



Dalton Conservation Commission
756 Dalton Road
Dalton, NH 03574

Via Email, U.S. Mail, and Hand Delivery

February 20, 2024

Mr. Phil Trowbridge, LRM Manager
N.H. Department of Environmental Services
29 Hazen Drive
Concord, NH 03302-0095
philip.r.trowbridge@des.nh.gov

Re: Wetlands Permit Application (RSA 482-A) NHDES File Number: 2023-03259 Subject Property: Douglas Drive, Dalton, Tax Map #406/1, Lot #406/2 (“Application”)

Dear Mr. Trowbridge,

As the municipal conservation commission for the Town of Dalton, we submit *The Report of the Dalton Conservation Commission* to the department, in accordance with RSA 482-A:11, III(a), for the above-referenced Application. Included are reports from retained subject-matter experts.

It is the primary duty of the Dalton Conservation Commission, under RSA 36-A:2, to ensure “*the proper utilization and protection of the natural resources and for the protection of watershed resources*” in the Town of Dalton.

We also remind the department of its mandate, “*to help sustain a high quality of life for all citizens by protecting and restoring the environment and public health in New Hampshire. The protection and wise management of the state's environment are the main goals of the agency.*”

According to page 10 of **Section 2, Section 2.1 NHDES Form W-06-012 – Project Description (Env-Wt 311.04(i)) of the Wetlands Permit Application**: “*The Granite State Landfill, LLC (“GSL”) proposes the construction of a state-of-the-art commercial landfill in Dalton, New Hampshire, to be a successor to the North Country Environmental Services, Inc. (“NCES”) landfill in Bethlehem, New Hampshire*”.

We ask the department to strongly consider the current conditions at the applicant’s NCES Landfill in neighboring Bethlehem in making its determination on the Application(s). The

controversial, 30-year history of the applicant's existing landfill, long-opposed by the citizens of the Town of Bethlehem, as well as its inability to protect the surrounding watershed of the Ammonoosuc River from contamination and degradation, must be taken into consideration.

Therefore, we request that the department use hindsight, and help us to protect our environment and natural resources, as well as public health, and **DENY** this Application, as well as the other permit applications associated with this unwanted and unneeded landfill development project.

Thank you for your attention to this matter. Please ensure that this report becomes a part of your record in this matter.

Signed,

 Nancy Comau
 Carol Shetty
 Brad Amicone

Enclosures

cc: Commissioner Robert Scott, NHDES
Commissioner Sarah Stewart, NHDNCR
Commissioner William Cass, NHDOT
Commissioner Tom Brady, Coos County
Commissioner Martha McLeod, Grafton County
Town of Dalton Selectboard and Planning Board
Town of Bethlehem Conservation Commission and Selectboard
Town of Whitefield Conservation Commission and Selectboard
Town of Littleton Conservation Commission and Selectboard
Town of Carroll Conservation Commission and Selectboard
Ammonoosuc River LAC
NH State Representative James Tierney, Coos 1
NH State Representative Jared Sullivan, Grafton 2
NH State Representative Linda Massimilla, Grafton 1
NH State Representative Matt Simon, Grafton 1
NH State Representative David Rochefort, Grafton 1
NH State Representative Seth King, Coos 4
NH State Representative Eamon Kelley, Coos 7
NH State Senator Carrie Gendreau, District 1
NH Executive Councilor Joe Kenney, District 1
NH Executive Councilor Cinde Warmington, District 2
NH Governor Chris Sununu
U.S. Senator Jeanne Shaheen
U.S. Senator Maggie Hassan
U.S. Representative Anne Kuster
Kim Cartwright, Ammonoosuc Conservation Trust
Jack Savage, Society for the Protection of NH Forests
Michelle Moren-Grey, North Country Council
Barbara Richter, NHACC
NH House Environment and Agriculture Committee
NH Senate Energy and Natural Resources Committee
US EPA: Jean Brochi
USACOE: Lindsey Lefebvre



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The Report of the Dalton Conservation Commission

Re: Wetlands Permit Application (RSA 482-A) NHDES File Number: 2023-03259 Subject Property: Douglas Drive, Dalton, Tax Map #406/1, Lot #406/2 (“Application”)

Dear Mr. Trowbridge,

As the municipal conservation commission for the Town of Dalton, we submit this report of our investigation and findings to the department to take into consideration in making its determination regarding the above-referenced Application. Due to the negative and far-reaching impacts associated with an industrial development of this size and nature, particularly at this greenfield location, and in consideration of the documented challenges the applicant has demonstrated over time in operating similar facilities, the Dalton Conservation respectfully requests that the department and other permitting agencies **DENY** the Application(s) for this proposed landfill development.

We provide the following for your consideration:

1. **According to the Town of Dalton Master Plan, updated in 2023: “Dalton should remain an outstanding and desirable place to live, where the old country values and rural character of the town are preserved and enhanced, while allowing for thoughtful influx of businesses to the area”.** (See Appendix A)

The Dalton Conservation Commission views the applicant’s landfill development as incompatible with the vision for the future as expressed within the Town of Dalton Master Plan.

2. **Forests are an essential, natural solution for climate change, sequestering atmospheric carbon while maintaining or enhancing soil stabilization and water quality.** According to page 8 of the **Alteration of Terrain Permit Application, part 1**, approximately **147 acres of “disturbance”** will take place, most of which will be forested habitat, forever lost. That is the equivalent of 112 football fields. The 70-acre lined landfill would be the size of 53 football fields, just 2700 feet from the water’s edge of Forest Lake and 190 feet from the state park forest.

The Dalton Conservation Commission updated the town NRI (Natural Resource Inventory) in 2023. (See Appendix B)

Dalton is rural and mostly forested, with 164.08 acres of ponds and open water. **Forest Lake is the largest lake at 196.22 acres and recent water quality testing has confirmed that the lake is pristine.** The town's geography is quite diverse, ranging from flat floodplain areas along the Connecticut and Johns Rivers to rugged mountainous areas, including steep slopes to the tops of the Dalton Mountain Range, which runs SW and NE across town. Out of 18,104 acres of land, approximately 2,065.04 acres are conserved lands. **Over 81% of Dalton is forested.** The Southwestern corner of Dalton, including Forest Lake and tributaries to Alder Brook, is classified as both "Highest Rank Habitat in NH" as well as "Highest Ranked Habitat in the Biological Region", and has been identified as a high priority area for conservation based on the updated NRI. The loss of so much high-valued forested land in this particular area is unacceptable.

3. The Town of Dalton contains 2,828.47 acres of wetlands, 5,030.17 acres of underlying aquifers, 74.1 miles of streams and rivers, and 164.1 acres of open water. Many of Dalton's residents obtain drinking water from personal drilled or dug wells. Maintaining good water quality is one of the highest priorities for the Dalton Conservation Commission.

Currently, the water quality in groundwater, streams, rivers, and lakes in Dalton is in very good to excellent condition. Water quality protection should continue to be addressed not only in Forest Lake, but also the smaller rivers, streams, and headwater brooks that feed other important, regional waterbodies like the Ammonoosuc and Connecticut Rivers. Based on locations of the underlying aquifers in Dalton, it is important to protect the quality of groundwater, brooks, streams, and aquifers in town. It is crucial that we conserve and maintain all types of wetlands throughout the Town of Dalton, the North Country, and throughout New Hampshire, with an emphasis on wetlands outside of conserved lands that are important linkages for wildlife. Wetlands play an important role in flood control, water quality maintenance and improvement, groundwater discharge and recharge, and shoreline stabilization.

On page 13 of Section **3.3 Project Summary and Work Sequence of the Wetlands Dredge and Fill Permit Application**, it is stated that "*approximately 11.5 acres of wetlands (10.2 acres of permanent, 0.5 acres of temporary, and 0.9 acres of after-the-fact wetlands) will be impacted within the footprint of the landfill and associated infrastructure*".

This includes 5 vernal pools within the landfill footprint identified by the applicant.

Wetlands are also important as they are an essential habitat type for most plant and animal species. The loss of such a large amount of wetlands may not only compromise the ecological integrity of the area, but also its flood storage value as it relates to Alder Brook and the Ammonoosuc River.

Vernal pools are particularly important, as they provide an essential breeding habitat for certain amphibians and invertebrates, particularly wood frogs and spotted salamanders, which have been identified at the project site, according to the Application. Vernal pools fill annually from precipitation, runoff, and rising groundwater in the fall and spring. By mid-summer, however, these wetlands are typically dry, making them a dynamic system inhabitable to many plant and wildlife species. The State of New Hampshire (Fish and Game Department and Wetlands Bureau) recognizes their value as important habitat and give them special attention.

This Application proposes major impacts to the environment of the site and the area. Not reviewing it as a whole means it is far more likely for even more wetlands to be negatively impacted by the project with future expansions. Once again, the conservation commission requests that the department and other permitting agencies consider the cumulative impacts of this project, direct and indirect, to wetlands and other aquatic resources, INCLUDING ground and surface water quality, not only from the landfill project and expansions (Concept 4 and Concept 1), but also all other proposed developments at this site, including the RNG project, sludge spreading operations, as well as Mr. Ingerson's proposed business park, campground, and drag strip.

4. The full impacts associated with this development at this site must be considered by the department and other permitting agencies. The department should not allow for project impact segmentation, and instead, consider all cumulative impacts of potential, future development proposed at this site.

On pages 47-48, **section-7-part-1-of-2-Alternatives Analysis of the Wetlands Permit Application**, the applicant shares that the current Application is a result of permitting time limits, particularly relative to the solid waste permit application. Under **Concept 5 – Wetland Permit Level Design: NHDES, and U.S. Army Corps of Engineers (USACE) regulatory feedback on Concept 4 required re-evaluation of the project scope and design from a three-phase project to a single development. The NHDES-WMD solid waste permit is by law limited to a 20-year period.** (See Appendix C)

The Dalton Conservation Commission requests that the department, USACOE, and EPA determinations be based, at a minimum, on the impacts associated with the previously-submitted 2020 Standard Dredge and Fill Wetlands Permit Application NHDES File Number: 2020-02239, aka **Concept 4** (see Appendix D).

Ideally, **Concept 1** should be included in considerations, as the applicant narrative on pages 45-46, section-7-part-1-of-2-Alternatives Analysis of the Wetlands Permit Application establishes the site parameters for **maximum potential expansion** of the proposed facility; 238-acre landfill footprint, 43 acres of wetlands disturbance, and 67 million cubic yards (MCY) of permitted capacity life. At 600,000 MCY (approximately 456,000 TONS) of annual permitted capacity, **Concept 1** represents a 111.67-year landfill facility at this location.

5. The department and other permitting agencies must take into consideration the reasons preventing the applicant from further expanding its current operations at the NCES Landfill in Bethlehem in determining whether the applicant meets the criteria for approval in accordance with RSA 149-M:12.

30 years of public opposition by the citizens of Bethlehem and their long-held concerns about contamination of the watershed of the Ammonoosuc River must be considered by the department and other permitting agencies in determining the fitness and abilities of the applicant to safely construct and operate a new, greenfield landfill at this location. On March 13, 2018, citing “serious impacts on our environment”, the citizens of Bethlehem voted against the expansion of the NCES Landfill for the second consecutive year at Town Meeting. (See Appendix E)

6. We request that the department and permitting agencies take into consideration the widespread PFAS contamination within the watershed of the Ammonoosuc River, which has occurred over the 30-year period of the applicant’s ownership, engineering, construction, and operation of the NCES Landfill in Bethlehem.

The NCES Landfill has had a long and very detailed history of site contamination, all within the watershed of the Ammonoosuc River. In the November 2023 Tri-Annual NCES Landfill Groundwater Monitoring Report, 18 groundwater monitoring wells were reported to have detections, along with AGQS exceedances, for PFAS contaminants. (See Appendix F)

7. The potential threat posed to air, soil, and groundwater by PFAS contaminants emitted atmospherically and/or released within the vicinity of the proposed landfill site is not addressed by the applicant. We ask the department and other permitting agencies to consider the impacts and costs associated with PFAS contamination found elsewhere in the state. This landfill would be a major depository of PFAS-laden waste, as well as a release source for PFAS contamination.

The proposed site and surrounding area has been tested, by both the applicant AND surrounding property owners, to be free of PFAS contamination in ground and surface waters. (See Appendix G)

The emerging threat to human health posed by the proliferation of PFAS contamination in drinking water, groundwater, soils, and air has become a major concern amongst the public. It is well documented that landfills are both a depository of societal waste containing PFAS compounds, as well as a source of release of PFAS contaminants, particularly in leachate generation. The proposed site is a greenfield, composed primarily of forested, wetlands habitat. On pages 779-800 of the **Solid Waste Application, Volume 2 Part 1 Attachments V1-V4 Site Report**, four monitoring wells (MW-1, MW-6, MW-18, and MW-21U) at the proposed GSL site were sampled in 2019 for PFAS compounds, with no detectable levels of contamination, further confirming that the site, and surrounding vicinity, of the proposed landfill site is free of PFAS contamination. (See Appendix H)

The NCES Landfill generates, on average, over 8 million gallons of PFAS-laden leachate, per year, according to the 2017-2022 annual facility reports. (See Appendix I)

8. On page 6 of the Application, under Section 3-6 Project Summary, the applicant states: “Development and operations of the GSL landfill will also provide economic benefits to the state and region in the form of jobs, wages, and significant local community benefits to the town of Dalton”. On page 9, under the Project Milestone timeline: “March 2, 2020 Town of Dalton Select Board meeting - February 26, 2020 draft Host Community Agreement from GSL is read by Board”

According to the NCES Landfill 2022 Annual Report, there are 19 people employed at that facility in the Town of Bethlehem. The applicant fails to provide evidence of any new jobs which will be created in the Town of Dalton. Furthermore, the Town of Dalton has not approved, nor signed on to, a Host Community Agreement with the applicant for hosting this

development project, nor has the applicant received any endorsement from the Town of Dalton in support of the proposed project. The applicant offers no evidence of support from the citizens of Dalton for this major industrial development. (See Appendix J)

9. On page 7 of the Application, under section 1, that applicant states: “Notification was made to the Dalton Conservation Commission. In accordance with Env-Wt 311.06(h), comments were not received from the Dalton Conservation Commission in regard to this application.” This is not a true statement, AND, proper notification was never provided to the Dalton Conservation Commission.

The conservation commission received an unsolicited offer for a site visit in a letter from attorney Brian Gould, dated June 8, 2023, at a time when there was no permit Application on file. The conservation commission did respond, notifying attorney Gould that with no Application, there was nothing to verify. Thus, such a site visit would be a waste of time and resources. (See Appendix K)

10. The Dalton Conservation Commission submitted a request for two site visits during the growing season, one in mid-May and one mid-June. (See Appendix L)

To date, the conservation commission has not received a response from the applicant for site access. The conservation commission has retained the services of a wetlands scientist, a hydrogeologist, and a bat biologist at great expense, to verify the information submitted in the Application. During a project presentation to the Town of Dalton Selectboard on January 15, 2024, a representative of the applicant informed Chair Dudley that a site visit would be a legal question. (See Appendix M)

11. Despite maintaining that “local approvals are not required” in several permit applications, the applicant is in receipt of two letters from the Town of Dalton, dated January 9, 2023 and January 14, 2024, informing the applicant that under RSA 674:41, the applicant “must obtain building approvals from the Dalton Select Board, after the Planning Board has had an opportunity to consider the applications”. (See Appendix N)

12. The Town of Dalton utilizes the AVRRDD Mt. Carberry Landfill in Success, NH for its waste disposal needs. The department and other permitting agencies should take that into consideration.

The Town of Dalton made the switch from the applicant’s NCES Landfill in 2020. The Towns of Franconia, Easton, and Sugar Hill also made the switch from NCES to Mt. Carberry in 2023.

13. Geographically, the proposed GSL site would require that waste and leachate would need to be transported a significant distance. The negative climate change impacts associated from the increase in greenhouse gas emissions as a result will be significant to air quality and other environmental impacts.

On page 4 of the Application, under Section 3-6 Project Summary, the applicant makes the claim: “Because GSL is located less than ten miles away from the NCES landfill, GSL is well-positioned to provide the same quality service to these cities and towns after the NCES facility

closes.” The average hauling distance for waste to the NCES Landfill in Bethlehem for those facilities cited by the applicant is **96 miles, each way**, not counting the NCES transfer station itself, which serves primarily Bethlehem residents, local haulers, and Littleton.

On page 5, the applicant continues: *“If the GSL facility is permitted, the facility will add significant value to New Hampshire residents. The GSL facility will anchor an integrated waste and resource management system in the region in which a majority of the waste accepted will originate from New Hampshire residents and businesses. Casella Waste Systems, Inc. (“CWS”), the parent company of both GSL and NCES, owns or operates six transfer stations (Bethlehem, Newport, Lebanon, Belmont, Allenstown, and Raymond) where waste and recyclables are or have been consolidated from municipalities, businesses, residents, and numerous waste haulers and transported to the NCES landfill for disposal in Bethlehem, while recyclables are exported to facilities in Vermont and Massachusetts. NCES also has a business relationship with Monadnock Disposal Services (“MDS”) in Jaffrey, which is a private hauler and transfer station operator not affiliated with CWS. The MDS transfer station serves 58 communities in the south-central portion of the state.*

We note the distance to the NCES Landfill in Bethlehem, 1-way:

- Casella Waste Systems, 264 John Stark Hwy, **Newport**, NH 03773 **94 miles**
- Casella Waste Systems 40 N Labombard Rd, **Lebanon**, NH **85.9 miles**
- Casella Waste Systems, 43 Industrial Dr, **Belmont**, NH 03220 **64.8 miles**
- Casella Waste Systems, 104 River Rd, **Allenstown**, NH 03275 **89.1 miles**
- Casella Waste Systems, 104 Prescott Rd, **Raymond**, NH 03077 **114 miles**
- Monadnock Disposal Services (“MDS”), **Jaffrey**, NH **131 miles**

According to the applicant’s **NHDOT Driveway Permit Application**, and page 6 of the **Facility Operating Plan**, as documented in **Volume 4 of the Solid Waste Permit Application**, *“Haulers are required to access the facility via Douglas Drive from the east on Route 116 (from Whitefield) unless they are local traffic from Littleton”*. The proposed, enforced truck traffic routes to the GSL site would add an additional **25 to 29 miles**, each way, over and above the current distance to the NCES Landfill facility. Thus, it can be estimated that the average distance for hauling waste to the proposed GSL site would be approximately **123 miles, each way**. (See Appendix O)

Additionally, to dispose of landfill leachate generated by the proposed GSL facility, tanker trucks would need to travel approximately **108 miles** to the City of Concord WWTP facility, each way.

14. Heavy-duty garbage truck and tractor-trailer traffic of an estimated 102 trips per day, Monday-Saturday, along Routes 3, 116 and/or 302 would represent a significant threat to commuters, pedestrians, and tourists in Littleton, Bethlehem, Whitefield, and Carroll/Twin Mountain, passing approximately 375 residences, 3 Elementary Schools, and thru 4 town centers.

According to page 10, **Volume 2, Part 1 of the Solid Waste Permit Application**, the applicant states: *“The proposed project is expected to produce about 102 incoming vehicles per day and that the daily volume of truck traffic would include; 50 transfer trailers, 7 leachate tankers, 20*

roll off style trucks and 14 conventional waste hauling trucks such as packers, front load and side load trucks. There is another 10 -15 support type vehicle expected at the site each day such as truck part deliveries, mail services and visitors.”

15. The proposed GSL facility will represent both a stigma and a significant nuisance to property and business owners throughout the North Country, potentially impacting both property values and the North Country tourism and outdoor recreation industries, as a result.

