

EXHIBIT 7-4 NATURAL RESOURCES SURVEY REPORT

Natural Resources Survey Report

Western Maine Renewable Energy Project Moscow, Maine



Prepared For:



Western Maine Renewables, LLC

P.O. Box 1000
Pittsfield, Maine 04967

Prepared By:

Tetra Tech, Inc.

Complex World, Clear Solutions™
451 Presumpscot St., Portland, ME 04103 | tetratech.com



May 2021

TABLE OF CONTENTS

	Page
1.0 Introduction	2
2.0 Survey Methods	2
2.1 Vernal Pool Survey Methods.....	3
2.2 Wetland and Watercourse Delineation Methods.....	3
3.0 Survey Results	4
3.1 Vernal Pool Survey Results.....	4
3.2 Wetland Delineation Results.....	4
3.3 Watercourse Delineation Results	5
4.0 Conclusion and Discussion	6
5.0 References	7

LIST OF TABLES

	Page
Table 1. Vernal Pool Survey Results for the Western Maine Renewable Energy Project, Moscow, Maine.	10
Table 2. Wetland Delineation Results for the Western Maine Renewable Energy Project, Moscow, Maine.	11
Table 3. Watercourse Delineation Results for the Western Maine Renewable Energy Project, Moscow, Maine.	19

LIST OF APPENDICES

Appendix A. Figures

- Figure 1. Project Overview, Western Maine Renewable Energy Project, Moscow, Maine.
- Figure 2. Project Study Area, Western Maine Renewable Energy Project, Moscow, Maine.
- Figure 3. Map Set for Aquatic Resource Survey Results, Western Maine Renewable Energy Project, Moscow, Maine.

Appendix B. Natural Resource Summary Tables

Appendix C. Maine State Vernal Pool Assessment Forms

Appendix D. Wetland Determination Data Forms, representative wetlands

Appendix E. Representative Site Photographs

1.0 INTRODUCTION

Western Maine Renewables, LLC, a joint venture between Patriot Renewables, LLC and Cianbro Development Corporation, proposes to construct the Western Maine Renewable Energy Project, a 14 turbine utility-scale wind energy facility located in the Town of Moscow, Somerset County, Maine (Project). The proposed Project is located approximately 5 miles northeast of the center of the Village of Moscow, on land currently comprised of forested timberland and the remnants of a former United States Air Force (USAF) long-range, over-the-horizon backscatter radar transmitter station (USAF Radar Station). The wind facility will have an installed capacity of approximately 58.8 megawatts of electricity. The Project is designed to use Vestas V150-4.2 megawatt turbines and will include upgrades to existing roads and construction of new roads; an aviation detection lighting system; a series of 34.5 kilovolt (kV) electrical collector lines among the turbines; a 34.5/115 kV Project substation; a 115 kV interconnection substation; and an operations and maintenance building (Appendix A, Figure 1).

Tetra Tech, Inc. (Tetra Tech) conducted natural resources surveys for vernal pools, wetlands, and watercourses within an approximately 1,499 acre area (Appendix A, Figure 2) covering multiple conceptual Project layouts dating back to when a portion of the property was purchased in 2012. The Study Area has changed slightly over the course of Project planning to accommodate a changing Project design, turbine layout and interconnection options. This report details the natural resource survey results for an approximately 536-acre Study Area (Study Area or Site) surrounding the proposed Project design as illustrated in Appendix A, Figure 2. The Study Area encompasses all areas associated with the proposed development design including roads, crane paths, turbine pads, operations and maintenance buildings and other appurtenant facilities.

The Study Area can be described as gently to steeply sloping terrain with a mixture of previously disturbed land within the radar fields surrounded by managed forest land, all in various stages of regeneration. There is an existing network of gravel access roads throughout the Study Area, as well as several abandoned USAF Radar Station buildings.

2.0 SURVEY METHODS

The resources identified in this report are subject to regulation under the Maine Natural Resources Protection Act (NRPA), 38 Maine Revised Statutes Annotated M.R.S. §§ 480-A to 480-FF and corresponding rules¹ administered by the Maine Department of Environmental Protection (MDEP). Additionally, these resources are subject to the provisions outlined in Sections 401 and 404 of the Clean Water Act administered by the United States Army Corps of Engineers (USACE).

