PERMIT-TO-INSTALL APPLICATION
OHIO RIVER CLEAN FUELS FACILITY
VILLAGE OF WELLSVILLE, COLUMBIANA AND JEFFERSON COUNTIES, OHIO

SUBMITTED TO:

OHIO ENVIRONMENTAL PROTECTION AGENCY

SUBMITTED BY:

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CEC PROJECT 061-933.0002

December 18, 2007

INTRODUCTION

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INTRODUCTION

1.0 Site Location

On behalf of Ohio River Clean Fuels, LLC (ORCF), Civil & Environmental Consultants, Inc. (CEC) has prepared this Permit-to-Install (PTI) application for a proposed coal-to-liquid fuels facility. ORCF has selected a site located west of Route 7 and the Ohio River near Wellsville, Columbiana and Jefferson Counties, Ohio. The proposed project site boundary is shown on Figure 1 – Site Location Map.

2.0 Project Team

ORCF enlisted the support of various consulting firms to carry the project from the design to the permitting stage. ORCF and the Project Team have presented portions of the information within this application to the Ohio EPA during pre-application meetings and teleconference calls during 2007. These discussions have provided insight into state and federal permitting requirements and the level of technical information appropriate and necessary for this application package. Consequently, this application has been compiled as a non-confidential document with the understanding that it will be made publicly available through the Ohio EPA's internet web site.

3.0 Project Description

The purpose of this project is to produce ultra-clean high-quality liquid transportation fuels from coal and biomass. The proposed facility will encompass an area of approximately 275 acres within a property boundary of more than 600 acres. Figure 2 is a proposed plot plan of the entire facility illustrating both the elements of the facility that are the subject of this PTI application as well as other key site elements.

Figure 3 is a block flow diagram of the entire manufacturing process. To simplify the presentation and organization of this application, the facility has been divided into twelve discrete but interrelated modules. Each module is illustrated in Figure 3. The following brief descriptions summarize the air quality permit modules of the facility. Detailed process descriptions and module-specific flow diagrams are provided in the module-specific permit application sections.

3.1 Feedstock Storage

Bituminous coal (e.g., Pittsburgh #8) and biomass (e.g., saw dust, wood chips, or dry chicken litter) will be stored in six piles: four for coal, one for biomass, and one for either coal or biomass. The total storage pile area will be approximately 19 acres. Air emission sources include material handling equipment and wind erosion of storage piles which will produce airborne particulate matter.

3.2 Feedstock Processing

Coal and biomass will be delivered to the facility by either conveyor or truck. Conveyor transfers will originate from a river-side coal terminal operated by a separate legal entity. ORCF will operate a transfer tower located at the coal terminal. From there, coal and biomass will be delivered via enclosed conveyor to the storage piles. Coal and biomass will also be delivered by truck to an enclosed hopper building. Fugitive particulate matter emissions will be generated from stacker/reclaimers used to manage the coal pile, and from conveyors used to transfer coal and biomass from the hopper building to the storage piles. Point source particulate emissions will be associated with various transfer towers, silos, crushers, and filling vessels. Products of combustion will be generated when fuel is burned to dry the feedstock prior to delivery to the gasifiers.

3.3 Gasification

Six gasifiers will be used to manufacture synthetic gas (syngas) consisting primarily of carbon monoxide and hydrogen from the feedstock. Gasification involves exposure of feedstock to sub-stoichiometric quantities of oxygen at elevated temperature (about 2,800 °F) and pressure. By-products of the gasification process include slag and ash. Slag and ash will be removed as described in Module 4. Syngas generated in the gasifiers is then cleaned in Module 5 – Syngas Cleanup. The gasification process will not be a source of atmospheric emissions under normal operating conditions. During startup and shutdown of the gasifiers and during emergencies or process upsets, it will be necessary to direct gasifier products to the high pressure flare.

3.4 Material Handling

Fly ash is collected and transferred to one of six storage silos prior to being shipped off-site. Point sources of particulate emissions include intermediate storage vents and storage silo vents. Fly ash will be pneumatically conveyed from the silos to trucks. Passive bin vent filters will control particulate emissions associated with the transfer of the fly ash from silos.

Dewatered slag from each of the six gasifiers will be conveyed to on-site storage via enclosed conveyors. The slag storage area will be surrounded on three sides by low barriers to contain material and provide partial wind barriers. The slag storage pile area is estimated at about one acre and will be a source of fugitive particulate emissions.

3.5 Syngas Cleanup

In this part of the plant, sulfur, mercury, and other impurities that would adversely impact the Fischer-Tropsch and Product Upgrade processes are removed from the syngas generated in the gasifiers. Syngas processing steps include:

- filtration (particulate removal);

- wet scrubbing (residual particulate, soluble alkali salts, hydrochloric acid, and hydrofluoric acid);
- activated carbon adsorption (mercury);
- Rectisol® (or equivalent) acid gas removal (hydrogen sulfide [H_2S], carbonyl sulfide [COS], CO_2, and other trace components such as cyanide, ammonia, mercury, and metal carbonyls); and
- Zinc oxide sorption (residual sulfur species)

Also included within this module are sulfur recovery systems that will be used to convert sulfur compounds removed from syngas in the acid gas removal process into elemental sulfur. The sulfur recovery system includes thermal oxidization for control of reduced sulfur species.

3.6 Fischer-Tropsch and Product Upgrade

In the Fischer-Tropsch process, syngas (essentially carbon monoxide and hydrogen), undergoes conversion to hydrocarbons and water in the presence of cobalt catalyst particles. Hydrocarbons formed in the Fischer-Tropsch reactors will be fractionated into various product streams. Emission sources associated with this process are process heaters; various equipment flanges, valves and seals that may be sources of fugitive volatile organic compounds; and catalyst regeneration gases sent to a low-pressure flare.

In the Product Upgrade process, middle distillates are hydrotreated and then refined via distillation into F-T-diesel, F-T-naphtha, and liquefied petroleum gas. Air emission sources include process heaters and various equipment flanges, valves and seals that may be sources of fugitive volatile organic compounds.

3.7 Tank Farm

Products from the Fischer-Tropsch and Product Upgrade processes will be stored in above-ground storage tanks or pressure vessels prior to being shipped offsite. The tank farm will include eight (three-million gallon) fixed-roof tanks to store middle distillates and four internal floating-roof tanks to store F-T naphtha and off-specification product. Liquefied petroleum gas (LPG) will be stored in ten nominal 30,000-gallon LPG bullets.

3.8 Product Loading

Tanker truck loading of product will occur at the loading rack adjacent to the tank farm. The design of the loading rack will provide capacity for four to eight tanker trucks to load F-T diesel and/or F-T naphtha simultaneously. A pipeline connection for product delivery is also anticipated. The F-T naphtha product loading rack will be equipped with a vapor recovery system.

3.9 Combined Cycle Plant

The power block will be constructed in three phases. The first phase will be a 1,200 MMBtu/hr boiler (Phase 1 Boiler) that will be constructed along with a steam turbine. A transitional stage where one combustion turbine generator (CTG) will be brought on line will begin roughly 18 months after the initial startup. The full operational phase where the second CTG will be brought on line will begin about 36 months after initial startup.

The Combined Cycle block will consist of two CTGs, each exhausting to its own Heat Recovery Steam Generator (HRSG) and a process steam turbine generator (PTG). Two 230 MW (nominal) CTGs will burn tailgas produced within the facility. Emissions from the HRSGs will be controlled by selective catalytic reduction and catalytic oxidation.

