

**DATE:** October 15, 2021

**TO:** Chair and Directors  
Solid Waste Advanced Technology Select Committee

**FROM:** Russell Dyson  
Chief Administrative Officer

**RE:** **Sustane Technologies Chester Facility – Status Update**

**FILE:** 5360-60/WTE

Supported by Russell Dyson  
Chief Administrative Officer

*R. Dyson*

### **Purpose**

To provide a status update regarding commissioning of the Sustane Technologies Inc. (Sustane) facility constructed in Chester, Nova Scotia.

### **Recommendation from the Chief Administrative Officer:**

THAT the board receive this report for information.

### **Executive Summary**

The engineering consulting firm Morrison Hershfield was originally retained by the CSWM service to assess waste-to-energy (WTE) technologies dating back to 2017, which included an evaluation of Sustane's WTE proposals in response to a Request for Information. Sustane was identified as the preferred by the CSWM Board and at its April 19, 2018 meeting, the Comox Strathcona Waste Management (CSWM) Board passed the following resolution:

THAT the Comox Strathcona Waste Management Board direct staff to monitor waste management technology proposed by Sustane Technologies Inc., in Nova Scotia, for up to one year of full operations;

AND FURTHER THAT a report on its effectiveness and efficiencies be presented to the CSWM Board following the monitoring period.

To that end, Morrison Hershfield was retained to develop performance criteria and conduct a performance review of the Chester facility for up to one year once the plant is commissioned and in full commercial operation, which was determined to be March/April 2019 at time of decision making. The one year timeframe was established to ensure consistent, continuous operation for measurement of costs, risk and benefits to the Chester community, as well as all performance criteria, including material performance, environmental protection, quality and marketability of end products. Morrison Hershfield will be reviewing the aforementioned criteria in the context of regulatory requirements of the Province of British Columbia.

In April 2019, the CSWM service entered into a partnership with the Regional District of Nanaimo and the Cowichan Valley Regional District to fund the independently sourced evaluation of the Sustane facility with a common interest to review and consider alternative technologies that are consistent with 5R pollution hierarchy.

Per the latest update from September 15, 2021, the Sustane solid waste processing facility constructed in Chester, Nova Scotia has not yet been fully commissioned. Attached as Appendix A is the meeting minutes from Morrison Hershfield providing a summary of Sustane's progress as well as an updated schedule for commissioning. Highlights from the memo include:

- The commissioning update for the two end product pathways are as follows:
  1. Plastics de-polymerization
    - The pyrolysis process was granted operating permit for the Industrial Chemical Petrochemical Manufacturing Facility on August 27, 2021, which set out all environmental monitoring requirements, including stack testing when the process reaches 50 per cent capacity which is anticipated by end of November 2021.
    - Sustane anticipates the plastics de-polymerization process to reach full capacity by end of 2021.
  2. Biomass thermal hydrolysis
    - The biomass process continues to experience yield and quality issues of end products.
    - Shifting focus to circular uses for end products such as biofertilizer and feedstock for insect protein production.
    - Operating at three to four days per week on process trials to produce samples for Canadian Food Inspection Agency testing and certification.
    - The processing capacity of the thermal conditioning system is stalled at 100 tonnes per day and is being redesigned in order to achieve its capacity target of 200 tonnes per day, expected by late 2022.
- In anticipation of the full continuous operation at end of 2021, Morrison Hershfield will review the performance requirement set out in the August 27, 2021 operating permit to align it with the performance monitoring activities agreed upon at the onset of the agreement with the participating regional districts from 2019. The one year monitoring period will commence following three months of full continuous operation.

Sustane continues to correspond with the BC Ministry of Environment and Climate Change Strategy about whether or not their technology will be considered waste diversion or waste to energy, as it has bearing on the viability of their technology in British Columbia which has a 70 per cent waste diversion requirement prior to consideration of an energy recovery process as part of the waste management system.

Prepared by:

***V. Schau***

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Vivian Schau  
Senior Manager of CSWM  
Services

Concurrence:

***M. Rutten***

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Marc Rutten, P.Eng.  
General Manager of  
Engineering Services

Attachments: Appendix A – Meeting Minutes from Sustane's progress update, September 15, 2021

# MINUTES



## MEETING WITH SUSTANE – PLANT UPDATE

**Project:** Assessment of Sustane Technology Performance      **Project No.:** 190229200

**Attendees:** Marc Rutten, Comox Valley Regional District (CVRD)  
 Vivian Schau, CVRD  
 Sarah Willie, CVRD  
 Ilse Sarady, Cowichan Valley Regional District (CowVRD)  
 Doug Stevens, CowVRD  
 Melissa Tokarek, CowVRD  
 Amanda Kletchko, CowVRD  
 Austin Tokarek, CowVRD  
 Sonam Bajwa, Regional District Nanaimo  
 Peter Vinall, Sustane Technologies  
 Kevin Cameron, Sustane Technologies  
 Veronica Bartlett, Morrison Hershfield (MH)  
 Todd Baker, MH

**Apologies** Larry Gardner, RDN and Melissa Tokarek, CowVRD

**Date / Time:** 2021-09-15 at 9:30 PDT      **Place:** Virtual Zoom Meeting

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ITEM	MINUTES	ACTION BY / DATE
1.	The meeting started with a short introduction of all attendees.	