Changes in Project design required several deployments to the Site to locate and evaluate all the natural resources that are subject to regulation and Project permitting. A portion of these surveys were conducted outside of the normal, growing season survey window and future surveys will be required, during seasonally appropriate conditions, to evaluate and verify the natural resources identified during these off-season surveys. These follow up surveys are scheduled to take place during the spring and summer of 2021.

Vernal pool, wetland and watercourse boundaries were delineated in the field and marked with alpha numeric coded flagging. Flags were spatially recorded using Apple iPads with the ArcGIS Collector application in conjunction with an EOS Positioning Systems Arrow 100 Sub-meter Global Navigation Satellite System.

¹NRPA rules available online: <https://www.maine.gov/dep/land/nrpa/index.html>

2.1 Vernal Pool Survey Methods

Vernal pool surveys were completed by Tetra Tech biologists in April and May 2020 in accordance with the criteria outlined in the Maine Association of Wetland Scientists Vernal Pool Technical Committee, Vernal Pool Survey Protocol (Maine Association of Wetland Scientists 2014). Two Site visits were completed during the vernal pool season to account for the different breeding periods of vernal pool species. During each visit, notes and photographs were collected to document Site conditions, biological activity, egg mass counts, and general pool characteristics. For each vernal pool observed within the Study Area, field scientists completed a Maine State Vernal Pool Assessment Form (MDEP 2017). For vernal pools that meet the criteria to be considered significant in accordance with NRPA Chapter 335, Significant Wildlife Habitat, section 9(B), forms were submitted to the Maine Department of Inland Fisheries and Wildlife for documentation in the State GIS system and significance determinations.

As described above, the Project layout has changed slightly during development and there are portions of the Study Area that were not included in the spring 2020 vernal pool survey effort. Areas added to the Study Area outside of the spring amphibian breeding season were surveyed for potential vernal pools (PVPs). The location and general characteristics of these PVPs were recorded and are included in the results of this report. Western Maine Renewables, LLC has begun spring 2021 vernal pool surveys to verify the results of the winter field work. For the purposes of this report, naturally occurring PVPs are considered significant vernal pools, and these designations will be adjusted as necessary once the spring 2021 surveys are completed and the level of biological activity in these pools is determined. A Natural Resource Report Addendum will be prepared upon completion of all spring 2021 vernal pool surveys.

2.2 Wetland and Watercourse Delineation Methods

Wetland and Watercourse delineations were completed by Tetra Tech biologists during the summer of 2020, with a few additional surveys completed in the winter of 2020–2021. Wetlands and watercourses were delineated in accordance with the USACE *1987 Wetland Delineation Manual* (USACE 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regional Supplement Version 2* (USACE 2012) (Regional Supplement); and in accordance with criteria set forth in the NRPA Rules, Chapter 310, Wetlands and Waterbodies Protection. Wetlands of Special Significance (WOSS), regulated under the NRPA 38 M.R.S.A. §§ 480-D, were evaluated accordance with the criteria described in NRPA, Chapter 310, Section 4(A).

USACE Wetland Determination Data Forms were completed at various sample locations within delineated wetlands and adjacent uplands in accordance with the procedures described in the Regional Supplement. Additionally, general notes on hydrology, vegetation and soil conditions were taken for each resource throughout the Study Area to adequately characterize the resources and to support Project planning and development. Photo documentation of these resources also was included in this effort.

Watercourses were mapped in accordance with the definitions described in the NRPA §480-B and the guidance provided in the Natural Resources Protection Act Identification Guide for Rivers, Streams, and Brooks (Danielson 2018). Representative Site photographs were taken of each watercourse and the physical dimensions, bottom composition, and flow regime were recorded.

In addition to the growing season survey, winter wetland delineations were performed in the winter of 2020–2021 to obtain preliminary data on the location and characteristics of wetlands and watercourses within areas that were added to the Study Area. Results for all wetland delineations completed outside of the growing season are indicated as such in the tables and figures presented in this report and will be subject to field-verification during a seasonally appropriate time of year, in 2021. A Natural Resource Report Addendum will be prepared upon completion of all 2021 field verification delineations.

