SECTION 10.0

Rare, Threatened & Endangered Species Review

Section 10.1

NH Natural Heritage Bureau Data Check

Section 10.1
NHB23-3333
RESPONSE

We are in receipt of your recent NHB DataCheck Results Let er dated December 12, 2023 (copy enclosed). We understand that the NHB let er and updated memo is in response to the "newly proposed project alternative presented during the Wetland Mitigation Pre-Application Meeting held on November 16, 2023; and all previous NHB memos can be disregarded."

To briefly summarize:

The project has requested and received three NHB DataCheck Results responses dating back from June 22, 2020 and December 6, 2022 to the current response dated December 12, 2023.

The initial June 22, 2020 response cited no known occurrences for sensitive species near the project area. On April 5, 2021 the applicant received a NHB comment let er which recommended further on-site botanical resource review. At this time, an initial botanical review was conducted during the 2021 growing season. No rare, threatened and endangered (RTE) plant species were documented. This review was conducted for the 3 phased project which was withdrawn on December 10, 2021.

During 2022 the new one phase project design alternative was developed. Based on the December 6, 2022 NHB response, supplemental plant survey investigations were conducted during the 2023 growing season and a NHFG review for the Common Loon was requested. See NHFG correspondence in Section 10.7.

The December 12, 2023 NHB let er lists RTE species found in the 12-06-22 let er in addition to listing additional natural community types. Based on this response, the applicant intends to coordinate with NHB staff regarding the specifics of the information requested.

NHB DataCheck Results Letter
NH Natural Heritage Bureau
Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

To: Nicholas Messina
35 Bow St
Portsmouth, NH 03801
nmessina@cmaengineers.com

From: NHB Review
NH Natural Heritage Bureau
Main Contact: Ashley Litwinenko - nhbreview@dncr.nh.gov

cc: NHFG Review

Date: 12/12/2023 (valid until 12/12/2024)
Re: DataCheck Review by NH Natural Heritage Bureau and NH Fish & Game
Permits: NHDES - Alteration of Terrain Permit, NHDES - Shoreland Standard Permit, NHDES - Wetland Standard Dredge & Fill - Major, OTHER - NHDES-WMD Standard Permit, USACE - General Permit, USCEQ - Federal: NEPA Review, USEPA - Stormwater Pollution Prevention

NHB ID: NHB23-3333

Town: Dalton
Location: 172 Douglas Drive

Project Description: Granite State Landfill, LLC proposes development of the Granite State Landfill project, which will consist of tree clearing, wetland filling (permitted separately) construction of a 70 acre lined landfill and associated berms, site infrastructure area, roadway improvements, and stormwater ponds. The project proposes a total area of disturbance of 148 acres, primarily on two parcels in Dalton. Portions of the project are also in Bethlehem, including improvements to Douglas Drive and NH Route 116.

Next Steps for Applicant:

NHB's database has been searched for records of rare species and exemplary natural communities. Please carefully read the comments and consultation requirements below.

NHB Comments: Please see the attached memo addressing NHB's concerns and recommendations regarding the proposed new landfill project in Dalton. In the memo, all requests are bolded. This is an updated memo for the newly proposed project alternative presented during the Wetland Mitigation Pre-application Meeting held on November 16, 2023; and all previous NHB memos can be disregarded. Please follow up with NHB to provide an anticipated timeframe for addressing the requests within the memo.

NHFG Comments: Please refer to NHFG consultation requirements below.

NHB Consultation

If this NHB DataCheck letter includes records of rare plants and/or natural communities/systems, please contact NHB and provide any requested supplementary materials by emailing nhbreview@dncr.nh.gov.

If this NHB DataCheck letter DOES NOT include any records of rare plants and/or natural communities/systems, no further consultation with NHB is required.

NH Fish and Game Department Consultation

If this NHB DataCheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB DataCheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://www.wildlife.nh.gov/wildlife-and-habitat/nongame-and-endangered-species/environmental-review. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB DataCheck results letter number and "Fis 1004 consultation request" in the subject line**.

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email NHFGreview@wildlife.nh.gov, and include the NHB DataCheck results letter number and "review request" in the email subject line.
Contact NH Fish & Game at (603) 271-0467 with questions.

NHB Database Records:
The following record(s) have been documented in the vicinity of the proposed project.
Please see the map and detailed information about the record(s) on the following pages.

Natural Community	**State[1]**	**Federal**	**Notes**
Northern white cedar - balsam fir swamp*	--	--	The primary threats to this natural community are changes to the hydrology of the wetland and increased nutrient and pollutant input from stormwater runoff. Construction activity in and repeated traffic through the wetland could also deleteriously affect its sensitive vegetation.
Northern white cedar seepage forest*	--	--	Highly sensitive to erosion and mechanical disturbance, changes in local hydrology, and increased nutrient inputs.

Plant species	**State[1]**	**Federal**	**Notes**
greater yellow lady's-slipper (*Cypripedium parviflorum var. makasin*)*	E	--	Occurs in a variety of wetland habitats, including mesic forests and peatlands. Potential threats include water level changes, water quality degradation, development (of adjacent uplands), off road vehicles, and succession. Another definite risk to this orchid is illegal collection.
marsh horsetail (*Equisetum palustre*)	E	--	This wetland species, which occurs in marshes and wet meadows, would be threatened by changes to local hydrology, including increased nutrient input from stormwater runoff, and sedimentation from nearby disturbance. It also occurs on river and streambanks, where the primary threats would be direct destruction of plants or their habitat.

Vertebrate species	**State[1]**	**Federal**	**Notes**
Common Loon (*Gavia immer*)	T	--	Contact the NH Fish & Game Dept (see above).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list.
An asterisk (*) indicates that the most recent report for that occurrence was 20 or more years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section above.

Disclaimer: NHB's database can only tell you of known occurrences that have been reported to NHFG/NHB. Known occurrences are based on information gathered by qualified biologists or members of the public, reported to our offices, and verified by NHB/NHFG.
However, many areas have never been surveyed, or have only been surveyed for certain species.

NHB recommends surveys to determine what species/natural communities are present onsite.

Information redacted pursuant to RSA 212-A

New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR
172 Pembroke Road, Concord, NH 03301
nhbreview@dncr.nh.gov

December 12, 2023

Nicholas Messina
Project Manager
CMA Engineers, Inc.
35 Bow Street
Portsmouth, NH 03801

RE: NH NHB DataCheck Letter NHB23-3333, Granite State Landfill, LLC

Dear Mr. Messina,

The NH Natural Heritage Bureau (NHB), under the authority of the Rare Plant Protection Act of 1987 (RSA 217-A), works to study, protect, and provide information on native plant species and natural communities in New Hampshire. NHB publishes the list of State Threatened and Endangered plants (Ncr 312) (http://www.gencourt.state.nh.us/rules/State_Agencies/ncr300.html) in New Hampshire and maintains a statewide database of known occurrences of these species, as well as exemplary natural communities and natural community systems. In cooperation with the NH Fish & Game Department's Nongame and Endangered Wildlife Program (Nongame Program), NHB also maintains the statewide database of threatened, endangered and special concern wildlife species.

The Granite State Landfill project proposes to directly and permanently impact 443,767 square feet (SF) of wetlands in addition to 36,896 SF of after-the-fact wetland impact associated with Douglas Drive and the gravel pit access roads. The combined total proposed wetland impact area is 480,663 SF (~11 ac). Additionally, approximately 909 linear feet (LF) of perennial stream and 956 LF of intermittent stream are proposed to be impacted. Wetlands provide unique habitats for plants and wildlife within NH's landscape and support numerous state-listed plant species.

On 12/12/2023, NHB provided a DataCheck Letter (NHB23-3333) for the subject project. The DataCheck indicates that the following State Endangered plant species and exemplary natural communities have been documented in the vicinity of the proposed project area:

greater yellow lady's-slipper (*Cypripedium parviflorum* var. *makasin*)

marsh horsetail (*Equisetum palustre*)

Northern white cedar - balsam fir swamp

Northern white cedar seepage forest

Natural Communities

Natural communities are recurring assemblages of plants and animals found in particular physical environments. An exemplary natural community is a viable occurrence of a rare natural community

type or a high-quality example of a more common natural community type based on community size, ecological condition, and landscape context (RSA 217-A:3, VII). NHB tracks exemplary occurrences of natural communities in NH and applies NatureServe's Conservation Status Ranks (https://explorer.natureserve.org/AboutTheData/DataTypes/ConservationStatusCategories) to assess the collapse or extirpation risk of ecosystems in the state. Status ranks range from S1 (critically imperiled) to S5 (secure). S1-ranked natural communities are critically imperiled due to extreme rarity (e.g., one to five occurrences), a very restricted geographic range, very steep recent declines, or other threats (e.g., development pressure). S5-ranked natural communities are widespread and abundant, with little risk of extirpation.

NHB is providing information below regarding critically-imperiled, imperiled, and vulnerable (S1-S3) wetland natural community types that have the potential to occur on-site. The conservation status ranks for each natural community type are included below in parentheses. Documented site information presented in the wetland mitigation pre-application meeting held on November 7, 2023, and in associated meeting materials, indicate site conditions that may support these natural community types. For example, the document titled, "Wetland Impact Sheets 2023-1109.pdf" indicates several areas of groundwater seepage, and aerial imagery indicates a primarily hardwood cover type, which may be indicative of rare seepage forest/forest seep natural community types. The solid waste application "Volume 3, Design Plans and Specifications.pdf" pg. 514 showed areas of "Peacham" soils within the 897A—Peacham, Bucksport, and Rumney soil series, which indicated that this soil type supports northern white cedar swamps. NH NHB's *Natural Communities of NH, Second Edition* publication (linked below) also references the Peacham soil series as occurring within ***northern hardwood seepage forests* (S3)**. Additionally, the "GSL Photo Log.pdf" dated November 2023 showed forested wetlands with larch as a major canopy component (photo 9), as well as a "bog" (photo 10) with emergent herbaceous vegetation and a thin woodland canopy comprised of conifers. Below are examples of S1-S3 natural community types that have a high potential to occur onsite based on information provided thus far:

- ***Northern white cedar seepage forest* (S2)**; see nearby occurrence on NHB23-3333
- ***Northern hardwood seepage forest* (S3)**;
- ***Larch-mixed conifer swamp* (S3)**;
- ***Northern white cedar - balsam fir swamp* (S2)**; see nearby occurrence on NHB23-3333

Other S1-S3 natural community types that may also occur onsite are described in the following sections of the *Natural Communities of NH, Second Edition*:

- **Northern conifer and hardwood swamps of central and northern NH**, pg. 117-122; note the four communities above are in this section.
- **Forest seeps**, pg. 127-131
- **Marshes, shrub thickets, and aquatic beds**, pg. 150-159
- **Open peatlands**, pg. 168-187

NHB requests that a botanist/ecologist that has experience classifying natural communities utilizing Natural Heritage methodology be consulted. This person would assess all field-delineated wetlands at

the project site to determine if they correspond with S1-S3 NH wetland natural community types. "Field-delineated wetlands" means wetlands within the "Wetland Field Delineation Limit" as depicted on ECP-1, sheet 2 and OCSP-1, sheet 3 within the hard-copy Permitting Plan Set mailed to NHB and dated October 2023. Consult the *Natural Communities of New Hampshire, Second Edition*, below, including the KEY TO WETLAND NATURAL COMMUNITIES on page 244 to aid in natural community classification of wetlands onsite.

