ADDENDUM TO PROPOSAL DOCUMENT(S)

ADDENDUM NUMBER: 1	**DATE OF ISSUANCE**: 2/28/2020	**PAGE NUMBER**: 1 of 1

PROPOSAL NUMBER & TITLE: 20-087P Waste Management Project

ISSUING OFFICE:

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PREVIOUS ADDENDUM ISSUED: NA

Addendum Number	Date of Issuance

DEADLINE FOR SUBMISSION OF QUESTIONS:
As Advertised: 4/22/2020 @ 5:00 PM
Revised by Addendum Number: NA
Revised to: NA

DATE AND HOUR OF PROPOSAL CLOSING:
As Advertised: 5/14/2020 @ 4:00 PM
Revised by Addendum Number: NA
Revised to: NA

The following corrections, changes, additions, deletions, revisions, and/or clarifications are hereby made a part of the Contract Documents. In case of conflicts between this Addendum and previously issued Documents, this Addendum shall take precedence. **The proposer must acknowledge receipt of this Addendum in the space provided on the Submittal Page**, failure to do so may subject the proposer to **disqualification**.

CHANGES TO THE PROPOSAL DOCUMENT:

1. Change all references to project name to:

   Septage and Waste to Energy Facilities for Waste Management

ADDENDUM ATTACHMENTS:

1. Technical Memo Market Analysis (6 Pages)
2. Crevasse-Moraine Neighbors United letter dated July 6, 2019 (4 pages)

END OF ADDENDUM

APPROVED BY: Signature on File

Technical Memorandum

Date:	January 10, 2019
Project:	Matanuska-Susitna Borough, Waste and Septage Planning Assistance
To:	Matanuska-Susitna Borough
From:	HDR, Inc.
Subject:	DRAFT Focused Market Analysis – Products from Waste Digestion

Introduction

The Matanuska-Susitna Borough (MSB), located in the state of Alaska just north of the Municipality of Anchorage and encompassing the Matanuska and Susitna rivers, is exploring alternatives in managing the waste produced by its residents and businesses. As a part of this exploration process, MSB desires to better understand the current market capabilities for an integrated waste management solution to manage residues from the Borough's existing solid and future liquid waste management facilities. In preparing to engage the private sector in the exploration of alternatives, MSB wishes to understand the values of potential byproducts that could be produced from the waste materials. MSB requested HDR, Inc., to evaluate the following commodities:

- Heating Oil;
- Diesel;
- Electric Energy;
- Fertilizer and Compost;
- Natural Gas; and
- Recycled Glass.

This memo presents market data on products that may be produced in the waste digestion process and serves to provide insight and understanding of the current market value of byproducts of waste digestion nationwide. Where available, Alaska-specific data was utilized however nationwide data better articulates the existence, or lack thereof, of available markets.

This market analysis develops reasonable values for pure forms of the described commodities. Cost considerations to generate or purify the described commodities for market sales are not considered. Volume-metric data is not available at this time but, typically, products generated in higher volumes (full truck loads) are more valuable to buyers because of a decrease in overhead to retrieve the commodity. Cost factors not included in this analysis include:

- Regulatory compliance; e.g., does the manufacture or use of diesel fuel require site-specific air permit amendments.
- Maintenance and engine life variance; e.g., does biodiesel with a higher acidity decrease the life of equipment used by the organization.
- Cost associated with manufacturing or refining a pure, certified product.

As an analogy, diesel fuel may be valued at $3.20 per gallon, but this value is to the consumer putting diesel in their vehicle; the cost per gallon has certain tax implications, profit margins, liability insurances, and corporate overhead rates involved in providing a commodity that is publicly trusted with a corporate backing.

Heating Oil

Heating oil in the U.S. is defined by ASTM Standard D396 and often referred to as heating oil No. 2. It is most similar to a blend of diesel and kerosene. Heating oil is produced by a refiner and can be made from industrial feedstock as well as from byproducts of the oil refining process. This oil is used in an atomized burner, where the oil is sprayed into a combustion chamber, and often has a low sulfur requirement associated with its consumption (ASTM D396 2018). Heating oil with up to 20 percent biofuels blends are used in the U.S. The U.S. Department of Agriculture published information emphasizing these biofuels are typically manufactured from homogenous industrial feed stocks of corn, soy beans, or cellulosic (wood) material (Radich 2016).

