
SECTION II

OHIO EPA

SECTION 401 WATER QUALITY CERTIFICATION APPLICATION

APPLICATION FOR OHIO EPA SECTION 401 WATER QUALITY CERTIFICATION

Effective October 1, 1996
Revised August, 1998

This application must be completed whenever a proposed activity requires an individual Clean Water Act Section 401 Water Quality Certification (Section 401 certification) from Ohio EPA. A Section 401 certification from the State is required to obtain a federal Clean Water Act Section 404 permit from the U.S. Army Corps Engineers, or any other federal permits or licenses for projects that will result in a discharge of dredged or fill material to any waters of the State. To determine whether you need to submit this application to Ohio EPA, contact the U.S. Army Corps of Engineers District Office with jurisdiction over your project, or other federal agencies reviewing your application for a federal permit to discharge dredged or fill material to waters of the State, or an Ohio EPA Section 401 Coordinator at (614) 644-2001.

The Ohio EPA Section 401 Water Quality Certification Program is authorized by Section 401 of the Clean Water Act (33 U.S.C. 1251) and the Ohio Revised Code Section 6111.03(P). Ohio Administrative Code (OAC) Chapter 3745-32 outlines the application process and criteria for decision by the Director of Ohio EPA. In order for Ohio EPA to issue a Section 401 certification, the project must comply with Ohio's Water Quality Standards (OAC 3745-1) and not potentially result in an adverse long-term or short-term impact on water quality. Included in the Water Quality Standards is the Antidegradation Rule (OAC Rule 3745-1-05), effective October 1, 1996, revised October, 1997 and May, 1998. The Rule includes additional application requirements and public participation procedures. **Because there is a lowering of water quality associated with every project being reviewed for Section 401 certification, every Section 401 certification applicant must provide the information required in Part 10 (pages 3 and 4) of this application.** In addition, applications for projects that will result in discharges of dredged or fill material to wetlands must include a wetland delineation report approved by the Corps of Engineers, a wetland assessment with a proposed assignment of wetland category (ies), official documentation on evaluation of the wetland for threatened or endangered species, and appropriate avoidance, minimization, and mitigation as prescribed in OAC 3745-1-50 to 3745-1-54. Ohio EPA will evaluate the applicant's proposed wetland category assignment and make the final assignment.

Information provided with the application will be used to evaluate the project for certification and is a matter of public record. If the Director determines that the application lacks information necessary to determine whether the applicant has demonstrated the criteria set forth in OAC Rule 3745-32-05(A) and OAC Chapter 3745-1, Ohio EPA will inform the applicant in writing of the additional information that must be submitted. The application will not be accepted until the application is considered complete by the Section 401 Coordinator. An Ohio EPA Section 401 Coordinator will inform you in writing when your application is determined to be complete.

Please submit the following to "Section 401 Supervisor, Ohio EPA/DSW, P.O. Box 1049, Columbus, Ohio 43216-1049:

- Four (4) sets of the completed application form, including the location of the project (preferably on a USGS quadrangle) and 8-1/2 x 11" scaled plan drawings and sections.
- One (1) set of original scaled plan drawings and cross-sections (or good reproducible copies).

(See Application Primer for detailed instructions)

1. The federal permitting agency has determined this project: (check appropriate box and fill in blanks)

- requires an individual 404 permit/401 certification- Public Notice # (if known) _____
- requires a Section 401 certification to be authorized by Nationwide Permit # _____
- requires a modified 404 permit/401 certification for original Public Notice # _____
- requires a federal permit under _____ jurisdiction identified by # _____
- requires a modified federal permit under _____ jurisdiction identified by # _____

Click to clear all entered information (on all 4 pages of this form)

CLEAR

2. Application number (to be assigned by Ohio EPA):

3. Name and address of applicant: Telephone number during business hours:
 Ohio River Clean Fuels, LLC. () (Residence)
 9013 NE Hwy 99, Suite S (360) 546-2342 (Office)
 Vancouver, WA 98665

3a. Signature of Applicant: Date:

4. Name, address and title of authorized agent: Telephone number during business hours:
 Civil & Environmental Consultants, Inc. () (Residence)
 333 Baldwin Road (412) 429-2324 (Office)
 Pittsburgh, PA 15205

4a. Statement of Authorization: I hereby designate and authorize the above-named agent to act in my behalf in the processing of this permit application, and to furnish, upon request, supplemental information in support of the application.

Signature of Applicant: *Stephen M. Dofnel* Date: 12/14/07

5. Location on land where activity exists or is proposed. Indicate coordinates of a fixed reference point at the impact site (if known) and the coordinate system and datum used.

Address:

Sixteen School Road, Wellsville, OH 40°35'23.51"N 80°40'33.58"W

Street, Road, Route, and Coordinates, or other descriptive location

Rocky Run & Ohio R. Watershed	Columbiana & Jefferson County	Yellow Creek Township	Wellsville City	OH State	43968 Zip Code
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6. Is any portion of the activity for which authorization is sought complete? Yes No
 If answer is "yes," give reasons, month and year activity was completed. Indicate the existing work on the drawings.

7. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharge or other activities described in this application.

<u>Issuing Agency</u>	<u>Type of Approval</u>	<u>Identification No.</u>	<u>Date of Application</u>	<u>Date of Approval</u>	<u>Date of Denial</u>
See	Attached	Table			

8. DESCRIPTION OF THE ACTIVITY (fill in information in the following four blocks - 8a, 8b, 8c & 9)

8a. Activity: Describe the Overall Activity:
 Ohio River Clean Fuels, LLC (ORCF) is proposing to construct a coal to liquids fuel plant in Columbiana and Jefferson Counties, Ohio. In order to obtain the footprint necessary for the ORCF facility, an approximate 357-acre development area is required for construction. As a result, ORCF is proposing to impact 0.19 acres of federally jurisdictional wetlands (1.52 acres of the 1.71 total wetland acres are isolated), 6,487 feet of streams (2,258 of the 8,745 feet of total stream length are isolated), and 0.29 acres of ponds. Given the relatively steep topography of the area, the majority of impacts will result from grading activities associated with pad construction that will house the ORCF facility.

8b. Purpose: Describe the purpose, need and intended use of the activity:

The ORCF facility will consist of a manufacturing plant as well as a self-sustaining power generation plant which will power the plant itself, as well as produce excess energy for sale into the grid. The plant will burn approximately 7 million tons of Appalachian coal and 2 million tons of biomass such as wood waste, switch grass, and biological wastes per year to create a clean synthetic fuel product. The fuel will be principally sold on the private market with the potential for military use. Construction is anticipated to begin in 2008 and last approximately 4 years.

8c. Discharge of dredged or fill material: Describe type, quantity of dredged material (in cubic yards), and quantity of fill material (in cubic yards). **(OAC 3745-1-05(B)(2)(a))**

The types of material that will be discharged to the Site are those that will be excavated/blasted during cut and fill operations at the Site. The total amount of earthwork involved for the development of the Site is estimated at 18,630,000 cubic yards of material. Anticipated materials are clean fill including rock and topsoil. Based upon preliminary geotechnical investigations, rock will likely constitute the majority of the fill material.

9. Waterbody and location of waterbody or upland where activity exists or is proposed, or location in relation to a stream, lake, wetland, wellhead or water intake (if known). Indicate the distance to, and the name of any receiving stream, if appropriate.

Streams to be impacted are unnamed tributaries to the Ohio River and Rocky Run. Rocky Run drains into Yellow Creek approximately 400' above its confluence with the Ohio River. For a detailed description of each water body to be impacted, refer to Section II of this application.

10. To address the requirements of the Antidegradation Rule, your application must include a report evaluating the:

- Preferred Design (your project) and Mitigative Techniques
- Minimal Degradation Alternative(s) (scaled-down version(s) of your project) and Mitigative Techniques
- Non-Degradation Alternative(s) (project resulting in avoidance of all waters of the state)

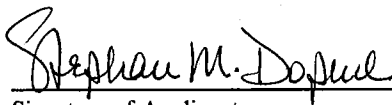
At a minimum, item a) below must be completed for the Preferred Design, the Minimal Degradation Alternative(s), and the Non-Degradation Alternative(s), followed by completion of item b) for each alternative, and so on, until all items have been discussed for each alternative (see Primer for specific instructions). (Application and review requirements appear at **OAC 3745-1-05(B)(2)**, **OAC 3745-1-05(C)(6)**, **OAC 3745-1-05(C)(1)** and **OAC 3745-1-54**).

