

REQUIREMENT T  
MINIMIZATION PLAN AND FUNCTIONAL ASSESSMENT

## Minimization and Functional Assessment Discussion

A discussion of functions and values concerning wetlands to be impacted by the proposed project is included in this section along with a discussion of impact minimization. The preferred right-of-way (ROW) width for a project of this nature is 150'. The national electric code (NEC) dictates a required ROW width of 100' is applicable. Where possible, engineering techniques (poles located to reduce line sag and sway) and potentially non-traditional construction methods will be employed to allow construction and operation of the proposed transmission line within ROW widths below the NEC standard. These minimization efforts allowed project impacts to be reduced to the maximum extent practicable while still serving the project need. No wetland acreage will be lost due to implementation of the proposed project. There are only measurable impacts proposed concerning three wetlands (ARK4, ME1, and EX3).

Permanent wetland impacts associated with the proposed project total approximately 0.06 acres. PFO to PSS conversion (Wetland ARK4) accounts for 871 sq. ft. of the total, due to the required tree clearing within the ROW of the electric transmission line. The remainder of permanent impacts – 1528 sq. ft. – are due to Wetland ME1 and MB2 being located within the permanent right-of-way associated with the project. Wetland MB2 will not be disturbed, as a result of the project. Wetland ME1, classified as a PEM, will be temporarily disturbed to install the electric duct bank, but will be restored to pre-existing condition once construction activities have ceased. Temporary impacts for the construction of the project total approximately 0.01 acre (246 sq. ft), from the use of an existing access road that currently traverses the edge of Wetland EX3. Wetland EX3 is located in a sewer line ROW in the area of a well-defined two track access road used to operate and maintain the line. This road will be used to access the proposed project ROW but no improvements to the road are required. Individual discussion of each wetland is provided in the following paragraphs.

### ARK4

The PFO conversion impact associated with ARK4 was minimized to the extent practicable by narrowing the ROW of the line to 70' instead of the desired 150'. The line cannot be shifted to the north due to conflicts with adjacent industrial enterprises. The ROW cannot be reduced further in width due to the proximity of the poles and the geometry of the line in this area. ROW negotiations with parcel owners required the line be sighted along the back property lines within applicable building setbacks. Tree clearing in this area will be conducted by hand as machinery and vehicles of any kind will be prohibited from entering the wetland. This will minimize/eliminate any potential incidental disturbance to the wetland beyond the actual removal of trees. The wetland will not be maintained as a PEM wetland and woody species will be allowed to repopulate the area provided they do not encroach on the minimum four-foot isolation distance from overhead wires. The vegetative community is currently dominated by Box Elder trees and saplings (*Acer negundo*) with a very limited understory. The removal of the trees will allow a greater percentage of sun exposure to the basin and a resurgence of the herbaceous layer is anticipated throughout the system.

Functions and values considered to be primary within the ARK4 system will not be hampered by tree removal. Primary functions of this basin-like wetland include: stormwater storage and pollution prevention. The wetland is considered poor wildlife habitat due to its close proximity to active railroad tracks. Only transient terrestrial species are expected to pass through the area. Two pipe outfalls from a nearby industrial facility discharge directly into ARK4 where the water is

contained by the railroad bed. Sediment, nutrients, and potential toxicant load is essentially trapped by the wetland and not allowed to enter the Schuylkill River. The presence of a more vigorous and thick herbaceous layer may actually enhance the system's ability to treat stormwater and mechanically trap sediment. The 0.02-acre loss of trees in this PFO is considered negligible since ARK4's primary functions will be maintained/enhanced and overall plant diversity in the system is expected to increase.

#### ME1

The project will result in the permanent impact of 205 sq. ft of Wetland ME1. Installation of the concrete duct will result in the permanent fill of 21 sq. ft. of the wetland, while the remainder of the impacted area will be maintained within the permanent right-of-way. Overhead configuration of the transmission line at this location is not permissible due to conflicts with an already existing 500 kV electric line. The concrete duct bank is proposed perpendicularly to the resource and crosses at the narrowest point practicable. A minimum of three-foot of cover over the bank will be required so hydrologic patterns are expected to be maintained and no loss of wetland is expected. The placement of the duct bank is considered a de-minimus impact.