For the winter of 2017–2018, heating oil in the United States averaged **$2.78** per gallon during the winter months as sold to the consumer. The U.S. Energy Information Administration (U.S. EIA) estimates that for the winter of 2018–2019 heating oil will cost approximately **$3.17** per gallon, and due to forecasted winter temperatures, the average U.S. household will increase consumption of heating oil 1.3 percent. Wholesale heating oil prices hover around **$2.00** per gallon and the value of industrial feedstock is approximately **$0.70** per gallon (U.S. EIA, November 2018).

In Massachusetts, the Green Energy Consumer Alliance sells a heating oil blended with 20 percent biodiesel provided by a third party blender. The Green Energy Consumer Alliance advertises this product as costing consumers 15 cents per gallon less than traditional heating oil. Using winter 2018 estimates, this is valued at **$3.02** per gallon.

Based on this information, it is estimated that industrial feed stock sold to a refiner is valued at less than **$0.70** per gallon, and heating oil refined on-site and sold wholesale is valued at **$2.00** per gallon. Biodiesel blended with heating oil will have a cost savings of approximately $0.15 per gallon (based on estimated value of **$3.02** per gallon). Please note there may be additional regulatory and maintenance issues associated with the consumption of uncertified heating oil in installation boilers.

Local commodity providers include Crowley Maritime Corporation who sells heating oil, natural gas, diesel fuel, propane and other fuel sources in the Anchorage and MSB area. An 8 January 2019 telephone call with a Crowley sales associate confirmed the following information:

- Heating oil is not a common commodity sold in the region as most commercial and residential buildings are now heated with natural gas.
- When heating oil is sold it is delivered in a minimum volume of 300-gals on a regularly scheduled route. This heating oil is sold at **$2.95** per gallon.
- Customers who were considered on call customers would pay **$3.05** per gallon with a minimum of 100 gallons purchased.

This price information is based on the delivered price of heating oil which fluctuates regularly, and cannot be relied upon for the actual expected value of heating oil derived from a bio-blending fuels process.

Diesel Fuel

Diesel fuel or Grade No. 1 fuel oil is a light- to middleweight distillate fuel used in engines requiring fuel with a higher volatility. Diesel engines typically burn at varying loads and speeds, and can be used in low operating temperatures. According to ASTM, diesel fuel contains no bio-blends (ASTM D-975 2018). Since the ability to produce diesel in accordance with ASTM D-975 standards is not feasible, biodiesel markets were also evaluated to better reflect the type of commodity produced.

ASTM D6751 defines the properties of biodiesel. Biodiesel is produced by a reaction of a vegetable oil or animal fat with an alcohol in the presence of a catalyst. The finished biodiesel derives approximately 10 percent of its mass from the reacted alcohol. Biodiesel has a higher acidity than diesel fuel and can lead to an increase in engine corrosion. Components of biodiesel may come out of solution when exposed to low temperature; additional research is being conducted to determine whether filtration or additives can prevent this from occurring (ASTM D651 2016). Any biofuel generated would need to be refined to be usable; when produced it will be high in impurities.

According to the U.S. EIA, diesel fuel in the U.S. is valued currently at **$3.28** per gallon, running a market spot check of consumer diesel fuel prices in Anchorage, Alaska, confirmed this diesel value at the consumer level. Wholesale prices for diesel in Anchorage are currently **$1.86** per gallon. Based on this information, it is estimated that diesel fuel sold will be valued less than **$1.86** per gallon, and diesel fuel used on site will be valued at **$3.28** per gallon in cost savings for the commodity itself. There may be additional regulatory and maintenance issues associated with the consumption of uncertified diesel fuel in installation engines (U.S. EIA, November 2018).

Electric Energy

Electrical energy is valued at an average of **$0.1046** per kilowatt hour nationwide. In Alaska, electricity has an average value of **$0.201** per kilowatt hour (U.S. EIA, October 2018). Locally, the MSB purchases electricity from the Matanuska Electric Association (MEA) at a value of approximately **$0.13** per kilowatt hour. MEA offers a net metering program in accordance with 3 AAC 50.900 of the Alaska regulations. Under the current system, renewable energy systems with a capacity up to 25 kilowatts (kW) are eligible for net metering on MEA's system with a non-firm purchased power rate (buyback rate) of approximately **$0.08** per kilowatt hour per a January 9, 2019 telephone call with an MEA sales associate. The buyback rate is adjusted on a quarterly basis in conjunction with MEA's quarterly rate filings to the Regulatory Commission of Alaska.

