. Low Vapor Pressure Material. Drain drum located in sump, vent not modeled.	Submerged	None
T27	1Q2021	502552	4226069	Fixed Roof	Yes	Vertical	Default	Water Trt Sulfuric Acid Tank	TBD	TBD	6,076	TBD	Submerged	None
T28	1Q2021	502575	4226069	Fixed Roof	Yes	Vertical	Default	Water Trt Caustic Tank	TBD	TBD	6,076	TBD	Submerged	None
T29	1Q2021	502575	4225919	Fixed Roof	Yes	Vertical	Default	Potable Water Storage Tank	TBD	TBD	10,567	TBD	Submerged	None
Chemicals Storage														
T30	1Q2021	502451	4226873	Container	Yes	NA	Default	DMDS Storage Tank	TBD	TBD	TBD	TBD	Submerged	None
T31	1Q2021	502417	4226889	Fixed	Yes	Vertical	Default	Soda Ash Mix Tank	TBD	TBD	218,735	TBD	Submerged	None
Solids Inventory														
T32	1Q2021	502282	4226493	NA	Yes	Vertical	Default	Raw Coal Bunker (Milling Feed)	NA	NA	TBD	TBD	Submerged	None
T33	1Q2021	502318	4226533	Fixed Roof	Yes	Vertical	Default	Fine Additive Storage Silo	NA	NA	TBD	TBD	Submerged	None
T34	1Q2021	502298	4226533	Fixed Roof	Yes	Vertical	Default	Coarse Additive Storage Silo	NA	NA	TBD	TBD	Submerged	None
T35	1Q2021	502338	4226533	Fixed Roof	Yes	Vertical	Default	Sodium Sulfide Additive Storage Silo	NA	NA	TBD	TBD	Submerged	None

Table 22. PI-14 Volatile Organic Liquid Compound Storage

Parts A through E: Note this table is a comprehensive list, non organic storage is also included below

1. Tank/ Unit ID	15. Control Techniques	16. Process Limitations/Additional Information	17. Tank Diameter: (ft)	18. Tank Height: (ft)	19. Tank Volume / Capacity:	20. Maximum Liquid Height:	21. External Floating Roof: Complete only if applicable.	22. Internal Floating Roof	23. Variable Vapor Space	24. Air Pollutant	25. Emission Factor	26. EF Source	27/28. NSPS?	29/30 NESHAP?	31. Applicability Determination
T19	Flare	NA	80.1	47.9	1,268,026	46.9	NA	NA	NA						
T20	Flare	NA	80.1	47.9	1,268,026	46.9	NA	NA	NA						
T21	Flare	NA	21.3	24	40,947	23	NA	NA	NA						
T22	Flare	NA	80.1	47.9	1,268,026	46.9	NA	NA	NA						
T23	Flare	NA	21.3	16.1	13,737	15.1	NA	NA	NA						
T24	N2 Blanket	NA	25.9	16.1	63,943	15.1	NA	NA	NA						
T25	N2 Blanket	NA	25.9	16.1	63,943	15.1	NA	NA	NA	Lean Amine	Emission Factor values from EPA's Tanks 4.0.9 used	AP 42	NA	NA	NA
T26	N2 Blanket	NA	3.9	5.9	793	4.9	NA	NA	NA						
T27		98% H2SO4 Concentration; NO POLLUTANTS TO MODEL	7.9	16.1	6,076	15.1	NA	NA	NA						
T28		50% NaOH Concentration; NO POLLUTANTS TO MODEL	7.9	16.1	6,076	15.1	NA	NA	NA						
T29	None	NA	15.1	16.1	10,567	15.1	NA	NA	NA						
Chemic															
T30	NA	NA				NA	NA	NA	NA						
T31	TBD	NA	37	40	218,735	NA	NA	NA	NA						
Solids															
T32	TBD	NA				NA	NA	NA	NA						
T33	TBD	NA	30	100	NA	NA	NA	NA	NA						
T34	TBD	NA	26	100	NA	NA	NA	NA	NA						
T35	TBD	NA	10	35	NA	NA	NA	NA	NA						

Table 23. PI-18 Mineral Processing

Table 23a. Part A. Mineral Processing Information

1. Type of Process Material	2. Equipment Process Unit	3. Number of Identical Units	4. Unit ID	5. Installation Date	6. Open/ Enclosed?	7. Maximum Capacity (tons/hr)	8. Actual Capacity (tons/hr)
Non Metallic	Coarse Additive	0	EU-1501	1Q2021	Enclosed	20	20
Non Metallic	Fine Additive	0	EU-1502	1Q2021	Enclosed	20	20
Non Metallic	Sodium Sulfide Additive	0	EU-1503	1Q2021	Enclosed	10	10
Non Metallic	Raw Coal Bunker	0	EU-1000	1Q2021	Enclosed	5000	5000

Table 23b. Part B. Dryer Details

9. Dryer Type:	10. Unit ID	11. Installation Date	12. Plate Perforation Diameter / Mesh Size	13. Volume Capacity (ft3)	14. Heat Capacity (mmBtu/hr)	15. Fuel Used
Coal Drying Heater	EU-1007	1Q2021	NA	21273	55.8	Natural Gas

Table 23c. Part C. Storage and Handling of Materials

16. Material Size & Specification	17. Type of Storage	18. Storage Capacity (tons)	19. Unit ID	20. Installation Date	21. Storage Open or Totally Enclosed/ Covered?
Coarse Additive 400-2000 microns	Silo	1672	EU-1501	1Q2021	Enclosed
Fine Additive <500 microns	Silo	2576	EU-1502	1Q2021	Enclosed
Sodium Sulfide mm sized crystaline flakes	Silo	43	EU-1503	1Q2021	Enclosed
Illinois Basin Coal	Coal Pile	93010	EU-1003	1Q2021	Open
Illinois Basin Coal	Coal Pile	93010	EU-1005	1Q2021	Open

Table 23d. Part D. Emission Factors

22. Process Unit & (ID, if applicable)	23. Air Pollutant	24. Emission Factor	25. Source of Emission Factor
EU-1501	PM	0.003 gr/scf	AP-42
	PM-10	0.003 gr/scf	AP-42
EU-1502	PM	0.003 gr/scf	AP-42
	PM-10	0.003 gr/scf	AP-42
EU-1503	PM 2.5	1.45 lb/acre/year	AP-42
	PM-10	3.63 lb/acre/year	AP-42
EU-1000	PM	0.028 lb/ton	AP-42
	PM-10	0.021 lb/ton	AP-42

Table 23e. Part E. Emission Controls and Limitations

26. Add-On Control Technology	27. Control	28. Process Limitations:
Baghouse	NA	None
Baghouse	NA	None
Baghouse	NA	None
Baghouse	NA	None

Table 23f. Part F. Federal Rule Applicability

29. Is a New Source Performance Standard (NSPS) applicable to this source?	30. Is a National Emission Standard for Hazardous Air Pollutants (NESHAP) applicable to this source?	31. Non-Applicability Determination
NA	NA	NA

Table 24. FED-02 MACT Pre-Construction Review

Part B Emission Unit Information | **Part C Compliance Method for New Affected Sources**

4. Unit ID	5. HAP Name or Type of HAP	6. Quantity of HAP Emitted		7. Unit ID	8. Complaince Method Description	9. Control Efficiency
		Actual Emissions (tpy)	Potential to Emit (tpy)			(%)
EU-1007	Total HAPs	TBD	0.45	EU-1007	None	NA
	n-Hexane		0.432			
	Formaldehyde		0.018			
	Toluene		8.15E-04			
	Benzene		5.04E-04			
	Nickel		5.04E-04			
EU-1501	Total HAPs are manganese compounds	TBD	2.00E-05	EU-1501	Baghouse	Typically >99.5% for PM
EU-1502	Total HAPs are manganese compounds	TBD	2.00E-05	EU-1502	Baghouse	Typically >99.5% for PM
EU-1504	Total HAPs are manganese compounds	TBD	3.62E-05	EU-1504	Baghouse	Typically >99.5% for PM
EU-2001	Total HAPs	TBD	1.04	EU-2001	None	NA
	n-Hexane		0.992			
	Formaldehyde		0.0413			
	Toluene		1.87E-03			
	Benzene		1.16E-03			
	Nickel		1.16E-03			
EU-2002	Total HAPs	TBD	0.43	EU-2002	None	NA
	n-Hexane		0.48			
	Formaldehyde		0.017			
	Toluene		7.72E-04			
	Benzene		4.77E-04			
	Nickel		4.77E-04			
EU-2003	Total HAPs	TBD	0.07	EU-2003	None	NA
	n-Hexane		0.0698			
	Formaldehyde		2.91E-03			
	Toluene		1.32E-04			
	Benzene		8.14E-05			
	Nickel		8.14E-05			
EU-2004	Total HAPs	TBD	1.26	EU-2004	None	NA
	n-Hexane		1.21			
	Formaldehyde		0.0502			
	Toluene		2.28E-03			
	Benzene		1.41E-03			
	Nickel		1.41E-03			
EU-2006	Total HAPs are manganese compounds	TBD	2.40E-05	EU-2006	Baghouse	Typically >99.5% for PM
EU-2007	Total HAPs are manganese compounds	TBD	3.60E-05	EU-2007	Baghouse	Typically >99.5% for PM
EU-3001	Total HAPs	TBD	0.31	EU-3001	None	NA
	n-Hexane		0.29			
	Formaldehyde		0.01			
	Toluene		5.50E-04			
	Benzene		3.40E-04			
	Nickel		3.40E-04			

Table 24. FED-02 MACT Pre-Construction Review

Part B Emission Unit Information / **Part C Compliance Method for New Affected Sources**

4. Unit ID	5. HAP Name or Type of HAP	6. Quantity of HAP Emitted		7. Unit ID	8. Complaince Method Description	9. Control Efficiency
		Actual Emissions (tpy)	Potential to Emit (tpy)			(%)
EU-3002	Total HAPs	TBD	0.31	EU-3002	None	NA
	n-Hexane		0.29			
	Formaldehyde		0.01			
	Toluene		5.50E-04			
	Benzene		3.40E-04			
	Nickel		3.40E-04			
EU-4001	Total HAPs	TBD	0.683	EU-4001	Flare	98% DRE
	Benzene		0.07			
	Toluene		0.185			
	Xylenes		0.232			
	Phenols		0.002			
	o-cresol		0.006			
	m+p-cresol		0.002			
	n-hexane		0.185			
EU-6000	Total HAPs	TBD	0.555	EU-6000	None	NA
	n-Hexane		0.526			
	Formaldehyde		0.022			
	Toluene		9.93E-04			
	Benzene		6.13E-04			
	Nickel		6.13E-04			
EU-6006	Total HAPs	TBD	0.002	EU-6006	None	NA
EU-6008	Total HAPs	TBD	0.04	EU-6008	None	NA
EU-7003	Methanol	TBD	12.19	EU-7003	None	NA
EU-7004	Methanol	TBD	12.19	EU-7004	None	NA
FUGVCC	Benzene	TBD	0.109303957	FUGVCC	LDAR	*See attachments H102-2000-EV-CAL-EV2-0001, H102-4000-EV-CAL-EV2-0001
	Toluene		0.290656947			
	Xylenes		0.364182468			
	Phenols		0.003725492			
	o-cresol		0.008803376			
	m+p-cresol		0.003725492			
	n-hexane		0.290164785			
FUGPRD	Benzene	TBD	0.010308838	FUGPRD	LDAR	*See attachments H102-2000-EV-CAL-EV2-0001, H102-4000-EV-CAL-EV2-0001
	Toluene		0.027461772			
	Xylenes		0.034357099			
	Phenols		0.000346474			
	o-cresol		0.000826756			
	m+p-cresol		0.000346474			