Sperduto, D. D., and W. F. Nichols. 2012. Natural Communities of New Hampshire, second edition. NH Natural Heritage Bureau, Concord, NH. Originally published by UNH Cooperative Extension, Durham, NH. (https://www.nh.gov/nhdfl/documents/webversion_tech-manual.pdf) **For each potential S1-S3 wetland natural community occurring on the project site, please provide the following, at a minimum, to NHB:**

- The tentative natural community classification, to be assessed by NHB ecologists;
- A comprehensive species list including cover descriptions (dominant, common, and occasional) in the tree, shrub, and herbaceous vegetation strata;
- Physical landform and site characteristics including general hydrology;
- At least 5 representative photographs of each natural community;
- Any notable features (disturbance, rare plant species, invasive plant species, wildlife usage, etc.);
- Shapefile of mapped location.

NH Threatened and Endangered Plants

NHB requests surveying all areas of appropriate habitat within proposed impact areas for the two State Endangered (S1) plant species identified on NHB23-3333:

- marsh horsetail (*Equisetum palustre*) - Occurs in forested wetlands, forest seeps, marshes, and riparian areas.
- greater yellow lady's-slipper (*Cypripedium parviflorum* var. *makasin*) - Historical record associated with a cedar swamp.

Furthermore, the natural community types identified on NHB23-3333 and listed in this memo have the potential to support several Threatened (S2) and Endangered (S1) plant species. **NHB recommends surveying for the following species in areas of suitable habitat that are within proposed impact areas:**

***Northern hardwood seepage forest* (S3)**

- large yellow lady's-slipper *(Cypripedium parviflorum* var. *pubescens*) (S2)

***Northern white cedar - balsam fir swamp* (S2)**

- northern sweet-coltsfoot (*Petasites frigidus* var. *palmatus*) (S1)
- chestnut sedge (*Carex castanea*) (S1)
- Bailey's sedge (*Carex baileyi*) (S2)
- fairy-slipper (*Calypso bulbosa* ssp. *americana*) (S1)
- showy lady's-slipper (*Cypripedium reginae*) (S1)
- greater yellow lady's-slipper (Cypripedium parviflorum var. makasin) (S1)
- large yellow lady's-slipper (*Cypripedium parviflorum* var. *pubescens*) (S2)
- ram's-head lady's-slipper (*Cypripedium arietinum*) (S1)
- Loesel's wide-lipped orchid (*Liparis loeselii*) (S2)

Document rare plant species, if located, with GPS, diagnostic photos, and a rare plant reporting form (https://www.nh.gov/nhdfl/reports/rare-plant-list.htm).

Contact NHB with results when natural community and rare plant surveys are complete.

Thank you for coordinating with NHB. Please contact us if you have questions regarding the recommendations set forth in this memo.

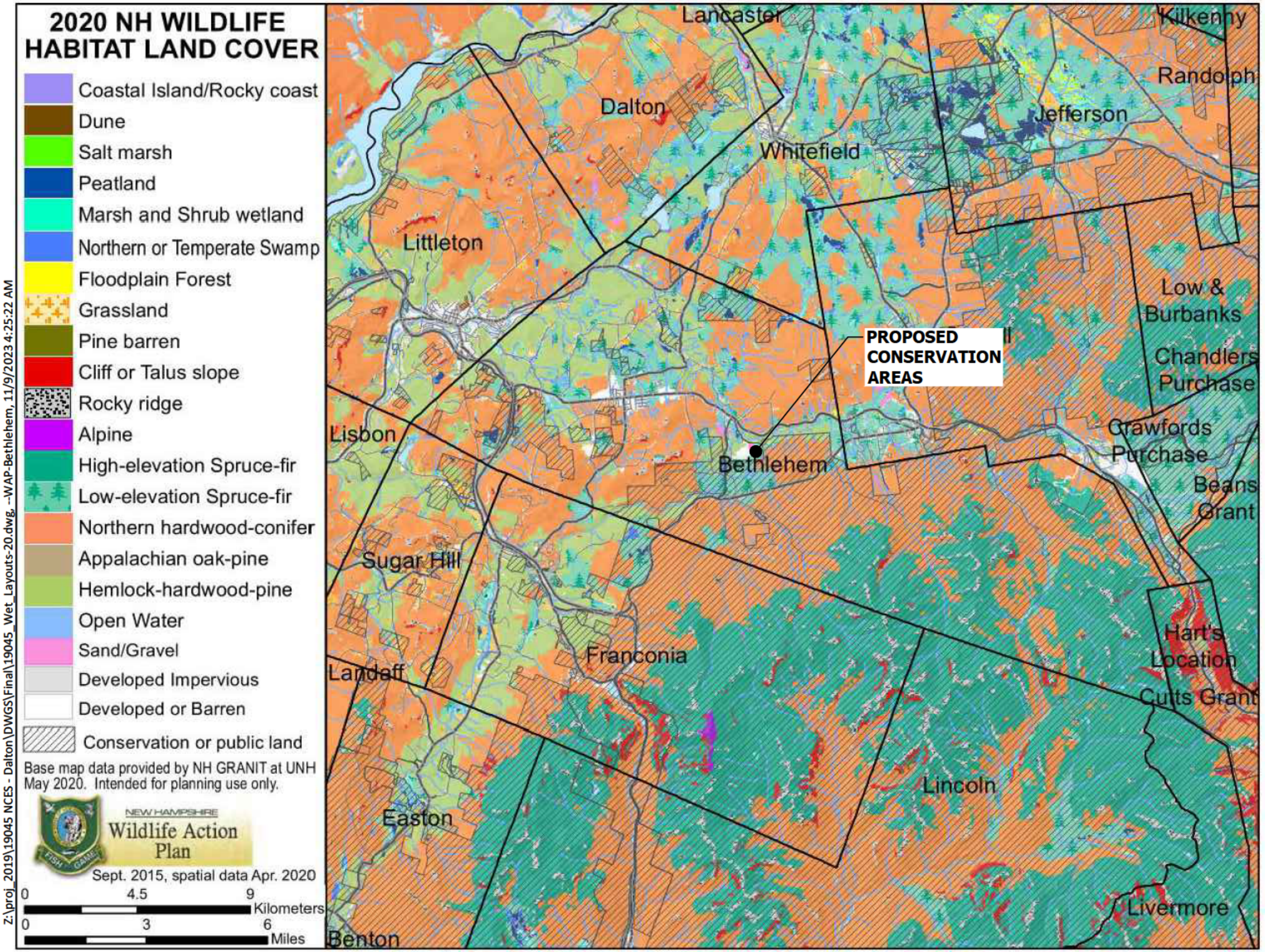
Sincerely,

Sabrina Stanwood

Sabrina Stanwood, NHB Administrator for
Ashley Litwinenko, NHB Environmental Reviewer
nhbreview@dncr.nh.gov

Section 10.2

NH Wildlife Action Plan Maps


2020 NH WILDLIFE HABITAT LAND COVER
Coastal Island/Rocky coast
Dune
Salt marsh
Peatland
Marsh and Shrub wetland
Northern or Temperate Swamp
Floodplain Forest
Grassland
Pine barren
Cliff or Talus slope
Rocky ridge
Alpine
High-elevation Spruce-fir
Low-elevation Spruce-fir
Northern hardwood-conifer
Appalachian oak-pine
Hemlock-hardwood-pine
Open Water
Sand/Gravel
Developed Impervious
Developed or Barren
Conservation or public land
Base map data provided by NH GRANIT at UNH May 2020. Intended for planning use only.
NEW HAMPSHIRE Wildlife Action Plan
Sept. 2015, spatial data Apr. 2020
0 4.5 9 Kilometers
0 3 6 Miles
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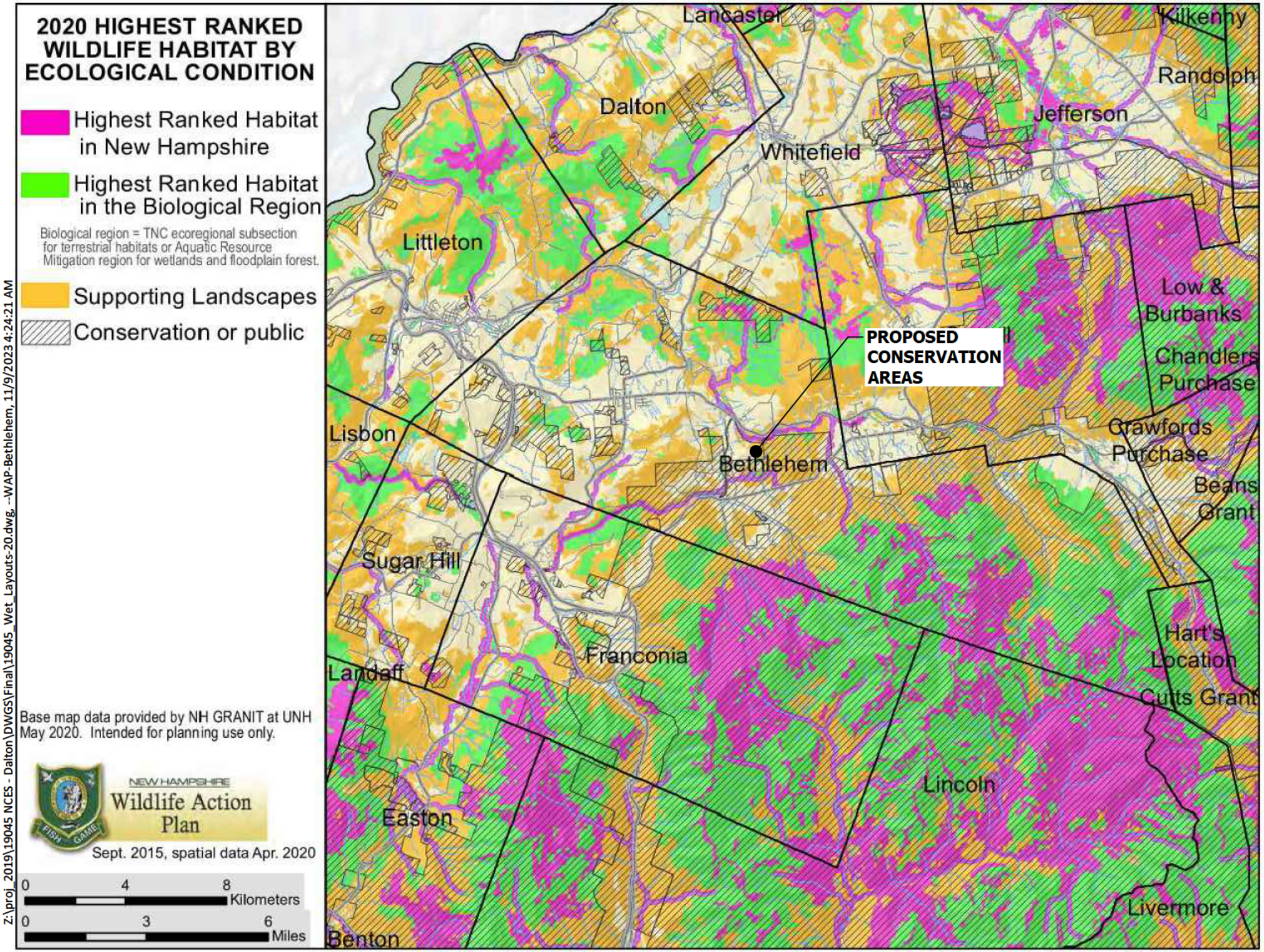
Lancaster
Kilkenny
Randolph
Dalton
Jefferson
Whitefield
Littleton
Low & Burbanks
PROPOSED CONSERVATION AREAS
Chandlers Purchase
Lisbon
Crawfords Purchase
Bethlehem
Beans Grant
Sugar Hill
Hart's Location
Franconia
Landaff
Cutts Grant
Lincoln
Easton
Livermore
Benton


