TRIOVEST

GREENHOUSE GAS INVENTORY REPORT

6880 FINANCIAL DRIVE, ONTARIO

01/11/2019

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1 EXECUTIVE SUMMARY

Triovest is applying for certification of 6880 Financial Drive, Mississauga, Ontario in the Canada Green Building Council (CaGBC) LEED Canada for Existing Buildings: Operation and Maintenance Program (LEED-EB) and is targeting the rating system's Energy and Atmosphere Credit 6: Emissions Reduction Reporting (EAc6)[1]. To qualify for EAc6, Triovest is reporting the building's greenhouse gas (GHG) emissions in a public GHG registry.

6880 Financial Drive is owned and managed by Triovest. The LEED submission, GHG inventory and corresponding report in accordance with CAN/CSA-ISO Standard 14064-1-06[2] has been complied by Triovest. Triovest has obtained property specific information to complete the Emission Reduction Report recertification submission. 3PAnalysis and Consulting has been engaged to provide independent third-party verification of the building's GHG emissions inventory.

This report details 6880 Financial Drive GHG emissions inventory, including a list of GHG emissions sources[3] and the quantity of emissions released from each source during the reporting period[4].

For the performance period, 6880 Financial Drive emitted the following breakdown of direct (scope 1) GHG emissions and energy indirect (scope 2) GHG emissions. No indirect (scope 3) GHG emissions were reported. Table 1 reports the breakdown of scope 1 and scope 2 emissions from the performance period.

[1] LEED Canada for Existing Buildings: Operations and Maintenance 2009 Reference Guide. 2009, Canada Green Building Council.

[2] CAN/CSA ISO 14064-1 Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. March 2006, International Standards Organization.

[3] Examples of GHG sources include consumption of natural gas for space and water heating and electricity consumption for building system operations, lighting and plug loads.

[4] The reporting period is defined as the one-year duration for which the quantity of GHG emissions from all sources is calculated.

Table 1 Greenhouse Gases by Emission Source for Performance Period

EMISSION BREAKDOWN	
Total Emissions (Tonnes of CO_2e)	1924.81
Direct GHG (scope 1) emissions (Tonnes of CO_2e)	1675.43
Percentage of reported scope 1 emissions from total energy use (%)	87%
Energy indirect GHG (scope 2) emissions (Tonnes of CO_2e)	249.39
Percentage of reported scope 2 emissions from total energy use (%)	13%

This GHG inventory has been developed in accordance with CAN/CSA-ISO Standard 14064-1-06 Greenhouse Gases – Part 1: Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals. In addition, the team has consulted with the World Resource Institute (WRI)/ World Business Council for Sustainable Development (WBCSD) Standard: Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard[5] and CAN/CSA-ISO Standard 14064-3-06 Greenhouse Gases – Part 3: Specification with Guidance for the Validation of Greenhouse Gas Assertions and additional resources.

2 PURPOSE

Triovest has made a commitment to incorporate sustainability into the ongoing operation of 6880 Financial Drive. One important initiative is to participate in LEED-EB certification, which, among other performance enhancement initiatives, includes evaluating building energy, water efficiency and GHG emissions. To achieve LEED-EB EAc6 during certification, Triovest is reporting 6880 Financial Drive's verified GHG emissions to the CSA CleanStart™ Registry.

3 BUILDING PROFILE

6880 Financial Drive is a 78,309.55 m^2, consisting of two 9-storey towers connected by a 2-storey 'Link'. It is comprised of office space, a cafeteria and parking. The building has a surface parking, 1 basement parking level below building, two above ground parking structures each with two levels plus basement.

Building system characteristics that influence the energy use and GHG emissions are:

- HVAC System
  - The building's heating and cooling is provided by hot water boilers and chillers (each tower contains a heating and cooling plant)
  - Ventilation is provided by central air handling units and compartment units
  - The offices spaces are conditioned via VAV boxes. Perimeter spaces are conditioned by fan powered boxes with hot water reheat coils on floors 2-9 and hot water wall-fin radiators (ground floor only). The cafeteria perimeter is served by 4-pipe fan coil units.
- Building Automation System
  - The building uses a Siemens APOGEE Building Automation System (BAS).
  - The system was installed in 2000 by Siemens and is currently serviced by Siemens. It controls the majority of HVAC systems in the building. All controls are DDC. It also stores all

[5] Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. March 2004. World Resources Institute and World Business Council for Sustainable Development.

of the system's trends, monitors alarms, delivers critical notifications to the operators' mobile devices and allows remote web-based access.