KBR

FUGITIVE AIR EMISSION INVENTORY CALCULATIONS

JOB NO.:	H102	DOC. NO.:	H102-2000-EV-CAL-EV2-0001	Rev:	A	0	1	2	3	4
CLIENT:	Riverview Energy Corporation	SUBJECT:	Piping and Equipment Fugitives	Date:	8-Jan-18	15-Jan-18	23-Jan-18			
PROJECT:	DCH Facility	BASIS:	Reference & PFD Factored Equipment	By:	RN	RN	RN			
LOCATION:	Dale, IN			Check:	SAL	SAL	SAL			
UNIT:	VCC			Appr.:	---	---	—			
UNIT No.	2000			Purpose:	IFI	IFI	IFI			

LINE | REV | PROJECT DEFINITION

SHADING LEGEND:	ENTRY	LINKED	CALC	GOAL SEEK	CHECK	SUM

Revision History

- A Initial Setup for Checking
- 0 T&C PFD Basis, MatBal Streams Aggregated
- 1
- 2
- 3
- 4

UTM Coordinates for Process Unit		
Perimeter	Easting (m)	Northing (m)
Corner 1		
Corner 2		
Corner 3		
Corner 4		
Corner 5		
Corner 6		
Corner 7		
Corner 8		

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1 Emissions Summary

Emission Factor Set Used : TCEQ-Refining

Fugitive Emission Source	Service	Em. Factor kg/hr	Equipment Counts	Uncontrolled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Primary Equipment Design Control Efficiency %	Secondary LDAR Program Control Efficiency %	Overall Fugitive Control Efficiency %	Contingency %	Controlled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Remarks
Valves	Gas	0.0268	3	0.08	0.70	0.18	0.78	0	97	97	50%	0.04163	0.36470	0.09178	0.40200	Streams with vapor pressure less than 0.002 psia @ 68 degF are excluded from fugitive evaluations
	Light Liquid	0.0109	32	0.35	3.05	0.77	3.36	0	97	97	50%	0.01045	0.09155	0.02304	0.10092	Final valve counts have most uncertainty until P&ID's are available in later engineering phases.
	Heavy Liquid	0.0109	153	1.67	14.59	3.67	16.08	0	97	97	50%	0.04997	0.43772	0.11016	0.48250	
Pumps (Includes Vessel Agitators)	Light Liquid	0.1139	18	2.05	17.95	4.52	19.79	80	85	97	0%	0.07424	0.65037	0.16368	0.71690	Double Mechanical Seals per API Seal Plans provided on all LL & HL pumps due to process conditions
	Heavy Liquid	0.0209	19	0.40	3.47	0.87	3.83	80	0	80	0%	0.12291	1.07667	0.27096	1.18681	
Flanges / Connectors	All	0.00025	1036	0.26	2.26	0.57	2.50	0	30	30	25%	0.30599	2.68044	0.67458	2.95465	Reactor and other large vessel flanges are welded due to high process pressures
Pressure Relief Valves	Gas	0.3500	19	6.65	58.25	14.66	64.21	100	97	100	15%	0.00000	0.00000	0.00000	0.00000	
	Liquids	0.3500	90	31.50	275.94	69.44	304.17	100	0	100	15%	0.00000	0.00000	0.00000	0.00000	
Compressors	All	1.3990	1	1.40	12.26	3.08	13.51	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Venting controlled by flare
Open-Ended Lines/Valves	All	0.00510	90	0.46	4.02	1.01	4.43	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Capped, blinded, or double block primary design.
Sampling Connections	All	0.03300	205	6.77	59.26	14.91	65.32	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Closed loop system designs used
Connectors - Miscellaneous	All	0.00025	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
Drains	All	0.02917	205	5.98	52.38	13.18	57.74	50	50	75	15%	1.49479	13.09438	3.29542	14.43393	50% of Drains are hardpiped with 100% control efficiency (entered as Secondary Efficiency)
Others		0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Gas/Vapor	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Liquid	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
		Totals =	1871	57.55	504.14	126.88	555.72					2.100	18.396	4.630	20.278	

2 Speciated Emissions Summary

Compound	Fugitive	gram/s	kg/hr	MT/yr	lb/hr	ton/yr	Contingency %	gram/s	kg/hr	MT/yr	lb/hr	ton/yr
Benzene	HAP	0.0025	0.009	0.079	0.020	0.087		0.0031	0.011	0.099	0.025	0.109
Toluene	HAP	0.0067	0.024	0.211	0.053	0.233		0.0084	0.030	0.264	0.066	0.291
Xylenes	HAP	0.0084	0.030	0.264	0.067	0.291		0.0105	0.038	0.330	0.083	0.364
Phenols	HAP	0.0001	0.000	0.003	0.001	0.003		0.0001	0.000	0.003	0.001	0.004
o-cresol	HAP	0.0002	0.001	0.006	0.002	0.007	25%	0.0003	0.001	0.008	0.002	0.009
m+p-cresol	HAP	0.0001	0.000	0.003	0.001	0.003		0.0001	0.000	0.003	0.001	0.004
n-hexane	HAP	0.0067	0.024	0.211	0.053	0.232		0.0083	0.030	0.263	0.066	0.290
Sum =	HAP	0.025	0.089	0.777	0.196	0.856		0.031	0.111	0.971	0.244	1.071

KBR

FUGITIVE AIR EMISSION INVENTORY CALCULATIONS

JOB NO.:	H102	DOC. NO.:	H102-4000-EV-CAL-EV2-0002	Rev:	A	0	1	2	3	4
CLIENT:	Riverview Energy Corporation	SUBJECT:	Piping and Equipment Fugitives	Date:	8-Jan-18	23-Jan-18				
PROJECT:	DCH Facility	BASIS:	Reference & PFD Factored Equipment	By:	RN	RN				
LOCATION:	Dale, IN			Check:	SAL	SAL				
UNIT:	Offsites Product Storage and Handling			Appr.:	---	---				
UNIT No.	4000			Purpose:	IFI	IFI				

LINE | REV | PROJECT DEFINITION

SHADING LEGEND: | ENTRY | LINKED | CALC | GOAL SEEK | CHECK | SUM

Revision History

A Initial Setup for Checking
0 T&C PFD Basis, MatBal Streams Aggregated
1
2
3
4

UTM Coordinates for Process Unit		
Perimeter	Easting (m)	Northing (m)
Corner 1		
Corner 2		
Corner 3		
Corner 4		
Corner 5		
Corner 6		
Corner 7		
Corner 8		

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Emission Factor Set Used : TCEQ-Refining

Fugitive Emission Source	Service	Em. Factor kg/hr	Equipment Counts	Uncontrolled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Primary Equipment Design Control Efficiency %	Secondary LDAR Program Control Efficiency %	Overall Fugitive Control Efficiency %	Contingency %	Controlled Fugitive Emissions kg/hr	MT/yr	lb/hr	ton/yr	Remarks
Valves	Gas	0.0268	0	0.00	0.00	0.00	0.00	0	97	97	50%	0.00000	0.00000	0.00000	0.00000	Streams with vapor pressure less than 0.002 psia @ 68 degF are excluded from fugitive evaluations
	Light Liquid	0.0109	34	0.37	3.24	0.82	3.57	0	97	97	50%	0.01110	0.09727	0.02448	0.10722	Final valve counts have most uncertainty until P&ID's are available in later engineering phases.
	Heavy Liquid	0.0109	0	0.00	0.00	0.00	0.00	0	97	97	50%	0.00000	0.00000	0.00000	0.00000	
Pumps	Light Liquid	0.1139	4	0.46	3.99	1.00	4.40	80	85	97	0%	0.01492	0.13067	0.03289	0.14404	Double Mechanical Seals per API Seal Plans provided on all LL & HL pumps due to process conditions
(Includes Vessel Agitators)	Heavy Liquid	0.0209	0	0.00	0.00	0.00	0.00	80	0	80	0%	0.00000	0.00000	0.00000	0.00000	
Flanges / Connectors	All	0.00025	141	0.04	0.31	0.08	0.34	0	30	30	25%	0.03209	0.28110	0.07074	0.30986	Reactor and other large vessel flanges are welded due to high process pressures
Pressure Relief Valves	Gas	0.3500	0	0.00	0.00	0.00	0.00	100	97	100	15%	0.00000	0.00000	0.00000	0.00000	
	Liquids	0.3500	0	0.00	0.00	0.00	0.00	100	0	100	15%	0.00000	0.00000	0.00000	0.00000	
Compressors	All	1.3990	3	4.20	36.77	9.25	40.53	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Venting controlled by flare
Open-Ended Lines/Valves	All	0.00510	4	0.02	0.18	0.04	0.20	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Capped, blinded, or double block primary design.
Sampling Connections	All	0.03300	8	0.26	2.31	0.58	2.55	100	85	100	15%	0.00000	0.00000	0.00000	0.00000	Closed loop system designs used
Connectors - Miscellaneous	All	0.00025	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
Drains	All	0.02917	8	0.23	2.04	0.51	2.25	50	50	75	15%	0.05833	0.51100	0.12860	0.56328	50% of Drains are hardpiped with 100% control efficiency (entered as Secondary Efficiency)
Others		0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Gas/Vapor	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
O&G Others - Liquid	All	0.00000	0	0.00	0.00	0.00	0.00	0	0	0	15%	0.00000	0.00000	0.00000	0.00000	
		Totals =	202	5.58	48.84	12.29	53.84					0.116	1.020	0.257	1.124	

2 Speciated Emissions Summary

Compound	Fugitive	gram/s	kg/hr	MT/yr	lb/hr	ton/yr	Contingency %	gram/s	kg/hr	MT/yr	lb/hr	ton/yr
Benzene	HAP	0.0002	0.001	0.007	0.002	0.008		0.0003	0.001	0.009	0.002	0.010
Toluene	HAP	0.0006	0.002	0.020	0.005	0.022		0.0008	0.003	0.025	0.006	0.027
Xylenes	HAP	0.0008	0.003	0.025	0.006	0.027		0.0010	0.004	0.031	0.008	0.034
Phenols	HAP	0.0000	0.000	0.000	0.000	0.000		0.0000	0.000	0.000	0.000	0.000
o-cresol	HAP	0.0000	0.000	0.001	0.000	0.001		0.0000	0.000	0.001	0.000	0.001
m+p-cresol	HAP	0.0000	0.000	0.000	0.000	0.000	25%	0.0000	0.000	0.000	0.000	0.000
n-hexane	HAP	0.0006	0.002	0.020	0.005	0.022		0.0008	0.003	0.025	0.006	0.027
Sum =	HAP	0.002	0.008	0.073	0.018	0.081		0.003	0.010	0.092	0.023	0.101