3.0 SURVEY RESULTS

The Study Area is located within the Kennebec River Watershed. Chase Stream flows southeast out of the southern end of Chase Pond in the northern limit of the Study Area and flanks the west side of the Study Area. Bassett Brook, a watercourse with a smaller contributing watershed, flows out of a large wetland complex that occurs just north of the proposed turbine array and bisects the Study Area flowing south and eventually into Chase Stream, just upstream of its intersection with Austin Stream. Austin Stream occurs to the east and south of the Study Area and flows generally west until it's confluence with the Kennebec River, in Bingham, Maine. Natural resources observed within the Study Area generally contribute to these three watercourses. North American beaver (*Castor canadensis*) activity is common in this area, and several wetlands and watercourses were observed to be affected by impoundments.

Many of the natural resources observed within the Study Area have been affected by disturbances caused by forest management activities and the development of the USAF Radar Station. Impacts to natural resources from forestry practices are observed as tire ruts within wetlands, cleared and regenerating vegetation, as well as compaction and disturbance of topsoil. As is common in many areas throughout Maine, non-wetland areas with shallow water tables that are subject to this level of disturbance, over time, develop the hydric conditions required to be considered a wetland. These naturalized wetlands can be found throughout the Study Area within logging landings and skidder paths. Similar disturbances across the Site have developed the conditions required to support vernal pool breeding amphibians.

Areas located within the USAF Radar Station fields are heavily altered. Signs of ditching and soil disturbance are evident throughout the Study Area. Stunted vegetation indicates these soils are heavily compacted. A grounding grid installed within these fields can be observed in the form of metal mesh wires that are occasionally exposed throughout the Site. All the resources identified within these fields have been subject to past disturbance.

The existing network of roads represent another human-caused disturbance that disrupt the natural flow of water within wetlands and watercourses in the Study Area. Water passes through culverts and flows within ditches created by road construction and maintenance. Due to these past disturbances, there are features within the Study Area that convey water but are not subject to the same regulations as naturally occurring or naturalized features.

3.1 Vernal Pool Survey Results

There are 7 vernal pools and potential vernal pools identified within the Study Area. The location of the vernal pools identified within the Study Area are shown on the resource maps included in Appendix A, Figure 3 (Map set). The results are also summarized in Appendix B, Table 1. Maine State Vernal Pool Assessment Forms, for naturally occurring vernal pools, are provided in Appendix C.

The majority of the vernal pools identified within the Study Area are non-natural vernal pools. These vernal pools are generally created by tire ruts and roadside ditches that cause water impoundments and provide conditions conducive to spring amphibian breeding activities.

One of the vernal pools is characterized as significant (VP19CP). This vernal pool is naturally occurring and meets the egg mass count criteria to be considered significant under MDEP NRPA Chapter 335, Significant Wildlife Habitat rules (MDEP 2014). Two vernal pools (VP21DS and VP40DS) meet the criteria to be considered significant due to egg mass counts but are not considered significant due to their origin as unnatural or the presence of a permanent inlet or outlet.

3.2 Wetland Delineation Results

Eighty-five (85) wetlands totaling approximately 49.58 acres are identified within the Study Area. The location of the wetlands within the study area are shown in the resource maps included in Appendix A,

Figure 3 (map set). A detailed description of each wetland is provided in Appendix B, Table 2. USACE Wetland Determination Data Forms documenting a collection of resources that are representative of wetlands that occur at the Site are included in Appendix D, and representative photographs are included in Appendix E.

WOSS are defined under Maine Wetland Protection Rules, Chapter 310, Section 4 (MDEP 2009). Nineteen (19) of the identified wetlands meet the criteria to be considered WOSS for one or more of the following criteria: contains a natural community that is critically imperiled, or imperiled; contains significant wildlife habitat; or is located within 25 feet of a river, stream, or brook.

