



**WETLAND AND STREAM MITIGATION PLAN
PROPOSED OHIO RIVER CLEAN FUELS FACILITY
COLUMBIANA AND JEFFERSON COUNTIES
WELLSVILLE, OHIO**

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1.0 INTRODUCTION

The purpose of this plan is to provide stream and wetland mitigation for impacts associated with the proposed development of the Ohio River Clean Fuel (ORCF) facility located near Wellsville in Columbiana and Jefferson Counties, Ohio. The ORCF development site consists of approximately 649 acres located primarily along a ridge top adjacent to the Ohio River (Figure 1).

This plan has been drafted to comply with the Ohio Revised Code Section 6111.03 and Section 404 of the federal Clean Water Act. The plan will provide the basis for the construction/enhancement of streams and wetlands, which will provide replacement functions and values, for those impacted during the construction of the ORCF facility. This plan has been prepared to satisfy the requirements of the U. S. Army Corps of Engineers (Corps) and the Ohio Environmental Protection Agency (Ohio EPA).



2.0 PROPOSED IMPACTS

2.1 PROPOSED WETLAND IMPACTS

A total of 12 wetlands totaling 1.71 acre are proposed to be impacted. Wetlands 1 through 8, 17, 28, and 29 will be impacted as a result of their location within the proposed project area. Refer to Figure 2 for the location of all identified wetlands within the project area. Wetland 12 will be impacted by the creation of the wetland mitigation area. The following table summarizes the proposed wetland impacts, their classification, assessment category, regulatory status, minimum mitigation ratio, and proposed mitigation amount.

**TABLE 1
WETLAND IMPACT SUMMARY**

Wetlands	Acreage	Classification	ORAM Score	Category	Jurisdiction	Mitigation Ratio	Mitigation Acreage
Wetland 1	0.04	PEM	33	1 or 2 gray	Ohio EPA	1.5:1	0.06
Wetland 2	0.20	PEM	38	2 modified	Ohio EPA	1.5:1	0.30
Wetland 3	0.56	PEM	41	2 modified	Ohio EPA	1.5:1	0.84
Wetland 4	0.02	PEM	31	1 or 2 gray	Ohio EPA	1.5:1	0.03
Wetland 5	0.02	PEM	52	2	Ohio EPA	1.5:1	0.03
Wetland 6	0.01	PEM	31	1 or 2 gray	Corps/OEPA	1.5:1	0.02
Wetland 7	0.25	PEM	40	2 modified	Ohio EPA	1.5:1	0.38
Wetland 8	0.35	PEM	37	2 modified	Ohio EPA	1.5:1	0.53
Wetland 12	0.02	PEM	21	1	Corps/OEPA	1.5:1	0.03
Wetland 17	0.02	PEM	26	1	Corps/OEPA	1.5:1	0.03
Wetland 28	0.08	PEM	26	1	Ohio EPA	1.5:1	0.12
Wetland 29	0.14	PEM	19	1	Corps/OEPA	1.5:1	0.21
Total	1.71						2.57



The total proposed wetland impacts regulated by the Corps are 0.19 acres and the total proposed wetland impacts regulated by the Ohio EPA are 1.52 acres. All of the wetland impacts will be mitigated at a minimum of a 1.5:1 ratio, totaling a minimum of 2.57 acres of wetland mitigation.

2.2 PROPOSED STREAM IMPACTS

A total of 27 stream segments totaling 8,745 linear feet (l.f.) (1.66 miles) consisting of 1,701 l.f. of ephemeral, 4,295 l.f. of intermittent, and 2,749 l.f. of perennial stream are proposed to be impacted. All of the stream segments will be impacted by the proposed project except UNT-B, UNT-Bb, and UNT-Bc which will be impacted by the creation of the wetland mitigation area. Refer to Figure 2 for the location of all identified streams within the project area. Similar to the wetland impacts, the streams will be impacted as a result of their location within the project area. The following table provides a summary of the proposed stream impacts.