Attachment C. Process Diagrams

DRAWING NUMBERS	TITLE
H102-0000-EV-DWG-EV2-0001	Drawing Index
H102-0000-EV-DWG-EV2-0002	Site Overall Conceptual BFD for Air Permits
H102-1000-EV-DWG-EV2-0001	Block 1000 Coal Handling BFD
H102-1500-EV-DWG-EV2-0001	Block 1500 Additives Handling BFD
H102-2000-EV-DWG-EV2-0001	Block 2000 VCC Unit BFD
H102-2000-EV-DWG-EV2-0002	Block 2000 VCC Detail BFD
H102-3000-EV-DWG-EV2-0001	Block 3000 Sulfur Recovery BFD
H102-3000-EV-DWG-EV2-0003	Block 3000 Amine Recovery Unit Detail BFD
H102-3000-EV-DWG-EV2-0004	Block 3000 Amine Storage Detail BFD
H102-4000-EV-DWG-EV2-0001	Block 4000 Offsites Unit BFD
H102-5000-EV-DWG-EV2-0001	Block 5000 Residue Solidification Unit BFD
H102-6000-EV-DWG-EV2-0001	Block 6000 Utilities BFD
H102-6500-EV-DWG-EV2-0001	Block 6500 Water Supply & Treatment BFD
H102-7000-EV-DWG-EV2-0001	Block 7000 Hydrogen Production BFD
H102-8000-EV-DWG-EV2-0001	Block 8000 Waste Water Treatment BFD

NOTES:

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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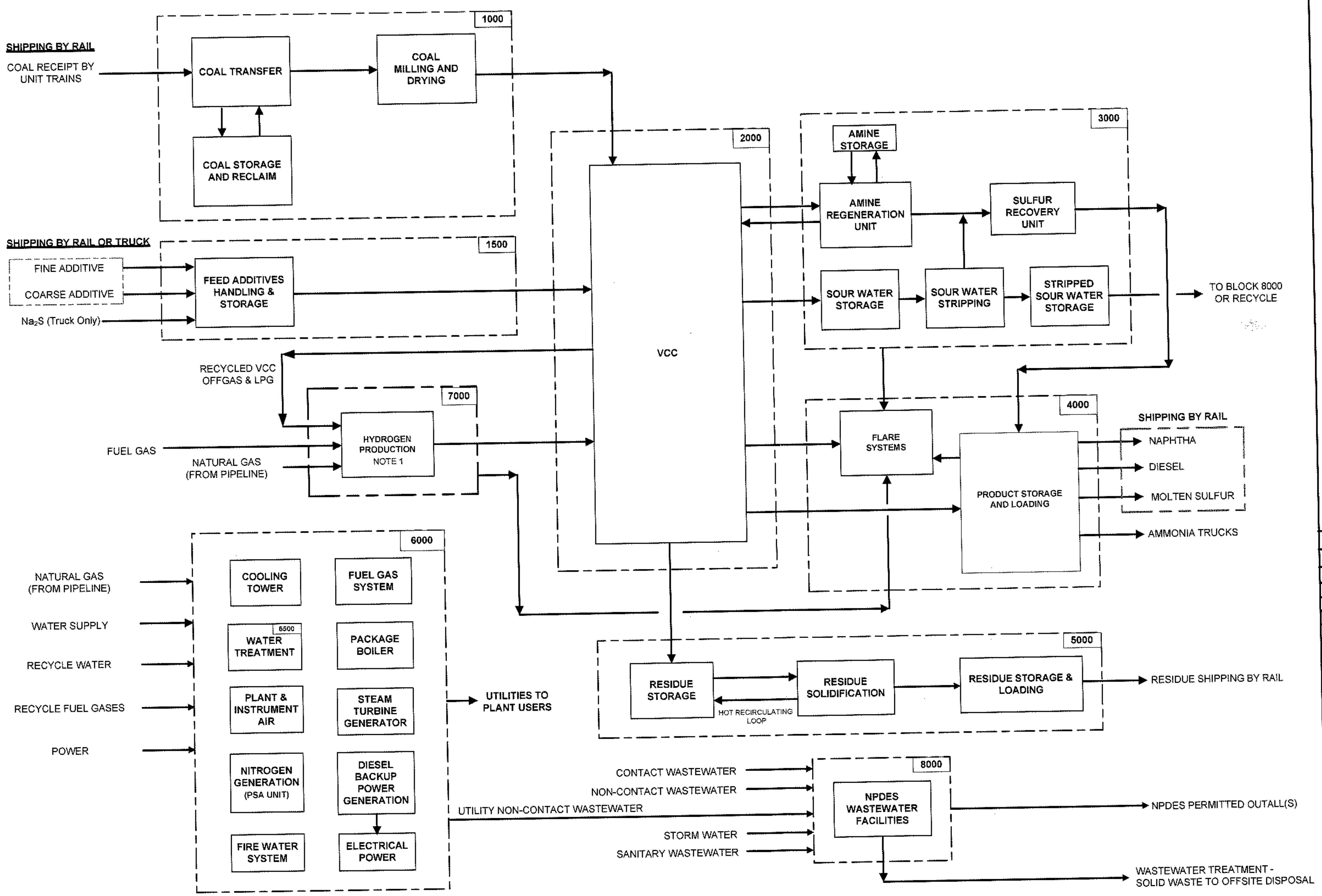
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
DRAWING INDEX
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-0000-EV-DWG-EV2-0001		0

OVERALL CONCEPTUAL BFD FOR AIR PERMITTING



NOTES:

1. HYDROGEN PRODUCTION LICENSED UNITS OWNED & OPERATED BY SUPPLIER FOR RIVERVIEW
2. BFD INDICATES EMISSIONS FROM OPERATING FACILITIES ONLY. IT DOES NOT INCLUDED CONSTRUCTION ACTIVITIES OR SECONDARY AIR EMISSIONS OUTSIDE PROCESS ACTIVITIES.

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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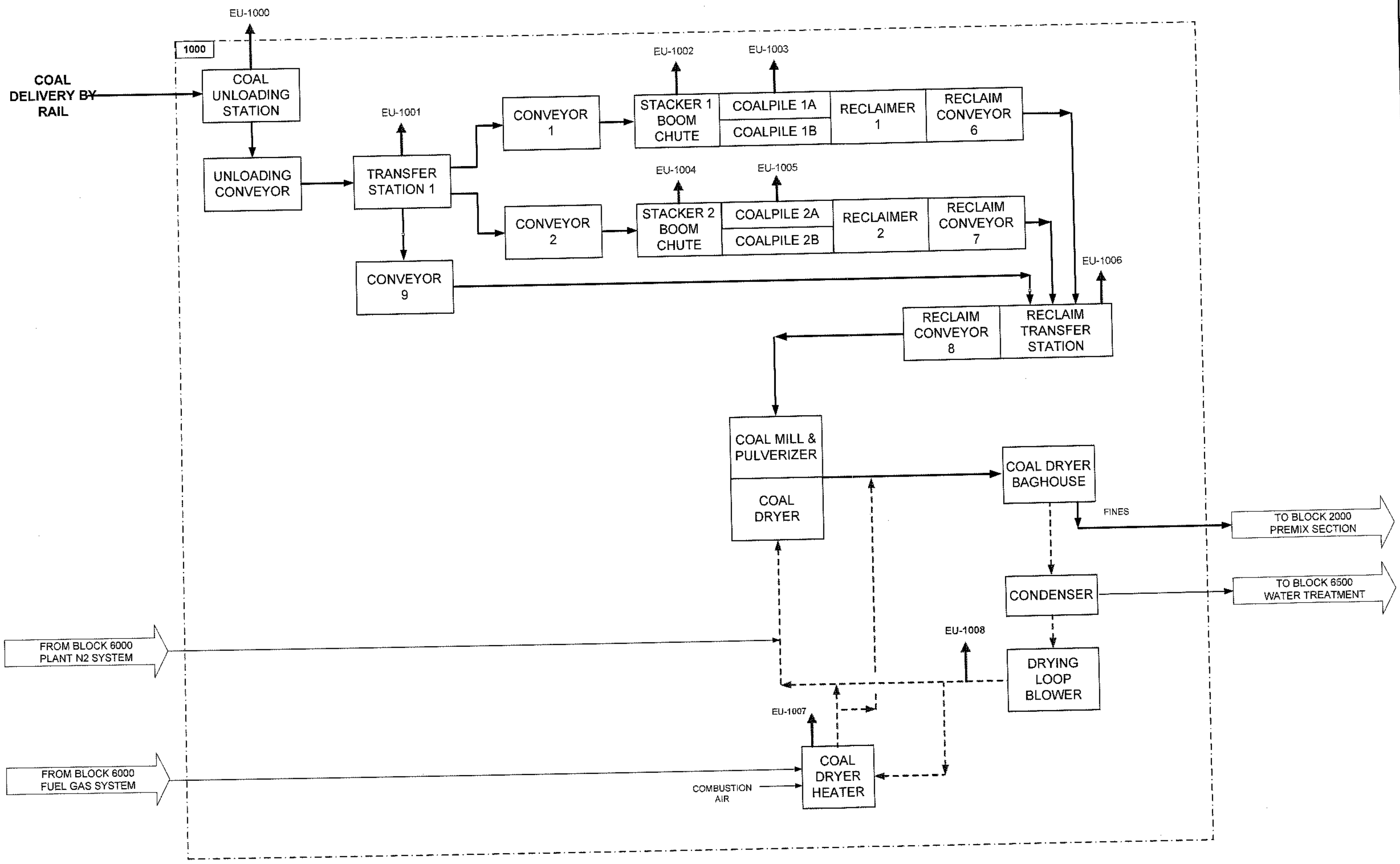
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
OVERALL PROCESS FACILITY
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT: RIVERVIEW ENERGY CORPORATION		
	KBR: H102	KBR: H102-0000-EV-DWG-EV2-0002	1 OF 1	0

BLOCK 1000

COAL HANDLING



NOTES:

EU-1000	Coal Unloading Station
EU-1001	Transfer Station 1
EU-1002	Stacker 1 Boom Chute
EU-1003	Coal Pile 1A/1B
EU-1004	Stacker 2 Boom Chute
EU-1005	Coal Pile 2A/2B
EU-1006	Reclaim Transfer Station
EU-1007	Coal Dryer Heater
EU-1008	Coal Drying Loop Purge

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	A	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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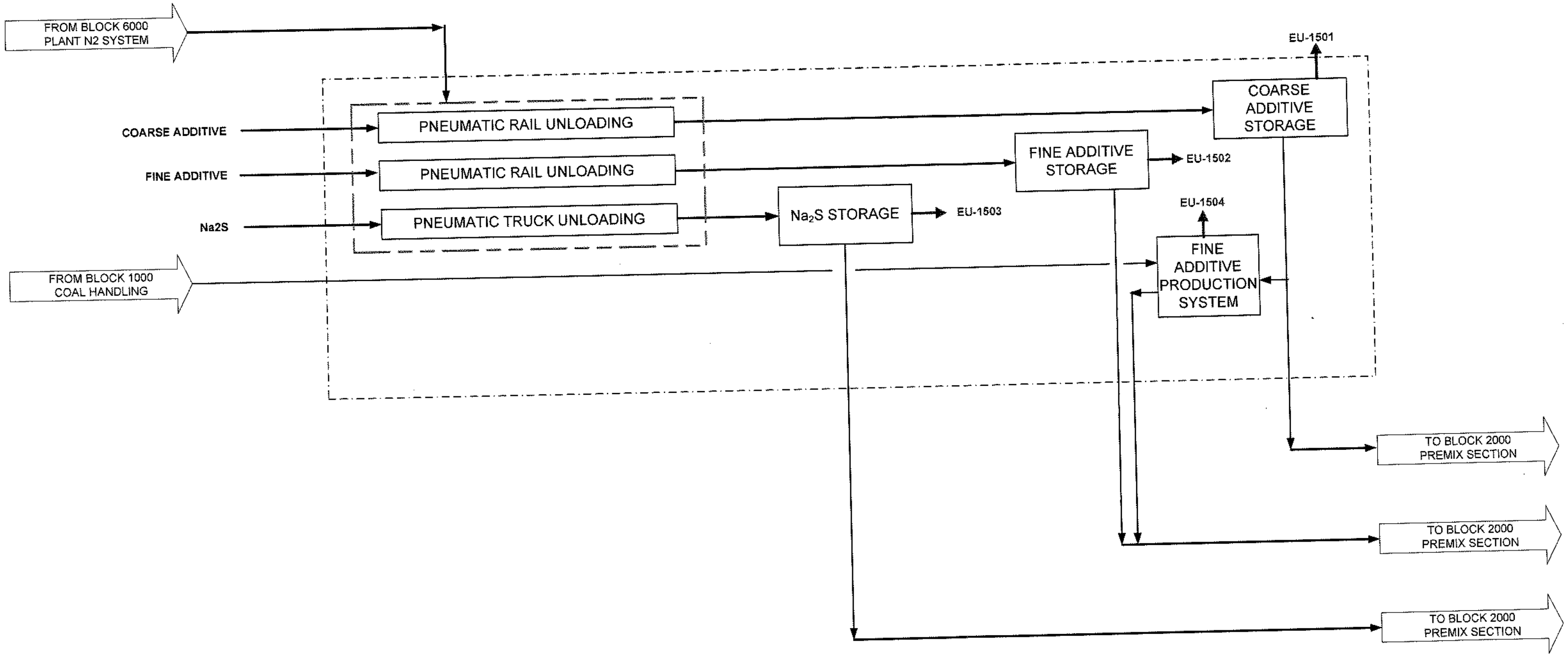
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 1000 – COAL HANDLING
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-1000-EV-DWG-EV2-0001		0

