



**NHDES Water Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095**

REMEDIAL ALTERNATIVES ASSESSMENT SEPTAGE LAGOONS CLOSURE

**Hopkinton Septage Lagoons
491 East Penacook Road
Hopkinton, New Hampshire 03229**

**NHDES Site No. 198705021
NHDES Permit #SEF-00-001**

Prepared For:

**Town of Hopkinton
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Hopkinton, New Hampshire 03229
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Prepared By:

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**September 7, 2023
Nobis File No. 30157.000**



September 7, 2023
File No. 030157.000

Anthony F. Drouin, Administrator
Residuals Management Section - Wastewater Engineering Bureau
New Hampshire Department of Environmental Services
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

**Re: Remedial Alternatives Assessment – Septage Lagoons Closure
Hopkinton Septage Lagoons**
491 East Penacook Road
Hopkinton, New Hampshire 03229
NHDES Site No. 198705021
NHDES Permit #SEF-00-001

Dear Mr. Drouin:

On behalf of the Town of Hopkinton (Town), Nobis Engineering, Inc. d/b/a Nobis Group® (Nobis) is providing this Remedial Alternatives Assessment report as required by the New Hampshire Department of Environmental Services (NHDES) for the Hopkinton Septage Lagoons (facility).

In a letter dated December 13, 2021, issued by the NHDES Residuals Management Section (RMS), NHDES requested preparation of a Scope of Work to characterize lagoon residual solid wastes stockpiled at the facility and an evaluation of remediation alternatives to address the material. The material has been characterized, and remedial alternatives have been considered based on the results of the characterization.

Once the remedial alternative has been approved by NHDES and the Town of Hopkinton has given notice to start work, Nobis will proceed with facility design and preparation of the closure plan in accordance with the applicable regulations.

We trust this information satisfies the needs of NHDES at this time. If you have any questions or comments regarding this submittal, please do not hesitate to call.

Sincerely yours,

Nobis Group®

Lori Cox, PE
Project Manager

Clarence "Tim" Andrews, P.G. | Associate
Director of State & Municipal Services

c: Mr. Neal Cass, Town of Hopkinton
File 030157.000



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1.0 INTRODUCTION

On behalf of the Town of Hopkinton (Town), Nobis Engineering, Inc. d/b/a Nobis Group® (Nobis) is providing this Residuals Management Alternatives Report, which describes the potential methods for managing the accumulated residual solids at the Hopkinton Septage Lagoon (facility) and presents the preferred method that will be the basis for the facility closure plan. After inspections by the New Hampshire Department of Environmental Services (NHDES) identified several regulatory compliance issues, the Town decided to close the facility. The facility stopped accepting septage in January 2022 but has not been formally closed the facility per the requirements of Env-Wq 1600 Septage Management.

2.0 RESIDUAL CHARACTERISTICS AND QUANTITY

In August 2022, personnel from NHDES and Nobis collected septage samples from each of the facility's five lagoons and the berms surrounding each lagoon, as well as the facility perimeter berm, which are believed to also be residual solids. Samples were submitted for laboratory analyses of the parameters listed in Env-Wq 1613, polychlorinated biphenyls (PCBs), and per-and polyfluoroalkyl substances (PFAS). Please refer to the Septage Residuals Characterization report¹ submitted to NHDES on December 9, 2022 for additional details and laboratory reports for the residuals sampling and characterization.

Septage samples from two lagoons contained chlorobenzene at concentrations exceeding the NHDES Soil Remediation Standard (SRS). Septage samples from four lagoons contained 4-chloroaniline at concentrations exceeding the SRS, and one septage sample also contained benzo[b]fluoranthene and benzo[a]pyrene at concentrations above SRS. No other SRS exceedances were observed for analytes with established standards. PFAS were detected in all samples, and though no regulatory standards have been established for PFAS in solid matrices, some disposal facilities are not accepting waste with PFAS.

Nobis also conducted an initial Global Positioning System (GPS) survey to estimate the extent and volume of the residual material present in September 2022. The estimated quantity of residual material initially calculated is 20,669 cubic yards, which includes approximately 2,000 cubic yards in the perimeter berm, which is believed to be residual material. However, further review of the data indicated the dataset had been corrupted and may be unreliable. As such, second GPS survey was conducted on August 9, 2023, and a revised quantity of 35,054.25 cubic yards of residual material was calculated. It is noted that the volume calculations completed include some

¹ "Septage Residuals Characterization Sampling Results and Volume Estimate, Hopkinton Septage Lagoons, 491 East Penacook Road, Hopkinton, New Hampshire 03229" prepared by Nobis Group, December 9, 2022.

assumptions on the aerial extent and depth of residuals remaining within the lagoons, and that the field survey completed is limited in accuracy. An elevation survey of the residual berms and septage facility features as well as test pit explorations will be needed to better define the volume of residuals at the facility.

