

April 11, 2025

VIA EMAIL

Dominique Dispirito
Solid Materials Management Unit
Remediation and Waste Management Unit

Email: Dominique.Dispirito@maine.gov

Subject: Demonstration PFAS Treatment System Proposal
Juniper Ridge Landfill Old Town, Maine

Dear Dominique,

At the request of NEWSME Landfill Operations (NEWSME), Sevee & Maher Engineers, Inc. (SME) is providing this letter describing the proposed demonstration treatment system for perfluoroalkyl and polyfluoroalkyl substances (PFAS) at the Juniper Ridge Landfill (JRL) in Old Town, Maine.

Leachate from JRL is subject to a condition of approval in the Public Benefit Determination (PBD), requiring the design and installation of a Maine Department of Environmental Protection (MEDEP)-approved system for the treatment of leachate for PFAS prior to Expansion II operations in 2028.

Before submitting the final design of a leachate PFAS treatment system, a demonstration PFAS leachate treatment system (Demonstration System) must be installed to evaluate treatment processes on a smaller scale before full-scale implementation.

This letter provides the information needed to gain MEDEP approval for Demonstration System construction and operation. It describes leachate supply, treatment system configuration, spill prevention, spill containment, leachate discharge, concentrate disposal, and the general operating conditions anticipated for the Demonstration System.

LEACHATE SUPPLY

Leachate from the existing leachate tank will serve as the source for the Demonstration System, as it represents a mixture of leachate from the site's active and closed landfill cells and reflects the chemical composition expected during full-scale operations.

A submersible pump will be installed in the existing leachate storage tank, using single-walled HDPE piping that extends through the tank's access hatch (on top of the tank), down its exterior, and to the influent end of the Demonstration System. Level controls located at the influent end of the system will activate the pump based on treatment system flow demands.

An air/vacuum release valve will be installed in the supply line at the highest point of the leachate transport pipe (the top of the tank) to prevent siphoning or unintended leakage in case of pipe damage. Supply piping will be secured to the exterior tank ladder cage on the north side of the leachate tank.

Piping details, such as size and thickness, will be determined later based on required system flow rates, currently anticipated to be under 10 gallons per minute.

TREATMENT SYSTEM CONFIGURATION

Casella has chosen the LEEF System by the Water and Carbon Group as the demonstration system for the site. This system uses foam fractionation to treat leachate at rates of up to 1,000 gallons per day. A document summarizing the system is attached.

The proposed Demonstration System will be delivered in a cargo trailer and will require a small influent tank to buffer flow from the leachate tank, an effluent tank to store treated leachate, and a high concentration residuals tank to manage the foam produced. All other equipment will be located inside the trailer as indicated in attached Figure 1 (attached).

SPILL PREVENTION

Site piping, storage tank, and treatment unit will be inspected daily while the Demonstration System is operating. Any damage or leakage will prompt an immediate system shutdown for necessary repairs.

SPILL CONTAINMENT

The existing leachate tank's secondary containment area includes the following materials (from top to bottom):

- 4 inches of drainage stone;
- 6-ounce nonwoven geotextile;
- 8 inches of drainage sand;
- Geosynthetic clay liner; and
- 6 inches of compacted impervious borrow.

Water collected in the leachate tank secondary containment area will be tested for specific conductance before discharge. Liquid measuring at or above 500 $\mu\text{mhos/cm}$ will be discharged to the loading rack pump station, while liquid below this threshold is discharged outside the containment.

The Demonstration System treatment unit will be installed within its own secondary containment that is supplied with the equipment. An influent, effluent, and residuals tank will also be installed in secondary containment that is sized to meet the capacity requirements of the tanks. Water collected within the containment areas will be pumped to the existing leachate loading rack pump station.

LEACHATE DISCHARGE

Treated leachate from the Demonstration System will be discharged through HDPE piping to the existing loading rack pump station, which discharges to the existing leachate storage tank. All piping outside the existing leachate storage tank secondary containment area will include secondary containment.

