

# River Pointe Logistics Center Mitigation Plan

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**Prepared For:**

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## Value Engineering Inc



Supporting Community Goals with Professional Service and Solutions

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## 1.0 OBJECTIVE

The developer, River Pointe Logistics, LLC, is proposing to construct several warehouse/distribution buildings on this property. The project site is between Potomac Street and River Road in Upper Mount Township, Northampton County, PA. The site contains 820 +/- acres, consisting of cultivated fields and managed woodlands. The property consists of twenty-five (25) tax parcels (C11 26 2; C11 31 1; C11 31 1A; C11 31 3; C11 31 4; C11 31 5; C12 3 4; C12 3 5; C12 6 1; C12 6 1A; C12 6 2; C12 6 3; C12 6 4; C12 6 4A; C12 6 4B; C12 6 4C; C12 6 4D; C12 6 4E; C12 6 5; C12 6 6; C12 6 7; C12 6 8; C12 8 1A; D11 5 1A 4; D11 6 3).

The project is proposed to permanently impact 0.12 acres (5,245 square feet) of Jurisdictional Wetlands and 0.38 acres (16,751 square feet) of Non-Jurisdictional Wetlands, totaling 0.50 acres (21996 square feet) of total impacts. The total required wetland mitigation area is, as calculated in the tables below:

Table 1a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft <sup>2</sup> )	Mitigation Ratio	Required Mitigation Area (ft <sup>2</sup> )	Provided Mitigation Area (ft <sup>2</sup> )
WE-24	PFO	5,245	2:1	10,490	10,490

Table 1b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft <sup>2</sup> )	Mitigation Ratio	Required Mitigation Area (ft <sup>2</sup> )	Provided Mitigation Area (ft <sup>2</sup> )
WE-2	PFO	3,172	2:1	6,334	6,334
WE-3	PFO	1,476	2:1	2,952	2,952
WE-8	PFO	747	2:1	1,494	1,494
WE14	PEM	3,524	1:1	3,524	3,524
WE-38	PEM	454	1:1	354	354
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,160	2:1	4,320	4,320

## 2.0 SITE SELECTION

The mitigation area locations were selected to provide maximum retention of wetlands as well as enhance existing protected wetlands. There is sufficient area available to provide mitigation for the impacted areas on-site.

## 3.0 SITE PROTECTION INSTRUMENTS

The wetland mitigation areas will be provided long-term protection through the establishment of a conservation easement, that is attached to this document. This conservation easement establishes that both the US Army Corps of Engineers (USACOE) and the Pennsylvania Department of Environmental Protection (PADEP) have the right to enforce site protections. A copy of the Conservation Easement will be provided.

## 4.0 BASELINE INFORMATION

### NATURAL FEATURES INVENTORY

#### 4.1 Site Location

The site is located along both sides of Marshfield Drive, in Upper Mount Bethel Township, Northampton County, PA in a rural area. The land was formerly owned by the Portland Generating Station as a natural buffer and no structures were constructed on the approximate 730-acre property.

#### 4.2 Current Land Use

The site is currently maintained as agricultural fields and woods. There are no existing structures on the property.

#### 4.3 Setting

The site is located within a rural area with steep elevations from the northern and western portions of the property to the eastern portion, where the unnamed tributaries join the Delaware River. The site is bordered by Potomac Street to the West, Pine Tree Lane to the South, River Road to the East, and North Delaware Street (PA-611) to the North.

The site lies within the Great Valley Physiographic Province. The upland area is developed from both Wisconsin and Illinoian-Age glacial till deposits overlying the bedrock.

The elevation ranges from approximately 650-ft asl in the western portion of the property to approximately 330-ft asl where the property meets River Road. There are four un-named tributaries which create sub-watersheds on this property:

- Unnamed tributary 14878 – this sub-watershed is just south of PA-611 and drains the northernmost portion of the property.
- Unnamed tributary (not shown on any reference maps) – this sub-watershed is just north of Marshfield Drive and drains most of the land north of Marshfield Drive that does not drain into 1478.
- Unnamed tributary 14877 – this subwatershed drains land the western portion of the property, up to its confluence with Unnamed tributary 18982.
- Unnamed tributary 18982 – this subwatershed drains the southern portion of the property, primarily south of the gravel pit, up to its joining with the Delaware River.

## 5.0 REVIEW OF SECONDARY DATA

The following paragraphs contain a result summary of the secondary data review (“desktop” review) conducted prior to the field investigation. The summary includes a description of general mapped site conditions and any indicators of wetland conditions identified from the resource maps. Mapping review consisted of the Portland U.S. Geological Survey (USGS) 7.5-Minute topographic quadrangle, the Web Soil Survey of Northampton County, the National Wetland Inventory (NWI), and aerial imagery. A USGS Map and a Wetland Delineation Plan displaying the aerial imagery, soils, and NWI wetlands are located in Appendices A and E, respectively.

#### 5.1 USGS 7.5-Minute Quadrangle

The site appears on the Portland USGS 7.5-minute topographic quadrangle sheet (Latitude: 40°54'00.5"N; Longitude: 75°05'25.2"W). The quadrangle sheet depicts unnamed tributaries, 14877, 14878, and 18982, (Refer to Appendix A for the USGS Map).

## 5.2 National Wetland Inventory

The National Wetland Inventory (NWI) map has identified six (6) features on the site. The features are as follows:

- 1.26 acre pond (PUBHh)
- 1.15 isolated freshwater forested shrub wetland (PF01B)
- 0.28 isolated freshwater forested shrub wetland (PF01B)
- 0.87 freshwater forested shrub wetland associated with unnamed trib. 14877 (PF01B)
- 0.52 freshwater forested shrub wetland associated with unnamed trib. 14877 (PSS1E)
- 0.44 freshwater forested shrub wetland associated with unnamed trib. 18982 (PF01B)

Refer to Appendix B for wetland mapping.

## 5.3 Web Soil Survey

The Natural Resources Conservation Service (NRCS) display thirty-four (34) soil map units on this site. The soil units are described below in Table 1 as well as in Appendix C. (Refer to the table below and the Plan Set for details regarding the soil map units and their physical properties.)