According to page 9, **Volume 2, Part 1 of the Solid Waste Permit Application**, the applicant states: *‘Hours the facility accepts waste (gate hours) are 6:00 a.m. to 6:00 p.m. Monday through Friday, 7:00 a.m. to 4:00 p.m. on Saturday’*. There are approximately 136 residences within 1.5 miles of the proposed facility (there are approximately **84 residences** along Forest Lake Road, with the farthest being 1.49 miles on Forest Lake Rd, 1.13 miles on the water on Newell Lane, and **52 residences** along W. Forest Lake Road (1.21/1.44 miles to WFL/RT116, with the farthest waterfront home being .98 miles away), which will be most directly impacted by **the nuisances and health hazards** posed by this upwind landfill, including noise and odor, as the prevailing winds blow in the E/SE direction of Forest Lake. All of these properties rely on private wells, which could be threatened by PFAS contaminants and other migrating emissions, including asbestos dust, deposited atmospherically. Residences along Mann’s Hill Rd in Littleton will overlook the daily operations of the landfill development from only 1.5 miles away.

Some of the far-reaching impacts would include:

- **Air pollution** from harmful landfill gas emissions, PFAS contaminants, fugitive asbestos and road dust emissions, unpleasant odors, and heavy-equipment noise, all of which could carry for miles, impacting water quality, homeowners, and visitors to Forest Lake State Park (the public beach is approximately $\frac{3}{4}$ of a mile away), the prevailing wind pattern is E/SE towards Forest Lake. Marriage ceremonies are often held at the free, state park beach.
- A **negative impact on the property values** of nearby homes, as well as the approximately 375 residences along the extensive trash truck traffic route thru the Towns of Whitefield, Bethlehem, and Carroll.
- A **negative impact on the tourism industry** of the North Country, the Littleton River District, and the profitability of businesses that rely on tourism and outdoor recreation dollars.
- Up to 24 trucks could be staged in an **early-morning, and daily, on-site queuing area**, awaiting entrance, spewing harmful diesel greenhouse gas emissions, road dust, noise and runoff pollution.
- **Ground and surface water contamination**, as well as atmospheric deposition of toxic pollutants, including PFAS, road dust, and storm water runoff from landfill emissions, dirty tractor trailers, and increased heavy-duty truck and tractor-trailer traffic, all of which have the potential to negatively impact **Forest Lake, Burns Pond, the**

Alder/Hatch/Bog Brook watersheds, the Ammonoosuc River, and the Connecticut River, as well as the **private wells of residences** in the impact zones.

- Forest Lake is a mere 2700 feet from the proposed landfill site and lies E/SE, the direction of prevailing wind patterns. The border of the Forest Lake State Park forest is just 190 feet away. There is currently an effort to create public hiking trails within the state park forest by a volunteer group recognized by NH Parks.
- **Fecal contamination** from landfill scavenger birds could have a drastic impact on the water quality of at least 3 EPA-identified “impaired waters”; Forest Lake, Burns Pond, and the Ammonoosuc River. This introduction of additional amounts of nitrogen and phosphorous would likely lead to an extensive increase in algal blooms and cyanobacteria, which can be harmful to both humans and pets.
- Scavenger birds would pose a threat to the existing Loon population.
- An increase in litter, noise, rodents, flies, and bears both in the vicinity of the landfill site and along the free curbside trash pickup routes offered by the applicant to Dalton residents.

16. In its own narrative, the applicant makes the case that this environmentally-sensitive site is incompatible with a major industrial project of this nature, even going so far as delineating the parameters for future expansions as described under Concept 1, with southern, western, northwestern, and eastern limits identified. Once again, the conservation commission urges the department and other permitting agencies to consider the cumulative impacts of this project as the applicant clearly signals under Concept 1 the boundaries for future expansions. Project impact segmentation should not be allowed. (See Appendix C)

Beginning on page 27, **section-7-part-1-of-2-Alternatives Analysis of the Wetlands Permit Application**, the applicant states: “*revisions evolved over a five-year span with the goal to minimize wetland disturbance while maintaining project justification*”.

“Using the subsequently completed field-delineated wetland survey as a base plan layer, the landfill footprint of Concept 1 filled and permanently disturbed 40 acres of wetland, with required stormwater ponds resulting in an additional 3 acres of wetland filling or disturbance (not allowed by rules). Concept 1 has a landfill footprint of 238 acres and a capacity of 67 million cubic yards (MCY)”

67 million cubic yards of lifetime capacity divided by 600,000 cubic yards of annual permitted capacity is the equivalent of 111.67 years of permitted life capacity for this development.

17. There is no benefit to the State of New Hampshire to approve the applicant’s request for a fill rate 600,000 annual cubic yards. Doing so would be an invitation for more out-of-state trash to be brought into New Hampshire, trucked south to north over great distance. According to **page 4, Section 3-6 Project Summary of the Wetlands Permit Application, under SECTION 3.1 - Needs Assessment**, the applicant states: “*The estimated total of GSL capacity would provide about 18 years of capacity at the projected fill rate of 600,000 annual cubic yards.*”.

Converted to tons, that would be approximately 456,000 tons of annual permitted capacity. That figure has been a constant throughout Concept 1 thru Concept 5, giving credence to the belief that there will be future expansions. The department and other permitting agencies must consider the cumulative impacts of this project. It should be noted that the applicant's NCES Landfill in Bethlehem, which the proposed GSL project is to replace, has never accepted 456,000 tons of waste in a year. According to the NCES annual facility reports, 433,006 tons was the great volume of waste accepted at that facility, which was in 2016. According to the facility report, 42% of waste intake that year was from out of state. From 2015-2022, the average total annual waste intake was 312,741 tons, with NH-generated waste averaging 218,803.88 tons/year. (See Appendix P)

18. There is no need to replace the NCES Landfill in Bethlehem. NH waste could be absorbed by the other two unlimited service area facilities in NH, thus allowing for the displacement of out-of-state waste currently being shipped to those two facilities, resulting in less out-of-state waste landfilled in NH.

The NCES Landfill 2022 Annual Facility Report numbers reflect this, with out-of-state waste comprising just 2% of annual waste intake. In a February 10, 2024 news report, the applicant's Director of Communications, Jeff Weld, was quoted stating "*The permitted capacity in its Stage VI permit is required to last through December 2026 and due to our efforts in successfully managing and preserving that permitted capacity, the facility is expected to operate well into 2027*". By successfully managing and preserving the permitted capacity of the NCES Landfill, Mr. Weld confirms what the annual facility report confirms, that the applicant does not need permitted capacity beyond the range of 230,200 cubic yards, or 180,000 tons, as currently permitted annually under the NCES Stage VI operating permit. The applicant has consistently sought 600,000 cubic yard/year, or 456,000 tons/year, in annual capacity, from Concept 1 thru Concept 5, which is over 2.5 times greater than the 181,810 tons landfilled at NCES in 2022. (See Appendix Q and R)

On page 4, Part 1, of the **Wetlands Dredge and Fill Permit Application, Section 3-6 Project Summary**, the applicant states: "*With the other solid waste disposal facilities in the state already taking the maximum amount of waste they are allowed to take under their permits, it is unclear where the waste now going to the NCES facility would be disposed.*"

Should the other two unlimited service area landfills in NH utilize the same management and preservation of their permitted capacity as NCES accomplished in 2022, both of those unlimited service area landfills could easily absorb NH-generated waste previously destined for Bethlehem. Considering the average 123-mile travel distance to the proposed GSL site, travel distances for NH towns to either the Mt. Carberry or Turnkey Landfills, depending on geography, shouldn't be a burden. (See Appendix O)

19. The 2022 NH Solid Waste Management Plan outlines eight goals, one of which is to "maximize the diversion of residential, commercial and industrial solid waste from disposal".

The Executive Summary states: “The majority of goals and actions in this plan are intended to achieve the state’s overarching disposal reduction goal established in RSA 149-M:2 – which aims to reduce disposal of municipal solid waste (MSW) and construction and demolition debris (C&D) by 25% by 2030 and by 45% by 2050”.

The Dalton Conservation Commission believes that permitting 600,000 cubic yards of annual capacity for this facility in this Application would be contrary to the waste-reduction goals for the state, as established by the department and mandated by the General Court, under RSA 149-M:29. (See Appendix S)

The plan goes on to state that **“Achieving these goals will also require public and private partners to engage in more regional, cooperative efforts. Stakeholders should explore partnerships in their neighboring areas to find ways to share resources/information and collaborate on mutual objectives. Efforts that help improve public access to more waste reduction, reuse, and diversion opportunities will have both local and widespread benefits. Those benefits include conserving limited resources, protecting public health, fostering a “greener” economy, and mitigating climate change.**

The Dalton Conservation Commission believes that the transportation of waste an average of 123 miles, each way, would be contrary to the goal of mitigating climate change. We agree that partnerships in neighboring areas, engaging in cooperative, collaborative efforts, is what will be required to assist the state in meeting the goals outlined within the 2022 NH Solid Waste Management Plan. The GSL project, as outlined by this Application, fails to assist the state with meeting these goals. North Country communities can work in a more collaborative manner to share hauling services, collaborate on recycling and food waste diversion efforts, assisted by the department and the state, to meet the goals of the 2022 NH Solid Waste Management Plan.

20. By permitting 600,000 cubic yard of annual capacity, the department would be enabling the practice of “backfilling”. This is the process in which excess capacity realized by meeting any of the state waste reduction goals would be offset by an increase in out-of-state waste disposed at this facility.

The applicant’s proposal of free curbside pickup of waste within the Town of Dalton would remove incentives for household waste reductions, realized from the current “Pay As You Throw” (PAYT) system. The introduction of free curbside pickup would also be an invitation to nuisance scavengers like bears and rodents within the Town of Dalton. The introduction of heavy-duty local trash vehicles on Dalton’s steep, rural roads, which are already difficult to traverse, would pose a threat to public safety.

21. According to the 2020-2021 Biennial Solid Waste Report, the department projects a waste disposal capacity shortfall to occur in 2034.

- The AVRRODD Mt. Carberry Landfill has permitted life capacity to 2041, with Phase IIIB expansion plans to extend the permitted life of that landfill to 2049.
- The Waste Management Turnkey Landfill has permitted life capacity to 2034, which is the reason for the projected shortfall.
- The NCES Landfill is to close by the end of 2026, according to the report.

In the Turnkey Landfill 2022 annual report, 376,459 tons of out-of-state waste was landfilled, equaling 49% of what was disposed of at that facility. NH-generated waste landfilled at NCES, averaging 218,803.88 tons/year from 2015-2022, could easily be absorbed by the Turnkey facility, particularly since the operating permit requires that disposal capacity must be made available for NH-generated waste.

Furthermore, in the November 1, 2023 “Final Report of the Committee to Study Unlimited Service Area Permits for Landfills and Out of State Waste Coming Into New Hampshire”, the committee recommended that a state-owned landfill be established in order to limit the influx of out-of-state trash. The committee also recommended that a moratorium be considered against the construction of new landfills. Should such recommendations be enacted, and with legislation currently proposed for each, there would be no need, nor justification, for the applicant’s landfill development.

Were the department to require Waste Management to exercise the same management and preservation of permitted capacity at the Turnkey facility, as exhibited by the NCES facility in 2022, Turnkey could realize nearly 13 more years of capacity life under its current permit to operate if they reduced their out-of-state waste intake to 15%, thus extending permitted facility life to year 2050, approximately. As a result, there would be no capacity shortfall in New Hampshire for nearly 25 years..

The Dalton Conservation Commission endorses the recommendations of the Committee to Study Unlimited Service Area Permits for Landfills and Out of State Waste Coming Into New Hampshire. (See Appendix T)

22. In section-7-part-2-of-2-Massachusetts Landfill Siting Alternatives Assessment of the Wetlands Permit Application, the applicant failed to include the current effort to re-open its Hardwick Landfill in Hardwick, MA. In section-7-part-1-of-2-Alternatives Analysis of the Wetlands Permit Application, the applicant failed to include the McKean County Landfill it owns in McKean, Pennsylvania. (See Appendix U)

Both landfills should be considered by the department and the other permitting agencies as viable alternatives to the greenfield GSL project, particularly since both landfills exist, are admittedly underutilized, with significant potential to satisfy the applicant’s regional disposal needs once the NCES Landfill closes.

23. The applicant has demonstrated a blatant disregard for past legal agreements and local control. In the 2011 Legal Agreement with the Town of Bethlehem, in which the applicant received concessions of great value from the town, the applicant agreed to confine all future landfill infrastructure within District V (see Term 4). The GSL development site access at Douglas Drive and Route 116, comprised of Lots 406-1 and 406-2, are in the Town of Bethlehem, outside of District V, in District III. The applicant also agreed ***“not to purchase, lease, rent, develop or otherwise acquire or seek permits to use any other property in the Town of Bethlehem (other than the expanded District V) for the purpose of a landfill”***.

By entering into a legal agreement with the current owner for the landfill development project, and by submitting this and other permit Applications, the applicant is in violation of the 2011 Legal Agreement with the Town of Bethlehem. (See Appendix V)

On page 4 of the **Alteration of Terrain (AoT) Permit Application, Part 1**, the applicant highlights the critical, required improvements to Douglas Drive as a component of the landfill operations by stating: *“The project is redesigning the site entrance at Route 116 from the current configuration to meet required traffic safety criteria, which include connecting the entrance at 90 degrees as part of the NHDOT Driveway Permit for the project. This modification, depicted on the enclosed plans, is part of several improvements at the driveway entrance and includes an inbound deceleration lane and outbound acceleration lane on Route 116. These improvements are covered by this application. The site entrance, Route 116 improvements, and the southern portion of Douglas Drive are within the quarter-mile designated river corridor of the Ammonoosuc River, which is on the opposite side (south) of Route 116 from the site entrance, therefore the Ammonoosuc River Local Rivers Advisory Committee is being provided a copy of this application. Parts of the Route 116 improvements are also within the protected shoreland of the Ammonoosuc River, which will require an NHDES-Shoreland Permit. Douglas Drive will be paved throughout and widened to a width of 32-feet in most locations of the approximately 1.5-mile length of road to the landfill. Existing culverts along Douglas Drive will also be replaced during construction with new corrugated HDPE pipe (N-12 or approved equivalent) as depicted on the enclosed plans. Additionally, GSL will be providing two new replacement open bottom culverts at stream crossing locations. Wetland impacts associated with the installation of these culverts are covered by the Standard Dredge and Fill application for the project, which is being filed by GSL concurrently with this application.”*

On page 3, the applicant also states: *“Local approvals are not required for Dalton, or in Bethlehem where the site entrance is located.”*

The use of Douglas Drive for landfill operations constitutes a significant “change of use”, requiring site plan review by the Town of Bethlehem Planning Board. Furthermore, the Town of Bethlehem Zoning Ordinance restricts private landfill operations to District V. Douglas Drive, the facility entrance, is in District III, in the Town of Bethlehem.

24. The applicant’s background, including a well-documented history of non-compliance with environmental and solid waste regulations, operational and engineering shortcomings, a tendency to disregard past legal agreements which run counter to the company’s current interests, and a poor track record as a community and business partner should be taken into consideration by the department and other permitting agencies in its determinations about the Applications for this landfill development project. (See Appendix W)

This should include failure of the applicant to gain public support in the North Country for its continued operations of the NCES Landfill in the Town of Bethlehem, for this proposed landfill development in Dalton, and the applicant’s apparent unwillingness to engage with the Town of Whitefield, relative to the proposed landfill traffic pattern and the impacts that influx of heavy-duty truck traffic will have on that community.

25. According to the Application(s), ownership of Douglas Drive, the landfill site access road, is to be retained by the current owner, who is not a licensed, certified solid waste operator in New Hampshire. We ask the department and other permitting agencies to take into

consideration the consequences of this attempt by the applicant to circumvent the 2011 Legal Agreement and the Town of Bethlehem Zoning Ordinance. This co-owner of a significant portion of the landfill operation is not listed as a partner, nor is he subject to the required background investigation, as a result of his omission from the Application(s) as a partner in the operation. Potential, future conflicts and liability questions could arise as a result of this "arrangement". Considering the need for leachate disposal/treatment off-site, including post-closure, unforeseen consequences could arise should there be legal disputes between these two, separate and distinct entities. Should there be a traffic accident at the site entrance, which entity would be liable, particularly if there are fatalities, or environmental contamination, as a result of a leachate tanker breach?

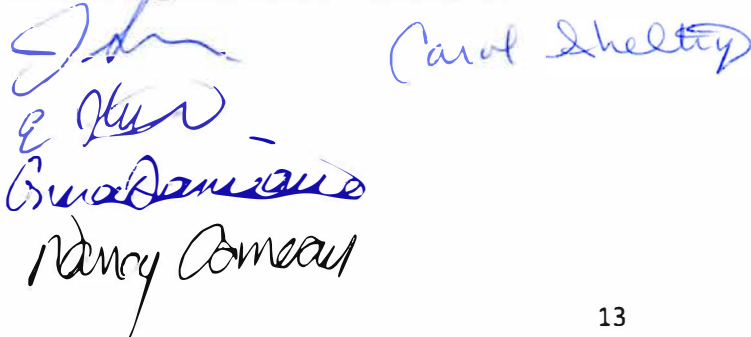
We would also note that on page 6 of the **Standard Permit Application Form for SW Landfill** it is noted at the bottom of the page: *"Note: a landfill shall not be constructed or operated on property not owned by the permittee"*.

26. The applicant's reliance upon a MRF (Materials Recovery Facility), which does not exist and would be sited elsewhere, should not be considered by the department and other permitting agencies in determining public benefit.

As mentioned on page 19 of the **Solid Waste Permit Application, Volume 6 Public Benefit, 4.2.2.1 Zero-Sort® Recycling at GSL and Proposed MRF in Southern New Hampshire**, the applicant attempts to claim GSL will assist the State of New Hampshire in meeting its waste reduction goals by linking the Application to a non-existing MRF sited at an unknown location in Southern New Hampshire. We request that the department strike all reference to any unsubstantiated claims made by the applicant relative to the MRF, which doesn't exist, and is not being proposed as a part of the GSL facility. The Application(s) for this facility must stand alone in determining public benefit. We also take issue with the applicant's proposal to introduce single-stream "Zero-Sort Recycling" within Dalton, which would most likely result in an increase in the contamination of recyclables, resulting in more recyclables being landfilled, thereby reducing the effectiveness of the current practice of source separation of recyclables at the Dalton Transfer Station.

In summary, due to the negative and far-reaching impacts associated with an industrial development of this size and nature, particularly at this greenfield location, and in consideration of the documented challenges the applicant has demonstrated over time in operating similar facilities, the Dalton Conservation Commission respectfully requests that the department and other permitting agencies **DENY** the Application(s) for this proposed landfill development.

The Dalton Conservation Commission


The block contains four handwritten signatures in blue ink. From top to bottom, they are: a signature that appears to be 'John', a signature that appears to be 'Carol Shelton', a signature that appears to be 'Cristina...', and a signature that appears to be 'Nancy Comeau'.

Connecticut Valley Environmental Services, Inc.

Town of Dalton Selectboard
& Conservation Commission
756 Dalton Road
Dalton, NH 03574

via email: selectmen@townofdalton.com
conservationchair@townofdaltonnh.gov

February 20, 2024

re: Comments on *NHDES Wetland Application #2023-03259* and Associated Applications
Granite State Landfill LLC (“GSL”), Dalton, New Hampshire

Dear Dalton Selectboard and Conservation Commissioners Members,

In response to your request, I am pleased to offer the following comments on the above-referenced application. At this time, it is my opinion that the evidence submitted to date (February 20, 2024) is insufficient to determine beyond a reasonable doubt as to whether or not the proposed Granite State Landfill (GSL) meets the “public benefit” standard for approval according to RSA 149-M:11.

This conclusion is based on a careful review of the following permit applications and supporting documents:

- *New Hampshire Department of Environmental Services (NHDES) Waste Management Division Standard Permit for Solid Waste Landfill Application*
- *NHDES Alteration of Terrain (AoT) Permit Application*
- *NHDES Wetlands Standard Dredge and Fill Permit Application*
- *National Pollution Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plan (SWPPP)*

Not available at the time of this review:

- *NHDES Shoreland Permit Application*
- *United States Army Corps of Engineers (ACOE) Individual Wetland Permit Application (Section 404, Clean Water Act)*
- *Draft NHDES Water Quality Certification (Section 401, Clean Water Act)*

This is an extremely important project that will disturb approximately 148 acres of land, add 25.5 acres of impervious surfaces, destroy 11.5 acres of wetlands, and have adverse effects on the

Ammonoosuc River and other known and unknown public interest factors. At a minimum, it is “projected that the GSL will generate leachate contamination for the better part of 100 years”¹.