3.10 Cooling Towers

The waste heat from condensers at the facility will be rejected by two hyperbolic wet cooling towers. Each tower will be 580 feet tall and 239 feet in diameter at the top. Ohio River water will be used for the cooling tower makeup with pre-treatment prior to use. The cooling towers will also provide cooling required for the coal-to-liquids processes.

3.11 Emergency Generator and Fire Pumps

Emergency power generation for the site will be provided by a single 16-cylinder diesel-powered 2-MW emergency generator. Two nominal 300 bhp diesel-driven fire pump engines will be used to provide fire protection at the facility.

3.12 Roadways and Parking

Plant roads at the Ohio River Clean Fuels facility will allow for delivery of raw materials (coal and biomass), export of products (F-T diesel, F-T naphtha, and LPG), shipping of by-products (sulfur, fly ash, and slag), and employee vehicle traffic and parking. Due to the high volume of traffic, all plant roads will be paved. Haul trucks will be covered and roadways will be watered and swept in accordance with a dust control plan.

4.0 Primary Emission Units and Air Pollution Control Equipment

Table 1 is a list of the primary emission units proposed for the ORCF facility. As detailed in the attached application, ORCF will employ multiple air pollution control technologies and strategies to reduce air emissions from the plant. Specifically, ORCF will limit the emission of particulate matter (total, PM_{10}, and $PM_{2.5}$), sulfur dioxide, nitrogen dioxide, carbon monoxide, volatile organic compounds, organic compounds, hazardous air pollutants, and air toxics through the use of the following methods:

- Full and partial enclosures as well as wind barriers
- Dust suppressants
- Baghouses, fabric filters, and pneumatic conveyance
- Enclosed conveyors
- Low-sulfur, clean fuels
- Good design and combustion practices
- Thermal oxidation
- Ultra Low-NOx and low-NOx burners
- Selective Catalytic Reduction
- Catalytic Oxidation
- Leakless/sealless or low-emission components
- Leak Detection and Repair Program
- Internal Floating Roof Tanks
- Vapor Recovery System
- Drift Eliminators
- Dust Control Program

Specific pollution control technologies associated with the primary emission units are identified in Table 1.

5.0 Emission Inventory Summary

Detailed information about the air emissions profile for the various processes proposed for the ORCF facility are provided in the individual Emission Inventory sections of the Permit Application. Table 2 summarizes the actual annual emissions from ORCF. ORCF has the potential to emit non-criteria air pollutants that are regulated as hazardous air pollutants (HAP) under Clean Air Act Section 112. Table 3 summarizes the HAP emissions from the facility. In addition to criteria pollutants and hazardous air pollutants, the facility has the potential to emit other air contaminants that may have an adverse impact on human health. These air toxics are defined by Ohio EPA as substances for which a health-based threshold limit value (TLV) has been established by the American Conference of Governmental Industrial Hygienists (ACGIH). Table 3 summarizes short-term and annual estimated emissions of air toxics from ORCF.

6.0 Regulatory Summary

Regulations applicable to the entire facility are discussed below. Module-specific applicable regulations are presented in the respective application modules. The matrix shown in Table 4 summarizes applicable regulations identified for each process module.

6.1 Air Pollution Nuisances Prohibited (3745-15-07)

The emission into the open air of smoke, ashes, dust, grime, acids, fumes, gases, vapors, odors, or any other substances or combinations of substances, in such a manner as to endanger the

health, safety or welfare of the public, or cause unreasonable injury or damage to property, is a public nuisance. It is unlawful for any person to cause, permit or maintain any such public nuisance.

6.2 Stack Height Requirements (3745-16)

Good engineering practice stack height requirements are established by this rule. According to 3745-16-02, the requirements of the rule apply to all new air contaminant sources, with certain exemptions that do not apply to ORCF. Good engineering practice (GEP) stack height is defined in 3745-16-01 as the greater of either:

- 65 meters measured from the ground-level elevation at the stack base (or building from which the stack arises);
- the height of the nearby structure (i.e., within 5 times the building height or up to 0.8 km) plus the lesser of the height or projected width times 1.5; or
- the height demonstrated by a fluid model or field study approved by the director which ensures that the emissions from the stack do not result in excessive concentrations.

Stack heights for ORCF sources will be evaluated relative to these criteria. Final stack heights will be selected on the basis of director-approved modeling evaluations and engineering considerations.

7.0 BACT Analysis Summary

The proposed ORCF coal-to-liquid fuels plant will be a chemical process plant (SIC Code 2869 and NAICS Code 325199). As a Chemical Process Plant, the facility is one of the 28 named source categories listed in Section 169 of the Clean Air Act. Therefore, the facility will be considered a major source if the potential to emit for any single pollutant regulated by the Act, including fugitive emissions, exceeds 100 tons per year.

As shown in Section 4, facility-wide potential emissions of all criteria pollutants exceed the 100-ton per year threshold, therefore the facility is a major stationary source as defined under OAC 3745-31-01(KKK). As such, the facility is subject to New Source Review.

Because Columbiana County, Ohio is in attainment (or is unclassified) for all regulated pollutants, Prevention of Significant Deterioration (PSD) review applies. While a portion of the facility property is within the adjacent Jefferson County, and Jefferson County has been designated a non-attainment area for fine particulate (PM2.5) air emission sources will not be located in Jefferson County. Non-attainment permitting requirements have therefore not been addressed in this application.

In accordance with OAC 3745-21-15(C) a new major stationary source shall apply best available control technology (BACT) for each regulated New Source Review pollutant that the major stationary source has the potential to emit in significant amounts. The significant emission rates, per OAC 3745-21-01(KKKKK) are:

Carbon Monoxide:	100 tpy
Nitrogen Oxide:	40 tpy
Sulfur Dioxide:	40 tpy
Total Suspended Particulate:	25 tpy
PM10:	15 tpy
Ozone (VOC):	40 tpy
Lead:	0.6 tpy
Fluorides:	3 tpy
Sulfuric Acid Mist:	7 tpy
Hydrogen Sulfide:	10 tpy
Total Reduced Sulfur:	10 tpy
Reduced Sulfur Compounds:	10 tpy
NMOC from landfills:	50 tpy

The Table 1 summarizes the emission units and pollutants that are considered in this BACT analysis.

7.1 Top-Down BACT Methodology

Best available control technology (BACT) is defined in OAC 3745-31-01(S) as:

"... an emission limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the director, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such major stationary 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 such air pollutant."

In a memorandum dated December 1, 1987, the U.S. Environmental Protection Agency (EPA) Assistant Administrator for Air and Radiation implemented the "top-down" method for determining BACT. As described in EPA's *Draft New Source Review Workshop Manual* (October 1990), the five steps of a top-down BACT analysis are:

Table 1
Summary of BACT Applicability by Permit Module

Module	BACT Analysis Required?					
	PE/PM10	CO	NO_x	VOC	SO_2	H_2S
1. Feedstock Storage	YES	NO	NO	NO	NO	NO
2. Feedstock Processing	YES	YES	YES	YES	YES	NO
3. Gasification	YES	YES	YES	YES	YES	NO
4. Material Handling	YES	NO	NO	NO	NO	NO
5. Syngas Cleanup	NO	YES	NO	NO	NO	YES
6. Fischer-Tropsch and Product Upgrade	YES	YES	YES	YES	YES	NO
7. Tank Farm	NO	NO	NO	YES	NO	NO
8. Product Loading	NO	NO	NO	YES	NO	NO
9. Combined Cycle Plant	YES	YES	YES	YES	YES	NO
10. Cooling Towers	YES	NO	NO	NO	NO	NO
11. Emergency Generator & Pumps	YES	YES	YES	YES	YES	NO
12. Roadways and Parking	YES	NO	NO	NO	NO	NO

1. **Identify all available control technologies applicable to the proposed source, including Lowest Achievable Emission Rate (LAER) technologies.** Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation. Techniques must be commercially available to be considered. Per page B-11 of the *Draft New Source Review Workshop Manual,* "Technologies which have not yet been applied to (or permitted for) full scale operations need not be considered available; an applicant should be able to purchase or construct a process or control device that has already been demonstrated in practice." On page B.18 of the *Draft New Source Review Workshop Manual,* EPA again specifies that a technology must be commercially available to be considered: "A control technique is considered available, within the context presented above, if it has reached the licensing and commercial sales stage of development. A source would not be required to experience extended time delays or resource penalties to allow research to be conducted on a new technique."