Additional coordination between the MSB and MEA would be required to set specific terms based on the size of the MSB system, but it can be assumed that following capital investments to produce electricity and infrastructure upgrades to sell electricity, any electricity produced and used at the facility will result in a cost savings of approximately **$0.13** per kilowatt hour, and electricity can be sold back to the utility/community at a rate of approximately **$0.08** per kilowatt hour.

Fertilizer and Compost

Fertilizer consists of chemical nutrients including nitrogen, phosphorus, potassium, calcium magnesium, sulfur, copper, iron, and other micro-elemental nutrients. Fertilizers are typically lab tested and may be augmented with ammonia, potassium minerals or other compounds (U.S. EPA,

N.D.). Fertilizer in Alaska may include specific formulation for growth in Alaska. Fertilizer is typically sold in concentrated amounts to feed or treat plants in soil; it is valued at **$2.97** per pound.

Composting is a process that decomposes plant and other organic waste under controlled conditions. A composting program may include yard wastes only (leaves and grass clippings) or may be a compostable municipal solid waste program that includes yard wastes, food wastes, and other degradable organic matter. Composting procedures include collecting wastes, forming wastes into piles, and aerating the material until an organic-rich material is produced. It can be conducted with little or low-technology equipment. The finished organic-rich material may be lab tested to inform the consumer on the nutrients in the material, or may be sold to the consumer without analysis. Compost may also be heat treated to prevent the spread of noxious weeds. Compost is valued at about **$100** per cubic yard of compost in Anchorage, Alaska (Alaska Compost Pricing 2018).

Natural Gas

Natural gas consists mainly of methane, a compound with one carbon atom and four hydrogen atoms. Natural gas also contains small amounts of hydrocarbon gas liquids and non-hydrocarbon gases. Natural gas can be used as a fuel. Anaerobic bacteria—bacteria that can live without the presence of free oxygen—decompose organic waste to produce a gas called referred to as *biogas*. Biogas is 40–60 percent methane. The rest is mostly carbon dioxide and small amounts of other gases.

Biogas can be used for on-site energy generation (whether to make electricity or to power the process itself). Biogas generally measures between 500 - 700 BTU per square foot of gas which is approximately half the heat content of pipeline-quality natural gas. Biogas is also usually acidic, reducing the lifespan of the boiler or engine burning it. Finally, there may be hydrogen sulfide issues when burning biogas which might require filtering, treatment or possible additional air permitting. It was found that pure natural gas is valued at **$11.02** per thousand cubic feet in Alaska (U.S. EIA, October 2018). Based on the above information, it is the conclusion of this market analysis that biogas is estimated to be valued at **$6.38** per thousand cubic feet.

Recycled Glass

A determination will need to be made as to whether the glass will be processed before or after combustion. Both methods to process glass will be labor intensive. Glass with the most value is that which has been sorted by color and has had impurities removed. 100 percent pure glass cullet sorted by color is valued at **$75** per metric ton. Glass with 80 percent purity may cost (a negative value) up to **$-50** per metric ton to find a buyer (Mongeon 2017).

Summary

With the possible exception of recycled glass, there is a market for the commodities evaluated. As noted above, the purpose of this study is to inform MSB of the market values of potential byproducts that could be produced from the waste materials. The market for petroleum and the energy-based products of diesel, electricity, fertilizer, and natural gas are generally on-par with the remainder of the US. The outlier is recycled glass, which generally has a range of value from low to a negative value, based mostly on the cost to transport glass to the recycled glass market. Table 1 below

provides a visualization of the commodity market observed in the Anchorage and MSB area as compared to the national average. Summarizing, HDR finds the commodities explored have commercial value and recommends MSB proceed with the engagement of prospective private sector proponents to offer expressions of interest.

Table 1 Price comparison of commodities

Commodity	National Average Price	Alaska Local Price
Heating Oil	$3.17 per gallon	$2.95 per gallon
Diesel	$3.28 per gallon	$3.28 per gallon
Electric Energy	$0.1056 per kilowatt hour	$0.13 per kilowatt hour**
Fertilizer and Compost	N/A	$2.97 per pound and $100/yd^3
Natural Gas	$12.26 per thousand cubic feet	$11.02 per thousand cubic feet
Glass	-$50 per metric ton	N/A

** - The buyback rate through MEA is currently approx. $0.08 per kilowatt hour for systems up to 25 kW

References

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Green Energy Consumers Alliance. (2018). Accessed from: https://www.greenenergyconsumers.org/heatingoil/considerbiodiesel#how.