Table 2. Soil Survey Information

Soil Series	Soil Map Units	Soil Type	Drainage Class	Depth to Restrictive Feature	Depth to Water Table	Landform Setting	Parent Material
Arnot	AtB; AtC; AtD	Arnot 90%	Well	10-20" to Lithic Bedrock	>80"	Valley Sides	Glacial Till
Berks-Weikert	BkF	Berks 65% Weikert 25%	Well	Berks – 20-40" to Lithic Bedrock; Weikert 9-20" to Lithic Bedrock	>80"	Backslopes	Shale Residuum
Chippewa	ChA; ChB; CkB	Chippewa 85%	Poorly	8 to 20" to Fragipan	0-6"	Depressions	Glacial Till
Conotton	CtA; CtB; CtC; CtD; CtF	Conotton 100%	Well	>80"	>80"	Terraces	Glacial Outwash
Delaware	DaA	Delaware 90%	Well	72-99" to Lithic Bedrock	>80"	Terraces	Alluvium
Halsey	Ha	Halsey 90%	Very Poorly	>80"	0-6"	Floodplains	Alluvium
Manlius	MaB; MaC; MaD	Manlius 90%	Well	20-40" to Lithic Bedrock	>80"	Backslopes	Glacial Till

Soil Series	Soil Map Units	Soil Type	Drainage Class	Depth to Restrictive Feature	Depth to Water Table	Landform Setting	Parent Material
Penargyl	PgB	Penargyl 100%	Well	72-99" to Lithic Bedrock	>80"	Footslopes	Colluvium
Phelps	PhB	Phelps 90%	Moderately Well	>80"	18-24"	Terraces	Glacial Outwash
Red Hook	RhB	Red Hook 95%	Somewhat Poorly	>80"	6-18"	Footslopes	Glacial Outwash
Rubble Land	RU	Rubble Land 75%	Excessively	40-72" to Lithic Bedrock	>80"	Backslopes	Mined Materials
Swartswood	SvB; SvC	Swartswood 90%	Well	20-36" to Fragipan	33-36"	Backslopes	Glacial Till
Swartswood and Wurtsboro	SwB	Swartswood 55% Wurtsboro 30%	Well/Mod. Well	17-36" to Fragipan; 60-120" to Lithic Bedrock	12-36"	Back/Foot Slopes	Glacial Till
Udorthents	Uc	Udorthents 85%	Somewhat Poorly	>80 inches	12-30"	Disturbed Landscapes	Human Made
Urban Land-Conotton	UmB	Urban Land 65% Conotton 25%	Well	10-100" to Lithic Bedrock	>80"	Disturbed Landscapes	Human-Made
Urban Land-Delaware	UnB	Urban Land 65% Delaware 25%	Well	10-100" to Lithic Bedrock	>80"	Disturbed Landscapes	Human-Made
Volusia	VoB; VuB	Volusia 85%	Somewhat Poorly	10-22" to Fragipan	6-18"	Toeslopes	Glacial Till
WATER	W						
Wurtsboro	WuB; WuC	Wurtsboro 90%	Moderately Well	17-28" to Fragipan; 60-120" to Lithic Bedrock	12-30"	Footslopes	Glacial Till

Listed below is a brief description of each soil series:

- Arnot – Shallow, well-drained soils that formed in thin layers of glacial till overlying the sandstone bedrock. These soils, as well as any inclusions within the map unit, are generally non-hydric.
- Berks – Moderately deep, well-drained soils that formed from the residual shale bedrock. These soils, as well as any inclusions within the map unit, are generally non-hydric.

- Chippewa – Very deep, poorly drained soils that formed in glacial till. These soils are generally found to be hydric.
- Conotton – Very deep, well drained soils that formed in glacio-fluvial (glacial outwash) materials. These soils, as well as any inclusions within the map unit, are generally non-hydric.
- Delaware – Very deep, well drained soils that formed in old alluvium on stream terraces. While Delaware soils are non-hydric, there may be hydric soil inclusions present, given the landscape position.
- Halsey – Very deep, very poorly drained soils that formed in floodplains. These soils are frequently found to be hydric.
- Manlius – Moderately deep, well-drained soils that formed in thin layers of glacial till overlying the sandstone bedrock. These soils, as well as any inclusions within the map unit, are generally non-hydric.
- Penargyl – Very deep, well drained soils that formed in colluvium materials. These soils, as well as any inclusions within the map unit, are generally non-hydric.
- Phelps – Very deep, moderately well drained soils that formed in glacio-fluvial (glacial outwash) materials. While Phelps soils are non-hydric, there may be hydric soil inclusions present, given the landscape position.
- Red Hook - Very deep, somewhat poorly drained soils that formed in glacio-fluvial (glacial outwash) materials. While Red Hook soils are non-hydric, there may be hydric soil inclusions present, given the landscape position.
- Rubble Land – Disturbed landscapes often associated with mining. These areas are generally non-hydric.
- Swartswood - Very deep, well-drained soils that formed in glacial till. These soils, as well as any inclusions within the map unit, are generally non-hydric.
- Udorthents - Disturbed landscapes often associated with land clearing. These areas are generally non-hydric.
- Urban Land – Landscapes that have been impacted by (non-agricultural) human activities. These areas are generally non-hydric.
- Volusia - Very deep, somewhat poorly drained soils that formed in glacial till. While Volusia soils are non-hydric, there may be hydric soil inclusions present, given the landscape position.
- Weikert - Shallow, well-drained soils that formed from the residual shale bedrock. These soils, as well as any inclusions within the map unit, are generally non-hydric.



- Wurtsboro - Very deep, moderately well drained soils that formed in glacial till. These soils, as well as any inclusions within the map unit, are generally non-hydric.

#### 5.4 Aerial Imagery

Aerial imagery (ESRI basemap 2010 imagery) was utilized through the Northampton County Tax Parcel Viewer. The aerial imagery displays the agricultural fields and woodlands on the site. Additionally, the pond on the property can be identified.