It is imperative that all of the above-mentioned documents are available for review in order to determine potential effects of GSL on natural resources. The fact that only a portion of these applications and plans is currently available makes it impossible to conclude whether or not the project is a “public benefit”. These applications are interdependent. For example: 1) GSL needs a Shoreland Permit for widening the access road (Route 116) which is within the designated river corridor of the Ammonoosic River if the project is to proceed²; 2) NPDES permits, enforceable by both the state and citizens, have details about the storage and handling of toxic substances in order to protect the public’s interest in waters on and adjacent to the GSL; 3) Water Quality Certification is likely to add conditions to protect water quality of the Alder Brook complex³; and, 4) the ACOE process will illuminate direct, indirect, and cumulative effects on all public interest factors⁴.

Furthermore, as you may know, the Dalton Conservation Commission (DCC) has not had an opportunity to visit the site during the growing season to investigate site conditions and confirm information in the current wetland and AoT permit applications. My hope is that a site visit will be offered and the ACOE permit application will be available for review before NHDES conducts a public hearing on the merits of the pending wetland application.

For this report, I focus on the revised GSL wetlands and AoT applications and supporting documents, including: the alternative analyses; Natural Heritage Inventory records; bedrock geology; wildlife action plan; compensatory mitigation measures; the NHDES Wetland Bureau’s requests for additional information and GSL’s responses to the same; and, written correspondence to and from the Town of Dalton, GSL, NHDES and other interested parties related to natural resources.

It is my opinion that, as of this letter’s date, the GSL’s wetland application should be rejected because: 1) the permit process is being segmented; 2) cumulative impacts are not addressed; 3) stormwater models do not use the best available science; 4) the landfill design is incomplete; 5) required natural resource information is missing; 6) the alternative analyses are insufficient, 7) compensatory mitigation measures provide uncertain benefit to the Town of Dalton; 8) existing, unauthorized wetland impacts for Douglas Drive should not be permitted as a component of GSL; 9) the Dalton Conservation Commission did not have access to GSL site during the

¹ Carex Environmental Consulting, February 12, 2014-letter, p. 1.

² “The site entrance, Route 116 improvements, and the southern portion of Douglas Drive are within the quarter-mile designated river corridor of the Ammonoosuc River, which is on the opposite side (south) of Route 116 from the site entrance, therefore the Ammonoosuc River Local Rivers Advisory Committee is being provided a copy of this application. Parts of the Route 116 improvements are also within the protected shoreland of the Ammonoosuc River, which will require an NHDES-Shoreland Permit.” (AoT, Part 1, p. 4).

³ “Sections of Alder Brook are identified as native cold water trout habitat. Indirect impacts to the brook such as increases in temperature, changes in water chemistry, and alteration of flow in Alder Brook are addressed in the Water Quality Certification application” (Wetland Application, Section 7.3.1, page 24). This application is not yet available for review.

⁴ <https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A/part-1508/section-1508.1>.

growing season; and, 10) the regulatory framework may change. I discuss each of these points below.

1. The Permit Process is being Segmented

As noted above, there are several permit applications that are likely to present significant findings on potential impacts that will inform whether the GSL is in the public's interest. Unfortunately, several of these important applications have not yet been filed. Consequently, it is my opinion that any action (approval or denial) on the NHDES Wetland Permit application at this time effectively segments the permit process. In other words, the permit process is being "piecemealed".

Significantly, wetland impacts trigger the need for a federal ACOE Individual Wetland Permit and a number of other federal jurisdictional authorities, notably including the National Environmental Policy Act (NEPA). This Act ensures that all impact (effects) on public interest factors are considered in a determination of "effects" before a decision is rendered. And recently, on April 20, 2022, the definition of "effects" was revised "to include direct, indirect, and cumulative effects"⁵.

The submission of permit applications on a staggered schedule piece-meals the permit process and circumvents full environmental review. The assessment of impacts identified in each of various applications should be done at the same time to better enable an evaluation of all "effects".

2. Cumulative Impacts are not Addressed

The impact of the asphalt plant, development of the drag strip and business/industrial park, and likely expansion of the existing rock quarry and gravel pit are not included in the analyses of the quantity and quality of stormwater. The applications indicate material from the quarry and pit will be used to construct the landfill, so expansion of these operations is likely.

All potential phases of the landfill and all other "past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions"⁶ within the vicinity of the proposed project need to be analyzed. And, any future alteration of terrain or wetlands within each watershed where the project is located should be explicitly forbidden by imposing strict conditions in the alteration of terrain and wetland permits.

3. Stormwater Models do not use the Best Available Science

Even though applications eventually may be deemed administratively and technically complete, the "facts" that are presented in them are not necessarily based on the best available science. The AoT models predict the post-development runoff rate from a 50-year precipitation event will be less than the pre-development rate. And the volume of water infiltrated into the ground will be

⁵ <https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A/part-1508/section-1508.1>.

⁶ <https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A/part-1508/section-1508.1>.

increased when the landfill is constructed. However, these analyses do not consider precipitation events of more intense storms (i.e., those associated with 100-year events and greater).

The stormwater ponds/infiltration basins are designed to infiltrate the 50-year, 24-hour storm without overtopping. This design storm is grossly inadequate as the frequency and intensity of storms have recently increased due to climate change, and are predicted to increase even further in the future. The Connecticut River Valley has experienced multiple 100-year and 500-year storms within the last fifteen years. Over the expected life of the landfill, 18 years, the site will likely see numerous storms that the constructed ponds will be unable to detain and infiltrate. It is unclear what impact these more intense storms will have on the integrity of the landfill and downstream aquatic resources if the stormwater management system is undersized.

Intense storms have become more frequent and are projected to become even more common due to climate change. Precipitation in the Northeast has increased in all seasons, and extreme precipitation events (defined as events with the top 1% of daily precipitation accumulations) have increased by about 60% in the region—the largest increase in the US.⁷

GSL stormwater models also do not evaluate the effect of frozen ground (which inhibits infiltration) nor increases in runoff due to rapid snow melt caused by unseasonably warm temperatures⁸ during a precipitation event such as the one that Dalton experienced on December 18, 2023. All of which can contribute to downstream flooding and transport toxic substances.

At a minimum, the numerous ponds (13 infiltration basins, six rain gardens, three deep-sump catch basins, and two stormwater ponds) will increase surface water temperatures to levels that will likely have adverse effects on downstream wetlands, cold-water fisheries, and highest ranked habitats in New Hampshire.

4. The Landfill Design is Incomplete

The wetland application states that “the enclosed plan set (see Section 14.1) includes sheets that detail proposed landfill and stormwater infrastructure construction, including infiltration basins, stormwater ponds, and lined rain gardens needed for each of the landfill development sequences” (Wetland Application, Section 2.1.2, p. 4). There are no specifications for infiltration basins and lined rain gardens depicted in Section 14.1 of the wetland application. The AoT application provides more details on infiltration basins and rain gardens but notes that the mandatory analysis of the feasibility of infiltration is not complete as additional onsite tests are proposed in 2024⁹.

⁷ USGCRP, 2023: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. <https://doi.org/10.7930/NCA5.2023>. November 2023. Figure 2.8.

⁸ “Warming is apparent in every region (based on changes in annual average temperature in 2002–2021 compared to the 1901–1960 average for the contiguous United States”. (ibid, Figure 21.1).

⁹ “We note that there are five pond locations that do not currently have infiltration test data due to reconfiguring some of the ponds since the tests were completed. The remaining infiltration tests will be completed in 2024.” (AoT, Part 1, p. 20).

There is one plan note in supporting documents for the wetland application that reads “[p]lant tree species **native to the site wetlands** [emphasis mine] on the pond bottoms on a maximum 50-foot center-to-center spacing to shade standing water in the ponds. Tree species shall include northern conifer (spruce, fir) and swamp hardwood (white birch, quaking aspen)” (Wetland Application, Section 14.1.3, p. 8). It is questionable whether these “wetland” species will thrive in the bottom of stormwater ponds that potentially will have neither hydric soils nor wetland hydrology. Without more clear design specifications for the rain gardens, including appropriate plantings, it is impossible to determine if they will function as expected.

Missing information previously identified by the DES Solid Waste Division that is relevant to the wetland application include an analysis of how discharging groundwater conditions will be affected by filling wetlands, and sufficient information to evaluate the minimum separation distance from the base of the landfill liner to bedrock and seasonal high groundwater elevations.

Extensive wetlands within the landfill footprint indicate a hydrological regime that is very near the soil surface (about one foot). Also, extensive soil test pit data indicate the depth to estimated seasonal high water table is consistently less than 36 inches (see AoT Application, Appendix L, Site Specific Soil Survey Mapping and Report), it appears the seasonal high groundwater elevations may be higher than what is indicated in the NHDES Solid Waste Landfill Application (see Figure 4, Groundwater Separation, p. 22; and Figure 8A, Conceptual Seasonal High Groundwater Elevation Contour Plan¹⁰). The log data for monitoring wells 13, 24 and 43, within the landfill footprint, record depths to water of 7.02 feet, 11.7 feet and 10.03 feet, respectively. These apparently erroneous and conflicting data deserve more scrutiny.

Therefore, at this time the wetland application should be deemed incomplete.

5. Required Natural Resource Information is Missing

The New Hampshire Natural Heritage Bureau (NHNHB), on December 12, 2023, requested field surveys to determine what species and natural communities occur on the GSL site, and a comprehensive list of plant species, native and invasive (Wetland Application, Section 10.1, pages 1-4). A plant species inventory and information on rare, threatened and endangered (RTE) species and exemplary natural communities, based upon onsite surveys responsive to NHNHB’s request, is missing from the wetland application and presumably not completed as the request was only made two months ago. Information on invasive species would dramatically improve the AoT application which only provides boiler-plate information on the control of invasive species and made no effort to make it site specific (see AoT Application Part 2, Appendix N-O, p. 3-7).

Similarly, there is no evidence that GSL has conducted field work, such as acoustical analyses, to document the presence or absence of the endangered northern long-eared bat, *Myotis septentrionalis*¹¹. These data on listed and invasive species are necessary to discern primary wetland functions and values, particularly with respect to ecological integrity.

¹⁰ This figure has numerous disclaimers.

¹¹ North East Ecological Services, 16 February 2024-letter report, p 1.

As listed in the wetland permit application form, typical primary wetland functions include ecological integrity among others (see Wetland Application, Section 9.1a, Wetlands Functional Assessment Worksheet, p.2). The GSL analysis of wetland functions and values, entirely based on the Federal Highway Methodology for assessing wetland functions, fails to address “ecological integrity” (RSA 482-A:2, XI). Furthermore, GSL’s wetland function-value evaluation concludes that one of the principal functions the onsite wetlands provide is flood flow alteration. However, the AoT application claims the wetlands are not supported by surface (sheet) flow (their hydrology is derived from ground water).¹² Therefore one or the other of these interpretations is erroneous. As indicated in the Highway Methodology Workbook Supplement, the flood flow alteration “function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.”¹³ The fact that the wetlands contain hydric soils, which absorb and detain water, and possibly receive and detain overland or sheet flow runoff from surrounding uplands suggest they function in flood flow attenuation. Mitigation for this function is intended to be provided by engineered stormwater control measures that still wait for the results of infiltration tests.

Noting that the wetland application is incomplete because it lacks photographs of each wetland impact area, the DES requested GSL provide them. Photographs and location information were collected on January 3 and 4, 2024 and provided to the NHDES on February 6, 2024. During this exercise, Wetland Impact Tables were revised (in February 2024) to allocate some resource types differently (e.g., from wetland to stream; see Wetland Application, Application Response 4). These changes require revisions to impact calculations for wetlands and streams and required impact fees. And unfortunately, the photos are of limited value as herbaceous vegetation has died and surface hydrology does not represent conditions during which hydrological interpretations are required to be made for wetland delineations and functional assessments.

Proposed work within the protected shoreline of the Ammonoosuc River will affect “198 linear feet of perennial stream, 24 feet of intermittent stream and associated 2,961 SF of permanent wetland impact is associated with re-grading a portion of the northern side slope adjacent to Route 116 in order to accommodate a truck turn lane. The post-development channel will continue to direct surface water runoff to an existing catch basin (See CMA Sheet DD-8) which discharges under Route 116 via an existing 24" RCP pipe. **This drainage will continue unimpeded to the Ammonoosuc River** [emphasis mine]” (Wetland Application 6.1, page 5). It is unclear if any of the stream impacts within the designated river corridor of the Ammonoosuc River should be treated as Tier 3 stream crossings rather than as Tier 1 stream crossings as they apparently have direct surface water connections to the River.

6. The Alternative Analyses are Insufficient

The purpose of the proposed project is to dispose of solid waste. An analysis of alternative methods (and sites) to dispose of this waste is required as part of the wetland application. The

¹² “Note the wetlands are primarily recharged by groundwater flow. There is no surface water flow in or emanating from these wetlands.” (AoT, Part 1, p. 8).

¹³ <https://www.nae.usace.army.mil/Portals/74/docs/regulatory/Forms/HighwaySupplement6Apr2015.pdf>, p. 4.

applicant has the responsibility to demonstrate that the preferred alternative, landfilling solid waste in Dalton, is the least environmentally-damaging practicable alternative.

The need to landfill solid waste would be less if the waste stream is reduced. The New Hampshire 2003 Solid Waste Plan (the "2003 Plan") places landfilling as the least desirable alternative and recommends consideration of waste reduction and incineration as practicable alternatives. To demonstrate consistency with the 2003 Plan, GSL should address the comparative economic and environmental costs of incinerating versus landfilling solid waste in Dalton.

The applicant does briefly address reducing the waste stream and states that "[i]f the GSL facility is permitted, CWS will construct a new materials recovery facility for recyclables in southern New Hampshire to complement operations of the landfill facility and further advance the state's goals and hierarchy" (Wetland Application, Section 3, page 5). This is a proposed measure that deserves serious consideration as it will minimize the need for the Dalton landfill and reduce proposed wetland impacts. GSL should provide more information on this facility and commit to its construction as a condition in wetland permits if they are issued.

With respect to offsite alternatives, it is unfair that Vermont and Maine will benefit from the construction of the landfill but will bear none of the adverse effects. It seems prudent, due to the significant impacts and importance of landfills to all of the New England states, for GSL to discuss with neighboring States (perhaps through the intervention of their federal congressional delegations) potential locations to locate a regional landfill (for use by all) that will have less impact on aquatic resources.

The offsite alternative analysis would have been more robust if it would have given more weight to the fact that the Ammonoosic River designated river corridor, highest ranked habitats in New Hampshire, acres of wetlands, vernal pools, perennial and intermittent streams, and cold-water fisheries are downgradient and will be adversely affected by the project. It is likely that there are suitable sites in New England for a landfill that will not put this many valuable aquatic resources at risk.

For these reasons, it is my opinion that the current offsite alternatives analysis is inadequate.

7. Compensatory Mitigation Measures provide Uncertain Benefit to the Town of Dalton

Aquatic resources which GSL determined will be directly impacted by the GSL have as their principal functions groundwater discharge, floodflow alteration, and wildlife habitat (Wetland Application, Section 9.0, page 12)¹⁴.

Replacing groundwater discharge and floodflow alteration functions is intended to be performed onsite by best management practices that include 17 forebays, 13 infiltration basins, six rain gardens, three deep-sump catch basins, and two stormwater ponds (AoT Application Part 2, Appendix N, p. 2). As compensation for unavoidable impact to wildlife habitat and non-principal functions (e.g., sediment trapping, nutrient trapping/retention/transformation, etc.) GSL

¹⁴ GSL did not consider "ecological integrity" in their function and value assessment.

is offering to 1) preserve a 254-acre conservation area adjacent to the Ammonoosuc River in Bethlehem that contains 172 acres of upland and 82 acres of wetland, 2) consider on-site preservation of 146.8 acres near Alder Brook, and 3) contribute \$3,512,164.30¹⁵ to the Aquatic Resource Mitigation (ARM) Fund.

It appears GSL is equivocating as to whether to commit to the Alder Brook Preservation Area so this part of the mitigation plan may not come to fruition. Moreover, there is no guarantee that Dalton and/or Bethlehem will receive a significant portion, or any, of the ARM funds. These will be awarded on a competitive basis between projects within towns of the Middle Connecticut River watershed from Lancaster to Lebanon (<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/arm-fund-service-areas.pdf>).

8. Existing, Unauthorized Wetland Impacts for Douglas Drive should not be Permitted as a Component of GSL

The existing Douglas Drive and gravel pit access roads are estimated to impact 0.9 acres of wetlands and a perennial stream. These are existing unpermitted impacts that are proposed to be added to aquatic impacts for the GSL. However, the roads and wetland impacts extend well beyond what is needed to access the landfill site (see Overall Site Plan in Section 14.1.3). This plan also clearly shows that road locations have not minimized impact to wetlands, which violates the wetland rules. Less-impacting road alignments are available.

These impacts should be permitted separately from the landfill. The purpose, need, and alternative analyses for Douglas Drive and gravel pit access roads are different from those that are necessary for landfill access. The roads were illegally constructed to access activities on the site that are not related to the GSL. To now allow these roads to be coopted as purported access to the landfill because they are within previously disturbed wetlands rewards the landowner for its illegal actions. A more comprehensive analysis of this issue should be provided. Otherwise, combining illegal road impacts with the GSL application implies NHDES will approve the landfill (i.e., essentially signaling that the issuance of the landfill wetland permit is a *fait accompli*). The NHDES should require restoration of the road impacts and submission of a separate application which evaluates road alignments that are less environmentally-damaging. Wetland impacts need to be avoided and minimized to the maximum extent practicable.

9. The Dalton Conservation Commission did not have Access to GSL Site during the Growing Season

The DCC has not had access to the project site during the growing season in order to verify the accuracy of information provided in the wetland application, in accordance with its authority to investigate under RSA 482-A:11, III. This is one of only a few opportunities the Town has to participate in the permitting process. And the Conservation Commission can only perform a credible wetland application review if it is able to verify resource impacts (e.g., RTE species, vernal pools and wetlands) through a site inspection.

¹⁵ This number is likely to change slightly due to GSL's reclassification of resource types in February 2024.

A site visit was conducted on January 8, 2021, with frozen ground and snow cover, for the previous version of the GSL. At that time, Mr. Gay and the landowner agreed that the DCC would be allowed to conduct a site visit during the growing season. However, when spring arrived, Casella's Regional Vice President, Associate General Counsel, and outside counsel, as well as the landowner, prevented DCC's site visit.

GSL offered a growing-season site visit prior to the submission of the current applications but placed conditions on the visit that would preclude "sampling of any kind" and allow only one DCC expert to attend (June 8, 2023, letter from Bryan K. Gould to Jon Swan, Chairman DCC). These conditions were unacceptable as the current application had not been filed and it is critical that soils be sampled with a hand-held auger (to a depth not to exceed 20 inches) in order to verify the accuracy of wetland delineations and hydrological interpretations. And due to the large size of the project, an associate was requested to assist DCC's expert in order to expedite necessary field work.

10. The Regulatory Framework May Change

Finally, there are initiatives in the New Hampshire legislature that would create a pause on any new landfill permits until 2031 (e.g., HB1620), and alter criteria for siting landfills from surface water bodies.

