

## PERMIT GVA1085

**Pursuant to:**

Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008  
and the BC Environmental Management Act, S.B.C 2003, c.53

**Issued to:**

CORE Energy Recovery Solutions Inc.  
(the "Permittee")

**To Authorize:**

the discharge of air contaminants to the air from  
a membrane and energy recovery ventilator manufacturing plant

**Located at:**

1440 East Georgia Street, Vancouver, BC V5L 2A8

**Effective Period:**

The terms and conditions set out in the Permit apply to the existing or planned works as of  
October 25, 2018 and this permit will expire on April 30, 2028.

All previous versions of this Permit are invalid.

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Issued: April 09, 2018  
Amended: October 25, 2018

  
R.H. (Ray) Robb, P. Eng.  
District Director

**SECTION 1 – AUTHORIZED EMISSION SOURCES**

Authorization to discharge air contaminants from the authorized Emission Sources and Works listed below is subject to the specified terms and conditions.

Approximate locations of the emission sources are shown on the Site Plan in section 4.

**EMISSION SOURCE 01: Mixing area spot hood exhaust discharging through a Vent(s).**

MAXIMUM EMISSION FLOW RATE: **19.8** m<sup>3</sup>/min  
MAXIMUM ANNUAL OPERATING HOURS: **351** h/y

MAXIMUM EMISSION QUANTITY:

1. 0.1213 t/y Acetone
2. 0.0183 t/y Ethanol
3. 0.0013 t/y Methanol

MAXIMUM EMISSION QUALITY:

1. 552.2 mg/m<sup>3</sup> Acetone
2. 104 mg/m<sup>3</sup> Ethanol
3. 161 mg/m<sup>3</sup> Methanol

WORKS AND PROCEDURES:

An articulated spot extraction hood and related appurtenances together with good operating practices discharging at a height of 8.6 meters above ground with an inside diameter of 0.3 meters and ambient exit gas temperature.

Transferring and mixing of solvents shall occur in the designated mixing area and shall be collected by an articulated spot extraction hood and be discharged via a rooftop fan and vent.

The maximum filling rate of solvent to storage containers is 19 liters per minute.

**EMISSION SOURCE 02A: Water-based media coating and drying discharging through a Stack(s).**

MAXIMUM EMISSION FLOW RATE: **85** m<sup>3</sup>/min  
MAXIMUM ANNUAL OPERATING HOURS: **4998** h/y  
MAXIMUM PRIMARY BURNER INPUT FIRING RATE: **2.11** GJ/h

MAXIMUM EMISSION QUALITY:

1. 5% Opacity.

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**WORKS AND PROCEDURES:**

A roof mounted up-blast fan and related appurtenances together with good operating practices discharging at a height of 7.7 meters above ground with an inside diameter of 0.56 meters and ambient exit gas temperature.

Water-only based media Gravure coating process (Type 1) utilizing one Faustel coating machine and one two-zone, ASI direct-fired natural gas dryer with a maximum input firing rate of 1,000,000 BTU per zone (totaling 2.11 GJ/h).

**ASI Dryer:**

The single ASI dryer shall operate during either the Type 1 (ES02A) or Type 2 and Type 3 (ES02B) coating processes.

Discharge of product of combustion emissions associated with Type 1 coating (ES02A) are not authorized while Type 2 or Type 3 coating (ES02B) is in operation.

The combined maximum annual operating hours for ES02A and ES02B shall not exceed 4998 hours per year.

**EMISSION SOURCE 02B: Solvent-based media coating, drying, and oxidation discharging through a Stack(s).**

**MAXIMUM EMISSION FLOW RATE: 105 m<sup>3</sup>/min**

**MAXIMUM ANNUAL OPERATING HOURS: 4998 h/y**

**MAXIMUM PRIMARY BURNER INPUT FIRING RATE: 2.11 GJ/h**

**MAXIMUM AFTERBURNER INPUT FIRING RATE: 1.15 GJ/h**

**MAXIMUM EMISSION QUALITY:**

1. 105.5 mg/m<sup>3</sup> Acetone
2. 84.2 mg/m<sup>3</sup> Ethanol
3. 4 mg/m<sup>3</sup> Methanol
4. 5% Opacity.