BLOCK 1500

ADDITIVES RECEIPT & STORAGE



NOTES:

EU-1501	Coarse Additive Storage Filter
EU-1502	Fine Additive Storage Filter
EU-1503	NA2S Additive Storage Filter
EU-1504	Fine Additive Production System

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	A	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

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BLOCK FLOW DIAGRAM FOR PERMITTING BASIS

BLOCK 1500 ADDITIVES HANDLING

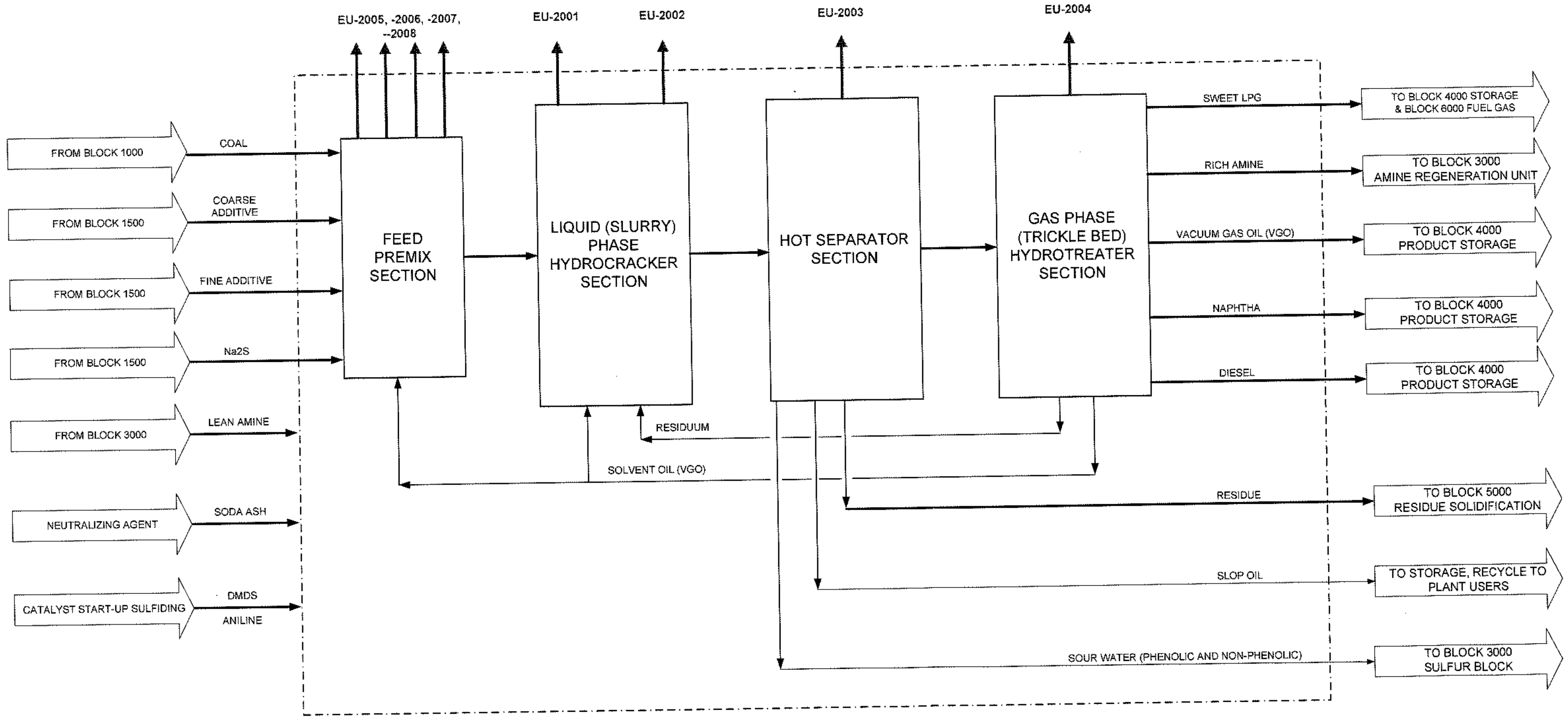
DIRECT COAL HYDROGENATION (DCH) PLANT

DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-1000-EV-DWG-EV2-0001		0

BLOCK 2000

VEBA COMBI CRACKER (VCC)



NOTES:

1. RESERVED

EU-2001	Feed Heater
EU-2002	Treat Gas Heater
EU-2003	Vac Column Feed Heater
EU-2004	Fractionator Feed Heater
EU-2005	Coal Handling System Filter
EU-2006	Coarse Additive Handling System Filter
EU-2007	Fine Additive Handling System Filter
EU-2008	Na2S Handling System Filter

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	[illegible]	ISSUE FOR INFORMATION	RN	SAL		

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BLOCK FLOW DIAGRAM FOR PERMITTING BASIS

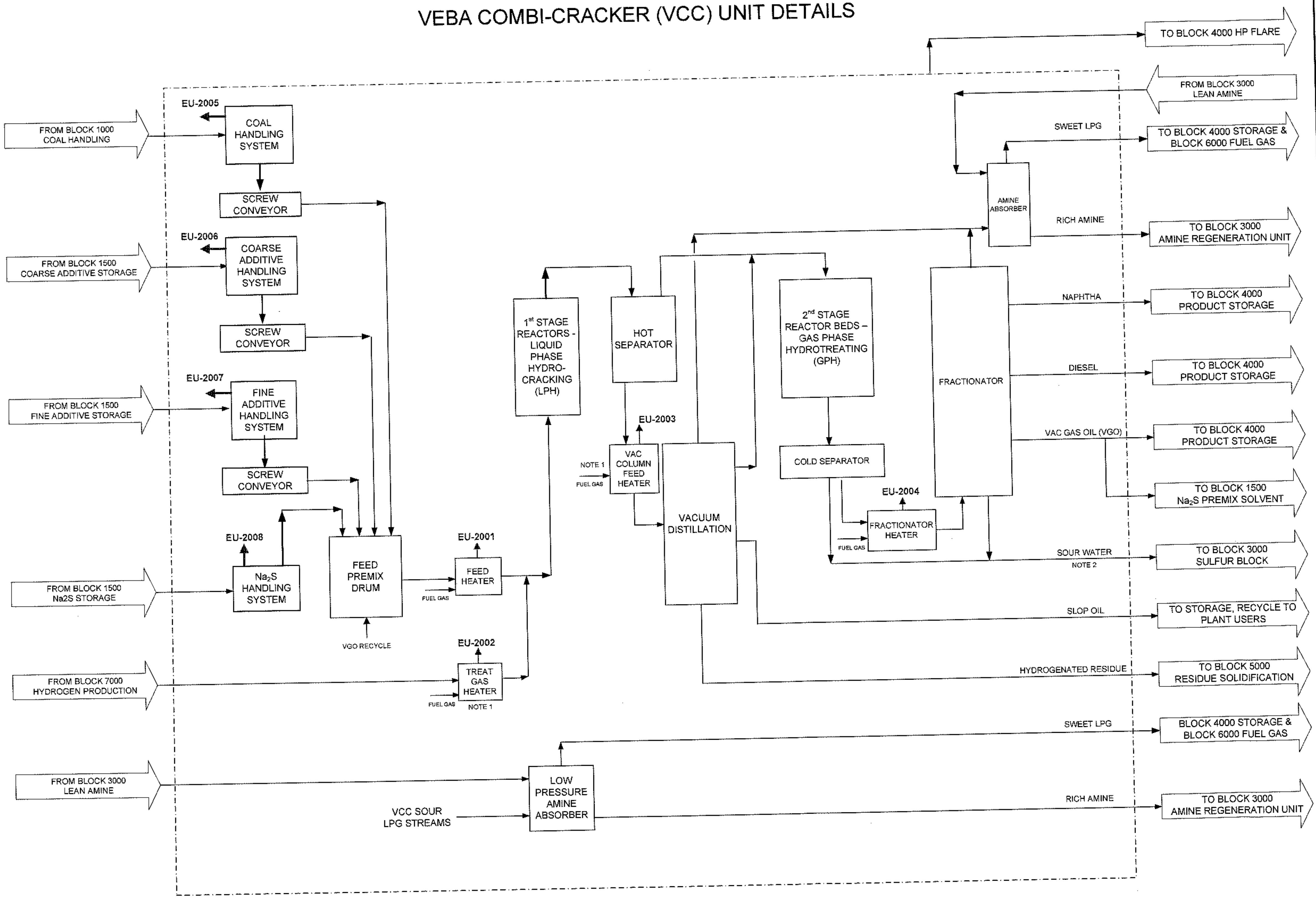
BLOCK 2000 – VCC UNIT

DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-2000-EV-DWG-EV2-0001		0

BLOCK 2000

VEBA COMBI-CRACKER (VCC) UNIT DETAILS



NOTES:

1. HEATER TO INCLUDE PROVISIONS FOR AIR PREHEAT.
2. PHENOLIC SOUR WATER FROM VCC VAC COLUMN.

EU-2001	Feed Heater
EU-2002	Treat Gas Heater
EU-2003	Vac Column Feed Heater
EU-2004	Fractionator Feed Heater
EU-2005	Coal Handling System Filter
EU-2006	Coarse Additive Handling System Filter
EU-2007	Fine Additive Handling System Filter
EU-2008	Na2S Handling System Filter