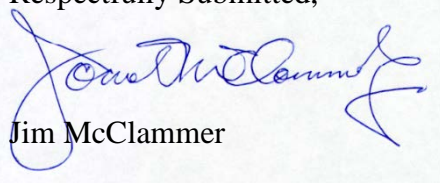
Another fundamental issue is resolving ambiguities with respect to "public benefit", specifically, who has the authority to interpret whether or not a solid waste project is a "public benefit". The December-2023 New Hampshire Supreme Court decision places the interpretation of "public benefit" (in RSA 149-M:1) in the hands of the NHDES. This requires the administrative branch of State government (who crafts rules to implement statutes enacted by the legislature) to interpret whether or not a project is a "public benefit". The Court has, in essence, downshifted its responsibility for interpreting statutory intent to the NHDES; whereas, this duty arguably should rest with the judicial branch (courts). This issue was long-settled by the Chevron Deference Doctrine. But this doctrine is currently being reviewed by the United States Supreme Court.¹⁶ Should the courts or the regulatory agencies determine whether or not a project is a "public benefit"? This question will be informed by the pending decision of the United States Supreme Court.

10. Conclusion

Based on uncertain outcomes in the regulatory framework, segmentation of the permit process, and basic deficiencies in the wetland and related applications it is my opinion that the wetland application should be rejected. A premature ruling on the wetland application puts at risk the New Hampshire's natural environment including the Ammonoosuc River, highest ranked habitats in New Hampshire, 11.5 acres of wetlands, five vernal pools, perennial and intermittent streams, cold water fisheries, and possibly exemplary natural communities and rare, threatened and endangered species.

¹⁶ <https://www.natlawreview.com/article/end-chevron-or-its-rebirth>

Respectfully Submitted,



Jim McClammer

NH Certified Wetland Scientist #003
Connecticut Valley Environmental Services, Inc.
391 River Road
Charlestown, NH 03603





February 20, 2024

To: Town of Dalton Conservation Commission
756 Dalton Road
Dalton, NH 03598

RE: Wetlands Permit Application (RSA 482-A) NHDES File Number: 2023-03259 Subject Property: Douglas Drive, Dalton, Tax Map #406/1, Lot #406/2; Standard Permit for Solid Waste Landfill (RSA 149-M:7)

This letter report is in response to the above Wetlands and Solid Waste Permits associated with the proposed Granite State Landfill to be in Dalton, New Hampshire “*Site*.”

Earth Forensics, Inc. was contracted to address and comment on groundwater and surface water issues related to the proposed Granite State Landfill (GSL) under the current wetland and solid waste permit review by the New Hampshire Department of Environmental Services (NHDES). We have previously provided comments to the Department relative to proposed code changes to ENV-SW-800 Landfill Requirements, but herein address deficiencies in the permittee’s permit application documentation. We have prepared this letter report to be included in the Project Impact Report for the Town of Dalton that provides an overall opinion of the likely potential impacts of the proposed GSL being planned for an area south of Dalton and north of the Ammonoosuc River, including Forest Lake.

Background (Geology, Hydrology and Hydrogeology)

The Site lies west and northwest of Forest Lake in a bowl-shaped area between the ridges that project south of Mann Hill and Dalton Mountain. There are two (2) stream systems in the basin called Hatch Brook and Alder Brook that drain the area southwards to the Ammonoosuc River. The eastern ridge below Dalton Mountain separates the Forest Lake basin from the Alder Brook basin but has a glacial pass through it, creating a clear view of the Alder Brook area from Forest Lake. Overall, the Alder Brook basin is at an elevation of 1,100 feet and is forested land with multiple wetlands. As designed, the GSL will occupy forested and wetland acreage east of Douglas Drive and west of the ridge descending from Dalton Mountain between two southwest-flowing headward creeks of Alder Brook.

The area is underlain by Upper Devonian Hedgehog Granite that forms a weathered low-lying ground surrounded by metasediments and metavolcanics, which are tightly folded Ordovician and Devonian marine rocks whose axial trends are northeast-southwest. The Dalton hills and valleys are west of the White Mountains and are part of the Appalachian Highlands fold and thrust belt. At one time, the entire area was completely buried by the Pleistocene continental ice sheet, which left till deposits throughout the region and small isolated deposits of stratified drift within the project basin.

Abundant surface water is present in creeks, brooks, streams, and rivers, all fed by groundwater. Groundwater flows through the till and drift where present, but primarily, the groundwater system moves through secondary fractures and joint systems within the underlying bedrock. The proposed project area is a “recharge area” that discharges southwest and south into the Ammonoosuc River. Bedrock joint and fracture systems are unmapped in the local area, so groundwater flow dynamics are not easily deciphered. The only way to determine groundwater conditions is through aquifer testing, long-term groundwater/surface water monitoring, potential tracer testing, groundwater chemistry, and computer modeling.

Hydrogeological Comments

The following comments are based on our review of the NHDES Standard Wetland Permit Application and associated Surface Water and Groundwater Summary prepared by Casella et al. (2023) and Solid Waste Landfill permit applications and related Hydrogeologic Report submitted by Sanborn, Head & Associates (Sanborn), which includes a Bedrock Assessment Report by Hager-Richter Geosciences, Inc. In addition, reports by Calex Environmental Consulting (2024) (Calex), Watershed to Life, Inc. and North Country Council, Inc. (2006), and other professional companies and agencies were reviewed to prepare opinions and assessments. The comments provided by Calex (2024) point out very critical omissions and unsubstantiated declarations in the Sanborn Head report and, therefore, in the permit application.

Groundwater Impacts

The project footprint is in an area of groundwater recharge. Although some areas were shown to have an upward groundwater vertical gradient, the area overall has a downward groundwater vertical gradient. This means that any leachate leaking around or through the landfill liners will go directly into the groundwater and then migrate off-Site. The Sanborn (2023) report states that placing a liner below the GSL footprint will reduce groundwater levels by intercepting precipitation. Thereby causing a greater separation between the liner and the water table or preventing the saturation of clean fill placed to raise the liner to a higher elevation

with greater separation from the water table. However, groundwater is derived from higher elevations outside the Site footprint, and the landfill liner footprint and daily cover will prevent precipitation from soaking into the landfill, causing it to runoff or enter the leachate system. The water table below the landfill will not drop so long as it remains in contact with the uphill recharging area.

The separation of groundwater below the footprint of the landfill liner is seven (7) feet. Regulations specify a minimum six (6) feet of separation, and Environmental Protection Agency (EPA) requirements are for five (5) feet of separation from the upper limit of the uppermost aquifer. Still, this distance is a minimum of 10 feet in several states. In this case, the uppermost aquifer is the overburden aquifer in the glacial till, drift, sand, gravel, and clays. Maintaining a one (1)-foot separation between the regulatory minimum and the estimated water table is a problematic issue because the aquifer is unconfined (water table), and while the seven (7)-foot separation value is below the required depth, the aquifer rises to the north and east up Dalton Ridge and Mountain. In other words, it is not a predictable flat groundwater system. In fact, the Site reduction in evapotranspiration (ET) under the Site, as well as the elimination of plants and the consequent loss of groundwater uptake, could result in the groundwater table mounding upwards under the landfill rather than subsiding.

History does not support the statement that the double liner will prevent leachate from escaping the landfill. Even the EPA states that, ultimately, the liner system will fail and that after closure, it is inevitable that the liner will deteriorate, and leachate leakage is guaranteed. For this reason alone, it is recommended that a landfill be placed in a zone of upward vertical gradients (groundwater discharge area). The EPA also states that monitoring for such leakage with monitoring wells is an unreliable method but is incredibly unreliable in fractured bedrock, and monitoring for leakage in this rock system is considered, at best, a gamble. It has been noted that PFAS leaking from the North Country (NCES) Landfill in Bethlehem is being found in 11 of 19 monitoring wells, and the landfill is likely failing to contain leachate as it was designed. The leachate being leaked has been found in two monitoring wells upstream of the Ammonoosuc River. The NCES landfill is 30 years old and was made with a “*state of the art*” double-liner system as being proposed here for this project (<https://www.concordmonitor.com/My-Turn-The-failure-of-the-NCES-Landfill-52355912>).

Groundwater Contamination

Contamination of the environment with PFAS or other chemicals is a real possibility, and the groundwater/surface monitoring system needs to be robust. This is especially true in the water pathway to Forest Lake and its abundant drinking water wells. PFAS is an increasingly severe set of chemicals of

concern for public health and a known product being released in leachates. As discussed above, PFAS and other chemicals are being found in the monitoring system for the NCES landfill in Bethlehem that threaten the water quality of drinking water and the Ammonoosuc River. It must be considered that such an event could take place at the GSL. Placing a landfill within the groundwater recharge area for the Alder Brook groundwater basin and Alder Brook catchment surface water area would also lead to discharges of leachate contaminants into the Ammonoosuc River but, in addition, could threaten the water supply and water quality for Forest Lake.

The Overburden aquifer is hydraulically separated from the fractured rock aquifer, although in certain monitoring well cases, they may be in connection. The principal issue is that the lower fractured rock aquifer may move unrelated to the upper aquifer system. In this case, the movement may affect areas unrelated to movement based on slope gradients, like the upper aquifer. The lineament and fracture systems vary throughout the catchment basin but generally strike NNW to SSE towards Forest Lake and NNE to SSW from Dalton Mountain towards the confluence of Alder Brook and Hatch Brook and onto the Ammonoosuc River. Monitoring against such a condition will require more than the customarily spaced vertical and shallow depth (<60 feet) groundwater monitoring well program. Groundwater monitoring wells placed in or near the gap in Dalton Ridge should be angle drilled to a depth (200 feet) to intercept as many fractures as possible. Once established, aquifer tests should be conducted with dyes to determine flow dynamics (velocity) and fracture connectivity.

The existing data sets for groundwater monitoring consist of shallow overburden wells and shallow overburden/bedrock well pairs. Nearly all the groundwater monitoring wells are within the Alder Brook basin. Instead of restraining all analyses to the Alder Brook Catchment, we recommend expanding the groundwater/surface water monitoring and analyses towards Forest Lake, including additional groundwater monitoring wells into the Dalton Ridge gap, and providing a cross-section or two from the landfill area to Forest Lake, including the fracture paths and groundwater elevations in the section. The fracture system determined by Hager-Richter (2023) assumes the fractures are vertical, but this is not necessarily the case and likely is not the case. A field check of these lineaments is a notable data gap, which could be readily solved with a few hard rock core-recovery borings.

The project data only includes groundwater and surface water monitoring since June 2018 from 61 groundwater monitoring wells, 36 piezometers, and 22 surface water monitoring gages. The data is limited in time and space, confined primarily to the Alder Brook catchment basin. Even so, it would seem almost

mandatory that a groundwater–surface water model for the landfill include Forest Lake and the Ammonoosuc River. This should consist of groundwater flow direction, travel times in the overburden and associated bedrock fracture systems and demonstrate variations between spring and fall maxima/minima elevations.

Wetland Destruction and Contamination

The wetlands within the 70-acre landfill footprint comprise streams, forested wetlands, scrub/shrubs, and five (5) vernal pools. Ten acres of wetland out of a total of 43.3 acres is proposed to be filled across the landfill's footprint, with 11.5 acres to be impacted. Areas to be filled include intermittent streams, vernal pools, scrub/shrub, and wildlife-sensitive habitats. Compensation is required for the destruction or disturbance of habitat and can be managed in several ways, from replacement to fee payment. The intended impacts on the wetlands include the removal of vegetation and filling streams and vernal pools to create a flat floor footprint for the landfill. Some impacts will also be made along the access road and Douglas Road. While the impacts are considered minimal in the permit-associated reports, they have continuity to the downstream wetlands and thus should not be regarded as minimal impacts. Although considered intermittent under the landfill, the stream channels will nonetheless remain topographically tied to downstream perennial creeks, which ultimately discharge into Alder Brook and the Ammonoosuc River. The water table's proximity to the landfill's base and its direct connection to the wetlands as they now exist, as well as when they are covered, may result in rapid downstream contamination should leachate find a pathway through the liner system. Downstream monitoring of the wetland features should be carefully maintained throughout the landfill's life.

Summary

Based on a review of the two principal permit reports and associated documents from other professionals and government agencies, the existing plan for the GSL has some problematic issues. Most of the monitoring is bunched up near the landfill footprint. At the same time, the groundwater regimes could reasonably evade the monitoring and, at the flow rates determined, quickly get to outside sensitive receptors such as Forest Lake and the Ammonoosuc River. Given the similarity in design with the Bethlehem Landfill (NCES) and the fact that that landfill is known to be failing and releasing contaminants, it would be prudent to exercise caution and prepare more definitive studies such as groundwater models and fate and transport models for the area even outside of the footprint. NCES is known to release PFAS and other contaminants, which should be considered a likely long-term potential of that happening at GSL. Since the impact of PFAS chemicals is still being reviewed, careful monitoring for these chemicals and many others is necessary in setting the landfill in an area of recharge to the aquifers. Lastly, a fractured bedrock aquifer system presents a challenge in containment and monitoring leachate leakage and downstream contamination. A better understanding of

the aquifer dynamics and potential for contaminant transport should be sought through field assessments from greater depths and over a wider area. Filling the wetlands under the landfill does not eliminate the possibility of leachate contamination emanating from them into their projected downstream features.

Respectfully submitted.

EARTH FORENSICS, Inc.

Executed this 20th day of February 2024, at Santa Ana, California



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16 February, 2024

Executive Summary

North East Ecological Services ('NEES') was initially retained by Save Forest Lake in 2021 to provide an independent review of the Granite State Landfill, LLC ('GSL') wildlife impact documentation to determine whether the proposed landfill construction posed a potential adverse impact on the northern long-eared bat, *Myotis septentrionalis*. NEES was subsequently retained by the Dalton Conservation Commission in March 2023 in anticipation of a renewed application by GSL. NEES reviewed the Habitat Assessment documents submitted by B.H. Keith Associates as part of both of these applications, in addition to site maps and project descriptions submitted by the Applicant. My initial response letter (dated 02 January 2021) found several deficiencies and inadequacies in the 2020 Habitat Assessment that should have prevented any determination of potential impact on the northern long-eared bat at that time. A review of the 2023 Habitat Assessment has not addressed any of these deficiencies. It is my opinion that the current Habitat Assessment, and therefore any conclusions or recommendations based on the Habitat Assessment, is qualitatively inadequate to assess likely impact to bats at the Project Site. The primary deficiencies of the Applicant's Habitat Impact Assessment include:

- Failure to conduct any field work to document presence or absence of this endangered species in 2020 or 2023,
- Failure to acknowledge multiple data sources that documents the northern long-eared bat in proximity to the GSL Project Site post-WNS,
- Failure to account for the increased regulatory status of the northern long-eared bat since the original application (upgraded to Federally Endangered),
- Failure to acknowledge the potential impact of bedrock blasting on the State Endangered eastern small-footed bat,
- Failure to acknowledge that the U.S. Fish and Wildlife Service released their proposed ruling (14 September, 2022) to list the tricolored bat *Perimyotis subflavus* as Endangered,
- Failure to consider the complete deforestation of more than 200 acres of forested habitat, as well as the complete and permanent loss of multiple wetlands, intermittent streams, perennial streams, and vernal pools, as a potentially significant impact to any local bat species (for both roosting and foraging habitat),
- Failure to document the impact of road expansion at the Project Site on the foraging and roosting habitat of northern long-eared bats,
- Failure to use the USFWS Impact Determination Key (IPaC Review) for the Project Site, which suggests that northern long-eared bats may be "potentially affected by activities in this location".

Sincerely,

D. Scott Reynolds, Ph.D., CWB, CSE

GSL Project Overview

The Granite State Landfill, LLC proposal centers on the construction of a solid waste landfill that would directly impact approximately 200 acres of forested habitat within a larger 1,279-acre parcel in Dalton, New Hampshire. The current version of the application has reduced the total impacted acreage to 150 acres of permanent impact, centered around a 70-acre sealed landfill and containment berm. The additional 80 acres of impact relate to supporting infrastructure, including offices, maintenance buildings, a leachate collection system, and perimeter access roads. In addition to extensive tree-clearing activities, the landfill footprint is anticipated to result in the loss of multiple wetlands and vernal pools, as well as the physical alteration of both intermittent and permanent streams. In the original permit application, GSL stated that this loss of wetland complexes and vernal pools would be offset by planned compensatory mitigation measures, including in-lieu fee payments; the details of the level of impact and the scale of the compensatory mitigation measures were not available for review. The original application also stated the potential for additional blasting at the Project Site if “local bedrock highs exist”, but no blasting plan was available for review. Because I do not have specific information about the wetlands and vernal pool impacts, or the extent and timing of any additional blasting, I will limit my review to forest habitat alterations, general wetland concerns, and potential impacts of blasting on bats.

2020 Habitat Assessment, B.H. Keith

In their initial Habitat Assessment, B.H. Keith utilized the 2020 Range-Wide Indiana Bat Survey Guidelines (hereinafter ‘2020 Guidelines’: USFWS, 2020) and 50 CFR Part 17 4(d) (‘the 4(d) Rule’) to determine the likelihood of presence, and potential for impact of the project, on the northern long-eared bat; at that point in time, the species was considered a Federally Threatened species. The Habitat Assessment focused on the components of the 4(d) Rule that outlines restrictions for the incidental take of northern long-eared bats within parts of their range that are being impacted by White-nose Syndrome (‘WNS’). The Assessment claimed to be conducted in accordance with the 2020 Guidelines, specifically referencing Phase 2, Step 2 of that document that outlines the requirements for determining the presence of suitable habitat. The 2020 Habitat Assessment failed to accurately characterize ‘suitable habitat’ for this species, and thus erroneously concluded that the project site did “not provide potentially suitable northern long-eared bat habitat”. The Habitat Assessment subsequently stated in the next sentence that the USFWS was consulted, and they concluded that “there are not critical habitats within [the] project area”. However, there is no evidence that such a determination was made in the context of the northern long-eared bat. In fact, a USFWS memo dated 13 May 2020 stated that the northern long-eared bat “may occur in [the] project location, and/or may be affected by [the] proposed project”.

Overall, the 2020 Habitat Assessment was based on five clustered sites within the 200-acre parcel that are subject to deforestation as part of the physical footprint of the landfill. Site A identified multiple trees with the potential for exfoliating bark, cracks, and crevices that had a mean tree diameter well above the minimum size outlined in the 2020 Guidelines. Site E is also identified as having a large, mature hardwood tree in edge habitat. The 2020 Guidelines clearly states that “individual trees may be considered suitable habitat when they exhibit characteristics

of suitable roost trees and are within 1,000 feet of other forested/wooded habitat.” It is clear from the data collected by the Applicant that “potential suitable summer habitat”, as defined by the 2020 Guidelines, exists at the Project site. The Applicant further attempted to nullify the seasonal tree-cutting restrictions of the 4(d) Rule by using stating that no ‘known maternity roosts’ existed at the Project Site. This conclusion is erroneous based on the fact that the Applicant never attempted to document the presence of the species, and thus ‘known maternity roosts’ is an impossibility. The Applicant could have, and should have, conducted a presence-absence survey as the logical extension of finding potential suitable summer habitat. The Applicant cannot use the absence of evidence as evidence of absence.

2023 Northern Long-eared Bat Phase I Bat Habitat Assessment, B.H. Keith

In the Applicants updated filing, a new bat impact assessment was included (Section 10.4) that was conducted by B.H. Keith and dated November 2023. However, relatively little new information and no additional or updated surveys were conducted as part of that assessment. The entire attachment consisted of the same five site surveys conducted 2020 under the 2020 Guidelines. This is in spite of the fact that the Applicant acknowledged the reclassification of the northern long-eared bat from Threatened to Endangered status since the initial 2020 surveys. The Applicant correctly stated that the 4(d) Rule applied to the northern long-eared bat in the initial 2020 Assessment was nullified, and that the Applicant was currently addressing potential impact through the “Interim Voluntary Guidance for the Northern Long-Eared Bat: Forest Habitat Modifications” document. As part of this Guidance document, the Applicant has assumed presence of the northern long-eared bat (“Step 1 Option 2”) and offered to avoid impact by conducting all vegetation management activity outside the “pup season” (identified in the Habitat Assessment as “November 01 through Apr 14th”).