**MINIMUM INCINERATOR EXIT TEMPERATURE: 843 °C**

**WORKS AND PROCEDURES:**

A TANN Corporation Model TR590 regenerative thermal oxidizer (RTO) with a maximum afterburner input firing rate of 1.15 GJ/h and related appurtenances together with good operating and combustion practices discharging at a stack height of 7.7 meters above ground with a stack inside diameter of 0.56 meters.

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Solvent-based (ethanol-only (Type 2) or acetone, ethanol, methanol mixture (Type 3)) media Gravure coating process utilizing one Faustel coating machine and one two-zone, ASI direct-fired natural gas dryer with a maximum input firing rate of 1,000,000 BTU per zone (totaling 2.11 GJ/h).

**ASI Dryer:**

The single ASI dryer shall operate during either the Type 2 and Type 3 (ES02B) or Type 1 (ES02A) coating processes.

**TANN Regenerative Thermal Oxidizer (RTO):**

The RTO residency time shall be 0.8 seconds.

The RTO minimum incinerator exit temperature of 843 degrees Celsius shall be continuously monitored and recorded in a visible and accessible location.

The Permittee shall maintain a log of inspections and maintenance conducted on the RTO as described in Section 3. This log shall be kept available for inspection for a minimum period of two years.


**Other Restrictions:**

Discharge of solvent and product of combustion emissions associated with Type 2 or Type 3 coating (EN02B) are not authorized while Type 1 coating (EN02A) is in operation.

The combined maximum annual operating hours for EN02A and EN02B shall be 4998 hours per year.

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**SECTION 2 – GENERAL REQUIREMENTS AND CONDITIONS**

**A. AUTHORIZED WORKS, PROCEDURES AND SOURCES**

Works and procedures, which this permit authorizes in order to control the discharge of air contaminants, shall be employed during all operating periods of the related sources. The Permittee shall regularly inspect and maintain all such works, procedures and sources.

The District Director must be provided with reasonable notice of any changes to or replacement of authorized works, procedures or sources. Any changes to or replacement of authorized works, procedures or sources must be approved by the District Director in advance of operation. For certainty, this does not include routine maintenance or repair.

The discharge criteria described in Section 1 of this permit are applicable on the issued or last amended date of this permit unless specified otherwise. If a date different to the issued or last amended date is specified, the existing works, procedures and sources must be maintained in good operating condition and operated in a manner to minimize emissions.

**B. NOTIFICATION OF MONITORING NON-COMPLIANCE**

The District Director must be notified immediately of any emission monitoring results, whether from a continuous emissions monitor or periodic testing, which exceed the quantity or quality authorized in Section 1 of this permit. Notification shall be made to Metro Vancouver's 24-hour number: 604-436-6777, or to [regulationenforcement@metrovanancouver.org](mailto:regulationenforcement@metrovanancouver.org).

**C. POLLUTION NOT PERMITTED**

Notwithstanding any conditions in this permit, no person shall discharge or allow or cause the discharge of any air contaminant so as to cause pollution as defined in the Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008 and the Environmental Management Act.

**D. BYPASSES**

The discharge of air contaminants that have bypassed authorized control works is prohibited unless advance approval has been obtained and confirmed in writing from the District Director.


**E. EMERGENCY PROCEDURES**

In the event of an emergency or condition beyond the control of the Permittee that prevents effective operation of the authorized works or procedures or leads to unauthorized discharge, the Permittee shall:

1. Comply with all applicable statutory requirements;
2. Immediately notify the District Director of the emergency or condition and of contingency actions invoked or planned to mitigate adverse impacts and restore compliance; Notification shall be made to Metro Vancouver's 24-hour number: 604-436-6777; and
3. Take appropriate remedial action for the prevention or mitigation of pollution.

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The District Director may specify contingency actions to be implemented to protect human health and the environment while authorized works are being restored and/or corrective actions are being taken to prevent unauthorized discharges.

If an emergency situation results in a "spill" as defined in the Environmental Management Act Spill Reporting Regulation, the spill shall also be reported immediately to the Provincial Emergency Program by telephoning 1-800-663-3456.

