



**CONESTOGA-ROVERS
& ASSOCIATES**

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March 31, 2014

Reference No. 076074-46

Director
Ontario Ministry of the Environment
Environmental Approvals Access and Service Integration Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

Dear Director:

Re: Environmental Compliance Approval Amendment Application
Waste Disposal Site ECA Number 8850-8V6S7Z
Air and Noise ECA Number 2478-8W4L3W
Lystek International Inc., Organic Materials Recovery Centre
191 Eco Park Way, Dundalk, Ontario

1.0 Introduction

Conestoga-Rovers & Associates (CRA) has prepared this Application on behalf of Lystek International Inc. (Lystek) to request amendments to the existing Environmental Compliance Approvals (ECAs) issued by the Ontario Ministry of the Environment (MOE) for the Organic Materials Recovery Centre (Centre) located at 191 Eco Park Way, Dundalk, Ontario (Site). Lystek are requesting amendments to the ECA to account for adjacent property recently acquired, increased retention of incoming liquid feedstock, increased storage of final fertilizer product, choice of additional alkaline amendment product, increased shipping and receiving times for Saturdays, and better building air flows within the Centre. Lystek continue to openly communicate the intent of the proposed changes with the community on an on-going basis.

The subject of the enclosed Application has no impact on Lystek's inbound or outbound quantity of materials, or processing methodology. It is mainly to address conditions within the existing ECA to improve on the processing efficiency of the Centre, and to streamline operations now that the Facility has an operating history. It is the intention of this Application to demonstrate that at full operating capacity, the Centre performs well within any air, noise, or water condition and that there are no environmental concerns with the requested amendments. In support of this Application, reference is made to a number of recent monitoring results including the Source Test (modeling actual odour emissions to property boundary) and an independent Acoustic Audit (measuring actual operating noise levels at sensitive receptors).

The Lystek process is a proprietary technology and all information contained in this report should be treated as confidential.



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This letter is structured to provide detailed description of the proposed ECA amendment, the rationale and supporting information, and to submit the ECA Amendment Application. The letter is organized as follows:

Section 1.0 – Introduction

Section 2.0 – Amendment to Waste Disposal Site Environmental Compliance Approval

2.1 – Site Location

2.2 – Incoming Liquid Feedstock Storage Lagoon

2.3 – Final Fertilizer Product Storage Lagoon

2.4 – Groundwater Monitoring

2.5 – Chemical Reagent Tanks

2.6 – Standby Process Reactor

2.7 – Site Operation Hours

2.8 – Financial Assurance

Section 3.0 – Amendment to Air and Noise Environmental Compliance Approval

3.1 – Building Air Flow

Section 4.0 – Additional Application Considerations

4.1 – Noise Assessment

4.2 - Stormwater Management

4.3 – Public Advisement

4.4 – Environmental Bill of Rights

4.5 – Explanation for Confidentiality

Section 5.0 – Summary of ECA Amendments

Section 6.0 – Closing

The following Attachments contain the Application and supporting documentation:

- Attachment 1 – ECA Application
 - ECA Application Form for an Amendment to An Existing ECA
 - Application Fee
 - Proof of Legal Name
 - Legal Survey Drawings



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- MOE District Office, Owen Sound, Pre-consultation Meeting Minutes held March 13, 2014
- Township of Southgate Council Meeting Minutes held February 19, 2014
- Dundalk Herald newspaper article published on February 26, 2014
- Public Advisory Committee Meeting Minutes held March 4, 2014
- Zoning Documents
- Attachment 2 – Design and Operations Report
 - Insert, Chapter 4.6.1 Incoming Liquid Feedstock Storage Lagoon
 - Excerpt, Updated Chapter 11.0 Financial Assurance
 - Excerpt, Updated Appendix Z Financial Assurance Calculation
 - Excerpt, Updated Figure 2.2 Overall Site Plan
 - Excerpt, Updated Figure 4.1 Facility Main Floor Plan
- Attachment 3 – ECA Application Supporting Information
 - Emissions Summary and Dispersion Modelling (ESDM) Report, including Source Testing Report prepared by CRA and dated March 2014
 - Acoustic Audit Report prepared by Novus Environmental and dated March 11, 2014

2.0 Amendment to Waste Disposal Site Environmental Compliance Approval

The Site is currently permitted by the MOE to operate under Waste Disposal Site ECA Number 8850-8V6S7Z (Waste ECA) issued October 5, 2012. The specific changes requested to the existing Waste ECA conditions are noted in bold-underlined-type font following the description of each of the changes.

