

March 1, 2022

The Honorable Stacy Brenner, Senate Chair
The Honorable Ralph Tucker, House Chair
Joint Standing Committee on Environment and Natural Resources
100 State House Station
Augusta, Maine 04333

Subject: Committee discussion on LD 1911 & 1639

To the Joint Standing Committee on Environment and Natural Resources:

We are writing to address the misconception that the Juniper Ridge Landfill (JRL) in Old Town, Maine has the ability and capacity to accept additional sludge materials. JRL is owned by the Maine Bureau of General Services and is operated by NEWSME Landfill Operations, LLC (NEWSME) of Saco, Maine. Since 2004, JRL has been an integral part of the State of Maine's (State) overall solid waste management program, providing environmentally sound disposal capacity for non-hazardous solid waste generated throughout Maine. JRL's ability to maintain effective and safe operating practices will be adversely impacted if two proposed legislative bills (i.e., LD 1911 and LD 1639) are made into law. Sevee & Maher Engineers, Inc. (SME) is a technical consultant for JRL and foresees unintended consequences from these proposed bills. LD 1911 will significantly increase the amount of sludge¹ requiring landfill disposal at JRL while LD 1639 will concurrently significantly reduce the amount of available high-strength bulking waste available to JRL to stabilize sludge. These conflicting bills will significantly affect the ability of JRL to provide and maintain critical disposal services to many municipalities and businesses across the State.

In 2021, JRL accepted 882,124 tons of non-hazardous waste consisting of construction and demolition debris (CDD), oversized bulky waste² (OBW), bypass municipal solid waste³ (MSW), incinerator ash and boiler ash, sludge, CDD processing fines,⁴ contaminated soil, and other solid waste which JRL is permitted to receive. Of these wastes, sludge is the most difficult waste to handle due to its low strength and high moisture content and it is normally mixed with other stronger wastes to compensate for its low strength.

In 2021, JRL received 90,069 tons of sludge which is equivalent to approximately 10 percent of the total waste received. This percentage is in line with others in the industry and across the State. This ratio is employed for the following reasons:

¹ Sludge is a residual resulting from treatment of water and wastewater. Typically, sludge is delivered to landfills as a matrix of low strength, high moisture content, organic fibers which are prone to microbial decomposition.

² A high-strength waste type created by the processing of CDD and currently being used to bulk sludge. May include Mattresses, rugs, furniture, and other non-recyclable items.

³ Solid waste from household and commercial sources that is bypassed from Maine MSW incinerators.

⁴ CDD processing fines is the residue from sorting CDD.

1. To maintain a stable waste mass through proper bulking and mixing of sludges and prevent low strength areas within the landfill that may lead to future instability of the waste mass;
2. To properly control odors associated with the sludge material, which has significant odor potential;
3. To prevent leachate drainage issues leading to leachate breakouts on side slopes, and further instability within the waste mass; and
4. To prevent uncontrollable landfill gas generation that can create odor, compliance, and stability issues within the waste mass.

It is important to clarify that a total sludge percentage of 10 percent does not equate to a 10 percent mix ratio of sludge to waste for the following reasons:

1. There are materials that are not suitable for mixing with sludges and these materials must be excluded. These materials include certain special wastes, materials with high gypsum content, and materials that need to be direct buried like asbestos containing materials;
2. There are materials used for alternative daily cover (ADC) that cannot be mixed with sludge, including certain contaminated soils and wood fines;
3. There are materials necessary for placement on the outside portions of the landfill to provide a 25- to 50-foot setback to sludge containing materials in order to maintain high strength slopes and minimize potential for odor and leachate related issues. Due to the pyramid shape of landfills, this can be a significant amount of material and significantly limit the available disposal area for sludge materials;
4. Both mixable material and sludge deliveries fluctuate intraday. JRL staff actively work with sludge generators to provide windows for sludge deliveries that aim to maximize the ability to maintain proper mix ratios; and
5. Sludge deliveries have a limited window to arrive and dump, typically 7:00 a.m. to 2:30 p.m. This window is aimed at assuring mixable material is available, minimizing odor potential in the surrounding community from trucks traveling to and from the facility as well as waste placement activities, and allowing operations staff to have time in the morning to prepare the operational area and time in the afternoon to properly cover and mix the sludge material. Simply adding operational hours will not increase the allowable sludge capacity, as this will not change the mixable waste deliveries and need for preparation before and clean up after sludge placement.

Due to these factors, the actual effective sludge mixing ratio at JRL with the available waste is roughly 20 percent to 30 percent which is in line with what global waste stability analysis has shown at a number of sites to be a proper ratio to assure a high strength waste mix. JRL's operators are highly trained and rely on experience to identify and utilize the types and quantities of different wastes delivered that can be mixed with the sludge to maintain efficient and stable waste placement while minimizing generation of odors.

Currently, JRL relies on access to several waste streams for bulking. Bypass MSW, when available, can be used for sludge bulking, however delivery is not reliable, both with the uncertain future of Coastal Resources Management (CRM) (formerly Fiberight), and the potential for the Penobscot Energy Recovery Corporation (PERC) facility to increase its future waste intake. Clean CDD (i.e., CDD with minimal sheetrock⁵) can be used for bulking and provides stability, however this material is also not consistently available. CDD that contains sheetrock is a permitted waste at JRL and is used regularly as a high-strength waste for stability of the landfill’s outer sideslopes, but should not be mixed with sludge due to potential for hydrogen sulfide generation. OBW is the main consistent waste stream received at JRL that can be reliably mixed with sludge to provide needed strength for landfill stability as well as provide conditions conducive to waste compaction and continued placement. Each sludge bulking material has a different proper mixing ratio based on both its moisture content and structural properties. These are as follows and can vary slightly based on the sludge moisture content and structural properties.