**TABLE 2
STREAM IMPACT SUMMARY**

Streams	Length (ft)	Classification	HMFEI Score	Stream Class	Jurisdiction	Mitigation Ratio	Mitigation Length (ft)
RR-A	20	Perennial	25	Class II	Corps/OEPA	1.5:1	30
RR-Aa	64	Ephemeral	0	Class I	Corps/OEPA	1.5:1	96
RR-Ab	179	Intermittent	1	Class I	Corps/OEPA	1.5:1	269
RR-Ac	840	Intermittent	0	Class I	Corps/OEPA	1.5:1	1,260
UNT-A	969	Perennial	10	Class II	Corps/OEPA	1.5:1	1,454
UNT-A	262	Ephemeral	0	Class I	Corps/OEPA	1.5:1	393
UNT-Aa	16	Perennial	8	Class II	Corps/OEPA	1.5:1	24
UNT-Aa	115	Ephemeral	0	Class I	Corps/OEPA	1.5:1	173
UNT-B	84	Perennial	17	Class II	Corps/OEPA	1.5:1	126
UNT-Bb	556	Intermittent	3	Class I	Corps/OEPA	1.5:1	835
UNT-Bc	123	Intermittent	3	Class I	Corps/OEPA	1.5:1	185
UNT-C (Isolated)	275	Intermittent	2	Class I	Ohio EPA	1.5:1	413
UNT-Ca (Isolated)	50	Intermittent	2	Class I	Ohio EPA	1.5:1	75
UNT-Ca1 (Isolated)	32	Ephemeral	0	Class I	Ohio EPA	1.5:1	48
UNT-D (Isolated)	828	Intermittent	2	Class I	Ohio EPA	1.5:1	1,242
UNT-Da (Isolated)	33	Ephemeral	0	Class I	Ohio EPA	1.5:1	50
UNT-Db (Isolated)	224	Ephemeral	1	Class I	Ohio EPA	1.5:1	336



Streams	Length (ft)	Classification	HMFEI Score	Stream Class	Jurisdiction	Mitigation Ratio	Mitigation Length (ft)
UNT-Dc (Isolated)	56	Ephemeral	0	Class I	Ohio EPA	1.5:1	84
UNT-Dc1 (Isolated)	162	Perennial	13	Class II	Ohio EPA	1.5:1	243
UNT-E	1,423	Perennial	18	Class II	Corps/OEPA	1.5:1	2,135
UNT-E	716	Intermittent	2	Class I	Corps/OEPA	1.5:1	1,074
UNT-Ea	187	Intermittent	0	Class I	Corps/OEPA	1.5:1	281
UNT-Ea	184	Ephemeral	0	Class I	Corps/OEPA	1.5:1	276
UNT-Eb	423	Ephemeral	0	Class I	Corps/OEPA	1.5:1	635
UNT-Ec	251	Ephemeral	0	Class I	Corps/OEPA	1.5:1	377
UNT-F	75	Perennial	8	Class II	Corps/OEPA	1.5:1	113
UNT-H (Isolated)	541	Intermittent	3	Class I	Ohio EPA	1.5:1	812
UNT-Ha (Isolated)	57	Ephemeral	1	Class I	Ohio EPA	1.5:1	86
Total Perennial	2,749						4,093
Total Intermittent	4,295						6,443
Total Ephemeral	1,701						2,552
Total Stream	8,745						13,118

The total proposed stream impacts regulated by the Corps totals 6,487 l.f. composed of 1,299 l.f. of ephemeral, 2,601 l.f. of intermittent, and 2,587 l.f. of perennial. The total proposed stream impacts regulated by the Ohio EPA and not the Corps (isolated), totals 2,258 l.f. composed of 402 l.f. of ephemeral, 1,694 l.f. of intermittent, and 162 l.f. of perennial. All of the stream impacts will be mitigated at a minimum of 1.5:1 resulting in a minimum of 13,118 l.f. (2.48 miles) of stream.

2.3 PROPOSED OPEN WATER IMPACTS

A total of 2 open water areas (manmade ponds) totaling 0.29 acre are proposed to be impacted (Figure 2). Pond A and B will be filled as a result of their location within the proposed project area. The following table summarizes the proposed pond impacts, regulatory status, minimum mitigation ratio, and proposed mitigation amount.



**TABLE 3
OPEN WATER IMPACT SUMMARY**

Open Water	Acreage	Jurisdiction	Mitigation Ratio	Mitigation Acreage
Pond A	0.12	Ohio EPA	1:1	0.06
Pond B	0.17	Ohio EPA	1:1	0.09
Total	0.29			0.29

The total proposed impacts to open water from the proposed project equals 0.29 acre. Both of these open water areas are isolated and are only regulated by the Ohio EPA. All of the open water impacts will be mitigated within the proposed wetland mitigation area at a minimum of 1:1 resulting in a minimum of 0.29 of open water mitigation.