2.1 Site Location

Lystek is currently permitted for the use of a 5.1 hectares (Ha) property located at 191 Eco Park Way in Dundalk, Ontario, comprising of Parts 1 & 2, Ref. Plan 16R-10075, Part-Lot 235 & 236, Concession 2 SWTSR, Geographic Township of Proton, Southgate Township, County of Grey, NOC 1B0.

Lystek has recently purchased additional property adjacent to the existing Site, for a total area of 8.7 Hectares (Ha). The updated Overall Site Plan including the new property boundaries is shown on Figure 2.2 located in Attachment 2. The new Site location description is as follows:

Site Location: Organic Materials Recovery Centre



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191 Eco Park Way
Parts 1 and 2 of Reference Plan 16R-10075 and Parts 1 and 2 of Reference Plan 10439
Part-Lot 235 & 236, Concession 2 SWTSR
Geographic Township of Proton
Southgate Township, County of Grey
NOC 1B0

This change affects the Definition of the "Site" in the existing Waste ECA (page 3). The corrected definition is as follows:

- (v) "Site" means the entire **8.7 hectare** waste disposal site located at municipal address 191 Eco Park Way and legally described as Parts 1 and 2 on Reference Plan 16R-10075 and Parts 1 and 2 on Reference Plan 10439, Lot 235 and 236, Concession-2 SWTSR, geographic Township of Proton

2.2 Incoming Liquid Feedstock Storage Lagoon

Lystek requires additional storage capacity for the receipt of incoming liquid feedstock material. There is no change to the daily quantity of material received in one (1) day (currently approved for 300 tonnes per day) or the type of material received (septage, liquid waste from food processing and preparation operations, and sewage biosolids). Lystek are prepared to construct a larger Liquid Feedstock Storage Lagoon to supplement the existing underground tank storage capacity. This will permit Lystek to hold incoming liquid feedstock material until such time as it can be processed. The capacity of the supplemental Liquid Feedstock Storage lagoon would provide approximately one (1) week of buffer capacity, at a volumetric storage capacity of 2,400 m³. In addition to the existing 225 m³ from the underground storage tanks, the total Site storage capacity for incoming liquid feedstock storage will be 2,625 m³.

The liquid level within the supplemental storage lagoon will be monitored, and the material will be pumped directly to one (1) of the existing 45 m³ liquid feedstock holding tanks, becoming integral to the existing process feed system. From this point, there is no change in how the liquid feedstock material is blended and converted into the Lystek final fertilizer product.

The supplemental Liquid Feedstock Storage Lagoon will be constructed on newly acquired property east of the existing Centre. An insert for the Site's Design and Operations Report is provided in Attachment 2, which describes the construction of the proposed lagoon including environmental controls and integration with the existing operations of the Centre. Of note, the lagoon is intended to be lined and covered similar to the Final Fertilizer Lagoons, including material unloading and spills containment area, as well as odour collection piping tied to the Centre's existing odour treatment system. The proposed location for the Liquid Feedstock Storage Lagoon is shown on Figure 2.2 located in Attachment 2.



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The amendment request affects the Approved Quantity for the Site per Condition 12.2 of the existing Waste ECA (page 10) is as follows:

- 12.2 The Owner shall ensure that the following maximum quantities of waste stored on Site are adhered to:
- (a) The total amount of waste stored within the processing building does not exceed 1,000 tonnes per day
 - (b) The total amount of waste stored in the feedstock holding **vessels** does not exceed **2,625 tonnes per day**
 - (c) The amount of treated waste does not exceed 90,000 tonnes at any time

2.3 Final Fertilizer Product Storage Lagoon

The Waste ECA for the Site currently approves a total final fertilizer storage capacity of 64,000 m³, including one (1) 31,600 m³ (constructed in 2012) and one (1) 32,400 m³ lagoon (not constructed). Lystek is amending the final fertilizer storage capacity and intends to construct Final Fertilizer Storage Lagoon 2 with a storage capacity of 58,400 m³, increasing the total final fertilizer storage capacity at the Site to 90,000 m³. A portion of Final Fertilizer Product Storage Lagoon 2 will now be constructed on the additional property that Lystek has purchased described above.

The total final fertilizer storage capacity currently approved for the Site allows for material to be stored in the final fertilizer lagoons for up to six (6) months to allow for outgoing shipments in the spring and fall months to match agricultural demand. The additional storage capacity will allow the Site to store material for approximately eight (8) months in order to better service the demands of the agricultural sector and accommodate seasonal variations due to weather.