10a) Provide a detailed description of any construction work, fill or other structures to occur or to be placed in or near the surface water. Identify all substances to be discharged, including the cubic yardage of dredged or fill material to be discharged to the surface water. **(OAC 3745-1-05(B)(2)(b))**

10b) Describe the magnitude of the proposed lowering of water quality. Include the anticipated impact of the proposed lowering of water quality on aquatic life and wildlife, including threatened and endangered species (include written comments from Ohio Department of Natural Resources and U.S. Fish and Wildlife Service), important commercial or recreational sport fish species, other individual species, and the overall aquatic community structure and function. Include a Corps of Engineers approved wetland delineation. **(OAC 3745-1-05(C)(6)(a, b)** and **OAC 3745-1-54**)

- 10c) Include a discussion of the technical feasibility, cost effectiveness, and availability. In addition, the reliability of each alternative shall be addressed (including potential recurring operational and maintenance difficulties that could lead to increased surface water degradation.) (OAC 3745-1-05(C)(6)(h, j-k) and OAC 3745-1-54)
- 10d) For regional sewage collection and treatment facilities, include a discussion of the technical feasibility, cost effectiveness and availability, and long-range plans outlined in state or local water quality management planning documents and applicable facility planning documents. (OAC 3745-1-05(C)(6)(i))
- 10e) To the extent that information is available, list and describe any government and/or privately sponsored conservation projects that exist or may have been formed to specifically target improvement of water quality or enhancement of recreational opportunities on the affected water resource. (OAC 3745-1-05(B)(2)(g))
- 10f) Provide an outline of the costs of water pollution controls associated with the proposed activity. This may include the cost of best management practices to be used during construction and operation of the project. (OAC 3745-01-05(C)(6)(g))
- 10g) Describe any impacts on human health and the overall quality and value of the water resource. (OAC 3745-1-05(C)(6)(c) and OAC 3745-1-54)
- 10h) Describe and provide an estimate of the important social and economic benefits to be realized through this project. Include the number and types of jobs created and tax revenues generated and a brief discussion on the condition of the local economy. (OAC 3745-1-5(B)(2)(e), and OAC 3745-1-05(C)(6)(i))
- 10i) Describe and provide an estimate of the important social and economic benefits that may be lost as a result of this project. Include the effect on commercial and recreational use of the water resource, including effects of lower water quality on recreation, tourism, aesthetics, or other use and enjoyment by humans. (OAC 3745-1-05(B)(2)(e,f), and OAC 3745-1-05(C)(6)(e))
- 10j) Describe environmental benefits, including water quality, lost and gained as a result of this project. Include the effects on the aquatic life, wildlife, threatened or endangered species. (OAC 3745-1-05 (B)(2)(e,f), OAC 3745-1-05 (C)(6)(b) and OAC 3745-1-54)
- 10k) Describe mitigation techniques proposed (except for the Non-Degradation Alternative):
 - Describe proposed Wetland Mitigation (see OAC 3745-1-54 and Primer)
 - Describe proposed Stream, Lake, Pond Mitigation (see Primer)

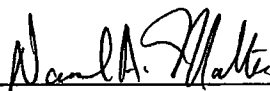
11. Application is hereby made for a Section 401 Water Quality Certification. I certify that I am familiar with the information contained in this application and, to the best of my knowledge and belief, such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.



 Signature of Applicant

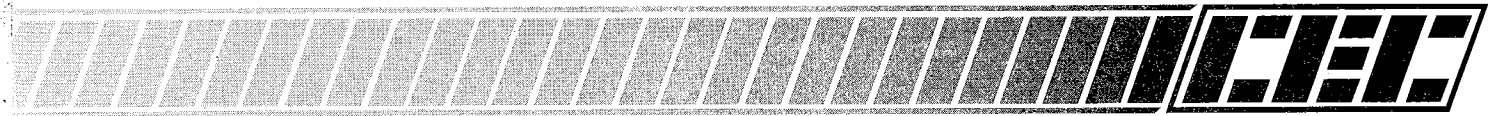
12/14/07

 Date



 Signature of Agent

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 3 has been filled out and signed.



**ALTERNATIVES ANALYSIS REPORT
PROPOSED OHIO RIVER CLEAN FUELS FACILITY
COLUMBIANA AND JEFFERSON COUNTIES
WELLSVILLE, OHIO**

Prepared for:

**OHIO RIVER CLEAN FUELS, LLC.
9013 NE HWY. 99, SUITE S
VANCOUVER, WA 98665**

Prepared by:

**CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
333 BALDWIN ROAD
PITTSBURGH, PENNSYLVANIA 15205**

CEC Project 061-933.0014

December 17, 2007

Civil & Environmental Consultants, Inc.

Pittsburgh 333 Baldwin Road
Pittsburgh, Pennsylvania 15205
Phone 412/429-2324
Fax 412/429-2114
Toll Free 800/365-2324
E-mail info@cecinc.com

Chicago	877/963-6026
Cincinnati	800/759-5614
Columbus	888/598-6808
Detroit	866/380-2324
Export	800/899-3610
Indianapolis	877/746-0749
Nashville	800/763-2326
St. Louis	866/250-3679

Corporate Web Site <http://www.cecinc.com>



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**ALTERNATIVES ANALYSIS
PROPOSED OHIO RIVER CLEAN FUELS FACILITY
COLUMBIANA AND JEFFERSON COUNTIES, WELLSVILLE, OHIO**

1.0 INTRODUCTION

On behalf of Ohio River Clean Fuels, LLC (ORCF), Civil & Environmental Consultants, Inc. (CEC) has prepared this Alternatives Analysis that presents the numerous alternatives that were considered, and carefully evaluated before selecting the optimum site for a proposed coal to liquids fuel facility. After an extensive search, ORCF selected a site located west of Route 7 and the Ohio River near Wellsville, Columbiana and Jefferson Counties, Ohio. This Alternatives Analysis identifies and discusses all alternatives that were considered and evaluated, both on site and off site, during the site selection phase of the project.

This document provides responses to Questions 10a-10k of the Ohio Environmental Protection Agency (Ohio EPA) Section 401 Water Quality Certification Application. It has been prepared to address the requirements of the Antidegradation Rule.



2.0 PROJECT DESCRIPTION

The ORCF project will involve the transformation of coal and other biomass into liquid fuel via a coal gasification process. Once constructed, the facility will produce approximately 52,000 barrels per day. The combustion gas and steam produced by the coal gasification process will be utilized at an onsite cogeneration plant that will produce enough electric power to operate the plant as well as an electrical surplus of approximately 250MW which will be exported to the adjacent power grid.

The development of the ORCF facility has been aggressively endorsed by local and state government, as well as the residents of Wellsville, Ohio and the surrounding areas. Direct economic benefits include the creation of over 4,000 temporary construction jobs during site construction, and approximately 350 permanent jobs once the plant is in production.

ORCF has partnered with the Columbiana County Port Authority (CCPA) to secure more than 600 acres at a site located at Milepost 49.5 on the Ohio River. The site is located near abundant reserves of Northern Appalachian Eastern Bituminous coal which will fuel the facility. Supplementing the coal input will be biomass such as switchgrass, hardwood waste, and chicken manure (overabundant in Columbiana County). The project will have direct access to river barge, rail, and truck transportation, as well as direct access to nearby petroleum pipelines for distribution of transportation fuels.

This permit application for the ORCF Facility includes a beltline that will extend east to the coal off-loading facility located on the Ohio River to the east. The coal off-loading facility, referred to as the Buckeye Mining Company (Buckeye) site, is an existing industrial yard with rail access as well as access to the Ohio River via mooring cells. If necessary, Buckeye will be obtaining necessary permits for updates to, or expansion of, its river operations independently of the ORCF project.