2020 HIGHEST RANKED WILDLIFE HABITAT BY ECOLOGICAL CONDITION
Highest Ranked Habitat in New Hampshire
Highest Ranked Habitat in the Biological Region
Biological region = TNC ecoregional subsection for terrestrial habitats or Aquatic Resource Mitigation region for wetlands and floodplain forest.
Supporting Landscapes
Conservation or public
PROPOSED CONSERVATION AREAS
Lancaster
Kilkenny
Randolph
Dalton
Jefferson
Whitefield
Littleton
Low & Burbanks
Chandlers Purchase
Lisbon
Bethlehem
Crawfords Purchase
Beans Grant
Sugar Hill
Franconia
Hart's Location
Landaff
Cutts Grant
Lincoln
Easton
Livermore
Benton
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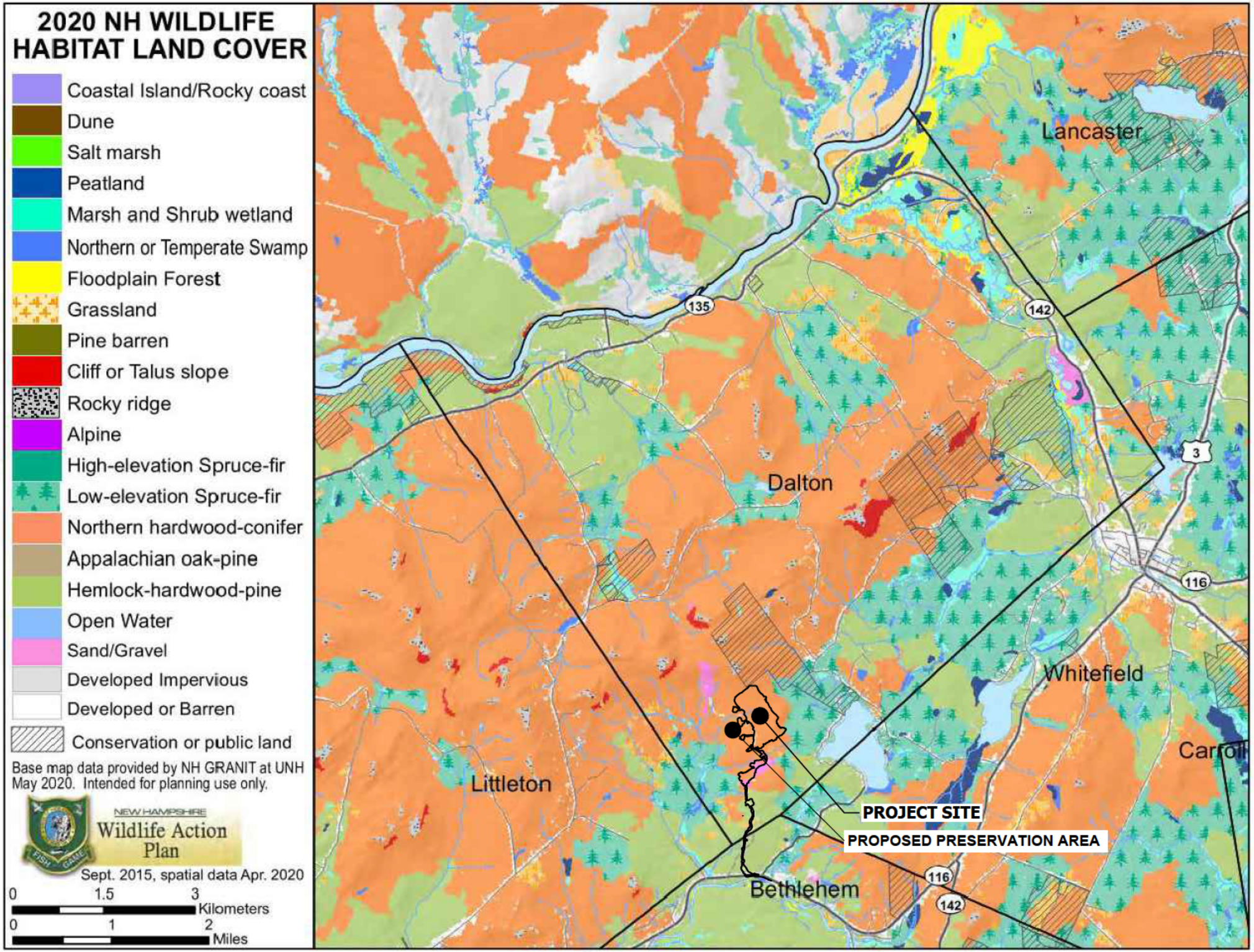
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Dune
Salt marsh
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Appalachian oak-pine
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Base map data provided by NH GRANIT at UNH May 2020. Intended for planning use only.
NEW HAMPSHIRE Wildlife Action Plan
Sept. 2015, spatial data Apr. 2020
0 1.5 3 Kilometers
0 1 2 Miles
Lancaster
Dalton
Whitefield
Carroll
Littleton
Bethlehem
135
142
3
116
116
142
PROJECT SITE
PROPOSED PRESERVATION AREA

2020 HIGHEST RANKED WILDLIFE HABITAT BY ECOLOGICAL CONDITION

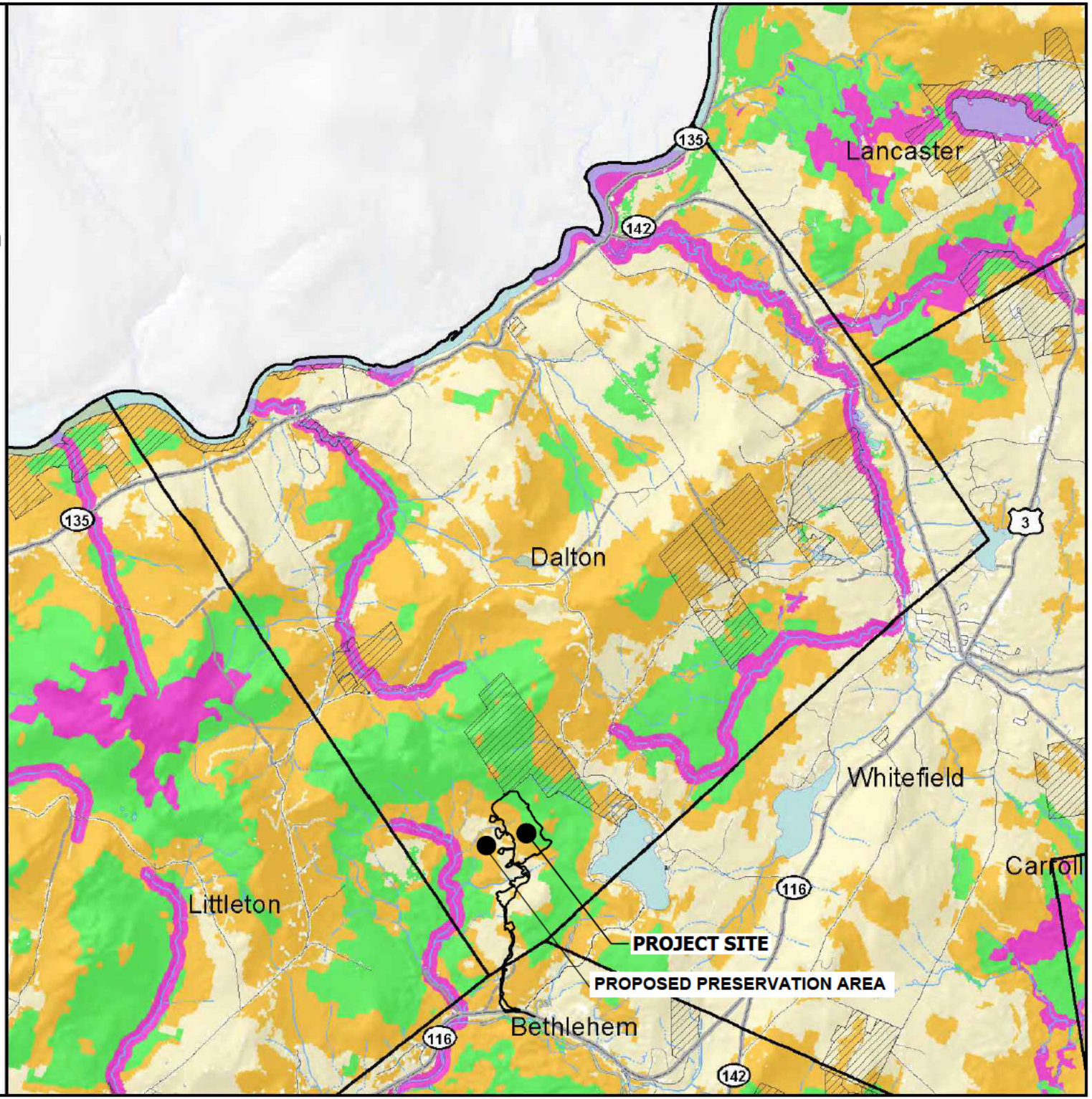
Highest Ranked Habitat in New Hampshire

Highest Ranked Habitat in the Biological Region

Biological region = TNC ecoregional subsection for terrestrial habitats or Aquatic Resource Mitigation region for wetlands and floodplain forest.

Supporting Landscapes

Conservation or public



Base map data provided by NH GRANIT at UNH May 2020. Intended for planning use only.

NEW HAMPSHIRE Wildlife Action Plan

Sept. 2015, spatial data Apr. 2020

0 1.5 3 Kilometers

0 1 2 Miles

Section 10.3

Vernal Pool Assessment

VERNAL POOL ASSESSMENT

PREPARED FOR:

GRANITE STATE LANDFILL, LLC
1855 VERMONT ROUTE 100
HYDE PARK, VERMONT 05655

PREPARED BY:

B.H. KEITH ASSOCIATES
P.O. BOX 326
FREEDOM, NEW HAMPSHIRE 03836

NOVEMBER 2023

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VERNAL POOL ASSESSMENT

1.0 INTRODUCTION

The characterization and assessment of vernal pools in the vicinity of the proposed project were conducted by wetland scientist and wildlife biologist, Barry H. Keith, for Granite State Landfill, LLC (GSL) from May 2019 through July 2023.

The proposed project is to be sited within an approximate 713 acre area located (Figure 1) off of Route 116 in Dalton, New Hampshire. The property is accessed by Douglas Drive, which currently provides access to Chick's Sand and Gravel, LLC, an active sand and gravel mining operation. The proposed project site encompasses approximately 150 acres (Figure 2). The "site" shall consist of the landfill and containment berm, perimeter road, infrastructure area and improvements to Route 116 and Douglas Drive. The proposed infrastructure area is a largely disturbed area associated with the active sand and gravel mining operations. The proposed landfill and perimeter road shall be positioned within a forested area east of Douglas Drive.

2.0 METHODOLOGY

In accordance with the vernal pool definitions as described by the U.S. Army Corps of Engineers (ACOE), State of New Hampshire (NHDES Administrative Rules Env-Wt 104.44) and the New Hampshire Fish and Game Department (NHF&G), vernal pools within the site were identified and assessed.

