Staff report

DATE:	September 5, 2017
	FILE: 5360-60
TO:	Chair and Directors Comox Valley Regional District (Comox Strathcona Waste Management) Board
FROM:	Russell Dyson Chief Administrative Officer
RE:	Waste to Energy Business Case Assessment – Status Update

Purpose
The purpose of this report is to provide information and recommendations regarding the Comox Strathcona Waste Management (CSWM) waste to energy (WTE) business case assessment.

Policy analysis
At the June 8, 2017 CSWM board meeting, the following resolution was passed:

> *THAT the Comox Valley Regional District (Comox Strathcona Waste Management) Board approve the draft request for information for Waste-to-Energy Technologies prepared by Morrison Hershfield;*
>
> *AND FURTHER THAT the Comox Valley Regional District (Comox Strathcona Waste Management) Board approve the issuance of the request for information (RFI) for Waste-to-Energy Technologies.*

At the August 10, 2017 meeting of the WTE select committee of the CSWM board (select committee) the following resolutions were passed:

1. *THAT the Waste to Energy Select Committee support the findings of Morrison Hershfield's technical memo.*
2. *THAT the Waste to Energy Select Committee carry forward three technologies/vendors – WTT Netherlands BV, Eco Waste Solutions and Sustane Technologies Inc – for more detailed analysis in the next stage of the CSWM Waste to Energy Assessment.*

Executive summary
At its June 8, 2017 meeting, the CSWM board approved the draft request for information (RFI) for WTE technologies prepared by Morrison Hershfield, as well as the issuance of the RFI. The RFI was posted publically on June 13, 2017, with a closing date of July 14, 2017. Six submissions were received and evaluated based on critical and detailed evaluation criteria agreed upon by the select committee earlier in the assessment process, and the results were compiled in a technical memo by Morrison Hershfield (provided as Appendix A).

The results of the RFI evaluation were presented by Morrison Hershfield to the select committee at their August 10, 2017 meeting. Overall, based on the four main evaluation criteria (innovation and risk, technology, environmental and social, and economics and affordability), WTT Netherlands BV and Eco Waste Solutions were ranked as the top two technologies/vendors.

According to Morrison Hershfield's original scope of work, following the evaluation and ranking of the RFI submissions, the top two ranked technologies/vendors are to be carried forward to a more detailed assessment, including cost and greenhouse gas modeling. However, during the August 10, 2017 meeting, the select committee requested that a third vendor be brought forward into the detailed evaluation (Sustane Technologies Inc.), based on the unique technology proposed as well as its high ranking in the environmental sensitivity analysis.

Morrison Hershfield has identified that bringing forward a third vendor/technology into the detailed evaluation phase of the WTE assessment will require an additional budget of $14,600 (excluding applicable taxes), and an additional 78 hours of work time. The current budget for the project is $86,900 (excluding applicable taxes), and 427 hours of work time. Completing the additional analysis will also result in a revised deadline for submitting the final WTE assessment report to the CVRD, from September 14, 2017 to November 3, 2017.

The final CSWM WTE assessment report to be provided by Morrison Hershfield in November 2017 will include a detailed cost comparison between viable WTE alternatives and ongoing CSWM landfilling activities. This comparison will take into consideration necessary costs associated with running the CSWM service such as landfill upgrades and development, recycling and diversion activities, and equipment use, all of which will continue to be required with or without the implementation of a WTE technology. In this way, a comparable $/tonne value can be estimated for viable WTE technologies and landfilling activities, and a direct comparison between the two options can be carried out.

The final CSWM WTE assessment report will also examine the potential impact of regional organics composting on WTE technology, including how the removal of organics from the municipal solid waste stream might impact a WTE facility, and if a threshold exists beyond which it is no longer feasible to have both facilities (WTE and regional organics composting) operating in the same service area.

Recommendations from the Chief Administrative Officer:
THAT the Comox Valley Regional District (Comox Strathcona Waste Management) board approve moving forward with three technologies/vendors – WTT Netherlands BV, Eco Waste Solutions and Sustane Technologies Inc – for more detailed analysis in the next stage of the CSWM Waste to Energy Assessment, at an increased project cost of $14,600 (excluding applicable taxes) and a revised project deadline of November 3, 2017.

Respectfully:

R. Dyson

Russell Dyson
Chief Administrative Officer

Prepared by:	Concurrence:
L. Butler	***M. Rutten***
Lisa Butler, P.Eng Engineering Analyst	Marc Rutten, P.Eng General Manager of Engineering Services Branch

Attachments: Appendix A – Morrison Hershfield technical memo "Evaluation of RFI Submissions for Energy Recovery Technologies"

MEMORANDUM

MORRISON HERSHFIELD

TO:	Lisa Butler, P.Eng., Engineering Analyst, CVRD	ACTION BY:	NA
FROM:	Konrad Fichtner, P.Eng.	FOR INFO OF:	The CSWM Select Committee
PLEASE RESPOND BY:		PROJECT No.:	5170574
RE:	Technical Memo – Evaluation of RFI Submissions for Energy Recovery Technologies	DATE:	August 3, 2017

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1. EXECUTIVE SUMMARY

On behalf of Comox Strathcona Waste Management (CSWM), Morrison Hershfield is conducting research into the feasibility of applying waste to energy (WTE) technologies to the solid waste generated in the Comox Valley Regional District (CVRD) and the Strathcona Regional District (SRD). As part of the process, a request for information (RFI) was issued to suppliers of WTE systems and also refuse derived fuel (RDF) suppliers. This memo summarizes the evaluation of the submissions received.

The RFI received a total of six submissions, of which five were directly related to the production of conventional RDF from municipal solid waste (MSW). Only one submission was for traditional (thermal) WTE:

- Eco Waste Solutions (“EWS”) – Traditional WTE through combustion
- REDWAVE, a Division of BT-Wolfgang Binder GmbH – RDF production
- SALT Canada Inc. – Aerobic landfill with subsequent mining and RDF production
- Sustane Technologies Inc. – Mechanical separation, pyrolysis of plastics and RDF from balance
- Wastaway – RDF production
- WTT Netherlands BV – Anaerobic Digestion (AD) of organics and RDF from balance

Each submission was evaluated through a two-tier process, first against Essential Criteria and then against Desirable Criteria. The Essential Criteria include suitability for volumes and types of materials expected, ability to produce surplus energy/fuel, and be mature enough for commercial implementation. All the submissions met the Essential Criteria, and were assessed further against Desirable Criteria.

The major categories of Desirable Criteria are:

- Innovation and Risk.
- Technology.
- Environmental and Social.
- Economics and Affordability.

All six vendors provided sufficient details to carry out the evaluation process effectively and all (with limited reference facility information from SALT) had a number of reference facilities operating at or above the potential feedstock generation rates anticipated for the CSWM service area.

On completion of the evaluation process the submissions were ranked as shown in Table ES1.