A culmination of various consulting firms has been assembled to carry the project from design to construction, referred to herein as the Project Team. The Project Team and their responsibilities include:

- CH2M Hill – Overall project management of engineering and site development,
- Uhde-Black & Veatch (UBV) – Preliminary design and engineering of the facility,
- AMEC Paragon – Preliminary design and engineering of the Fischer-Tropsch process. Integration of the Fischer-Tropsch process into the general process and final design;
- Idaho National Laboratories – Extensive process design and optimization working in conjunction with UBV, AMEC Paragon, and the technology providers;
- Dallis Dawson & Associates – Grading, earthworks, site design;
- Civil & Environmental Consultants, Inc. – Environmental permitting of surface water, air, and stormwater management, as well as the Ohio Power Siting Board application.

ORCF and the Project Team have presented portions of the information within this 401/404 application to the Ohio EPA and the U.S. Army Corps of Engineers (Corps) during numerous meetings in 2007. These “pre-application” meetings have provided insight into state and federal permitting requirements. As a result, ORCF has reworked the site design to significantly reduce impacts to on-site wetlands and streams. It is noted that avoidance and minimization of environmental impacts has truly guided the site design and has led to the final proposed site configuration presented in this Alternatives Analysis report.



3.0 SITE DESIGN CRITERIA

The Alternatives Analysis was prepared to present practicable alternatives to wetland and stream encroachments at the selected site. An alternative is considered practicable if it is capable of being implemented under the considerations of construction cost, existing technology, and logistics. Regulations require a demonstration that there are no other site designs that would eliminate wetland or other jurisdictional water impacts, or have fewer impacts while still fulfilling the basic project purpose. The purpose of the project is to site a 50,000 barrels per day (BPD) coal to liquids fuel plant in Ohio.

After careful consideration, ORCF has incorporated extensive site design changes that ultimately led to the selection of a site development plan that has significantly reduced environmental impacts. The design changes included a significant reduction of on-site fill, producing a costly reduction of impacts to streams and wetlands.

During the site selection process, numerous criteria were considered. Some of the more critical site design considerations and criteria are listed below:

- Size of the Site (minimum 275 acres needed for development footprint);
- Access to coal (from a regional perspective);
- Access to coal (from a site specific perspective);
 - The existence of (or the potential to construct) coal off loading facilities along a navigable river;
 - Distance from river barge unloading area to on-site coal stockpile area (2 miles max.);
 - Amount of coal needed for the system;
- Access to highway infrastructure (3 miles max.);
- Access to biomass;
- Access to rail;
 - Raw material delivery;



- Product export;
- Access to gas or product pipelines (15 miles max.);
- Access to the power grid for surplus electricity generated (10 miles max.);
- Geotechnical considerations;
 - Stability issues (certain facility components need to be constructed on rock due to low tolerances for settlement);
 - Underground mines (depth to mines and mine stabilization considerations);
 - Quantities of cut and fill;
 - Depth and amount of rock that will need to be handled/moved;
- Geographically located near a large labor force;
- Distance from urban areas; and
- Homeland security considerations.



4.0 OFF-SITE ALTERNATIVES ANALYSIS

The off site Alternatives Analysis presents and describes eight sites originally considered by ORCF. They include the Ashtabula Site, Gallipolis/Jay Hall Site, LTV Steel Site, Marietta Dock Site, Powhatan 4 Site, Robena Site, Southpoint Site, and the Upshur Project Site. Figure 3 provides a regional map that identifies the locations of all these facilities. The following sections of the report outline the site locations, wetlands and/or streams onsite and justification for not selecting each site for the project.

4.1 OFF-SITE ALTERNATIVE 1 – ASHTABULA SITE

The Ashtabula Site is located along Lake Road (State Route 531) in Ashtabula, Astabula County, Ohio near the Ashtabula River and Lake Erie (Figure 4). The site is approximately 90 acres in size and a previous industrial site.

Approximately 2,774 feet of stream runs through the property. The stream is most likely degraded, due to its location within a highly industrialized setting.

The Ashtabula site was found to be too small to accommodate the 50,000 BPD plant footprint. The existing acreage would only accommodate two gasifiers, which would not provide sufficient capacity for the proposed plant. ORCF is unable to acquire additional acreage from the neighboring property owner because the owner would not allow a Phase I Environmental assessment to be completed, and was only offering an “as-is” property transaction, which was unacceptable to ORCF.

The closest loading docks are located approximately two miles away from the Ashtabula Site, resulting in a non-direct access point for transfer of raw materials. The closest place to offload coal would be East Liverpool, Ohio; therefore, coal would have to be trucked to the site. Coal would have to be shipped inland via rail from Appalachia or other coal regions of the United States. Also, the absence of neighboring liquid pipelines in Ashtabula County further reinforces the fact that all product shipments would have to be by truck or rail. These transportation costs



would significantly increase the overall plant operations expenditures. Additionally, there is no potential for CO₂ sequestration at this site. For these reasons, the Ashtabula site was rejected as a viable alternative.

4.2 OFF-SITE ALTERNATIVE 2 – GALLIPOLIS/JAY HALL SITE

The Gallipolis/Jay Hall Site is located off of State Route 7, along the Ohio River in Gallipolis, Gallia County, Ohio (Figure 5). The site is approximately 434 acres in size and is bisected by George Creek. Approximately 11,000 feet of George Creek and its tributaries are located within the site.

The rail line bisects the property, which is good for access, but bad for design purposes. Although the Gallipolis site is located along the Ohio River, a portion of the property to the east of the rail line is within the 100 year floodplain. This portion of the property is not viable land for development purposes. Also of significance is the location of the site near the town of Kanauga, Ohio and across the Ohio River from Point Pleasant, West Virginia. For these reasons, the Gallipolis/Jay Hall Site was rejected.

4.3 OFF-SITE ALTERNATIVE 3 – LTV STEEL SITE

The LTV Steel site is located near the Cuyahoga River in Cleveland, Cuyahoga County, Ohio (Figure 6). The site is approximately 175 acres and partially operational.

There are approximately 0.52 AC of potential wetlands onsite.

The LTV Steel site was found to be too small to accommodate the 50,000 BPD plant footprint. The existing acreage would not accommodate six gasifiers, which is necessary to provide sufficient capacity for the proposed plant. Also, the tops of the gasifiers would be at the same level as the adjacent elevated highway if placed at this location.



Although the LTV site is accessible to the Cuyahoga River, which is moderately navigable, and a rail line does exist, the site is distant from available coal reserves. Transportation costs to ship coal to the site would significantly increase the overall plant operation costs. Also, there is no clear pathway for getting electricity to the east coast. Lastly, there is no potential for CO2 sequestration at this site.

It is difficult to locate a plant of this nature in an urban setting. The LTV site is located near downtown Cleveland, which may subject the project to additional public scrutiny and likely opposition.

ORCF worked with LTV and considered several different locations at the Cleveland facility. This project was of interest to ISG (formerly LTV, now Arcelor Mittal) due to potential integration of the plant and the steel mill. This would have been beneficial to ISG since they could have used the surplus steam, electric power, oxygen and other inert gases from the ORCF facility. ORCF had concerns about the viability of the steel mill, but ultimately learned that Arcelor Mittal was already in due-diligence with another developer selling a large fraction of their unused land and facilities which ultimately was developed into a Wal-Mart. For these reasons, the LTV Steel site was rejected as a viable alternative.

4.4 OFF-SITE ALTERNATIVE 4 – MARIETTA DOCK SITE

The Marietta Dock site is located along the Ohio River, north of Marietta, Washington County, Ohio (Figure 7). The site is an undeveloped greenfield site and is approximately 131 acres in size.

Although the Marietta Dock site was considered as a potential site for the facility, it was quickly rejected due to its lack of supporting infrastructure. The Marietta Dock site is an undeveloped greenfield site with approximately 923 feet of stream onsite. For these reasons the Marietta Dock site was quickly rejected since it did not achieve the project's purpose and need.



4.5 OFF-SITE ALTERNATIVE 5 – POWHATAN 4 SITE

The Powhatan 4 Site is located along State Route 7, near the Ohio River north of Clarington, Belmont County, Ohio (Figure 6). The site is approximately 110 acres in size and previously an industrial site.

According to the National Wetland Inventory (NWI) maps, there are approximately 43 acres of potential wetlands and/or inundated areas onsite, along with approximately 17,000 feet of stream including Walden Run and its tributaries.