Wetlands within the Study Area are generally characterized by soils that are shallow to bedrock, with high organic content in the upper horizons. Common hydrology indicators include saturated soils and water stained vegetation. Soils within these wetlands are generally saturated throughout most of the growing season; however, a State-wide drought that occurred during the 2020 growing season likely contributed to observations of wetlands without saturated soils at or near the surface.

Common herbaceous vegetation within wetlands includes reed canary grass (*Phalaris arundinacea*), sensitive fern (*Onoclea sensibilis*), tussock sedge (*Carex stricta*), cattail (*Typha latifolia*), bluejoint (*Calamagrostis canadensis*), and cinnamon fern (*Osmundastrum cinnamomeum*). Common shrubs include meadowsweet (*Spiraea alba*), wild raisin (*Viburnum nudum*), speckled alder (*Alnus incana*), and mountain alder (*A. viridis*). Common tree species include red maple (*Acer rubrum*), quaking aspen (*Populus tremuloides*), northern white cedar (*Thuja occidentalis*) and black ash (*Fraxinus nigra*).

As described above, heavy logging activities and other human development have disturbed much of the vegetation on-Site, which are characterized as having dense populations of common red raspberry (*Rubus idaeus*), blackberry (*R. allegheniensis*), and other early successional species such as aspen (*Populus* spp.) and gray birch (*Betula populifolia*). Other portions of the Study Area occur within plantations typically dominated by red spruce (*Picea rubens*), eastern white pine (*Pinus strobus*) and balsam fir (*Abies balsamea*); these areas contain wetlands and uplands that are heavily managed for timber production.

There are a series of wetlands (Appendix A, Figure 3 map set sheet 31) that were previously delineated to support the permitting effort of the Northern Clean Energy Connect (NECEC) transmission project. These resources are included in the figures of this report and labeled “NECEC wetlands”. Tetra Tech evaluated these resources where they intersect with the Study Area. Boundaries of these resources were not modified.

3.3 Watercourse Delineation Results

Thirty-three (33) watercourse segments are identified within the Study Area (Appendix A, Figure 3 and Appendix B, Table 3). Six perennial watercourses and 27 intermittent and ephemeral watercourses were observed. Several of the delineated watercourses are associated with larger wetland complexes that continue off-Site. Bassett Brook, the only known named watercourse within the Study Area, flows out of a large, beaver impounded wetland, just west of an old USAF Radar Station field, and passes under an existing road, through an approximately 7-foot tall culvert, and eventually flows into Chase Stream, off-Site.

Many of the watercourses observed within the Study Area were observed to have been impacted by commercial forestry operations and/or development of the USAF Radar Station and Site access roads. This is evidenced by the channelization of sheet flow runoff, non-natural ditches, and culverts that collect and divert surface water throughout the Study Area.

4.0 CONCLUSION AND DISCUSSION

Vernal pool, wetland, and watercourse data collected during these surveys will be used to support continued Project planning and permitting activities. Disturbances from timber removal and construction of the USAF Radar Station are evident throughout the Site as described in the previous sections. These disturbances, coupled with natural impoundments and alteration of hydrology by North American beaver activity, have altered the natural hydrology of the Site. Relatively low levels of amphibian breeding and absence of observations of some of the more sensitive pool-breeding amphibians may be a result of these historic disturbances, low species diversity and abundance, limited available habitat in this area, or some combination of these factors.

Avoiding and minimizing direct impacts to water resources and sensitive natural resources is recommended. The mapped resources should be avoided to the extent practicable during final design of the Project, and during both construction and operational activities. Additionally, the implementation of impact avoidance and minimization strategies, such as erosion and sedimentation control, winter clearing, and micro-siting of proposed Project infrastructure would further reduce potential impacts to sensitive natural resources. Road improvements could present opportunities to improve watercourse crossings to reduce the impacts caused by human-caused impoundments and disturbances. Construction and operational best management practices, including post-construction restoration of disturbed soils also is recommended to minimize impacts to water resources and water quality during construction, and throughout the long-term life of the Project.