The design and operation of Final Fertilizer Storage Lagoon 2 does not change, and will be in accordance with the features and construction details specified in the Site's Design and Operations Report approved by the current ECA Waste. The lagoon will continue to be constructed with a geomembrane liner and floating cover system, and wet well liquid level monitoring and pumping chamber.

The amendment request affects the approved quantity for the Site per Condition 12.2 of the existing Waste ECA (page 10) as follows:

- 12.2 The Owner shall ensure that the following maximum quantities of waste stored on Site are adhered to:
- (a) The total amount of waste stored within the processing building does not exceed 1,000 tonnes per day



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- (b) The total amount of waste stored in the feedstock holding vessels does not exceed 2,725 tonnes per day
- (c) The amount of treated waste does not exceed 90,000 tonnes at any time

2.4 Groundwater Monitoring

Lystek will install two additional nests of groundwater monitoring wells including both a shallow and deep monitoring well (approximately 3 meters deep), on the east side of the Site, at each of the toe of slopes of the supplemental Liquid Feedstock Storage Lagoon and Final Fertilizer Storage Lagoon 2. These wells will be used to monitor the groundwater level and quality prior to and post installation of the lagoons, primarily to help identify any issues with the integrity of the liner systems of the proposed storage lagoons. The new monitoring wells will be added to the current water level and water quality monitoring schedule approved under the existing ECA Waste. The approximate locations of these two monitoring well nests are shown on Figure 2.2 located in Attachment 2.

2.5 Chemical Reagent Tanks

Three (3) 19,500 Liter (L) double-walled polyethylene reagent tanks are currently approved under the current Waste ECA for the Site, which specifically list the storage of potassium hydroxide (KOH) and sodium hydroxide (NaOH). Lystek is amending the type of alkaline solution used in their process to include calcium hydroxide (CaOH), which will be used to offset the use of KOH, as appropriate. A 30,500 L reagent tank will be installed indoors for the storage of the CaOH solution. The tank will be built with a mechanical mixer to avoid settlement of the CaOH solution.

The new 30,500 L CaOH storage tank intends to replace the third 19,500 L KOH tank currently approved under the Waste ECA. The total chemical reagent holding system will comprise of two (2) 19,500 L double-walled chemical storage tanks for NaOH and KOH blended product and one (1) 30,500 L double-walled chemical storage tank for CaOH.

There is no change to the existing design and operation of chemical loading and Lystek process feed system. The new double-walled 30,500 L tank will be located indoors adjacent to the two (2) existing 19,500 L tanks and will be fitted by an incidental spills containment curb, where potential spills are captured by the building drain system. The tank will be equipped with overfill alarms and level monitoring between the double walls of the tank. Refer to Figure 4.1 Facility Main Floor Plan for the location of the chemical tank within the Centre building.

2.6 Standby Process Reactor

Lystek is currently permitted for three (3) 9,000 L steel process reactors whereas the Centre has been designed to house a total of four (4) reactors. It was always the intent to have four (4) reactors within the Centre, with the fourth (4th) for standby redundancy in case of maintenance of any of the other



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three (3) reactors. Lystek would like to update the Waste ECA to recognize four (4) reactors at this time. A fourth process steam boiler, for standby redundancy, will also be installed in conjunction with the new reactor.

There is no change to the air and noise considerations with the inclusion of a fourth (4th) reactor in the Waste ECA. The original emissions modeling and acoustic assessment accounted for three (3) operating reactors and demonstrated compliance, and there is no change to Lystek's operation at this time. Cake feedstock, liquid feedstock, live steam, and chemicals will continue to be directed into the reactors, and operated through a batch sequence where only one (1) reactor can fill and drain at a time. While one (1) reactor is filling, the other reactor may be offline, in a heating cycle, or draining. A maximum of three (3) reactors and boilers will be online at any given time and the additional reactor will be on standby and available for maintenance redundancy.

2.7 Site Operation Hours

Lystek is currently permitted to allow shipping and receiving from Monday through Friday from 6:00 a.m. to 6:00 p.m. and on Saturdays from 7:00 a.m. to 12:00 p.m. An amendment is requested in order to provide additional flexibility for receiving and shipping material to the Centre on weekends, specifically extending the hours on Saturdays from 12:00 p.m. to 4:00 p.m., for a total Site shipping and receiving time of 7:00 a.m. to 4:00 p.m.