Waste Streams Used For Sludge Mixing	Proper Mixing Ratio (Waste to Sludge)	Observed Results
OBW	4 to 1	Maintains waste stability with minimum gas issues
MSW/Clean CDD	4 – 5 to 1	Semi-stable waste, some gas issues
Non-Bulky Waste	≥ 6 to 1	Difficult to maintain a stable waste, try to avoid, increased potential for gas issues

Based on these factors, JRL is currently at an appropriate sludge intake percentage and additional significant sludge intake is not feasible without creating the potential for operational and compliance related issues.

Proposed legislative bill LD 1911 will result in additional sludge requiring landfill disposal. Many of Maine’s municipalities operate wastewater treatment plants (WWTP) to handle sewage from local residences and commercial/industrial properties; the WWTP generates sludge on a daily basis. Historically a portion of the resulting sludge has been sent to composting facilities where it is composted and then reused as a soil amendment. According to the Maine Department of Environmental Protection (i.e., the Department) in 2020 25,000 tons of sludge was land applied. Separate of the 25,000 tons reported by the Department, the Hawk Ridge Composting Facility (Hawk Ridge) in Unity, Maine processes 7,000 tons of in-state sludge annually. Hawk Ridge is owned by Casella Waste Systems, which is the parent company responsible for JRL. If composting were to be discontinued at Hawk Ridge the sludge usually processed at that facility would likely go directly to JRL for disposal. As shown in the table below in order for JRL to accept these additional waste streams, an additional volume of approximately 120,000 tons to 150,000 tons of proper bulking material would be needed to maintain proper mixing and compliant operations.

⁵ Sheetrock and other plaster products contain gypsum. Gypsum is a soft sulfate mineral that when in the presence of sludge results in the off-gassing of hydrogen sulfide (i.e., rotten egg smell).

	Sludge (tons)	Sludge (cy)	Additional Proper Bulking Material Required (cy)	Ratio
Additional 25,000 tons of sludge from elimination of land spreading ²	25,000	30,864	123,456	4:1
Additional 7,000 tons of sludge from Hawk Ridge ³	7,000	8,642	34,564	4:1
<p><u>Notes:</u></p> <p>¹ Required proper bulking material based on mixing with sludge at a 4:1 ratio.</p> <p>² Approximately 25,000 tons of in-state sludge is currently land applied.</p> <p>³ Approximately 7,000 tons of in-state sludge composted at Hawk Ridge.</p> <p><u>Conversions:</u> Waste Density = 1,800 lb/cy Sludge Density = 1,620 lb/cy</p>				

Proposed Legislative bill LD 1639 will significantly reduce the amount of OBW available to JRL in that the principle OBW waste stream to JRL comes from Resource Waste Services of Lewiston, Maine. Since a large portion of the construction and demolition debris accepted at Resource Waste Services comes from outside of Maine, LD 1639, if made law, would ultimately reduce the amount of OBW going to JRL and in turn affect JRL's current ability to dispose of sludge in a manner necessary for continued compliant landfill operation. This would in turn jeopardize future sludge disposal needs of many Maine communities. This loss of material will likely require JRL to reduce sludge intake volumes from levels received in 2021. As a side note, in addition to the loss of OBW will be the loss of wood fines which JRL effectively utilizes for ADC. This loss would require JRL to utilize virgin soil materials either mined from on-site sources or hauled in from off-site where this material would otherwise have a higher value and more efficient end use.

The following table shows the potential sludge volume decrease necessary should Resource Waste Services cease delivery of OBW to JRL.

	Allowable Sludge (tons)	Sludge (cy)	Proper Bulking Material (cy)	Ratio
50 Percent Reduction of OBW and MSW	34,241	42,272	169,089	4:1
80 Percent Reduction of OBW and MSW	13,696	16,909	67,636	4:1
<p><u>Conversions:</u> Waste Density = 1,800 lb/cy Sludge Density = 1,620 lb/cy</p>				

It is noteworthy that over the past two years, CRM and PERC have processed very little of the MSW loads intended for those facilities and consequently much of that waste was bypassed to JRL. The bypassed MSW from those facilities greatly helped with the sludge mixing necessary for operation of JRL. The PERC

facility has recently increased its processing capacity, which is expected to result in a reduction of bypass MSW going to JRL. As the CRM facility becomes operational the bypass MSW to JRL will be further reduced, also affecting the amount of sludge that JRL can receive and manage.

JRL's engineers rely on direct experience for successful sludge mixing as well as guidance from the waste disposal industry relative to acceptable sludge percentages for landfill operation. Sludge acceptance at JRL has averaged eight percent over the past twelve years and has been at 10 percent for the past three years. Analysis of a recent landfill stability incident at the Greentree Landfill in Pennsylvania⁶ supports the 10 percent sludge recommendation.

In summary, JRL's current sludge intake volumes are consistent with industry practice, and proper operation. JRL is currently at an appropriate sludge intake percentage, and additional significant sludge intake is not feasible without creating the potential for operational and compliance related issues. Should LD 1911 pass, disposal of this additional sludge at JRL will not be feasible. Should LD 1639 pass, JRL will likely need to decrease sludge intake volumes from 2021 volumes in order to continue to maintain proper operations.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.



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⁶ Benson, Craig H., Geosyntec. Root Cause Analysis Report, Greentree Landfill, Kersey, Pennsylvania. December 2017.