The Current Status of the Bat Community Within New Hampshire

An effective and complete impact analysis requires an understanding of the ecology of any potentially impacted species or communities, including the nature of any pre-existing threats to their continued viability. The community of bats found in New Hampshire contains up to eight species, all of which have been designated as Federally Endangered, Federally Threatened, State Endangered, or State Species of Concern (Table 1). Although there are multiple cumulative threats to the continued persistence of these species throughout their range (including habitat loss, physical exclusion, and wind energy development), the primary threat to the hibernating species is the presence of White-nose Syndrome, an emergent fungal disease that has decimated bat populations throughout the eastern half of North America (Blehert et al., 2009; Frick et al., 2010).

White-nose Syndrome (“WNS”) is caused by the psychrophilic fungus *Pseudogymnoascus destructans* (Lorch et al., 2011; Langwig et al., 2015). WNS has been documented in almost all species of hibernating bats in the eastern United States (Locke, 2008; Reeder & Turner, 2008), including all five hibernating bat species known to occur in New Hampshire. Although the exact mechanisms of mortality are still uncertain, bats infected with WNS appear to have difficulty maintaining homeostasis during hibernation and generally die in early spring as a result of

electrolyte imbalance, dehydration, and starvation (Cryan et al., 2010; Ehlman et al., 2013, Bohn et al., 2016). Within two years of being detected at a site, WNS typically causes 40% - 99% mortality within the hibernaculum (Langwig et al. 2015). Since first being documented in 2006, WNS has spread across 41 states and five provinces in Canada, causing the mortality of an estimated six million bats (USFWS, 2016) and dramatic shifts in both species' abundance and community structure throughout the northeast (Frick et al., 2010; Brooks, 2011; Nocera et al. 2019). This includes an estimated population reduction of up to 98% in northern long-eared bats (Turner et al., 2011). Prior to the emergence of WNS, the NHFG had conducted multiple surveys of the hibernating bat population within the state and all the evidence suggested a robust and growing population across all species. Since the outbreak of WNS in New Hampshire in 2009, the population of hibernating bats has experienced a 99.8% decline, with bats extirpated from three of our eight known hibernacula, and two of the remaining hibernacula having less than three bats as of 2022 (Reynolds, unpublished data).

Table 1: Conservation Status of Bat Species in New Hampshire (NHFG, 2023)

Common Name	Species	FE	FT	SE	SGCN	SC
Northern long-eared bat	<i>Myotis septentrionalis</i>	X		X		
Little brown bat	<i>Myotis lucifugus</i>			X		
Eastern small-footed bat	<i>Myotis leibii</i>			X		
Tricolored bat	<i>Perimyotis subflavus</i>	X		X		
Big brown bat	<i>Eptesicus fuscus</i>				X	
Silver-haired bat	<i>Lasionycteris noctivagans</i>				X	X
Eastern red bat	<i>Lasiurus borealis</i>				X	X
Hoary bat	<i>Lasiurus cinereus</i>				X	X

FE = Federally-Endangered, FT = Federally-Threatened, SE = State-Endangered, SC=Species of Special Concern, SGCN = Species of Greatest Conservation Need. **Species in bold hibernate throughout the winter**
X = proposed listing released September 2022

Pre-Existing Knowledge of the Bat Community in Proximity to the GSL Project Site

Due diligence for any impact analysis is an investigation into the current state of knowledge of the impacted wildlife community. For bats, there is often very little pre-existing site-specific knowledge about species composition or abundance. For the GSL Project site, it is important to realize that half of the known bat hibernacula in the state are found within 25 miles of the Project site, with three hibernacula located in Grafton County within 14 miles west or southwest of the Project site. The farthest site (Mascot Mine: Coos County) has historically been the state's largest hibernaculum and the only known wintering site for the eastern small-footed myotis. The other three sites (Red Mine, Paddock Copper Mine, and Carter Mine) have historically contained multiple bat species, including the majority of the known northern long-eared bats in the state. Although all of these sites were severely impacted by WNS by 2015, we do have documented fall swarming activity in proximity to three of these sites from 2017 for both the northern long-eared bats and eastern small-footed bats (Jessie Mohr, unpublished report); these data suggest that local populations of these species persist despite their documented presence in known hibernacula. There is also documented evidence of both northern long-eared bats and little brown bats from Whitefield, approximately 10 miles northeast of the GSL Project site. These data,

collected in August 2017 as part of the Northern Pass Project Habitat Impact Assessment, confirmed the presence of these species at both sampling sites (Segments 244 and 245) within Whitefield. Given that Normandeau Associates is now currently retained as the Natural Resources Consultant for the GSL Project, and they were the consultant that collected the data for the Northern Pass Project, these data should have been incorporated into the Impact Assessment. It is also important to state that the GSL Project site is only a few miles from the White Mountain National Forest, where extensive research on bat communities has been conducted by the U.S. Forest Service (Leighlan Prout) for over two decades.

2023 Interim Voluntary Guidance for the Northern Long-Eared Bat: Forest Habitat Modification, U.S. Fish & Wildlife Service

The Interim Voluntary Guidance for the Northern Long-Eared Bat: Forest Habitat Modification (“Interim Guidance”) document, released by the USFWS on 06 March 2023 states that unlawful “take” includes harassment and harm to any endangered species. The Interim Guidance defined “harm” as any activity that negatively impacted the species, including “significant habitat modification or degradation”. The Interim Guidance provided a clear three-step process for determining both the significance of the impact and the likelihood that such impact would result in take. Step One required evaluating species presence at the project site. The document identifies four options for determining presence; conduct a presence/absence survey (Option 1), assume presence (Option 2), estimate presence using a Determination Key (Option 3), or seek formal consultation with the USFWS (Option 4). The Interim Guidance states that “take is not reasonably certain to occur if vegetation management activities are avoided in close proximity to bats during the pup season”. But the Interim Guidance also clearly states that if northern long-eared bats are present “at any time of year”, it is *possible* (USFWS original italics) that take could occur regardless of when the impact occurs.

The Interim Guidance maintains the same definition of suitable summer habitat as the 2020 Guidelines and the 4(d) Rule used by the Applicant in their 2020 Habitat Assessment. The Interim Guidance also highlights the fact that the northern long-eared bat continues to occur in small pockets distributed throughout its historic range, and that these populations remain “vulnerable to impacts from other stressors, such as forest habitat modification”. The Interim Guideline further highlights the value and sensitivity of northern long-eared bats to forested wetland habitat.

2023 Information for Planning and Consultation (IPaC) System

The U.S. Fish & Wildlife Service states that the Information for Planning and Consultation (IPaC) system replaces the 4(d) Rule determination system to allow project proponents to comply with the new species status and “receive automatic verification or concurrence for some actions” (USFWS, 2023). This is the “Determination Key” (Option 3) identified by the 2023 Voluntary Guidelines. Specifically, any potential project applicant can receive a determination of no likely impact by entering site-specific information into the IPaC system. If the project site has the potential to contain endangered species, it will identify these species as well. Creating a polygon around the proposed Project Site revealed that the northern long-eared bat is “potentially

affected by activities in this location”. There is no evidence that such an effort was made by the Applicant as part of this Habitat Assessment.

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DALTON MASTER PLAN 2023

Vision and Goals for the Future of the Community



Adopted by Dalton
Planning Board 3/8/2023

... a small New England town
in the Great Northern Woods
of New Hampshire





i photo credits: Dalton Community Facebook Page, Town Website

A Vision for the Future

Dalton should remain an outstanding and desirable place to live, where the old country values and rural character of the town are preserved and enhanced, while allowing for thoughtful influx of businesses to the area. The town center is a center of civic and community life, with community gatherings and events for residents of all ages and visitors exploring Dalton's rich and robust outdoor recreation assets. Cottage industries continue to support Dalton residents and families and tourism has growth as an industry that capitalizes on Dalton's natural resources and beauty. Local regulations are simple and targeted at the most common concerns of Dalton's residents without detracting from each person's enjoyment of their property or adding significant burdens for enforcement. Dalton's rural character has been preserved, but better opportunities for seniors to age within the community have been identified as a priority, as well as ensuring greater affordability and access to housing for young adults and families. Residents come together to participate in and volunteer for community efforts and management and pride in the community continues to grow.

Goals

The goals listed below relate to the topics in this Master Plan. For more details, and the actions and policies which support them, explore each chapter of the plan and the implementation approach. They were developed input from people as the base, what data tells us, discussion of the Planning Board, and best practices.

Community Connection Goals

CC Goal 1	Provide robust opportunities for the community to come together and celebrate Dalton.
CC Goal 2	Improve the vibrancy and use of the town center as a gathering space for the community.
CC Goal 3	Increase civic connection, transparency, and relationships.

Land Use Goals

LU Goal 1	Ensure orderly development of land within Dalton.
LU Goal 2	Improve affordability, tie new residential development with land preservation.
LU Goal 3	Have sound regulations that promote health and diversity in Dalton.

Natural Resource Goals

NR Goal 1	Increase land protection, preservation and stewardship in the community.
NR Goal 2	Protect natural resources from inappropriate or hazardous development pressures.
NR Goal 3	Expand network of outdoor recreation assets and use of them.

Economic Development Goals

ED Goal 1	Support Dalton's tradition of cottage and home-based industries as the core of business activity in the rural dispersed community.
ED Goal 2	Improve access to high-speed internet within Dalton as a tool to increase markets for cottage industries, improve access to basic needs, education, training, health care, and social connection in the digital age.
ED Goal 3	Encourage business creation and growth unique to Dalton's unique resources and aspirations of its residents, such as agriculture, outdoor recreation businesses, restaurants and retail.

Transportation Goals

T Goal 1	Have a clearly marked, safe and well-connected network for on- and off-road bicycle and walking that allows residents and visitors to explore the varied terrain, views and landscapes in town.
T Goal 2	Promote ride-sharing as a tool to aid neighbors and reduce environmental impact. Residents commuting to work and seniors or those with mobility challenges will benefit from ride-sharing.
T Goal 3	Improve and strengthen the network of local roads by better understanding and planning for the costs of roadway maintenance and betterment projects.
T Goal 4	Improve and strengthen Dalton's transportation network of state numbered routes through regional and statewide engagement.
T Goal 5	Visually improve "gateways" into Dalton along major routes.

Land Use

Introduction

The Master Plan can have a direct impact on the use of natural resources and environmentally sensitive areas and on the general character of the community. Additionally, it can affect roads and transportation, affordable housing in keeping with community standards, and include provisions for elderly or needy members of the community. The tax base, quality and cost of essential services such as schools, fire and police protection, and road maintenance can also be affected.

Change is the natural evolution that occurs over time in any community. In the past, shifts within the attitudes and expectations of the residents of Dalton influenced the rate and type of change observed. Today, the cost or value of land has been most influential in relation to Dalton's development pattern. While historically land was valued for its productive value as forest, currently the demand for affordable building sites is the driving development pressures through sub-division of land. Dalton's relatively low and stable tax rates, coupled with limited regulation of development may fuel land speculation at little risk to investors. The rate of change and increased development observed may begin to threaten the rural character of the community. The thoughtful governance of how land will be used is critical to a successful future for the Town of Dalton.

This Land Use section of the Master Plan evaluates the existing uses of land within the community today and considers the uses of land most suitable for Dalton moving forward based upon the opinions of residents and property owners put forward in the 2021 Master Plan outreach and engagement process.

As development pressures continue to grow in Dalton, the community will need to explore additional land use regulation. Locally, land use in Dalton is regulated through Subdivision Regulations adopted in 1984 with revisions through 2013 and enforced by the Planning Board. However, not all land is equally suitable for development due to natural factors such as slope, soil make-up, ground and surface water, and increases in development come along with greater opportunities for conflict between incompatible land uses. Dalton must understand and take all of these factors into consideration when planning for the future.

Land Use Goals, Policies & Actions

The table below lists goals (*aspirations*), actions (*tasks to accomplish*), and policies (*guiding principles*) related to land use and the municipality. For more detailed Actions check out the Implementation chapter.

Land Use Goal 1: Ensure orderly development of land within Dalton.

LU Action 1.1	Dalton will identify a strategy for the protection of land. Such a strategy would identify priority areas for protection based upon ecological value, access for public recreation, and eligibility for grant opportunities and other funding vehicles.
LU Action 1.2	Utilize a capital improvement planning process to identify needed investments in municipal assets such as town hall, road, fire and EMS, and transfer station needs.

LU Policy 1.1	Ensure that land regulations in Dalton provide reasonable and realistic opportunities for the development of workforce housing.
LU Policy 1.2	Support cottage business development as well as business or mixed-use growth along Routes 142 and 135.
LU Policy 1.3	Creation and tracking of outcomes and trends related to implementation of this plan will improve accountability and measure effectiveness of Master Plan efforts.

Land Use Goal 2: Improve affordability, tie new residential development with land protection.

LU Action 2.1	Audit the Dalton subdivision regulation to identify barriers to cost-efficient subdivisions and explore ways to encourage development sited with consideration of natural resources like conservation or cluster subdivisions.
LU Action 2.2	Audit the Dalton subdivision regulations to see if lot sizes and frontage requirements could be reduced, or road construction standards adjusted to reduce costs.
LU Policy 2.1	Encourage housing that meets the economic needs of Dalton’s workforce to preserve economic diversity and meet the requirements of NH’s workforce housing statute (RSA 674:58-61).

Land Use Goal 3: Have sound regulations that promote health and diversity of development in Dalton.

LU Policy 3.1	Dalton will continually evaluate the interests of its citizens and the impact of existing regulations on development of private property. Regulations will be supported by the community and reflect a history of property owner autonomy.
LU Policy 3.2	Dalton will educate property owners and residents on the role and purpose of Master Planning and land use regulation in order to promote informed decision making by the community.

Current Land Use

Residential. Dalton’s land use pattern is predominately residential. Due to the lack of water and wastewater infrastructure, residences have been primarily single-family homes scattered throughout the town. The Subdivision Regulations of Dalton require 2 acres of land for each parcel of land subdivided. These regulations also provide for minimum side (20 ft), front (50 ft), and rear (30 ft) setbacks between property lines and structures. The lot size minimums used align with the community’s desire to remain a principally low-density residential community. As of the 2020 census, there were 548 dwelling units in Dalton, increased from 508 in 2010. Of those dwelling units 128 are vacant and 420 are occupied. In NH vacant structures are most often seasonal, vacation, or occasional use homes, not abandoned.

Community Center. The town center contains the town hall; the municipal building where basic administrative offices are maintained including a library, the fire station, and a church. Police services are contracted by the state police. While these services are located in a centralized location, Dalton stakeholders feel there is opportunity to improve the function of this area of town. A classic town center with government, retail commercial and multi-unit dwellings, and the town common does not exist today;

however as time continues such a center, if developed, should be located around the historic town center. Opportunities exist to strengthen the town center through increased community and civic events as well as through mixed-use development including some smaller lot or multi-family housing development.

Commercial and Industrial. The vast majority of business operations in town operate from individual homes and are discussed here as cottage industries. As of 2020, there are 52 registered businesses in Dalton. Existing small businesses are sometimes viewed as a mixed blessing. The lack of land use regulations and enforceable standards to limit the impact of such businesses upon abutting residences causes conflicts between neighboring property owners. The town should consider the establishment of specified commercial, industrial, or mixed-use areas of town to control the possible impacts associated with accumulations of industrial or commercial equipment and their uses. Dalton may consider the establishment of property maintenance standards, applicable to all land uses, to mitigate the impact if such is needed. At the present time there are no limitations on business activity or where such uses can be located. This lack of separation has opened up conflict where heavy land uses associated with commercial or industrial use are not buffered from existing residential uses. This a natural outgrowth of how Dalton has evolved with limited regulation and a healthy number of home occupations and small businesses.

Recreational and Tourism. Dalton, by virtue of its location in the White Mountains and its close proximity to I-93, has become increasingly accessible to people who are seeking recreational opportunities in the woods, streams, ponds, and mountains of the area. Forest Lake not only has a growing number of year-round residents but is a prime summer camp location for both residents local to the area and visitors alike. Development has extended to formerly remote and sometimes inaccessible areas near the lake. This is making it more difficult to establish and enforce reasonable and sustainable building development controls and guidelines. New development can create an increasing burden on infrastructure and services alongside an increase in the community's tax base. At the same time tourism along the Connecticut and Johns Rivers, while a real potential, has yet to be developed as a resource for the town in terms of attracting tourism business. Future unfettered development in this remote, rustic, and rural area may attract the tourists seeking outdoor activities but may also threaten the rural nature of Dalton without limitation.

Forestry and Agricultural. As a part of the economy of Dalton farming has been on the same steady decline as it is everywhere in the New England area. Prime farmland soils are located along riverbeds and scattered throughout the steep terrain typical of Dalton. By its nature, because of the ruggedness of most of the land in Dalton, the farming value of the land has always been at best marginal with the possible exception of river bottom locations. At the present time there are very few actual functioning farms in Dalton and as such they have very little impact on resources, nor do they contribute significantly to the economy however the continuation of these historic land uses is of great value and importance to the community moving forward. Forestry is a viable and important activity in Dalton. Forests are the town's most abundant resource covering approximately 80% of the land. They consist of both softwood and hardwood species which are valuable to the wood products industry. Where the land is steeply sloped it is generally unsuited for most commercial or industrial uses. There are former pasture areas, once cleared for farming, which have returned or are in the process of returning to forest. This represents a potential economic resource for Dalton.

Public Lands. Dalton’s public lands consist of Forest Lake State Park, a recreational field on Route 135, and the lands upon which municipal buildings are located. Future considerations might include the purchase of lands or easements for land protection purposes. Respondents to the 2021 Master Plan survey indicated a desire for increased land conservation along the Route 135 and Route 142 corridors in town. 55% of respondents sought increased conservation on Routes 135 whereas 48% were interested in more conservation along Route 142.

Natural Resources

Introduction

The residents of Dalton pride themselves upon the rural character of the town's landscape, offering scenic beauty in abundance. Dalton's natural resources support the community's rural character, recreational opportunities, quality of life of people, wildlife, and water supply. The environment created by Dalton's system of natural resources serves both residents and visitors. The type and distribution of the town's natural resources also influences the location and type of development that takes place within the community. Some areas are of a higher priority for land protection than development due to the natural resources present. Some natural resources such as wetlands and floodplains make land unsuitable for development.

In the 2021 Master Plan survey, responses made it clear that residents are deeply interested in the continued preservation of natural spaces and the challenges posed by proposed development plans and climate change. Residents are particularly concerned about forested areas, water resources including groundwater aquifer, wildlife habitats, and the Forest Lake State Park area.

Understanding natural resource values provides a rational basis for determining which areas of Dalton are more appropriate for protection and open space, and which areas are more suitable for development, therefore Dalton's natural resources are a critical consideration in establishing a proper approach for land planning and management. Using the current existing natural resource conditions, planning can be undertaken to ensure that Dalton's land is utilized to conserve and protect natural resources, develop where appropriate, and insure reasonable and practical regulations and strategies are implemented to reflect the desires of the community for future growth.

Dalton may consider the concept of smart growth which is "an approach to achieving communities that are socially, economically, and environmentally sustainable". Sustainability means that resources are utilized in a manner that neither depletes nor permanently damages them. Dalton should strive to implement smart principles and sustainability approaches when considering their Master Plan and Natural Resource goals.

The information in this chapter will assist Dalton in determining compatible future uses for certain land areas and how to engage the community in the preservation of these valued attributes.

Natural Resources Goals

The table below lists goals (*aspirations*), actions (*task to accomplish*), and policies (*guiding principles*) related to land use and the municipality. For more detailed Actions check out the Implementation chapter.

Natural Resources Goal 1: Increase land protection, preservation, and stewardship in the community

NR Action 1.1	Dalton will identify a strategy for the protection of land. Such a strategy would identify priority areas for protection based upon ecological value, access for public recreation, and eligibility for grant opportunities and other funding vehicles.
NR Action 1.2	Continue to complete periodic natural resource inventories (NRIs) to inform land protection efforts and ensure transparency of local priority setting.
NR Policy 1.1	Improved access and understanding of Dalton's rich natural resources and what property owners and residents can do to be stewards.