The primary driver for this request is to better utilize the optimum fertilizer application windows to service Lystek's agricultural customers. In the spring, once soils have drained, farmers are under pressure to fertilize the land as quickly as possible so they can plant their crops and maximize the growing season. In the fall, the situation is similar as the available application window is contingent on favourable weather (wet soils and frost).

The amendment affects the Hours of Operation for the Site per Condition 15.2 (page 11) of the existing Waste ECA as follows:

- 15.2 Notwithstanding Condition 14.1, the Owner shall ensure that shipping and receiving are limited to:
- (a) Monday through Friday from 6:00 a.m. to 6:00 p.m.
 - (b) Saturday from 7:00 a.m. to 4:00 p.m.

2.8 Financial Assurance

Lystek is currently approved for a financial assurance in the amount of \$490,886.96 for the Site as per the calculations completed for the original Design and Operations Report. The financial assurance approved for the Site includes the cost required to remove materials from the Site and leave the Site



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and buildings in a state that meets MOE's guidelines. To reflect all the upcoming modifications described for the Site, the financial assurance calculation was updated to an amount of \$773,019.92.

Details of the additional components included in financial assurance calculations are provided in Attachment 2, as 'Chapter 11' to be included in the updated Design and Operations Report for the Facility. A detailed breakdown of the calculations is also included in an updated Appendix Z. Lystek is prepared to provide a bond in the updated financial assurance amount to the MOE.

The amendment affects the Financial Assurance for the Site per Condition 7.1(a) (page 6) of the existing Waste ECA as follows:

7.1 (a) Either no later than sixty (60) days from the date of issuance of this Approval, or prior to the receipt of any waste on Site, whichever occurs first, the Owner shall submit to the Director, financial assurance, as defined in Section 131 of the EPA, in the amount of **\$773,019.92**. This financial assurance shall be in a form acceptable to the Director and shall provide sufficient funds for the analysis, transportation, Site clean-up, monitoring and disposal of all quantities of waste on the Site at any one time.

3.0 Amendment to Air and Noise Environmental Compliance Approval

The Site is currently permitted by the MOE to operate under Air and Noise ECA Number 2478-8W4L3W (Air and Noise ECA) issued October 5, 2012.

3.1 Building Air Flow

Lystek are seeking an amendment in order to be able to operate their existing building ventilation and odour control system at a higher flow rate and increase room space air exchanges within the Facility and to improve indoor air quality. Lystek will increase the air flow rate exhausting out of the 25 meter high stack, from the current permitted amount of 30,000 m³/hr (8.33 m³/s) to 40,000 m³/hr (11.11 m³/s). This increase is in line with the capacity of the existing equipment at the Site including biofilter fans and stack fans.

The biofilters are currently permitted to maintain a minimum empty bed resistance time (EBRT) of at least 45 seconds under the current ECA Waste. Based on the current approved air flow rate of 30,000 m³/hr, this equals a biofilter media bed height of 1.0 m. At the increased airflow rate of 40,000 m³/hr, the media depth will increase to 1.3 m to maintain 45 seconds EBRT. It is noted that when a biofilter cell is offline for maintenance purposes, building air flow rates will be temporarily reduced in order to maintain EBRT.



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The updated ESDM Report demonstrating compliance is provided in Attachment 3. The actual emission concentration estimates for odour, ammonia and hydrogen sulphide were utilized as per the results of compliance source testing undertaken by CRA on February 13, 2014. The actual concentrations determined by the source test represent process conditions at the maximum operating range achievable at the time of the measurement, within the approved operating capacity of the Facility (currently at 30,000 m³/hr).

Lystek will continue to monitor the building ventilation and odour control system, including the inspection of head losses associated with the media bed. There are no changes noted to the design and operations of the building ventilation and odour treatment system associated with the proposed building air flow increase.

4.0 Additional Application Considerations

4.1 Noise Assessment

The subject Air and Noise Amendment Application does not include a detailed Acoustic Assessment Report. The additional noise sources subject of this Amendment Application are considered negligible, and it is predicted that any resulting noise addition would not be heard at receptors while in operation. A recent acoustic audit has confirmed that the Centre is essentially inaudible at the nearby receptors during regular operation. The noise considerations that are subject of the Air and Noise Amendment include the following:

- Slightly modified vehicle traffic movement (unloading at the supplementary Liquid Feedstock Storage Lagoon that is located further east and away from nearby sensitive receptors)
- One (1) standby processing reactor and steam boiler system (not in operation, not contributing noise levels)
- One (1) diesel-fired power washer (operated intermittently, and located within enclosed building)
- One (1) 30,500 L chemical tank with mixer (located within enclosed building)

To place the noise levels of the proposed power washer and chemical tank mixer in perspective. These noise levels will be considerably less than the air handling equipment, and the air handling equipment is already an insignificant source, where noise modelling indicates that the predicted impact at the receptors are well below 20 dBA. Furthermore, recent acoustic measurements have confirmed that the Centre, which consists of operating air handling equipment, process reactors, and vehicle movement, is essentially inaudible at the nearby receptors. A copy of the acoustic audit, which was completed by Novus Environmental on March 11, 2014 is included in Attachment 3.