The Powhatan 4 site is too small to accommodate the 50,000 BPD plant footprint. The existing acreage would not accommodate six gasifiers, which is necessary to provide sufficient capacity for the proposed plant. ORCF's original intent was to use both the flattened areas on either side of State Route 7. The river side was slated for Fischer Tropsch and Product Workup processes, as well as tankage, and the northwest side would house the gasifiers and other auxiliaries. Another concern was that a portion of the plant would need to be located on old fly ash, which would be too unstable to hold the proposed structures. The site is bisected by State Route 7, and facilities could not be placed on the flyash areas on the south side of the roadway. The northern portion of the property, which is more stable, does not allow enough acreage for the plant footprint. For these reasons, the Powhatan 4 site was rejected as a viable option.

4.6 OFF-SITE ALTERNATIVE 6 – ROBENA MINE SITE

The Robena Mine site is located near the Monongahela River near Masontown, Greene County, Pennsylvania. A distinct project boundary was not provided to ORCF by the site's owner. However, a general area was made available to ORCF with few constraints on where they could construct their proposed facility.

Although the Robena Mine site is located along the Monongahela River, ORCF was concerned about the ability to bring large amounts of coal and biomass into the site given the narrow width of the Monongahela River is at that location. The Robena Mine site does not have any existing



infrastructure, such as petroleum pipelines, which reinforces the fact that product shipments would have to arrive by truck or rail. These transportation costs would significantly increase the overall plant operation costs. Additionally, there is no potential for CO2 sequestration at this site. For these reasons, the Robena Mine site was rejected as a viable alternative.

4.7 OFF-SITE ALTERNATIVE 7 – SOUTH POINT SITE

The South Point site is located along the Ohio River in South Point, Lawrence County, Ohio. The site is approximately 502 acres and consists of several different entities, which were proposed as a potential industrial park development.

Approximately 10,000 feet of Solida Creek flow through the property and two wetland areas have been identified onsite. The Federal Emergency Management Agency (FEMA) has mapped the 100 year floodplain on significant portions of the site (approximately 60 acres).

The South Point site is served by Norfolk Southern Railroad with existing rail lines on the main portion of the site and access to the Ohio River. Although the South Point site is large, the available tracts of sufficient area would be enclosed and too restrictive for the proposed project. Another major concern with the South Point site was its location immediately adjacent to a major urbanized area (South Point) which included a nearby elementary school.

The Lawrence County Economic Development Corporation (LEDC) proposed to develop portions of the Park for private, commercial, and industrial use. ORCF spent almost a year investigating this site for development, and the LEDC was unable to endorse the site for its intended use.

4.8 OFF-SITE ALTERNATIVE 8 – UPSHUR SITE

The Upshur Project site is located in Upshur, Upshur County, West Virginia (Figure 11). The site is approximately 185 acres and includes a reclaimed strip mine and enclosed deep mine.



There is a 1.19 acre pond onsite, along with approximately 1,400 feet of stream.

The Upshur Project site does not allow for access to water and there are no rail lines near the site; therefore, all coal would have to be transported by truck into the site. Transportation costs to ship coal to the site would significantly increase the overall plant operational costs, and truck transportation alone may not support the demand needed for the process. Additionally, there is not an adequate pathway to get electricity to the east coast, and there is no potential for CO2 sequestration at this site. For these reasons, the Upshur Project site was rejected as a viable option.

4.9 SUMMARY OF OFF-SITE ALTERNATIVES ANALYSIS

ORCF evaluated eight areas throughout Ohio, Pennsylvania, and West Virginia during their off-site selection process. Site selection criteria included access to infrastructure, onsite ecological resources, and the site's surrounding environment. Perhaps most important to the project was the need for access to barge and rail traffic in order to make the project economically feasible. If a site met this limiting factor, it was then further evaluated based on its suitability for the project's facilities, and the site's current land use. Undisturbed greenfield sites were less desirable than those previously impacted and disturbed. Although some of the sites met some of the necessary criteria, none of the sites met all or most of the criteria.



5.0 OFFSITE ALTERNATIVES ANALYSIS - WELLSVILLE AREA

Potential development areas were also investigated in and around the Wellsville, Ohio area for a possible location of the ORCF facility. The Columbiana County Port Authority (CCPA) assisted ORCF in identifying viable sites within the Wellsville area. The CCPA is very familiar with development opportunities within Columbiana County and currently leases space within their existing Intermodal Park located to the south of Wellsville.

While evaluating these areas, numerous criteria were used to identify desirable sites. The proximity of the site to transmission lines, gas pipelines, highway infrastructure, railroad, and access to river/barge raw material handling facilities were major considerations in the site selection process (refer to the Site Design Criteria described in Section 3). Characteristics which discouraged ORCF from certain sites in the Wellsville area included the proximity and density of residential areas, greenfield sites, sites within the 100-year floodplain along the Ohio River, on-site streams and wetlands, insufficient site acreage, and insufficient area for river off-loading/coal handling facilities.

Raw coal transported via barge is by far the most economical means to deliver coal and other raw materials to the ORCF plant. Conveyor belts less than one mile in length were considered optimal for transferring raw materials from a river off-loading facility to the Site. For this reason, only sites within one mile of the river were considered during the site selection process.

Considering all of the above site design criteria, the CCPA led ORCF to the proposed site location (Figure 2). CEC prepared Figure 12 which identifies a 5-mile reach upriver and downriver from the proposed Site location. The purpose of the figure is to identify those criteria that preclude the development of a large industrial site along the Ohio River.

On the Ohio side of the river, existing residential areas, existing industrial development and the lack of potential coal handling/coal unloading facilities preclude any major development opportunities. In general, the topography slopes steeply down to Route 7 which is located immediately adjacent to the Ohio River along much of the river frontage. These factors alone



preclude development. On the West Virginia side of the Ohio River, existing development (such as the Mountaineer Race Track and Gaming Resort), residential areas, steep slopes, lack of river access, and the 100-year floodplain within agricultural areas preclude development along the majority of land available in West Virginia.

After conducting an evaluation of potential industrial sites along the Ohio River corridor, ORCF had determined that the subject property meets the majority of their site selection criteria discussed in Section 3.0. The close proximity to barge traffic, highways, major pipelines, the power grid system, and an available work force make the proposed site extremely attractive. Also, the Buckeye Mining site to the east will provide rail access and an off-loading area for coal directly adjacent to the proposed ORCF plant.

The current site use includes an all terrain vehicle (ATV) park and primitive campground. From an ecological perspective, the site is more desirable to develop than a "greenfield" site. Although barely visible from aerial imagery; an on the ground investigation identifies significant impacts caused to the Site's landscape from ATV use. Considering the current impacts to the Site, and its proximity to all necessary infrastructure, the ORCF facility is proposed to be constructed in the most economically feasible and ecologically beneficial location.



6.0 ON SITE ALTERNATIVES ANALYSIS

CEC's wetland and stream delineation report (Appendix A) identified 30 wetlands totaling 3.65 acres, 46 streams totaling 29,427 linear feet, and five open-water ponds totaling 2.62 acres on the proposed site. Of the 1.71 acres of wetlands identified, 1.52 acres were considered isolated (and not regulated) by the Army Corps of Engineers. A total of 10 of the 46 streams totaling 2,258 linear feet are also considered isolated and not regulated.

The following sections evaluate six onsite alternative project configurations that were evaluated prior to arriving at the seventh and final Proposed Minimal Degradation Alternative (Figure 2). These numerous iterations of on-site alternatives demonstrate how ORCF has avoided and minimized impacts to aquatic resources to the extent practicable.

Given the size requirements for this project (275 acres) and the topography as it relates to locations of wetlands and streams, a Non-Degradation Alternative was not feasible for this Site. It would be impossible to create development pads large enough to accommodate the plant without disturbance to some streams and/or wetlands at the Wellsville site. Also, the nature of the coal to liquids plant process does not allow for multiple tiered operations. That is, there is little flexibility in maneuvering plant components at different elevations.

6.1 ALTERNATIVE 1 – ORIGINAL SITE PLAN, MAXIMUM DEGRADATION ALTERNATIVE

Alternative 1 was the initial site design that provided a site layout that was originally considered for development (Figure 13). The Original Site Plan proposes impacts to Rocky Run and its major tributaries and, therefore is referred to as the Maximum Degradation Alternative. Alternative 1 would impact 2,330 feet of Rocky Run, and is the only Alternative which proposes impacts to the main stem of Rocky Run. The design of Alternative 1 is driven by the most efficient process for the flow of raw materials to the final product.