2.4 STREAM AND WETLAND FUNCTIONS

The on-site wetlands, streams, and ponds provide some habitat for wildlife such as rearing, resting, and feeding habitat for certain terrestrial and wetland adapted species. Based on observations of animal tracks and plant life, the wetlands, streams, ponds, and surrounding woodlands provide foraging and feeding habitat, water sources, resting areas and escape cover for small vertebrates, snakes, rabbits, turkey, and white-tailed deer. To a limited extent, they also contribute to food chain production within the small headwater areas.

Wetlands 12, 17, 28, and 29 were scored using the Ohio Rapid Assessment Method (ORAM) version 5.0 as Category I wetlands. These wetlands support minimal wildlife habitat, and minimal hydrological and recreational functions. Wetlands 1, 4, and 6 were scored using the ORAM as Category 1 or 2 Gray Zone. These wetlands could have been Category 2 wetlands at one time but have experienced significant degradation and are providing minimal wildlife habitat, and minimal hydrological and recreational functions. Wetlands 2, 3, 7, and 8 were scored using the ORAM as Category 2 Modified and have experienced minor disturbances or have recovered from past disturbances. The Category 2 Modified wetlands provided higher quality wildlife habitat and



hydrological and recreational functions than Category 1 wetlands but do not provide these functions at the same level as Category 2 wetlands. Wetland 5 was scored using the ORAM as a Category 2 wetland. This wetland supports moderate wildlife habitat, and moderate hydrological and/or recreational functions.

Streams within the proposed project area were assessed using the Headwater Habitat Evaluation Index (HHEI) and Headwater Macroinvertebrate Field Evaluation Index (HMFIEI). The combination of these two evaluation indices categorized each of the identified streams into Primary Headwater Habitat (PHWH) stream classes. Class III streams usually are found to have native fauna adapted to cool-cold perennial flowing water characterized by a community of vertebrates (either cold water adapted species of headwater fish and/or obligate aquatic species of salamanders from the lungless family Plethodontidae), and/or a diverse community of benthic macroinvertebrates including cool water taxa, with larval life stages resident in the stream continuously on an annual basis. Class II streams are usually found to have a moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis. The native fauna of these streams is characterized by species of vertebrates (fish or salamanders) and/or benthic macroinvertebrates that are pioneering, headwater, temporary, and/or temperature facultative. Class I streams are usually found to be normally dry, with little or no aquatic life present. This type of primary headwater waterway is normally ephemeral, with water present for short periods of time due to infiltration from snow melt or storm water runoff.

The primary physical habitat distinction between a Class I and Class II-PHWH streams is the presence of flowing water or isolated pools for extended periods of time in Class II-PHWH stream channels during summer months. The primary biological distinction is that Class I-PHWH streams either have no species of aquatic life present, or if present, it is of relatively poor biological diversity.

Of the 27 stream segments proposed to be impacted by the project seven were classified as Class II streams and 20 were classified as Class I streams. Due to the site characteristics which include past



disturbances from mining and ongoing disturbances from all-terrain vehicles (ATV) a majority of the identified streams within the project area appear to be impaired.

Two ponds, A and B will be impacted by the proposed project. Pond A is located within an area that was previously strip-mined for coal and appears to have been created as a result of the past mining activity. Pond B is a man made impoundment located within a residential area. Both of these ponds are hydrologically isolated from adjacent surface water.

The proposed project site is located along a steep sided ridge top which overlooks the Ohio River. Most of the project area is dominated by deciduous forest, residential houses, and utility right-of-ways. Additionally, much of the forested habitat is slightly to severely disturbed by an on-going primitive campground, ATV park, and hunting club. Most of the buffers surrounding the identified aquatic resources have experienced historical and current disturbances and have not recovered or are still recovering. The disturbances to the upland habitat buffers are indirectly and directly affecting the quality of the identified aquatic resources as apparent in the wetland ORAM scores and the stream PHWH classes.

The mitigation presented in this plan will provide improved wetland and stream values and functions compared to the aquatic resources proposed to be impacted.



3.0 MITIGATION GOALS AND SUCCESS CRITERIA

3.1 MITIGATION GOALS

Mitigation goals serve as the basis for designing the mitigation projects and measuring success.