Natural Resource Goal 2: Protect natural resources from inappropriate or hazardous development pressures.

NR Action 2.1	Explore ways to promote natural resource protection through the subdivision review process by considering steep slopes, wildlife habitat areas, and reducing impervious surface areas associated with new road construction standards.
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Natural Resources Goal 3: Expand network of outdoor recreation assets and use of them

NR Action 3.1	Use the town website and visible public posting locations to show maps of Dalton's recreational assets.
NR Action 3.2	Encourage the reinstatement of community events at parks and recreation areas to celebrate these resources and build sense of community.
NR Policy 3.1	Awareness and increased use of Dalton's recreation assets including trails, paths, common walking loops, parks, swimming, and river access points should be expanded.

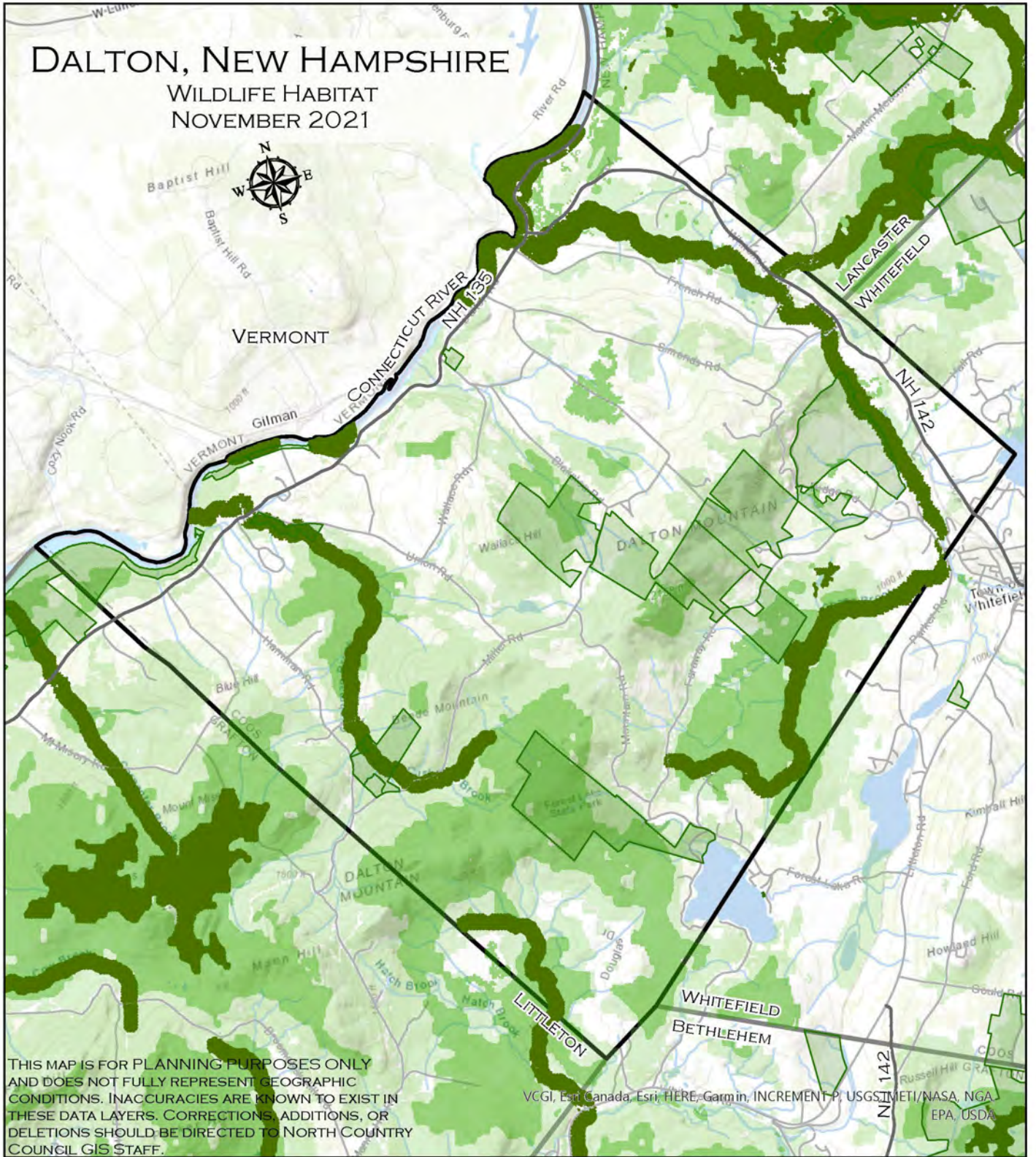
Existing Conditions

Inventories & Maps. Dalton's abundant natural resources are located across a mix of state, local, and privately owned property. These areas include scenic vistas, Forest Lake State Park, Chase Bog, as well as stream and river corridors as resources that contribute to economic and recreational vitality of Dalton. In 2005, Dalton's Conservation Commission developed a [natural resources inventory](#), which is currently being updated in 2023. Included in this Natural Resources section of the Master Plan are a series of maps that display Dalton's natural resources landscape including:

- Recreation Assets
- Wildlife Habitat Area
- Water Resources and Flood Information
- Forest Areas
- Farm Soils
- Steep Slopes

DALTON, NEW HAMPSHIRE

WILDLIFE HABITAT
NOVEMBER 2021



WILDLIFE ACTION PLAN

- TIER 1
- TIER 2
- TIER 3

- DALTON TOWN BOUNDARY
- NEIGHBORING TOWNS
- CONSERVED LAND
- ROADS
- STREAMS
- WATER BODIES

0 0.5 1 2
MILES

TIER 1: HABITATS OF HIGHEST RELATIVE RANK BY ECOLOGICAL CONDITION IN NH

TIER 2: HABITATS OF HIGHEST RELATIVE RANK BY ECOLOGICAL CONDITION IN BIOLOGICAL REGION

TIER 3: SUPPORTING LANDSCAPES

Local Capacity & Capabilities. The Town has natural resource land protection and preservation assets to put to work at local, state, and federal levels. Locally, conservation-minded landowners and a municipal Conservation Commission can pursue public and private land protection projects. The recognized Friends of Forest Lake group provides a local connection to State owned conservation and recreational waters and forests near the State Park.

David Dana Forest. This conserved forest block is mostly spruce-fir and managed for timber products by The NH Forest Society. Several fields are mowed annually to maintain them as grassy openings for wildlife habitat. There are several trails available to public use, limited to foot traffic only. For more trail information, visit [TrailFinder](#) or [The NH Forest Society](#). A unique feature of the Forest is the old gold mine that was operated by the Whitefield Mining Company until 1885. The mine is an excavated cliff face. According to historic records, a very limited amount of commercial gold was removed from the site before it was determined to be uneconomical and closed.

Additionally, the Forest trails allows access to the Johns River and fishing holes. River access is via an old railroad bed that runs to the north off of the town roadway just east of the spot on Ridge Rd where the Dana Forest entrance is marked by a Forest Society sign.

David Dana donated the land in Dalton to the Forest Society. The land was once proposed for a 23-lot subdivision. The land offers diverse habitat, a half mile of frontage along the Johns River, productive timberland, and nearly two (2) miles of recreational trails.

Forest Lake State Park. This was one of the ten original state parks established in 1935 with the aid of Civil Works Administration and the Civilian Conservation Corps under President Franklin Roosevelt's administration. The park includes 397 acres and a 200-foot sandy beach that lies along the shore of Forest Lake and a public boat launch off Newell Road. Popular activities include swimming, picnicking, mountain biking, fishing, and boating.

There are local efforts to develop recreational trails throughout the state park parcel, but these efforts require local support, volunteers, and connections to trail builders to ensure trails are established equitably for both recreation users, land protection, and preservation of the natural resources.

Input & Analysis

Survey Responses. When asked during the 2021 Master Plan survey, 81% of respondents stated they chose to live or run their business in Dalton because of its rural character and 68% of respondents indicated their preference for close proximity to natural areas and water bodies.

When asked to share their biggest hope for the future of Dalton there was a strong theme to keep the rural character and open lands unchanged (24%) as well as protect and conserve the environment (18%)

When asked to share their biggest concern for the future of Dalton the primary concern was development of a landfill (32%). There was also a moderate theme of concern for the protection and prevention of degradation of natural resources as well as concerns of pollution mitigation (both had 7% response rate).

55% of respondents would prefer to see more conservation or protection of the land along the Rt 135 corridor (Dalton Rd connecting to Littleton and Lancaster).

48% of respondents would prefer to see more conservation or protection of the land along the Rt 142 corridor (Whitefield Rd connecting Dalton to Whitefield).

Areas of focus for preservation centered around Forest Lake (13) and Dalton Mountain (4) areas.

60% of survey respondents indicated a desire to see more development of outdoor recreation businesses.

Trends. Two major trends could be pulled from the survey responses regarding Dalton's greatest natural resource challenges and or needs:

1. A need for increased or continued preservation of natural spaces including forested areas, water resources, wetlands, wildlife habitats and the Forest Lake State Park area.
2. Concerns regarding the potential impacts from a proposed landfill, increased development, climate change, loss of property owner control, and lack of land use regulations.

Conservation Commission. Member of the Dalton Conservation Commission provided input on this chapter of the Master Plan. The Conservation Commission identified the following aspirations.

- More people to help with town clean-up.
- Conduct more Bioblitzes (A bioblitz is a targeted assessment of a particular piece of land, or ecosystem to identify as many plant and animal species present as possible. Events are done in a quick timeline with a group of participants.)
- Find ways to rejuvenate and expand community events at Forest Lake Stake Park (beach and forest areas)
- Consider outreach to property owners located in prime natural resources areas with information about the resource, its importance, and any land owner considerations to be a steward of the resources. (i.e. wetlands, shorelands, prime aquifers, etc.)
- Consider identifying historical sites within the Natural Resources Inventory and then explore ways to highlight and celebrate those resources such as sites along the CT river, or those along scenic by-ways or other roads in town.

The Opportunities discussed below have been identified as tools to assist the community and Conservation Commission.

Opportunities

This section discusses two (2) different types of opportunities for the community to achieve land protection goals. The tools presented are based upon discussion with the Dalton Conservation Commission and include:

- Land Protection, Recreation and Natural Resource Funding Opportunities
- Encouraging Stewardship and Participation at the Municipal Level

When asked to share opinions on Dalton's greatest natural resource challenge and/or needs response trends centered around:

- A need for increased or continued preservation of natural spaces, including forested areas, water resources, wetlands, wildlife habitats and the Forest Lake State Park area
- The challenges of the proposed landfill, increased business development, climate change, loss of property owner control, and lack of zoning

When asked to share opinions on Dalton's greatest economic development (or business) challenge or need response trends centered around:

- A need to increase the tax base for the community in order to stabilize taxes and reduce residential tax burdens
- A need to increase opportunities for businesses Dalton. Primarily focused around small businesses with limited impacts to the area. Environmental, recreational, and tourism based businesses were highlighted, as well as business that provide employment for Dalton residents
- A few respondents called out the lack of high-speed internet as a challenge

When asked to share opinions on Dalton's greatest transportation challenge or need response trends centered around:

- Road maintenance needs, particularly those of dirt roads were identified as well as areas for improvement along route 135 & 142
- A need for increased public transportation, and transportation services to meet the needs of aging seniors
- Some minor trends around increased bicycle and pedestrian conditions, improved enforcement of traffic laws, and impacts of truck traffic (both current and potentially increased in the future)

When asked about expanded or new social, or community services response trends centered around:

- More services or activities for seniors
- More services and activities for children & families
- Increased volunteerism
- Use of town center for community events
- Improved/maintained trails
- Police
- *(a trend also emerged around no new or expanded services)*

When asked to identify any specific issues in neighboring town which are of importance to Dalton response trends centered around:

- Communities with which water resources are shared, including those upstream and downstream along rivers were identified. The development there impacts things in **Dalton and Dalton's development impacts the waters downstream as well.**
- Increased development in Littleton, Whitefield, and Lancaster were identified as **impacting Dalton's affordability, and future community** development in Gilman and Whitefield was called out as another impact to Dalton.
- The impact of recreation and trails based development in the area was identified as a topic which could impact Dalton.
- The town of Bethlehem and its operational landfill were identified as impactful and an opportunity to coordinate and learn from neighbors. Additionally, a potential future landfill in town was identified as a way in which Dalton may impact its neighboring communities.

TOWN OF DALTON, NEW HAMPSHIRE

NATURAL RESOURCES INVENTORY

August 2023



Report Prepared by:

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SUMMARY AND HOW TO USE THIS REPORT

Land-use planning is instrumental in balancing future growth and development with protection of natural resources. We completed this report to give Dalton data on these resources, so the Town can make informed and balanced decisions about future growth and identify potential areas for conservation. By identifying and describing natural resources town-wide, this natural resource inventory (NRI) provides Dalton with a foundation for proactive planning, rather than the all-too-common reactive approach.

The Town of Dalton is committed to protecting and sustaining its quality of diverse natural resources. We completed a town-wide natural resource inventory using a combination of field work, mapping using GIS software, and assembling existing data. This project compiled natural resource data into a digital database in GIS format and produced a written report for use in the Town of Dalton. The data from this project is compatible for integration with the existing Town GIS. Efforts from this project will aid in future work and inventories, as well as provide tools to guide future development decisions in Dalton.

Based on results from this study, Elise Lawson of Watershed to Wildlife and the Dalton Conservation Commission offer the following additional recommendations:

1. **Surface Water Protection – 74.1 miles of streams/rivers – 164.1 acres of open water** - Many of Dalton’s residents obtain drinking water from personal drilled or dug wells. Maintaining good water quality is one of the highest priorities for the Dalton Conservation Commission. Currently, the water quality in these streams, rivers, and lakes is in very good to excellent condition. Water quality should continue to be addressed not only in Forest and Mirror Lakes and the Connecticut and Johns Rivers, but also in smaller rivers, streams, and headwater brooks that feed these waterbodies.
2. **Aquifer Protection – 5,030.17 acres – 27.8% of town** - Based on locations of the underlying aquifers in Dalton, it is important to protect the quality of groundwater, brooks, streams, and aquifers in Town. Future water supplies are a very valuable natural resource for Dalton and the abutting municipalities - proven by the drinking water systems already in use.
3. **Forest lands – 81.5% forested**
 - a. **Dense Softwood Protection- 1,850.09 acres – 10.2% of Town** - Although many of the dense softwood stands are scattered and small, there are a few areas that contain adequate acreage of dense softwood for deer wintering areas throughout town. All dense softwood stands are beneficial to many wildlife species for cover particularly in the winter. Areas where dense softwoods are along wetlands, rivers, and streams are often used as wildlife travel corridors.
 - a. **Carbon Sequestration** – Given the number of larger properties in town, there are potential opportunities to generate income from Carbon offset programs. Funds can be used to purchase forested land for conservation. Sustainable forestry and

recreation are important components of this program. Funds can also be used to help private landowners put forested properties into conservation easements.

4. **Wetland Conservation** – **2,828.47 acres wetlands – 15.6% of Town** - The Dalton Conservation Commission recognizes the importance of wetland protection to maintain good water quality and wildlife habitat. In 2006 the DCC completed a town-wide wetlands study (*Functional Assessment of Wetlands throughout Dalton, NH*, September 2006). It is hoped that the Town will continue to pursue ways to further conserve the functionality and diversity of these wetlands. An update of past wetland studies would help Dalton work with willing landowners to conserve some of these valuable wetland resources.
5. **Land Conservation** – **2,065.04 acres of conserved land or easements – 11.4%** - Dalton's conservation lands include State Parks, Hydro-electric company easements, and conservation easements held by private landowners. The Conservation Commission should consider partnering with land conservation organizations to establish a Town Forest. This report prioritizes additional areas to consider for land conservation.
6. **Hillside and Viewshed Protection** - Dalton's hilly topography is directly related to the Town's tourism industry, scenic beauty, and diversity of natural resources: from the tops of hills to the beaver ponds, streams, and floodplain river habitat at the bottom of the slopes. Research and considerations should be made towards evaluating and possibly updating the zoning ordinance in Dalton to conserve viewsheds as an important feature and tourist attraction to the area, while continuing to consider landowner rights.
7. **Cooperation** - It is recommended that Dalton continue to work with neighboring municipalities, organizations, schools, and State and Federal agencies throughout the region to share future data as it becomes available. This will avoid an all-too-common problem of separate entities replicating work. Natural resource features do not end at town boundaries. A watershed approach to conserving them is recommended. Many surrounding towns have completed Natural Resource Inventories (including Lancaster and Whitefield most recently), and all the data between the towns and Dalton have compatible GIS formats.

Long-term uses of this project could include, but are not limited to:

- Assist in determining "least-impact" sites for future development
- Include in future Master Plan updates
- Promote protection plans for water quality, wetlands, and aquifers
- Locate ideal locations for telecommunication towers or wind farms while conserving scenic resources
- Continue to identify land for purchase or conservation easements for long term conservation of sensitive and diverse ecological areas

INTRODUCTION, HISTORY, AND OBJECTIVES

The Town of Dalton, New Hampshire is rural and mostly forested containing 28.3 square miles or 18,104.4 acres, with 164.08 acres of ponds and open water. The Town's geography is quite diverse, ranging from flat floodplain areas along the Connecticut and Johns Rivers to rugged mountainous areas including steep slopes to the tops of the Dalton Mountain Range which runs SW and NE across town. Out of 18,104 acres of land, approximately 2,065.04 acres are conserved lands – 11.4%. Over 81% of Dalton is forested.

The land within the Town of Dalton has a long and rich history based on natural resources, dating back to use by Native Americans living in the region. Dalton was incorporated in 1784 after being part of a territory called Chiswick, which originally included Lisbon, Littleton and Dalton. Some of the first settlers in Dalton found that the land was favorable for sheep farming. Timber harvest or “lumbering” was also a large part of the economy along with several lumber, brick and grist mills along rivers and streams.

The latest Master Plan for Dalton was completed in March 2023. According to this latest Master Plan, the vision for the future of Dalton is that “Dalton should remain an outstanding and desirable place to live, where the old country values and rural character of the town are preserved and enhanced” (Town of Dalton, 2023). Land use (LU) and natural resource (NR) goals include the following:

- LU Goal 1: Ensure orderly development of land within Dalton.
- LU Goal 2: Improve affordability, tie new residential development with land preservation.
- LU Goal 3: Have sound regulations that promote health and diversity in Dalton.
- NR Goal 1: Increase land protection, preservation, and stewardship in the community.
- NR Goal 2: Protect natural resources from inappropriate or hazardous development pressures.
- NR Goal 3: Expand network of outdoor recreation assets and use of them.

Goals of the Natural Resource Inventory

This project provides a Natural Resource Inventory (NRI) with the addition of data to the existing Dalton GIS database that can integrate with past and future studies. One of the goals of this project is to provide an inventory, management recommendations, and further planning tools for the Town of Dalton. This report can be used as an educational and planning tool. It contains a written report with maps, as well as an extensive GIS database that can be overlaid existing maps in the Town's database. It promotes conservation of water, forested land, riparian habitat, wetlands, and unique co-existing natural resource features throughout the Town.

Measurable objectives of this project include the following:

1. Provide the Town of Dalton with updated, standardized coverages that can be integrated into the existing GIS database.

2. Create a document that can be incorporated into the latest (2023) Dalton Master Plan.
3. Identify areas for future conservation efforts, focusing on areas of contiguous open space, wildlife corridors, and sensitive ecological areas.
4. Maintain inventories of natural and scenic resources, including wetlands, open water, steep slopes, and hilltops.
5. Increase awareness of the values of the characteristics of Dalton including forest and water resources, scenic view areas, recreation areas, riparian buffer habitat, and wetlands with associated wildlife habitat through public presentations and discussion.
6. Provide the Town with the ability to continue to build upon and update the natural resources digital database.