2. **Eliminate technically infeasible options.** The technical feasibility of the control options identified in Step 1 is evaluated with respect to the source-specific factors. This demonstration should show, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option on the emission unit under review. Technically infeasible control options then are eliminated from further consideration in the BACT analysis.

3. **Rank remaining control technologies by control effectiveness.** This ranking should include control efficiencies, expected emission rate, expected emissions reduction, energy impacts, environmental impacts, and economic impacts. If the top control alternative is chosen, then cost and other detailed information about other control options need not be provided.

4. **Evaluate the most effective controls and document results, including a case-by-case consideration of energy, environmental, and economic impacts.** If the top control alternative is selected, impacts of unregulated air pollutants or impacts in other media are considered to determine if the selection of an alternative control option can be justified. If the top control option is not selected as BACT, evaluate the next most effective control option.

5. **Select BACT**, which will be the most effective option not rejected in Step 4. Steps 1 through 5 have been completed for PM/PM10, NO_x, CO, VOC, and SO_2 emissions from each emission source that is subject to the BACT requirements. The details of each BACT analysis are included within the respective application Modules.

7.2 BACT Determinations

Table 2 summarizes the BACT determinations and applicable emission limits contained within the module-specific BACT analyses.

8.0 Air Quality Impacts Summary

A dispersion modeling analysis was performed for this project in accordance with an Ohio EPA-approved modeling protocol. The modeling evaluation demonstrates that the facility will not have an adverse impact on the National Ambient Air Quality Standards. In addition, the Prevention of Significant Deterioration (PSD) evaluation concludes that modeled impacts are below the Class II PSD increment for each of the criteria contaminants, as well as the Ohio acceptable increments. Further detail concerning the modeling results is provided in Appendix A.

9.0 PTI Application Organization

This PTI application is organized into twelve process groups which comprise the total operations with significant facility air emissions. Based on pre-application meetings with representatives of the Ohio Environmental Protection Agency, Northeast District Office as well as Central Office, it was agreed that organization of this application in separate modules would be beneficial to the review process. The twelve modules in the order presented are:

Module - Description

1 - Feedstock Storage
2 –Feedstock Processing
3 - Gasification
4 – Material Handling
5 – Syngas Cleanup
6 – Fischer-Tropsch & Product Upgrade
7 – Tank Farm
8 – Product Load-Out
9 – Combined Cycle Plant
10 – Cooling Towers
11 – Emergency Generator and Fire Pumps
12 – Roadways and Parking

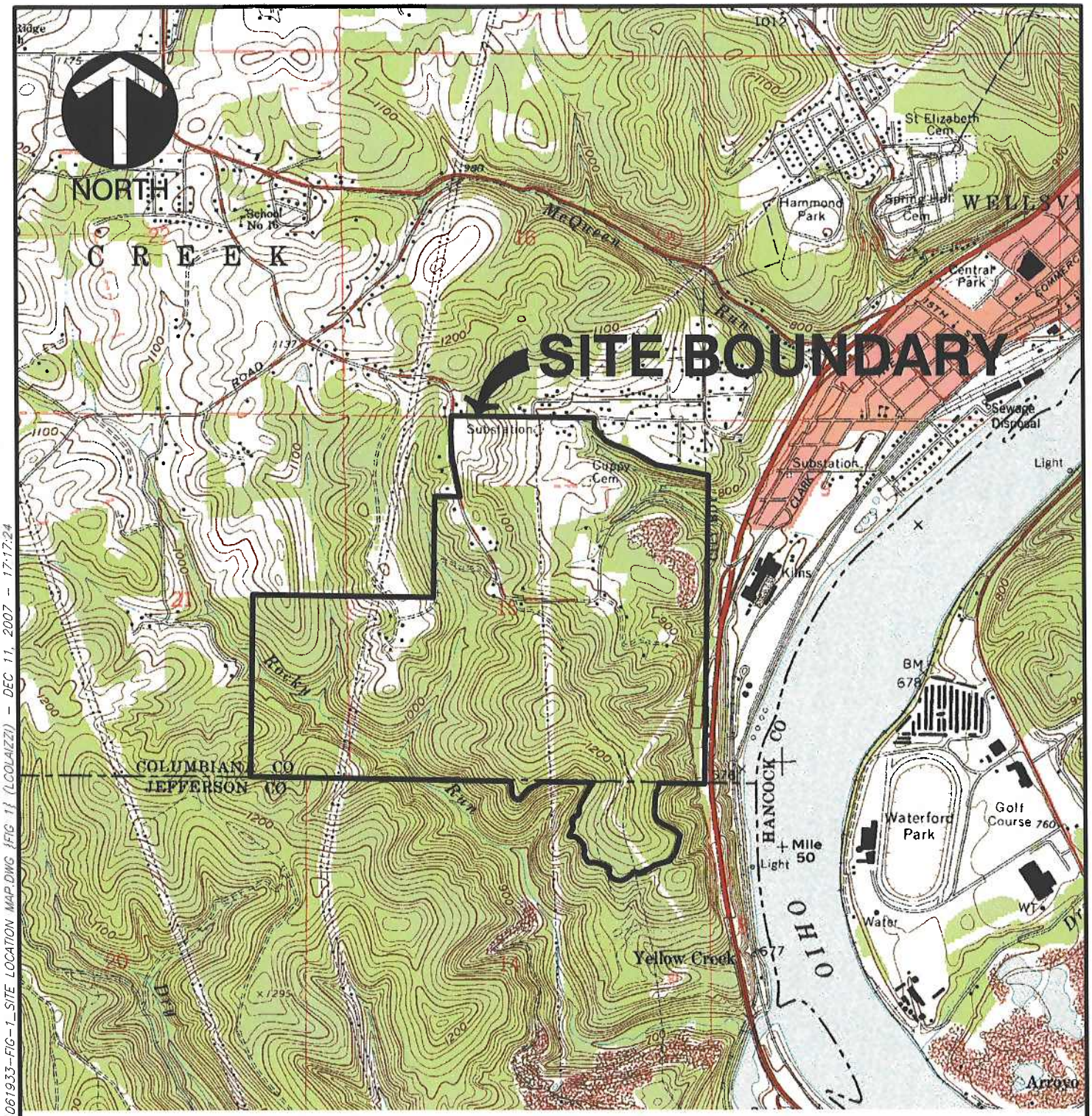
Each module consists of four sections and four attachments:

- Section 1 - Process Description
- Section 2 - Air Emission Inventory
- Section 3 - Source-Specific Applicable Regulations
- Section 4 - BACT Analysis
- Attachment A – Figures
- Attachment B – Supporting Calculations
- Attachment C – Documentation
- Attachment D – OEPA Application Forms

Process descriptions provide module-specific information related to the unique emission sources for the identified process. Block flow diagrams for each module are included as figures in Attachment A for each module. Section 2, the air emissions inventory, describes the module-specific emission sources, pollutants, and techniques used to estimate actual and potential emissions. Detailed supporting calculations are presented in Attachment B for each module. Source-specific applicable regulations are listed and discussed in Section 3 for each module and Section 4 presents the BACT analyses for each affected process. References, RBLC database summary tables, and other unique sources of documentation are provided in Attachment C. The Ohio EPA permit application forms unique to each module are provided in Attachment D. Finally, Appendix A contains the dispersion modeling evaluation for the proposed facility.