3.1.1 Wetlands

The overall goal of the wetland mitigation is to provide biologically diverse wetland habitats that contain higher functions and values when compared to those wetlands proposed to be impacted. This will be accomplished by offsetting the loss of 1.71 acres of wetlands with the creation of a minimum of 2.57 acres of wetland habitat (1.5:1 mitigation ratio) within the project site. These areas will provide high quality habitat for a variety of native plant and animal species and improve water quality within an unnamed tributary of the Ohio River.

3.1.2 Streams

The overall goal of the stream mitigation is to provide replacement and enhanced streams that will contribute to an overall improvement of watershed water quality when compared to those streams proposed to be impacted. This will be accomplished by offsetting the loss of 8,745 linear feet of stream with the preservation, enhancement, and restoration of a minimum of 13,118 l.f. of streams (1.5:1 mitigation ratio) within the adjacent ORCF-owned Rocky Run stream valley area. This stream mitigation will provide high quality habitat for a variety of native plant and animal species and improve water quality within the Yellow Creek watershed and, ultimately, the Ohio River.



3.2 SUCCESS CRITERIA

The mitigation success criteria measure the success or failure of the project in meeting the defined mitigation goals. The following criteria will be used to measure the success of the proposed mitigation in compensating for impacts to wetlands and streams by the proposed project.

3.2.1 Wetlands

- (1) To offset the loss of 1.71 acres of emergent wetlands by creating a minimum of 2.57 acres of upland buffer, wet shrub/emergent marsh and intermediate/deep marsh habitat. Additionally, within the wetland mitigation area a minimum of 0.29 acres of open water will be created to offset the loss of 0.29 acres of ponds.
- (2) Greater than 50% of the dominant plant species in the wetland mitigation area will be classified as obligate, facultative wetland, or facultative, according to Reed (1988). Planted woody vegetation in the wetland mitigation project area will have a minimum 80% survival rate and will show a positive increase in height at the end of each year of monitoring during the five-year monitoring period.
- (3) Wetland mitigation success will also be determined based upon native species composition, presence of invasive species, and overall wildlife usage. These success criteria will be determined by visual inspections during routine monitoring of the wetland mitigation site.

3.2.2 Streams

- (1) To offset the loss of 8,745 l.f. (1.66 miles) of streams by creating a minimum of 13,118 l.f. (2.48 miles) of stream mitigation consisting of exclusion fencing, flood plain seeding/planting, vernal pool creation, vernal pool enhancement, wetland enhancement, and sediment trap/wetland creation areas along Rocky Run. For the exclusion fencing, the



success will be determined when ATV traffic is prevented from impacting the stream and the riparian buffer is reestablished between the stream and fencing.

- (2) Stream mitigation will be deemed a success when the habitat assessment scores, in accordance with the Ohio EPA's QHEI scoring parameters, increase 20% and when the IBI scores show that Rocky Run is within attainment of its WWH designation after 5 years. Improvements will be measured against the baseline data presented in CEC's December, 2007 Benthic Macroinvertebrate and Fish Community Data Report presented in Appendix D of the 401/404 permit application.

Upon approval of this mitigation plan by reviewing agencies, ORCF will assume responsibility for achieving the success criteria specified above. Success monitoring and reporting will be required for five years following construction of the mitigation project. Refer to Section 4.7 and 5.6 of this Mitigation Plan for details relating to monitoring and reporting.



4.0 WETLAND MITIGATION

4.1 SITE SELECTION

The proposed wetland mitigation site has many desirable qualities that led to its selection. First, the proposed mitigation site is located adjacent to the Project site and within the same Ohio River headwater watershed as most of the proposed wetland impacts. Second, the configuration and size of the cleared/farmed area is conducive to wetland creation. Third, the wetland mitigation site has a desirable source of hydrology. Fourth, the area had been previously cleared for livestock grazing, significantly reducing clearing and grubbing costs. Last, and maybe most obvious, the presence of an existing developed spring, intermittent streams, and a wetland indicates that the area can and does support wetland hydrology. The existing developed spring and wetland also provided a valuable “biological benchmark” that was used in the design of the mitigation area.

