

## **APPENDIX E:**

- **Project-Wide Avoidance and Minimization Protocol for Vernal Pools**
- **Project-Wide Avoidance and Minimization Protocol for Waterbodies**

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# **PROJECT-WIDE AVOIDANCE AND IMPACT MINIMIZATION PROTOCOL FOR VERNAL POOLS**

## **INTRODUCTION**

Vernal pools are recognized as important habitats on both the federal level (USACE and U.S. EPA) and by the states of Connecticut, Rhode Island, and Massachusetts. The term “vernal pool” commonly refers to a small isolated fresh water body, typically contained in a small depression, that fills with water seasonally and reaches maximum depth in the spring, does not have fish populations, and provides breeding habitat for certain species of woodland amphibians, invertebrates, and/or other animals that are adapted to seasonal water drawdowns and that require the absence of fish populations to survive. As such, some species rely on the micro-habitat provided by vernal pools for all or portions of their lifecycles.

Pool-breeding amphibians depend on both aquatic and terrestrial habitats for survival. Thus, vernal pool habitat includes three main features<sup>1</sup>:

- Vernal pool depression/seasonal breeding pool;
- Vernal pool envelope (area within 100 feet of the vernal pool depression edge); and
- Vernal pool critical terrestrial habitat (area within approximately 100-750 feet of the vernal pool depression edge), consisting mainly of terrestrial (upland) non-breeding habitat.

Generally, federal and state agencies recommend protecting vernal pool habitat by:

- Avoiding direct impacts to the vernal pool depression and vernal pool envelope.
- Limiting site clearing, grading and construction activities to <25% of the vernal pool terrestrial habitat.
- Implementing best management practices (BMPs) as documented in the literature (e.g., Calhoun *et al.*, refer to footnote):

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<sup>1</sup> Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

## PROJECT INVESTIGATIONS

To identify vernal pools in the Project area, the Companies<sup>2</sup> conducted field investigations along the ROWs during amphibian breeding periods. These studies were conducted in 2007, 2008, and 2011. Based on the results of the field studies, three primary categories of vernal pools habitat were documented within the ROWs:

- **Traditional vernal pool:** Characterized by a confined basin depression (generally less than 2 acres) that contains water for two or more continuous months in the spring and/or summer; lacks a permanent surface water connection with other wetlands or waterbodies; does not have established (reproducing) fish populations; and supports the breeding of obligate and/or facultative vernal pool indicator species.
- **Cryptic (“non-classic”) vernal pool:** An area within a larger wetland that exhibits the hydrology (e.g., seasonal flooding) appropriate to support the breeding of obligate and/or facultative vernal pool species.
- **Depressions containing man-made amphibian habitat:** In some locations along existing on-ROW access roads, depressions have developed that hold water in the spring and opportunistically provide habitat for some amphibian species. These depressions are typically very small, and have formed over time as soils along the access roads have been compacted by the movement of equipment and vehicles used to perform ROW management activities.

The locations of the vernal pools along the ROWs are summarized, by state, in Table VP-1. As this table shows, a large percentage of the vernal pools found along the ROWs are within areas presently managed by the Companies in scrub-shrub vegetation.

**Table VP-1  
Summary of Vernal Pools Located along Project ROWs**

VERNAL POOL LOCATION ALONG ROWS	STATE		
	Connecticut	Rhode Island	Massachusetts
<b>Vernal Pools Identified within ROWs (full easement widths) (No.)</b>	88	34	16
<b>Vernal Pools in Relation to Presently Managed Portions of the ROWs</b>			
• Vernal pools traversed by existing access roads (No.)	9	3	4
• Existing transmission line structures in wetlands containing vernal pools (No.)	17	4	9
• Existing transmission line structures located directly in vernal pools (No.)	0	0	0
• Vernal pools located entirely within managed (scrub-shrub) portions of existing ROWs (No.)	45	18	4

<sup>2</sup> References herein to “the Companies” mean CL&P and National Grid.

## **PROJECT CONSTRUCTION ACTIVITIES AND VERNAL POOLS**

The principal types of Project construction activities that could directly or indirectly affect vernal pools and the obligate or facultative species that rely on such habitats include:

- The removal of vegetation in, or the tree canopy over vernal pools located along the Project ROWs;
- The development of new access roads or improvements to existing access roads through vernal pools (especially the man-made vernal pool habitats located along existing access roads);
- The movement of vehicles and equipment use on access roads or work pads in the vicinity of vernal pools and associated amphibian migratory routes;
- The placement of structures, counterpoise, and guys directly in vernal pools (if such areas cannot otherwise be avoided); and
- The development and use of temporary work pads in order to install or remove structures in or near vernal pools, especially during breeding periods.

## **AVOIDANCE AND MINIMIZATION MEASURES**

After the completion of the vernal pool habitat studies, the Companies performed constructability field reviews and engineering evaluations to assess the locations of the vernal pools in relation to the proposed Project facilities. Based on the results of these analyses, new transmission line structures, access roads, and work pads were adjusted to avoid or minimize direct adverse effects to vernal pools to the extent practicable, taking into consideration engineering design requirements for the new transmission lines and the need to maintain safety during construction.