### 6.0 EXISTING WETLANDS INVENTORY

There are 43 identified wetlands on the property, totaling, 32.27 acres. Of these 43 identified wetlands:

- 27 are identified as Jurisdictional
  - 6 are identified as Emergent (PEM)
  - 2 are identified as Scrub/Shrub (PSS)
  - 19 are identified as Forested (PFO)
- 16 are identified as Non-Jurisdictional
  - 9 are identified as Emergent (PEM)
  - 7 are identified as Forested (PFO)

There are thirteen (13) Waters present on the property, totally 16,468 linear feet. Of these 13 Waters:

- 8 are identified as Jurisdictional
- 5 are identified as Non-Jurisdictional

Table 3a. Existing Wetland Inventory

Wetland #	Latitude	Longitude	Size (ft <sup>2</sup> )	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
1	40.911942	-75.101419	92,875	2.13	PEM	Jurisdictional
2	40.906947	-75.097363	56,957	1.31	PFO	NON-Jurisdictional
3	40.904726	-75.099295	73,071	1.68	PFO	NON-Jurisdictional
4	40.910158	-75.087879	141,333	3.24	PFO	NON-Jurisdictional
5	40.907564	-75.089360	86,125	1.98	PFO	Jurisdictional
6	40.906809	-75.088325	1,676	0.04	PEM	Jurisdictional
7	40.906665	-75.088727	6,296	0.14	PEM	Jurisdictional
8	40.906173	-75.089988	5,807	0.13	PFO	NON-Jurisdictional
9	40.905791	-75.089501	10,901	0.25	PFO	NON-Jurisdictional
10-11	40.903580	-75.099375	17,403	0.40	PSS	Jurisdictional
13	40.902178	-75.099833	111,088	2.55	PFO	Jurisdictional
14,15,16,17	40.904180	-75.093343	55,339	1.27	PEM	NON-Jurisdictional
18	40.898118	-75.100707	221,831	5.09	PEM	Jurisdictional
19	40.901894	-75.095204	669	0.02	PFO	Jurisdictional
20	40.900384	-75.095835	70,286	1.61	PEM	Jurisdictional
21	40.902236	-75.091300	626	0.01	PFO	Jurisdictional
22	40.900647	-75.093143	32,083	0.74	PFO	Jurisdictional
23	40.90251	-75.091862	4,963	0.11	PEM	Jurisdictional
24	40.903724	-75.090065	7,192	0.17	PFO	Jurisdictional
25	40.900862	-75.084698	2,261	0.05	PFO	Jurisdictional
26	40.897262	-75.085667	2,203	0.05	PFO	Jurisdictional

Wetland #	Latitude	Longitude	Size (ft <sup>2</sup> )	Size (ac)	Type	Jurisdictional/NON-Jurisdictional
27	40.896778	-75.085705	19,574	0.45	PFO	Jurisdictional
28-29	40.895900	-75.086427	2,857	0.07	PFO	Jurisdictional
30	40.896478	-75.086235	3,940	0.09	PFO	Jurisdictional
31	40.896831	-75.086500	17,484	0.40	PFO	Jurisdictional
32	40.89660	-75.087143	198	0.004	PFO	Jurisdictional
33	40.896960	-75.088496	41,526	0.95	PFO	Jurisdictional
34	40.895997	-75.090794	1,038	0.02	PFO	Jurisdictional
35	40.896375	-75.087760	1,372	0.03	PFO	Jurisdictional
36	40.895858	-75.088627	583	0.01	PFO	Jurisdictional
37	40.895342	-75.089757	361	0.01	PFO	Jurisdictional
38	40.906202	-75.094356	454	0.01	PEM	NON-Jurisdictional
39	40.905530	-75.094901	4,047	0.09	PEM	NON-Jurisdictional
40	40.894297	-75.109014	2,160	0.05	PFO	NON-Jurisdictional
41	40.905653	-75.089080	910	0.02	PFO	NON-Jurisdictional
42	40.895183	-75.101252	44,541	1.02	PEM	NON-Jurisdictional
43	40.890279	-75.107332	103,314	2.37	PEM	NON-Jurisdictional
44	40.896049	-75.107198	160,144	3.68	PEM	NON-Jurisdictional
TOTAL			1,405,488	32.27		

Table 3b. Waters Inventory

Waters #	Latitude	Longitude	Size (ft <sup>2</sup> )	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
1	40.908311	-75.086319	6,405	0.15	Unnamed Tributary to the Delaware	Jurisdictional
2	40.908867	-75.086940	6,392	0.15	Unnamed Tributary to the Delaware	NON-Jurisdictional
3	40.903648	-75.098789	3,487	0.08	Unnamed Trib 14877	Jurisdictional
4	40.904339	-75.094091	1,024	0.02	Unnamed Trib 14877	NON-Jurisdictional
5	40.900922	-75.097271	3,694	0.08	Unnamed Trib 14877	NON-Jurisdictional
6	40.901306	-75.095786	65,007	1.49	Unnamed Trib 14877	Jurisdictional
7	40.900997	-75.095267	2,979	0.07	Unnamed Trib 14877	Jurisdictional
8	40.902838	-75.095972	40,024	0.92	Unnamed Trib 14877	Jurisdictional
9	40.901089	-75.084967	28,326	0.65	Unnamed Trib 14877	Jurisdictional
10	40.901216	-75.085354	30,244	0.69	Unnamed Trib 14877	Jurisdictional
11	40.896240	-75.085790	6,844	0.16	Unnamed Trib 14877	Jurisdictional
12	40.895839	-75.089030	98,801	2.27	Unnamed Trib 18982	Jurisdictional
14	40.898500	-75.089473	5,306	0.12	Unnamed Trib 18982	NON-Jurisdictional
Pond	40.906091	-75.090997	4,373	0.10	Unnamed Trib 14877	NON-Jurisdictional

Waters #	Latitude	Longitude	Size (ft <sup>2</sup> )	Size (ac)	Associated Subwatershed	Jurisdictional/NON-Jurisdictional
TOTAL			303,135	6.96		

## 7.0 DETERMINATION OF CREDITS

It is proposed that the project will impact 9 wetlands and 8 Waters. The proposed impacts are as follows:

Table 4a. Wetland Impact Table to Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft <sup>2</sup> )	Mitigation Ratio	Required Mitigation Area (ft <sup>2</sup> )	Provided Mitigation Area (ft <sup>2</sup> )
WE-24	PFO	5,245	2:1	10,490	10,490