The ACOE NH Programmatic General Permit (PGP) defines vernal pools as "*confined basin depressions with water for two or more continuous months in the spring and/or summer, for which evidence of one or more of the following indicator vernal pool species: wood frogs (Rana sylvatica), mole salamanders (Ambystoma spp.) and fairy shrimp (Eubranchipus spp.) has been documented or for which evidence of two or more of the following facultative organisms: caddisfly (Trichoptera) larvae casings, fingernail clams (Sphaeriidae), or amphibious snails (Basammatophora) and evidence that the pool does not contain an established reproducing fish population has been documented.*" Vernal pool habitat is defined as "*the seasonal pool depression, seasonal pool envelope (100' radius from the VP edge) and seasonal pool terrestrial habitat (750'radius from the VP edge).*

In accordance with Env-Wt 104.44, the New Hampshire Department of Environmental Services (NHDES) defines a vernal pool as:

"a surface water or wetland, including an area intentionally created for purposes of compensatory mitigation, which provides breeding habitat for amphibians and invertebrates that have adapted to the unique environments provided by such pools and which:

(a) Is not the result of on-going anthropogenic activities that are not intended to provide compensatory mitigation, including but not limited to:
(1) Gravel pit operations in a pit that has been mined at least every other year; and
(2) Logging and agricultural operations conducted in accordance with all applicable New Hampshire statutes and rules; and

(b) Typically has the following characteristics:
(1) Cycles annually from flooded to dry conditions, although the hydroperiod, size, and shape of the pool might vary from year to year;
(2) Forms in a shallow depression or basin;
(3) Has no permanently flowing outlet;
(4) Holds water for at least 2 continuous months following spring ice-out;
(5) Lacks a viable fish population; and
(6) Supports one or more primary vernal pool indicators, or 3 or more secondary vernal pool indicators."

Lastly, the NHF&G report entitled "Identification and Documentation of Vernal Pools in New Hampshire", Tappan *et al*, defines a vernal pool as an area which "*is typically a temporary body of water providing essential breeding habitat for certain amphibians and invertebrate species and does not support fish."*

2.1 Vernal Pool Documentation

Employing the above referenced guidance, an initial screening of the site for potential vernal pool habitat was conducted during the delineation and classification of the wetlands from April through November 2018.

Five (5) vernal pool habitats and two 2) potential vernal pool habits were identified and mapped by Horizons Engineering, LLC using sub-meter GPS methods. Initial field surveys of these areas occurred on May 10, 2019 and April 23, 2020. Follow-up site visits were conducted during May 14, 2020, April 9, 2021, June 3, 2021, April 13, 2022, May 5, 2022, May 31, 2022, June 15, 2022, April 27, 2023, and July 7, 2023. The survey collected data such as pool size, depth, general condition of the pool, pool envelope, and seasonal pool terrestrial habitat. Sampling was conducted to determine the presence and relative abundance of the number of egg masses and individuals (tadpoles and larvae) indicator species within the pool. As observed, other facultative species were documented.

2.2 Vernal Pool Assessment

The Army Corps of Engineer (ACOE) New England District Vernal Pool Assessment method was employed to characterize vernal pools and provide a valuation for specific features of the pool. The ACOE method defines vernal pools as "*depressional aquatic resource basins that typically go dry in most years and may contain inlets or outlets,*

typically of intermittent flow. Vernal pools range in both size and depth and depending upon landscape position and parent material(s). Pools usually support one or more indicator species including: wood frogs, spotted salamanders, blue-spotted salamanders, marbled salamanders, Jefferson's salamander, and fairy shrimp; however, they should preclude sustainable populations of fish."

Using this standardized rapid assessment method, each pool was characterized to provide a valuation of the features of the pool and surrounding habitat. The ACOE- New England District "Draft Vernal Pool Characterization Form" was used to assess each of the respective pools.

3.0 OBSERVATIONS

As previously stated, initial field investigations centered on conducting a reconnaissance level review of the previously delineated and classified wetlands and the immediate environs during the 2018 field (April-November) season. This reconnaissance level screening of potentially viable habitat served to identify areas of temporarily pooled or ponded waters within the site. Five (5) vernal pools (Figure 3) labeled VP-1, VP-2, V-3, VP-4 and VP-5 and two (VP-6 and VP-7) potential vernal pools were identified. VP-1 and V-2 are positioned within wetlands to the west of Douglas Drive. VP-3, VP-4,VP-55, VP-6 and VP-7 are located (Figure 4) to the east of Douglas Drive.

Table 1
Vernal Pools

ID #	Wetland Classification	Mean Pool Depth	Maximum Pool Area
VP-1	PSS1E	12"	3,600
VP-2	PFO1/4E	8"	1,600
VP-3	PSS1E	8"	900
VP-4	PFO1/4E	8"	338
VP-5	PSS/EM1E	12"	1,056
VP-6	PSS1E	4"	1,015
VP-7	PEM/SS1E	5"	625
TOTAL			9,134 SF

Generally, several factors affect the utilization and character of a vernal pool. Typically, these sites are most active from early spring through mid-spring when the frogs and salamanders come out of hibernation and migrate to the pools to breed. Principal indicator species are wood frogs *(Rana sylvatica)* and mole salamanders such as spotted salamanders *(Ambystoma maculatum)* and Jefferson salamanders *(Ambystoma jeffersonianum)*. While spring peepers *(Hyla crucifer)* are often found in vernal pools,

however they are not considered as an indicator specie. The most common invertebrate indicator specie is the fairy shrimp *(*Order: *Anostraca).*

In addition to assessing the habitat components such as size, depth, vegetative characteristics, surrounding land cover types, etc., the presence and number of egg masses and tadpoles/larvae are key components in determining the viability of a vernal pool.

Based on the reconnaissance level site review, more comprehensive field surveys were conducted on May 10, 2019 and on April 23, 2020. A follow-up site visit was conducted on May 14, 2020.

All of the vernal pools (see photo log) are naturally occurring. VP-2 and VP-3 have been man-altered in the past.

VP-1 is an oval shaped naturally occurring scrub-shrub wetland dominated by winterberry *(Ilex verticillata).* This small isolated wetland is positioned less than 100 feet away from VP-2. The pool encompasses much of the overall wetland area, with a maximum pool size estimated at 3,600 square feet. Spotted salamander egg masses were documented in both 2019 and 2020. The May 14, 2020 site visit observed six (6) egg masses. During the April 9, 2021 period, dry conditions prevailed. Only one (1) wood frog and one (1) wood frog egg mass were observed. A follow up inspection on June 3, 2121 found the pool nearly dry with exposed un-hatched egg masses evident. Dry spring conditions in 2022 yielded similar results. Given the cool wet spring/summer of 2023, all the vernal pools and the two potential vernal pools (VP-6 and VP-7) experienced extended hydroperiods and were correspondingly more successful in hatching juvenile amphibians.

VP-2 is positioned within the western limits of a larger wetland complex. While naturally occurring, the pool's hydrology has been influenced by a rutted old woods road that traverses across the wetland. The woods road serves to restrict flow from the wetland providing for an extended hydroperiod for the pool to develop. Due to the road's position, the pool was estimated to have a maximum length of 80' with a width of 20' (1,600 SF). The wetland was classified as a palustrine broad-leaved deciduous/needle-leaved evergreen forested area (PFO1/4E) that temporarily ponds water during the spring months. Four (4) spotted salamander egg masses were documented during the 2019 field survey and one (1) during the April 2020 survey. Later in the season, the May 14, 2020 site visit observed eight (8) spotted salamander and seven (7) wood frog egg masses. Similarly, spring weather conditions which vary from year to year serve to dictate the viability and productivity of a given pool.

VP-3 is positioned east of Douglas Drive at the northeast edge of a large log landing area. The area was logged during the winter of 2018-2019. Comparable to VP-2, rutting has likely served to restrict/re-direct surface water flow to and from the pool. This scrub-shrub (PSS1E) wetland also contains limited emergent habitat. The maximum pool size was estimated at 900 square feet with a maximum depth of 8 inches. The pool is quite

shallow. During the 2019 field survey, the maximum depth was only 4 inches. No egg masses were observed. The pool was dry later that spring. After a cool wet period, the spring 2020 inspection estimated the maximum water depth at 8 inches. Ten (10) spotted salamander and one (1) wood frog egg masses were documented. The May 14, 2020 site visit observed that the general pool size and depth of water had decreased. This shallow perched depression position adjacent to an open southwest exposure associated with a former log landing likely influences the generally limited hydroperiod of this pool.

VP-4 and VP-5 are also positioned east of Douglas Drive immediately west of an old woods road. VP-4 is adjacent to the road. VP-5 is approximately 100 feet or less westerly of VP-4. Both of these pools are interconnected by forested wetland. VP-4 is a small depression within the forested wetland. The maximum pool size was estimated at about 338 square feet with a maximum depth of 12 inches. Two (2) wood frog egg masses were documented in 2019 with four (4) observed in 2020. VP-5 is a natural depression dominated by scrub-shrub and emergent vegetation. This approximate 1056 square foot area has a pool canopy cover of less than 30 percent. The maximum depth was approximately 18 inches. During 2019, the spring survey observed six (6) wood frog egg masses and four (4) spotted salamander egg masses. The April 2020 survey documented ten (10) wood frog egg masses and seven (7) spotted salamander egg masses. Subsequent field observations were consistent with the April 2020 observations.

VP-6 and VP-7 were originally assessed as “potential vernal pools.” These two locations are within low lying depressions in scrub-shrub/emergent wetland areas. Monitoring observations from 2019-2021 indicated that water levels were low and could not sustain a viable amphibian breeding population. Abnormally dry conditions prevailed through this period. May 5, 2022 site visit observed 8 spotted salamander and 7 wood frog egg masses in VP-6. The water depth was measured between 4-6 inches. During the same period, VP-7 exhibited 10 wood frog egg masses, numerous caddis fly casings, and a few hatched polywogs, Recent clearcutting ccurred adjacent to approximately 50% of the wetland/pool edge. Follow up site visits in 2022 and 2023 revealed continued vernal pool habitat utilization. Based on these observations, during wetter spring seasons, VP-6 and VP-7 do periodically function as viable amphibian breeding habitat.

Table 2
Vernal Pool Characterization Score

ID#	Pool Characteristics	Pool Envelope & Critical Terrestrial Habitat
VP-1	20.0	31.2
VP-2	22.0	30.9
VP-3	20.0	24.9
VP-4	20.0	30.6
VP-5	26.0	30.6
VP-6	N/A	28.5
VP-7	N/A	29.5

Based on the U.S. Army Corps of Engineers Vernal Pool Characterization ranking criteria, VP-1, VP-3 and VP-4 all ranked equally for pool characterization (score: 20.0). VP-2 scored 22.0 for pool characterization while VP-5 received a score of 26.0.

VP-4 and VP-5, which are positioned in close proximity within the same wetland system, received a similar ranking of 30.6 for envelope and critical habitat. The vernal pools (VP-1 and VP-2) west of Douglas Drive received an envelope and critical habitat score of 31.2 and 30.9 respectively. The small size and proximity of the open log landing negatively influenced the envelope and critical habitat score of VP-3. This area received a score of 24.9.

In summary, all vernal pools were found to provide viable vernal pool habitat. The generally shallow pool depths and proximity of the pool to the former log landing for VP-3 adversely affects both the habitat viability and the duration of ponding.

The positioning of the old woods road at VP-2 likely serves to retain water in the pool for an extended duration.

While small in size (500 SF), VP-5 received the highest score (26.0) for pool characteristics. The scrub-shrub and emergent wetland vegetation, and generally deeper pool depths serve to enhance the score of this area.