5.0 REFERENCES

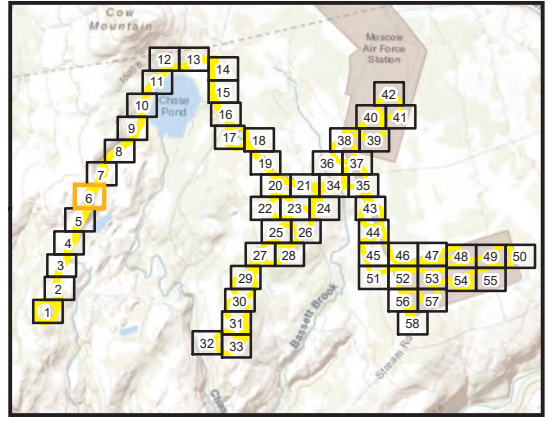
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. Roe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. December 1979. 142 pp. Available online at: <https://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States.pdf>. Accessed January 14, 2021.
- Danielson, T. J. 2018. Natural Resources Protection Act (NRPA) Streams, Rivers, and Brooks. Maine Department of Environmental Protection, Augusta, ME.
- Maine Association of Wetland Scientists. 2014. Vernal Pool Survey Protocol. Maine Association of Wetland Scientists Vernal Pool Technical Committee. April 2014. 84 pp. Available online at: http://mainewetlands.org/s/Complete-MAWS-2014-VP-Survey-Protocol_v3_05142014-6zs7.pdf. Accessed January 14, 2021.
- MDEP (Maine Department of Environmental Protection). 2017. Maine State Vernal Pool Assessment Form. Available online at: https://www.maine.gov/dep/land/nrpa/vernalpools/svpa_form.pdf. Accessed January 14, 2021.
- _____. 2009. Chapter 310. Wetlands and Waterbodies Protections. Rule Chapters for the Department of Environmental Protection. Available online at: https://www.maine.gov/dep/land/nrpa/310_booklet.pdf. Accessed November 14, 2020.
- USACE (United States Army Corps of Engineers). 1987. Environmental Laboratory. United States Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87 1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS. 100 pp.
- _____. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, C.V. Noble, and J.F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Appendix A. Figures



Legend

-  Study Area
-  20 Foot Contour
-  Wetland Continuation Line
-  Delineated Wetland (Winter)