3.0 RESIDUALS MANAGEMENT ALTERNATIVES

Three alternatives for managing the residual materials were evaluated. These methods are described in the 2017 NHDES Guidance on Closures of Facilities/Lagoons Subject to Env-Wq 800/Env-Wq 1600 (2017 Guidance) and include excavation with beneficial reuse, excavation and off-site disposal, and excavation and closure on site as a monofill.

3.1 Alternative #1 - Excavation and Beneficial Reuse

According to the land application standards described in Env-Wq 1608.09, only septage from domestic sources can be applied to land. Because some septage was received from commercial and industrial sources, land application cannot be considered.

3.2 Alternative #2 - Excavation and Off-Site Disposal

Excavation of the residual materials with off-site disposal was considered. Republic Waste Services (Republic) and Strategic Environmental Services (SES) were contacted about disposal of the residuals. Republic stated that they were having difficulty finding a facility that would accept septage sludge from a similar facility. SES estimated that transportation and disposal costs alone would be approximately \$240 per ton. A volume of 35,054 cubic yards (52,581 tons) is assumed based on field survey described in Section 2. The residuals would likely need to be treated with lime or bleach for pathogen reduction prior to acceptance.

Additional costs would be incurred for permitting, excavation of the materials, and site work for excavation and loading of the material for transport, and for import of clean material to backfill the lagoons once the residuals have been removed. The total estimated cost of Alternative #2 is \$13.9 million, as summarized in Table 1.

3.3 Alternative #3 – Excavation and Closure as Monofill

Closure on site as a monofill by consolidating waste and capping was the last alternative evaluated. The alternative was divided into four phases. A feasibility study would be conducted prior to Phase 1. The study would include a survey of the property, a test pitting program to

determine waste extents more accurately, and an evaluation of monofill siting and temporary waste placement options.

Phase 1, the Design and Permitting phase, involves the design of the facility, drafting of a stormwater pollution prevention plan (SWPPP), meeting with the local advisory committee to discuss impacts to the Contoocook River, and obtaining applicable permits. Per Env-Wq 1609, a facility permit application and facility design and closure plan will also be produced and submitted to NHDES for approval. Due to the size of the area to be impacted by construction an Alteration of Terrain (AoT) Permit Application and associated fees are included in Phase 1

Phase 2 of the closure involves dewatering and excavation of the residual material, which would be temporarily relocated on site. The lagoon footprints would be backfilled with clean import material once residual sludge has been excavated. Preparation of the site for excavation, which would include clearing and grubbing, site stabilization, and erosion control, is also included in this phase. It is noted that water treatment may be needed, but costs have not been included in the estimated Phase 2 cost.

Phase 3 is construction of the residual sludge monofill cell and includes excavation, cap construction, and applicable testing of the soils and cap materials. The 2017 Guidance does not require construction of a low-permeability cap. However, because of detections of PFAS and exceedances of SRS, installation of a low-permeability cap has been assumed to reduce further impacts to groundwater.

The total cost for Alternative #3 is \$3.8 million, as summarized on Table 2.

This alternative will require ongoing monitoring and inspection per landfill post-closure requirements described in Env-Sw 807. The facility is already within a Groundwater Management Zone, as the closed Hopkinton-Webster Landfill also occupies the property, and the expired permit included requirements for both the landfill and septage lagoon facilities. Post-closure inspections and gas monitoring will need to be conducted quarterly initially, but the inspection frequency may be reduced to semi-annually with approval of NHDES after demonstrating that performance conditions warrant less frequent inspections. Cost for this alternative include only capital cost for excavation and monofill construction. The estimated cost does not include provisions for long-term monitoring requirements.

4.0 RECOMMENDATION AND PROPOSED SCHEDULE

Based on waste characteristics, two alternatives are feasible — excavation with off-site disposal and waste consolidation and capping on site as a monofill. Excavation with off-site disposal is estimated to cost \$13.8 million, and on site waste consolidation as a monofill is estimated to cost \$3.9 million. Based on cost and feasibility, Alternative #3 – Excavation and Closure as Monofill is recommended.