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

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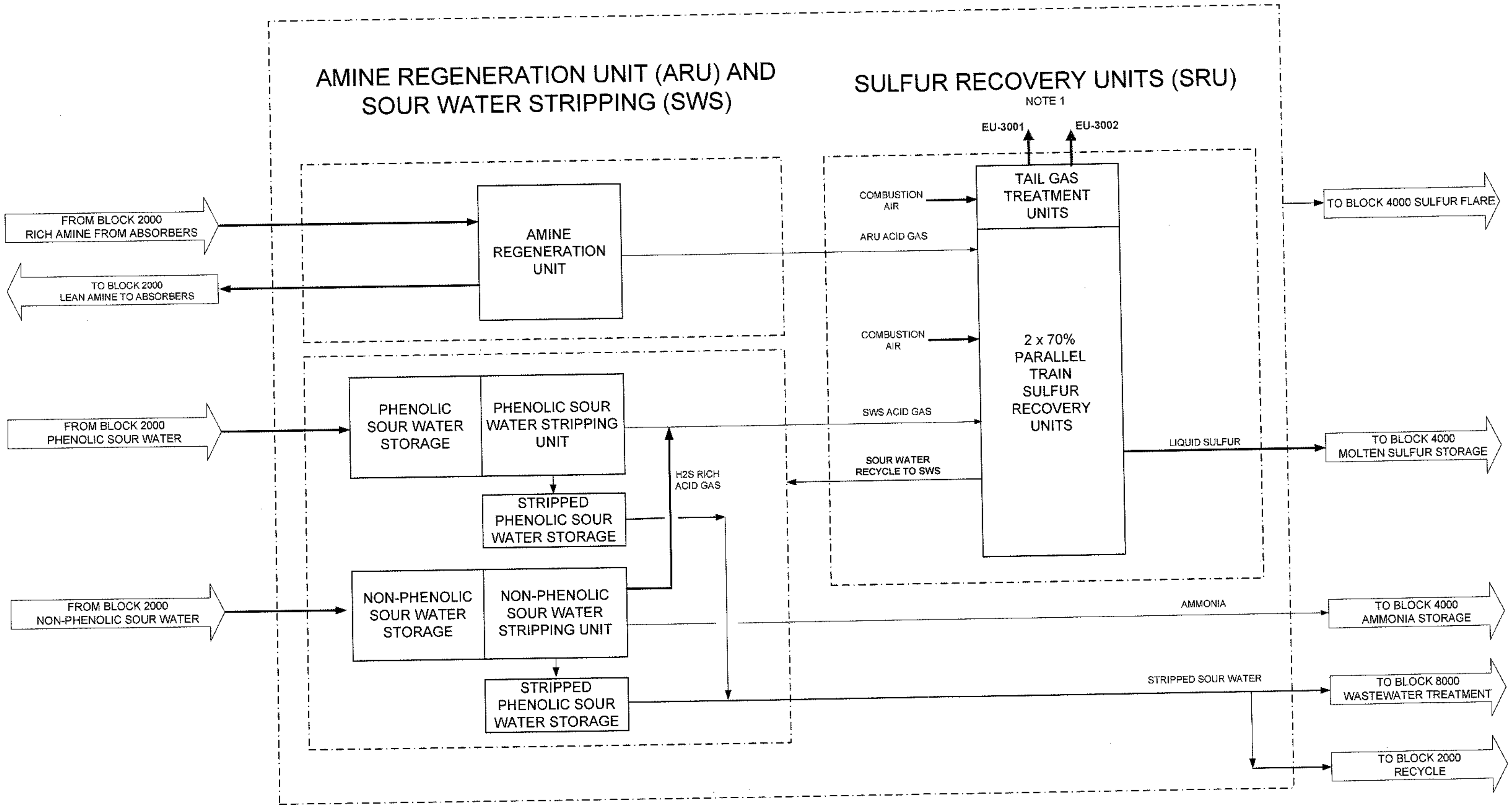
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 2000 – VCC UNIT DETAIL
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-2000-EV-DWG-EV2-0002		0

BLOCK 3000

SULFUR RECOVERY



NOTES:

1. 2 x 70% CLAUS SRU's WITH TAIL GAS TREATMENT UNITS (TGTU)

EU-3001	TGTU Stack A
EU-3002	TGTU Stack B

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	16JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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BLOCK FLOW DIAGRAM FOR PERMITTING BASIS

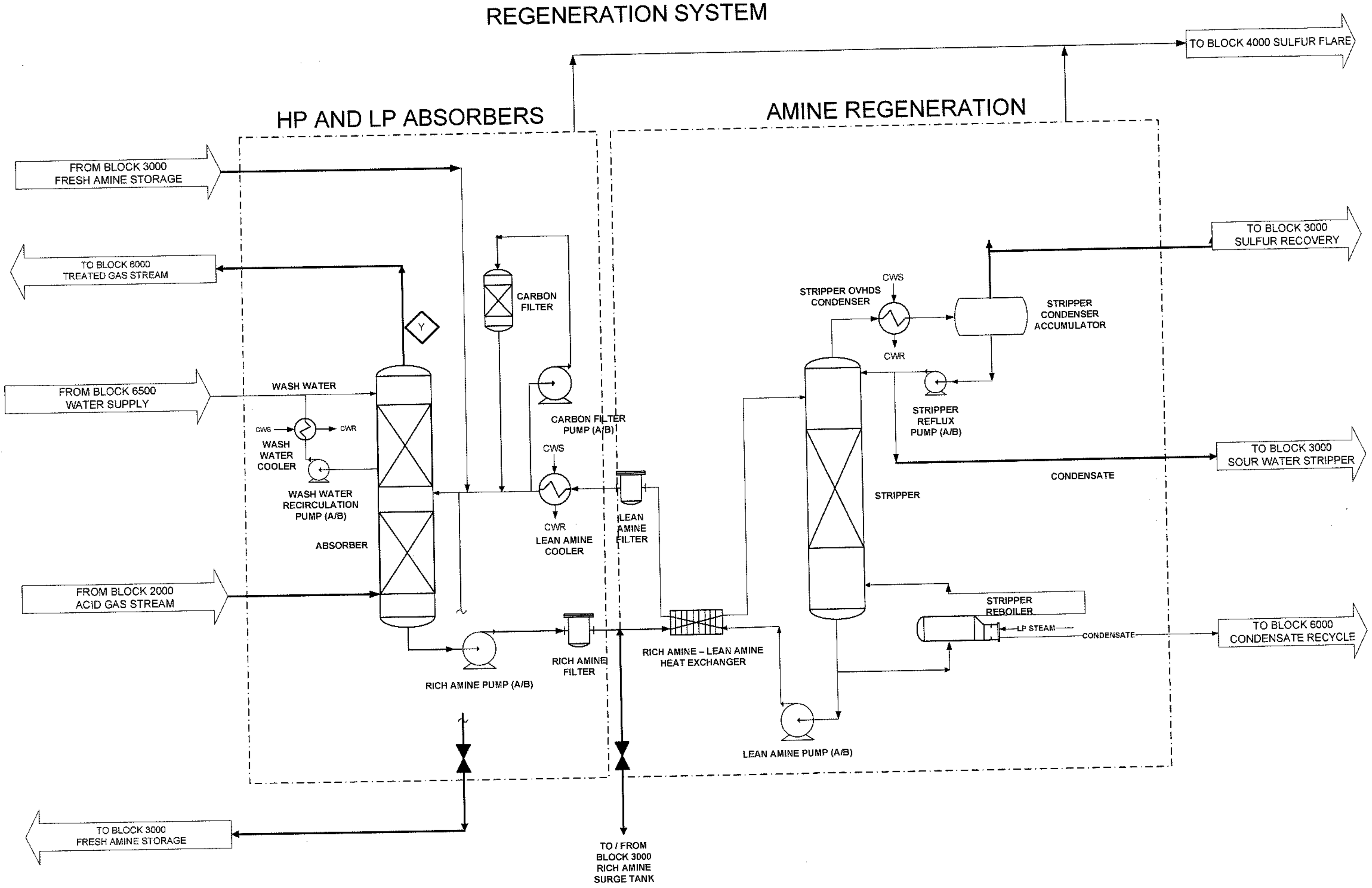
BLOCK 3000 – ARU – SWS - SRU UNITS

DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-3000-EV-DWG-EV2-0001	1 OF 1	0

Print date 1/17/2018 8:20 PM DWG # H102-0000-EV-DWG-EV2-XXXX_DCH
BFDs_Rev1_18Jan18.vsd Page # 7

BLOCK 3000
AMINE ABSORBERS & AMINE REGENERATION SYSTEM



NOTES:

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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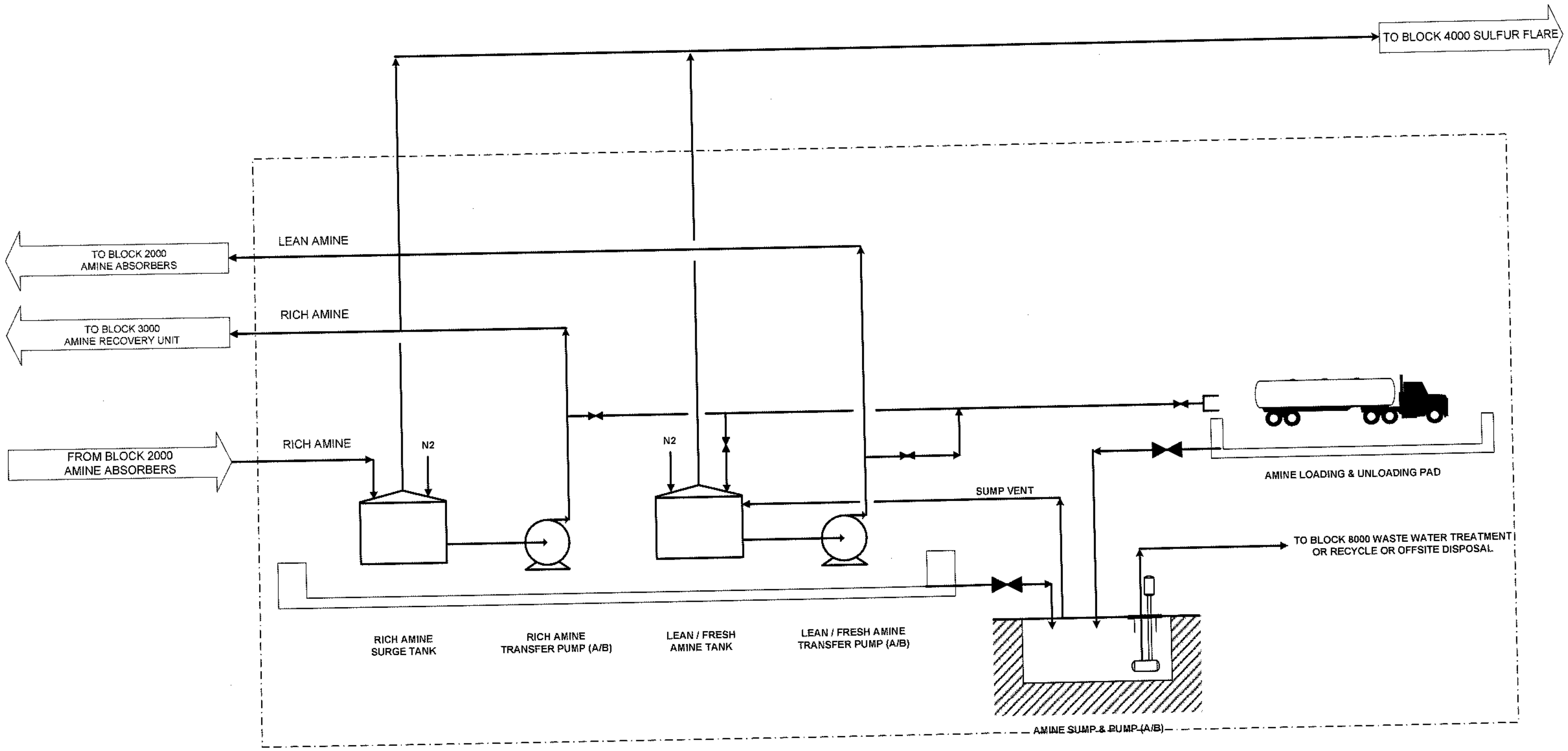
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 3000 – ARU DETAILS
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-3000-EV-DWG-EV2-0003	1 OF 1	0