Principal functions noted in ME1 include: sediment stabilization and retention, flood flow attenuation, and wildlife habitat. The system occurs as a complex with a perennial stream (Stream ME2). The thick herbaceous layer combats scour issues along the banks of the watercourse and provides some capability to trap sediments mobilized in the water column during periods of high flow. The wetland occupies a narrow floodplain terraced slightly above the ordinary high water mark of the watercourse resulting in limited storage capacity of minor floodwaters. Habitat for semi-aquatic species living in and around the watercourse is provided by the wetland. Escape cover and foraging grounds are believed to be the key habitat components provided by the wetland. Bird species may also frequent the area. Wetland functions and values provided by ME1 may be temporarily impacted during construction, but no permanent impacts are anticipated as a result of the project.

#### EX3

Construction vehicles will be accessing the project ROW via the existing Exeter Township sewer line maintenance road. This road traverses a portion of Wetland EX3 within the project area, and 246 sq. ft. of the wetland will be temporarily impacted. Continual daily traffic on this route associated with the proposed project is not anticipated as vehicles will use this road only to access a portion of the ROW with daily travel occurring within the proposed ROW. Township vehicles already frequent this road on a weekly basis. The travel corridor is well worn and firm with no evidence of deep rutting during periods of excessive precipitation. Wetland functions are considered extremely limited since the area is continually disturbed by mowing activities and houses an active sewer line and associated manholes. The substrate was heavily disturbed during installation of the line and the wetland likely formed because of compaction and continual use of the road during construction and continued maintenance. Hydrology indicators in the system are weak and a problematic hydric soil indicator was employed for the wetland determination.

**Wetland ARK4**

**Wetland Function-Value Evaluation Form**

Total Area of Wetland 0.13 acres Human made? Yes Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Adjacent land use Industrial, railroad, Floodplain Forest Distance to nearest road or development is 0.01mi

Dominant wetland system present is PFO Is a Contiguous undeveloped buffer zone present? No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Low

How many tributaries contribute to the wetland? Two Intermittent Streams

Wetland ID: ARK4

Prepared by: L. Diebel

Wetland impact:  
Type: permanent Area: 870 sq. ft.

Evaluation based on:  
Office No Field Yes

Corps manual wetland delineation completed? Yes

Function/Value	Suitability		Rationale (Reference #)	Principal F/V	Comments
	Y	N			
Groundwater Recharge					
Floodflow Alteration	X		4, 6, 7, 9, 10, 13, 15	X	Wetland outlet is constricted due to abutting railroad bed
Fish and Shellfish Habitat					
Sediment/Toxicant Retention	X		1, 2, 10	X	Wetland receives discharge directly from industrial facility
Nutrient Removal					
Production Export					
Sediment/Shoreline Stabilization					
Wildlife Habitat					
Recreation					
Educational/Scientific Value					
Uniqueness/Heritage					
Visual Quality/Aesthetics					
Endangered Species Habitat					
Other					

**Wetland ME1**

**Wetland Function-Value Evaluation Form**

Total Area of Wetland 0.12 acre Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Adjacent land use Maintained ROW, Industrial, Railroad Distance to nearest road or development is 0.0 ft.

Dominant wetland system present is PEM Is a Contiguous undeveloped buffer zone present? No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Low

How many tributaries contribute to the wetland? 3 Tributaries














Wetland ID: ME1

Prepared by: L. Diebel

Wetland impact:  
Type: permanent Area: 18sq. ft.  
Type: temporary Area: 170sq. ft.

Evaluation based on:  
Office No Field Yes

Corps manual wetland delineation completed? Yes

Function/Value	Suitability		Rationale (Reference #)	Principal F/V	Comments
	Y	N			
 Groundwater Recharge					
 Floodflow Alteration	X		3, 4, 6, 9, 14		
 Fish and Shellfish Habitat					
 Sediment/Toxicant Retention	X		1, 2, 10		
 Nutrient Removal					
 Production Export					
 Sediment/Shoreline Stabilization	X		1, 2, 6, 12, 13, 15	X	
 Wildlife Habitat	X		5, 8, 19	X	
 Recreation					
 Educational/Scientific Value					
 Uniqueness/Heritage					
 Visual Quality/Aesthetics					
 ES Endangered Species Habitat					
Other					