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Mongeon, Pierre-Andre. (2017). Recycling Product News. Breaking down the factors behind scrap glass prices. Accessed from: https://www.recyclingproductnews.com/article/27088/breaking-down-the-factors-behind-scrap-glass-prices

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July 6, 2019

John Moosey
Borough Manager
Matanuska-Susitna Borough
350 E. Dahlia Avenue
Palmer, Alaska 99645

cc: Bob Blankenburg, P.E., Program Manager, Solid Waste Program, ADEC
Lori Aldrich, Solid Waste Regional Manager, ADEC
Earl Crapps, Program Manager, Domestic/Municipal Wastewater Treatment Program, ADEC
Vern Halter, Mayor, MSB
Terrance Dolan, Public Works Director, MSB
Mike Camfield, P.E., Project Manager, MSB
MSB Assembly Members Jim Sykes, Matthew Beck, George McKee, Ted Leonard, Dan Mayfield, Jesse Summer, Tam Boeve

Re: Solid Waste Disposal Permit No. SW1A007-20; Septage Treatment; Waste-to-Energy

A group of concerned citizens have recently organized under the name Crevasse Moraine Neighbors United. We are concerned about the Borough's continued disregard of our legitimate objections to the Borough's mis-management of operations at the Crevasse Moraine property, often referred to as the Central Landfill. We are acting at this time based upon the Borough's ill-conceived plan to install a septage treatment facility at the Central Landfill, which will unavoidably exacerbate many of the existing problems there, even if it actually works, and because the existing Solid Waste Disposal Permit for the Central Landfill is due to expire in about eighteen months. Eighteen months should be plenty of time for the Borough to act without disruption to essential public services, if it chooses to do so.

Some of us are new to these neighborhoods, and some of us were here in 1984 when the Borough promised that the Central Landfill would be closed in 20 years and rehabilitated into a recreational facility. We acknowledge in advance that we have little faith in the Borough willingness to act in good faith, and thus we believe it is time to involve State authorities. Our lack of faith is based on the Borough's consistent failure to timely and effectively notify affected landowners and solicit our input on the Borough's Central Landfill development plans, failure to act on our input into the management of the greatest nuisance in our neighborhoods, and failure to live up to the promises made to us over many years related to management of the Central Landfill property.

We have reviewed the documents posted by the Borough related to the proposed Central Landfill septage and leachate treatment facility, including the June 3, 2019 memorandum by Mr. Dolan, and have found no meaningful analysis of options that did not involve adverse impacts to our neighborhoods. There is a vague discussion about creation of a waste to energy facility at the Central Landfill property in the preliminary engineering report by Clark Engineering dated

February 8, 2018, that includes no discussion of the adverse impacts anticipated, or why the Central Landfill property is the appropriate location for this facility.

Therefore, we are giving you notice that we will be opposing any and all efforts to locate a waste to energy or septage/leachate treatment facility on the Central Landfill property. In addition, we will challenge any attempt to renew, extend, or replace the Alaska Department of Environmental Conservation (ADEC) Solid Waste Disposal Permit No. SW1A007-20 for the so-called "Palmer Central Landfill". We oppose extension of landfill operations or creation of a septage treatment facility at the Central Landfill on a number of grounds. Foremost, the Borough has known about the problems related to its use of this site as a landfill for over 35 years, and has yet to resolve those problems in a manner that protects our neighborhoods and our quality of life.

We have reviewed the 2019 ADEC inspection letter dated June 19, 2019, and believe that the inspector must have conducted that inspection immediately after a clean-up day, as the inspection report does not correspond with documented photographs and what we see on a daily basis. When a refuse transfer site was operated on the Crevasse Moraine property, there was a significant problem with trash blowing from that site into our neighborhoods. The Borough promised in 1984 that the new Central Landfill would be constructed in such a manner that blowing trash would not be a problem. As of this date the wind distribution of trash from the landfill continues and has not been mitigated. The Borough's long-term inability to comply with the requirements of State law, specifically 18 AAC 60.340(a), makes it clear that Crevasse Moraine is an inappropriate location for landfill activities. Land clearing for the proposed septage and leachate treatment facility, and related gravel extraction, has only allowed more trash to blow off the permitted landfill site.

Transport of trash from the landfill by birds has also not been abated despite complaints over many years and the bird mitigation policy and procedure required by ADEC. This trash not only includes nuisance items like common food waste, but also includes items such a parts of animal carcasses, diapers containing human feces, and other contaminated waste. This has the potential to be a significant health hazard for the surrounding neighborhoods. We have not seen the Borough undertake any effective action limiting bird access to garbage at the Central Landfill. The Borough's failure to control bird vector access to garbage is a continuing violation of 18 AAC 60.230(a)(2), 18 AAC 60.230(b), and 18 AAC 60.340(a). The Borough's inability to control bird access also causes significant concern about the safety of any open air septage or leachate treatment lagoons.