BLOCK 3000
AMINE SOLVENT STORAGE AND HANDLING SYSTEM



NOTES:

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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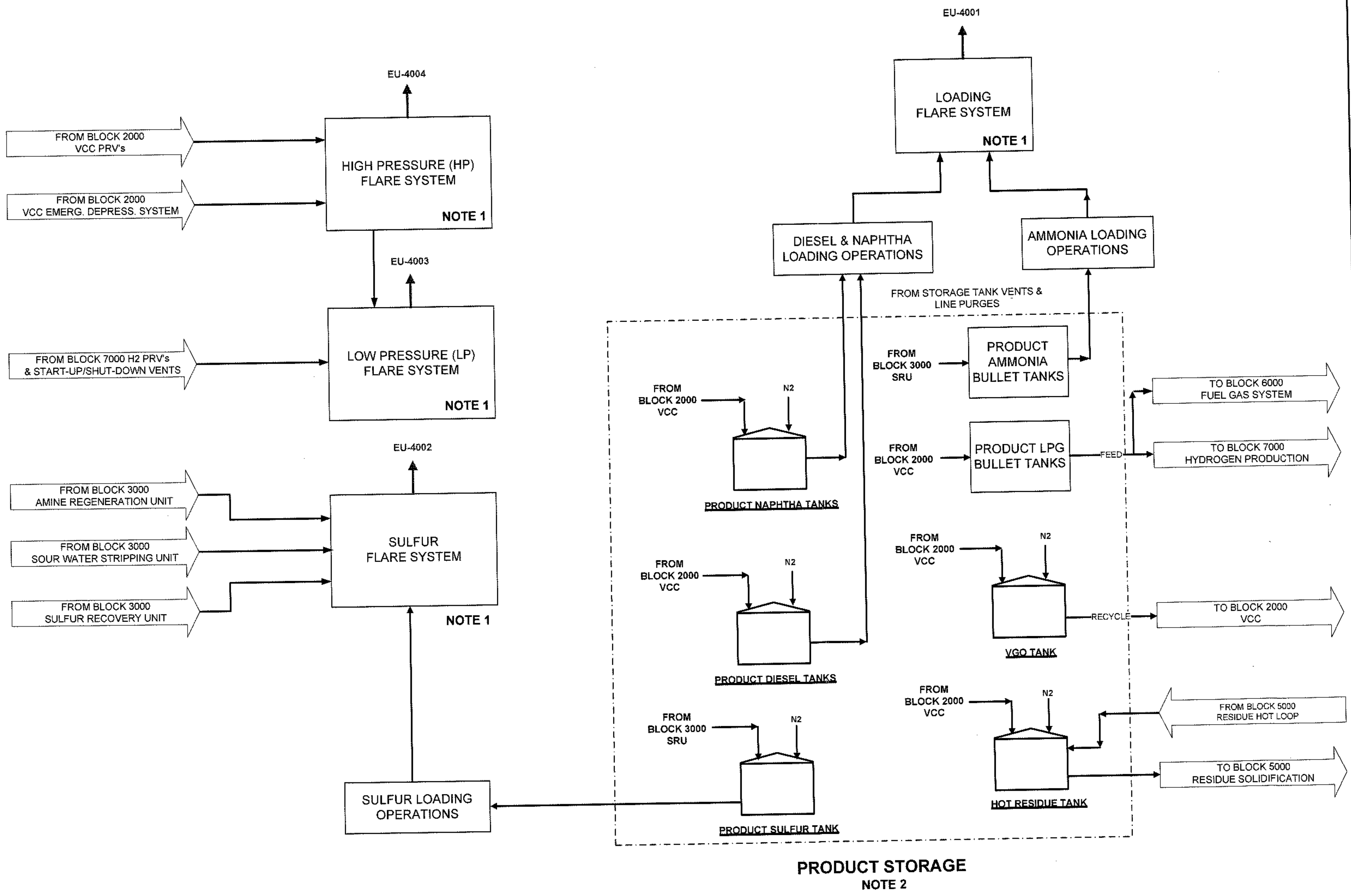
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 3000 – ARU STORAGE DETAIL
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT: RIVERVIEW ENERGY CORPORATION		
	KBR: H102	KBR: H102-3000-EV-DWG-EV2-0004	1 OF 1	0

BLOCK 4000

OFFSITES



NOTES:

1. Normal operation of all flares is in STANDBY MODE, i.e., pilots and purges. Flare Systems use Block 6000 supplied Fuel Gas System for supply to pilots and purges, as well as adjustment of Btu/scf heating value as needed at flare tip.

2. Steam is used for heating VGO, Residue, and Sulfur Tanks; Condensate is returned to Block 6500.

EU-4001	Loading Flare
EU-4002	Sulfur Block Flare
EU-4003	LP Flare
EU-4004	HP Flare

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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BLOCK FLOW DIAGRAM FOR PERMITTING BASIS

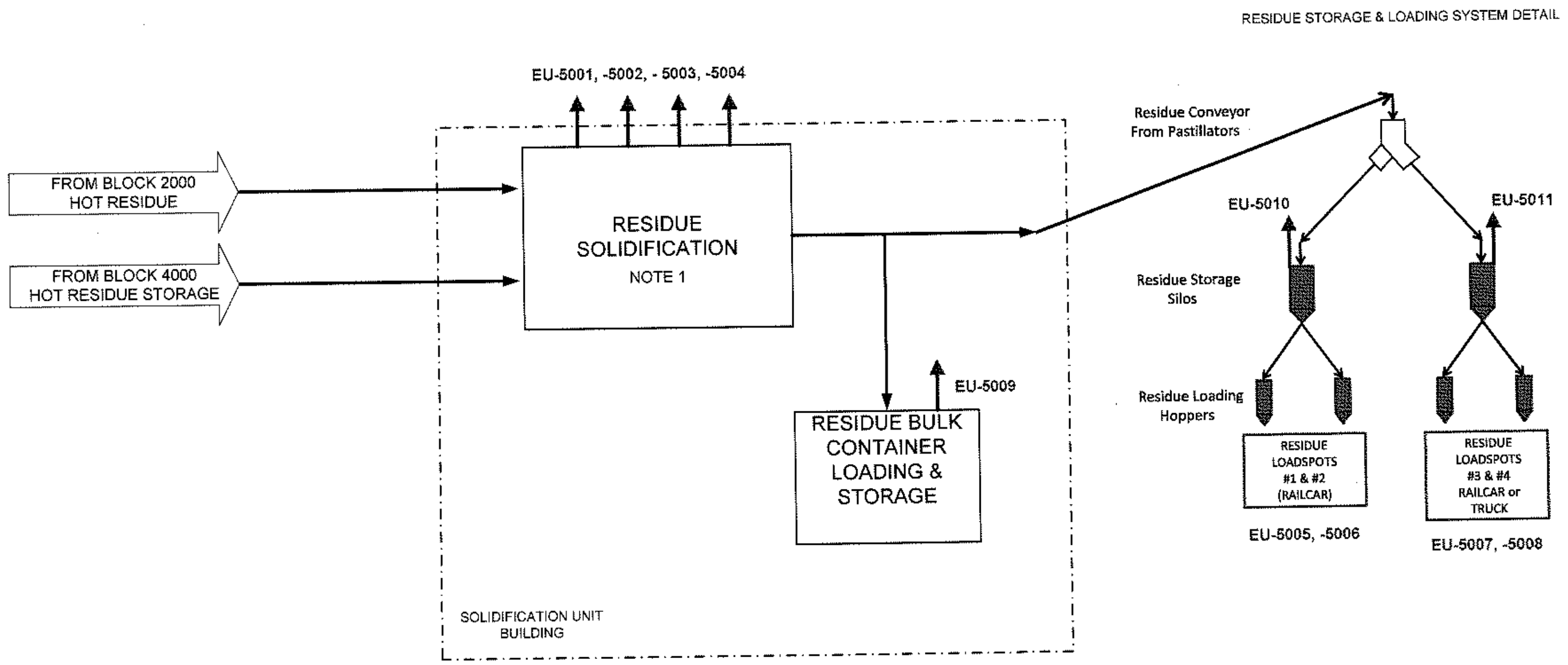
BLOCK 4000 - OFFSITES

DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-4000-EV-DWG-EV2-0001		0

BLOCK 5000

RESIDUE SOLIDIFICATION, SHIPPING, & HANDLING



NOTES:

1. FOUR PASTILATOR LINES (A/B/C/D) ARE SERVICED BY ONE STACK. A TOTAL OF 16 PASTILATORS ARE USED TO SOLIDIFY RESIDUE.

EU-5001A/B/C/D	Residue Pastillators Stack1
EU-5002A/B/C/D	Residue Pastillators Stack2
EU-5003A/B/C/D	Residue Pastillators Stack3
EU-5004A/B/C/D	Residue Pastillators Stack4
EU-5005	Residue Railcar Loading
EU-5006	Residue Railcar Loading
EU-5007	Residue Rail/Truck Loading
EU-5008	Residue Rail/Truck Loading
EU-5009	Residue Bulk Container Loading
EU-5010	Residue Rail Silo Filter
EU-5011	Residue Swing Silo Filter

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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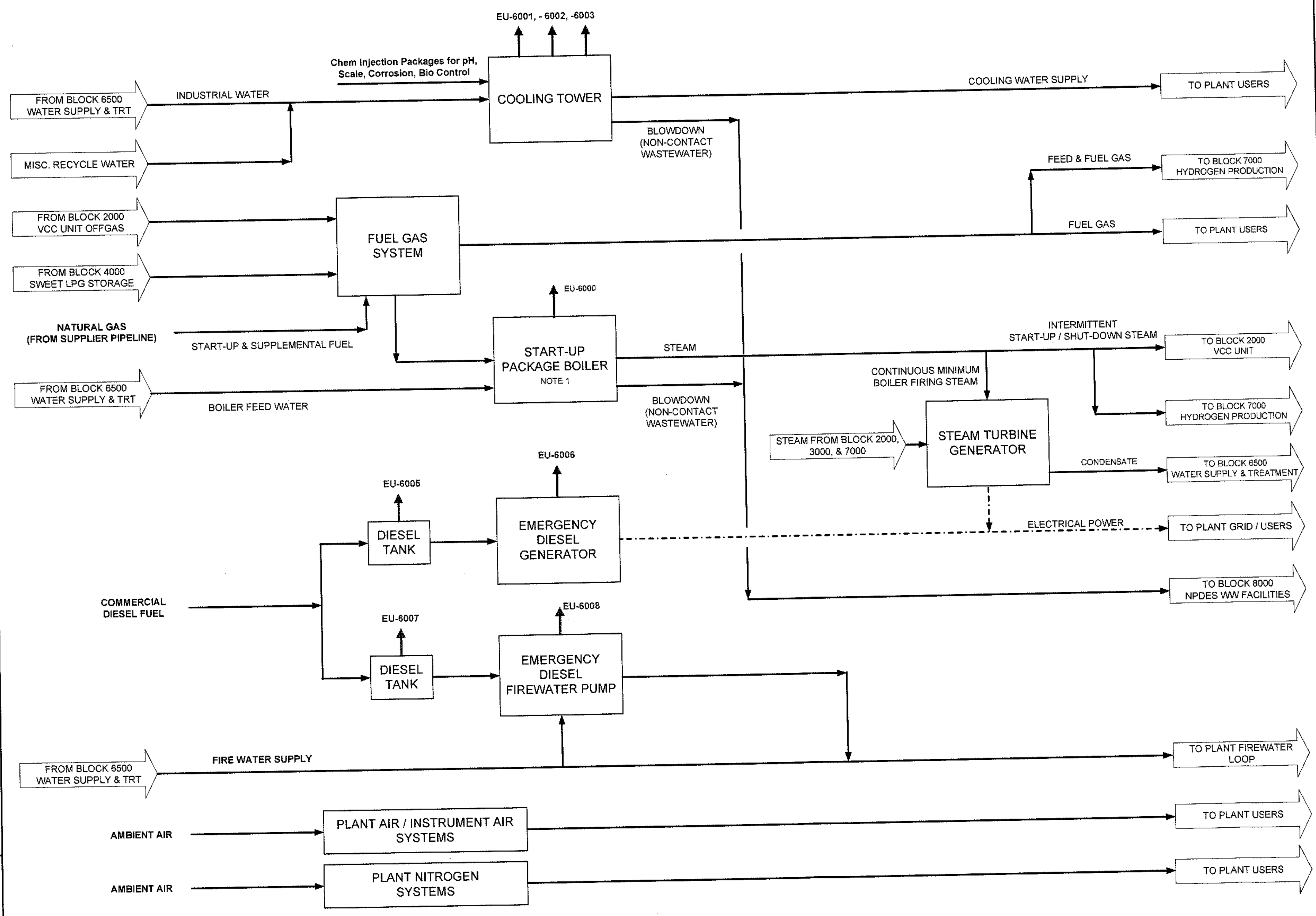
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 5000 – RESIDUE SOLIDIFICATION & HANDLING
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-5000-EV-DWG-EV2-0001		0