ATTACHMENT A

FIGURES



OHIO

QUADRANGLE LOCATION

REFERENCE:
USGS 7.5 MIN. TOPOGRAPHIC QUADRANGLE, WELLSVILLE, OHIO – WEST VIRGINIA, DATED 1960. PHOTOREVISED 1992.

THIS DRAWING SUPERSEDES CEC DWG NO.: 061933.0002 SITE LOCATION.DWG, DATED 06/20/07.

SCALE IN FEET

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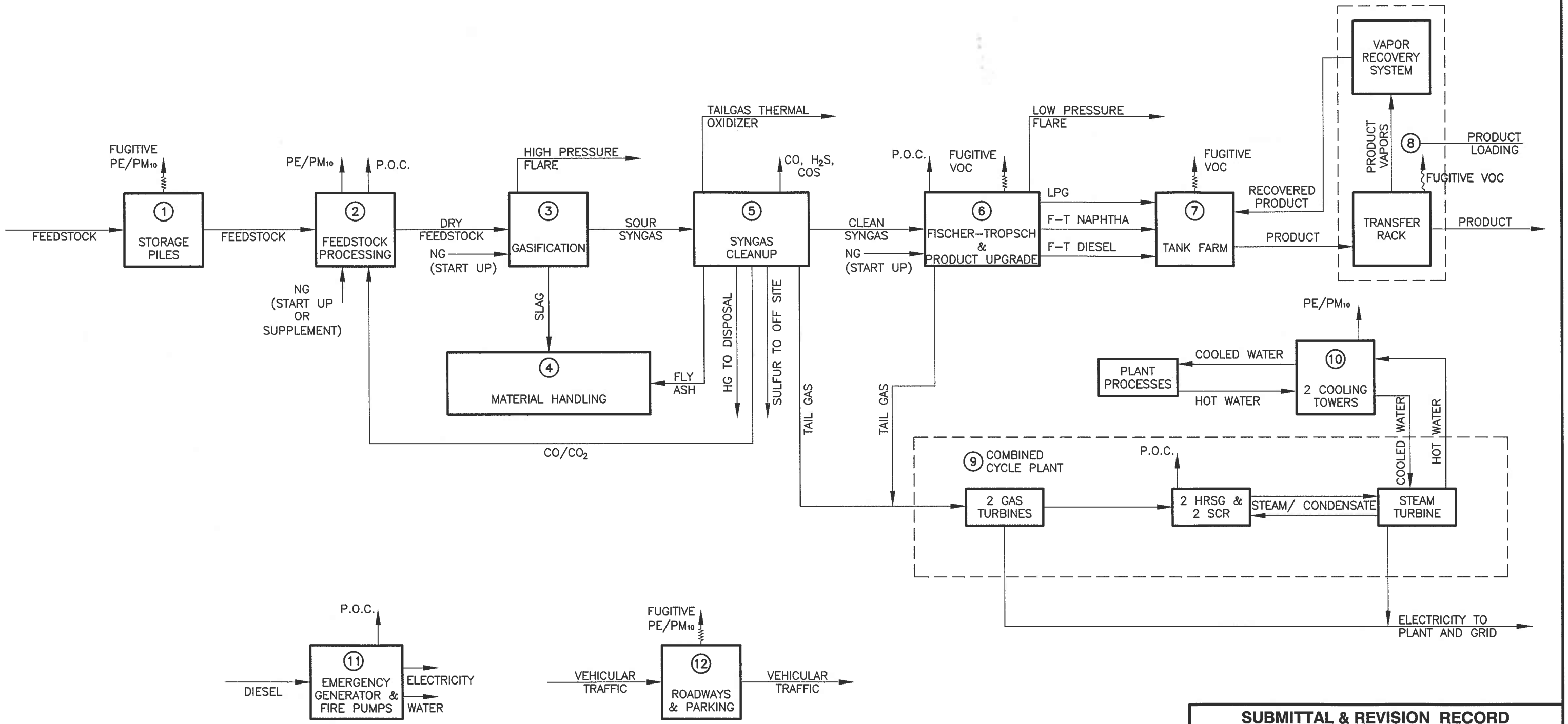
OHIO RIVER CLEAN FUELS, LLC
PROPOSED COAL TO LIQUID FUEL PLANT
COLUMBIANA AND JEFFERSON COUNTY
WELLSVILLE, OHIO

SITE LOCATION MAP

APPROVED: Kam			PROJECT NO:	061-933	FIGURE NO: 1
DRAWN BY: DWD/LKC	CHKD BY: DJL	DWG SCALE: 1"=2,000'	DATE:	12/17/07	

\\SVR-PITT\CADD\PROJECTS\2006\061-933\DWG\061933-FIG-1_SITE LOCATION MAP.DWG (FIG 1) (LOLAIZZI) - DEC 11, 2007 - 17:17:24



LEGEND

CO	=	CARBON MONOXIDE	PE	=	PARTICULATE EMISSIONS
COS	=	CARBONYL SULFIDE	P.O.C.	=	PRODUCTS OF COMBUSTION
HRSG	=	HEAT RECOVERY STEAM GENERATOR	PMIO	=	RESPIRABLE PARTICULATE
H_2S	=	HYDROGEN SULFIDE	SCR	=	SELECTIVE–CATALYTIC REDUCTION
NG	=	NATURAL GAS	VOC	=	VOLATILE ORGANIC COMPOUNDS

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
A	06/25/07	OHIO EPA DRAFT SUBMISSION, DRAWING: 061-933-SP1.DWG
B	12/17/07	AIR PERMIT APPLICATION