Table ES1: Ranking of Submissions

VENDOR	TECHNOLOGY	SCORE
WTT	AD and RDF	83%
EWS	Thermal WTE	81%
REDWAVE	RDF	79%
Sustane	RDF and pyrolysis	77%
WastAway	RDF	75%
SALT	Aerobic Landfill, RDF	54%

As can be seen in the above rating table, the top two technologies/vendors have very similar scoring. However, the scores are achieved for different reasons:

- WTT has the highest score because they produce both energy and fuel. Markets for the energy (electricity or bio-gas) are proven and available; while the markets for the RDF are somewhat speculative at this time. The technology is proven and less costly than thermal WTE. Emissions are minimal at the location of the facility, but there will be emissions where the RDF is burned and these cannot be determined until the user of the RDF is known.
- The traditional WTE offered by EWS is proven, reliable, and the markets for the main energy recovered (electricity) are always there. Additional waste heat will be available which could lead to the development of facilities that require heat, such as greenhouses. The major downside to traditional WTE is the cost, which is substantially higher than for the offered RDF technologies.

The other RDF technologies have slightly to substantially lower scoring, depending on the performance of the technology and the information provided.

In summary, traditional WTE is a proven technology with secure markets for the energy and a high degree of landfill space savings, but it is expensive compared to most other technologies. RDF is substantially less expensive than WTE, mostly because the actual combustion takes place at an existing facility somewhere else that will burn the fuel produced. The biggest risk with RDF is finding long term markets for the product, without which none of the proposed RDF technologies would meet their goal of being net energy producers and diverting a large amount of waste from landfilling.

It is proposed to continue work carrying forward the WTT technology combination of AD and RDF, and the EWS technology of conventional WTE. These will be researched in more detail so that cost information can be put into the existing model to determine ultimately how these technologies compare financially with landfill expansion. Other components of the study, such as siting issues, regulatory requirements and consultation plan development will take place in parallel. The final report will also include levels of residuals, integration options, timelines, and GHG emissions.

2. PURPOSE

Morrison Hershfield (MH) has been retained by Comox Strathcona Waste Management (CSWM) to seek information from qualified waste-to-energy (WTE) technology vendors through a request for information process. The purpose is to gather and compare technology information and costs from technology suppliers/vendors interested in participating in an assessment of WTE for managing municipal solid waste (MSW) in the Comox Valley Regional District (CVRD) and the Strathcona Regional District (SRD).

Morrison Hershfield was commissioned to evaluate the Vendor submissions and present results to the CSWM WTE Select Committee for discussion. This technical memorandum (Memo) describes the evaluation process for the vendors, summarizes the vendor technologies and identifies the top scoring submissions.

3. RFI PROCESS

Vendors of the various energy recovery technologies were invited to submit responses to a Request for Information (RFI) posted on BC Bid on June 13, 2017. Appendix A contains the RFI documents that were posted publically. In addition, specific vendors, primarily based in Europe, were approached and referred to the BC Bid website for access to the RFI. The European vendors were selected on the basis of the Consultant team's knowledge of firms who provide the selected technologies. The vendors were given until July 14 to submit responses to the RFI.

The purpose of the RFI was to obtain vendor specific information so that technologies could be ranked for suitability to CSWM. The RFI provided background information and clarified that technologies must be capable of processing quantities equivalent to approximately 125 tonnes MSW per day from the CSWM area.

A total of six different vendors of mixed municipal solid waste (MSW) processing and energy recovery technologies responded, as follows:

- Eco Waste Solutions ("EWS")
- REDWAVE, a Division of BT-Wolfgang Binder GmbH
- SALT Canada Inc.
- Sustane Technologies Inc.
- Wastaway
- WTT Netherlands BV

4. SUMMARY OF TECHNOLOGIES OFFERED BY VENDORS

4.1 Eco Waste Solutions ("EWS")

EWS is a well-known Canadian supplier of smaller conventional incineration systems. EWS is proposing that the WTE facility will comprise two EWS Enercon Thermal Conversion Modules. Each module will have a capacity of 100 tonnes per day. The system operates under excess air conditions with precisely controlled combustion through temperature and oxygen level controls and flue gas recirculation.

Air pollution systems are included and are generally provided by companies specialized in supplying this equipment. Air pollution equipment can be specified to meet emission limits, or even stay well below them if desired.

The system is designed to produce electricity or steam, or both. The bottom ash by-product has been tested according to U.S. EPA. All test results have been well below any standards set by these regulatory agencies and have proven the ash to be non-hazardous, non-leaching and essentially inert. The vendor claims that beneficial use can include road construction backfill, road re-surfacing material, aggregate replacement in cement, landfill cover or a beneficial additive to some soils to improve drainage or correct pH.

There are numerous facilities currently using this technology and it is well proven.

4.2 REDWAVE, a Division of BT-Wolfgang Binder GmbH

REDWAVE offers a mechanical-biological waste treatment technology for the mixed residual MSW. Mixed waste is mechanically separated into wet (organics) and dry components and sensor-based sorting recovers recyclables from the dry component. The wet organics are biologically dried and stabilized, and together with the residue from dry sorting are converted into a refuse derived fuel (RDF). RDF can be utilized in cement kilns, pulp mills and or other industry with high energy demand to offset fossil fuels. The vendor mentions two pulp mills located on the Island, in Port Alberni and Crofton, as potential markets, however no market for the RDF has been established.

This is a proven technology in Europe. It is generally not used in Canada due to its cost and difficulties in establishing long term markets for the RDF.

4.3 SALT Canada Inc.

SALT Canada Inc. offers a technology that consists of two distinct steps. In the first step, conventional landfill cells are made aerobic (similar to composting) by injecting large amounts of air. The waste is stabilized and the cell can be opened and mined within four years. In a second step, valuable materials (recyclables) are then mechanically extracted and the remaining waste is processed into fuel or RDF while the landfill cell can be used for repeat filling. This requires an overall time frame of six years between final cell filling and preparation for the cell for further waste acceptance.

This is a somewhat unusual approach and to the best of our knowledge has not yet been successfully applied in its entirety. Anecdotally, landfills are rarely mined due to high cost, and when they are mined it is generally to create new space for disposal. There is a substantial risk that the recovered materials will be contaminated and have a low value. As with any RDF, the challenge is finding long term markets for the fuel.

4.4 Sustane Technologies Inc.

The technology offered by Sustane is using a proprietary de-bonding, separation and cleaning processes, to obtain end products including clean biomass pellets, synthetic diesel, and metals. The biomass pellets are not considered a refuse derived fuel (RDF) as they contain virtually zero plastics. The vendor claims that this has been done in Nova Scotia where the fuel has been certified by the Department of Environment, Nova Scotia, as recovered biomass, with all the attributes of forest based biomass.

Plastics are separated and the low-density plastics fraction is processed into a synthetic diesel product for internal use (25%) and also for sale (75%).The remaining part of the MSW is bio dried and pelletized to create biomass and biodiesel for local markets. The synthetic diesel product will achieve ASTM specifications, typically at a 50% blend and will be sold as a marine diesel or industrial/commercial fuel oil (No. 2) replacement.