Table 4b. Wetland Impact Table to Non-Jurisdictional Wetlands

Wetland No.	Wetland Type	Proposed Impact (ft <sup>2</sup> )	Mitigation Ratio	Required Mitigation Area (ft <sup>2</sup> )	Provided Mitigation Area (ft <sup>2</sup> )
WE-2	PFO	3,172	2:1	6,334	6,334
WE-3	PFO	1,476	2:1	2,952	2,952
WE-8	PFO	747	2:1	1,494	1,494
WE14	PEM	3,524	1:1	3,524	3,524
WE-38	PEM	454	1:1	354	354
WE-39	PEM	4,047	1:1	4,047	4,047
WE-40	PFO	2,160	2:1	4,320	4,320

The project proposes to permanently impact 0.21 acres (9,346 square feet) of Jurisdictional Wetlands and 0.39 acres (16,946 square feet) of Non-Jurisdictional Wetlands, totaling 0.48 acres (20,768 square feet) of total impacts. The total impacts will be 769 Linear Feet of Jurisdictional Waters and 871 Linear Feet of Non-Jurisdictional Waters. The total required Waters mitigation area is, as calculated in the tables below.

Table 4c. Impact Table to Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-1	695	9.22	116	12.3
WA-8	2,442	16.39	857	26.4
WA-9	1,412	20.06	900	15.4
WA-10	1,433	21.10	567	8.4
WA-12	5,146	16.11	30	4

Table 4d. Impact Table to Non-Jurisdictional Waters

Wetland No.	Overall Length (ft)	Overall Width (ft)	Lineal Feet of Disturbance (ft)	Average Width of Disturbance Area (ft)
WA-2	590	10.89	487	11.57
WA-4	134	8.30	231	18.67
WA-14	609	8.71	13	10

The Rapid Condition Assessment of Each Feature is listed in the table below.

Table 5. Rapid Condition Assessment of Impacted Wetlands and Waters

Feature	Riverine Condition Index	Wetland Condition Index
WA-1	0.55	---
WA-2	0.66	---
WA-4	0.44	---
WA-5	0.41	---
WA-6	0.80	---
WA-8	0.63	---
WA-9	0.79	---
WA-14	0.31	---
WE-2	---	0.90
WE-3	---	0.91
WE-8	---	0.83
WE-14	---	0.79
WE-24	---	0.80
WE-38	---	0.77
WE-39	---	0.77
WE-40	---	0.94

The areas of impacted wetlands are classified as PEM and have a mitigation ratio of 1:1. The Wetland Condition Index of Wetlands #2 and #3 are forested and have WCI values of 0.90 to 0.91. The WCI of the non-forested wetlands (#8, #14, #24, #38, #39, #40) range from 0.77 to 0.94 (0.82 average) and are generally of lower quality than the forested wetlands.

#### Avoidance of Wetland Impacts

The initial project concepts proposed to disturb upwards of 10.0 acres of wetlands; including both PEM areas as well as PFO areas. The project scope was scaled down to minimize the impacts of wetlands leading to the current design, which has 0.60 acres of permanent impacts.

### 8.0 MITIGATION WORKPLAN

The proposed wetland mitigation site was selected during field visits with representatives from the US Army Corps of Engineers with input from PADEP. The wetland mitigation sites were selected because of its close proximity to the project and proposed impacts as well as their ability to meet the required 1:1 ratio for wetland impacts. While one complete mitigation area was originally considered, it did not

fit with the design of the project. The three mitigation areas are provided to address current and future impacts to wetlands. The locations were chosen due their location between Wetland # 14 and the unnamed tributary to the Delaware River. The wetland mitigation and riparian areas are shown in the attached Mitigation Plan and summarized in Table 4 below.

**Table 6. Wetland Impact and Mitigation Area Size (acre and ft<sup>2</sup>)**

Wetland ID-Type	Impacted Wetland/Water	Mitigation Ratio	Required Area
Mitigation Area #1	Wetland #2, 3, 8, 14, 24	Varies	0.40 acre/17,424 ft <sup>2</sup>
Mitigation Area #2	Wetland #38, 39, 40	Varies	0.20 acres/8,712 ft <sup>2</sup>
Mitigation Area #3	Wetland #8, 14	Varies	0.17 acres/7,405 ft <sup>2</sup>
WETLAND TOTAL		Varies	0.77 acres/33,541 ft <sup>2</sup>
Riparian Plantings	Un-named Tributary to the Delaware	1.1:1	0.081 acres/3,529 ft <sup>2</sup>
WATER TOTAL	769 ft Jurisdictional/871 ft Non-Jurisdictional	1.1:1	1,640 ft Riparian Plantings

### Soil Conditions

The areas selected for mitigation are underlain by Red Hook soil. The Red Hook soil series is characterized as Somewhat Poorly Drained due to a shallow depth to a seasonal high water table. The soils were evaluated by a Certified Professional Soil Scientist and Soil Classifier in April and May 2023. Numerous augering borings were advanced in each mitigation area to characterize the soils and hydrology of the site. There are distinct and prominent redoximorphic features all soil profiles for both mitigation areas; this represents a seasonal high water table. Seepage was present in the soils for Mitigation Areas #1 and #3, but not present at Mitigation Area #2. Aquic conditions are present in all subsoils; with proper grading, a hydric soil will form. Included in this Narrative are the soil profile descriptions.

### Hydrologic Conditions

As the proposed mitigation areas are along/contiguous to an existing PEM wetland system or located along the unnamed tributary to the Delaware River, the sites should receive ample stormwater runoff. Sources of hydrology for the mitigation site include mainly stormwater runoff from the proposed driveways as well as flow from the adjacent wetlands and Waters. The mitigation areas will be adjacent to these wetlands and Waters. The average yearly precipitation for Northampton County is 45.4 inches, which is substantially higher than the potential rate of evapotranspiration.