3.1 VERNAL POOL FUNCTIONS

In accordance with the ACOE mitigation guidance, using the Corps Vernal Pool Characterization Form, "*vernal pools may be classified as providing high, medium, or low levels of functions"* as follows:

- *Low value vernal pools would be those with a score of 10 or less for the pool and 11 or more for the landscape.*
- *Medium value vernal pools would be those with a score of 11 to 20 for the pool and 12 to 22 for the landscape.*
- *High value vernal pools would be those with a score of 21 or more for the pool and 23 or more for the landscape.*

Where the pool and landscape scores do not fall within the same category, the lower of the two categories (representing the limiting factor) is used.

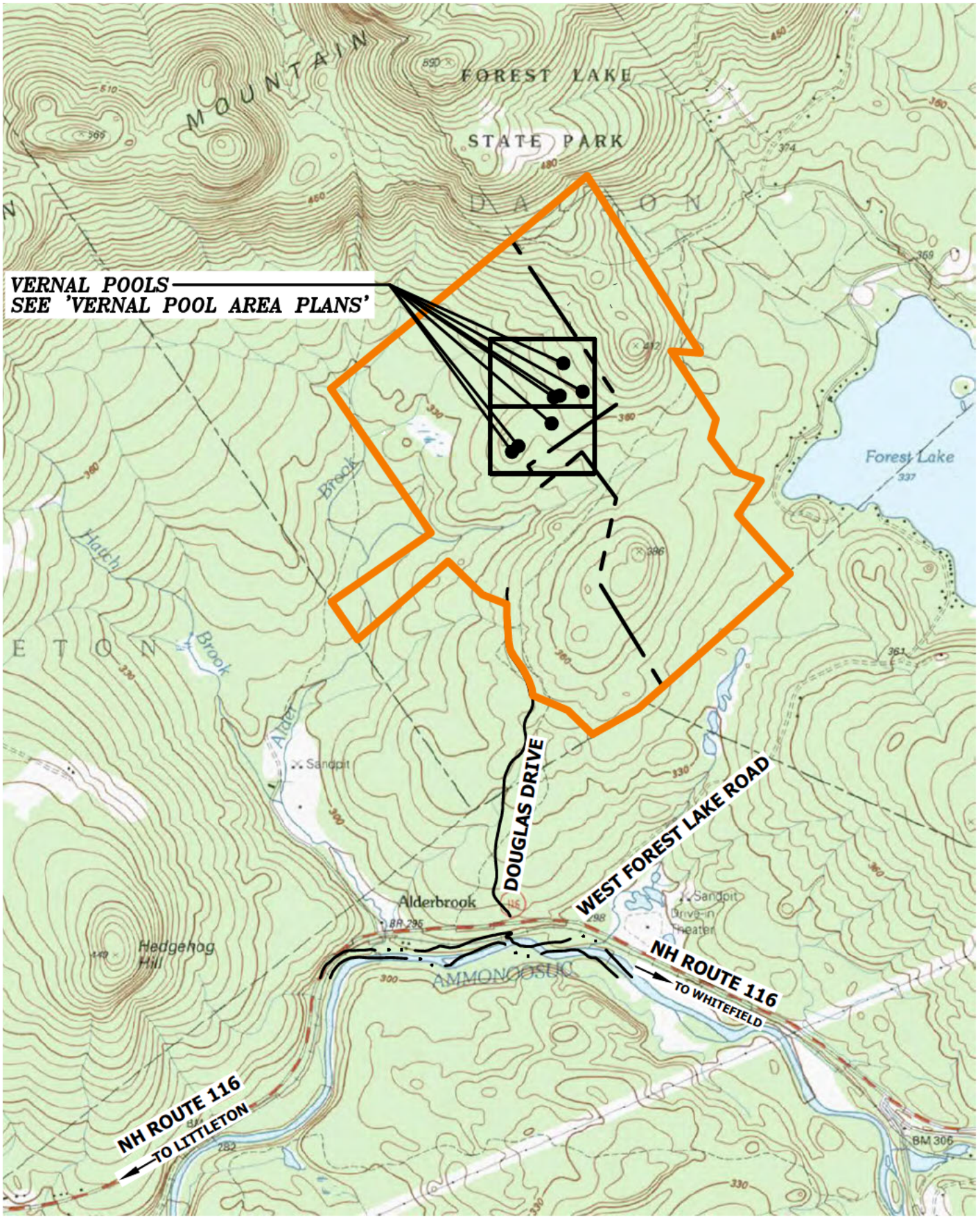
Table 3
Vernal Pool Functions

ID#	Pool Characteristics	Pool Envelope & Critical Terrestrial Habitat
VP-1	Medium	High
VP-2	High	High
VP-3	Medium	High
VP-4	Medium	High
VP-5	High	High
VP-6	N/A	High
VP-7	N/A	High

In summary, VP-1, VP-3 and VP-4 are classified as providing medium levels of functions. VP-2 and VP-5 ranked as providing high levels of functions. VP-6 and VP-7 were not ranked.

4.0 VERNAL POOL IMPACTS

Vernal pools (VP-1 and VP-2) are located west of Douglas Drive. These vernal pools are outside of the project footprint and will not be directly impacted by the proposed project. Five pools, pool envelope and critical terrestrial habitat around the pools shall be impacted by the project. These areas, totaling 7,550 square feet are positioned within the proposed landfill footprint.



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GRANITE STATE LANDFILL, LLC

DALTON, NEW HAMPSHIRE

FIGURE 1 - VERNAL POOL LOCATION PLAN

PROJECT #:	19045
DRAWN BY:	BHK/KRP
DATE:	NOV 2023

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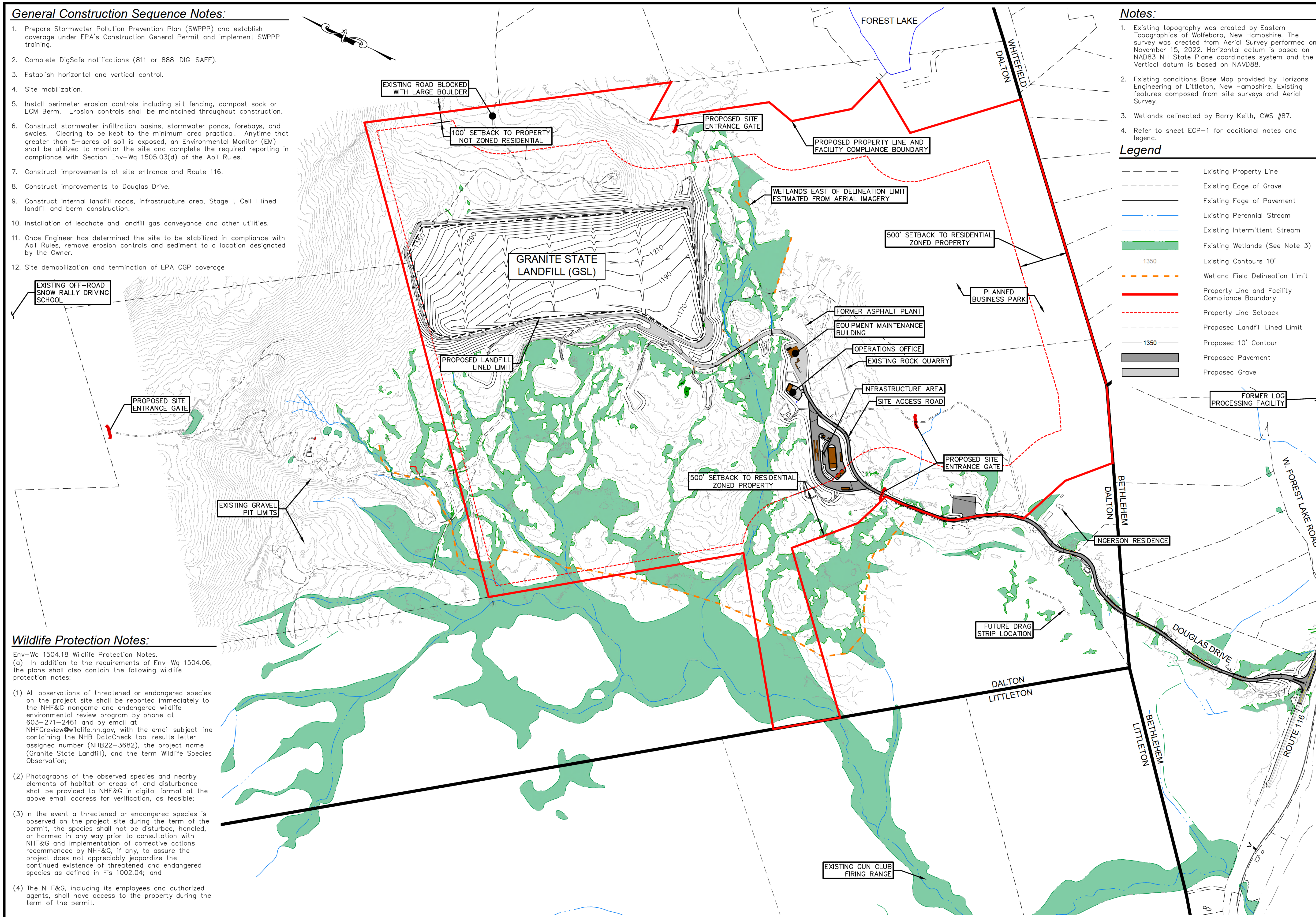
General Construction Sequence Notes:

1. Prepare Stormwater Pollution Prevention Plan (SWPPP) and establish coverage under EPA's Construction General Permit and implement SWPPP training.
2. Complete DigSafe notifications (811 or 888-DIG-SAFE).
3. Establish horizontal and vertical control.
4. Site mobilization.
5. Install perimeter erosion controls including silt fencing, compost sock or ECM Berm. Erosion controls shall be maintained throughout construction.
6. Construct stormwater infiltration basins, stormwater ponds, forebays, and swales. Clearing to be kept to the minimum area practical. Anytime that greater than 5-acres of soil is exposed, an Environmental Monitor (EM) shall be utilized to monitor the site and complete the required reporting in compliance with Section Env-Wq 1505.03(d) of the AoT Rules.
7. Construct improvements at site entrance and Route 116.
8. Construct improvements to Douglas Drive.
9. Construct internal landfill roads, infrastructure area, Stage I, Cell I lined landfill and berm construction.
10. Installation of leachate and landfill gas conveyance and other utilities.
11. Once Engineer has determined the site to be stabilized in compliance with AoT Rules, remove erosion controls and sediment to a location designated by the Owner.
12. Site demobilization and termination of EPA CGP coverage



Wildlife Protection Notes:

Env-Wq 1504.18 Wildlife Protection Notes.
(a) In addition to the requirements of Env-Wq 1504.06, the plans shall also contain the following wildlife protection notes:

(1) All observations of threatened or endangered species on the project site shall be reported immediately to the NHF&G nongame and endangered wildlife environmental review program by phone at 603-271-2461 and by email at NHFGreview@wildlife.nh.gov, with the email subject line containing the NHB DataCheck tool results letter assigned number (NHB22-3682), the project name (Granite State Landfill), and the term Wildlife Species Observation;

(2) Photographs of the observed species and nearby elements of habitat or areas of land disturbance shall be provided to NHF&G in digital format at the above email address for verification, as feasible;

(3) In the event a threatened or endangered species is observed on the project site during the term of the permit, the species shall not be disturbed, handled, or harmed in any way prior to consultation with NHF&G and implementation of corrective actions recommended by NHF&G, if any, to assure the project does not appreciably jeopardize the continued existence of threatened and endangered species as defined in Fis 1002.04; and

(4) The NHF&G, including its employees and authorized agents, shall have access to the property during the term of the permit.