Based on the Vendor's experience in Nova Scotia, the proposed facility will generate recovered materials that can stimulate additional "green" businesses at the location. The submission suggests that CSWM may wish to consider an "Eco-Park" concept to reap the benefit of this enabling technology.

The vendor stated that they can offer the biomass pellets at a price discount to forestry-based biomass to facilitate the sale process for use in pulp and paper boiler applications.

This technology has been proven in Europe and the first Canadian plant is currently under construction in Chester, Nova Scotia. This operation will process 200 tonnes per day of MSW. A facility in Madrid, Spain, has a relatively similar throughput to the one requested with a 100 tonne per day (built in 2010).

4.5 WastAway

WastAway proposes a technology which processes MSW to RDF. A multi-stage process includes pre-shredding of MSW, metals removal, inerts screening, a Hydrolyzer (a form of continuous-flow autoclave), dryer and pelletizer to form RDF. Only one operational plant exists in the U.S., and this facility is more of a demonstration facility than a commercial one. The preparation fuel is relatively recent for this reference plant.

WastAway identified Nanaimo Forest Products – Harmac Pacific Pulp as a potential buyer of the RDF for use in their boilers. The submission names David Bramley, Environmental Superintendent, to be available to confirm interest if required. The interest has not been confirmed at this stage.

4.6 WTT Netherlands BV

Waste Treatment Technologies (WTT) has numerous reference facilities across Europe and proposed two combinations of technologies feasible for CSWM:

- RDF production and biodrying, or
- RDF production, AD and biodrying.

Both these options produce RDF. RDF can replace fossil fuels at cement manufacturers in BC. The option with AD also produces biogas, which can be converted into electricity/heat. The biodried product can be upgraded/refined to compost for land application. The quality of the compost that comes from the processing of mixed MSW can have numerous contaminants, which may limit end markets for land application.

If a facility is selected to generate AD, the bio drying and AD tunnels can be built as hybrid or dual purpose tunnels. These hybrid tunnels can operate under both anaerobic and aerobic conditions. By operating an AD tunnel as composting tunnel the capacity of the tunnel will be tripled. This technology is therefore very flexible to handle smaller or larger volumes.

This is a proven technology in Europe. No facility using WTT technology to produce RDF is in operation in Canada, however WTT technology is used in the Surrey Biofuel Facility to produce compost and biogas.

5. EVALUATION CRITERIA FOR VENDORS

Each submission was evaluated by two team members through a two-tier process. Each submission was evaluated against Essential evaluation criteria (Table 1) and Desirable evaluation criteria (

Table 2). All the submissions met the Essential Criteria, and were assessed further against Desirable Criteria.

The major categories of Desirable Criteria are:

- Innovation and Risk.
- Technology.
- Environmental and Social.

- Economics and Affordability.
- Submission Completeness.

The team allocated weighting to the key categories based on knowledge of local conditions and client priorities. A sensitivity of these weightings is summarized later in this memo.

Table 1: Essential Criteria Used for Evaluating Technology Categories

ESSENTIAL CRITERIA	GUIDANCE ON EVALUATION	EVALUATION RATING
Suitable for volumes expected	Technologies must have practical applications between 20% and 100% of the expected materials to be processed	Yes/ No
Suitable for types of materials expected	Must be able to process/recover types of waste materials expected in the residual waste	Yes/No
Energy recovery	If technology recovery energy, there must be a new surplus of energy after satisfying plant internal requirements	Yes/ No
Maturity	Technology must be proven with at least one full scale facility that has been in successful continuous operation for a year or more	Yes/ No

Table 2: Desirable Criteria Used for Evaluating Technology Categories with Allocated Weighting

DESIRABLE CRITERIA (WEIGHTING)		GUIDANCE ON EVALUATION RATING
Innovation and Risk (25%)	Technology readiness	1. No commercially operating plant, only pilot scale or demonstration facilities. 2. At least one full scale demonstration facility operating successfully for a year or more. 3. One or more commercially operating facilities for one+ years.
	Energy recovery efficiency/ potential	1. Low energy production (up to 100kWh per tonne of feedstock) or unlikely to find markets as fuel. 2. Moderate energy recovery (100 to 250 kWh per tonne of feedstock) or questionable markets for fuel. 3. High energy recovery (over 250 kWh per tonne of feedstock) or firm markets for fuel.
	Technology risk	1. Emerging technology, can be commercialized but scale-up factor greater than 3 forms significant risk. 2. Emerging technology, full scale systems have been trialed but may be difficult to get bank funding. 3. Proven technology, easy to commercialize, commercial funding should be available with good business case.
Technology (25%)	Operational flexibility	1. Modules can accept only designed throughput, no flexibility for higher or lower volumes of feedstock. 2. Moderate flexibility, can operate efficiently with plus/minus 20% of design capacity. 3. Highly flexible, up to 50% more or less feedstock can be handled.
	Complexity	1. Complex technology with sophisticated control requirements, high maintenance needs, and requires highly skilled operators.

DESIRABLE CRITERIA (WEIGHTING)		GUIDANCE ON EVALUATION RATING
		2. Can be operated with common industrial technical skills; requires regular maintenance and replacement of worn parts. 3. Simple and robust process which can be operated with basic trainable skills.
	Feedstock quality requirements	1. Very strict quality requirements requiring extra processing. 2. Moderate processing required. 3. Can take waste with minimal processing.
	Utility requirements	1. Requires full access to utilities, gas, water, power, and sewer. 2. Requires access to power and water. 3. Power access is all that is required.
	Expected availability and reliability	1. Questionable reliance, unproven. 2. Moderate reliance, availability of 80% expected. 3. Proven High reliability and availability of 90% achievable.
	Suitability for CSWM waste volumes and types	1. Technology modules too large for waste volumes expected. 2. Modules too small and many smaller modules must be used. 3. Well suited for CSWM waste volumes and types.
Environmental and Social (25%)	Emission control	1. Questionable ability to treat all emissions to best achievable standard. 2. Emission control systems fully proven. 3. No stack emissions from this process.
	Greenhouse gas (GHG) emissions	1. Questionable ability to reduce emissions in the local context. 2. GHG reduction likely but depends on end product. 3. GHG reduction guaranteed.
	Social benefits	1. Marginal benefits to the local community (small employment opportunities or limited opportunities for local use of end products, etc.). 2. Some social benefits 3. High potential for social benefits (many employment opportunities or opportunities for local use of end products, etc.).
	Residue to landfill (per tonne input)	4. High (more than 20% by weight). 5. Medium (5% to 20% by weight). 6. Low (under 5% by weight).
Economics and Affordability (25%)	Capital costs ($/tonne of installed annual capacity)	1. High, more than $800 per tonne. 2. Medium, $400 - $799 per tonne. 3. Low, under $400 per tonne.
	Operating costs ($/tonne), excluding capital but including profits from product or energy sales	1. High, over $100 per tonne. 2. Medium, $50 - $99 per tonne. 3. Low, under $50 per tonne.
	Quality of end products	1. Quality product moderate with questionable markets. 2. Good market potential but not yet established. 3. Firm markets already exist.