### **F. AMENDMENTS**

The terms and conditions of this permit may be amended, as authorized by applicable legislation. New works, procedures or sources or alterations to existing works, procedures or sources must receive authorization in advance of operation.

### **G. STANDARD CONDITIONS AND DEFINITIONS**

Unless otherwise specified, the following applies to this permit:

1. Gaseous volumes are corrected to standard conditions of 20 degrees Celsius (°C) and 101.325 kilo Pascals (kPa) with zero percent moisture.
2. Contaminant concentrations from the combustion of specific fuel types are corrected to the following Oxygen content, unless specified otherwise:
  - 3% O<sub>2</sub> for natural gas and fuel oil; or
  - 8% O<sub>2</sub> for wood fuel
3. Where compliance testing is required, each contaminant concentration limit in this permit will be assessed for compliance based on a valid test using test methods approved by the District Director.
4. Visual opacity measurements are made at the point of maximum density, nearest the discharge point and exclude the effect of condensed, uncombined water droplets. Compliance determinations are based on a six-minute average in accordance with the United States Environmental Protection Agency (US EPA) Method 9: Visual Determination of the Opacity of Emissions from Stationary Sources. Continuous Emission Monitor System (CEMS) opacity compliance determinations are based on a one-hour average (taken from the top of each hour).
5. If authorized in Section 1 of this permit, standby fuel use is restricted to a maximum of 350 hours per year and to those periods during which the primary authorized fuel is not available. Fuel oil sulphur content shall not exceed 15 milligrams per kilogram (mg/kg) and emissions during fuel oil firing shall not exceed 10% opacity.
6. Definitions in the Environmental Management Act and Air Quality Management Bylaw apply to terminology used in this permit.
7. Threshold Limit Values (TLV) refer to the Time Weighted Average (TWA) exposure limits for substances specified in the American Conference of Governmental Industrial Hygienists Threshold Limit Values handbook, current on the latest date that this permit issuance or amendment came into effect.
8. Sulphur Oxides (SO<sub>x</sub>) are expressed as Sulphur Dioxide.
9. Nitrogen Oxides (NO<sub>x</sub>) are expressed as Nitrogen Dioxide.

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10. The Canadian Council of Ministers of the Environment (CCME) "Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks (PN1180)" shall be adhered to for all applicable tanks unless otherwise stated in this permit.
11. Authorized 'Maximum Annual Operating Hours' of 8760 hours per year for an emission source is equivalent to authorization for continuous operation of the emission source for an entire calendar year, including leap years.

**H. RECORDS RETENTION**


All records and supporting documentation relating to this permit must be kept for at least three years after the date of preparation or receipt thereof, and be made available for inspection within 48 hours of a request by an Officer.

**I. HEATING, VENTILATION, AIR CONDITIONING AND INTERNAL COMBUSTION ENGINES**

Air contaminants discharged from any natural gas-fired heating, ventilation or air conditioning system for buildings and any internal combustion engine located at the discharge site shall be maintained and operated in a manner prescribed by the manufacturer to ensure good combustion of the fuel with minimum discharge of air contaminants.

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**SECTION 3 – REPORTING REQUIREMENTS**

**A. MONITORING REQUIREMENTS AND REPORTING**

Unless otherwise approved in writing by the District Director prior to any sampling or analysis, all measurements shall be performed by an independent agency in accordance with Metro Vancouver Air Emissions Sampling Program Manual of Methods and Standard Operating Procedures and the BC Ministry of Environment Field Sampling Manual, as they may be amended from time to time. Any variance from these procedures must receive prior written approval from the District Director.


A minimum of 5 working days advance notice must be given prior to taking measurements required by this Monitoring and Sampling Program. Notification must be given to the Metro Vancouver Environmental Regulation & Enforcement Division (phone 604-436-6777, Fax 604-436-6707, email [regulationenforcement@metrovancover.org](mailto:regulationenforcement@metrovancover.org)).

Unless otherwise specified, sampling shall be performed under operating conditions representative of the previous 90 calendar days of operation. All field data and calculations must be submitted with monitoring results and they shall be reported in the metric units which are used in this permit. These submissions shall include process data relevant to the operation of the source of the emissions and the performance of the emission control works.

The Permittee shall conduct the following monitoring and sampling and submit electronic reports of the results to the District Director by the dates specified below using a password enabled web based application provided by Metro Vancouver.