Notes:

1. Existing topography was created by Eastern Topographics of Wolfeboro, New Hampshire. The survey was created from Aerial Survey performed on November 15, 2022. Horizontal datum is based on NAD83 NH State Plane coordinates system and the Vertical datum is based on NAVD88.
2. Existing conditions Base Map provided by Horizons Engineering of Littleton, New Hampshire. Existing features composed from site surveys and Aerial Survey.
3. Wetlands delineated by Barry Keith, CWS #87.
4. Refer to sheet ECP-1 for additional notes and legend.

Legend

- Existing Property Line
- Existing Edge of Gravel
- Existing Edge of Pavement
- Existing Perennial Stream
- Existing Intermittent Stream
- Existing Wetlands (See Note 3)
- 1350 Existing Contours 10'
- Wetland Field Delineation Limit
- Property Line and Facility Compliance Boundary
- Property Line Setback
- Proposed Landfill Lined Limit
- 1350 Proposed 10' Contour
- Proposed Pavement
- Proposed Gravel

no.	revision	date	by

CMA ENGINEERS
Civil/Environmental/Structural
Portsmouth, NH 603/431-6196 • Manchester, NH 603/627-0708 • Portland, ME 207/541-4223
c m a e n g i n e e r s . c o m

date: October 2023
project no: 1101
designed by: ATR/NJM/STF/AJS
drawn by: ATR/NJM/STF
checked by: AJS
approved by: AJS
scale: 0 450' 900' Scale: 1" = 450'

Granite State Landfill, LLC
Dalton, New Hampshire
Permitting Plan Set

Overall Site Plan

drawing no. OVSP-1

sheet: 3 of 50

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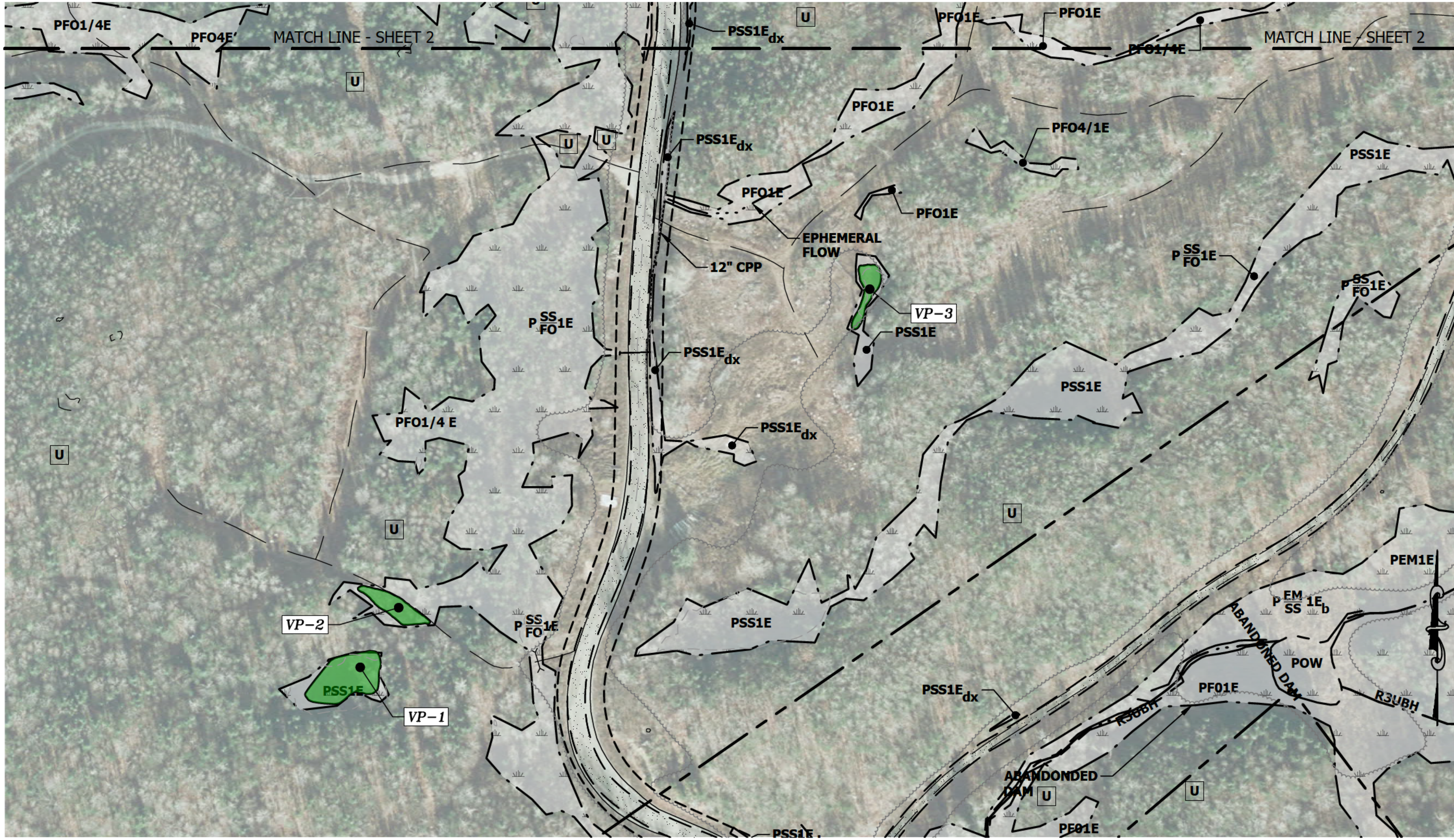

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VERNAL POOL AREA PLAN (1 OF 2)

PROJECT #: 19045
DRAWN BY: BHK/KRP
DATE: NOV 2023

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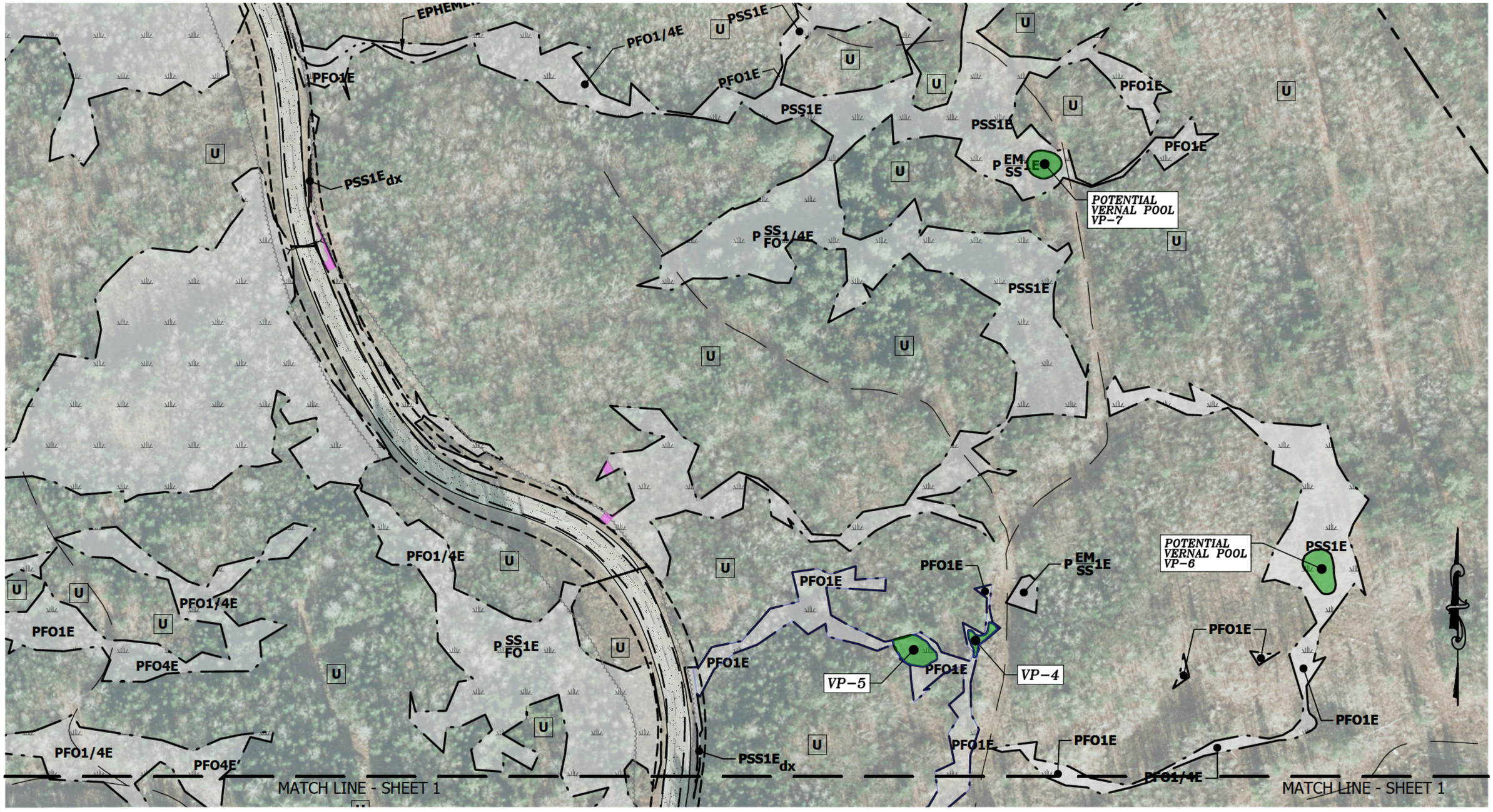

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VERNAL POOL AREA PLAN (2 OF 2)

PROJECT #:	19045
DRAWN BY:	BHK/KRP
DATE:	NOV 2023

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VERNAL POOL HABITAT MAP (1 OF 2)

PROJECT #: 19045
DRAWN BY: BHK/KRP
DATE: NOV 2023

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PFO1E
PFO1/4E
PSS1E
PSS1E dx
PFO4E
P SS FO 1/4E
P EM SS 1E
U
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1150
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1170
1180
1190
1200
1210
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1250
POTENTIAL VERNAL POOL VP-7
POTENTIAL VERNAL POOL VP-6
VP-4
VP-5
MATCH LINE - SHEET 1
MATCH LINE - SHEET 1

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SCALE IN FEET

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VERNAL POOL HABITAT MAP (2 OF2)

PROJECT #: 19045
DRAWN BY: BHK/KRP
DATE: NOV 2023

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-1
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 5/10/19
Longitude/Latitude (in decimal degrees): 44 20'N 71 41'37"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☐ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts) (NA)
- ☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: Natural

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☐ Loose till
- ☐ Peat
- ☒ Dense till
- ☐ Alluvium
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☐ Forested wetland (4 pts)
- ☐ Herbaceous wetland (4 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☒ Shrub wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Other:_____(variable points)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☐ Intermittent stream reach (2 pts)

5. Pool canopy cover (%): less than 50%

6. Predominant substrate:

- ☒ Mineral soil
- ☒ Organic matter (peat/muck) Depth 6"+/– Sampling location (e.g., deepest zone, edge, etc.) edge

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 90' Width 40'
Area: 3600 sf

b. Maximum depth at deepest point at time of survey (include units): 18"+/–

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☒ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☒ Clear
- ☐ High turbidity
- ☐ High algae content
- ☒ Tannic

20 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT

VP-1
Pool ID _____

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 100 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)

☐ Shrub _____ (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 95 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☐ Shrub _____ % (10 pts) ☒ Developed gravel road & log landing 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

31.2 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)			
Spotted Salamander (*Ambystoma maculatum*)	5/10/19	3	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list): mosquito larvae	5/10/19		many

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

20 **TOTAL for Pool Characteristics** 31.2 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

Note: Snowy winter with prolonged spring period.