CONCENTRATE DISPOSAL

Concentrate will be discharged back into the leachate storage tank through the loading rack pump station.

OPERATING CONDITIONS

The Demonstration System will operate only during the week and during operating hours of the landfill facility (7:00 a.m. to 5:00 p.m.) and during non-freezing conditions. A representative of LEEF will be onsite when the system is operating.

System flow rates are currently expected to be less than 10 gallons per minute.

CLOSING

NEWSME will pursue other approvals necessary for this Demonstration Project and may conduct other demonstration projects in the future.

Prompt installation of the demonstration system is critical to allow sufficient evaluation of treatment effectiveness.

Feel free to contact me if you require additional information or have any questions regarding this proposal.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.

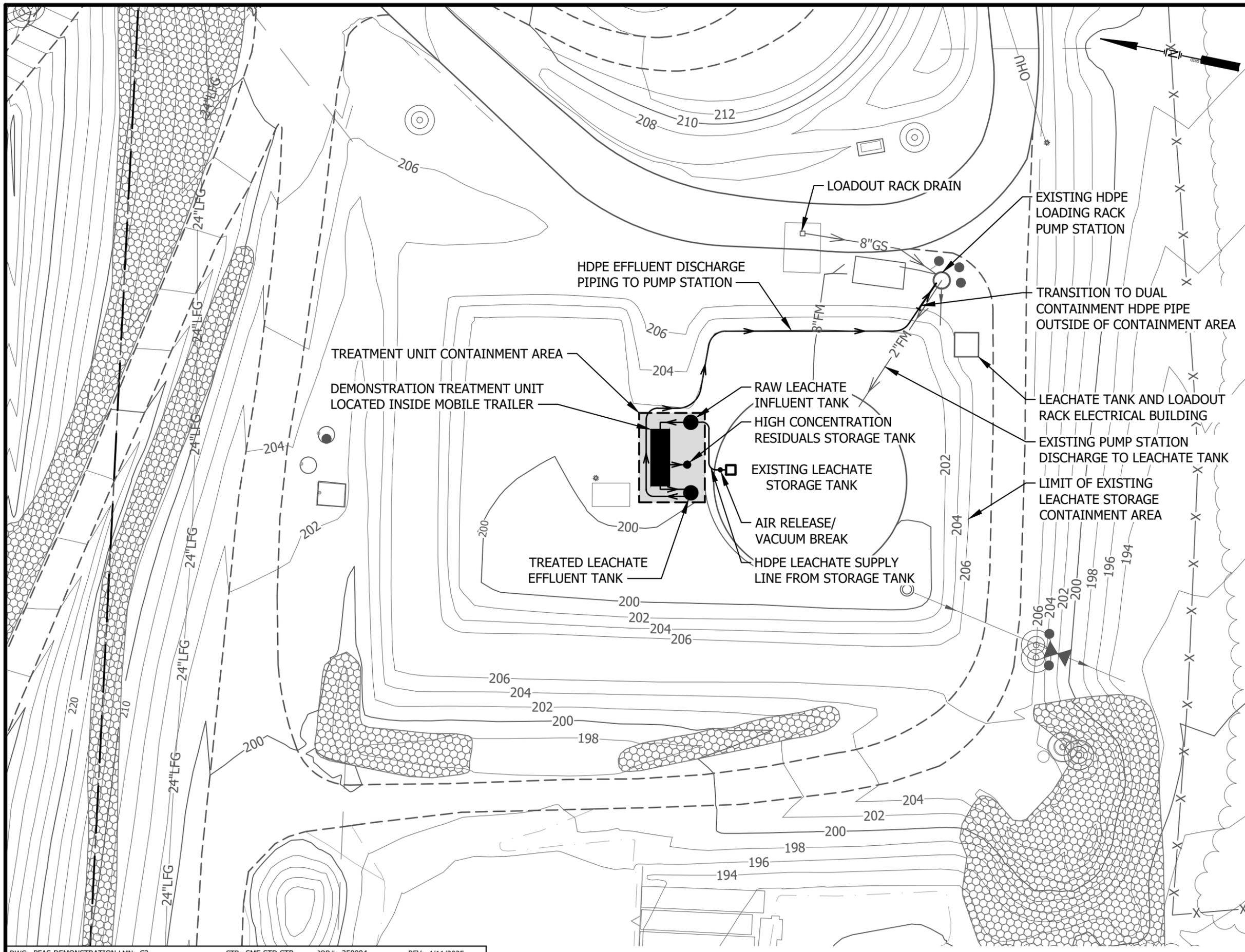


Brian D. Pierce, P.E.
Principal/Chief Engineer

Attachments: Figure 1
LEEF System Documentation

cc: Wayne Boyd, NEWSME
Jeffrey Pelletier, NEWSME
Kathy Tarbuck, MEDEP