EMISSION SOURCE	INITIAL DUE DATE	SUBSEQUENT DUE DATES	REQUIREMENT	PARAMETER(S)	TEST METHOD	REPORT TYPE
02B	February 28, 2019	Every 3 years, on or before February 28 every third year.	Written report detailing the measured discharge rate and concentration of acetone, ethanol, and methanol in the emissions.	Acetone, Ethanol, Methanol	Those approved by Metro Vancouver	Stack

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**B. INFORMATION REPORTING REQUIREMENTS**

The Permittee shall submit electronic reports containing the required information to the District Director by the dates specified below using a password enabled web based application provided by Metro Vancouver.

<b>EMISSION SOURCE</b>	<b>INITIAL DUE DATE</b>	<b>SUBSEQUENT DUE DATES</b>	<b>REQUIREMENT</b>	<b>REPORT TYPE</b>
Facility	March 31, 2019	On or before March 31 for each subsequent year.	Written report providing details of the types and amounts of principal products produced and principal raw materials used in the preceding calendar year.	Materials and Products
01, 02A, 02B	March 31, 2019	On or before March 31 for each subsequent year.	Written report providing details of the total number of hours and days operated in the preceding calendar year. Detailed records are to be maintained in a written bound log or other format approved by the District Director and made available for inspection by Metro Vancouver staff for a minimum period of three years.	Operating Period
Facility	March 31, 2019	On or before March 31 for each subsequent year.	Written report providing details of the types, amounts and end use of organic solvents and organic solvent-containing materials used in the preceding calendar year.	Solvent Use
02B	December 31, 2018	Every 3 years, on or before December 31 every third year.	<b>Sampling Test Plan:</b> A written sampling test plan, including proposed methodologies, shall be submitted for written approval by Metro Vancouver prior to commencing sampling.	Information - Other

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EMISSION SOURCE	INITIAL DUE DATE	SUBSEQUENT DUE DATES	REQUIREMENT	REPORT TYPE
01, 02B	January 31, 2019	On or before January 31 for each subsequent year.	<p><b>Annual Solvent Emission Estimate:</b> The Permittee shall submit an estimate of the annual acetone, ethanol, and methane emissions in tonnes per year (t/a) discharged from each of EN01 and EN02B:</p> <p>Emission calculations for the previous calendar year may be performed using purchase data and material content data. Mass balance or emissions factors can be used to calculate solvent emissions from purchase data. Manufacturer supplied control efficiency of the TANN Corporation Model TR590 regenerative thermal oxidizer (RTO) for EN02B can be assumed for the amount of VOC that was vented through the RTO.</p>	Information - Other
02B	November 30, 2018	N/A	<p><b>RTO Temperature Verification and Calibration Plan:</b> Submit a written plan outlining a proposed annual RTO exit temperature verification and calibration procedure for written approval by the District Director.</p>	Information - Other
02B	January 31, 2020	On or before January 31 for each subsequent year.	<p><b>RTO Calibration Summary and Maintenance Report:</b> Submit a written report that includes a summary of the calibration measurements, conducted by an independent consultant in accordance with vendor specified procedures, and any maintenance actions taken on the RTO in the previous calendar year. Alternate methods may be proposed in writing and subject to written approval by the District Director.</p>	Information - Other

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EMISSION SOURCE	INITIAL DUE DATE	SUBSEQUENT DUE DATES	REQUIREMENT	REPORT TYPE
02A, 02B	January 31, 2020	N/A	<b>ASI Dryer - Low-NOx Burner Upgrades:</b> Submit a plan for written approval by the District Director outlining an implementation schedule for upgrades to the burners for the ASI Dryer. Upgrades shall result in the burner achieving nitrogen oxides (NO <sub>x</sub> ) emissions not exceeding a concentration of 60 mg/m <sup>3</sup> in the flue gas.	Information - Other

**C. AMENDED OR ADDITIONAL REQUIREMENTS**

Based on the results of the monitoring program, including the stack sampling results or any other information, the District Director may:

1. Amend the monitoring and reporting requirement of any of the information required by this Permit including plans, programs and studies.
2. Require additional investigations, tests, surveys or studies.