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-1
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): [illegible] 4/23/20
Longitude/Latitude (in decimal degrees): 44 20'N 71 41'37"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☐ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts)
- (NA)
- ☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: natural

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☐ Loose till
- ☐ Peat
- ☒ Dense till
- ☐ Alluvium
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☐ Forested wetland (4 pts)
- ☐ Herbaceous wetland (4 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☒ Shrub wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Other:_____(variable points)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☐ Intermittent stream reach (2 pts)

5. Pool canopy cover (%): less than 50%

6. Predominant substrate:

- ☐ Mineral soil
- ☒ Organic matter (peat/muck) Depth 16" Sampling location (e.g., deepest zone, edge, etc.) edge

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 90' Width 40'
Area: 3600 SF

b. Maximum depth at deepest point at time of survey (include units): 15"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☒ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☐ Clear
- ☐ High turbidity
- ☐ High algae content
- ☒ Tannic

20 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT

VP-1
Pool ID _____

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 100 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)

☐ Shrub _____ (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 95 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☐ Shrub _____ % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

31.2 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)			
Spotted Salamander (*Ambystoma maculatum*)	4/23/20	1	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list): _____			
Rare Species (list): _____			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list): _____			
Other species (e.g., Ducks, Turtles, etc.)(list): _____			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

20 **TOTAL for Pool Characteristics** 31.2 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

Note: Normal to dryer winter conditions and cool wet spring.

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-2
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 5/10/19
Longitude/Latitude (in decimal degrees): 44 20' 39"N 71 41'36"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☒ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts)
- (NA)
- ☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: natural/man altered (skidder ruts)

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☒ Dense till
- ☐ Loose till
- ☐ Alluvium
- ☐ Peat
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☐ Forested wetland (4 pts)
- ☐ Shrub wetland (4 pts)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☐ Herbaceous wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Intermittent stream reach (2 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☐ Other:_____(variable points)

5. Pool canopy cover (%): greater than 50%

6. Predominant substrate:

- ☐ Mineral soil
- ☒ Organic matter (peat/muck) Depth 12" Sampling location (e.g., deepest zone, edge, etc.) center

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 70' Width 20'
Area: 1400 SF

b. Maximum depth at deepest point at time of survey (include units): 12"+/-

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☐ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☒ Clear
- ☐ High turbidity
- ☐ High algae content
- ☐ Tannic

22 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT

Pool ID VP-2

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 100 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)

☒ Shrub _____ (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

_____ **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	**DATE**	**EGG MASSES (#)**	**TADPOLES/LARVAE**
Wood Frog (*Lithobates sylvaticus*)			
Spotted Salamander (*Ambystoma maculatum*)	5/10/19	4	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list): _____			
Rare Species (list): _____			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list): _____			
Other species (e.g., Ducks, Turtles, etc.)(list): _____			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

22 **TOTAL for Pool Characteristics** 30.9 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

Note: Overall shallow pool. Marginal water depths in spring.

US Army Corps of Engineers - New England District

DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-2

Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343

Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____

Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____

Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.

Survey date(s): 4/23/20

Longitude/Latitude (in decimal degrees): 44 20' 39"N 71 41'36"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)

☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)

☒ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)

☐ Pool part of wildlife corridor (4 pts)

(NA)

☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: natural/man altered (skidder)

3. Parent material:

☐ Glacial fluvial ("outwash")

☒ Dense till

☐ Loose till

☐ Alluvium

☐ Peat

☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

☐ Forested wetland (4 pts)

☐ Shrub wetland (4 pts)

☐ Peatland (acidic fen or bog) (4 pts)

☐ Herbaceous wetland (4 pts)

☐ Open water (2 pts)

☐ Intermittent stream reach (2 pts)

☐ Floodplain (overflow/oxbow) (3 pts)

☐ Other:_____(variable points)

5. Pool canopy cover (%): greater than 50%

6. Predominant substrate:

☐ Mineral soil

☒ Organic matter (peat/muck) Depth 12" Sampling location (e.g., deepest zone, edge, etc.) deepest area

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 80' Width 20'

Area: 1600 SF

b. Maximum depth at deepest point at time of survey (include units): 12"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)

☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)

☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)

☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

☐ No inlet/outlet (8 pts)

☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)

☐ Temporary inlet/outlet (6 pts)

9. Water quality:

☒ Clear ☐ High turbidity ☐ High algae content ☐ Tannic

20 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT

Pool ID VP-2

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 100 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)

☐ Shrub _____ (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

_____ **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)			
Spotted Salamander (*Ambystoma maculatum*)	4/23/20	1	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

22 **TOTAL for Pool Characteristics** 30.9 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

Note: Cold early spring conditions.

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-3
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 5/10/19
Longitude/Latitude (in decimal degrees): 44 20' 53"N 71 41'30"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- [x] Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- [x] Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- [ ] Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- [ ] Pool part of wildlife corridor (4 pts)
- (NA)
- [ ] Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: recent logging

3. Parent material:

- [ ] Glacial fluvial ("outwash")
- [ ] Loose till
- [ ] Peat
- [x] Dense till
- [ ] Alluvium
- [ ] Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- [ ] Forested wetland (4 pts)
- [ ] Herbaceous wetland (4 pts)
- [ ] Floodplain (overflow/oxbow) (3 pts)
- [x] Shrub wetland (4 pts)
- [ ] Open water (2 pts)
- [ ] Other:_____(variable points)
- [ ] Peatland (acidic fen or bog) (4 pts)
- [ ] Intermittent stream reach (2 pts)

5. Pool canopy cover (%): _____ 20%

6. Predominant substrate:

- [x] Mineral soil
- [x] Organic matter (peat/muck) Depth 4" Sampling location (e.g., deepest zone, edge, etc.) edge

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 60' Width 12'
Area: 720 SF

b. Maximum depth at deepest point at time of survey (include units): 4"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- [ ] Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- [x] Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- [ ] Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- [ ] Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- [ ] No inlet/outlet (8 pts)
- [ ] Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- [ ] Temporary inlet/outlet (6 pts)

9. Water quality:

- [x] Clear
- [ ] High turbidity
- [ ] High algae content
- [ ] Tannic

20 Point total

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☐ Forested 50 % (16 pts) ☒ Open (e.g., meadow, agriculture, golf course) 50 % (4 pts)

☐ Shrub _____ (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

24.9 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	5/10/19	0	none
Spotted Salamander (*Ambystoma maculatum*)			
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

20 **TOTAL for Pool Characteristics** 24.9 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

Note: Marginally viable vernal pool.

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-3
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 4/23/20
Longitude/Latitude (in decimal degrees): 44 20' 53"N 71 41'30"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

☒ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
☐ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
☐ Pool part of wildlife corridor (4 pts)
(NA)
☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: recent logging near pool

3. Parent material:

☐ Glacial fluvial ("outwash")
☒ Dense till
☐ Loose till
☐ Alluvium
☐ Peat
☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

☐ Forested wetland (4 pts)
☒ Shrub wetland (4 pts)
☐ Peatland (acidic fen or bog) (4 pts)
☐ Herbaceous wetland (4 pts)
☐ Open water (2 pts)
☐ Intermittent stream reach (2 pts)
☐ Floodplain (overflow/oxbow) (3 pts)
☐ Other:_____(variable points)

5. Pool canopy cover (%): less than 20%

6. Predominant substrate:

☒ Mineral soil
☒ Organic matter (peat/muck) Depth 4" Sampling location (e.g., deepest zone, edge, etc.) leaves-deep

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 70' Width 15'
Area: 1050 SF

b. Maximum depth at deepest point at time of survey (include units): 8"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

☐ No inlet/outlet (8 pts)
☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
☐ Temporary inlet/outlet (6 pts)

9. Water quality:

☒ Clear ☐ High turbidity ☐ High algae content ☐ Tannic

20 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT

Pool ID VP-3

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 50 % (16 pts) ☒ Open (e.g., meadow, agriculture, golf course) 50 % (4 pts)

☐ Shrub _____ (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

24.9 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	4/23/20	1	none
Spotted Salamander (*Ambystoma maculatum*)	4/23/20	10	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

20 **TOTAL for Pool Characteristics** 24.9 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

Note: Shallow pool with average depth +/- 4".

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-4
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 5/10/19
Longitude/Latitude (in decimal degrees): 44 21'N 71 41'26"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☒ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts)
- (NA)
- ☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: ~~natural/near edge of wood~~ road

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☐ Loose till
- ☐ Peat
- ☒ Dense till
- ☐ Alluvium
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☒ Forested wetland (4 pts)
- ☐ Herbaceous wetland (4 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☐ Shrub wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Other:_____(variable points)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☐ Intermittent stream reach (2 pts)

5. Pool canopy cover (%): 90

6. Predominant substrate:

- ☒ Mineral soil
- ☒ Organic matter (peat/muck) Depth 6" Sampling location (e.g., deepest zone, edge, etc.): ~~center~~ (muck & leaves)

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 40' Width 20'
Area: 800 SF

b. Maximum depth at deepest point at time of survey (include units): 10"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☐ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☒ Clear
- ☐ High turbidity
- ☐ High algae content
- ☐ Tannic

20 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT Pool ID: VP-4

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 95 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course)_____% (4 pts)

☒ Shrub 5 (10 pts) ☐ Developed_____% (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course)_____% (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	5/10/19	2	none
Spotted Salamander (*Ambystoma maculatum*)			
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

20 **TOTAL for Pool Characteristics** 30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

US Army Corps of Engineers - New England District

DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton, NH Pool ID: VP-4

Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343

Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail _____

Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____

Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.

Survey date(s): 4/23/20

Longitude/Latitude (in decimal degrees): 44 21'N 71 41'26"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☒ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts)
- (NA)
- ☐ Other: _____ (variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: wooded area east of Douglas Drive

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☐ Loose till
- ☐ Peat
- ☐ Dense till
- ☐ Alluvium
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☒ Forested wetland (4 pts)
- ☐ Herbaceous wetland (4 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☐ Shrub wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Other: _____ (variable points)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☐ Intermittent stream reach (2 pts)

5. Pool canopy cover (%): 90

6. Predominant substrate:

- ☒ Mineral soil
- ☒ Organic matter (peat/muck) Depth 6" Sampling location (e.g., deepest zone, edge, etc.) ave. depth

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 40' Width 20'

Area: 800 SF

b. Maximum depth at deepest point at time of survey (include units): 12"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☐ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☒ Clear
- ☐ High turbidity
- ☐ High algae content
- ☐ Tannic

20 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT Pool ID: VP-4

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 95 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)

☒ Shrub 5 (10 pts) ☐ Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course) _____ % (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	4/23/20	4	none
Spotted Salamander (*Ambystoma maculatum*)			
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

20 **TOTAL for Pool Characteristics** 30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-5
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 5/10/19
Longitude/Latitude (in decimal degrees): 44 21'41" N 71 41'59"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☒ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts)
- (NA)
- ☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: natural depression within larger wetland

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☐ Loose till
- ☐ Peat
- ☒ Dense till
- ☐ Alluvium
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☐ Forested wetland (4 pts)
- ☒ Herbaceous wetland (4 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☒ Shrub wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Other:_____(variable points)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☐ Intermittent stream reach (2 pts)

5. Pool canopy cover (%): less than 30%

6. Predominant substrate:

- ☒ Mineral soil
- ☒ Organic matter (peat/muck) Depth 6" Sampling location (e.g., deepest zone, edge, etc.) center

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 25' Width 20'
Area: 500 SF

b. Maximum depth at deepest point at time of survey (include units): 15-18"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☐ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☒ Clear
- ☐ High turbidity
- ☐ High algae content
- ☐ Tannic