The proposed timeline for implementation of Alternative #3 is as follows:

Date	Description of Work
September 2023	Submit Remedial Alternatives Report to NHDES and Town of Hopkinton for review and comment.
Fall 2023 or Spring/Summer 2024	Land Survey and Test Pitting Program to determine waste extents and possibility of relocation of residual material to another part of site.
Winter 2023 or Summer/Fall 2024	Start Design and Permitting Process Prepare Facility Closure Plan
Summer/Fall 2024 or Spring/Summer 2025	Excavation and Dewatering of Residual Material
2025 or 2026	Construction of Landfill

This proposed schedule is variable, because it is subject to NHDES review and approvals for permits, financial planning and funding requirements by the Town, and contractor availability. It is also not known whether the construction work will be subject to a bid process, which may impact the proposed timeline.

T A B L E S

TABLE 1
Estimated Septage Lagoon Closure Costs
Alternative #2 – Excavation and Off-Site Disposal
Town of Hopkinton
491 East Penacook Road, Hopkinton NH 03229

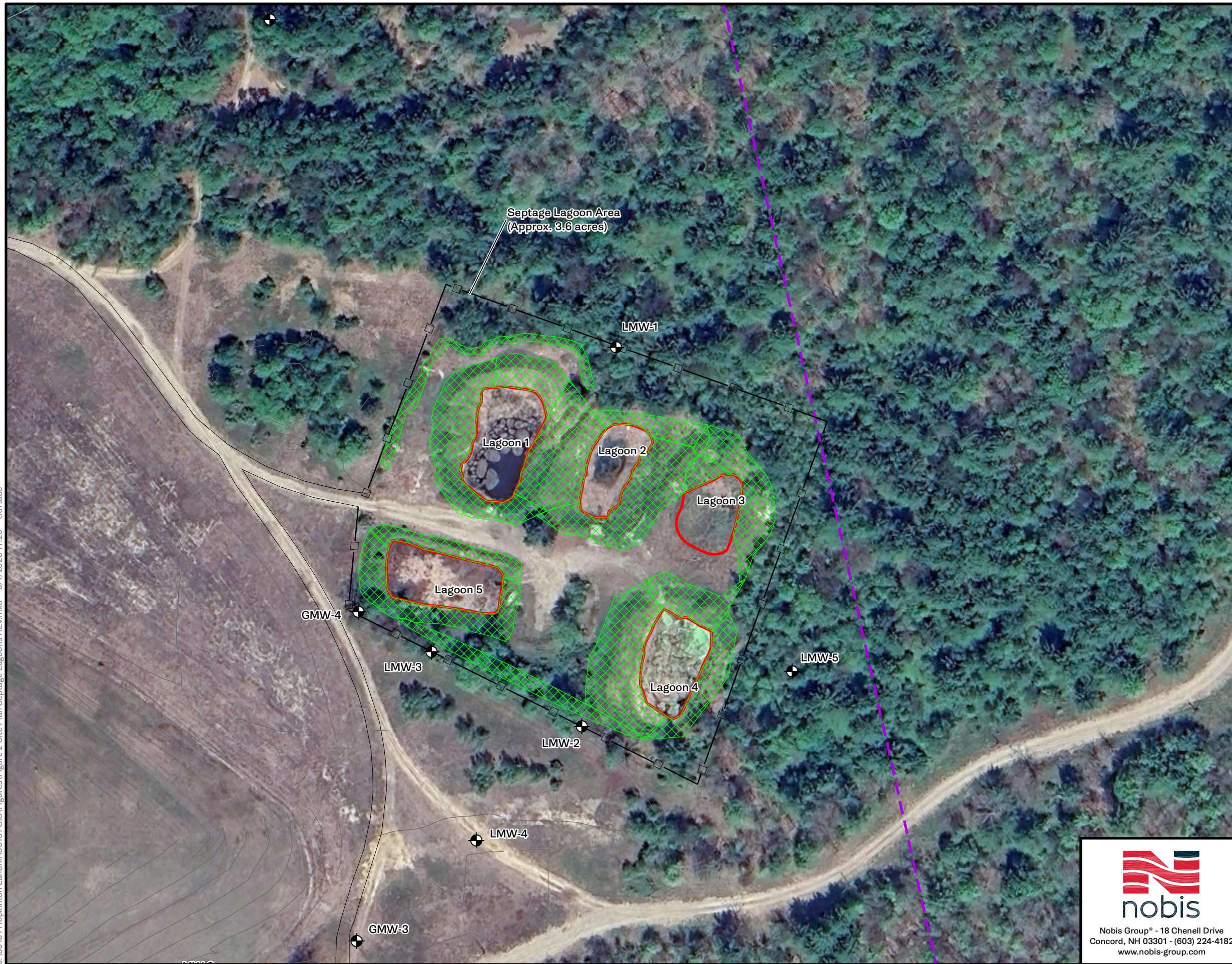
Phase	Estimated Cost
<u>Dewatering and Excavation of Waste</u> Includes engineering oversight and travel, mobilization, clearing and grubbing, project trailer, portable toilet, grading and drainage for dewatering, erosion and sedimentation controls, skim, excavation and relocation of septage, import of fill and backfill of lagoon footprints, and site stabilization.	\$1,250,000
<u>Off-Site Disposal</u> Includes off-site transportation to a licensed disposal facility and disposal costs. Provisional cost estimate of \$240/ton of residual material with 52,581 tons estimated.	\$12,619,440
Total Estimated Cost	\$13,869,440