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4.2 Stormwater Management

A detailed water balance of the Site with the proposed changes has not been completed at this time but the extent of changes is expected to be minimal. The features that would be different from the currently approved stormwater management system (ECA Number 1401-8P4M7S) are the cover area of the supplemental Liquid Feedstock Storage Lagoon and the cover area of the portion of the Final Fertilizer Storage Lagoon 2 that gets expanded into the adjacent property. The water balance at the site will maintain that all post-development peak flows are attenuated to pre-development levels or less, through the use of supplemental infiltration galleries located at the toe of slope of the lagoon expansion areas, or other. All water courses eventually drain to the roadside ditches and the Foley Drain System, and ultimately contribute to the Grand River watershed.

4.3 Public Consultation

Lystek has taken voluntary steps to provide notification to the local Southgate Public Advisory Committee (PAC) and the local public in advance of the upcoming modifications proposed for the Site, as follows:

- Lystek notified the Township of Southgate during the February 19, 2014 Council Meeting of the purchase of the adjacent property. The minutes from the council meeting are attached.
- The Dundalk Herald, Southgate's community newspaper, published an article on February 26, 2014 which outlined Council's authorization of Lystek's Option to Purchase the additional lands as well as the intent to build additional fertilizer storage capacity on it. This article has been attached.
- Lystek informed the PAC of the purchase of the new adjacent property and schedule for construction of the second final fertilizer product storage lagoon during the meeting held on Tuesday, March 4, 2014. The minutes from the meeting are attached.
- The minutes to March 4th's PAC meeting where the proposed changes were discussed have been posted on Lystek's website via the "News" section. This posting is viewable at: <http://www.lystek.com/why-lystek/news/#March 4>

4.4 Environmental Bill of Rights

The subject Amendment Application does not contain any proposal for a prescribed instrument under the Environmental Bill of Rights. All discharges limits are consistent with the amounts considered and currently approved under the existing ECAs, with the exception that odour emissions are actually significantly less than originally predicted. There is no new contaminant or odour emissions/discharges since there is no change to the material receiving, handling/processing, or shipping. All material storage tanks and lagoons that have been implemented at the Site have not lead to any observable leak, and these containment systems will continue to be specified and implemented at the Site.



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4.5 Explanation for Confidentiality

The Lystek process and details of the Centre is proprietary, involving patented technology.

5.0 Summary of ECA Amendments

The amendments requested are summarized as follows:

- An **8.7 hectare** Waste Disposal Site (Processing) encompassing the following:
 - A 1950 m² (approximate) reinforced concrete and structural steel building for the receipt and processing of waste and for ancillary functions
 - Five 50 m³ pre-cast concrete underground storage tanks
 - One 31,600 m³ and one **58,400 m³** lagoon lined with a 30 mil geomembrane for the storage of treated waste
 - **One 2,400 m³ liquid feedstock lagoon for the storage of incoming liquid feedstock material;**
 - **Two** 19,500 L double-walled polyethylene reagent tanks for the storage of potassium hydroxide or sodium hydroxide
 - **One 30,500 L double-walled reagent tanks for the storage of calcium hydroxide solution;**
 - **Four** 9,000 L single-walled steel process reactors
 - Ancillary structures including but not limited to weigh scales, lagoon wet wells and groundwater monitoring network

6.0 Closing

Due to the nature of the amendments, Lystek is requesting that this application be considered by the MOE on an expedited basis such that the alterations can be completed at the earliest possible timeframe.

We would respectfully request that the MOE issue a draft amendment for Lystek's review, when ready.



**CONESTOGA-ROVERS
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Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Tej Gidda, P.Eng.

SS/mg/2

cc: Rick Mosher, Lystek International Inc.
Mike Beswick, Lystek International Inc.
Kyle Muffels, Conestoga-Rovers & Associates
District Manager, Ministry of the Environment Owen Sound Office