Where information gaps were identified, the Vendors were approached for further information. If data gaps still existed, the evaluator used his/her best judgement based on professional experience to score the Vendor. All scoring was justified with comments to provide transparency and consistency. Where no information was available from the Vendor and it was not possible to fill remaining data gaps with any confidence, a score of 1 was given against the relevant criteria.

Appendix B provides a summary spreadsheet for evaluation of all vendors.

6. RATING OF SUBMISSIONS

The RFI received a total of six submissions, of which five were directly related to the production of conventional RDF from MSW. Only one submission was for traditional (thermal) WTE.

All six vendors provided sufficient details to carry out the evaluation process effectively and all (with limited reference facility information from SALT) had a number of reference facilities operating at or above the potential feedstock generation rates anticipated for the CSWM service area.

On completion of the evaluation process for technology providers in accordance with the evaluation criteria and weighting shown above, the submissions were ranked as shown in Table 3.

Table 3: Ranking of Submissions

VENDOR	TECHNOLOGY	SCORE
WTT	AD and RDF	83%
EWS	Thermal WTE	81%
REDWAVE	RDF	79%
Sustane	RDF and pyrolysis	77%
WastAway	RDF	75%
SALT	Aerobic Landfill, RDF	54%

A summary of the scoring justification for each vendor is presented below:

- WTT has the highest score because they produce both energy and fuel. Markets for the energy (electricity or bio-gas) are proven and available; while the markets for the RDF are somewhat speculative at this time. The technology is proven and less costly than thermal WTE. Emissions are minimal at the location of the facility, but there will be emissions where the RDF is burned and these cannot be determined until the user of the RDF is known.
- The traditional WTE offered by EWS is proven, reliable, and the markets for the main energy recovered (electricity) are always there. Additional waste heat will be available which could lead to the development of facilities that require heat, such as greenhouses. The major downside to traditional WTE is the cost, which is substantially higher than for the offered RDF technologies.
- REDWAVE is an advanced mechanical recycling and RDF production technology. They have good reference facilities and the system is expected to be reliable. A major unanswered question, as with the other RDF technologies is finding markets for the product, and determining the actual emissions when (and where) the product is burned as fuel.

- Sustane adds to its RDF technology the separation of plastics which are subjected to pyrolysis to create a diesel equivalent fuel. While highly desirable, there have been very limited commercially successful applications of pyrolysis for waste products.
- WastAway offers an RDF process with a special process step that breaks down the microbial structure of the organic materials in the waste. WastAway claims it makes a better fuel, however, the process seems much more complex than other RDF technologies. The firm only has one full scale demonstration facility operating at this time. However, WastAway has gone farther than other firms in establishing potential markets for RDF.
- The SALT technology, while in the end making an RDF, is highly untraditional, and there are many unanswered questions and lacking reference facilities, which resulted in lower scoring.

Vecoplan LLC, which is a well-known and reputable German company, also provides a technology for the production of RDF. Vecoplan did not submit a response to the RFI, but provided to Morrison Hershfield a web link to a video showing both actual video and concept animations of its energy recovery facility installation with the City of Edmonton. Vecoplan could therefore not be evaluated, however, their information supports the feasibility of recovering recyclables and making of RDF through modern mechanical systems, as offered by other Vendors.

7. SENSITIVITY ANALYSIS

A sensitivity analysis was conducted to see what would happen if weighting criteria were changed to focus on **economics/affordability**. With 50% of the weighting on economics/affordability, 20% on environmental and 15% each on technology and innovation, the rankings are modified as shown in Table 4.

Table 4: Submission Rankings with Emphasis on Economics/Affordability

VENDOR	TECHNOLOGY	SCORE
WTT	AD AND RDF	81%
WASTAWAY	RDF	76%
REDWAVE	RDF	75%
SUSTANE	RDF AND PYROLYSIS	74%
EWS	THERMAL WTE	72%
SALT	AEROBIC LANDFILL, RDF	48%

This change in ranking demonstrates the high cost of thermal WTE compared to RDF systems.

The next sensitivity analysis was conducted to see what would happen if weighting criteria were changed to focus on **social/environmental**. With 50% of the weighting on social/environmental, 20% on economics/affordability and 15% each on technology and innovation, the rankings are modified as shown in Table 5.

Table 5: Submission Ranking with Emphasis on Social/Environmental

VENDOR	TECHNOLOGY	SCORE
WTT	AD and RDF	83%
Sustane	RDF and pyrolysis	82%
EWS	Thermal WTE	80%
REDWAVE	RDF	80%
WastAway	RDF	78%
SALT	Aerobic Landfill, RDF	58%

The social/environmental bias results in WTT staying the preferred technology because they recover energy with secure markets through AD in addition to RDF. Sustane benefits from the pyrolysis of plastics to oil.

Overall, the combination of AD with RDF is the preferred technology in all situations. Conventional WTE will rank higher or lower, depending on the emphasis on costs.

8. CONCLUSIONS

Of the six submissions, only one offered conventional WTE technology. All others provided some form of conversion to RDF or other fuel.

Conventional WTE ranked near the top primarily because the technology is well proven and markets for energy (electricity and heat) and recovered metals are also proven. In addition, the bottom ash could be recycled or used for various purposes, resulting in very little residue going to landfill.

RDF processing offered by the various Vendors is also proven, although the degree varies with the technology. The greatest challenge with RDF is finding long term markets for the fuel, and without the markets, the technologies are – simply put – very expensive ways of extracting recyclables and stabilizing the balance of residual waste.

Currently in Canada conversion of waste into fuels is appealing as a solution to reduce landfill disposal needs and to extract the most value from the waste stream. However, some of the technologies that are proposed by the vendors are still not proven in Canada. For example it must be seen how the WTE facility in Halifax, Nova Scotia, which is currently under construction, will deliver and prove the viability for RDF markets. The Halifax facility, which will use the Sustane technology plans to convert the plastics fraction of the MSW into a liquid fuel, similar to diesel fuel, while the organics will be converted into burnable pellets. As a point of interest, a larger waste to liquid fuel plant in Edmonton, which is based on the Canadian Enerkem gasification technology, is considerably larger than what is required for CSWM. Enerkem is considering new facilities only where a minimum of 200,000 tonnes per year of waste are available, which is presumably why they did not respond to this RFI.

Conventional WTE costs can be expected to be over $50 million to build the plant and over $80 per tonne to operate it, after the sale of energy.