I:\SERVER\cfs\Casella\OldTownLandfill\Expansion\Phase II Expansion\Acad\Figures\PFAS-DEMONSTRATION.dwg, B_FIG 1-C2, 4/11/2025 3:05:26 PM, jrl



- NOTES:**
ALL LOCATIONS ARE APPROXIMATE.
- ASSUMPTIONS:**
1. DEMONSTRATION SYSTEM ONLY OPERATES DURING LANDFILL OPERATING HOURS.
 2. SYSTEM WILL NOT BE OPERATED DURING FREEZING TEMPERATURES.
 3. MAXIMUM DEMONSTRATION SYSTEM TREATMENT FLOW OF 10 GPM.
 4. STORMWATER COLLECTED IN THE DEMONSTRATION TREATMENT UNIT CONTAINMENT WILL BE PUMPED TO THE LOADOUT RACK DRAIN.

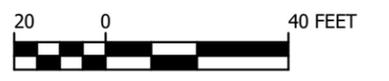


FIGURE 1
 DEMONSTRATION PFAS TREATMENT AREA
 PHASE II EXPANSION
 NEWSME LANDFILL OPERATIONS LLC
 JUNIPER RIDGE LANDFILL
 OLD TOWN, MAINE



Treatability Study

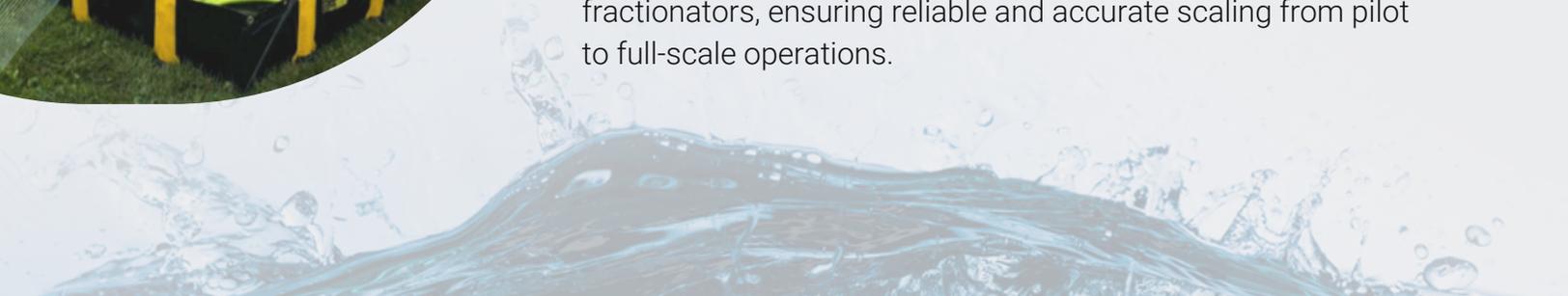
LEEF System®

The Water & Carbon Group (WCG) recognizes that each landfill's leachate is unique, making it crucial to analyze its properties and understand how foam fractionation impacts PFAS removal. To support this, WCG offers detailed treatability studies, which provide vital insights into leachate composition and key parameters for optimizing LEEF System performance.