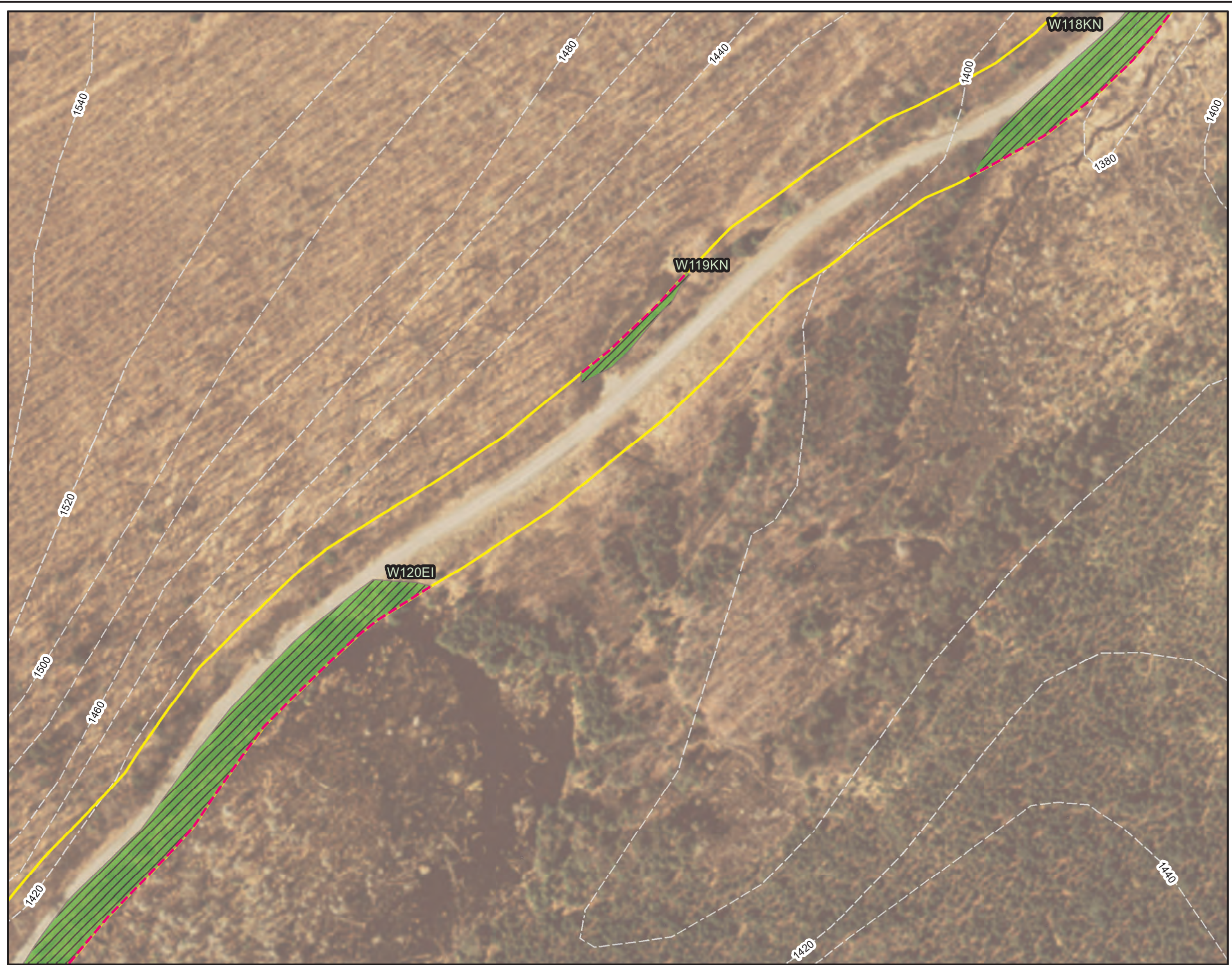
Figure 3
Sheet 6 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For: 





Prepared By:  **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984
 Universal Transverse Mercator, Zone 19 North



Legend

-  Study Area
-  20 Foot Contour
-  Wetland Continuation Line
-  Delineated Wetland (Winter)

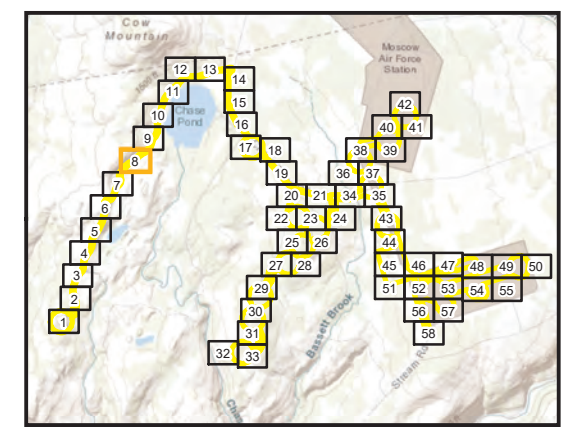


Figure 3
Sheet 8 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For: 

Prepared By:  **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984
 Universal Transverse Mercator, Zone 19 North

Document Path: Z:\projects\1942\PROJECTS\PA\1942\1942_7500_MooseCove_Winter_Soam\GIS\MapDocs\RESULTS\1942\1942_052021\Figure3\Figure3_Sheet8of58.mxd



Legend

- Study Area
- 20 Foot Contour
- Wetland Continuation Line
- Delineated Wetland (Winter)
- Delineated Stream (Winter)

N

0 125 250 Feet

Figure 3
Sheet 9 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984
 Universal Transverse Mercator, Zone 19 North



- Legend**
- Study Area
 - 20 Foot Contour
 - Wetland Continuation Line
 - Delineated Wetland (Winter)
 - Delineated Stream (Winter)