RDF plants of the conventional and proven variety will be about $20 million to $30 million to build and $50 to $80 per tonne to operate. The primary unknowns are the market for and value of the RDF. Without a confirmed market, the operating costs would be much higher, since there would be no revenue from the sale of RDF and an additional disposal fee for the stabilized RDF at a landfill.

In summary, traditional WTE is a proven technology with secure markets for the energy and a high degree of landfill space savings, but it is expensive compared to most other technologies. RDF is substantially less expensive than WTE, mostly because the actual combustion component is an existing facility somewhere else that will burn the fuel produced. The biggest risk with RDF is finding long term markets for the product, without which none of the proposed RDF technologies would meet their goal of being net energy producers and diverting a large amount of waste from landfilling.

9. Next Steps

The project will proceed in accordance with the established work plan, carrying forward the two preferred technologies: RDF combined with AD, and traditional WTE. The next tasks are the Assessment of Siting and Regulatory Requirements and Consultation Plan Development. While these are being conducted, outstanding information will be gathered for the two top ranked technologies to enable a more detailed financial evaluation and comparison with current landfill expansion plans.

The final project task is the preparation of a summary report, which will:

- Look at residual waste from the two technology options and potential reuse and disposal options;
- Review possibilities for integrating the technologies with existing infrastructure (Integrated Resource Recovery);
- Integrate the technical options into the existing cost model;
- Develop cost and benefit comparison of a viable WTE alternative vs. the proposed CVWMC Cell 2 and 3 engineered landfill;
- Assess constraints, risks and timelines for selected options;
- Develop key tasks and timelines to commission a viable WTE technology as per the RFP requirements; and
- Provide estimates for potential net GHG emissions of selected WTE options and landfill operations.

The result will be a draft assessment report, which after review will be finalized and presented to the CSWM Board.

APPENDIX 1:
REQUEST FOR INFORMATION

Comox Strathcona
Waste Management

Request For Information

Waste-to-Energy Technologies

Closing Date and Time:

Friday July 14, 2017 at 4:00 PM PDT

Contact Person:

Nathalie Maurer, P. Eng.
Environmental Engineer
Morrison Hershfield
nmaurer@morrisonhershfield.com

1. INTRODUCTION

Comox Strathcona Waste Management (CSWM), a function of the Comox Valley Regional District (CVRD), is seeking information from qualified waste-to-energy (WTE) technology vendors interested in participating in a feasibility assessment of WTE for managing municipal solid waste (MSW) in the Comox Valley Regional District (CVRD) and the Strathcona Regional District (SRD).

There is interest in WTE technologies for managing the residual waste component of the MSW stream. This is due to the current high cost of landfilling and the anticipated need for substantial investments for landfill expansion. Information being requested from WTE technology vendors will be used to undertake an assessment of whether there are financial, social and environmental benefits of applying WTE instead of increasing landfill capacity.

Information from vendors will be used to undertake the WTE feasibility assessment and these vendors will be recognized in the final assessment report as contributors. The final report will become a public document.

2. ACKNOWLEDGMENT LETTER

Upon receipt of the Request for Information document the Proponent shall complete the Acknowledgement Letter at the back of this document and submit the letter to Nathalie Maurer at nmaurer@morrisonhershfield.com or via fax at 604-454-0403.

3. BACKGROUND

3.1 Physical Setting

The Comox Valley Regional District (CVRD) is located approximately 70 km North West of Nanaimo, BC on the east coast of Vancouver Island. The majority of the CVRD's residents reside in Comox, Courtenay and Cumberland. The Strathcona Regional District (SRD) is located immediately north of the CVRD. The majority of SRD's residents reside in Campbell River. The two regional district centres are located approximately 50 km apart. The CVRD covers 1,725 km^2 and the SRD covers approximately 20,000 km^2. The region's climate is one of the mildest in Canada due to moderation by the Pacific Ocean, which also contributes heavy precipitation to the western coast of Vancouver Island.

3.2 Population and Community Growth

Over the next 10 years the southern waste-shed population (CVRD) is expected to grow at an average rate of 1.1% per year and the northern waste-shed (SRD) population is expected to grow at an average rate of 0.6% per year. From 2027 onwards, the population growth is expected to grow at an average rate of 0.9% and 0.3% for the southern and northern waste-sheds respectively. Table 1 below shows the estimated combined population growth for the next 50 years.

Table 1 Projected Population for next 50 years[1]

Year	CVRD Population	SRD Population	Combined Population
2016	66,527	44,671	111,198
2021	69,280	47,390	116,670
2026	73,002	48,661	121,663
2036	79,411	50,269	129,680
2046	86,855	51,798	138,652
2056	94,996	53,373	148,368
2066	103,900	54,996	158,896

3.3 Solid Waste Management System and Waste Generation

The Comox Strathcona Waste Management (CSWM) service covers waste management for both regional districts (CVRD and SRD). For additional information on the CSWM system the 2012 CSWM Solid Waste Plan can be found at the following link: http://www.cswm.ca/files/CSWM_amended_solid_waste_plan_2013.pdf.

Two main landfills are used for disposal of the majority of the region's waste. The Campbell River Waste Management Centre (CRWMC), located near Campbell River, handles waste from the SRD while the Comox Valley Waste Management Centre (CVWMC), located in

[1] Sub-Provincial Population Projections - P.E.O.P.L.E. 2016 (Aug 2016)

Cumberland, handles waste from the CVRD. The CVWMC is currently being expanded with a new engineered landfill and the CRWMC is expected to close in the next 5-6 years.

There are extensive recycling programs throughout the regions and centralized composting is also being implemented to remove organics from the waste stream. The goal of both regions is to achieve 70% diversion through recycling and composting by 2022 according to the Comox Strathcona Solid Waste Management Plan.

The landfill disposal for 2016 was 63,390 tonnes[2]. Of the total, approximately 58% of the waste was landfilled at the CVWMC and 37% went to the CRWMC. The remainder of the waste was disposed at small, remote landfills in Tahsis, Zeballos and Gold River.

To estimate the projected waste disposal tonnages, it was assumed that with the implementation of composting and additional recycling will result in a 30% decrease in the disposal rate. The estimated disposal tonnages for the next 50 years are shown in Table 2 below. Respondents to this RFI should assume 2021 tonnages for implementation of a WTE facility (this is after implementation of a regional organics management program, and the earliest that a WTE facility could conceivably be built).

Table 2 Projected Disposal Tonnages for next 50 years (based on 2016 per capita disposal rate less 30%)

Year	CVRD Disposal (tonnes)	SRD Disposal (Tonnes)	Total Disposal
2016	37,925	25,465	63,390
2021	27,646	18,911	46,557
2026	29,131	19,418	48,549
2036	31,689	20,060	51,748
2046	34,659	20,670	55,328
2056	37,908	21,298	59,206
2066	41,461	21,946	63,407

There is no waste composition analysis currently available for the CSWM area. Typical waste composition for mid-sized communities in BC may be used if required. Waste composition studies conducted by Nanaimo, BC would have similar values to the study region and the 2012 CSWM Solid Waste Management Plan provides an estimated composition of waste disposed.