Water Resource Impacts

Under the Maximum Degradation Alternative, 21 streams, totaling 14,537 linear feet would be impacted as a result of site development activities. These impacts consist of filling in 7,877 feet of perennial stream, 4,770 feet of intermittent stream, and 1,890 feet of ephemeral stream.

Under Alternative 1, 16 onsite wetlands would be filled, resulting in impacts to 1.92 acres of Category 1 and Category 2 wetlands. In addition, three of the five ponds, totaling 1.08 acres would be impacted as a result of filling from Alternative 1.

Impacts to Surface Water Flow Patterns

There are several primary drainage features onsite. Alternative 1 significantly alters and degrades the majority of these major drainages. Most notably, Rocky Run itself would undergo substantial alternations to its current geomorphologic state. A portion of Rocky Run as well as its major tributaries to the north would also be either culverted or filled as a result of the construction of Alternative 1 (RR-A and RR-D drainage systems, Figure 13). The drainage system of UNT-E would also be impacted under Alternative 1, along with the isolated stream systems of UNT-C, UNT-D, UNT-F, UNT-G, and UNT-H.

The surface water flow patterns would be drastically altered as a result of Alternative 1, and new stormwater management features would need to be constructed to carry the water to onsite stormwater detention facilities, and ultimately off-site into either Rocky Run, or directly into the Ohio River.

Impacts to Water Quality

Overall, on-site water quality would suffer as a result of the construction of Alternative 1. The most notable decreases in onsite water quality degradation would most likely come from the clearing of trees and narrowing of riparian corridors which has the potential to increase stream water temperatures and decrease dissolved oxygen concentrations in Rocky Run.



Impacts to Aquatic Communities

The fish and benthic macroinvertebrate communities within Rocky Run would be directly impacted as a result of this alternative. During CEC's jurisdictional waters/streams assessment performed at the Site (Appendix D), fish and benthic macroinvertebrate communities were documented within Rocky Run, most notably in the upstream and downstream portions of the watershed. These aquatic communities within the fill area would be eliminated as a result of the implementation of the Maximum Degradation Alternative.

Impacts to Terrestrial Flora

Under the Maximum Degradation Alternative, approximately 48 percent of the Site will be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial communities that currently exist within the boundaries of the Site include mature forests, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. With the exception of the mature forest, these communities are infested with hardy, invasive, nonnative, plant species, including Japanese knotweed (*Polygonum cuspidatum*), multiflora rose (*Rosa multiflora*), tree of heaven (*Ailanthus altissima*), and garlic mustard (*Allaria petiolata*).

Impacts to Terrestrial Fauna

During the 2007 field visits, reptiles and amphibians observed included the spotted salamander (*Ambystoma maculatum*), red-spotted newt (*Notophthalmus viridescens*), northern dusky salamander (*Desmognathus fuscus*), northern two-lined salamander (*Eurycea bislineata*), eastern American toad (*Bufo americanus*), northern spring peeper (*Pseudacris crucifer*), bull frog (*Rana catesbeiana*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), northern leopard frog (*Rana pipiens*), common snapping turtle (*Chelydra serpentina*), eastern box turtle (*Terrapene carolina*), northern black racer (*Coluber constrictor*), black rat snake (*Elaphe obsoleta*), northern water snake (*Nerodia sipedon*), and eastern garter snake (*Thamnophis sirtalis*). It is most likely



that the above mentioned species will be displaced or eliminated from those areas proposed for impacts.

In addition, other terrestrial fauna, including mammals observed at the Site, such as the Virginia opossum (*Didelphis virginiana*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), eastern cottontail rabbit (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), red squirrel (*Tamiasciurus hudsonicus*), white-tailed deer (*Odocoileus virginianus*), Canada goose (*Branta canadensis*), wild turkey (*Meleagris gallopavo*), and morning dove (*Zenaida macroura*). These larger and more mobile fauna will most likely be able to relocate to adjacent undisturbed areas.

Impacts to Threatened and Endangered Species

Although the Site lies within the ranges of the Federally-Endangered Indiana Bat (*Myotis sodalis*), no specimens were found at the Site during the presence/absence survey performed by CEC (Appendix C). There were no other species of concern identified by the U.S. Fish and Wildlife Service or the Ohio Department of Natural Resources (ODNR), therefore no additional impacts to threatened and/or endangered species are anticipated.

Summary of Alternative 1 Impacts

Alternative 1 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	7,877	1.92	1.08
Intermittent	4,770		
Perennial	1,890		
Total	14,537		
Isolated Portion of Total	1,226	0.97	0.12

Although Alternative 1 provides an ideal plant design from a logistics and efficiency standpoint, the design was rejected due to the significant amount of impacts to on-site water resources.



6.2 ALTERNATIVE 2 – AVOIDANCE OF ROCKY RUN IMPACTS

Efforts to reconfigure the main plant layout resulted in the shifting of the main plant to the north and east. Under Alternative 2 (Figure 14), the proposed fill within Rocky Run was removed by raising the elevation of the main plant pad, the coal storage area, and product tank farm. Thus the total amount of cut and fill material was reduced. The majority of fill was placed in the unnamed tributary to Rocky Run (RR-A).

Alternative 2 was the Site design presented to the Ohio EPA and the Corps by CEC and the Project Team during a July 10, 2007 meeting in Columbus.

Water Resource Impacts

Under Alternative 2, 33 streams, totaling 15,186 linear feet would be impacted including 7,253 feet of perennial stream, 5,803 feet of intermittent stream, and 2,129 feet of ephemeral stream.

Under Alternative 2, 18 onsite wetlands would be filled, resulting in impacts to 2.14 acres of Category 1 and Category 2 wetlands. In addition, four of the five ponds, totaling 2.10 acres would be impacted. Although Alternative 2 impacts more wetlands, streams and ponds than does Alternative 1, it is not regarded as the Maximum Degradation Alternative since it does not impact Rocky Run.

Impacts to Surface Water Flow Patterns

Although Rocky Run would not be directly impacted, the majority of the RR-A drainage system would be filled and/or culverted as a result of the construction of Alternative 2. The northern drainage system of UNT-A and UNT-B (excluding UNT-Ba), and Pond E, would also be filled as a result of construction. The drainage system of UNT-E would also be impacted under Alternative 2, along with the isolated stream systems of UNT-C, UNT-D, and UNT-H.



The surface water flow patterns would still be drastically altered, and new stormwater management features would be constructed to carry the water to onsite stormwater detention facilities, and ultimately off-site into either Rocky Run, or directly into the Ohio River.

Impacts to Water Quality

It is unknown what impacts, if any, construction of Alternative 2 design scenario would have on water quality within the on-site tributaries. The most notable impacts to onsite water quality may come from the clearing of trees and eliminating riparian corridors which serve to shade the stream and decrease surface water temperatures. It is assumed that onsite erosion and sedimentation controls along with best management practices would be used to prevent excess silt from entering the streams during the construction phase of the project.

Impacts to Aquatic Communities

The majority of the unnamed tributary streams on-site are identified as Category I, II, and III Primary Headwater Habitat Streams. These streams systems have relatively small drainage areas, do not support any fish species, and support minimal assemblages of benthic macroinvertebrates. Regardless, these aquatic communities would be eliminated as a result of the implementation of Alternative 2.

Impacts to Terrestrial Flora

Under Alternative 2, approximately 66 percent of the Site will be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial communities that currently exist within the boundaries of the Site include mature forests, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. Alternative 2 effectively eliminates the mature forested portion of the RR-A drainage system.



Impacts to Terrestrial Fauna

The impacts associated with terrestrial fauna are the same as those described under Alternative 1.

Alternative 2 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	2,129	2.14	2.10
Intermittent	5,803		
Perennial	7,253		
Total	15,186		
Isolated Portion of Total	2,208	1.33	0.29

Impacts to Threatened and Endangered Species

There will be no impacts to threatened and/or endangered species.

Summary of Alternative 2 Impacts

The plan was rejected due to the significant amount of impacts that it would have to the onsite water resources, specifically the drainages of RR-A, UNT-A, and UNT-B.