METHODOLOGY

Nancy Comeau and Jon Swan, members of the Dalton Conservation Commission, were the main contacts for consultant Elise Lawson of Watershed to Wildlife. Elise has worked as a natural resource consultant for 25 years. This town-wide Natural Resource Inventory uses a combination of existing mapping data, previous work, and current field work to produce an overall base NRI for Dalton, NH.

Field Work

Elise completed 3½ days of field work for this study (October 6, 2022, May 9, 11, 25, 2023). The Dalton Conservation Commission reached out to landowners for permission to walk on their properties for this NRI. We respect the rights of landowners, and we did not trespass on private property unless granted permission. Field work was conducted to get an overall view of Dalton with a focus on previously identified targeted areas. This work included inventories and assessments of several wetland complexes, beaver ponds, riparian habitats, and upland habitats including higher elevation uplands. In most cases Class VI roads and



This flat wetland area is associated with Chase Bog Brook. It contains very poorly drained soil called Bucksport Muck and Peacham very poorly drained soils. Pillsbury and Lyme poorly drained soils are in adjacent the forested wetlands. These hydric soils are common in northern New Hampshire. Photo taken 5-25-2023.

Vernal Pools – During this NRI and a previous vernal pool study, 8 vernal pools were documented in Dalton. An additional 5 vernal pools were documented on private property as part of a wetland permit application and there are likely many more in Town. ***We recommend continuing to document and record vernal pools throughout town to build upon the database.*** Vernal pools are unique, often isolated and important wetland types. Vernal pools provide essential breeding habitat for certain amphibians and invertebrates such as wood frogs (*Rana sylvatica*), spring peepers (*Pseudacris crucifer*), yellow spotted salamanders (*Ambystoma maculatum*), blue spotted salamanders (*Ambystoma laterale*), and fairy shrimp (*Branchinecta lynchi*). These creatures depend on vernal pools as breeding sites because they are only temporary water bodies preventing fish and other aquatic predators from taking up residency. Reptiles such as painted turtles (*Chrysemys picta*) also rely on vernal pools as important feeding areas in early spring. Vernal pools fill annually from precipitation, runoff, and rising groundwater in the fall and spring. By mid-summer, however, these wetlands are typically dry, making them a dynamic system inhabitable to many species except for specifically adapted plant and wildlife species. For this reason, many unique, rare, threatened, and endangered species are linked to this wetland type. The State of New Hampshire (Fish and Game Department and Wetlands Bureau) recognizes their value as important habitat and give them special attention. Refer to Map #4 – *Wetlands and Water Resources* - at the end of the report

Natural Resource Inventory for Dalton, NH

for locations of known vernal pools throughout Dalton. A description of vernal pools documented during this study is shown in the table below.

Vernal Pool Number	Location/ Description	Probable or Confirmed	Documentation Date
VP01	Near Johns River and CT River confluence	Confirmed during region-wide vernal pool study – presence of fairy shrimp	2004
VP02	Near Johns River and CT River confluence	Confirmed during region-wide vernal pool study	2004
VP03	In ag field in northeastern Dalton	Confirmed during region-wide vernal pool study	2004
VP04	Near French and Whitefield Roads, and Johns River	Confirmed – wood frog tadpoles and yellow spotted salamander egg masses	5-9-2023
VP05	Forest Lake State Park	Confirmed – wood frog tadpoles and yellow spotted salamander egg masses	5-9-2023
VP06	Forest Lake State Park near the road	Confirmed – wood frog tadpoles and yellow spotted salamander egg masses	5-9-2023
VP07	Near Faraway Road	Confirmed – wood frog tadpoles, yellow spotted salamander egg masses, and blue spotted salamander egg masses	5-9-2023 - has been monitored for many years.
VP08	Near Faraway Road	Confirmed – wood frog tadpoles and yellow spotted salamander egg masses	5-9-2023 - has been monitored for many years.
VP09	West of Forest Lake Within 100 feet of VP10	Confirmed – Spotted salamander egg masses	2019 and 2020 Documented by Horizons Engineering for Wetland Permit Application
VP10	West of Forest Lake Within 100 feet of VP09	Confirmed – wood frog and spotted salamander egg masses	2019 and 2020 Documented by Horizons Engineering for Wetland Permit Application

Natural Resource Inventory for Dalton, NH

Vernal Pool Number	Location/Description	Probable or Confirmed	Documentation Date
VP11	West of Forest Lake	Confirmed – wood frog and spotted salamander egg masses	2019 and 2020 Documented by Horizons Engineering for Wetland Permit Application
VP12	West of Forest Lake Connected to VP13 by forested wetland	Confirmed – wood frog egg masses	2019 and 2020 Documented by Horizons Engineering for Wetland Permit Application
VP13	West of Forest Lake Connected to VP 12 by forested wetland	Confirmed – Wood frog and spotted salamander egg masses	2019 and 2020 Documented by Horizons Engineering for Wetland Permit Application



An active vernal pool with abundant salamander (yellow spotted and blue spotted) egg masses and wood frog tadpoles in a hemlock forest. The pool is approximately 200 x 75 feet and well buffered all around. Photo taken 5-9-2023.

All perennial streams in Dalton not only have a variety of upland forest types, but they also have several wetland types associated with them. Beaver activities along streams are dynamic and ongoing. Beaver enhance the diversity of wildlife habitat and make these rivers and streams some of the most diverse river/wetland complex systems throughout town. The Johns River and Chase Bog Brook are two high value areas ecologically, in part thanks to the presence of beaver. There are many unnamed headwaters streams located throughout Dalton with diverse habitat and excellent vegetative buffers. These areas provide high value plant and wildlife habitat and connectivity to forests, wetlands, and other habitat types.

The Connecticut River is the largest river in Dalton, and the most vulnerable to runoff, erosion, and pollution because it flows right through several towns in New Hampshire and Vermont. Wherever possible:

- ***minimize impervious surfaces adjacent to the river***
- ***maintain and enhance native vegetative buffers***
- ***continue to test the water quality throughout the year***

Table1: List of named Rivers and Streams in Dalton

River/Stream	Length in Dalton (miles)	Direction of flow	Watershed Area in Dalton (HUC 12)	River Confluences
Connecticut River	7.18	Southwest	Dalton Tributaries Lancaster Tributaries	Atlantic Ocean
Johns River	6.3	North and northwest	Johns River Watershed	Connecticut River
Cushman Brook	4.82	North and northwest	Dalton Tributaries	Connecticut River
Chase Bog Brook	3.78	Northeast	Johns River Watershed	Johns River in Whitefield to Connecticut River in Dalton

Lakes/Ponds – Dalton contains 164.08 acres of lakes, ponds and open water, making up less than 1% of the town area. Forest Lake is the largest lake at 196.22 acres. Of that 106.02 acres are in Dalton and the remaining in Whitefield. Forest Lake is mostly developed around it except for a section along the southern shoreline which contains a 12-acre forested wetland in Whitefield. The water quality of this lake is particularly important as it is not only habitat for wildlife, but also a popular recreation area. Residents and several towns around Forest Lake are concerned with a proposed landfill adjacent to Forest Lake, Alder Brook and the Ammonoosuc River. Recent water quality testing of Forest Lake (including 14 private wells adjacent to the

lake) has shown that the water quality² of Forest Lake is excellent. Many residents are concerned with future water quality levels if a landfill is constructed. See appendix A for the latest water quality reports on Forest Lake.



Forest Lake is the largest body of water in Dalton and is in the southwest corner of town. The lake is also in Whitefield. Water quality, wildlife, and stunning mountainous views are all what make it a popular destination. Photo taken on 5-9-2023 facing southeast towards the White Mountains.

The second largest lake in Dalton is Mirror Lake which is 54.4 acres total. Of that, 9.1 acres are in Dalton, and 45.3 acres are in Whitefield.



Mirror Lake looking towards the portion within Dalton. Like Forest Lake, Mirror Lake is important for recreation, and maintaining excellent water quality should be a priority. Water leaving Mirror Lake enters the Johns River and eventually the Connecticut River. Photo taken 7-27-22 during field work in Whitefield.

² Most recent water testing was for **PFAS** - Per- and poly-fluoroalkyl substances are a group of human-made chemicals (of which there are thousands) known as PFAS. These chemicals were developed in the 1940s to repel water or make a surface slippery. Since then, PFAS have been adapted for many consumer products and are now common drinking water contaminants throughout the United States. More information found [here](#).

There are several smaller unnamed ponds found in Dalton, most of which are dependent on beaver activities. These ponds can be any size from no open water to a several acre pond. The size can vary year to year. There are a few areas of open water, especially along the Johns River and Chase Bog Brook.

All rivers and water bodies offer recreational and wildlife value for Dalton, and the entire region. Swimming, kayaking, canoeing, birdwatching, hiking, skiing, fishing and hunting are all common activities in Dalton. Tourism accounts for a large portion of income for New Hampshire and these waterbodies are significant components.

Maintaining good water quality of these areas is not only important ecologically, but also for valued tourism. Continue monitoring water quality in these lakes, especially with potential land use changes and continued development.



This pond adjacent to route 142, although relatively small, it offers excellent habitat for wildlife. 5-25-23

[Sub-Watersheds \(Map #4 at end of report\)](#)

The ability to view the landscape from a watershed or sub-watershed perspective helps to understand drainages, flows, and associated habitat throughout the Town. Sub-watersheds do not stop at municipal boundaries. All things downstream are affected by land management upstream, particularly in the headwaters. The State of NH breaks down the watershed to the HUC 12 level, and most towns and cities contain more than one subwatershed determined by topography and ridgelines.

Dalton contains portions of 6 sub-watersheds when broken down to the level 12 hydrologic unit code (HUC) listings. The largest subwatershed in Dalton is Dalton Tributaries which cover north and west portions of town at 8,424 acres. It includes Blue Hill, Beede Mountain, Wallace Hill and a portion of Dalton Mountain. The drainage from these hills and ridges flows into the Connecticut River. The Johns River subwatershed is the next largest in Dalton covering 6,926.5 acres and includes both the Chase Bog Brook and Johns River areas and drainages.

All 6 of the subwatersheds in Dalton are part of a larger watershed area called the Upper Connecticut River Watershed. A list of these subwatersheds are shown and described in the following chart and table.

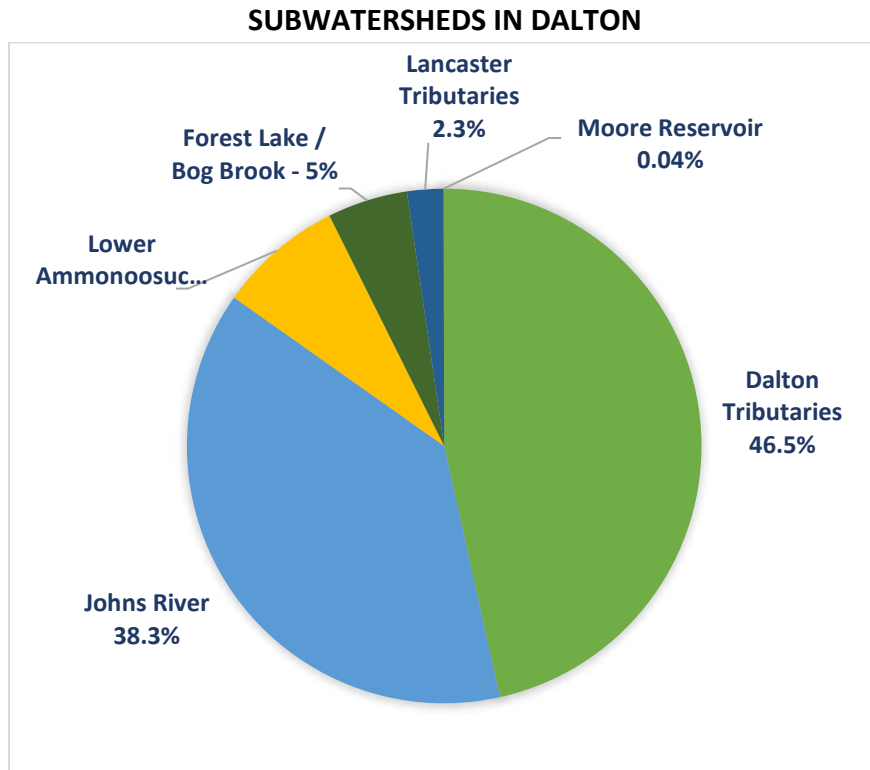


Table 2: List of Sub-watersheds in Dalton, NH

HUC 12 Name - subwatershed	Acres in Dalton	General Location description	HUC 6 Name – larger watershed Area	Acres in Dalton
Dalton Tributaries	8,423.99	Northwestern to central areas	Upper Connecticut River	18,104.42
Johns River	6,926.52	South and eastern areas including the Johns River and Chase Bog Brook		
Lower Ammonoosuc River	1,422.14	Southwest corner of Dalton		
Forest Lake-Bog Brook	911.86	Part of Forest Lake State Park just east of Ammonoosuc River subwatershed		
Lancaster Tributaries	413.52	Northeast corner of Dalton		
Moore Reservoir	6.39	Small area on the west townline with Littleton		

Riparian Zones and Floodplains

A riparian zone or riparian area is the interface between land and a stream or river. Riparian zones are important habitats because of their role in soil conservation, their biodiversity, and the influence they have on aquatic ecosystems. Riparian habitats occur in many forms including grassland, woodland, wetland, floodplains, or a combination of features. They are important travel corridors for many wildlife species. A floodplain is flat or nearly level land adjacent to a stream or river that experiences occasional, seasonal, or periodic flooding. Floodplains are a category of riparian zones and often support rich, diverse ecosystems. Dalton contains a diverse amount of riparian and floodplain areas.

Floodplains are very fertile agricultural areas, especially along larger rivers. The floodplains along the Connecticut River contain fertile areas and have a long history of farming in both Vermont and New Hampshire. There are smaller although equally fertile floodplain areas along some of the smaller rivers and streams including Johns River and Chase Bog Brook. Floods carry nutrient-rich sediment and distribute it across a wide area. Although some portions of Dalton's riparian areas and floodplains have been impacted by development, most areas have not, and there are a few opportunities for maintenance of adjacent riparian habitat and creation of additional buffers.



Large undeveloped riparian habitat along the Johns River in northeastern Dalton. This area contains high value wildlife habitat and diverse plant communities. Photo taken 10-6-2022.



The riparian buffers along the Connecticut River are excellent in this area near the confluence with the Johns River. Photo taken on 10-6-2022.

Floodplains and riparian areas are home to a diversity of wildlife. The rich soils create excellent insect and amphibian breeding habitats, and these species in turn become prey for birds such as woodcock and barred owl, for mammals such as mink and raccoon, and for reptiles such as smooth green snake and wood turtle. These corridors allow wildlife to move from one habitat to another. Intact riparian areas are essential for creating and maintaining a healthy aquatic system. Overhanging vegetation such as shrubs and trees provide important shade to aquatic habitats allowing them to maintain cooler water temperatures and adequate amounts of dissolved oxygen. This is particularly important for trout and other salmonid species. The root systems of the riparian vegetation are also important for reducing the amount of erosion and subsequent sediment accumulation that the constant moving water and flooding situations can cause. Riparian habitats also slow and hold floodwaters reducing shoreline damage and can work as a filtration system removing nutrients and toxins from the water and assisting in maintenance of water quality. Riparian vegetation can also provide habitat structure to aquatic systems through dead or broken limbs and whole trees that fall into the water.

Logging these forested riparian areas is generally not recommended due to proximity to the rivers and wetlands. If timber is harvested in these areas, it should occur during the winter months when the ground is completely frozen.

Conserving or expanding riparian areas and shoreland buffers is a vital part of conserving Dalton natural resources. Adherence to New Hampshire's Shoreland Protection Program will help maintain existing riparian habitat, providing wildlife travel corridors and maintaining good water quality.

Wetlands and Hydric Soils (Maps #3 at end of report)

Wetlands are an essential habitat type for most plant and animal species in New Hampshire. Wetlands are extremely diverse depending on the hydrology, soils, topography, and climate of an area. In addition to the rivers, lakes, and ponds, there are four general types of Palustrine³ wetlands: forested, scrub shrub, emergent (wet meadow), and open water, with additional sub-types within each of these categories. This diversity extends into each individual wetland where a variety of plant/wildlife species and water regimes co-exist. In addition, the edge habitats within and around wetlands are frequently used by many wildlife species. It is estimated that riparian areas and wetlands are used by over 90% of the region's wildlife species and provide preferred habitat for 50% of local species. For these reasons wetlands provide critical wildlife habitat and offer plentiful viewing and hunting opportunities.



A diverse wetland in Dalton. The open area is mostly an emergent wetland with open water. Scrub shrub and forested wetlands are around the edges, followed by upland habitats. There is an unnamed perennial stream flowing through this wetland as well as fresh beaver activity. Photo taken 10-6-2022.

³ Palustrine wetlands are a group of vegetated wetlands traditionally called marshes, swamps, bogs, fens. They also include the small, shallow, permanent or intermittent water bodies often called ponds.



Small perennial stream and associated forested wetland in the David Dana Forest, Dalton, NH. Photo taken on 10-6-2022.



Beaver have a huge impact on wetlands throughout Dalton. Here they have expanded the ponded area of this wetland compared to the 2005 NRI in town. A perennial stream leaving this wetland enters the Johns River near French and Whitefield Roads. Photo taken 5-25-23.

Along with providing important plant, wildlife, and fish habitat, wetlands are also an important protector of water sources. Because they often contain hydrophytic vegetation (plants adapted to living in water and/or wet conditions) and poorly drained soils, wetlands store significant amounts flood and/or run-off water, minimizing serious damage in times of high water. They are important contributors to groundwater recharge. This ability to retain water allows wetlands to act as a filtration source. As moving water is slowed and stored in wetlands, suspended sediments and particles settle to the mucky substrate and plant roots are

given a chance to absorb excess nutrients, toxins, pollutants, and contaminants. These functions make wetlands an important source for maintaining the health of aquatic systems.

Wetland areas are dynamic and constantly changing. The general trend (without severe weather or other outside influences) is for wetlands to slowly fill in over time. The process begins with open water, and over time, submerged plants appear. Floating-leaved plants, such as water lilies, eventually follow. Then emergent plants such as reeds, sedges, and wetland grasses begin to flourish. Shrubs such as high bush cranberry (*Viburnum trilobum*), sweet gale (*Myrica gale*), mountain holly (*Ilex mucronate*), and bog rosemary (*Andromeda glaucophylla*) begin to appear and heaths such as leatherleaf (*Chamaedaphne calyculata*) and labrador tea (*Ledum groenlandicum*) surface among the shrubs. Trees including red maple (*Acer rubrum*), gray birch (*Betula populifolia*), and larch (*Larix laricina*) subsequently emerge. This natural successional process is often referred to as lakefill.