3.4 Heating Value of MSW

Waste reduction initiatives are being implemented to achieve a 70% diversion rate, which results in an estimated heating value that could range from 11 – 13 GJ/tonne. New waste diversion is being achieved through the Province of BC's Product Stewardship expansion, which targets primarily packaging, and waste diversion will also be substantially improved

[2] CSWM 2016 Disposal Tonnages

through the construction of a regional composting facility. The reduction of food waste will increase the heating value of the waste, although this will be partially offset by the removal of large amounts of plastic and paper/cardboard packaging. It has been conservatively estimated by Morrison Hershfield that the lower heating value of waste, as received, will be 11 FGJ/tonne in the future once 70% diversion has been achieved.

3.5 Provincial Regulations and Guidelines

The BC Ministry of Environment (MoE) has issued a guideline document for the inclusion of WTE in solid waste management plans. The document may be found at http://www.env.gov.bc.ca/epd/mun-waste/guidelines.htm. The primary elements of the document that apply to this information request are:

- The Ministry expects local governments to have a minimum target of 70% reduction of waste before utilizing a WTE facility as a waste management option. The 70% target is calculated only from Reduce, Reuse, and Recycling initiatives.
- The Ministry expects that resource recovery facilities (4th R) will obtain at least 60% of the potential energy from the MSW used as a fuel.
- If a WTE facility does not achieve 60% energy efficiency, the Ministry will consider the WTE facility as a residual management facility (5th R).

The BC MoE has established air quality standards for MSW incinerators. The criteria may be found at http://www2.gov.bc.ca/gov/content/environment/air-land-water/air/air-quality-management/regulatory-framework/objectives-standards. All new facilities must meet the standards set out in the MOE document.

4. WTE ASSESSMENT

4.1 Purpose and Objectives

On behalf of the CSWM, Morrison Hershfield is conducting a detailed review of WTE as a means of substantially reducing reliance on landfilling. Tipping fees in the region are currently $130 per tonne and the overall solid waste system is also supported by taxation. The region is concerned about continued increases in solid waste management costs and about placing an even heavier burden on its taxpayers. This study will enable the CSWM to make an informed decision on whether or not to include WTE in its integrated system. It will identify the cost savings from reduced landfill costs and compare them to the increased costs of WTE. It is expected to result in an apples to apples comparison of an integrated system (which includes diversion, transfer, etc.) with an integrated system that continues to rely primarily on landfilling for disposal.

A previous assessment of WTE was conducted in 2011 and focused on conventional, well proven WTE technologies. The approach in 2017 is to continue to include traditional WTE technologies, but also to open the door to innovative systems that show reasonable promise of being commercially viable and reliable. While the generation of energy and its use is an important aspect of financial viability and GHG reduction (compared to landfilling), the main focus is on the removal of residual waste (after recycling and composting) from the need for landfill disposal.

This study is driven primarily by the high unit cost of landfilling and the high capital cost of landfill expansion. The intent is to identify those WTE technologies that are able to recover energy while substantially reducing the volume of waste/residuals going to landfill at a cost lower than current landfill practices.

The proposed technologies should focus on the waste volumes projected to come from the CSWM service area. A major import of waste from other jurisdictions is not envisioned, however a smaller amount from neighbouring regional districts may be considered in the future. Proposed units could be centrally located or smaller decentralized units could be suggested to reduce transportation requirements should it be economically viable. Creation of local employment and potential spinoff benefits will be considered by the CSWM.

Environmental protection is an important component. It is expected that any proposed technology will meet current emission guidelines in BC for WTE technologies. Vendors are also requested to demonstrate the ability of their proposed technology to remain substantially below current emission limits. The reduction of GHG and a technology's ability to demonstrate this is an essential consideration.

This RFI is intended to inform the CSWM of the possibilities available to them and to guide their future decision making and ultimately, their procurement process. Vendors supporting this process with information will be recognized in the summary report.

4.2 Confidentiality

Information provided as part of this RFI will be summarized for the final assessment report, which will become a public document. Only summary information will be used from the submissions and qualifications of the vendors. Detailed submissions will not be included in the final assessment report. If it is necessary for a vendor to withhold information, the vendor should indicate what information is being withheld and for what reason (e.g. proprietary information).

4.3 Intent

The information requested in this document is intended to be used as information only and the submission of information does not create a legal or contractual relationship between the vendor and the CVRD. This is not intended to be a request for qualifications leading to a request for detailed proposals, nor is it intended to be a request for proposals that would result in legal obligations by either party.

4.4 Vendor's Expense

Costs for preparing the submission shall be borne by the vendor.

4.5 Ownership of Submissions and Freedom of Information

All documents and information submitted to the CVRD become the property of the CVRD. Each respondent should clearly identify any information that is considered to be confidential or proprietary information.

The CVRD is subject to the provisions of the Freedom of Information and Protection of Privacy Act. As a result, while section 21 of the Freedom of Information and Protection of Privacy Act does offer some protection for confidential third party business, financial and proprietary information, the CVRD cannot guarantee that any such information provided to the CVRD will remain confidential if a request for access is made under the Freedom of Information and Protection of Privacy Act.

4.6 Submission Requirements

To be considered for the assessment of WTE, interested technology vendors must submit the requested information (as specified in section 5: Questionnaire) by 4:00PM PDT, Friday, July 14, 2017.

Submissions may be sent electronically to Nathalie Maurer at Morrison Hershfield, at nmaurer@morrisonhershfield.com.

Late submissions will not be considered.

The person(s) authorized to sign on behalf of the vendor and to bind the vendor to statements made in response to this request for information must sign the submission form. Unsigned submissions will not be accepted.

The vendor shall be solely responsible for the delivery of their submission in the manner and time prescribed.

4.6.1 Enquiries

All enquiries related to this request for information are to be directed by email, no later than 4:00PM PDT, Friday, July 7, 2017, to:

Nathalie Maurer
Email: nmaurer@morrisonhershfield.com
Ph: 604-454-0402
Fax: 604-454-0403

Information obtained from any other source is not official and should not be relied upon.

4.6.2 Addenda

Addenda may be issued during the submission period in response to queries received. Addenda will be in written form and sent to all vendors who have responded to the acknowledgement letter (section 6). All addenda must be considered when responding to this request for information.

Verbal answers are binding only when confirmed by written addenda.

4.7 Submission Evaluation

This is a request for information and not a competitive process. There will not be a formal evaluation of submissions. Submissions will be reviewed with considerations given to the following categories: Innovation, Technology, Environmental/Social and Economics. Therefore, there may be a ranking of submissions to identify technologies that best meet the CSWM's needs and requirements. Contributions made by vendors will be recognized in the final report, which will become a public document.

4.8 Project Description

The following information, assumptions and instructions will assist vendors with preparing the requested information. For additional details, please address them to Morrison Hershfield's contact person. Information must be provided in the form provided in section 5.