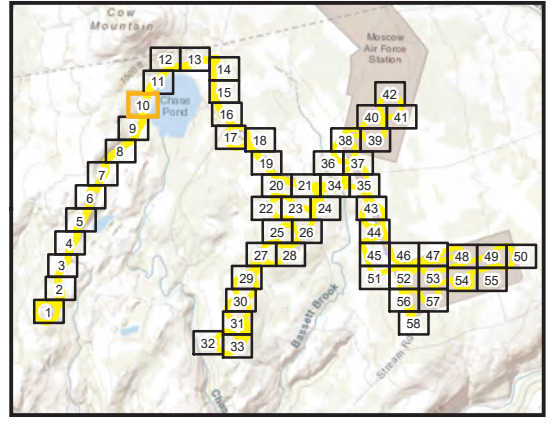


Figure 3
Sheet 10 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984
 Universal Transverse Mercator, Zone 19 North



Legend

- Study Area
- 20 Foot Contour
- Delineated Stream (Winter)

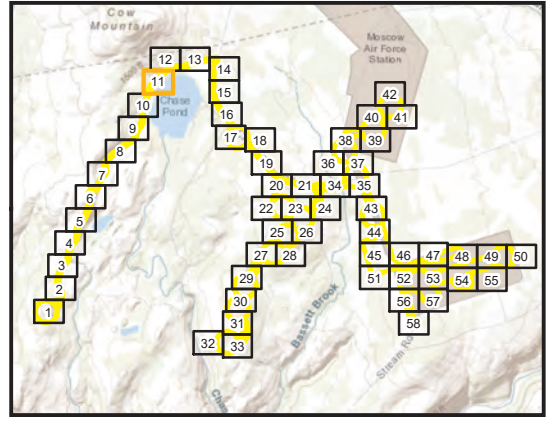


Figure 3
Sheet 11 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984 Universal Transverse Mercator, Zone 19 North



Legend

- Study Area
- 20 Foot Contour
- Delineated Stream (Winter)

The inset map shows the project area within a larger regional context, including Cow Mountain and Moose Air Force Station. It displays 50 numbered survey points (1-50) distributed across the terrain. A north arrow and a scale bar (0 to 250 feet) are also present.

Figure 3
Sheet 12 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984
 Universal Transverse Mercator, Zone 19 North



Legend

- Study Area
- 20 Foot Contour
- Wetland Continuation Line
- Potential Vernal Pool
- Delineated Wetland (Winter)
- Delineated Stream (Winter)

0 125 250 Feet

Figure 3
Sheet 14 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984 Universal Transverse Mercator, Zone 19 North



Legend

- Study Area
- 20 Foot Contour
- Delineated Stream (Winter)