TABLE 2
Estimated Septage Lagoon Closure Costs
Alternative #3 – Excavation and Closure as Monofill
Town of Hopkinton
491 East Penacook Road, Hopkinton NH 03229

Phase	Estimated Cost
<u>Feasibility Study</u>	\$45,000
Includes land survey, test pitting program with engineering oversight, feasibility report	
<u>Phase 1 - Design and Permitting</u>	\$145,000
Includes design, preparation of closure plan, Alteration of Terrain (AoT) permit fee, meeting with local advisory committee to discuss impacts on Contoocook River, and preparation of stormwater pollution prevention plan (SWPPP).	
<u>Phase 2 - Dewatering and Excavation of Waste</u>	\$1,250,000
Includes engineering oversight and travel, mobilization, clearing and grubbing, project trailer, portable toilet, grading and drainage for dewatering, erosion and sedimentation controls, skrim, excavation and relocation of septage, import of fill and backfill of lagoon footprints, site stabilization, and end-of-season demobilization.	
<u>Phase 3 - Construction</u>	\$2,400,000
Includes engineering inspections and oversight, mobilization, project trailer, portable toilet, erosion and sedimentation controls, dewatering, excavation and waste relocation, grading, stormwater controls, gas venting, compaction testing, liner material testing, liner installation and materials, fill materials, imported soil, grass seed, road improvements, and disposal costs.	
Total Estimated Cost	\$3,840,000

F I G U R E S


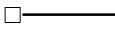




J:\30151 Hopkinton Landfill\GIS\Figures\Figure 2 Site Plan Septage Lagoons REV.mxd 9/7/2023 17:25 tfurtado