**Wetland EX3**

**Wetland Function-Value Evaluation Form**

Total Area of Wetland 0.12 acres Human made? Yes Is wetland part of a wildlife corridor? No Or a "habitat island"? Yes

Adjacent land use Industrial, Maintained Lawn, Forest Distance to nearest road or development is 0.02 mile

Dominant wetland system present is PEM Is a Contiguous undeveloped buffer zone present? No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? \_\_\_\_\_

How many tributaries contribute to the wetland? None














Wetland ID: EX3

Prepared by: L. Diebel

Wetland impact:  
Type: N/A Area: N/A

Evaluation based on:  
Office No Field Yes

Corps manual wetland delineation completed? Yes

Function/Value	Suitability		Rationale (Reference #)	Principal F/V	Comments
	Y	N			
 Groundwater Recharge					
 Floodflow Alteration					
 Fish and Shellfish Habitat					
 Sediment/Toxicant Retention	x		1, 2		Potential sources of toxicants present in upgradient industrial area
 Nutrient Removal					
 Production Export					
 Sediment/Shoreline Stabilization					
 Wildlife Habitat					
 Recreation					
 Educational/Scientific Value					
 Uniqueness/Heritage					
 Visual Quality/Aesthetics					
 Endangered Species Habitat					
Other					



Below is an example list of considerations that was used for a New Hampshire highway project. Considerations are flexible, based on best professional judgment and interdisciplinary team consensus. This example provides a comprehensive base, however, and may only need slight modifications for use in other projects.



**GROUNDWATER RECHARGE/DISCHARGE**— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

#### CONSIDERATIONS/QUALIFIERS

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet.
10. Wetland contains only an outlet, no inlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g., springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Piezometer data demonstrates discharge.
17. Other



**FLOODFLOW ALTERATION (Storage & Desynchronization)** — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

## CONSIDERATIONS/QUALIFIERS

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high percent of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other





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**SEDIMENT/TOXICANT/PATHOGEN RETENTION** — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas.

### CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Fine grained mineral or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.

### STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

10. Wetland is associated with an intermittent or perennial stream or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present.
17. Other



**NUTRIENT REMOVAL/RETENTION/TRANSFORMATION** — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

### CONSIDERATIONS/QUALIFIERS

1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.



4. Potential sources of excess nutrients are present in the watershed above the wetland.
  5. Wetland saturated for most of the season. Ponded water is present in the wetland.
  6. Deep organic/sediment deposits are present.
  7. Slowly drained fine grained mineral or organic soils are present.
  8. Dense vegetation is present.
  9. Emergent vegetation and/or dense woody stems are dominant.
  10. Opportunity for nutrient attenuation exists.
  11. Vegetation diversity/abundance sufficient to utilize nutrients.
- STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.
12. Waterflow through this wetland is diffuse.
  13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
  14. Water moves slowly through this wetland.
  15. Other

**SEDIMENT/ShORELINE STABILIZATION** — This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.



#### CONSIDERATIONS/QUALIFIERS

1. Indications of erosion or siltation are present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. Potential sediment sources are present upstream.
5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout.
7. Wide wetland (>10') borders watercourse, lake, or pond.
8. High flow velocities in the wetland.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond.
14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other





**WILDLIFE HABITAT** — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.<sup>1</sup>

#### CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width.
6. Wetland is contiguous with other wetland systems connected by a watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/shrub/vine/grasses/mosses)
16. Plant/animal indicator species are present. (List species for project)
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species are present.
23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources, etc.).
24. Other

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<sup>1</sup>In March 1995, a rapid wildlife habitat assessment method was completed by a University of Massachusetts research team with funding and oversight provided by the New England Transportation Consortium. The method is called WEThings (wetland habitat indicators for non-game species). It produces a list of potential wetland-dependent mammal, reptile, and amphibian species that may be present in the wetland. The output is based on observable habitat characteristics documented on the field data form. This method may be used to generate the wildlife species list recommended as backup information to the wetland evaluation form and to augment the considerations. Use of this method should first be coordinated with the Corps project manager. A computer program is also available to expedite this process.