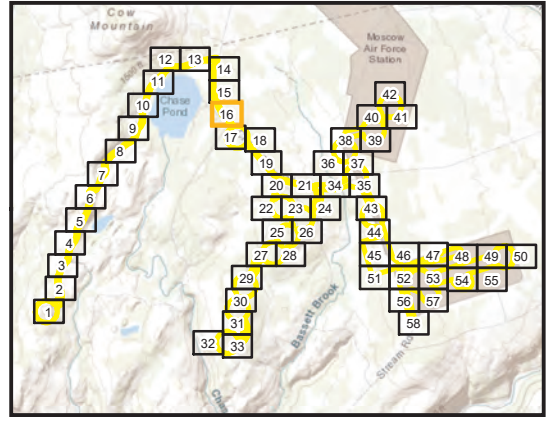


Figure 3
Sheet 16 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

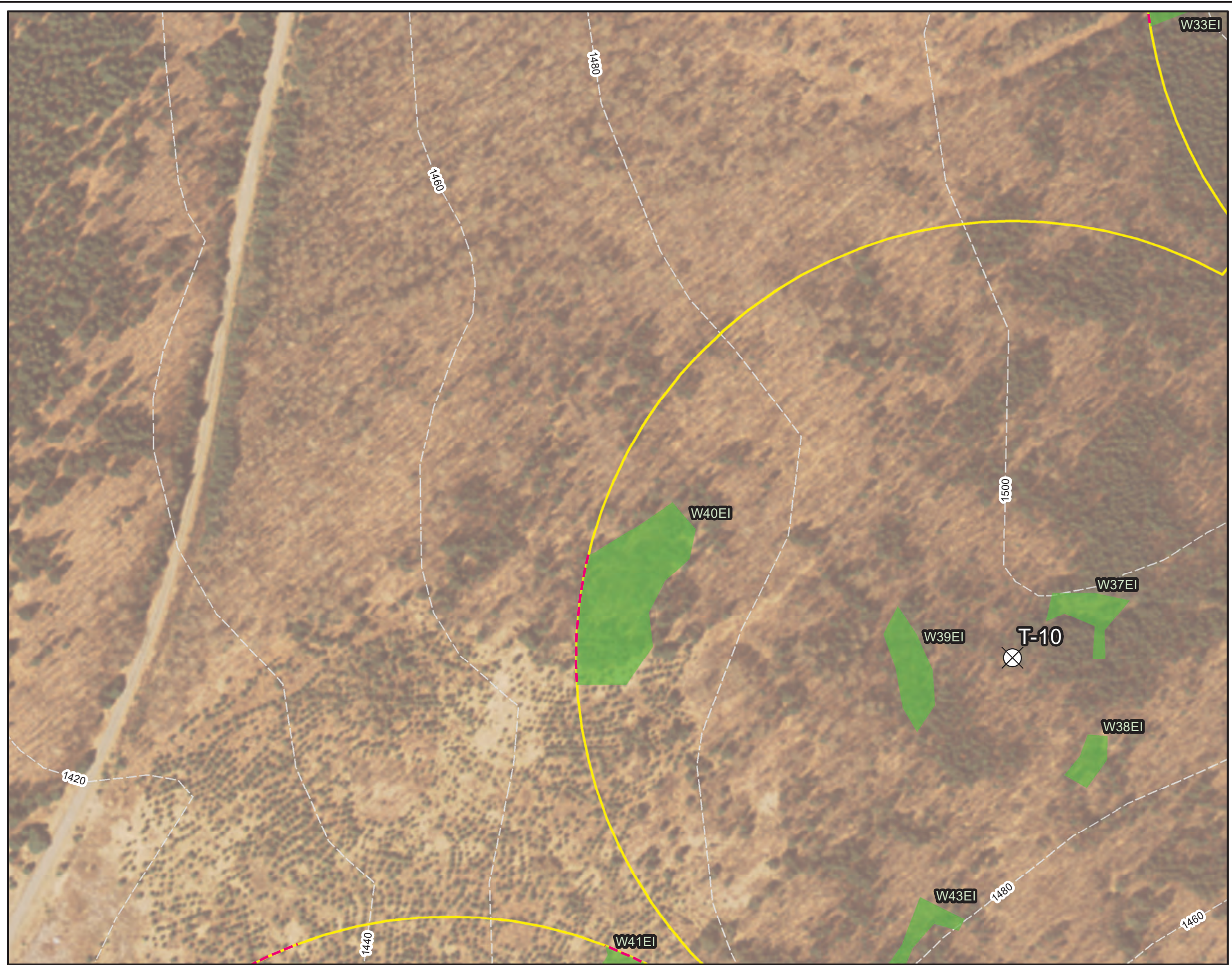
Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984 Universal Transverse Mercator, Zone 19 North

Document Path: Z:\projects\942\PROJECTS\PA\T\01\942_7300_MOSCOW_WIND\COMMENTS\MAPPING\RESULTS\TERRAIN\DATA_RESOURCES\FIG3\Figure3_Sheet16.mxd



Legend

- Study Area
- 20 Foot Contour
- ⊗ Turbine Location
- Wetland Continuation Line
- Delineated Wetland (Summer)

N

0 125 250 Feet

Figure 3
Sheet 25 of 58
Aquatic Resource Survey Results
Western Maine Renewable Energy Project

Prepared For:

Prepared By: **TETRA TECH** Date: **05/2021**

Source: Esri, et. al., 2020; Tetra Tech, 2020-21; Western Maine Renewables, 2021

Coordinate System: World Geodetic System, 1984
 Universal Transverse Mercator, Zone 19 North