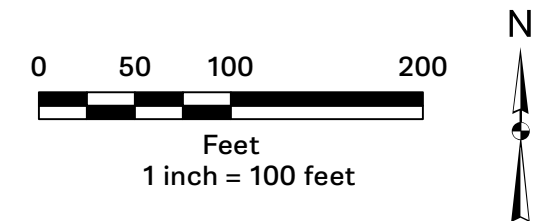


Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

Legend

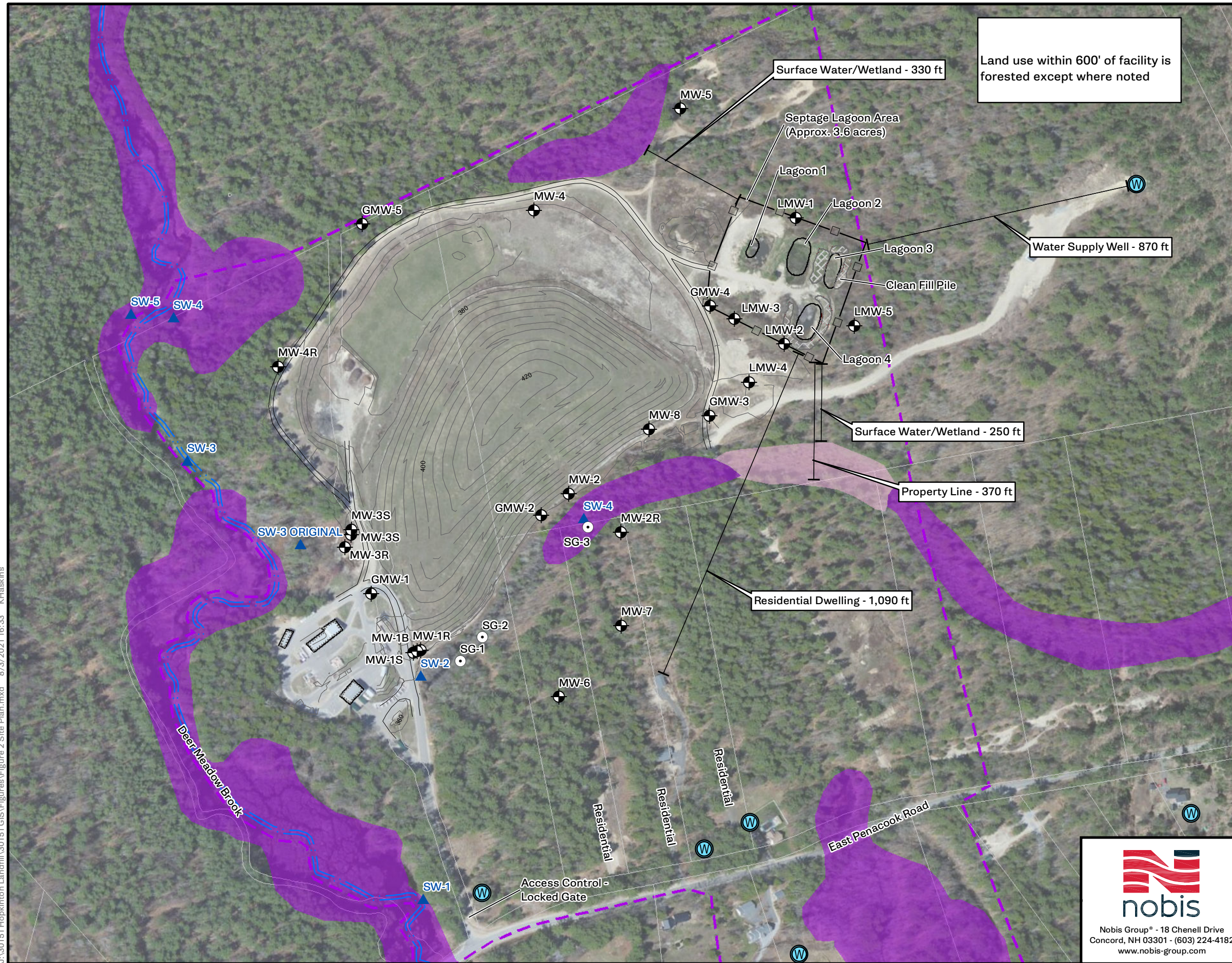
-  Monitoring Well
-  Septage Lagoon Area
-  GMZ
-  Property Boundary
-  Septage Lagoon
-  Perimeter Berms




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FIGURE 1	
SITE PLAN HOPKINTON SEPTAGE FACILITY 491 EAST PENACOOK ROAD HOPKINTON, NEW HAMPSHIRE	
PREPARED BY: TEF	CHECKED BY: TA
PROJECT NO. 30157.000	DATE: SEPTEMBER 2023

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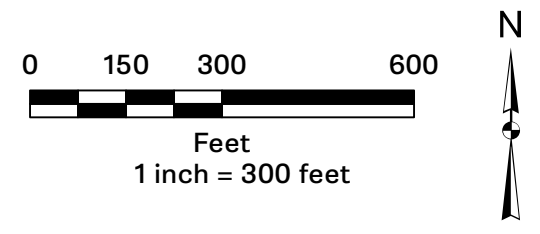


Land use within 600' of facility is forested except where noted

Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

- Legend**
- Staff Gauge
 - ▲ Surface Water Sample
 - ⊙ Residential Water Well
 - ⊕ Monitoring Well
 - Stream
 - Septage Lagoon Area
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub
 - - - GMZ
 - Property Boundary



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FIGURE 2	
SITE AREA	
HOPKINTON-WEBSTER LANDFILL	
491 EAST PENACOOK ROAD	
HOPKINTON, NEW HAMPSHIRE	
PREPARED BY: KH	CHECKED BY: LC
PROJECT NO. 030157.000	DATE: AUGUST 2023