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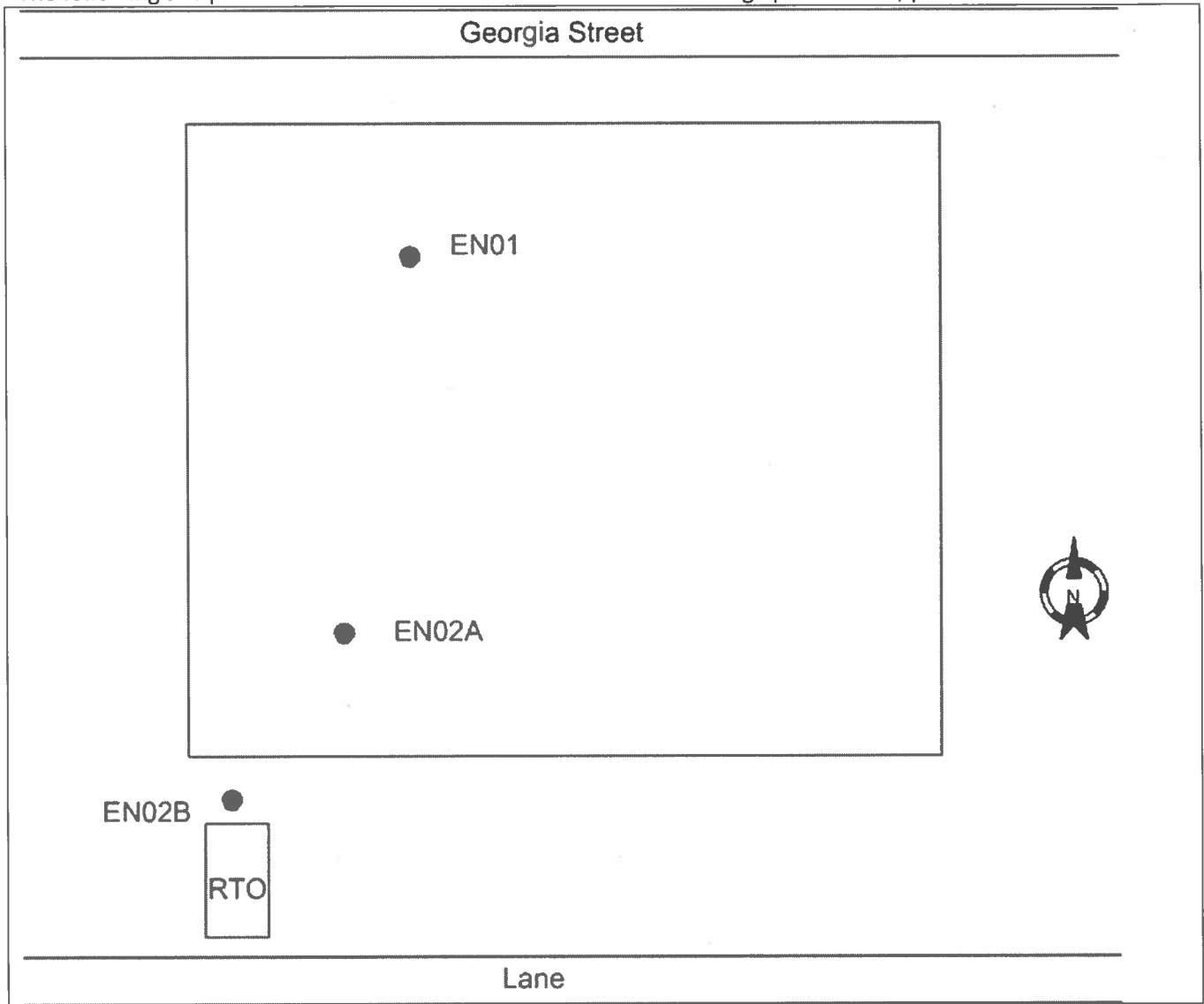
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**SECTION 4 – SITE PLAN**

LEGAL DESCRIPTION OF DISCHARGE SITE: PID 007-260-318 Lot K of Lot 18 Block B District Lot 182 Plan 17716

The following site plan is not to scale and the locations of the discharge points are approximate.



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