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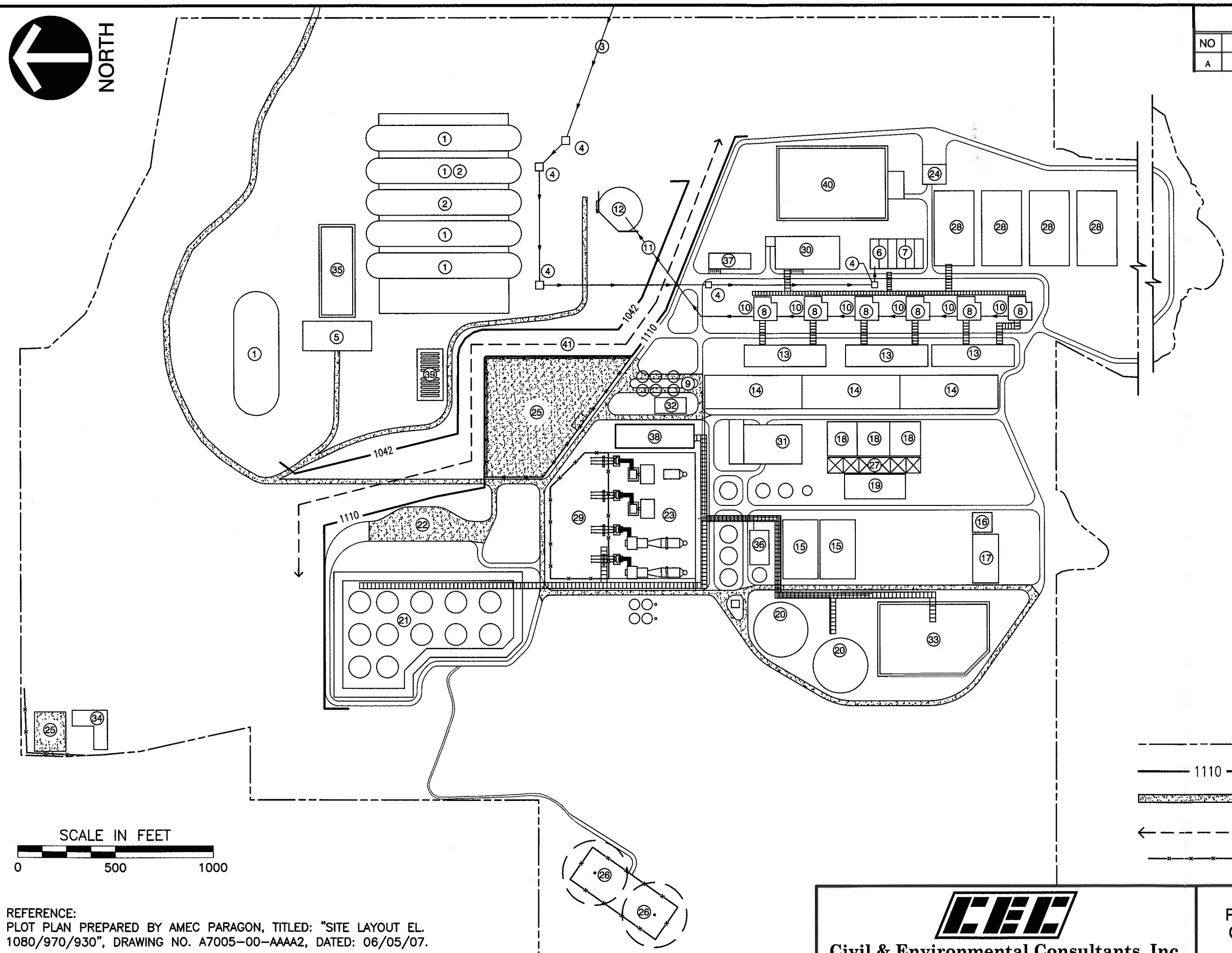
BLOCK FLOW DIAGRAM
AIR PERMITTING MODULES

APPROVED:					PROJECT NO:	061-933.0002	FIGURE NO: 3
DRAWN BY:	RLS/LKC	CHKD BY:	DJL	DWG SCALE: N.T.S.	DATE:	12/11/07	



SUBMITTAL & REVISION RECORD		
NO	DATE	DESCRIPTION
A	12/17/07	AIR PERMIT APPLICATION

LEGEND

AIR PERMIT ELEMENTS

1. COAL STORAGE
2. BIOMASS STORAGE
3. CONVEYORS (COAL & BIOMASS)
4. TRANSFER TOWERS
5. COAL & BIOMASS HOPPERS
6. COAL & BIOMASS CRUSHERS, SILOS & BUNKERS
7. COAL & BIOMASS MILLING AND DRYING & FILLING VESSEL VENTS
8. GASIFICATION
9. FLY ASH STORAGE AND LOADOUT
10. SLAG DEWATERING SILOS
11. SLAG CONVEYOR
12. SLAG STORAGE
13. CO SHIFT
14. RECTISOL OR EQUIVALENT ACID GAS REMOVAL SYSTEM
15. SRU/TGU
16. SULFUR FORMING
17. SULFUR STORAGE
18. FISCHER–TROPSCH
19. PRODUCT UPGRADE
20. COOLING TOWER
21. TANK FARM
22. PRODUCT LOADING
23. COMBINED CYCLE PLANT
24. FIRE STATION
25. PARKING
26. FLARE
27. AIR COOLERS
28. AIR SEPARATION
29. SWITCHYARD
30. PROCESS WATER TREATMENT
31. SHOP / WAREHOUSE
32. LABORATORY
33. PROCESS POND / SETTLING BASIN
34. ADMINISTRATION BUILDING
35. COAL RUN–OFF POND
36. WATER / WASTEWATER TREATMENT BUILDING
37. CHEMICAL HANDLING STORAGE
38. CONTROL BUILDING
39. LPG BULLETS
40. STORMWATER / WASTEWATER POND
41. TERRAIN WIND BARRIER

OTHER SITE ELEMENTS

PROPERTY BOUNDARY

1110 PROPOSED CONTOUR

ROADWAYS & PARKING AREAS ASSOCIATED WITH PREDICTED FUGITIVE EMISSIONS

TERRAIN WIND BARRIER AREA

FENCING

REFERENCE:
PLOT PLAN PREPARED BY AMEC PARAGON, TITLED: "SITE LAYOUT EL. 1080/970/930", DRAWING NO. A7005–00–AAAA2, DATED: 06/05/07.

DRAWING No. PROP CONTOURS 9–10–07 ALT 2.dwg BY DALLIS DAWSON, DATED 7–5–07.