26 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT Pool ID: VP-5

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 95 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course)_____% (4 pts)

☒ Shrub 5 (10 pts) ☐ Developed_____% (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course)_____% (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☒ Field estimate ☐ GIS ☐ Aerial photo estimate

30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	5/10/19	6	few
Spotted Salamander (*Ambystoma maculatum*)	5/10/19	4	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):			
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

26 **TOTAL for Pool Characteristics** 30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 18-2193 Project Name NCES Granite State Landfill, Dalton,NH Pool ID: VP-5
Observer: Barry H. Keith, CWS, PWS, CWB Phone or E-mail: 603-539-8343
Landowner/Applicant: Chick Sand and Gravel/Casella Waste Systems, Inc. Phone or E-mail_____
Address: Douglas Drive (TM 406-2.1) City: Dalton State: N.H. Zip _____
Location of vernal pool: City/State: West side of Douglas Drive, Dalton, NH – See Attached Plans.
Survey date(s): 4/23/20
Longitude/Latitude (in decimal degrees): 44 21'41" N 71 41'59"W

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- ☐ Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- ☒ Pool part of a pool complex (within 1000 feet of one or more other vernal pools)
- ☒ Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2pts)
- ☐ Pool part of wildlife corridor (4 pts) (NA)
- ☐ Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: small shrub/emergent vernal pool within forested area

3. Parent material:

- ☐ Glacial fluvial ("outwash")
- ☐ Dense till
- ☐ Loose till
- ☐ Alluvium
- ☐ Peat
- ☐ Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- ☐ Forested wetland (4 pts)
- ☒ Shrub wetland (4 pts)
- ☐ Peatland (acidic fen or bog) (4 pts)
- ☒ Herbaceous wetland (4 pts)
- ☐ Open water (2 pts)
- ☐ Intermittent stream reach (2 pts)
- ☐ Floodplain (overflow/oxbow) (3 pts)
- ☐ Other:_____(variable points)

5. Pool canopy cover (%): less than 30%

6. Predominant substrate:

- ☐ Mineral soil
- ☐ Organic matter (peat/muck) 6" Depth _____ Sampling location (e.g., deepest zone, edge, etc.) center

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length 25' Width 20'
Area: 500 SF

b. Maximum depth at deepest point at time of survey (include units): 15"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- ☐ Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- ☒ Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- ☐ Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- ☐ Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- ☐ No inlet/outlet (8 pts)
- ☐ Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- ☐ Temporary inlet/outlet (6 pts)

9. Water quality:

- ☒ Clear
- ☐ High turbidity
- ☐ High algae content
- ☐ Tannic

26 **TOTAL for Pool Characteristics (out of 28 max.)**

DRAFT Pool ID: VP-5

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

☒ Forested 95 % (16 pts) ☐ Open (e.g., meadow, agriculture, golf course) ____ % (4 pts)

☒ Shrub 5 (10 pts) ☐ Developed ____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

☒ Forested 90 % (16 pts) ☐ Open (e.g., agriculture, golf course) ____ % (4 pts)

☒ Shrub 5 % (10 pts) ☒ Developed 5 % (0 pts)

☐ Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: ☐ Field estimate ☐ GIS ☐ Aerial photo estimate

30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	4/23/20	10	none
Spotted Salamander (*Ambystoma maculatum*)	4/23/20	7	none
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):	4/23/20	case Building Caddis Fly Larvae	Many
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species ☒ Yes ☐ No

SUMMARY:

26 **TOTAL for Pool Characteristics** 30.6 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area** Other comments

x. VERNAL POOL CHARACTERIZATION FORM

Project File # 18-2193 Project Name GSL Pool ID VP-6

Observer BHK Phone or Email 603-539-8343

Landowner/Applicant GSL Phone or Email

Address

Location of vernal pool: Sht 22-YY

Survey date(s) 4/27/23 & 7/7/23

Longitude/Latitude (in decimal degrees)

A. VERNAL POOL CHARACTERISTICS

1. Landscape setting (check all that apply)

[ ] Upland depression

[x] Pool part of wildlife corridor

[x] Pool part of a pool complete (within 1000 feet of one or more other vernal pools)

2. Vernal pool condition

Describe any recent modification to the pool: Clearcut to pool edge.

3. Describe the aquatic resource type(s) in pool (e.g., forested, scrub-shrub, etc.) - PSS1E

4. Pool canopy cover (%): 10%

5. Predominant substrate (e.g., mineral soil, organic matter): Organic

6. Pool size

a. Approximate dimensions at maximum capacity (include units):
Length 30' +/- Width: 35'+/- Area: 1015 SF

b. Maximum depth at deepest point (include units): 8"

7. Hydrology

a. Estimated month pool dries, or if never: 5 mo.

b. Inlet/outlet (none, temporary, permanent): none

8. Water quality (clear, high turbidity, high algal content, tannic): clear

OTHER COMMENTS:

4/23 Depth range 3-8"
7/7/23 Depth Range 2-3"

Append photos, sketch of pool and surrounding landscape.

see report

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL TERRESTRIAL HABITAT (100-750 ft)

a. Land use type and approximate percentage within 100 ft VP envelope (total equals 100%)

[x] Forested 100 % (15 pts)

[ ] Shrub % (10 pts)

[ ] Open (e.g., meadow, agriculture, golf course) % (5 pts)

[ ] Developed (includes area beyond barriers) % (0 pts)

b. TOTAL for VP envelope (maximum of 15): 15

c. Land use type and approximate percentage within 100-750 ft VP critical terrestrial habitat (total equals 100%)

[x] Forested 70 % (15 pts)

[x] Shrub 30 % (10 pts)

[ ] Open (e.g., meadow, agriculture, golf course % (5 pts)

[ ] Developed (includes area beyond barriers) % (0 pts)

d. TOTAL for VP CTH (maximum of 15): 13.5

e. How above determined (field estimate, GIS, air photo interpretation): Field

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	**DATE** 4/27/23	**EGG MASSES (#)**	**TADPOLES/ LARVAE**
Wood Frog (*Lithobates sylvaticus*)		12	
Spotted Salamander (*Ambystoma maculatum*)		6	
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy shrimp (*Eubranchipus* spp.)		Present/ absent	Abundance:
OTHER SPECIES	**DATE**	**PRESENCE/ ABSENCE**	**FEW/ COMMON/ MANY**
Rare species (list):			
Facultative species: (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanusl*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaerlidae, Pisidiidae))). List:			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish): List:			
Other species (.e.g, ducks, turtles, etc.): List: caddis fly larvae			some

x. VERNAL POOL CHARACTERIZATION FORM

Project File # 18-2193 Project Name GSL Pool ID VP-7

Observer ~~BHK~~ Phone or Email 603-539-8343

Landowner/Applicant ~~GSL~~ Phone or Email

Address

Location of vernal pool: 21-1-93

Survey date(s) 4/27/23 & 7/7/23

Longitude/Latitude (in decimal degrees)

A. VERNAL POOL CHARACTERISTICS

1. Landscape setting (check all that apply)

[ ] Upland depression

[x] Pool part of wildlife corridor

[x] Pool part of a pool complete (within 1000 feet of one or more other vernal pools)

2. Vernal pool condition

Describe any recent modification to the pool: none

3. Describe the aquatic resource type(s) in pool (e.g., forested, scrub-shrub, etc.) - PEM/SS1E

4. Pool canopy cover (%): 20

5. Predominant substrate (e.g., mineral soil, organic matter): ~~organic~~

6. Pool size

a. Approximate dimensions at maximum capacity (include units):

Length 30'+/- Width: 20'+/- Area: 625 SF

b. Maximum depth at deepest point (include units): 8"

7. Hydrology

a. Estimated month pool dries, or if never: 5

b. Inlet/outlet (none, temporary, permanent): none

8. Water quality (clear, high turbidity, high algal content, tannic): clear

OTHER COMMENTS:

Depth range: 3-8" (4/27/23)

Pool APPROXIMATELY ~~85%~~ dry ib 7/7/23.

Append photos, sketch of pool and surrounding landscape.

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL TERRESTRIAL HABITAT (100-750 ft)

a. Landuse type and approximate percentage within 100 ft VP envelope (total equals 100%)

[X] Forested % (15 pts)

[ ] Shrub % (10 pts)

[ ] Open (e.g., meadow, agriculture, golf course) % (5 pts)

[ ] Developed (includes area beyond barriers) % (0 pts)

b. TOTAL for VP envelope (maximum of 15): 15

c. Landuse type and approximate percentage within 100-750 ft VP critical terrestrial habitat (total equals 100%)

[X] Forested 90 % (15 pts)

[X] Shrub 10 % (10 pts)

[ ] Open (e.g., meadow, agriculture, golf course % (5 pts)

[ ] Developed (includes area beyond barriers) % (0 pts)

d. TOTAL for VP CTH (maximum of 15): 14.5

e. How above determined (field estimate, GIS, air photo interpretation): Field

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	**DATE** 4/27/23	**EGG MASSES (#)**	**TADPOLES/ LARVAE**
Wood Frog (*Lithobates sylvaticus*)		14	
Spotted Salamander (*Ambystoma maculatum*)		8	
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy shrimp (*Eubranchipus* spp.)		Present/ absent	Abundance:
OTHER SPECIES	**DATE**	**PRESENCE/ ABSENCE**	**FEW/ COMMON/ MANY**
Rare species (list):			
Facultative species: (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanusl*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaerlidae, Pisidiidae))). List:			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish): List:			
Other species (.e.g, ducks, turtles, etc.): List: stone fly larvae present			some

VERNAL POOL PHOTOGRAPH LOG
GRANITE STATE LANDFILL
DALTON, NH

Photo 1: Vernal Pool (VP-1) 4/13/22.

Photo 2: Vernal Pool (VP-2) 4/13/22.

Photo 3: Vernal Pool (VP-3) 4/13/22.

Photo 4: Vernal Pool (VP-4) 4/13/22.

Photo 5: Large egg mass (VP-4) 5/3/22.

Photo 6: Vernal Pool (VP-5) 4/13/22

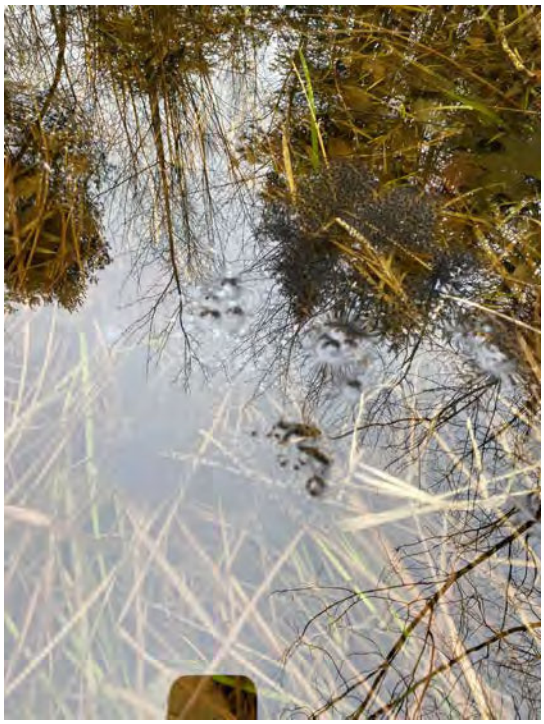

Photo 7: Wood Frog egg mass (VP-5) 4/13/22.

Photo 8: Dry conditions (VP-6) 7/7/23.

Photo 9: Piezometer at VP-7 (7/7/23)

Photo 10: Vernal Pool (VP-7) 4/13/22.