6.3 ALTERNATIVE 3 – PRESERVATION OF THE NORTHERN DRAINAGE SYSTEM

Under Alternative 3 (Figure 15), the drainage system to the north, including Pond E, and the UNT-A and UNT-B drainage systems would be preserved. As a result of avoiding these drainages, fill would be placed to the west in Tributary RR-A. The large amount of fill in the western drainage was necessary to balance the cut and fill volumes at the site.



Water Resource Impacts

Under Alternative 3, 27 streams, totaling 11,193 linear feet would be impacted as a result of construction. These impacts consist of filling in 4,280 feet of perennial stream, 5,161 feet of intermittent stream, and 4,280 feet of ephemeral stream. Also, 15 onsite wetlands would be filled, resulting in impacts to 2.20 acres of Category 1 and Category 2 wetlands. Lastly, three of the five ponds, totaling 0.74 acres would also be impacted.

Impacts to Surface Water Flow Patterns

Under Alternative 3, the northern drainage system of UNT-A and UNT-B including Pond E, would be preserved as a result of construction. However, Alternative 3 would significantly alter and degrade the majority of the RR-A drainage system. The drainage system of UNT-E would also be impacted under Alternative 3, along with the isolated stream systems of UNT-C, UNT-D, and UNT-H.

The surface water flow patterns of RR-A and the other impacted drainages would be drastically altered, and new stormwater management features would be constructed to carry the water to onsite stormwater detention facilities, and ultimately off-site into either Rocky Run, or directly into the Ohio River.

Impacts to Water Quality

It is unknown what impacts, if any, construction of Alternative 3 design scenario would have on water quality within the on-site tributaries. The most notable impacts to onsite water quality may come from the clearing of trees and eliminating riparian corridors which serve to shade the stream and decrease surface water temperatures. It is assumed that onsite erosion and sedimentation controls along with best management practices would be used to prevent excess siltation from entering the streams during the construction phase of the project.



Impacts to Aquatic Communities

The majority of the unnamed tributary streams on-site are identified as Category I, II, and III Primary Headwater Habitat Streams. These stream systems have relatively small drainage areas, do not support any fish species, and support minimal assemblages of benthic macroinvertebrates. Regardless, these aquatic communities would be eliminated as a result of the implementation of Alternative 3.

Impacts to Terrestrial Flora

Under Alternative 3, approximately 61 percent of the Site will be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial communities that currently exist within the boundaries of the Site include mature forests, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. Alternative 3 significantly impacts the mature forested portion of the RR-A drainage system.

Impacts to Terrestrial Fauna

The impacts associated with terrestrial fauna are the same as those described under Alternative 1.

Impacts to Threatened and Endangered Species

There will be no impacts to threatened and/or endangered species.



Summary of Alternative 3 Impacts

Alternative 3 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	1,752	2.20	0.74
Intermittent	5,161		
Perennial	4,280		
Total	11,193		
Isolated Portion of Total	2,166	1.60	0.29

Recommendations by the Ohio EPA and the Corps at the July 10, 2007 meeting led to the design of Alternative 3. However, significant impacts remained to the RR-A drainage system as a result of Alternative 3, and it was later rejected by the Project Team in an effort to further reduce impacts.

6.4 ALTERNATIVE 4 – PRESERVATION OF THE WESTERN DRAINAGE SYSTEM

Under Alternative 4 (Figure 16), the drainage system to the west, RR-A, and the majority of its supporting tributaries would be preserved. As a result of avoiding these drainages, fill would be placed in the northern drainages of UNT-A, UNT-B, and Pond E.

Water Resource Impacts

Under Alternative 4, 24 streams, totaling 9,932 linear feet would be impacted. These impacts consist of filling in 4,702 feet of perennial stream, 3,420 feet of intermittent stream, and 1,810 feet of ephemeral stream. Included in this total is an additional 20 feet of impacts which are required for the expansion of a culvert on RR-A. A culvert and road currently exist on RR-A; however it would need to be extended to allow for an improved construction access road to the flares.



Under Alternative 4, 12 onsite wetlands would also be filled, resulting in impacts to 1.68 acres of Category 1 and Category 2 wetlands as well as three of the five ponds, totaling 1.65 acres of pond impacts.

Impacts to Surface Water Flow Patterns

The western drainage system of RR-A, as well as the majority of its supporting tributaries would be preserved under Alternative 4. However, Alternative 4 significantly alters and degrades the majority of the UNT-B drainage and all of the UNT-A drainage, as well as Pond E. The drainage system of UNT-E would also be impacted under Alternative 4, along with the isolated stream systems of UNT-C, UNT-D, and UNT-H.

The reduction of impacts to the western drainage systems would be accomplished by placing fill in the northern drainage of UNT-A, UNT-B, and Pond E. The surface water flow patterns of these impacted drainages would be drastically altered, and new stormwater management features would be constructed to carry the water to onsite stormwater detention facilities, and ultimately off-site into either Rocky Run, or directly into the Ohio River.

Impacts to Water Quality

It is unknown what impacts, if any, construction of Alternative 4 design scenario would have on water quality within the on-site tributaries. The most notable impacts to onsite water quality may come from the clearing of trees and eliminating riparian corridors which serve to shade the stream and decrease surface water temperatures. It is assumed that onsite erosion and sedimentation controls along with best management practices would be used to prevent excess siltation from entering the streams during the construction phase of the project.

Impacts to Aquatic Communities

The majority of the unnamed tributary streams on-site are identified as Category I, II, and III Primary Headwater Habitat Streams. These stream systems have relatively small drainage areas,



do not support any fish species, and support minimal assemblages of benthic macroinvertebrates. Regardless, these aquatic communities would be eliminated as a result of the implementation of Alternative 4.

Impacts to Terrestrial Flora

Under Alternative 4, approximately 51 percent of the Site will be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial communities that currently exist within the boundaries of the Site include mature forests, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. Alternative 4 eliminates impacts to the mature forested valley of the RR-A drainage system.

Impacts to Terrestrial Fauna

The impacts associated with terrestrial fauna are the same as those described under Alternative 1.

Impacts to Threatened and Endangered Species

There will be no impacts to threatened and/or endangered species.

Summary of Alternative 4 Impacts

Alternative 4 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	1,810	1.68	1.65
Intermittent	3,420		
Perennial	4,702		
Total	9,932		
Isolated Portion of Total	2,258	1.50	0.29

Although the majority of impacts have been reduced in the RR-A drainage area (moving from Alternative 3 to 4), significant impacts remained in the northern drainage system under the



Alternative 4 design scenario. Given the impacts to the tributaries in the north, it was rejected by the Project Team in an effort to further reduce impacts.

6.5 ALTERNATIVE 5 – RELOCATION OF FILL TO THE SOUTH, 1ST REVISION

Under Alternative 5 (Figure 17), the main drainage to the west, RR-A, and a portion of the main drainage to the north, UNT-B and Pond E would be preserved. This is possible because of the proposed transportation of fill offsite to the property bordering the project area to the south. Fill would be placed in the drainages which feed RR-A to the west as well as UNT-A to the north. However, the main drainage features in the north and west would be preserved under Alternative 5. A small drainage feature in the southeastern portion of the off-site southern property will be filled.

Water Resource Impacts

Under Alternative 5, 26 streams, totaling 10,430 linear feet would be impacted. These impacts consist of filling in 3,302 feet of perennial stream, 5,067 feet of intermittent stream, and 2,061 feet of ephemeral stream. Included in this total is an additional 20 feet of impacts which are required for the extension of a culvert on RR-A. A culvert and road currently exist on RR-A; however it would need to be extended to allow for an improved construction access road to the flares.

Under Alternative 5, 14 onsite wetlands would also be filled, resulting in impacts to 1.90 acres of Category 1 and Category 2 wetlands. In addition, two of the five ponds, totaling 0.29 acres would be impacted as a result of Alternative 5.

Impacts to Surface Water Flow Patterns

The design of Alternative 5 reflects an improvement in the amount of degradation to on-site water resources. Alternative 5 avoids impacts to the perennial stream system of RR-A as well as the northern drainage of UNT-B and Pond E. The drainage system of UNT-E would remain



impacted under Alternative 5, along with the isolated stream systems of UNT-C, UNT-D, UNT-F, UNT-G, and UNT-H.