On the other hand, there are several environmental and human-induced reasons for wetlands to increase in size. Some examples of these include:

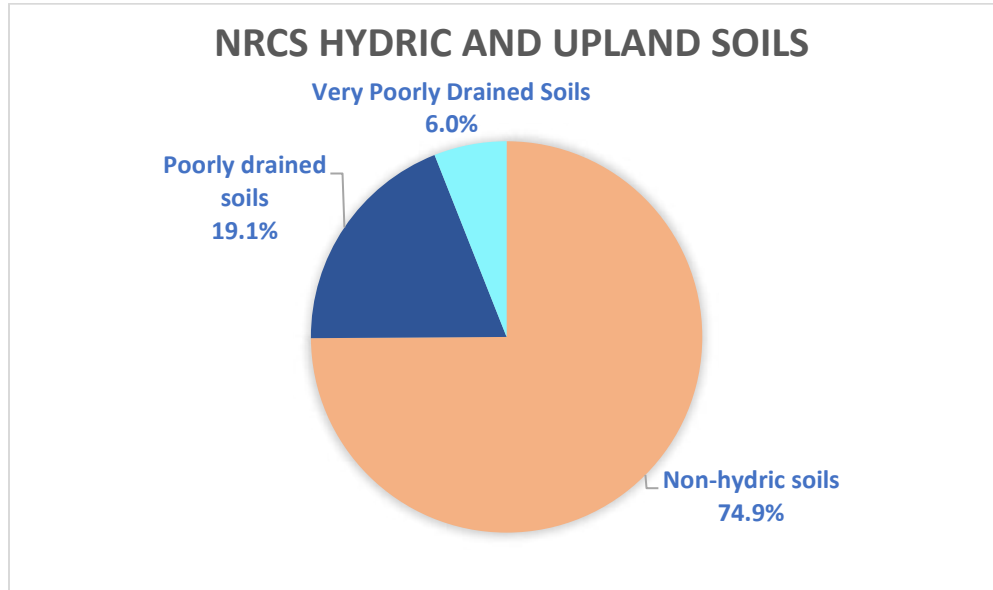
- Human development, including damming or excavation such as the mining of gravel and sand could increase wetland sizes and often create new wetlands
- Severe weather changes – an increase in rain will increase the wetland area, whereas a drought may diminish the area
- The cyclic movements of beaver as hardwood saplings regenerate in early succession. In Dalton there is fresh sign of beaver activities in most of the wetland complexes throughout Town
- Human activities such as logging and landscape alteration can dredge out wetland areas or increase the amount of runoff into wetlands



Left Photo: 2003 aerial photo of a wetland in Dalton. At the time of this photo, there was no open water areas indicating the beaver were not living there and maintaining the dams. The area is predominantly emergent wetland.

Right Photo: 2015 aerial photo of same wetland. The presence or absence of beaver living in this area will dictate the amount of open water. Beaver activities can dramatically change the look and hydrology of wetlands and are impressive engineers.

Dalton contains over 2,828.5 acres of wetlands (15.6% of town). They range in size from less than an acre to several hundred acres and contain a variety of wetland habitats including forested, scrub shrub, emergent, riverine, and open water wetlands. Most wetlands mapped in Dalton have been obtained from the U.S. Fish and Wildlife Service’s National Wetland Inventory. By examining the 2015 aerial photographs, Elise digitized 45 additional wetland areas for this study making up nearly 70 acres. These figures are much higher compared to the last NRI, most likely due to the quality of aerial photography and inclusion of identified forested wetlands.



Of the hydric soils mapped throughout Dalton, 3,455.41 acres are classified as poorly drained and 1,088.38 acres are very poorly drained – with a total of 4,543.79 acres (25.1%) hydric soils throughout Dalton. Poorly drained soils are defined as soils where water is removed from the soil so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. In very poorly drained soils, water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Hydric soils are scattered throughout the Town. There are generally fewer wetlands in the hilly or mountainous parts of Town. On the other hand, along flatter areas like the Johns River, Chase Bog Brook and Cushman Brook, there are more areas with very poorly drained soils. The largest wetland areas are found along the Johns River near where it enters the Connecticut River: at the northeastern corner of Dalton. These series of wetlands contain a combination of forested, scrub shrub, emergent wetlands, open water, and a Lower Perennial stream. Another large wetland complex is along Chase Bog Brook in the southern part of Dalton. Both of these areas have been highlighted in the past as ecological hotspots in town.

Dalton should continue to prioritize maintaining and enhancing water quality, working to conserve and maintain all types of wetlands throughout the Town. Emphasis should be placed on wetlands outside of conserved lands that are important linkages for wildlife.



The aquifer under and around the Johns River (shown here) and Connecticut River has some of the highest water transmissivity in Town. Photo taken 10-6-2022.

Stratified drift aquifers consisting of sand materials, such as those in Dalton tend to be more porous and have a higher potential for quicker transmissivity and recharge. This also raises the risk of contamination and requires a region-wide approach, working with neighboring towns. ***Most people in Dalton get water from surface water, drilled or dug wells, and these aquifers are important water sources in the future. Whenever possible, these aquifers should be protected from contamination (impervious surfaces, point and non-point source pollution sources, development) to ensure future water quality and availability for the Town.***

[Slope \(Map #6 at the end of this report\)](#)

Slope is an important component of an area's landform and influences the plants and animals living there. Soils tend to be shallower on steeper slopes, the volume and amount of surface water runoff is higher, and the erosion potential is greater compared to flatter areas. These conditions create a unique habitat where in some cases plants and wildlife have special adaptations for dealing with the limitations associated with steep slopes.

Steep slopes provide opportunities for panoramic views and for this reason tend to be sought for residential development. Slope has several limitations for building such as structural problems and a greater chance of erosion. The consequences of erosion are loss of soil resulting in sedimentation of surface waters, loss of the productive capability of the land, and in severe cases, visual scars that can be seen from far away. Slope is traditionally expressed as a percent and represents the amount of rise or fall in feet for a given horizontal distance. For example, a 15% slope means that for a 100-foot horizontal distance, the rise or fall in height is 15 feet. As slope becomes steeper the expenses associated with building increase. In general, slopes between 15% and 25% are considered areas where development would be restrictive and

slopes greater than 25% are considered too steep to provide adequate sites for structures such as roads, homes, and septic systems.

NRCS soil data was used to determine areas in Dalton with slopes equal to and greater than 20%. Using NRCS data, 6,251.53 acres or 34.5% of the land in Dalton contains slopes that are 20% and over. Of that nearly 2,748.32 acres or about 15.2% of Dalton's land mass contains slopes over 30%. The topography in Dalton is quite different from neighboring towns, Lancaster and Whitefield, which have 13% and 10.8% steep slopes respectively. Although steep slopes are scattered throughout town, they are predominantly associated with Dalton Mountain, Beede Mountain, Wallace Hill, and Blue Hill. There are also steep slopes associated with the Connecticut River. This illustrates why there is less farming in many areas along the Connecticut River through town.



The view from the top of a hill towards the Connecticut River Valley is enhanced by the permanent opening and steep slope. Photo taken May 11, 2023.

Rare Species and Exemplary Natural Communities

The Town of Dalton has documented occurrences of rare species and communities. They are listed by the NH Natural Heritage Bureau (NHB), the State agency that houses reported occurrences.

New Hampshire is home to more than 500 species of vertebrate animals. Many of these animals live in Dalton and the surrounding towns. The number would be considerably larger if a complete list of invertebrates (insects, crustaceans, clams and snails) were included. About 75% are nongame wildlife species – not hunted, fished, or trapped. Thirty species are endangered and 21 are threatened in the state. The New Hampshire Fish and Game Department maintains

Wildlife Action Plan (Map #2)

The New Hampshire Fish and Game Department worked together with many partners in the conservation community to create New Hampshire's Wildlife Action Plan (WAP). The plan, which was mandated and funded by the federal government through the State Wildlife Grants Program, provides a base tool for restoring and maintaining critical habitats and populations of the state's species of concern and their habitat. New Hampshire Fish and Game states that the Wildlife Action Plan is a first step on a statewide scale to work towards helping keep species off the rare species lists. The NH Wildlife Action Plan was submitted to the U.S. Fish and Wildlife Service on October 1, 2005, and was approved in the spring of 2006. It was then revised in 2015.

In the GIS phase of the Wildlife Action Plan, biologists and GIS technicians conducted co-occurrence analyses using a variety of digitized natural resource features such as wetlands, riparian habitat, unique rock outcrops, dense softwood stands, alpine areas, etc. This analysis identified and ranked areas of conservation priorities throughout the state and at a statewide level.

Dalton contains several areas classified as "Highest Rank Habitat in NH" as well as "Highest Ranked Habitat in the Biological Region". Areas classified with these two categories include the following:

- Along the entire length of the Johns River, including its confluence with the Connecticut River – eastern and northeastern portions of Dalton
- Surrounding and including the Chase Bog Brook and associated wetland complex in the southern part of Dalton
- Undeveloped areas and wetlands along Cushman Brook through its confluence with the Connecticut River in the northwestern part of Dalton
- Southwestern corner of Dalton including Forest Lake and tributaries to Alder Brook.

Of note, these same areas were also highlighted in a town-wide wetland study completed in Dalton in 2006 (Watershed to Wildlife and North Country Council, 2006). This study ranked the wetland complexes in Dalton and found the top four wetland areas in order of ranking were:

1. Chase Bog Brook Wetland
2. Johns River – Gilead Farm Wetland
3. Cushman Brook Wetland
4. Alder Brook Wetland

These same areas are priority areas for land conservation if possible. Data from this study and previous studies can be leveraged when applying for funds or partnerships with land trusts and other granting agencies.

Habitat Area Summary Table

The table below is a summary of different habitat areas in acres, square miles, and percentage of town land area.

Habitat Type	Acres	Square Miles	Percentage of Town Land Area
Dalton Town Boundary	18,104.42	28.3	100%
Conservation Land	2,108.44	3.29	11.6%
Ponds and Open Water	164.08	0.26	0.9%
Wetland Complexes (from National Wetland Inventory data & field work)	2,828.47	4.42	15.6%
Hydric Soils – poorly and very poorly drained	4,543.79	7.10	25.1%
Floodplain Forest	164.99	0.26	0.9%
Aquifers	5,030.17	7.86	27.8%
Northern Hardwood Conifer	8,040.34	12.56	44.4%
Hemlock-Hardwood Pine Forest	3,660.75	5.72	20.2%
Lowland spruce-fir	2,891.64	4.52	16.0%
Permanent Wildlife Openings	1,165.45	1.82	6.4%
Farmland Soils – prime, statewide and local importance	3,150.58	4.92	17.4%
Steep slopes – 20% and greater	6,251.53	9.77	34.5%
Steep slopes – 30% and greater	2,748.32	4.29	15.2%

DISCUSSION – FUTURE OPPORTUNITIES AND BENEFITS

This project is an inventory of natural resources, including a written report, maps, and a digital database in GIS format. It is the property of the Town of Dalton and was funded by the Town. Mapping data from this project is compatible with the existing Town GIS. Efforts from this project will aid in future work and inventories, as well as provide tools to guide future development and conservation decisions in Dalton.

It is anticipated that the results from this study will help the Town of Dalton in many ways. Town-wide zones based on habitat and vegetation can be assessed and modified. Data gathered from this work will also assist the Conservation Commission, Planning Board, and Select Board in foreseeing possible conflicts with future development. Perhaps the most powerful advantage of this project is that future studies and work can be easily integrated to build upon this database indefinitely.

Based on results from this study, Elise Lawson and the Dalton Conservation Commission offer the following additional recommendations:

1. **Surface Water Protection** - Many of Dalton's residents obtain drinking water from personal drilled or dug wells. Maintaining good water quality is one of the highest priorities for the Dalton Conservation Commission. Currently, water quality in these streams, rivers, and lakes is in very good to excellent condition. Water quality should continue to be addressed not only in Forest and Mirror Lakes and the Connecticut and Johns Rivers, but also in smaller rivers, streams, and headwater brooks that feed these waterbodies..
 - a. Where possible work to maintain or enhance riparian habitat adjacent to headwater streams and brooks. Any wetland setback should also apply to all riparian habitat along perennial streams.
 - b. Continue monitoring water quality in the Connecticut and Johns Rivers, Forest Lake, and some of the smaller feeder streams and ponds in town. Areas where there are little buffers and/or downstream from developed land should be prioritized. Continue to encourage Dalton landowners to test their private wells regularly.
 - c. The Town should update potential contamination source location inventory at least on an annual basis and ensure that compliance (secondary contain structures, and spill kits) are in place.
2. **Aquifer Protection** - Based on the locations of the underlying aquifers in Dalton, it is important to protect the quality of groundwater, brooks, streams, and aquifers in Town. Future water supplies are a valuable natural resource for Dalton and the abutting municipalities.

- a. Implement Best Management Practices (BMPs) within aquifer areas.
 - b. Monitor septic system plumes with a focus on parcels adjacent to rivers, wetlands, and aquifers.
 - c. Monitor the placement of future septic systems keeping in mind the potential high permeability of many of Dalton's soils.
 - d. Develop Town-wide ordinances to help protect aquifers, including restriction of impervious surface development and dumping of waste on top of aquifers, particularly areas with high productivity and flow.
3. **Dense Softwood Stand Protection** – Based on results from this project, there are a few areas that contain adequate acreage of dense softwood stands scattered throughout Town. These areas are beneficial to many wildlife species for cover as well as important wintering areas.
- a. Maintain existing dense softwood stands for the benefit of the deer, moose, and other wildlife populations.
 - b. Where possible, investigate extending some existing softwood areas and/or connect patches of softwood stands to increase overall size. Willing landowners can be encouraged to do so, particularly those abutting wetlands and riparian habitat.
4. **Wetland Conservation**– The Dalton Conservation Commission recognizes the importance of wetland protection as an important means to maintain good water quality. It is hoped that the Town will pursue ways to conserve the functionality and diversity of these wetlands. An update of Dalton's overall wetland study could help Dalton work with willing landowners to conserve some of these valuable wetland resources. This NRI recommends the following:
- a. Update an overall wetland study throughout Dalton to identify, assess and functionally rank wetlands in town.
 - b. Continue to inventory vernal pools throughout Dalton to enable the Conservation Commission, Planning Board, and Select Board to critique and adjust future subdivision proposals if vernal pools are likely to be impacted.
 - c. Monitor stormwater runoff and associated drainage immediately after storm events whenever possible. Treatment devices for stormwater structures should be installed and maintained; particularly within 150 feet of rivers and wetlands.
5. **Land Conservation** – Create a Town Forest working with local, state, and national land trusts to help make this happen. Over 11.5% of the land is conserved. Four main areas have been identified as higher priority areas for conservation based on this NRI, NH

Wildlife Action Plan work, and previous wetland studies. They are described below and shown on Map #2 at the end of this report.

- a. **Connecticut and Johns Rivers with associated wetlands and floodplain habitat** - Any opportunity to conserve riparian and wetland habitat along these rivers would increase water quality, aquifer protection, and unique habitat in Dalton. Within these areas, maintaining and increasing vegetative buffers is highly recommended.
 - b. **Chase Bog Brook and associated wetlands** – This area has been termed the “Gem of Dalton”. Since the last NRI and wetland study in town, there has been some development along the perennial stream and wetlands. It has a very high ecological value, and any opportunity to protect this habitat is highly recommended.
 - c. **Cushman Brook and associated riparian habitat** –The area along this brook has high value due to limited development, a variety of habitat types, and its confluence with the Connecticut River.
 - d. **Southwestern corner of Dalton** - The southwest corner of Dalton contains a series of headwater streams, open habitat, and Forest Lake. It offers diverse wildlife habitat and is ranked high priority to maintain good water quality.
6. **Hillside and Viewshed Protection** - Dalton’s hilly topography, lakes, and rivers are directly related to the Town’s tourism industry, scenic beauty, and diversity of natural resources (wetlands, streams and rivers, wildlife, plants, soils, etc.). We recommend evaluating and possibly updating the zoning ordinance in Dalton to conserve viewsheds as an important feature and tourist attraction to the area, while continuing to consider landowner rights.
- a. **Scenic View Conservation** - The potential for continued population increase in Dalton makes it wise to take a proactive approach to deal with future development pressures and preserve the scenic vistas and beauty. Scenic easements are types of conservation easements that make protection of scenic resources possible.
 - b. **Ridge-line Development Criteria** - Several municipalities throughout the State have developed ridge-line ordinances to protect ridgeline views. Dalton may want to review some of these and explore the possibility of implementation.
 - c. **Steep Slope Development Criteria** – Develop town-wide ordinances to restrict future development and road construction at sites with over 25% slopes and limit development on slopes between 20% and 25%.
7. **Cooperation** – Natural resources do not end at the town boundary. It is recommended that Dalton continue to work with neighboring towns, schools, organizations, and State

and Federal agencies throughout the region to share future data as it becomes available. This will avoid an all-too-common problem of separate entities replicating work. A watershed approach to conserving natural resources including water quality is recommended. Most of the surrounding municipalities have completed or are in the process of completing Natural Resource Inventories, and all the data between the towns and Dalton should be compatible in GIS software programs.

- a. Work with North Country Council, who has developed several templates for town-wide ordinances in areas from wetland and shoreline setbacks to restrictions on steep slopes, to ridgeline development.
 - b. Consider working with the [Connecticut River Joint Commissions](#) on projects to ecologically enhance the Connecticut River area
 - c. Partner with local high schools and colleges to encourage young people to be involved and outdoor classrooms.
8. **Carbon Sequestration** – Explore the possibility of bringing funds into Dalton from Carbon offset programs. A great resource is The Northeast Forest Carbon Program (website: <https://www.northeastforestcarbon.org/>). Funds from participating organizations can be used to incentivize landowners to protect their land from development for a period of time. Sustainable forestry is an important part of this process.

Long-term uses of this project could include, but are not limited to:

- Include NRI data in future Master Plan updates.
- Assist the Town and others in determining “least-impact” sites for future development.
- Locate ideal locations for telecommunication towers or wind farms while conserving scenic resources.
- Promote the protection of water quality, wetlands, and aquifers under portions of the Town.
- Continue to identify land for purchase or easements for protection into the future.

Furthermore, Dalton officials should consider requesting that all future development plans be delivered in digital format, which would build upon the existing database (including assist in updating tax maps for assessment) at little cost to the Town.

Appendix B: Results from Water Quality Testing at Forest Lake



GRANITE STATE ANALYTICAL SERVICES, LLC.

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 Phone: (800) 699-9920 | (603) 432-3044 | website: www.granitestateanalytical.com

CERTIFICATE OF ANALYSIS FOR DRINKING WATER

DATE PRINTED: 05/29/2020
CLIENT NAME: Eliot Wessler
CLIENT ADDRESS: 66 Newell Lane
 Whitefield, NH 03598
SAMPLE ID#: 2005-02181-001
SAMPLED BY: Finkle, Adam
SAMPLE ADDRESS: Forest Lake
 Whitefield/Dalton NH
MORE LOC INFO:

DATE AND TIME COLLECTED: 05/19/2020 11:15AM
DATE AND TIME RECEIVED: 05/20/2020 10:56AM
ANALYSIS PACKAGE: PFC-6-alpha-NH
RECEIPT TEMPERATURE: ON ICE 6.6° CELSIUS
CLIENT JOB #

Legend	
Passes	
Fails EPA Primary	
Fails EPA Secondary	
Fails State Guideline	
Attention	

Test Description	Results	Test Units	Pass /Fail	DQ Flag	RL	Limit	Method	Analyst	Date-Time Analyzed
Date Extracted	-					No Limit	EPA 537.1	2062	05/26/20 7:00AM
Perfluorobutanesulfonic Acid (PFBS)	<2.00	ng/L			Sub Report	No Limit	EPA 537.1	2062	05/27/20 9:19PM
Perfluoroheptanoic Acid (PFHpA)	<2.00	ng/L			Sub Report	No Limit	EPA 537.1	2062	05/27/20 9:19PM
Perfluorohexanesulfonic Acid (PFHxS)	<2.00	ng/L	✓		Sub Report	18 ng/L	EPA 537.1	2062	05/27/20 9:19PM
Perfluorononanoic Acid (PFNA)	<2.00	ng/L	✓		Sub Report	11 ng/L	EPA 537.1	2062	05/27/20 9:19PM
Perfluorooctanesulfonic Acid (PFOS)	<2.00	ng/L	✓		Sub Report	15 ng/L	EPA 537.1	2062	05/27/20 9:19PM
Perfluorooctanoic Acid (PFOA)	<2.00	ng/L	✓		Sub Report	12 ng/L	EPA 537.1	2062	05/27/20 9:19PM

The results presented in this report relate to the samples listed above in the condition in which they were received.
 RL: "Reporting limit" means the lowest level of an analyte that can be accurately recovered from the matrix of interest.

Data Qualifier (DQ) Flags: None

Note: Air present in VOC vials. Analyst 2062 = Alpha Analytical (Mansfield).

* NELAP Accredited Analysis



Donald A. D'Anjou, Ph. D.
 Laboratory Director