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WELLSVILLE, OHIO

PROPOSED PLOT PLAN
AIR PERMIT APPLICATION

APPROVED:				PROJECT NO:	061-933.0002	FIGURE NO:	2
DRAWN BY:	LKC	CHKD BY:	DJL	DWG SCALE:	1"=500'	DATE:	11/23/07

ATTACHMENT B

TABLES

Primary Emission Units and Control Technologies

Module	Primary Emission Units	Associated Pollutant(s) and Control Technologies	
1 - Feedstock Storage	Storage Pile Wind Erosion	PE/PM10	Chemical Dust Suppressants and Wind Barriers
	Feedstock Conveyor Load-In/Load-Out		
	Coal Stacker/Reclaimers (Units 1 & 2)		
2 - Feedstock Processing	Transfer Towers (5)	PE/PM10	Enclosed conveyors and transfer points equipped with fabric filters
	Coal/Biomass Hopper Building		
	Coal and Biomass Crusher Houses (2)		
	Coal and Biomass Silo Baghouses (4)		
	Coal and Biomass Bunkers (10)		
	Filling Vessel Vents (10)		
	CMD Hot Gas Generators (10)	CO	Good Combustion Practices
		PE/PM10	Use of Clean Fuels and Good Combustion Practices
		SO_x	Low Sulfur Fuels
		VOC	Good Combustion Practices
		NO_x	Low NO_x Burners and Flue Gas Recirculation
3 - Gasification	Gasifiers (6) via High Pressure Flare	CO	Good Design and Good Combustion Practices
		PE/PM10	Smokeless Design
		SO_x	Good Design and Good Combustion Practices
		VOC	Good Design and Good Combustion Practices
		NO_x	Good Design and Good Combustion Practices
4 - Material Handling	Slag Dewatering Silo Vents (6)	PE/PM10	High moisture content
	Slag Dewatering Transfer to Conveyors (6)		Covered Conveyors, Limited drop heights, high moisture content
	Slag Transfer to Silo Conveyors (6)		
	Slag Storage Pile Wind Erosion		High moisture content, watering as needed
	Slag Loadout to Trucks		Limited drop heights, high moisture content
	Intermediate Fly Ash Storage Vents (6)		Enclosed pneumatic transfer systems controlled via bin vent filters
	Fly Ash Storage Silo Vents (6)		
5 - Syngas Cleanup	Acid Gas Removal Units (3)	CO	Process Design
	TTO 1&2 Startup/Shutdown	H_2S	Thermal Oxidation
	Sulfur Sweep & Spent Degassing Air 1&2	H_2S	Thermal Oxidation
6 - Fischer Tropsch & Product Upgrade	Large and Medium Process Heaters	CO	Good combustion practices
		PE/PM10	Clean Fuels and Good Combustion Practices
		SO_x	Good Design, Good Combustion Practices, proper maintenance
		VOC	Good Combustion, Design, Operation, Engineering, Clean Fuels
		NO_x	Selective Catalytic Reduction
	Small Process Heaters	CO	Good Combustion, Design, Operation, Engineering, Clean Fuels
		PE/PM10	Clean Fuels and Good Combustion Practices
		SO_x	Good Design, Good Combustion Practices, proper maintenance
		VOC	Good Combustion Practices
		NO_x	Good Combustion Practices
	Fugitive Valve Leaks	VOC	Leakless/Sealless or low-emission pumps, valves, & compressors
	Fugitive Compressor Seal Leaks		
	Fugitive Pump Leaks		
	Fugitive Flange Leaks		LDAR
	Low Pressure Flare		Good Design and Good Combustion Practices
7 - Tank Farm	F-T Diesel Tanks (8)	VOC	Fixed Roof Design (low VP material)
	Off-spec Tank		Internal Floating Roof Tanks
	F-T Naphtha Tanks (3)		
8 - Product Loading	F-T Diesel Loading	VOC	Low VP material
	F-T Naphtha Loading		Vapor Recovery System
9 - Combined Cycle Plant	Combustion Turbine Generator (CTG) 1&2	NOx	Selective Catalytic Reduction
		CO	Catalytic Oxidation
	Phase 1 Boiler	NOx	Low-NOx burners
10 - Cooling Towers	Cooling Towers 1&2	PE/PM10	High efficiency drift eliminators achieving 0.0005% drift
11 - Emergency Generator & Fire Pumps	Emergency Generator	CO	Good Combustion Practice, Engine Design, Limited Operation, Ignition Timing Retard, Turbocharger/Aftercooler
		PE/PM10	
		VOC	
		SO_x	Good Combustion Practice, Limited Operation, Low Sulfur Diesel Fuel
		NO_x	Good Combustion Practice, Good Engine Design, Limited Operation, Ignition Timing Retard, Water Spray Injection System
	Emergency Fire Pumps 1&2	CO	Good Combustion Practice, Good Engine Design, Limited Operation, Ignition Timing Retard
		PE/PM10	
		VOC	
		SO_x	Good Combustion Practice, Limited Operation, Low Sulfur Diesel Fuel
		NO_x	Good Combustion Practice, Good Engine Design, Limited Operation, Ignition Timing Retard, Water Spray Injection System
12 - Roadways & Parking	Truck Traffic	PE/PM10	Dust Control Program
	Employee Vehicle Traffic		
	Parking Lots 1&2		

Actual Emissions Summary (Tons per Year)

Module	Emission Unit	CO	NO_x	PE (total)	PM10	PM2.5	SO_x	VOC
1 - Feedstock Storage	Storage Pile Wind Erosion			6.1	3.1	0.5		
	Storage Pile Handling			19.8	9.0	1.3		
	Source Group Totals:			**25.9**	**12.1**	**1.8**		
2 - Feedstock Processing	Transfer Towers (5)			19.7	19.7	19.7		
	Coal & Biomass Hopper Bldg.			0.6	0.6	0.6		
	Crusher Houses (2)			10.2	10.2	10.2		
	Coal & Biomass Silo Baghouses (4)			14.4	14.4	14.4		
	Coal & Biomas Bunkers (10)			18.9	18.9	18.9		
	CMD Stacks (10)	97.5	58.0	8.8	8.8	8.8	10.6	6.4
	Filling Vessel Vents (10)			3.3	3.3	3.3		
	Source Group Totals:	**97.5**	**58.0**	**75.9**	**75.9**	**75.9**	**10.6**	**6.4**
3 - Gasification	High Pressure Flare Pilot Burner	0.2	0.3	0.0	0.0	0.0	0.0	0.0
	Gasifiers (6) Startup/Shutdown Flaring	65.6	9.8	0.2	0.2	0.2	732.0	4.1
	Source Group Totals:	65.8	10.1	0.3	0.3	0.3	732.0	4.1
4 - Material Handling	Slag Dewatering Silo Vents (6)			11.2	11.2	11.2		
	Slag Dewatering Transfer to Conveyor (6)			0.1	0.1	0.1		
	Slag Conveyor to Storage Area (6)			11.2	11.2	11.2		
	Slag Storage Pile Wind Erosion			1.6	0.8	0.1		
	Slag Loadout to Trucks			0.4	0.2	0.0		
	Intermediate Fly Ash Storage Vents (6)			0.4	0.4	0.4		
	Fly Ash Storage Silo Vent (Loading) (6)			0.4	0.4	0.4		
	Fly Ash Storage Silo Vent (Unloading) (6)			0.4	0.4	0.4		
	Source Group Totals:			**25.6**	**24.6**	**23.8**		
5 - Syngas Cleanup	AGR - Rectisol Unit 1	4,055.0						
	Tailgas Thermal Oxidizers (2)	19.3	25.8	1.7	1.7	1.7	305.2	1.2
	Source Group Totals:	**4,074.3**	**25.8**	**1.7**	**1.7**	**1.7**	**305.2**	**1.2**
6 - Fischer Tropsch & Product Upgrade	Process Heaters (9)	248.1	98.3	22.5	22.5	22.5	1.7	16.3
	Low-Pressure Flare	110.3	131.4	10.0	10.0	10.0	0.8	0.1
	Equipment Leaks							1.7
	Source Group Totals:	**358.4**	**229.7**	**32.5**	**32.5**	**32.5**	**2.5**	**18.1**
7 - Tank Farm	Off-Spec Internal Floating Roof Tank							0.9
	F-T Naphtha Tanks (3)							2.6
	F-T Diesel Tanks (8)							3.8
	Source Group Totals:							**7.3**
8 - Product Loading	F-T Diesel Loading							0.3
	F-T Naphtha Loading							1.4
	Source Group Totals:							**1.7**
9 - Combined Cycle Plant	Combined Cycle Plant	243.1	510.3	160.5	160.5	160.5	182.1	233.1
	Auxiliary Boiler (Not additive)	905.7	4,150.9	81.9	81.9	81.9	6.5	59.3
	Source Group Totals:	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
10 - Cooling Towers	Cooling Towers (2)			21.1	21.1	21.1		
	Source Group Totals:			**21.1**	**21.1**	**21.1**		
11 - Emergency Generator & Fire Pumps	Emergency Generator	3.8	6.6	0.2	0.2	0.2	0.3	0.4
	Emergency Fire Pumps (2)	0.9	2.5	0.1	0.1	0.1	0.3	0.1
	Source Group Total (see below)	**4.7**	**9.1**	**0.4**	**0.4**	**0.4**	**0.6**	**0.5**
12 - Roadways & Parking	Product Loadout Vehicle Traffic			1.8	0.4	0.1		
	Coal & Biomass Traffic			35.5	6.9	1.7		
	By-Product Traffic			41.2	8.0	2.0		
	Employee Traffic			0.4	0.1	0.0		
	Source Group Totals:			**79.0**	**15.4**	**3.9**		
FACILITY TOTALS:	Module 9 Operating Condition	**CO**	**NO_x**	**PE (total)**	**PM10**	**PM2.5**	**SO_x**	**VOC**
	With Phase 1 Boiler:	**5,506.3**	**4,483.5**	**344.2**	**265.8**	**243.1**	**1,057.4**	**98.6**
	With Combined Cycle Plant:	**4,843.7**	**842.9**	**422.7**	**344.3**	**321.7**	**1,233.0**	**272.4**