4.2 WETLAND CREATION

ORCF proposes to construct a total of 4.34 acres of created wetland consisting of wet shrub/emergent marsh habitat, intermediate/deep marsh habitat, open water habitat, and upland buffer habitat on ORCF-owned property contiguous with the Project (see Figure 1). The property consists of pasture fields, prior converted wetlands, drainage swales, intermittent streams, and a developed spring currently being used as a watering source for cattle. The mitigation plan calls for grading one large area to create topography that will retain wetland hydrology and planting this area with aquatic, wetland, and upland vegetation. The grading plan, planting plan, and plant specifications for the onsite wetland mitigation area is shown on Figure 3.

4.2.1 Grading Plan

The grading plan incorporates depressional topography, an elevated berm, and a water control outlet structure to maintain a seasonal high water table in the various wetland habitats. The depressional



topography will collect precipitation from approximately 40 acres of upland drainage, two intermittent streams, and the existing spring.

The approximate base elevations of land surface relative to the estimated pool elevation of the created wetland cells are summarized for each plant community in the following table.

**TABLE 4
WETLAND DESIGN CRITERIA SUMMARY**

Habitat Type	Hydrologic Design Criteria	Approximate Acreage
Upland Buffer Habitat	> 2.5 feet above Pool Elevation	1.74
Wet Shrub/Emergent Marsh Habitat	0.0 to 2.5 feet above Pool Elevation	1.40
Intermediate/Deep Marsh Habitat	0.0 feet to 3.0 feet below Pool Elevation	0.79
Open Water Habitat	> 3.0 feet below Pool Elevation	0.41
TOTAL		4.34

4.2.2 Wetland Hydrology

The hydrology of the replacement wetland will be maintained by a combination of surface water runoff, intermittent streams, and the interception of the local groundwater table. A water control structure will be installed between the wetland and the down slope perennial stream within a constructed berm to regulate the water level within the designed wetland area. Direct precipitation will also augment wetland hydrology.

4.2.3 Wetland Plant Communities

The wetland vegetation specified within this mitigation plan includes the use of trees, shrubs, herbaceous, and aquatic vegetation to create a diverse wetland complex that provides wildlife habitat using native regional plant communities. Many of the wetland plant species were selected based



primarily on wetland plant species found within the onsite wetlands that will be impacted. Selection of temporary and permanent wetland and upland herbaceous seed mixtures was also based on the commercial availability of products. The plant communities specified for the wetland mitigation areas are described below and shown on Figure 3. Planting specifications are also provided on Figure 3.

Upland Buffer Habitat (1.74 acres)

The upland habitat adjacent to the wet shrub/emergent marsh habitat area will include silver maple (*Acer saccharinum*), pin oak (*Quercus palustris*), and green ash (*Fraxinus pennsylvanica*). This community typically occurs at the upland edges of marshes. The upland habitat surrounding the wetland mitigation area will also be planted with species selected to provide mast and for their potential to provide bat roosting habitat. These species include red maple (*Acer rubrum*), shagbark hickory (*Carya ovata*), and white oak (*Quercus alba*).

The variable upland buffer is proposed around the boundary of the wetland mitigation area. The upland buffer will be planted on all side slopes and surrounding upland areas of the excavated mitigation area. The upland buffer will be seeded with warm season grasses designed to provide both food and shelter for wildlife and planted with a mixture of mast producing trees.

Wet Shrub/Emergent Marsh Habitat (1.40 acres)

The Wet Shrub component of the wetland will include sandbar willow (*Salix interior*), black willow (*Salix nigra*), nanny berry (*Viburnum lentago*), winter berry (*Ilex verticillata*), elderberry (*Sambucus canadensis*), and silky dogwood (*Cornus amomum*). These communities typically occur between upland habitats and the edges of marshes where seasonal high water tables occur.

The emergent marsh component of the wetland will be dominated by various sedges (*Carex spp.*), burreeds (*Sparganium spp.*), bulrushes (*Schoenoplectus spp.*) swamp milkweed (*Asclepias*



incarnata), blue flag (*Iris versicolor*), and soft rush (*Juncus effusus*). The emergent marsh habitat will be subject to variable water levels during the year, but the core species require shallow inundation for a portion of the growing season.

Intermediate/Deep Marsh Habitat (0.79 acre)

The intermediate/deep marsh planting habitat features woody shrubs, emergent, and floating-leaved rooted vegetation including arrow arum (*Peltandra virginica*), swamp smartweed (*Polygonum amphibium*) pickerelweed (*Pontederia cordata*), and button bush (*Cephalanthus occidentalis*). Other wetland vegetation from the emergent marsh zone will overlap into this area and provide ecological diversity.