As a result of this effort, no new transmission line structures will be located directly in vernal pools along the Project ROWs in any of the three states. However, given the linear nature of the Project and the number of wetlands along the ROWs, a limited number of work pads and temporary or permanent access roads must be placed in vernal pools or in wetlands that contain embedded (cryptic) vernal pools.

To avoid or minimize potential adverse effects on vernal pool breeding habitats during construction, the Companies propose the following mitigation measures, which will be implemented on a site-specific basis to the extent practicable:

- During tree clearing and vegetation removal along the ROW, access through vernal pools will be avoided when practicable. Where limited access across vernal pools is unavoidable, low impact clearing equipment / techniques and/or temporary timber mats, corduroy roads, or equivalent will be used to support vehicles and equipment. Work during frozen ground conditions also may be considered, if construction and/or transmission outage schedules allow.
- Trees that must be removed from the ROW will not be intentionally felled into vernal pools. Directional felling, extended cable winching and/or booms, and other forestry practices will be

used if appropriate and feasible. If trees are felled into a vernal pool, whether out of necessity or inadvertently, and removal is likely to cause adverse effects, the trees or parts of the trees may be left in place.

- Except in areas where access roads and work pads must be installed, existing scrub-shrub vegetation within 25 feet of vernal pools will be maintained, consistent with ROW vegetation management requirements.
- If low growth (scrub-shrub) vegetation must be removed adjacent to vernal pools, the cut vegetation (slash) will be left in place to serve as recruitment for leaf litter and coarse woody debris.
- Erosion and sedimentation control best management practices will be installed and maintained along construction access roads and around work pads as necessary to protect water quality and to limit the potential for soil deposition into vernal pools. Sediment built up behind these devices will periodically be removed and placed in upland areas, in a manner that will preclude the potential for subsequent deposition into the pools. (*Note:* The specific types of controls will be determined in the field, in accordance with each Company's BMP manual and consistent with stormwater management requirements for the Project.)
- Where existing on-ROW access roads adjacent to or through vernal pools must be improved, timber mats or corduroy road will be used if practicable; otherwise, clean materials will be used (e.g., clean riprap, gravel, stone or equivalent and rock fords).

*Note:* Some man-made depressions along existing on-ROW access roads provide amphibian breeding habitat, based on the results of the field surveys. In general, such depressions provide low-quality vernal pool habitat. To accommodate Project construction vehicles, these access roads must be graded and otherwise improved. The proposed access road improvements will eliminate these depressions and the associated potential for amphibian breeding habitat. To avoid direct impacts to amphibians that may breed in these depressions, the Companies will attempt to perform the improvements to these on-ROW access roads outside of the breeding and migration seasons of vernal pool species.

- To the extent that circuit outage and other construction timing constraints allow, the Companies will attempt to schedule vegetation clearing and the installation of access roads and work pads in and around vernal pool habitats so as not to interfere with amphibian breeding and migration seasons.
- For Project activities that must occur adjacent to or within vernal pools during amphibian migration periods, measures will be implemented on a site-specific basis as necessary to facilitate unencumbered amphibian access to and from vernal pools. Mitigation measures will be identified after taking into consideration site-specific conditions, including the type of construction activity in proximity to a vernal pool, the amphibian species known to occur in the vernal pool, and seasonal conditions. Options to be evaluated to allow amphibian access to vernal pools may include, but not be limited to, placing wood chip ramps at intervals along erosion and sedimentation control fencing in the immediate vicinity of vernal pools; leaving gaps in or staggering the installation of erosion and sedimentation controls; and aligning erosion and sedimentation controls to avoid bifurcating vernal pool habitat. Installation of any mitigation devices will be based on field and seasonal conditions, and will depend on species-specific

requirements. Further, in some cases, the objective may be to fence off construction areas near vernal pools, allowing amphibian access around such areas entirely.

- Construction activities that must occur in or near vernal pools will conform to the measures detailed in the Companies' *Wetland Invasive Species Control Plan* to avoid or minimize the potential for the spread of invasive species to vernal pool habitat.
- Erosion and sedimentation control devices will be promptly removed upon final re-vegetation and stabilization of the ROW.