The Borough's recently announced plan to import spruce bark beetle contaminated wood into the Central Landfill without any public review exacerbates this nuisance problem. The Borough has not published for public review or comment any comprehensive plan to treat contaminated wood in a manner that destroys the beetles immediately upon delivery to the landfill. Absent implementation of such a plan, the Borough cannot pretend that it can contain bark beetles to the Central Landfill property, and a failure to do so is a clear violation of 18 AAC 60.230(a)(1) and 18 AAC 60.233(2). We already have a substantial bark beetle infestation problem in the Crevasse Moraine neighborhoods and trail system, there is no justification for making it worse

The Borough has exposed its neighbors to landfill gas containing explosive methane emitted from the Central Landfill. The ADEC has received and documented numerous complaints. We do not know, and do not want to find out the hard way, that this landfill gas has exceeded the limits established by 18 AAC 60.350. Depending on localized weather conditions the level of landfill gas emissions and stench from decomposing garbage in the Central Landfill reach nuisance levels in the surrounding neighborhoods. The failure to control the widespread obnoxious odors and hazardous gas emissions is a violation of 18 AAC 60.233(2). Complaints to Borough officials about the landfill gas problem have not been responded to, indicating that the Borough is either unwilling or unable to resolve this problem. Adding to the volume of refuse disposed at Central Landfill will only continue to accelerate and exacerbate the current situation over a longer term.

Noise levels related to the Central Landfill, including the excavation of gravel related to approved or proposed landfill related operations, have also reached nuisance levels. Industrial noise levels in residential neighborhoods is a nuisance in violation of 18 AAC 80.233(2). While some industrial noise during normal business hours, 8:00 a.m. to 5:00 p.m. might be unavoidable, there should be no industrial operations related to the landfill intruding on neighboring properties outside of those hours.

The Borough's management of landfill related traffic at Crevasse Moraine is deficient in a multiple ways. First, on many early mornings and evenings after landfill operations are officially closed the North 49th State Street gates to the landfill are left open with no supervision of landfill access. This is a clear violation of the access control requirements of 18 AAC 60.220(1) and (2). This lack of access control creates an obvious public safety problem and indicates that all after-hours landfill operations at the Central Landfill must cease.

Second, the level of traffic generated by the Central Landfill and associated Gravel mining and contruction on North 49th State Street has reached nuisance, if not hazardous, levels in violation of 18 AAC 60.233(2). Landfill related traffic now frequently blocks access to North 49th State Street from neighboring subdivision roads on weekends and some weekdays. The semi trucks removing gravel from the Central /landfill are too large to mix safely with the residential street design and traffic on North 49th State Street. During the busy morning and early evening traffic times, the large multi-trailer garbage trucks take up too much space on this residential road when pedestrians (typically school children) are occupying the shoulders. The addition of septic tankers to the existing traffic mix will only compound this issue.

Finally, 18 AAC 60.233(2) specifies that: "The owner or operator of a landfill or solid waste treatment works **shall ensure that** dust, odor, noise, traffic, **and other effects** from the operation of the facility do not become a nuisance or a hazard to the public health, safety, or welfare." (emphasis added) We have not received adequate information, notice, or an opportunity to be heard about the Borough's proposed landfill leachate and septage treatment facilities on the Crevasse Moraine property. By proceeding with these projects without reasonably seeking input from those who will clearly be impacted by these landfill related developments, and incorporating that input into any ongoing project development plans, the Borough is violating its obligations under 18 AAC 60.233(2).

The only rational cure for all of these State law violations is to allow Solid Waste Disposal Permit No. SW1A007-20 to expire. Expiration of this Permit would require the Borough to relocate its landfill and associated operations to a less populated and more environmentally appropriate location where these services can be provided in conformance with State law. By giving the Borough notice now of our intention to oppose any waste to energy, septage treatment, or renewal, extension, or replacement of the Solid Waste Disposal Permit, we give the Borough sufficient time to find an environmentally appropriate site for a septage treatment facility and future landfill operations.

If you have any questions related to this letter, please do not hesitate to contact us.

Sincerely,

Crevasse Moraine Neighbors United
P. O. Box 1693
Palmer, Alaska 99645

We are members of Crevasse Moraine Neighbors United, and we agree with the positions taken in this letter.

John E. Thiel Jr.