The reduction of impacts to the northern and western drainage systems is accomplished by eliminating fill placed in the northern drainage of UNT-B and Pond E and the western drainage of RR-A. The surface water flow patterns of these impacted drainages would be drastically altered, and new stormwater management features would be constructed to carry the water to onsite stormwater detention facilities, and ultimately off-site into either Rocky Run, or directly into the Ohio River.

Impacts to Water Quality

It is unknown what impacts, if any, construction of Alternative 5 design scenario would have on water quality within the on-site tributaries. The most notable impacts to onsite water quality may come from the clearing of trees and eliminating riparian corridors which serve to shade the stream and decrease surface water temperatures. It is assumed that onsite erosion and sedimentation controls along with best management practices would be used to prevent excess siltation from entering the streams during the construction phase of the project.

Impacts to Aquatic Communities

The majority of the unnamed tributary streams on-site are identified as Category I, II, and III Primary Headwater Habitat Streams. These streams systems have relatively small drainage areas, do not support any fish species, and support minimal assemblages of benthic macroinvertebrates. Regardless, these aquatic communities would be eliminated as a result of the implementation of Alternative 5.

Impacts to Terrestrial Flora

Under Alternative 5, approximately 61 percent of the Site will be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial



communities that currently exist within the boundaries of the Site include mature forests, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. Alternative 5 eliminates significant impacts to the mature forested valley of the RR-A drainage system.

Impacts to Terrestrial Fauna

The impacts associated with terrestrial fauna are the same as those described under Alternative 1.

Impacts to Threatened and Endangered Species

There will be no impacts to threatened and/or endangered species.

Summary of Alternative 5 Impacts

Alternative 5 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	2,061	1.90*	0.29
Intermittent	5,067		
Perennial	3,302		
Total	10,430		
Isolated Portion of Total	2,258	1.50	0.29

Alternative 5 was designed in an attempt to reduce impacts to both the northern and western drainage systems. After creating Alternatives 3 and 4 which place fill in either the northern or western drainages, an attempt was made at avoiding placing fill in both of these drainage systems. Efforts made by the Project Team created the opportunity to transport fill to the south to further avoid impacts to streams and wetlands. However, significant costs were associated with moving fill to the south.

Alternative 4 also results in the fill of UNT-F and UNT-G on the eastern portion of the project site, which were previously avoided in the preceding alternatives. However, avoidable impacts



remained to the resources as a result of Alternative 5, and it was later rejected by the Project Team in an attempt to further manipulate site elevations and reduce aquatic resource impacts and project costs.

6.6 ALTERNATIVE 6 – RELOCATION OF FILL TO THE SOUTH, 2ND REVISION

Under Alternative 6, the main drainage to the west, RR-A, and the main drainage to the north, UNT-B and Pond E would be preserved. Alternative 6 went further than Alternative 5 in preserving the drainage feature in the southeastern portion of the southern property as well as the drainage systems of UNT-F and UNT-G in the east.

Water Resource Impacts

Under Alternative 6 (Figure 18), 22 streams, totaling 9,019 linear feet would be impacted. These impacts consist of filling in 2,644 feet of perennial stream, 4,565 feet of intermittent stream, and 1,810 feet of ephemeral stream. Included in this total is an additional 20 feet of impacts which are required for the expansion of a road improvement culvert on RR-A.

Under Alternative 6, fourteen onsite wetlands would be filled, resulting in impacts to 1.90 acres of Category 1 and Category 2 wetlands. In addition, two of the five ponds, totaling 0.29 acres would be impacted as a result of filling from Alternative 6.

Impacts to Surface Water Flow Patterns

The design of Alternative 6 improves upon the amount of degradation to surface water resources by decreasing the amount of impacts from Alternative 5. Alternative 6 avoids all impacts avoided in Alternative 5, while also avoiding the drainage system of UNT-F, UNT-G and the drainage system in the southeastern corner of the southern property. The drainage system of UNT-E would be impacted under Alternative 6, along with the isolated stream systems of UNT-C, UNT-D, UNT-F, UNT-G, and UNT-H. The surface water flow patterns of these impacted drainages would be drastically altered, and new stormwater management features would be



constructed to carry the water to onsite stormwater detention facilities, and ultimately off-site into either Rocky Run, or directly into the Ohio River.

Impacts to Water Quality

It is unknown what impacts, if any, construction of Alternative 6 design scenario would have on water quality within the on-site tributaries. The most notable impacts to onsite water quality may come from the clearing of trees and eliminating riparian corridors which serve to shade the stream and decrease surface water temperatures. It is assumed that onsite erosion and sedimentation controls along with best management practices would be used to prevent excess siltation from entering the streams during the construction phase of the project.

Impacts to Aquatic Communities

The majority of the unnamed tributary streams on-site are identified as Category I, II, and III Primary Headwater Habitat Streams. These streams systems have relatively small drainage areas, do not support any fish species, and support minimal assemblages of benthic macroinvertebrates. Regardless, these aquatic communities would be eliminated as a result of the implementation of Alternative 6.

Impacts to Terrestrial Flora

Under Alternative 6, approximately 62 percent of the Site would be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial communities that currently exist within the boundaries of the Site include mature forest, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. Alternative 6 eliminates significant impacts to the mature forested valley of the RR-A drainage system.



Impacts to Terrestrial Fauna

The impacts associated with terrestrial fauna are the same as those described under Alternative 1.

Impacts to Threatened and Endangered Species

There will be no impacts to threatened and/or endangered species.

Summary of Alternative 6 Impacts

Alternative 6 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	1,810	1.90	0.29
Intermittent	4,565		
Perennial	2,644		
Total	9,019		
Isolated Portion of Total	2,258	1.50	0.29

Alternative 6 was designed through the continuing efforts to reduce impacts to surface water resources on-site. Compared to earlier alternatives, Alternative 6 demonstrates a drastic improvement over the reduction of impacts. However, it was foreseeable by the Project Team that additional regrading and redesign of the Site elevation could reduce impacts to the drainage systems of RR-Aa and RR-Ab. For this reason, Alternative 6 was further refined into Alternative 7.

6.7 ALTERNATIVE 7 – PREFERRED SITE PLAN, MINIMAL DEGRADATION ALTERNATIVE

Alternative 7, the Preferred Site Plan, represents the site design alternative with the least amount of impacts to surface water resources, and referred to as the Minimum Degradation Alternative. Alternative 7 pulled back the fill in the western portion of the site resulting in less stream



impacts to RR-Ab and RR-Aa (compared to Alternative 6). Additionally, raising the Site elevation to 1110' and 1042' eliminated the need to transport fill material off-site to the south.

Water Resource Impacts

Under the Preferred Site Plan, 24 streams, totaling 8,745 linear feet of streams would be impacted. These impacts consist of filling in 2,749 feet of perennial stream, 4,295 feet of intermittent stream, and 1,701 feet of ephemeral stream. These impacts also account for 763 feet of stream impacts to UNT-B, UNT-Bb and UNT-Bc for the construction of the wetland mitigation area. In addition to the grading activities for the Site and mitigation area, an additional 20 feet of impacts are required for the extension of a culvert on RR-A which will allow access to the flares. The table below provides a list of the streams proposed to be impacted.

Streams	Length (ft)	Classification	HMFEI Score	Stream Class	Jurisdiction	Reason for Impact
RR-A	20	Perennial	25	Class II	USACE	Access Road to Flares
RR-Aa	64	Ephemeral	0	Class I	USACE	Switchyard and grading
RR-Ab	179	Intermittent	1	Class I	USACE	Pad grading
RR-Ae	840	Intermittent	0	Class I	USACE	Process pond and grading
UNT-A	969	Perennial	10	Class II	USACE	Coal handling, entrance road, and associated grading
UNT-A	262	Ephemeral	0	Class I	USACE	Coal hopper
UNT-Aa	16	Perennial	8	Class II	USACE	Coal run-off pond
UNT-Aa	115	Ephemeral	0	Class I	USACE	Coal run-off pond
UNT-B	84	Perennial	17	Class II	USACE	Wetland mitigation
UNT-Bb	556	Intermittent	3	Class I Mod.	USACE	Wetland mitigation
UNT-Bc	123	Intermittent	3	Class I	USACE	Wetland mitigation
UNT-C (Isolated)	275	Intermittent	2	Class I	OEPA	Entrance road grading
UNT-Ca (Isolated)	50	Intermittent	2	Class I	OEPA	Entrance road grading