Open Water Habitat (0.41 acre)

This habitat will be created to mitigate the open water (pond) impacts within the proposed Project and to provide habitat diversity within the wetland mitigation area. The open water habitat will be enhanced with boulders, logs, and standing snags.

The proposed wetlands will exhibit a wide range of hydrologic regimes due to the micro-topography constructed with these varying habitat elevations. The wet shrub/emergent marsh habitat should exhibit a seasonally saturated to a seasonally flooded/semi-permanently saturated soils moisture regime. The intermediate/deep marsh habitat will be located in depressions and will have a semi-permanently flooded to permanently flooded hydro-period. Lastly, the open water habitat will exhibit a permanently flooded hydro-period.

4.3 ANTICIPATED WETLAND FUNCTIONS

The wetland mitigation area has been designed to provide replacement hydrologic and ecological functions equal to or greater than the proposed impacted wetland areas at the proposed Project.



ORCF expects that the depressional topography of the wetland replacement area will provide a more diverse habitat for flora and fauna and will provide enhanced water quality functions compared with the proposed impacted wetlands. As previously stated, the majority of impacted wetlands (1.52 of the 1.71 acres or 89%) are “isolated” and provide limited values and functions.

Wildlife habitat will be enhanced by the construction of a wetland complex with a high level of horizontal and vertical habitat interspersions. The depressional area will provide breeding habitat for amphibians. The open water, marsh, and upland habitat will provide feeding, resting and rearing habitat for migratory and resident birds, amphibians, reptiles, and mammals.

4.4 HABITAT ENHANCEMENT FEATURES

The proposed wetland mitigation design includes several wildlife amenities that will enhance the overall wildlife habitat at the site. These include the installation of one 7-chamber bat box. The bat box will be mounted on a 16-foot pressure treated post to provide maternity roosts that can house approximately 300 bats. Additionally, one wood duck box will be installed adjacent to the open water area. The wood duck box will be installed approximately 52 to 60 inches above the high water elevation on a pressure treated post equipped with a predator guard. Additionally, several bluebird boxes will be installed within the upland buffer area.

The wetland design also includes the placement of standing snags to provide perching areas for birds and downed logs to provide habitat for amphibians and reptiles. The standing snags should be a minimum of 12 inch diameter at breast height (dbh) and stand a minimum of 20 feet above the pool elevation. Downed logs should be a minimum of 12 inch dbh and minimum of 30 feet long. The downed logs should be arranged in a criss-cross fashion and span the various habitat types to create transition passageways. Rock piles have been incorporated to provide additional breeding habitat and sunning areas for reptiles and amphibians. Rock should be a minimum of 12 inches and should be stacked a minimum of 12 inches above the water level. Rock can be obtained from the site during grading operations. No riprap will be used.



4.5 CONSTRUCTION OF THE WETLAND MITIGATION AREA

4.5.1 Construction Schedule

It is anticipated that grading/filling of the wetland replacement areas identified in this plan will be initiated in 2010 or possibly 2011. Herbaceous wetland plantings will be installed during the fall (September 1 to October 15) or spring (April 15 to May 15). Planting of dormant trees and shrubs shall be done in the fall (September 15 to November 15) or spring (April 15 to May 15). Seed mixtures will be sown in the fall (October through November) or early spring (April). Within 24-hours following seeding, weed-free straw mulch will be placed in those areas not inundated with water. Refer to the Notes section on Figure 3 for additional information relating to planting and seeding.

A temporary seed mixture will be used to stabilize the mitigation site if the construction sequence is delayed more than 30 days between grading and planting of the areas, or if final planting is delayed until after October 15. Temporary seeding will only include switch grass (*Panicum virgatum*).

4.5.2 Erosion Control Measures

The following guidelines are provided to ensure adequate erosion and sedimentation measures during construction of the wetland mitigation areas specified by this plan.

- Reduce the area and length of time that the site is cleared and graded.
- Limit the amount of disturbed area exposed at any one time.
- Provide immediate vegetative stabilization of disturbed areas.
- Strict adherence to the design plans and specifications contained herein.