In terms of understanding the hydrology of the mitigation areas, the following soils information is provided:

**Table 7. Hydrologic Conditions for Mitigation Areas**

Wetland ID-Type	Shallowest Depth to Redoximorphic Features (in)	Shallowest Depth to Water (in)	Proposed Grading Cut (in)
Mitigation Area #1	14	21	24
Mitigation Area #2	14	--	24
Mitigation Area #3	11	6	

Based on the proposed depths of grading, the bottom of the mitigation areas will be within soils that already exhibit saturated conditions (redoximorphic features) and just above the depth to a hydraulically restrictive soil horizon. From a hydrologic standpoint, these mitigation areas will not readily drain and given the inputs from both stormwater runoff and the adjacent wetland areas, these soils will have adequate hydrology to form a wetland. Additionally, in the Appendix, there is a Cross-Section figure that further illustrates the soil conditions and grading as it relates to the mitigation areas.

### Grading and Topography

The mitigation design proposes to utilize a minimal amount of grading within the created wetland area. The design proposes to excavate approximately 24-inches of soil adjacent to both mitigation areas, stockpile, and replace with 6 inches of topsoil. The final grading will be an 18-inch cut and have 6 inches of topsoil overlying aquic soil conditions; water that enters the mitigation areas will not readily drain. The construction of the driveways will have steep slope embankments that will provide additional stormwater runoff into the mitigation areas. Additionally, there will be 'rough' grading within the mitigation areas, creating microtopography that will facilitate wildlife habitat.

Additionally, there will be some woody debris from brush hogging activities (up to 8-10" dbh) that will be placed in the mitigation areas. This woody debris will serve to enhance the wildlife habitat potential of the mitigation areas.

### Vegetation

The three wetland mitigation areas will have separate seed mixes. The three mitigation areas should be consistently wet and will be seeded with Ernst ERNMX-120 Wetland and Food Cover Seed Mix and Ernst ERNMX-131 Obligate Wetland Seed Mix in the low-lying areas. In the higher elevations of the mitigation areas, the seed mix will be Ernst ERNMX-122 Fac-Wet Wetland Seed Mix. The seeding rate for both mitigation areas will be 20 lbs/acre.

### Riparian Buffers

The riparian buffer plantings will consist of trees that are adapted to the existing soil conditions between along the unnamed tributaries to the Delaware River. This will occur along Waters 8.

The existing conditions of proposed riparian buffer are at the edge of the agricultural field and consist of annual weeds (e.g. goldenrod) and invasive brush (e.g. common privet and multiflora rose). The function of the riparian buffer is to prevent pollutants from entering a stream from runoff, control erosion, and provide habitat and reduce nutrient inputs into the stream.

The riparian buffer would involve the removal of invasive weeds and shrubs and the plantings and the planting container-size trees (larger than bare root stock) at a density of 250 trees per acre. Plant selection will be completed in accordance with the guidance provided in the PADEP Riparian Buffer Guidance (2010). The plantings may include the following species:

- River birch
- Red maple
- Box elder
- Pin oak
- Slippery elm
- Sycamore

The riparian buffer will result in a 50-ft buffer along the headwaters of this stream, preventing pollutants from entering the stream and mitigating the impacts from this project.

## 9.0 Maintenance Plan

General maintenance activities may be necessary to ensure successful ecological function is achieved. General maintenance activities may include but is not limited to removal of exotic and nuisance species. The created wetland will also be subjected to evaluations to ensure hydric soils, hydrophytic vegetation and hydrology are being achieved to meet the definition of a jurisdictional wetland in accordance with the 1987 wetland delineation manual and the Piedmont and Eastern Mountain Regional Supplement.

The property owner/developer will be responsible for constructing and maintaining the wetland mitigation project. They will also be responsible for monitoring and protecting the mitigation site subsequent to construction completion. An as-built survey will be performed once construction of the wetland is completed. The as-built survey will record the topography and limits of the proposed mitigation area.

Signage and no-mow rocks surround the mitigation area should be implemented to prevent site landscapers or other parties from encroaching into mitigation area(s).

The area will be monitored twice/year in Years 1-3 and annually in Years 4 and 5. The results of this monitoring will determine the level of maintenance with regards to invasive species removal and/or re-seeding of the wetland areas.

The area will also be monitored twice/year in Years 1-3 and annually in Years 4 and 5. Maintenance activities for this area will include invasive species monitoring and removal and mowing if grass is present.

For the riparian buffers, the use of tree shelters and stakes will help prevent damage to trees by rodents, deer, herbicides, and mowers or weed-whackers. Tree shelters will be inspected to ensure that they are upright, straight, and that the bottom edge is pressed one inch into the ground to prevent rodent entry. Check stakes for cracks, curves, and rot. The tree diameters should be removed when the trees measure 1.5 to 2.5 inches in diameter at top of shelter.

Mowing will be utilized to manage weeds and invasive species for the first 2-3 years. Mowing suppresses the growth of vegetation around the saplings, freeing up sunlight, water, and nutrients for the saplings to use. To allow for spontaneous growth of native trees from seeds stored in the seedbank and dropped by birds, reduce mowing frequency once planted saplings reach a height of 15 feet and begin canopy closure. Continue woody invasive removal once mowing is reduced. While chemical control is not prescribed as required maintenance, it may be needed to manage weeds and invasive species.

Replanting due to seedling failure (Years 2-3) will occur if tree survival rate falls below 70% or density falls below 250 trees/acre. Replanting can occur in either fall (using containerized seedlings) or spring (using containerized seedlings or bare root stock).

## 10.0 Performance Standards for Success

Within 6 months of creation, the mitigation area will need to be delineated as a jurisdictional wetland. This means the site will be evaluated to determine that hydric soils, hydrology and hydrophytic vegetation are present and functioning as a jurisdictional wetland.

The approved mitigation plan must meet objective and verifiable standards during the establishment and monitoring period and over the long-term. The constructed wetland will have a unique hydrology that should contribute to a plant species composition that is consistent with the plant communities proposed for this area.

At the conclusion of 5 years, the following cover and vegetation measurements will be used to determine the ecological performance standards of the constructed wetlands:

- 100% absolute cover of bare ground
- 95% Percent cover of native, non-invasive species (NNI)
- < 5% Percent cover by non-native, invasive species (I)
- Plant species richness with consistency of the plant mix diversity.

For each individual year, the following performance standards will be met, as shown in the table below:

**Table 8. Performance Standards for Mitigation Areas Years 1-5**

Year	Absolute Percent Cover	Percent Cover Native Non-Invasive Species	Percent Cover Non-Native Invasive Species
1	80	≥ 75	< 10
2	85	≥ 80	< 10
3	90	≥ 85	< 5
4	95	≥ 90	< 5
5	100	≥ 95	< 5

These measurements will occur over the 5-year monitoring period. As is the case with any newly established wetland, the performance standards should consider the expected stages of the aquatic resource development process, in order to allow early identification of potential problems and appropriate adaptive management.