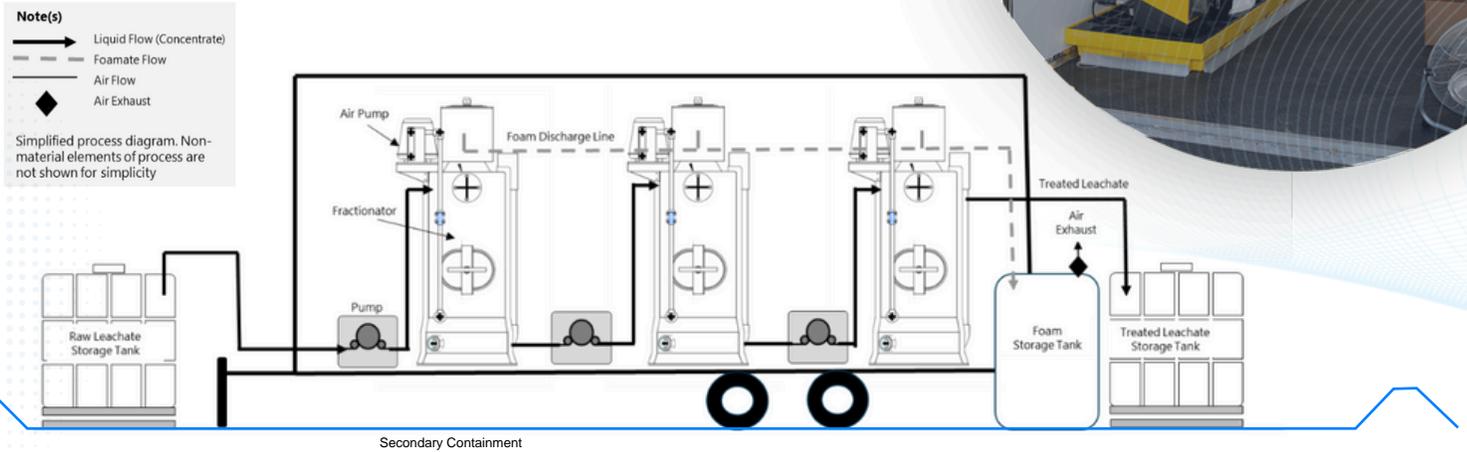


WCG's LEEF-1K Demonstration Trailer is a versatile, three-stage foam fractionation system designed for rapid deployment. It can treat up to 1,000 gallons per day (GPD) of leachate using three LEEF foam fractionation units operating in series. This system allows for the testing of concentrated residuals and provides a reliable demonstration of the full-scale system's effectiveness.

By utilizing the LEEF-1K Demonstration Trailer, landfill operators gain practical experience with the foam fractionation process, helping them become familiar with the operation of a full-scale LEEF system before its installation. Extensive testing on over 20 different leachates and wastewaters across the United States has shown that the performance of the treatability-test system closely mirrors that of larger LEEF fractionators, ensuring reliable and accurate scaling from pilot to full-scale operations.



LEEF-1K Demonstration System Overview



Day	Description
1	<ul style="list-style-type: none"> Initial mobilization Safety briefing Test sequence 1 – Primary Testing
2	<ul style="list-style-type: none"> Test Sequence 2 – Process Efficiency Testing Test Sequence 3 – Process Efficiency Testing
3-4	<ul style="list-style-type: none"> Test Sequence 4 – Surfactant Testing Test Sequence 5 – Concentrate Residuals Testing
4-5	<ul style="list-style-type: none"> De-mobilization
1 week after receipt of lab results	<ul style="list-style-type: none"> Test report

Included in each Treatability Study

- Detailed test plan
- All consumables
- Mobilization of LEEF-1K Demo Trailer System to client site
- Trained operators for mobilization and test plan activities
- Execution of proposed test plans
- De-mobilization of the LEEF-1K Demo Trailer System
- Test report including lab results



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