4.8.1 Feedstock

- All residual waste that currently goes to landfill (after diversion) generated in the CSWM service area will be made available as feedstock for the WTE facility.
- Waste will be delivered to the facility 5 days per week with only typical fluctuations due to seasons and climate expected.

- Waste will be delivered as-is and no further processing will be undertaken by CSWM.

- Heating value for the purpose of this study can be assumed to be 11 GJ per tonne (lower heating value, as received). Typical seasonal fluctuations must be expected.

4.8.2 Technology

- All technologies that process residual waste for the purpose of recovering energy and substantially reducing volumes going to landfill will be considered. These include but are not limited to:
    - Small scale mass burn technology
    - Controlled air combustion systems
    - Fluidized bed systems
    - Rotary kiln combustion processes
    - Close coupled two stage gasification
    - True gasification (with syngas cleaning before further processing or combustion)
    - Other gasification or pyrolysis systems
    - Newer technologies not identified above

- In addition to complete systems that process residual waste into energy, consideration will also be given to technologies that convert residual waste into fuel. The viability of markets for this fuel must be demonstrated. Typical technologies might include:
    - Dirty material recovery facility (MRF) for additional recovery of recyclables and conversion of remaining waste to refuse derived fuel (RDF) or solid recovered fuel (SRF), either in pellet form or as fluff
    - Other fuel conversion technology

4.8.3 Size

- The facility shall be sized for the full amount of feedstock available in 2021 identified in Section 3.3. The technology's ability to handle more or less feedstock than the rated capacity must be defined. Note: it is recognized that WTE facilities may take longer to implement (as much as 5 – 7 years), however, 2021 was chosen as a theoretical earliest possible date for the purpose of this RFI).

- Module sizes need to be identified should any increase in capacity be required in the future.

- Vendors of newer technologies that are not commercially operating in other jurisdictions should include the scenario of a pilot demonstration facility as a first step, clearly outlining costs and potential benefits of this newer technology.

4.8.4 Site Location

- A site location has not been determined at this time. It may be located at one of the existing landfills. There may be other potential locations available – vendors are encouraged to investigate options for privately owned sites.
- Assume that costs for land are not part of the Vendor's responsibility.
- Assume that major utilities (water, power, sewer and natural gas) are available.
- Identify any synergies that the proposed process could benefit from if located at landfills (e.g. landfill gas utilization) or close to other industries in the region.
- Identify whether a preferred site has already been identified and provide a description of the site.

4.8.5 Development and Operating Timelines

- No development timeline is available at this time. Vendors are requested to provide realistic time estimates for the design, construction and commissioning of their equipment.
- Assume that the facility will operate for 25 years and include cost provisions for appropriate maintenance and upgrades of major components, if required.

4.8.6 Emissions and Residuals

- Emissions shall meet the criteria identified in Section 3.5.
- Due to the sensitivity of the airshed of the CSWM service area, vendors shall provide an indication of expected actual emissions of an operating plant and show how much key emissions are below regulated values. Expected emissions must be based on experience with similar operating facilities.
- Effluent must meet applicable municipal and provincial regulatory standards.
- Residuals shall be quantified and compared to process input tonnage.
- Types of residuals must be identified (e.g. ash, sludge, char, baghouse fines, etc.).

4.8.7 Transport and Hauling

- Assume that no transportation or hauling is required and all waste will be delivered by others to the facility.
- Assume hauling of residuals to a landfill, as identified by the vendor, will be handled by others. Residuals must be treated at the facility so that they can be safely landfilled.

4.8.8 Energy Recovery

- Assume the current value of electricity sold to the grid is $65/MWh.
- Assume the current value of natural gas is $3/GJ.
- District energy: Assume that there is no infrastructure to absorb excess heat at this time. For the possibility of planning future infrastructure around the WTE facility, please indicate how much heat (GJ/hr) could be available for heating purposes (without sacrificing power production efficiency).
- Assume current market value for recovered metals and assume that metals will be marketed by the vendor.

4.8.9 Ownership

- In a base case, the facility would be privately owned and operated. The CSWM will provide land and a long term (up to 25 year) commitment to supply waste as feedstock for a tipping fee.
- Vendors are requested to comment on alternative procurement/ownership models and indicate and quantify any advantages that may be derived from alternate models.

5. QUESTIONNAIRE

Vendors are requested to provide the following information. Incomplete submissions may be excluded from the review and may not be used for the WTE assessment.

1. Technology

    a. Technology type (combustion, gasification, pyrolysis, RDF, other)

    b. Identify key components (pre-processing, combustion, energy recovery, air pollution control):
        i. Describe pre-processing, if required
        ii. Identify type of combustion or gasification technology and describe briefly
        iii. Indicate what energy is recovered and how (e.g. electricity through steam turbine generator, or methanol from syngas)
        iv. Identify utility requirements, such as natural gas, propane, electricity, water, sewer, etc.

    c. Identify proposed module size:
        i. Include rated capacity
        ii. Indicate flexibility to operate full time at above or below rated capacity (give %)
        iii. Provide approximate footprint and height

    d. Provide high-level mass balance, including:
        i. Tonnes of waste being fed (before any processing)
        ii. Additional inputs (e.g. chemicals, reagents, etc.)
        iii. Water consumption
        iv. Discharges solid (bottom ash, fly ash, metals recycled, etc.)
        v. Discharges liquid

    e. Provide high level energy balance, including:
        i. Waste energy input
        ii. Auxiliary energy input (e.g. natural gas, electricity)
        iii. Total energy generated
        iv. Internal energy consumption
        v. Net energy for sale

    f. Provide expected availability of the technology (e.g. number of hours the plant operates per year at capacity and how many hours is the plant down for scheduled maintenance, plus allowance for unscheduled maintenance).

2. Energy Recovery

    a. Indicate the type of energy recovered

    b. Provide the net energy for sale per tonne of waste received

    c. Provide the potential additional waste-heat energy available per tonne of waste received

   d. In the case of RDF/fuel preparation, identify potential markets and the energy amount that would be sold as fuel

   e. Identify any potential use or reuse opportunities for any residual generated

3. Environmental

   a. Greenhouse gas (GHG) emissions
      i. Provide the expected net GHG benefits of the process per tonne of waste processed. Also include any assumptions for deriving the benefits.

   b. Other emissions
      i. Confirm that regulatory emission levels can be consistently maintained
      ii. Provide estimate (and basis of that estimate) of what typical emissions will be of the following during normal operations in mg/Rm^3 (based on a temperature of 25°C and a pressure of 101.3 kilopascal, corrected to 11% oxygen and 0% moisture):
         1. Particulates (PM10 and PM2.5)
         2. Carbon monoxide
         3. NOx
         4. Sulfur dioxide
         5. Hydrogen chloride
         6. Lead
         7. Mercury
         8. Dioxins/Furans I-TEQ (International Toxic Equivalents)

   c. Residue
      i. Indicate the total residue to landfill from the process for each tonne of waste processed (in tonnes).
   d. Effluent
      i. Identify effluent (if any) with indication of volumes, characteristics, and hazard level.