For the riparian buffers, performance standards will consist of the following criteria:

**Table 9. Performance Standards for Riparian Buffer Area Years 1-5**

Year	Tree Survival Rate	Percent Cover Non-Native Invasive Species
1	95	< 10
2	90	< 10
3	85	< 5



4	80	< 5
5	75	< 5

## 11.0 Monitoring

The wetland mitigation area is required to be monitored for a period of five years. The monitoring shall include periodic inspections by a qualified wetland scientist, specifically twice/ year for Years 1-3 and annually for Years 4-5. The inspections shall occur during the growing season. Within the following years, monitoring reports will be filed annually.

A multi-year plan has been developed for the monitoring and documentation of the created wetlands. A wetland scientist will conduct the implementation and documentation of the monitoring.

### Monitoring Periods

Monitoring of the mitigation areas will be conducted semi semi-annually (spring and fall) for a period of five years.

### Monitoring Field Procedures

The monitoring plan field procedures have been developed to survey the mitigated wetlands. The survey will document the following parameters:

- Surface water depths
- Vegetation coverage
- Listing of invader species and removal efforts
- Wildlife observed in wetland
- Photographs of the site

### Depth of Water Surface and Hydrology

The water surface depth must be determined. In most cases the elevations will be consistent, however, a check is strongly recommended. These depths will be recorded on the field data sheets.

### Vegetation Coverage and Composition

During the monitoring periods, a percent cover for each planted species will be generated. In the event of poor coverage, the representative plant species will be obtained from nursery stock or donor stock and will be replanted. If exotic and/or invasive species are observed, it will be noted in the monitoring report and they will be promptly removed from the mitigation areas.

### Wildlife Observed in Wetland

Observations of macroinvertebrates, waterfowl, fish, and other associated wildlife are to be made during the survey. An informal listing and approximate numbers of the animals seen are to be included in the survey. Any evidence of the presence of animals that was seen in the field, such as tracks, dens, scratchings, etc. will be noted. A survey of macroinvertebrates will not be performed during dry periods, when surface water is not present.

### **Photographs of the Site**

As the monitoring is being conducted, photographs are to be taken of the wetlands to document the growth and development. These photographs are to be included with the survey. The location, time, and date the picture was taken must be written on each photograph. These photos will be compiled and included with the reports.

### **Reporting**

Reports will be submitted semi-annually for five years. All of the information, which was collected during surveys, must be included in the field data sheets for that monitoring period. Copies of the report will be provided to the PADEP, U.S. Fish & Wildlife Service and the Corps. In addition to the monitoring inspection memorandum completed at the end of Year 5, a monitoring closeout report will be completed for review by the permitting agencies.

## **12.0 Long-Term Management**

The mitigation areas will be managed in perpetuity through a Conservation Easement. Maintenance will include any and all activities necessary to improve and sustain the ecological function of the site. Such may include but are not limited to application of mechanical and chemical means to control and eliminate exotic and nuisance species.

For the riparian buffers, after a period of five years the trees should stand roughly 10-15 feet tall (size will vary based on species); the canopy will likely not yet be fully closed. Any mortality should be evenly distributed and not exceed 20-25%. It is important to backfill any patches of significant mortality with new plantings, as consistent shade discourages invasive growth. Inspections will focus on identifications of invasive species so that they do become prolific.

It is anticipated that long-term management will consist of quarterly site visits by on-site staff designated by the site owner to ensure that the mitigation areas are functioning as designed. A wetland scientist will complete annual site visits to verify the condition of the mitigation areas and report to the project owner if any changes are needed. It is anticipated that these annual long-term costs will be \$6,000/year. In consideration of long-term management of the mitigation and riparian areas, this amount will be included in the operating budget for this facility. For the purposes of ensuring long-term maintenance, the amount of \$150,000, or 25 years of maintenance, will be set aside for this location and kept in escrow with Upper Mount Bethel Township.

## **13.0 Adaptive Management**

At the outset of the project, adaptive management techniques will be utilized. As surprises often arise, the wetland scientist that designed the mitigation plan will be both on-site during mitigation construction and on-call throughout the construction phase.

If, during the course of monitoring, it is evident that the mitigated wetland is not meeting its performance standards as anticipated, both the USACOE and PADEP will be notified immediately. The district engineer will evaluate and pursue measures to address deficiencies in the compensatory mitigation project.

It is possible that performance standards may be revised to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project.

No other revisions to performance standards will be allowed except in the case of natural disasters.

#### 14.0 Financial Assurances

The purpose of the financial assurance is to provide a high level of confidence that the mitigation project will be successfully completed, in accordance with applicable performance standards. To that end, financial assurances may be in the form of performance bonds, escrow accounts, casualty insurance, letters of credit, legislative appropriations for government sponsored projects, or other appropriate instruments, subject to the approval of the district engineer. For this project, the mitigation costs will be included in the escrow account for the entirety of the project; this escrow will be entered into with Allen Township.

It is estimated that the financial assurances will include the following costs.

**Table 10. Financial Assurances Costs**

Wetland ID-Type	Cost	Amount	Costs Total
Mitigation Area #1 Seed Mix	\$1,700/acre	0.242 acres	\$411.40
Mitigation Area #2 Seed Mix	\$1,314/acre	0.760 acres	\$998.65
Riparian Plantings	\$12,500/acre	0.10 acres	\$1,250.00
Construction Costs for Grading, Planting, and E&S Control	\$1,500/day	5 days	\$7,500
Inspection Costs	\$500/day	5 days	\$2,500
Monitoring Reports – Year 1	\$3,000/report	2 reports	\$6,000
Monitoring Reports – Year 2	\$3,000/report	2 reports	\$6,000
Monitoring Reports – Year 3	\$3,000/report	2 reports	\$6,000
Monitoring Report – Year 4	\$3,000/report	1 report	\$3,000
Monitoring Report – Year 5	\$3,000/report	1 report	\$3,000
TOTAL			\$36,660.05

