Memorandum

To: Kathy Leary, City Administrator, City of Gustavus
Michelle Beadle, Alaska Department of Environmental Conservation

From: John Barry, P.E., Technical Services Manager, Neval Engineering

Date: February 2, 2025

Subject: Response to HDR Proposed Gustavus Septage PER 65% Alternatives Memo dated 11/21/24

Pump Trailer vs. Pump Truck

A pump trailer is specified in the costing for the septage stabilization and treatment options. A pump trailer loaded with the average volume of septage pumped from a typical tank (1000 gals.) would be cumbersome to maneuver considering the weight of the loaded trailer (septage about 8300 lbs. + trailer weight (unknown)). A pump truck would be much more maneuverable into the spaces where tanks are often located. A pump truck will cost considerably more than the trailer, and the truck will need a covered parking place at the DRC, but it will be much more practical for accessing septic tanks than a trailer. The City doesn't have a pickup truck to tow the trailer.

Capital and Operating Costs

Capital costs matter to the City because it will have to contribute at least 10% of the cost, assuming that grant money would cover most of the project cost. The operating costs will have the most significant impact on Gustavus residents over time.

Septage Stabilization and Treatment Alternatives

Alternative 1A: Mechanical Dewatering – Mechanical dewatering with a screw press is the most practical option. Leachate disposal can be done in a subsurface drainfield at the DRC. The 4000 sq. ft. drainfield is oversized and the final design should be smaller. The drainfield design will be based on a daily application rate which could be spread out to more operating days than the rate used in the report. There is not enough suitable drain rock produced from the Gustavus gravel pits for a drainfield of this size so it will have to be built with gravelless chambers set on coarse grained sand.

The operating costs use a rate of eight septic tanks pumped per day. This rate was achieved in 2023 by an out of town contractor using a pump truck and working long days. Septic tank pumping won't be done in such a compressed time frame. This applies to all of the alternatives.

Alternative 1B: Passive Dewatering – This method is slow, messy and produces dewatered sludge with a much higher water content that the screw press.

Alternative 1C: Aerobic Digester - High capital and operating costs plus the burden, expense and risk of maintaining the required mechanical equipment for twenty years makes this alternative unattractive.

Alternative 1D: Reed Bed Drying – It's an interesting alternative and the capital and operating costs are the lowest of the alternatives. The filtrate from the large, lined open lagoon will be piped to a drainfield, which needs to be sized to accept the filtrate plus the average annual 62 inches of rainfall that will be captured in the bed. There's a lot of risk with this method since it hasn't been tried in SE Alaska.

Alternative 1F: No Action – There is a lot of risk with this alternative since it depends on the performance of a third party contractor. Although there isn't a capital cost, the operating costs for residents of Gustavus is the highest per tank ($1000+).

Sludge Disposal Alternatives

Alternative 2A: Incineration – High capital and operating costs compared to other alternatives.

Alternative 2B: Monofill – The dewatered sludge is placed once or twice per year in a lined landfill with soil cover. The leachate collection system and drainfield need to be sized to accept the leachate plus the average annual 62 inches of rainfall that will be captured in the bed. The drainfield also has to accommodate the water from the screw press. The sludge has to be stored on site between placements. This option takes up a large section of the DEC permitted solid waste disposal area. The proposed location of the monofill is in the same place as the current balefill expansion. The monofill area can't be used for other landfill purposes.

Alterative 2C: Ship to Juneau for Drying – Local disposal of sludge is preferred, but this study shows that shipping dewatered sludge to Juneau is the lowest cost sludge disposal alternative. Details about the specialty sludge dumpster used for storing and shipping the sludge are needed to determine if it's suitable for shipping sludge on the ferry.

Alternative 2D: Land Application – Withdrawn from consideration. It was examined by the DRC committee in 2007 and was determined to be not feasible due to airport separation requirements and lack of suitable and available land.