ITEM	MINUTES	ACTION BY / DATE
2.	<p>Marc Rutten provided a short summary of the project background and how Sustane was selected for a technology performance review.</p> <p>MH completed an assessment of waste to energy (WTE) technologies on behalf of the Comox Strathcona Waste Management (CSWM) in 2017-18. The assessment included a request for information and vendor submissions were received and evaluated. Sustane was one of WTE technology providers that were preferred by the CSWM Board. The CSWM requested that MH conduct a performance review of Sustane's Chester facility once the plant was fully operational. The performance review is commissioned by the CVRD in partnership with the CowVRD and RDN.</p> <p>Veronica Bartlett provided a summary of MH's scope of work. The performance review is designed to take place over the course of one year, starting when the Chester plant is in full commercial operation and when data from the first quarter is made available. The review aims to confirm how well the plant performs in terms of material performance, environmental protection, efficiency, quality of products produced and markets, financial costs of operation.</p>	-
3.	<p>Peter Vinall provided an overview of the Sustane technology and of the general layout of the Chester facility.</p> <p>An independent consultant has undertaken a Life Cycle Assessment (LCA) on behalf of Sustane. The LCA quantified the carbon reductions from sending municipal solid waste (MSW) to Sustane compared to landfill disposal. The assumptions were based on a North American community without source segregated organics collection and without access to a landfill with landfill gas capture.</p> <p>Sarah Willie highlighted that the LCA assumptions may not be applicable to BC where landfill gas capture is required at a 75% efficiency.</p>	Peter to share LCA study with MH.

ITEM	MINUTES	ACTION BY / DATE
4.	<p>Peter Vinall provided an progress update on the Chester plant (refer to attached slide deck). The following main points were emphasized:</p> <ul style="list-style-type: none"> <li>- The two main end product pathways are plastics and biomass. Sustane is focusing on finding “circular solutions” for end products, which can be used in new products or for beneficial use rather than as fuel source.</li> <li>- Materials with end products that have circular uses include plastics to chemical/plastics feedstocks, biomass to biofertilizer/ biochar / insect protein production in aquaculture.</li> <li>- Biomass product development: The facility has had issues with plastics shrinkage during the biomass thermal hydrolysis process. Sustane is limited to 100 tonnes per day and has experienced some issues with quality. A new cooking chamber is being designed and tested in the Chester facility in coming months. The redesigned version has larger diameter and a smaller number operating units that work under higher pressure.</li> <li>- The biomass process is currently operating 3 - 4 days per week on process trials and producing trial volumes for testing and certification. The Chester facility can produce feedstock for insect protein production for aquaculture / pet food mfg, as well as biofertilizer. Sustane is providing samples over a 9 months period to obtain CFIA certification for three new organic matter products.</li> <li>- Sustane expects to achieve continuous operation of the biomass process in late 2021 and to full capacity (200 tonnes per day) in late 2022 with the redesigned thermal hydrolysis system.</li> <li>- Plastics de-polymerization: Sustane is no longer referring to the thermal process as pyrolysis since many perceive pyrolysis to be a waste-to-energy technology. Sustane’s process involves depolymerizing in absence of oxygen.</li> <li>- The plastics de-polymerization process was successfully commissioned in late 2020. Sustane had an interim approval for commissioning and testing. The operating permit for the Industrial Chemical Petrochemical Manufacturing Facility was granted on August 27, 2021. It sets out all environmental monitoring requirements. Stack testing is requested when the process is operating at 50% capacity, which Sustane anticipates will be in about three months.</li> <li>- Sustane is anticipating to operate the plastics process at full capacity at the end of this year.</li> <li>- Sustane is aware of emerging contaminants, such as PFAS. Peter explained that these are minor contaminants that they are looking into. Peter explained that according to correspondence with BC regulators, an Environmental Assessment should not be required in BC.</li> </ul>	

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ITEM	MINUTES	ACTION BY / DATE
5.	<p>Next steps</p> <p>In 2019 MH developed an initial list of performance criteria which Sustane would be asked to provide for the review. Based on the Aug 27 operating permit requirements, MH will revisit the list of data and performance measures to be monitored. The list of required performance criteria will be adapted to align with Sustane's other reporting requirements.</p> <p>Veronica highlighted that the operating permit lists a number of Reference Documents provided by Sustane. Some of the definitions of the permit refer to these reference documents. MH will review the permit and highlight which reference documents MH wishes to see to support the review.</p> <p>MH will correspond with Sustane about progress by the end of the year and determine the timing of next call.</p>	<p>MH to revise the performance criteria and list reference documents needed (in the next two months).</p>

Dist: Participants, Larry Gardner (RDN) and Melissa Tokarek (CowVRD)