Given the flatness of topography and the “bowl-like” nature of the area, the primary erosion control materials to be used during wetland construction will include silt fences and straw bales (as needed).



These materials will be installed at down gradient locations and other areas on the site where earth is to be disturbed in order to confine sediment.

Temporary and permanent revegetation of exposed soils will be performed by seeding and planting replacement wetlands and disturbed upland areas with appropriate grasses, forbs and woody plants. Since the goal of the project is ecological mitigation, plant species have been carefully selected for both their ability to control erosion and for their roles in providing beneficial ecological functions.

4.5.3 Construction Sequence

Rough grading of the wetland mitigation areas will be performed to the grade elevations shown on Figure 3. These grades represent the top of replaced topsoil.

Planting of trees and shrubs shall be done in the fall (September 15 to October 15) or spring (April 15 to May 15) following permanent seeding and when plants are dormant. Plants shall be of the size and type specified on Figure 3, unless the owner or representative for the owner approves substitutions.

The following construction sequence is anticipated for the wetland mitigation project:

- Installation of erosion control features;
- Establish survey control/wetland stakeout;
- Removal and stockpiling of all existing topsoils and wetland soils in an area adjacent to the mitigation site;
- Rough grading of site;
- Fine grading of the mitigation area to a depth of one foot below final grades;
- Placement of one foot of stockpiled topsoil/wetland soils;
- Installation of stock plant material;
- Seeding and mulching of all wetland and disturbed areas. Temporary seeding, if necessary;



4.6 CONSERVATION OF ON-SITE RESOURCES

The wetland that will be constructed as part of the mitigation will be protected in perpetuity, via an Environmental Covenant or Conservation Easement prepared by ORCF. Figure 3 identifies the area surrounding the wetland mitigation site that will be protected in perpetuity. ORCF will forward a copy this Environmental Covenant or Conservation Easement once the 401/404 permit application has been approved by the Corps and Ohio EPA.

4.7 MONITORING AND MAINTENANCE PLAN

4.7.1 Site Inspection Schedule

Monitoring and maintenance of the wetland mitigation area will be conducted for a period of five years by ORCF. Monitoring will occur bi-annually (spring and fall) during the first two years after the wetland mitigation area is constructed and annually (fall) during the final three years of monitoring. The first monitoring event will be conducted after the end of the first active growing season (September 1 - October 30). A person qualified to evaluate wetlands will conduct the monitoring work.

4.7.2 Monitoring Parameters and Reporting

Yearly reports with photographs will be submitted to the Corps and Ohio EPA within 90 days of each late-summer/fall inspection. The monitoring reports will include the following information:

- Identification of wetland plant species, ranked in order of dominance, for each wetland plant community type.
- An estimate of percent aerial coverage of the dominant plant species.
- Water depth and estimated hydro-period of the monitoring area.



- Photographs taken from permanent photo stations. A plan showing the location and orientation of each photograph will also be included.
- Observations of wildlife usage.
- The presence of invasive and/or exotic vegetation.
- Notes relating to the water level and the water control structure and the need to raise or lower water level within the wetland.
- Problems encountered, if any, and a written plan to correct any deficiencies identified during the monitoring phase.
- An assessment of compliance with the mitigation success criteria.

If the constructed wetland has not achieved the design objectives within the monitoring period, remedial work will be required to assure establishment of a minimum of 2.57 acres of functional wetlands. Corrective actions and remedial measures may include replanting vegetation or regrading, as necessary; and other reasonable actions and measures necessary for the success of the mitigation project. Replacement wetlands shall be considered successful when they meet the design objectives as stated in the approved wetland mitigation plan.



5.0 STREAM MITIGATION

5.1 SITE SELECTION

In order to provide adequate compensation for 8,745 feet of stream impacts, ORCF performed an extensive search for stream mitigation sites. The search for stream mitigation began on-site and expanded throughout Columbiana and Jefferson Counties, Ohio within the Yellow Creek and Little Beaver Creek watersheds.

ORCF contracted with Civil & Environmental Consultants, Inc. (CEC) to identify potential stream mitigation projects adjacent to the proposed project and within ORCF site. CEC subsequently contacted the Columbiana and Jefferson County Soil and Water Conservation Districts to discuss potential mitigation projects within their respective counties. ORCF teamed with Crossroads Resource Conservation and Development Council, Inc. (Crossroads RC&D) to establish an avenue to compensate the Conservation Districts for identifying potential stream mitigation sites within the Yellow Creek and Little Beaver Creek watersheds.