Potential HAP Emissions Summary (TPY)

Module	2	3	3	5	6	6	6	7	8	9	10	11	11	
Emission Unit → / Hazardous Air Pollutant ↓	Feedstock Processing	High Pressure Flare Pilot Burner	High Pressure Flare Gasifier Venting	Syngas Cleanup	Process Heaters	Low Pressure Flare	Equipment Leaks	F-T Naphtha Tanks	F-T Naphtha Loading	Phase 2 CTGs	Cooling Towers	Emergency Generator	Fire Pumps (2)	TOTAL
Acetaldehyde										1.01E-01		1.17E-04	8.05E-04	0.102
Acrolein												3.65E-05	9.71E-05	0.000
Antimony Compounds										1.23E-04				0.000
Arsenic Compounds	8.96E-04	5.07E-07		4.44E-05	5.91E-04	2.63E-04				2.69E-04	3.69E-06			0.002
Benzene	9.41E-03	5.33E-06		4.66E-04	6.20E-03	2.76E-03				2.69E-04		3.60E-03	9.80E-04	0.024
Beryllium Compounds	5.38E-05	3.04E-08		2.66E-06	3.54E-05	1.58E-05				2.92E-05				0.000
1,3-Butadiene													4.11E-05	0.000
Cadmium Compounds	4.93E-03	2.79E-06		2.44E-04	3.25E-03	1.45E-03				1.08E-03				0.011
Carbon Disulfide										5.16E-03				0.005
Carbonyl Sulfide			**0.34**	**8.57**										8.910
Chromium Compounds	6.27E-03	3.55E-06		3.11E-04	4.13E-03	1.84E-03				5.72E-05	5.80E-06			0.013
Cobalt Compounds	3.76E-04	2.13E-07		1.86E-05	2.48E-04	1.10E-04				2.92E-05				0.001
Cyanide Compounds										6.40E-04				0.001
Dichlorobenzene	5.38E-03	3.04E-06		2.66E-04	3.54E-03	1.58E-03								0.011
Ethyl benzene														0.000
Formaldehyde	3.36E-01	1.90E-04		1.66E-02	2.21E-01	9.85E-02				1.34E+00		3.66E-04	1.24E-03	2.014
Hexane	**8.1**	**4.56E-03**		**0.4**	**5.3**	**2.4**	**0.2**	**0.5**	**0.36**					17.204
Hydrochloric acid										1.46E-03				0.001
Hydrogen fluoride										5.61E-03				0.006
Lead Compounds	2.24E-03	1.27E-06		1.11E-04	1.52E-03	6.57E-04				6.28E-05	4.22E-06			0.005
Manganese Compounds	1.70E-03	9.64E-07		8.43E-05	1.12E-03	4.99E-04				1.12E-04	8.97E-04			0.004
Mercury Compounds	1.16E-03	6.59E-07		5.77E-05	7.68E-04	3.42E-04				1.35E-04	2.11E-08			0.002
Methyl Chloride										1.23E-01				0.123
Naphthalene	2.73E-03	1.55E-06		1.35E-04	1.80E-03	8.01E-04				1.40E-01			8.90E-05	0.146
Nickel Compounds	9.41E-03	5.33E-06		4.66E-04	6.20E-03	2.76E-03				4.38E-05	3.06E-05			0.019
Phenol										**2.06E+00**				2.060
Polycyclic Organic Matter	3.94E-04	2.23E-07		1.95E-05	2.60E-04	1.16E-04						9.81E-04		0.002
Selenium Compounds	1.08E-04	6.09E-08		5.33E-06	7.09E-05	3.15E-05				1.85E-03	9.39E-06			0.002
Toluene	1.52E-02	8.62E-06		7.55E-04	1.00E-02	4.47E-03				2.60E-03		1.30E-03	4.29E-04	0.035
Xylenes												8.95E-04	2.99E-04	0.001
TOTAL HAP	8.466	0.005	0.340	8.989	5.571	2.476	0.200	0.5	0.36	3.78	0.00095072	0.007	0.004	**30.702**
Air Toxics														
Ammonia			0.01							3,559				
Hydrogen sulfide			1.8	12	1.1									

Notes:

There are no HAP emissions associated with Modules 1, 4, & 12.

Bold values indicate the highest HAP for each Module.

Module 6 equipment leak estimate includes BACT controls for VOC emissions.

Module 7 F-T naphtha tanks are subject to 40 CFR 63, Subpart EEEE and therefore reflect the use of federally-enforceable controls (internal floating roof tanks).

Module 8 (loading rack) is subject to 40 CFR 63, Subpart EEEE and therefore reflect the use of federally-enforceable controls (vapor recovery system).

Module 9 includes Phase 2 Combined Cycle emissions.

benzene:	0.031 tpy
formaldehyde:	1.112 tpy
hexane:	**26.7** tpy
naphthalene:	0.205 tpy
toluene:	0.05 tpy
TOTAL:	28.08 tpy

Phase 1 boiler HAP emissions are not additive to plant totals because all processes will not be operational during Phase 1.

Module 10 emission estimates reflect use of high-efficiency drift eliminators.

Table 4
Summary of Applicable Regulations by Application Module

Applicable Regulations	Module 1	2	3	4	5	6	7	8	9	10	11	12
Ohio Administrative Code												
3745-15-07	■	■	■	■	■	■	■	■	■	■	■	■
3745-16	■	■	■	■	■	■	■	■	■			
3745-17-07	■	■	■	■	■	■			■	■	■	
3745-17-07(B)				■								■
3745-17-08	■			■								■
3745-17-10		■	■			■			■			
3745-17-11		■		■					■	■	■	
3745-18-06									■			
3745-18-06(F)											■	
3745-21-01							■					
3745-21-07			■			■		■				
3745-21-07(D)							■					
3745-21-08			■			■						
3745-21-09(L)							■					
3745-31	■	■	■	■	■	■	■	■	■	■	■	■
3745-31-03					■		■					
National Emission Standards for Hazardous Air Pollutants												
40 CFR 63 Subpart Q										■		
40 CFR 63 Subpart SS								■				
40 CFR 63 Subpart UUU					■							
40 CFR 63 Subpart WW							■					
40 CFR 63 Subpart ZZZZ											■	
40 CFR 63.2330 Subpart EEEE							■	■				
New Source Performance Standards												
40 CFR 60 Subpart Da									■			
40 CFR 60 Subpart GGG						■						
40 CFR 60 Subpart IIII											■	
40 CFR 60 Subpart J		■			■	■						
40 CFR 60 Subpart KKKK									■			
40 CFR 40.40b Subpart Db									■			
40 CFR 60.89.112											■	
40 CFR 60.89.113											■	
40 CFR 60.100a Subpart Ja					■							
40 CFR 60.110b Subpart Kb							■					
40 CFR 60.250 Subpart Y		■										
40 CFR 60.690 Subpart QQQ					■							
Other Clean Air Act Sections												
40 CFR 68 Subpart G						■			■			
40 CFR 75 (CEMS)												
Acid Rain Program									■			
NOx CAIR Rule									■			

Regulation Applies = ■

ATTACHMENT C

OEPA GENERAL COVER SHEET

Ohio Environmental Protection Agency
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049