BLOCK 6000

UTILITY SYSTEMS



NOTES:

1. PACKAGE BOILER TO PROVIDE STEAM REQUIRED FOR H2 & VCC UNIT START-UPS / SHUT-DOWNS AND SUPPLEMENTAL STEAM TO TURBINE GENERATOR.

EU-6000	Package Boiler
EU-6001	Cooling Tower Cell A
EU-6002	Cooling Tower Cell B
EU-6003	Cooling Tower Cell C
EU-6005	EDG Diesel Tank
EU-6006	Emergency Diesel Generator
EU-6007	EDFWP Diesel Tank
EU-6008	Emergency Diesel FireWater Pump

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

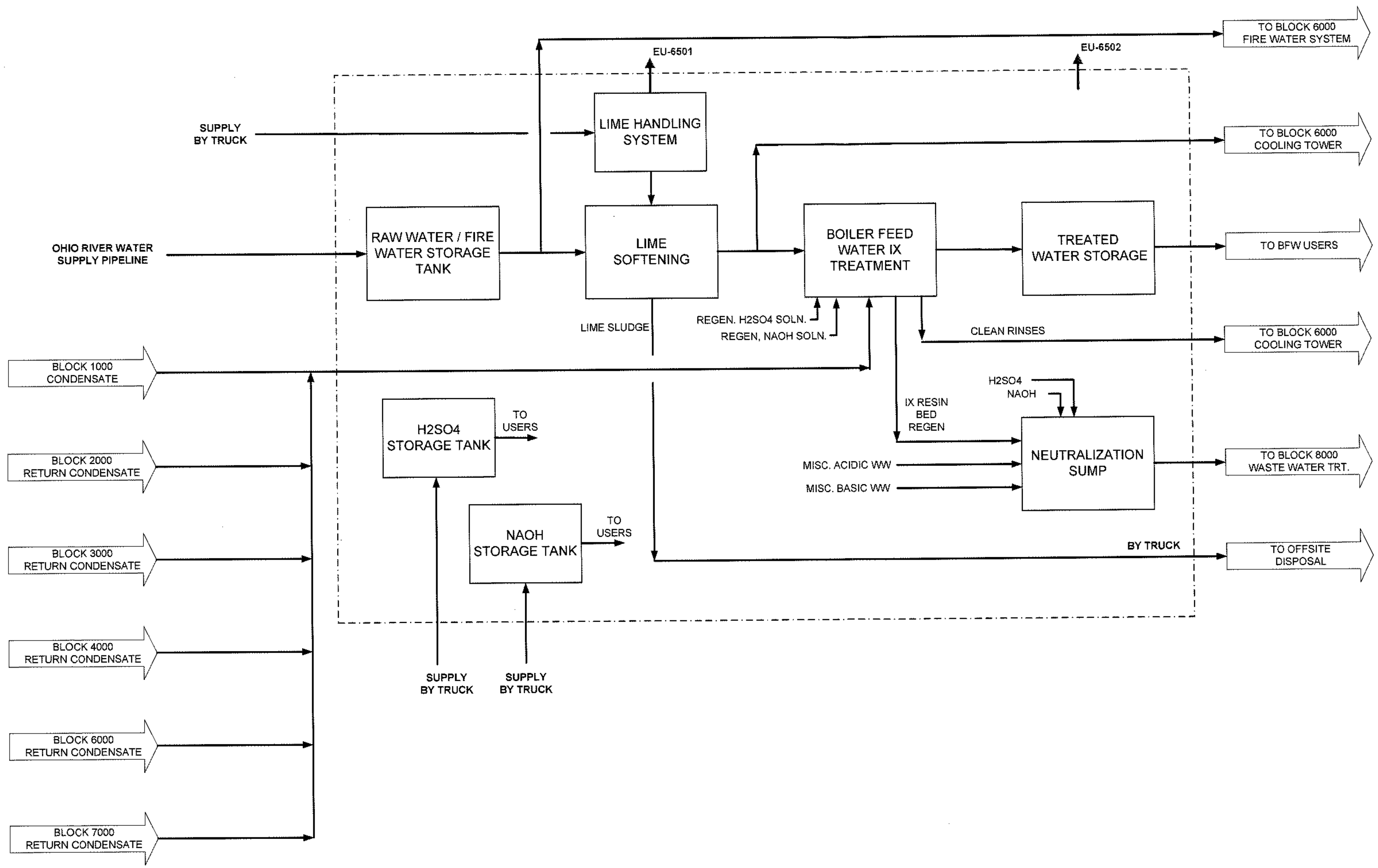
KBR

BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 6000 - UTILITIES
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-6000-EV-DWG-EV2-0001		0

BLOCK 6500

WATER SUPPLY AND TREATMENT



NOTES:

EU-6501	Lime Silo Filter
EU-6502	Deaerator Vent

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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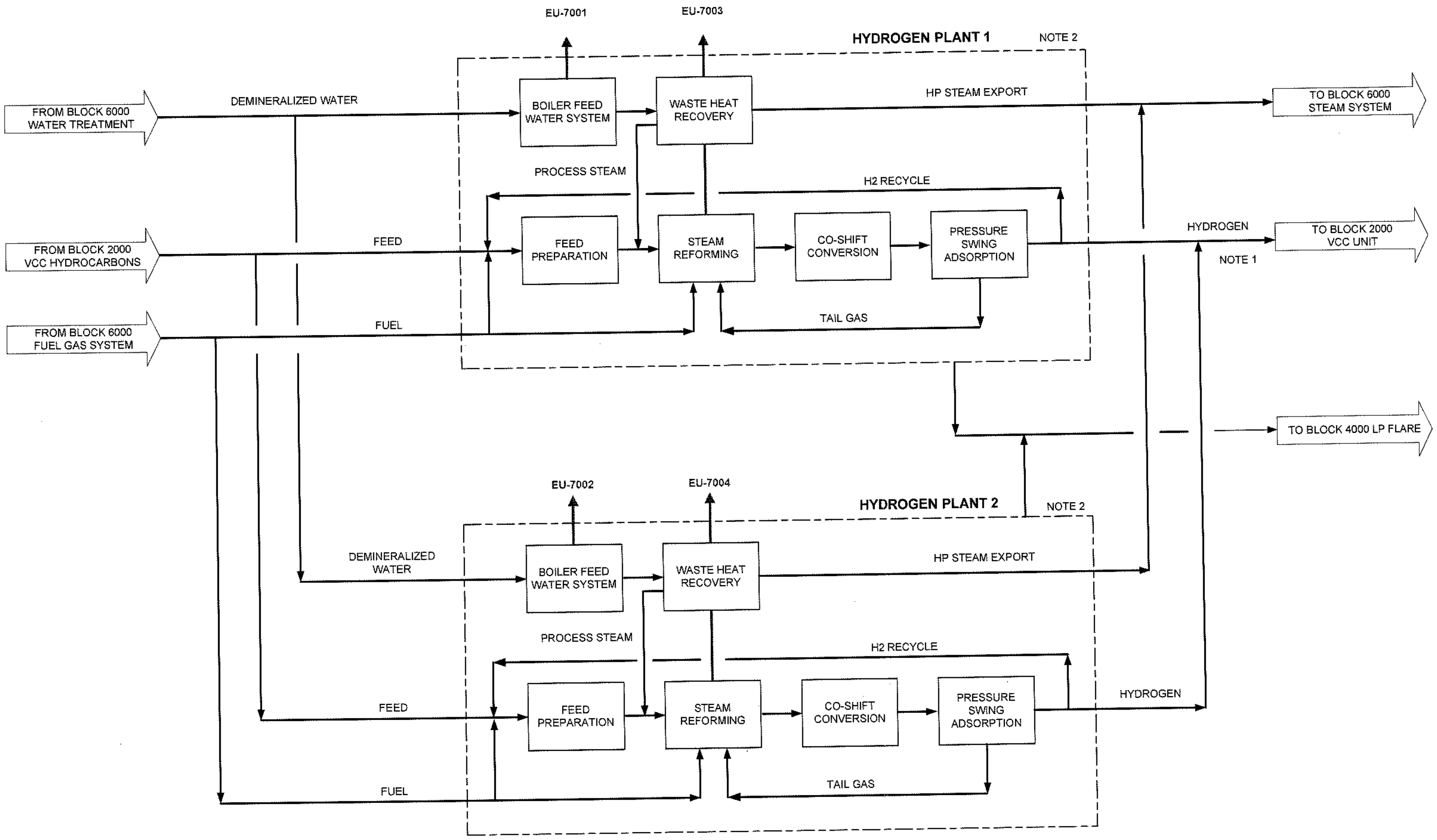
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 6500 – WATER SUPPLY & TREATMENT
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-6500-EV-DWG-EV2-0001		0

BLOCK 7000

HYDROGEN PRODUCTION



NOTES:

1. 2 TRAINS, TOTAL 506.7 MTPD HYDROGEN PRODUCTION
2. HYDROGEN PRODUCTION LICENSED UNITS OWNED & OPERATED BY SUPPLIER SOLELY FOR RIVERVIEW

EU-7001	Hydrogen Plant 1 Reformer
EU-7002	Hydrogen Plant 2 Reformer
EU-7003	Hydrogen Plant 1 DA Vent
EU-7004	Hydrogen Plant 2 DA Vent

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	18JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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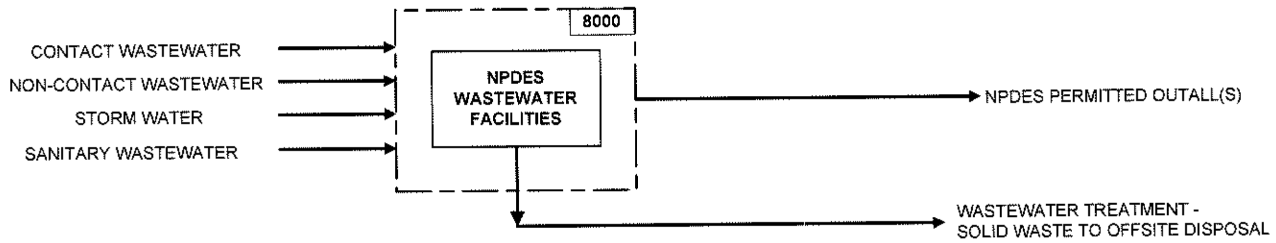
BLOCK FLOW DIAGRAM FOR PERMITTING BASIS
BLOCK 7000 - HYDROGEN PRODUCTION
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-7000-EV-DWG-EV2-0001	1 OF 1	0