Alternative 2E: Composting – This alternative should be investigated further rather than assuming the compost would be contaminated with PFAS without any lab testing data to make that determination. The combined capital and operating cost is lower than the proposed alternative that combines mechanical dewatering with monofill. Composting may be the most practical of the local disposal alternatives from an operating standpoint.

Capital + Operating Cost by Alternative			
Septage Dewatering Alternatives		Sludge Disposal Alternatives	
1A Mechanical Dewatering	2,698,725	2A Incineration	2,968,080
1B Passive Dewatering	1,953,297	2B Monofill	2,055,712
1C Aerobic Digester	4,741,246	2C Ship to Juneau	579,196
1D Reed Bed Drying	1,555,299	2E Composting	4,186,932
1E No Action	0	2F No Action	857,404
Best Total Cost - Combined Alternatives			
No Action		857,404	
Mechanical Dewatering + Ship to Juneau		3,277,921	
Composting		4,186,932	
Mechanical Dewatering + Monofill		4,754,437	

The most important advantage of sludge composting is that it would provide a local sludge disposal opportunity that doesn't require space in the permitted landfill area. Incineration and monofill have issues. The compost product, if PFAS test results allow, could be used for non-agricultural applications such as landscaping, for example the revegetation of the ditch at the DRC that was rerouted in 2024.

The DRC food composting program has provided experience that will benefit a sludge composting program and that should be taken into account when calculating operating costs. The food waste composting operation would be completely separate.

The cost estimate for the screw press in Alternative 1A is $100,000. The cost estimate for the screw press in Alternative 2E is $450,000. Is it the same screw press?

Alternative 1A specifies a 1200 square foot enclosed treatment building to house the screw press costing $600,000. Alternative 2E specifies a 4500 square foot composting structure costing $1,350,000. Is an enclosed treatment building to house the screw press included in the cost of the 4500 square foot composting structure?

The current DRC composting operation handles 50,000 to 70,000 pounds of food waste and produces 10-20 cubic yards of compost annually. The City has a detailed design for a new 900 square foot, five bay food waste composting building at the DRC that will replace the current 1400 square foot Quonset hut. In 2022 PND Engineers estimated the cost to construct the new compost facility at $445,000. The HDR report estimates 24 cubic yards of sludge produced annually by the screw press that could be composted. HDR should look more closely at the proposed 4500 square foot covered area necessary for a sludge composting operation considering the DRC's experience with composting food waste.

Disposal of the compost in the landfill or using it to cover the landfill does not fit into the landfill manager's operating plan and would make a mess in the landfill.

Odor could be an issue.

Some details about the Petersburg sludge composting operation would be good.

PFAS and Composting

A septage treatment facility design for composting needs to include management of septage containing PFAS. The plan should be based on using sampling data to determine if septage contains PFAS before it's treated, what the PFAS limits should be and what the disposal criteria is for septage that tested positive for PFAS. Perceptions about potential PFAS contamination without a testing program to validate actual PFAS content should not influence the selection of a preferred alternative. Current federal and state regulations for disposal of septage and leachate containing PFAS are not clear. The drinking water standard could be used as the criteria. The facility design should include provision for treating septage and disposing of the sludge containing PFAS, such as having the option to ship PFAS sludge to Juneau.

An example of a wastewater PFAS management plan could be that the septic tanks in the known PFAS plume and some margin around the plume could be designated as a PFAS risk. Tanks from this area could be pumped on a campaign basis and kept in the holding tanks at the DRC pending PFAS test results. The sampling method and testing costs should be considered. Decisions about how to treat or otherwise dispose of the septage can be made based on test results.

In the report the local disposal of treated septic sludge is not recommended due to PFAS contamination, but disposal of leachate from the treated septage in a drainfield is present in all the alternatives. Does this mean the PFAS concentrates in the sludge and the leachate is expected to be uncontaminated? There are no drinking water wells in the vicinity of the DRC that could become contaminated.