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# **PROJECT-WIDE IMPACT AVOIDANCE AND MITIGATION PROTOCOL FOR WATERBODIES**

## **INTRODUCTION**

The construction, operation, and maintenance of the Project will have a minimal effect on waterbodies (i.e., watercourses, lakes, ponds) and water quality. The design of the proposed overhead transmission lines inherently avoids most direct adverse effects to such water resources. Moreover, the Companies have taken a number of steps to further avoid and minimize impacts to waterbodies. For example:

- No new 345-kV transmission line structures will be placed in watercourses, lakes, or ponds;
- The new overhead transmission line conductors will span all watercourses, lakes, and ponds;
- Construction equipment access across major waterbodies (e.g., Willimantic, Natchaug, Quinebaug rivers and Mansfield Hollow Lake in Connecticut; Blackstone River in Massachusetts) will not be required (the installation of the new 345-kV lines across major rivers will be accomplished by working from either side of the watercourse);
- Access roads across smaller watercourses along the ROWs will be improved (where roads exist) or established (new access roads) only as necessary for the safe construction, operation, and maintenance of the Project. Where access roads are required across streams, temporary spans (using mats or equivalent), temporary culverts, or permanent culverts will be installed, consistent with Project-specific federal and state regulatory requirements.
- Major construction equipment will be prohibited from fording streams. However, depending on site-specific conditions, equipment used by vegetation clearing crews may have to pass across smaller watercourses to access areas to be cleared and/or to remove felled trees and other vegetation. Clearing crews may use temporary fords, mat spans, log corduroys or timber mats, depending on site-specific conditions.
- Where temporary construction (work) pads must encompass small watercourses, the work pad design will incorporate culverts or other site-specific measures designed to maintain flows and minimize aquatic habitat disturbance during the construction period.

Where spans and/or culverts must be installed across watercourses, or vehicles/equipment must ford small watercourses, temporary and localized turbidity will likely occur, causing an unavoidable but short-term and minor change in background water quality, best management measures will be implemented to minimize such effects. Any background change in water quality will be highly localized in the immediate vicinity of the crossing site and will typically be associated only with equipment crossings (in the case of fords), the installation and removal of temporary spans (including temporary culverts), or the installation of permanent bridges/culverts.

Potential impacts to watercourses as a result of most transmission line construction activities will be limited to the crossing locations identified on the Project maps. With the exception of the temporary watercourse crossings that may be performed within the ROW by vegetation clearing crews to best access areas of required tree removal, no other construction access across watercourses will be used without the prior approval of the USACE and the involved state regulatory agencies.

## **AVOIDANCE AND MITIGATION MEASURES**

The Companies propose the following mitigation measures during Project activities involving watercourse crossings. These measures are intended to avoid or minimize adverse effects to watercourses by avoiding or limiting effects on water quality and by maintaining flows.

- Attempt to schedule in-water activities (e.g., the installation of temporary and permanent watercourse crossings) during low-flow periods, to the extent practicable. However, some crossings may have to be installed outside of typical low-flow periods in order to adhere to Project construction schedules and to conform to any transmission line outage windows that must be coordinated to maintain the reliability of the transmission grid. However, no access road crossings will be installed across watercourses during conditions of peak flows or bank-full conditions.
- Install and maintain temporary erosion and sedimentation controls along the ROWs where construction activities disturb soils near watercourses. These controls will be installed and maintained to prevent sedimentation into water resources. Sediment that accumulates behind these controls will periodically be removed and placed in upland areas, in a manner that will preclude the potential for subsequent deposition into watercourses or other waters of the U.S., or will otherwise be disposed of off-site.
- Where existing access roads must be improved or new access roads must be established across watercourses, clean materials will be used (e.g., clean riprap, gravel, stone or equivalent and rock fords).
- Access roads across watercourses will be installed, where practicable, so as to avoid or minimize direct adverse effects to stream banks and stream-bottom sediments, as well as to provide unobstructed ambient flow in perennial streams (e.g., span crossings will provide adequate clearance above the watercourse to convey flows).
- At watercourses that support native trout reproduction, improvements to existing access roads or the development of new access road crossings will be scheduled, to the extent possible, to avoid conflicts with fish spawning or migration.
- Existing riparian vegetation along the ROW within 25 feet of watercourse banks will be maintained, to the extent practicable and consistent with ROW vegetation management requirements.
- Temporary and permanent culverts, where required, will be sized in general accordance with the USACE' stream crossing standards.

- Appropriate BMPs will be used, as determined by site-specific conditions, to prevent or minimize the potential for sedimentation into watercourses.
- Mat spans or equivalent access across watercourses will be periodically swept, as appropriate, to minimize the potential for soil deposition into watercourses as a result of vehicle/equipment movements.
- Concrete (used for some structure foundations) will not be mixed, tested, placed, or disposed of so as to enter a watercourse.
- Except for equipment that is not readily mobile or must remain on-site for prolonged periods to safely complete a construction task (e.g., drilling rigs, cranes for structure installation), construction vehicles and equipment will not be refueled within 25 feet of a watercourse. For refueling that must be performed less than 25 feet from a watercourse, appropriate spill prevention measures, as detailed in Project-specific Spill Prevention, Control, and Response Plans, will be applied.
- No bulk petroleum products will be stored within 25 feet of a watercourse.
- As the final phase of construction, temporary mat spans and culverts will be removed and watercourses will be restored. Temporary erosion and sedimentation controls will be removed upon the stabilization of exposed soils near watercourses.

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