BLOCK 8000

NPDES WASTEWATER FACILITIES



NOTES:

LEGEND:

XX00 = PROCESS BLOCK OR PLANT AREA NUMBER

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	1	16JAN18	ISSUE FOR PERMIT	RN	SAL	BP	
IFI	0	28NOV17	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

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BLOCK FLOW DIAGRAM FOR PERMITTING BASIS

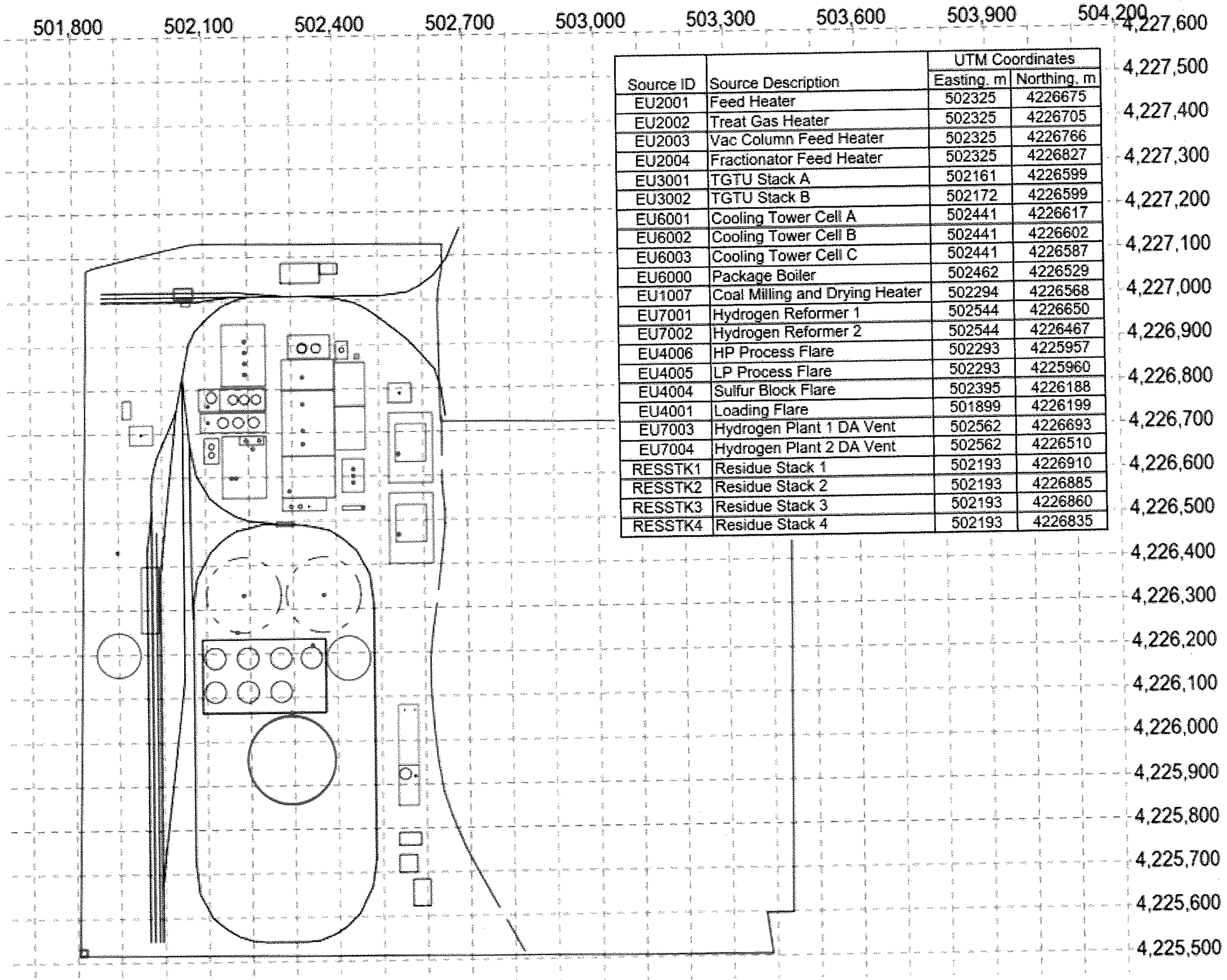
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT: RIVERVIEW ENERGY CORPORATION		
	KBR: H102	KBR		0

Attachment D. Site Plans

NOTES:

UTM EASTING AND NORTHING COORDINATES



Source ID	Source Description	UTM Coordinates	
		Easting, m	Northing, m
EU2001	Feed Heater	502325	4226675
EU2002	Treat Gas Heater	502325	4226705
EU2003	Vac Column Feed Heater	502325	4226766
EU2004	Fractionator Feed Heater	502325	4226827
EU3001	TGTU Stack A	502161	4226599
EU3002	TGTU Stack B	502172	4226599
EU6001	Cooling Tower Cell A	502441	4226617
EU6002	Cooling Tower Cell B	502441	4226602
EU6003	Cooling Tower Cell C	502441	4226587
EU6000	Package Boiler	502462	4226529
EU1007	Coal Milling and Drying Heater	502294	4226568
EU7001	Hydrogen Reformer 1	502544	4226650
EU7002	Hydrogen Reformer 2	502544	4226467
EU4006	HP Process Flare	502293	4225957
EU4005	LP Process Flare	502293	4225960
EU4004	Sulfur Block Flare	502395	4226188
EU4001	Loading Flare	501899	4226199
EU7003	Hydrogen Plant 1 DA Vent	502562	4226693
EU7004	Hydrogen Plant 2 DA Vent	502562	4226510
RESSTK1	Residue Stack 1	502193	4226910
RESSTK2	Residue Stack 2	502193	4226885
RESSTK3	Residue Stack 3	502193	4226860
RESSTK4	Residue Stack 4	502193	4226835

LEGEND:

ISSUE	REV	DATE	REVISION DESCRIPTION	BY	CHK	APP	CLIENT
IFP	C	18JAN18	ISSUE FOR INFORMATION	RN	SAL	BP	
IFI	B	9JAN18	ISSUE FOR INFORMATION	RN	SAL		
IFI	A	8JAN18	ISSUE FOR INFORMATION	RN	SAL		

RIVERVIEW ENERGY CORPORATION

KBR

PLOT PLAN FOR PERMITTING BASIS
AIR DISPERSION MODELING PLOT PLAN
DIRECT COAL HYDROGENATION (DCH) PLANT
DALE, INDIANA

CLASS	JOB NO.	DOCUMENT NO.	SHEET	REV
	CLIENT	CLIENT RIVERVIEW ENERGY CORPORATION		
	KBR H102	KBR H102-0000-EV-DWG-EV2-0100		C

Table 1. Tank Emissions Summary
Naphtha Product Tank, Diesel Product Swing Tank

Tank Identification	Components	Losses per Tank (lbs)					Total Emissions	
		Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions	Total Tanks Emissions (lbs/yr)	Total Tanks Emissions (tons/yr)
Naphtha Product Tank - Internal Floating Roof Tank	Product Naphtha	1,040.01	73.68	556.33	0	1,670.03	3,340.06	1.67
Number of Tanks	Hexane (-n)	42.86	1.11	22.93	0	66.9	133.8	0.07
2	Benzene	10.36	0.44	5.54	0	16.34	32.68	0.02
	Toluene	9.56	1.47	5.11	0	16.15	32.3	0.02
	Ethylbenzene	0.77	0.37	0.41	0	1.55	3.1	0.00
	Xylene (-m)	3.19	1.84	1.71	0	6.74	13.48	0.01
	Isopropyl benzene	0.13	0.15	0.07	0	0.35	0.7	0.00
	Cyclohexane	21.57	0.88	11.54	0	33.99	67.98	0.03
	Unidentified Components	951.57	67.42	509.02	0	1,528.01	3,056.02	1.53
Diesel Product Swing Tank - Internal Floating Roof Tank	Product Naphtha	1,040.01	72.02	556.33	0	1,668.36	1,668.36	0.83
	Hexane (-n)	42.86	1.08	22.93	0	66.87	66.87	0.03
	Benzene	10.36	0.43	5.54	0	16.33	16.33	0.01
Number of Tanks	Toluene	9.56	1.44	5.11	0	16.11	16.11	0.01
1	Xylene (-m)	3.19	1.8	1.71	0	6.7	6.7	0.00
	Isopropyl benzene	0.13	0.14	0.07	0	0.35	0.35	0.00
	Cyclohexane	21.57	0.86	11.54	0	33.97	33.97	0.02
	Unidentified Components	951.57	65.9	509.02	0	1,526.49	1,526.49	0.76
	Ethylbenzene	0.77	0.36	0.41	0	1.54	1.54	0.00

Table 2. Tank Emissions Summary
Diesel Product Tank and Fuel Storage Tank, Fresh Amine Tank, VGO Tank, Surge Tank, Vacuum Residue Tank

Tank Identification	Components	Losses(lbs)			Total Emissions	
		Working Loss	Breathing Loss	Total Emissions per Tank	Total Emissions (lbs/yr)	Total Emissions (tons/yr)
Diesel Product Tank - Vertical Fixed Roof Tank	Product Diesel	26.06	26.72	52.78	158.34	0.07917
Number of Tanks						
3						
Diesel Fuel Storage Tank - Vertical Fixed Roof Tank	Distillate fuel oil no. 2	4.92	5.98	10.9	10.9	0.00545
	Hexane (-n)	0	0	0	0	0
Number of Tanks	Benzene	0.01	0.01	0.02	0.02	0.00001
1	Toluene	0.12	0.14	0.26	0.26	0.00013
	Ethylbenzene	0.02	0.02	0.03	0.03	0.000015
	Xylene (-m)	0.28	0.34	0.63	0.63	0.000315
	1,2,4-Trimethylbenzene	0.22	0.26	0.48	0.48	0.00024
	Unidentified Components	4.28	5.19	9.47	9.47	0.004735
Fresh Amine Tank - Vertical Fixed Roof Tank	Lean Amine	0.03	0.23	0.26	0.26	0.00013
Number of Tanks						
1						
VGO Tank	VCC VGO	0.16	0.08	0.24	0.48	0.00024
Number of Tanks						
2						
Hydrogenated Residue Surge Tank	Hydrogenated	0.01	0	0.02	0.04	0.00002
Number of Tanks						
2						
Vacuum Residue Feed Tank	VCC Residue	0.25	0.08	0.33	0.33	0.000165
Number of Tanks						
1						

Table 3. Total Annual Potential Emissions

		Total Annual Potential Emissions	
Identification	Components	Total VOC Emissions (lbs/yr)	Total VOC Emissions (tons/yr)
Naphtha Product Tank - Internal Floating Roof Tank	Product Naphtha	3,340	1.67
Diesel Product Tank - Vertical Fixed Roof Tank	Product Diesel	158	0.08
Naphtha Product Loadout	Product Naphtha	3,115	1.56
Diesel Product Loadout	Product Diesel	0	0
	Overall Total	6,613	3.31