For EPA Use Only
Application
Or ID Number _____

Date Received _____

Check No. _____ Check ID No. _____

Check Date _____ Amount _____

Revenue ID No. _____

- ☐ DAPC
- ☐ DDAGW
- ☐ DHWM
- ☐ DSW
- ☐ DSIWM
- ☐ RTK
- ☐ DEFA
- ☐ TRI
- ☐ _____

GENERAL COVER SHEET

1. Facility Information

Core Place ID	
Legal Name	OHIO RIVER CLEAN FUELS, LLC
Alternate Name	
Street Address	SIXTEEN SCHOOL ROAD
City/State/Zip	WELLSVILLE, OHIO
Location	SOUTHEASTERN BORDER OF COLUMBIANA COUNTY SOUTHWEST OF WELLSVILLE
County	COLUMBIANA (PORTIONS IN JEFFERSON)

2. Owner Information

Owner Name	OHIO RIVER CLEAN FUELS, LLC
Effective Date	NEW FACILITY
Mailing Address	9103 NE HWY 99, SUITE S
City/State/Zip	VANCOUVER, WASHINGTON 98665
Phone Number	440-257-0054
Billing Address	SAME
City/State/Zip	

Operator Information

Operator Name	OHIO RIVER CLEAN FUELS, LLC
Effective Date	NEW FACILITY
Mailing Address	SAME AS OWNER
City/State/Zip	
Phone Number	440-257-0054
Billing Address	SAME AS OWNER
City/State/Zip	

4. Division/Program Specific Secondary ID Numbers (for existing facilities only)

DAPC	Facility ID	NA
DPC	TRI ID	NA
DDAGW	PWS ID	NA
DHWM	RCRA ID	NA
DSW	NPDES ID	NA
DSIWM	Facility ID	NA
RTK	RTK ID	NA
Other	(_____)	

5. Supplemental Information

Primary SIC Code	2869 - INDUSTRIAL CHEMICALS
Primary NAICS Code	325110
D&B D-U-N-S No.	TBD
Lat./Long.	40 DEG 35 MIN 27.56 SEC N LAT / 80 DEG 40 MIN 21.11 SEC W LONG
Point Description	FACILITY CENTROID

Section I - General Permit To Install (PTI) Application Information

This section should be filled out for each permit to install (PTI) application. A PTI is required for all air contaminant sources (emissions units) installed or modified after 1/1/74. See the line by line PTI instructions for additional information.

1. State the reason(s) for the application.

☒ new installation (for which construction has not yet begun)
☐ initial application for an air contaminant source already installed or under construction
☐ modification to an existing air contaminant source/facility - List previous PTI number(s) for air contaminant sources included in this application, if applicable, and describe requested modification (attach an additional sheet, if necessary):

_____

☐ reconstruction of an existing air contaminant source/facility. Please explain:

_____

☐ startup of an air contaminant source/facility that has been shutdown for _____ years.
☐ other, please explain: _____

2. Please check the appropriate boxes below. If you check exempt/not subject, explain why.

☐ not affected ☒ subject to Subparts: Da, Db, J, Y, QQQ, GGG, Kb, IIII (SEE NOTES BELOW)
New Source Performance Standards (NSPS)

☐ exempt/not subject - explain below
☐ unknown

New Source Performance Standards are listed under 40 CFR 60 - Standards of Performance for New Stationary Sources.

☒ not affected ☐ subject to Subpart: _____ **National Emission Standards for Hazardous Air Pollutants (NESHAPS)**

☐ exempt/not subject - explain below
☐ unknown

National Emissions Standards for Hazardous Air Pollutants are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

☐ not affected ☒ subject to Subparts: B, UUU, EEEE, WW, SS (SEE NOTES BELOW)
Maximum Achievable Control Technology (MACT)

☐ exempt/not subject - explain below
☐ unknown

The Maximum Achievable Control Technology standards are listed under 40 CFR 63 and OAC rule 3745-31-28.

☐ not affected ☒ subject to regulation **Prevention of Significant Deterioration (PSD)**
☐ unknown

These rules are found under OAC rule 3745-31-10 through OAC rule 3745-31-20.

☒ not affected ☐ subject to regulation **Non-Attainment New Source Review**
☐ unknown

These rules are found under OAC rule 3745-31-21 through OAC rule 3745-31-27.

Please describe any of the above applicable rules and/or exemptions. Identify whether they apply to the entire facility and/or to specific air contaminant sources included in this PTI application (attach additional page if necessary):

Section I - General Permit To Install (PTI) Application Information

THIS APPLICATION IS DIVIDED INTO TWELVE MODULES. FACILITY-WIDE EMISSIONS EXCEED MAJOR SOURCE THRESHOLDS FOR ALL CRITERIA POLLUTANTS, THEREFORE NSR APPLIES. BECAUSE COLUMBIANA COUNTY IS IN ATTAINMENT FOR ALL CRITERIA POLLUTANTS, PSD REVIEW APPLIES TO POLLUTANTS THAT EXCEED SIGNIFICANT EMISSION RATES (SER). ALL CRITERIA POLLUTANTS EXCEED THE SER, THEREFORE PSD REVIEW APPLIES TO EACH EMISSION UNIT. NO NESHAPS APPLY TO EMISSIONS FROM THE FACILITY. NSPS AND MACT DO NOT APPLY TO SOURCES IN MODULES 1, 3, 4, 10, OR 12. NSPS AND/OR MACT SUBPART APPLICABILITY FOR MODULES 2, 5, 6, 7, 8, 9, AND 11 IS AS FOLLOWS:

APPLICATION MODULE	APPLICABLE NSPS SUBPART	APPLICABLE MACT SUBPART
3	J, Y	
5	J, QQQ	B, UUU
6	J, GGG	
7	Kb	EEE, WW
8		EEEE, SS
9	Da, Db	
11	IIII	

3. Do you qualify for permit to install registration status as determined by Ohio Administrative Code(OAC) rule 3745-31-05?

☐ yes
☒ no

If yes, are you requesting registration status per OAC rule 3745-31-05?

☐ yes
☒ no

4. Is any information included in this application being claimed as a trade secret per Ohio Revised Code (ORC) 3704.08?

WARNING: IF YOU ARE SENDING YOUR PTI APPLICATION ELECTRONICALLY, E-MAIL IS NOT A SECURE METHOD TO TRANSFER DATA. IF YOUR PTI APPLICATION CONTAINS CONFIDENTIAL INFORMATION YOU MAY NOT WANT TO SEND IT USING E-MAIL. OHIO EPA IS NOT RESPONSIBLE FOR ANY BREACH OF SECURITY THAT MAY OCCUR DURING ELECTRONIC TRANSMISSION OF THE E-MAIL.

☐ yes (A "non-confidential" version must be submitted in order for this application to be deemed complete.)
☒ no

5. Person to contact for this application:

STEPHAN M. DOPUCH
Name

VICE PRESIDENT
Title

9013 NE HWY 99, SUITE S, VANCOUVER, WASHINGTON, 98665
Address (Street, City/Township, State and Zip Code)

(440) 257-0054
Phone

(440) 368-2427
Fax

SDOPUCH@BAARDENERGY.COM
E-mail

Section I - General Permit To Install (PTI) Application Information

6. Authorized Signature: Under OAC rule 3745-31-04, this signature shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

Stephen M. Dodd — December 15, 2007

Authorized Signature (for facility) — Date

Vice President

Title

OAC rule 3745-31-04 states that applications for permits to install shall be signed:

(1) In the case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility.

(2) In the case of a partnership by a general partner.

(3) In the case of sole proprietorship, by the proprietor, and

(4) In the case of a municipal, state, federal or other governmental facility, by the principal executive officer, the ranking elected official, or other duly authorized employee.

NOTE: If submitting this application via e-mail, make sure you rename this file using the required format identified in the PTI instructions after inserting all of the emissions unit and EAC forms that will comprise the completed application. Failure to do so will result in a rejected application. *See the PTI instructions on how to insert the files.*