4. Social

   a. Provide the size of facility approximately in m^2.

   b. Include the desired size of site in hectares.

   c. Provide the typical number of employees (full time equivalents), including:
      i. Management
      ii. Skilled trades
      iii. Unskilled
      iv. If possible, provide staffing plan from an existing, similar facility showing types of skills needed.

   d. Indicate any spinoff benefits from the facility. May include creation of local jobs (outside of the facility boundaries) or other spinoff businesses, activities, etc.

5. Capital costs

    a. Provide estimated capital costs for the size of facility proposed. Base costs on site specific estimates and/or cost experience from existing, similar facilities:
        i. Provide costs in CAD$, based on theoretical project construction in 2021 and an expected plant life of 25 years.
        ii. Include in costs: Design, fabrication, shipping allowance to Vancouver Island, construction and supervision, commissioning and start-up, trial operation, manuals and training of operators, initial emissions testing, one year of spare parts and 50% performance bond for 5 years.
        iii. Exclude: Taxes, site/land costs, grid tie-in, financing, legal, insurance, environmental and building permits.

6. Operating costs

    a. Provide an estimate of operating costs per tonne of waste processed. Please also provide an approximate breakdown of the operating cost into:
        i. Labour %
        ii. Fixed operating expenses %
        iii. Variable operating costs %
        iv. Spare parts %
        v. Other (define) %

7. Reference facilities

    a. Indicate maturity of technology by identifying how many plants there are world-wide and in North America using this technology.

    b. Provide information on three reference facilities utilizing the same or similar technology and as close to the proposed size as possible. Information should include:
        i. Name and location of the facility
        ii. Brief description of the facility
        iii. Capacity and type of feedstock
        iv. Years in continuous commercial operation
        v. Type of energy recovery
        vi. Manager and/or contact person with email and phone number

8. Additional Information

Please provide additional information to demonstrate the technology track record and/or performance, to supplement the estimated costs, to supplement the information requested above and/or to indicate interest in the potential project.

6. ACKNOWLEDGEMENT LETTER

The undersigned has received a CSWM Request for Information package regarding waste-to-energy technologies and has the intent to submit the requested information. Failure to return this form may result in no further communication regarding this Request for Information.

____
Company

____
Address

____
Contact name and title

____
Contact phone number

____
Contact email address

____
Fax number

____
Signature Date

The acknowledgement letter is to be signed and returned immediately to:

Nathalie Maurer, P.Eng.
Environmental Engineer
Morrison Hershfield
Email: nmaurer@morrisonhershfield.com
Ph: 604-454-0402
Fax: 604-454-0403

7. SUBMISSION FORM

Comox Strathcona Waste Management
Request-For-Information
Waste-to-Energy Technologies

Closing Date and Time: 4:00 p.m. PDT, Friday, July 14, 2017.

This form must be completed, signed and included with the submission.

The undersigned confirms that their submission is in response to the Request for information for Comox Strathcona Waste Management regarding Waste-to-Energy Technologies, and the Proponent acknowledges receipt of addenda # _____ through addenda #_____

____
Company

____
Address

____
Contact name and title

____
Contact phone number

____
Contact email address

____
Fax number

____
Signature Date

600 Comox Road, Courtenay, BC V9N 3P6
Tel: 250-334-6000 Fax: 250-334-4358
Toll free: 1-800-331-6007
www.comoxvalleyrd.ca

Comox Strathcona Waste Management

Addendum #1

RFI - Waste-to-Energy Technologies

Closing Date and Time: Friday July 14, 2017 at 4:00 PM PDT

This addendum is issued in response to questions received regarding the above request for information.

Q: Can you confirm, that process water such as condensate can be discharged to the available sewer system and no consideration must be given to an on-site treatment system?

A: Process water can be discharged into an existing sewer system if one exists in the area, or trucked to a WWTP (at the proponent's expense). However, any discharge to into a sewer system must meet local sewer discharge guidelines or standard, and treatment of process water (if required) would be the proponent's responsibility.

Q: The information provided with the RFI state that there is an existing centralized composting in the CVRD, but does not include handling of bio-solids.

Must biosolids and / or digestate be considered in this RFI or are other solutions in place?

A: Proponents should assume that biosolids and digestate are not included in the feedstock. However, we welcome proponents to include information on ability of a technology to deal with biosolids and/or digestate as part of Additional Information.

Please confirm receipt of this addendum by return email to Nathalie Maurer, via email: nmaurer@morrisonhershfield.com. The receipt of the addendum should also be acknowledged in the RFI Submission Form.

600 Comox Road, Courtenay, BC V9N 3P6
Tel: 250-334-6000 Fax: 250-334-4358
Toll free: 1-800-331-6007
www.comoxvalleyrd.ca

Comox Strathcona Waste Management

Addendum #2

RFI - Waste-to-Energy Technologies

Closing Date and Time: Friday July 14, 2017 at 4:00 PM PDT

This addendum is issued in order to clarify the confidentiality of vendors' submissions.

Vendors are encouraged to submit as much information as possible to enable the review of their technology and proposed solution. It is recognized that this may require the inclusion of confidential information about technology performance or price. The CVRD is prepared to honour and keep confidential any sensitive information submitted, provided it is clearly marked in the RFI which information is to be kept confidential, so that there is no confusion on the part of the CVRD or Morrison Hershfield as to what can be included in the summary report/made public, and what cannot be included. Morrison Hershfield and the CVRD reserve the right to use sensitive information for their review along with drawing general conclusions from it, which will later be part of the public report on the technologies.

Please confirm receipt of this addendum by return email to Nathalie Maurer, via email: nmaurer@morrisonhershfield.com. The receipt of the addendum should also be acknowledged in the RFI Submission Form.

APPENDIX 2: SUMMARY SCORING

APPENDIX 2: Detailed Evaluation Spreadsheet for Evaluation of Vendors - Summary Scoring

WTE Technologies

Evaluation Area	Allocated Weighting (%)	EWS	REDWAVE	SALT	Sustane	Wasteaway	WTT
Innovation	**25**	3.00	2.67	1.33	2.67	2.00	2.67
Technology	**25**	2.50	2.33	2.17	1.83	2.17	2.50
Environmental	**25**	2.50	2.50	2.00	2.75	2.50	2.50
Economics/Affordability	**25**	1.67	2.00	1.00	2.00	2.33	2.33
Submission completeness	**0**	3.00	2.00	1.00	2.00	2.00	2.00
	100	**2.42**	**2.38**	**1.63**	**2.31**	**2.25**	**2.50**

Ranking		
WTT	2.5	83%
EWS	2.4	81%
REDWAVE	2.4	79%
Sustane	2.3	77%
Wasteaway	2.3	75%
SALT	1.6	54%