The Conservation Districts assisted ORCF by identifying several potential stream mitigation sites throughout Columbiana and Jefferson Counties. These mitigation sites included agriculturally degraded streams, streams that had been historically culverted or tile drained, and any other unstable stream channels. CEC identified several potential stream mitigation sites within, and adjacent to, the proposed ORCF project. ORCF then deliberated over each stream mitigation project that was identified to determine their proposed stream mitigation plan. Factors that contributed to the final stream mitigation selection included: location relevant to the proposed project, cost, feasibility, sustainability, constructability, anticipated results, and potential for watershed improvement.

After reviewing all of the available stream mitigation projects and soliciting input from the Conservation Districts, CEC, the Ohio EPA, and the Corps, ORCF decided to focus their effort on rehabilitating Rocky Run and protecting its associated riparian corridor. The proposed stream



mitigation site has many desirable qualities that led to its selection. First, the proposed mitigation site is located adjacent to the project site and within the same sub-watershed of the Ohio River as the proposed stream impacts (Figure 1). Second, Rocky Run is significantly degraded by unrestricted ATV use. Third, the stream mitigation site includes a forested riparian corridor, existing wetlands, degraded vernal pools, and potential areas for wetland creation/enhancement. Fourth, since ORCF will control the corridor adjacent to Rocky Run they will be able to control external factors such as ATV's that would potentially affect the integrity of the mitigation. Finally, ORCF anticipates that restoration of Rocky Run will have the greatest impact to regional water quality.

Based on conversations with Ohio EPA, CEC used the methodology described within the draft document titled *Compensatory Mitigation Requirements for Stream Impacts in the State of Ohio, Revision 4.0*. Although it has not been finalized, this draft document was released by the Ohio EPA on April 14, 2004 and is a useful tool in evaluating mitigation using a credit and debit system. A more detailed discussion is provided in Section 6.0 of this report.

5.2 ROCKY RUN

5.2.1 Existing Conditions

The proposed development project is located within the Yellow Creek sub-watershed of the Upper Ohio drainage area. The Yellow Creek sub-watershed, located in the Western Allegheny Plateau Eco-region, is dominated by historically coal mined areas, agricultural land, and forested areas encompassing approximately 240 square miles. Rocky Run, a tributary of Yellow Creek is dominated by forested habitat with some agricultural land within its 3 square mile drainage area. Yellow Creek and Rocky Run have been designated by the State of Ohio as Warm Water Habitat (WWH) identified in rule 3745-1-13 (Central Ohio tributaries drainage basin) of Chapter 3745-1, Water Quality Standards, of the Ohio Administrative Code. The WWH designation for Rocky Run is based on the 1978 water quality standards and is not based on the results of a biological field



assessment performed by the Ohio EPA. Based on previous conversations with Ohio EPA, CEC understands that Rocky Run has not been assessed to date.

Currently, the central and lower portions of Rocky Run are severely degraded by unrestricted access of ATVs across, through, and adjacent to its channel. As a result of this ATV traffic, extensive siltation and sedimentation have diminished the overall quality of Rocky Run has suffered. Photographs 1 - 6, presented in Attachment A, contain typical views of the disturbed Rocky Run stream channel and riparian corridor. As previously mentioned, CEC performed a biological assessment of Rocky Run and other streams within the proposed project area in the Fall of 2007. The results of this biological assessment indicate that a large portion of Rocky Run is not within attainment of its Ohio EPAWWH designation.

As discussed in the Benthic Macroinvertebrate and Fish Community Data Report (Appendix D), three sampling stations were established within Rocky Run. Station RR-01 was located downstream of the proposed project site, near the confluence of Rocky Run and Yellow Creek (Attachment A, photo 7). Station RR-02 was located further upstream on Rocky Run near the southern portion of the ORCF project and directly downstream of the confluence with Tributary RR-A (Attachment A, Photo 8). This section of the stream, floodplain, and riparian corridor was extensively disturbed by ATVs. Station RR-03 was located further upstream on Rocky Run above the confluence with Tributary RR-D (Attachment A, photo 9). Refer to Figure 4 for sampling locations. The following table presents a summary of the results from the Benthic Macroinvertebrate and Fish Community Data Report.