## SOIL PROFILE DESCRIPTIONS

# Soil Profile Description Sheet

Project Name: River Pointe Logistics Center

Date: 5/5/2023

Project Location: \_\_\_\_\_

Tested by: Stephen Dadio, CPSS/CPSC

Test Location: Mitigation Area #1

Boring #: **1**

Soil mapped: Red Hook  
 Soil classified: Red Hook Taxadjunct  
 Taxonomic class: Fine-loamy, mixed, semiactive, mesic Typic Endoaquults

**LIMITING ZONES**

Depth of Rock Limiting Layer: —  
 Depth to Redoximorphic Features: **14"**  
 Depth to Seepage: **21"**

Horizon	Depth (Inches)	Color	Texture	Rock Fragments		Structure			Moist Consistence	Redoximorphic Features			Boundary
				Size	Quantity (%)	Grade	Size	Type		Abundance	Size	Contrast	
Ap	0-14	10YR 3/3	silt loam			1	m	gr	friable				abrupt/smooth
Bt1	14-24	10YR 5/4	silt loam			2	m	sbk	firm	many	medium	prominent	clea/wavy
2Bt2	24-36	10YR 5/4	fine sandy loam	gravels	10	1	m	sbk	friable	many	medium	prominent	abrupt/wavy
2C	36-48	7.5YR 4/4	very gravelly loamy sand	gravels	40	0		m	very friable				

Notes:

**Legend**

**Structure**

- |                 |                |                                |
|-----------------|----------------|--------------------------------|
| <u>Grade</u>    | <u>Size</u>    |                                |
| 0-Structureless | vf-very fine   | abk-angular blocky             |
| 1-Weak          | f-fine         | gr-granular                    |
| 2-Moderate      | m-medium       | m-massiv sbk-subangular blocky |
| 3-Strong        | co-coarse      | pl-platy sg-single-grained     |
|                 | vc-very coarse | pr-prismatic                   |

# Soil Profile Description Sheet

Project Name: River Pointe Logistics Center

Date: 5/5/2023

Project Location: \_\_\_\_\_

Tested by: Stephen Dadio, CPSS/CPSC

Test Location: Mitigation Area #2

Boring #: **2**

Soil mapped: Red Hook  
 Soil classified: Red Hook Taxadjunct  
 Taxonomic class: Fine-loamy, mixed, semiactive, mesic Typic Endoaquults

**LIMITING ZONES**

Depth of Rock Limiting Layer: —  
 Depth to Redoximorphic Features: **14"**  
 Depth to Seepage: —

Horizon	Depth (Inches)	Color	Texture	Rock Fragments		Structure			Moist Consistence	Redoximorphic Features			Boundary
				Size	Quantity (%)	Grade	Size	Type		Abundance	Size	Contrast	
Ap	0-14	10YR 3/2	silt loam			1	m	gr	friable				abrupt/smooth
Btg	14-30	10YR 5/2	silty clay loam			2	m	sbk	firm	common	medium	prominent	abrupt/wavy
2BC	30-36	10YR 6/3	sandy clay loam	gravels	10	1	m	sbk	friable	many	medium	prominent	

Notes:

**Legend**

**Structure**

- |                 |                |                                |
|-----------------|----------------|--------------------------------|
| <u>Grade</u>    | <u>Size</u>    |                                |
| 0-Structureless | vf-very fine   | abk-angular blocky             |
| 1-Weak          | f-fine         | gr-granular                    |
| 2-Moderate      | m-medium       | m-massiv sbk-subangular blocky |
| 3-Strong        | co-coarse      | pl-platy sg-single-grained     |
|                 | vc-very coarse | pr-prismatic                   |

# Soil Profile Description Sheet

Project Name: River Pointe Logistics Center

Date: 5/5/2023

Project Location: \_\_\_\_\_

Tested by: Stephen Dadio, CPSS/CPSC

Test Location: Mitigation Area #3

Boring #: **3**

Soil mapped: Red Hook  
 Soil classified: Red Hook Taxadjunct  
 Taxonomic class: Fine-loamy, mixed, semiactive, mesic Typic Endoaquults

**LIMITING ZONES**

Depth of Rock Limiting Layer: —  
 Depth to Redoximorphic Features: **11"**  
 Depth to Seepage: **6"**

Horizon	Depth (Inches)	Color	Texture	Rock Fragments		Structure			Moist Consistence	Redoximorphic Features			Boundary
				Size	Quantity (%)	Grade	Size	Type		Abundance	Size	Contrast	
Ap	0-11	10YR 3/2	silt loam			1	m	gr	friable				abrupt/smooth
Btg	11-24	10YR 5/2	silty clay loam			2	m	sbk	firm	common	medium	prominent	

Notes:

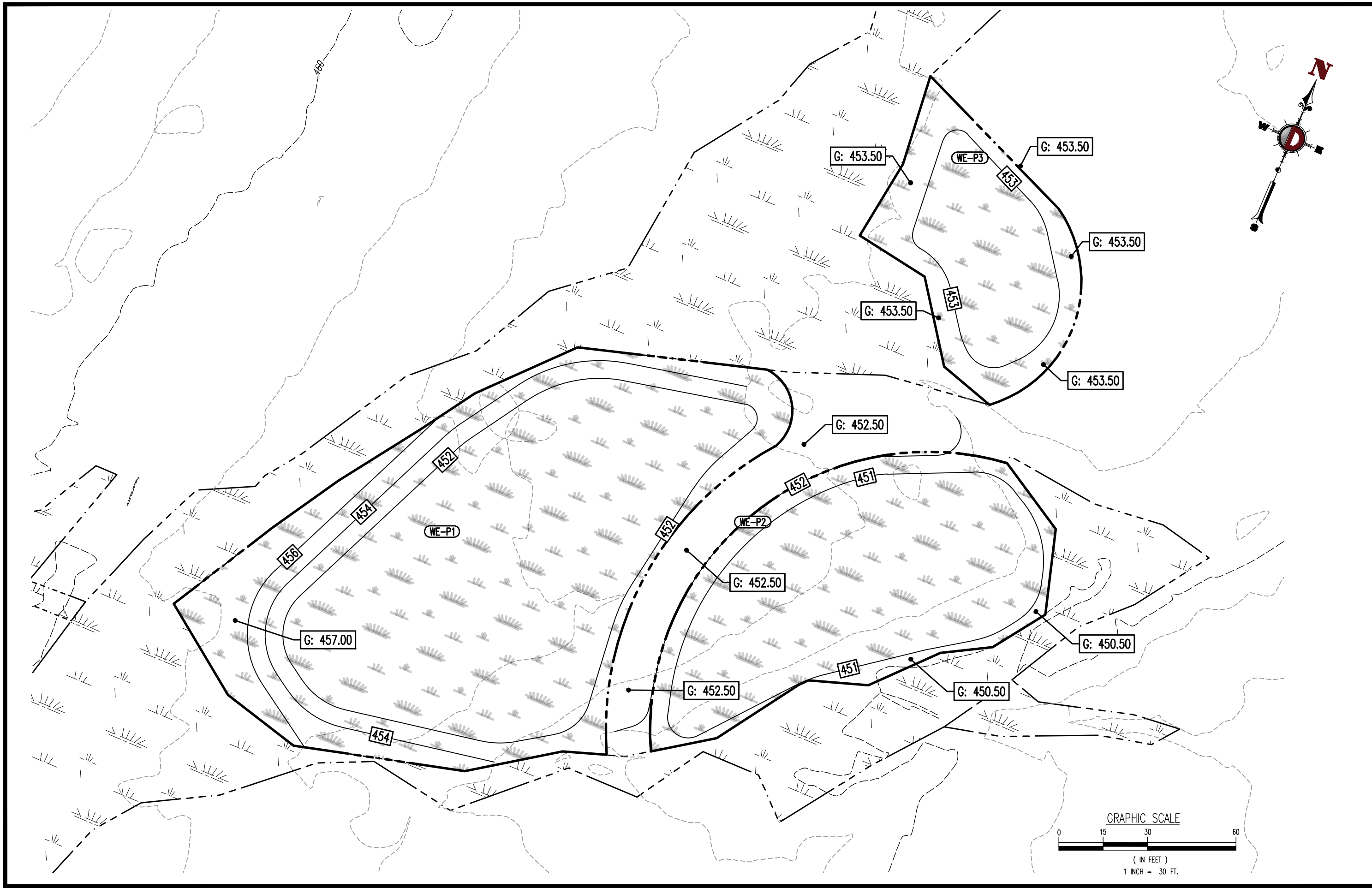
**Legend**

**Structure**

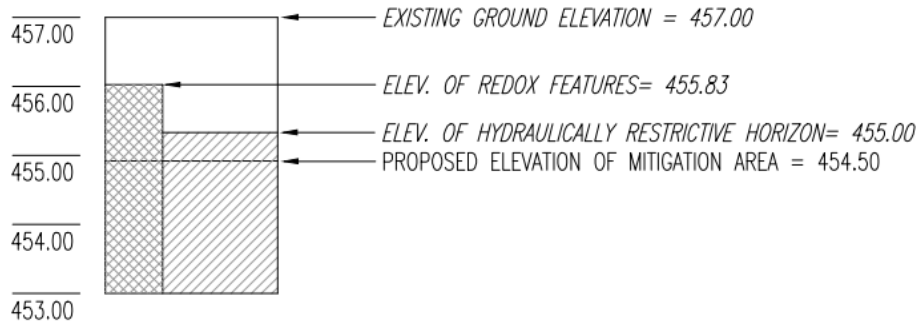
- |                 |                |                                |
|-----------------|----------------|--------------------------------|
| <u>Grade</u>    | <u>Size</u>    |                                |
| 0-Structureless | vf-very fine   | abk-angular blocky             |
| 1-Weak          | f-fine         | gr-granular                    |
| 2-Moderate      | m-medium       | m-massiv sbk-subangular blocky |
| 3-Strong        | co-coarse      | pl-platy sg-single-grained     |
|                 | vc-very coarse | pr-prismatic                   |

## MITIGATION PLAN



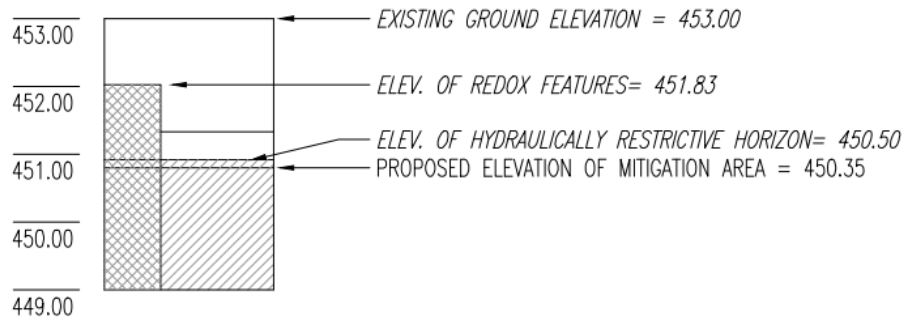


## MITIGATION AREA CROSS-SECTION



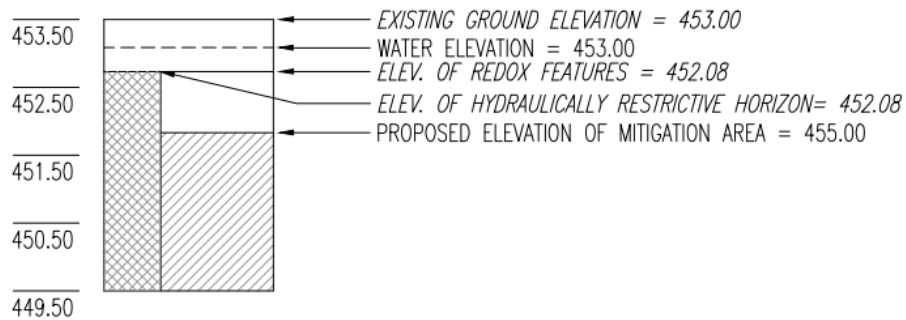
## MITIGATION AREA #1 SECTION

NOT TO SCALE



## MITIGATION AREA #2 SECTION

NOT TO SCALE



## CONTINGENCY AREA SECTION

NOT TO SCALE