UNT-Ca1 (Isolated)	32	Ephemeral	0	Class I	OEPA	Entrance road grading
UNT-D (Isolated)	828	Intermittent	2	Class I	OEPA	Slag storage
UNT-Da (Isolated)	33	Ephemeral	0	Class I	OEPA	Pad grading
UNT-Db (Isolated)	224	Ephemeral	1	Class I Mod.	OEPA	Pad grading and beltline
UNT-Dc (Isolated)	56	Ephemeral	0	Class I	OEPA	Coal handling and beltline
UNT-Dc1 (Isolated)	162	Perennial	13	Class II	OEPA	Coal handling and beltline
UNT-E	1,423	Perennial	18	Class II	USACE	Fire water pretreatment pond and pad grading
UNT-E	716	Intermittent	2	Class I	USACE	Fire water pretreatment pond, process water treatment, and gasification
UNT-Ea	187	Intermittent	0	Class I	USACE	Fire water pretreatment pond
UNT-Ea	184	Ephemeral	0	Class I	USACE	Fire water pretreatment pond
UNT-Eb	423	Ephemeral	0	Class I	USACE	Fire water pond and coal milling and drying
UNT-Ec	251	Ephemeral	0	Class I	USACE	Gasification
UNT-F	75	Perennial	8	Class II	USACE	Pad grading
UNT-H (Isolated)	541	Intermittent	3	Class I	OEPA	Liquified Petroleum Gas (LPG) bullets and pad grading
UNT-Ha (Isolated)	57	Ephemeral	1	Class I	OEPA	Pad grading
Total Perennial	2,749					
Total Intermittent	4,295					
Total Ephemeral	1,701					
Total Stream Impacts	8,745					

Under the Preferred Site Plan, 12 onsite wetlands would be filled, resulting in impacts to 1.71 acres of Category 1 and Category 2 wetlands. In addition, two of the five ponds, totaling 0.29



acres would be impacted as a result of filling. The following tables provide a summary of the wetlands and ponds proposed to be impacted.

Wetland	Acreage	ORAM Score	Category	Jurisdiction	Reason for Impact
Wetland 1	0.04	33	1 or 2 gray	OEPA	Biomass storage
Wetland 2	0.20	38	2 modified	OEPA	Coal storage
Wetland 3	0.56	41	2 modified	OEPA	Coal storage and associated grading
Wetland 4	0.02	31	1 or 2 gray	OEPA	Coal storage and associated grading
Wetland 5	0.02	52	2	OEPA	Beltline infrastructure
Wetland 6	0.01	31	1 or 2 gray	USACE	Coal handling
Wetland 7	0.25	40	2 modified	OEPA	LPG bullets
Wetland 8	0.35	37	2 modified	OEPA	Entrance road
Wetland 12	0.02	21	1	USACE	Wetland mitigation
Wetland 17	0.02	26	1	USACE	Pad grading
Wetland 28	0.08	26	1	OEPA	Coal handling
Wetland 29	0.14	19	1	USACE	Gasification
Total	1.71				

Ponds	Acreage	Jurisdiction	Reason for Impact
Pond A	0.12	OEPA	Coal Storage
Pond B	0.17	OEPA	LPG bullets and coal handling
Total	0.29		

Impacts to Surface Water Flow Patterns

The design of Alternative 7 reflects an improvement in the amount of degradation to on-site water resources, and represents the smallest amount of impacts to on-site water resources. Alternative 7 avoids fill impacts to the perennial stream system of RR-A as well as UNT-B and Pond E. A culvert extension of approximately 20 feet is proposed for RR-A. This results from road improvements required to access the flares. The drainage system of UNT-E will also be impacted under Alternative 7, along with the isolated stream systems of UNT-C, UNT-D, and UNT-H.



Alternative 7 also incorporates impacts to UNT-B, UNT-Bb & UNT-Bc associated with the wetland mitigation area. Surface water patterns here will be altered by grading to create ample hydrology for success of the wetland mitigation area.

Impacts to Water Quality

It is unknown what impacts, if any, construction of Alternative 7 design scenario would have on water quality within the on-site tributaries. The most notable impacts to onsite water quality may come from the clearing of trees and eliminating riparian corridors which serve to shade the stream and decrease surface water temperatures. It is assumed that onsite erosion and sedimentation controls along with best management practices would be used to prevent excess siltation from entering the streams during the construction phase of the project.

Impacts to Aquatic Communities

During CEC's jurisdictional waters/streams assessment performed at the Site, the majority of the streams were identified as Category I and Category II Primary Headwater Habitat Streams. Although these streams only support depauperate assemblages of tolerant invertebrates and fish, these aquatic communities would be eliminated and displaced downstream as a result of the implementation of the Proposed Site Plan – Minimum Degradation Alternative.

Impacts to Terrestrial Flora

Under the Proposed Site Plan, approximately 54 percent of the Site will be impacted/developed, which entails the removal of existing terrestrial habitats and vegetation. Existing terrestrial communities that currently exist within the boundaries of the Site include mature forests, early successional/second-growth forests, shrub uplands, active pasturelands, and residential lawns. The Proposed Site Plan significantly reduces impacts to the mature forested valley of the RR-A drainage system.



Impacts to Terrestrial Fauna

The impacts associated with terrestrial fauna are the same as those described under Alternative 1.

Impacts to Threatened and Endangered Species

There will be no impacts to threatened and/or endangered species.

Summary of Alternative 7 Impacts

Alternative 7 – Summary of Impacts			
Streams (feet)		Wetlands (Acres)	Ponds (Acres)
Ephemeral	1,701	1.71	0.29
Intermittent	4,295		
Perennial	2,749		
Total	8,745		
Isolated Portion of Total	2,258	1.51	0.29

The Project Team has worked diligently to reconfigure the site layout in order to avoid and minimize impacts to on-site aquatic resources. Through revised grading efforts, and raising the level of the proposed pad, impacts to streams and wetlands were able to be minimized compared to those presented in all other alternatives. Any further attempts to manipulate the current site configuration will affect certain critical components of the plant, compromising the integrity of the design.

6.8 ECONOMIC CONSIDERATIONS

Construction costs for each of the Alternatives are shown in the table below. Costs are based on; necessary cut and fill volumes at assumed unit rates (in some alternatives fill transportation is also included), new channel construction if necessary, entrance road costs, site clearing and grubbing, property costs, and offsite mitigation costs.



Alternative		Cost Estimate for Construction of Alternative
1	Original Site Plan/Maximum Degradation Alternative	Alternative was rejected based on ecological impacts before a cost estimate was completed.
2	Avoidance of Rocky Run Impacts	\$113,075,000
3	Preservation of Northern Drainage System	\$83,752,200
4	Preservation of Western Drainage System	\$104,138,200
5	Relocation of Fill to the South, 1 st Revision	\$107,448,600
6	Relocation of Fill to the South, 2 nd Revision	\$98,275,700
7	Proposed Site Plan/Minimal Degradation Alternative	\$91,125,000

6.9 SUMMARY OF ON-SITE ALTERNATIVES ANALYSIS

With regards to onsite alternatives, ORCF has expended a significant amount of effort in reconfiguring the Wellsville site from the original site development concept. Alternative 7 represents the Proposed Site Plan/Minimal Degradation Alternative (Figure 2). This Alternative is the direct result of minimization and avoidance of wetland and stream impacts, to the extent possible.

As you can see from the table below, the progression of alternatives has directly led to the minimization of impacts to aquatic resources. It is understood that Alternatives 1 through 6 would also fulfill the project purpose and need, but with greater impacts to onsite natural resources. Therefore, these alternatives have been rejected.



	Alternative	Stream Impacts (linear feet)	Wetland Impacts (acres)	Pond Impacts (acres)
1	Original Site Plan/Maximum Degradation Alternative	14,537	1.92	1.08
2	Avoidance of Rocky Run Impacts	15,186	2.14	2.10
3	Preservation of Northern Drainage System	11,193	2.20	0.74
4	Preservation of Western Drainage System	9,932	1.68	1.65
5	Relocation of Fill to the South, 1 st Revision	10,430	1.90	0.29
6	Relocation of Fill to the South, 2 nd Revision	9,019	1.90	0.29
7	Proposed Site Plan/Minimal Degradation Alternative	8,745	1.71	0.29