- Heating System
  - Each tower contains a central heating plant located in their respective penthouse mechanical rooms. The following is true for both tower's heating plants, except where noted otherwise:
    - The plant contains five identical Cleaver Brooks (Model No. FLX-600) 6,000 MBH (input) forced draft water tube modulating gas-fired boilers with a nameplate efficiency of 80% and dedicated circulation pumps. According to Triovest, at most two boilers are run at the same time.
    - The heating plant consists of a primary loop and two secondary loops.
    - The primary loop contains three 15 HP pumps (P-13, P-14, P-15), which operate as two duty; one standby.
    - The constant temperature secondary hot water loop contains two pumps (P-16, P-17) which operate as duty/standby (50 HP at Tower 1, 40 HP at Tower 2). The loop serves the cafeteria fan coil units, loading dock supply fans, back-of-house unit heaters, and MAU pre-coil heat exchanger HE-3. The tower 1 loop also serves the link AHU heating coils (SF-3, SF-4, SF-5, SF-6)
    - The variable temperature secondary loop has a three-way valve which modulates to maintain a temperature setpoint reset based on outdoor air temperature. The loop contains two 15 HP pumps (P-18, P-19) which serve the perimeter fan-powered boxes and ground floor wall-fin radiators; these operate as duty/standby. The boilers are understood to be in good working condition. Steel water-tube forced draft hot water boilers have an estimated service life of approximately 21-24 years. All three boilers are original to the building construction in 2000, and thus have an estimated remaining service life of 4-7 years or more.
- Ventilation Systems
  - Each tower contains its own ventilation systems. The following is true for both tower's ventilation systems, except where noted otherwise:
    - Outdoor air for the office space is introduced and tempered by two make-up air units (MAUs) for the east and west areas of each floor (SF-1, SF-2). The supply fans are equipped with a VSD, set to maintain an operator-specified duct static pressure. Each MAU is equipped with a chilled water pre-coil and re-coil, and steam humidifier.
    - A shell and tube heat exchanger (HE-3) is in place between the secondary hot water loop and MAU pre-coil to allow heat to be added to the loop if necessary.
    - Each floor (GF to 9F) contains two compartment units (for west and east zones) which mixes return and fresh air, cools via a cooling coil with 2-way valve, then delivers this air to the space. The CU fans are equipped with a VSD, set to maintain an operator specified duct static pressure. The compartment unit outdoor air dampers are controlled based on return air CO2.
    - The 2nd floor link (SF-3), ground floor lobby (SF-4), cafeteria (SF-5), and fitness centre (SF-6, now an office space) are each served by a dedicated mixed-air AHU. Each AHU contains a heating and cooling valve. The SF-3 and SF-6 supply fans and all of the return fans contain VSDs to maintain pressure setpoints.
  - Each tower contains central washroom, general, and electrical exhaust fans.
  - The parking garage is served by direct gas-fired make-up air units interlocked to exhaust fans and the CO monitoring and control system.
- Cooling System
  - Each tower contains a central cooling plant located in their respective penthouse mechanical rooms. The Tower 1 plant contains three York 600ton centrifugal chillers (Model No: YKEBEDH5-CTES) connected in parallel. The Tower 2 plant contains three York 500ton centrifugal chillers (Model No: YKEDDDH4-CRES) connected in parallel.
  - The following is true for both tower's cooling plants, except where noted otherwise:

    - The plant contains a single chilled water loop containing four 60 HP pumps (P-4, P-5, P-6, P-7). The pumps operate as 3 duty, 1 standby, however at most 2 pumps are operated according to Triovest.
    - The cooling plant contains four Baltimore Aircoil forced draft cooling towers. The Tower 1 fans have 60 HP motors and the Tower 2 fans have 40 HP motors. Each cooling tower fan contains a VSD which modulate the fan speed to maintain a condenser water temperature setpoint.
    - The condenser water loop contains three pumps (two duty, one standby). The Tower 1 pumps are 100 HP, and the Tower 2 pumps are 75 HP. The pumps contain VSDs but are operated at constant speed (approx. 75%).
    - When the outdoor air conditions permit the use of water-side free cooling, the plant will shut down the chillers and instead use the cooling towers and a plate-and-frame heat exchanger (HX-1 and HX-2) to provide chilled water to the building.
    - Centrifugal chillers have an estimated service life of approximately 25 years. The York chillers are original to the building construction in 2000, and thus have an estimated remaining service life of 8 years or more.
- Humidification System
    - Five Fulton high efficiency steam boilers provide steam for humidification at the MAUs (SF-1, SF-2 at both towers) and link AHUs (SF-3 to SF-6) in the building.
- Lighting System
    - The majority of the base building office lighting is provided by 2 x 4ft T8 lamps with 32W lamps. The fixtures contain dimmable ballasts which are controlled to deliver approximately 50% output through a Lutron digital addressable lighting control system.
    - The office spaces contain occupancy and perimeter daylight sensor lighting controls.
    - The elevator lobbies contain 23W CFL pot lights and 32W T8 lamps.
    - The washrooms contain 23W CFL pot lights and 32W T8 lamps
    - The stairwells, cafeteria, and back-of house area contain LED fixtures.
    - The underground parking and parking structure lighting consists of approximately 400 80W induction lamps and 1,000 55W LED lamps. Each LED fixture is dimmable with occupancy sensor control. The perimeter above grade parking structure fixtures have daylight sensor control.
    - Surface level parking consists of pole light fixtures with approximately 100 200W induction lamps.
    - All exterior lighting is controlled by daylight sensor.
    - The majority of the building's interior lighting is controlled by a Lutron system that provides the time of day scheduling and digital addressable control.
- Domestic Hot Water
    - Domestic hot water is provided by gas-fired hot water tanks and supplementary hot water storage tanks.
- Domestic Cool Water
    - City fed, with a set of three on-site booster pumps, two rated at 15HP and one rated at 10HP for each tower (P-27, P-28, P-29).

4 GHG INVENTORY BOUNDARIES

4.1 ORGANIZATIONAL BOUNDARIES

An organizational boundary is used to determine how GHG emissions are accounted for and reported. Typically, one of the following approaches is used[6]:

[6] Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. March 2004. World Resources Institute and World Business Council for Sustainable Development.

- Equity share approach: accounts for GHG emissions based on share of equity in the operation
- Financial control approach: accounts for GHG emissions based on the financial control over the operation
- Operational control approach: accounts for GHG emissions based on the control of operations

CAN/CSA-ISO Standard 14064-1-06 Section 4.1 states that the organization may use a different consolidation methodology where specific arrangements are defined by a GHG program or legal contract. Since LEED-EB evaluates buildings rather than organizations, to meet EAc6 requirements the 6880 Financial Drive building was used as a physical boundary, rather than using one of the organizational boundaries described above. As such, the emissions from the base building equipment and the tenant equipment (including HVAC energy, tenant plug loads and refrigerant GHG emissions) are included in the GHG inventory without taking into consideration whether Triovest or the tenants have control or ownership. In addition, since LEED-EB credit EAc6 does not take transportation into consideration, emissions from owned or leased vehicles are excluded from the inventory.

Emissions from the combustion of biomass and GHG removals are not applicable to this inventory, and therefore have not been included in the calculations.

4.2 OPERATIONAL BOUNDARIES

Operational boundaries are defined to prevent double counting of reported emissions. These boundaries can be separated into the following three emission types:

- Direct GHG emissions (scope 1): emissions released from sources owned or controlled by the building. They may include on-site fuel combustion, refrigerant emissions, diesel used in back up generators, generation of electricity, steam and/or heat in equipment.
- Energy Indirect GHG emissions (scope 2): indirect emissions from the generation of purchased energy for the building. They may include the purchase of electricity, steam and/or chilled water.
- Other Indirect GHG emissions (scope 3): emissions that are released from activities outside the organizational boundaries of the building. They may include business travel, employee commuting, third party manufacture of materials and resources, outsourced services, and transmission and/or distribution losses from the electricity network.

4.3 DIRECT GHG EMISSIONS

Direct GHG emissions released from sources at the building level include emissions from the combustion of natural gas and diesel and the release of refrigerant gases.

Natural gas is supplied by Enbridge. Consumption is measured from 2 separate meters.

As reported by Triovest, 6 chillers containing refrigerant R-134a are on site. Each chiller has a refrigerant charge of 1400lbs. The emissions from the refrigerant are limited to the leakage from the refrigerant loop.

Triovest also reported that there are no PFC's or SF_6's in the building.

There are four diesel generators on site. Triovest provided details on how often the generator is tested and generator model numbers which were used to identify usage rate (L/min).

As transportation emissions are excluded in LEED-EB credit EAc6, direct emissions from 6880 Financial Drive owned or leased vehicles are not included in the GHG inventory.

4.4 ENERGY INDIRECT GHG EMISSIONS

The GHG inventory includes indirect GHG emissions inventory from electricity.

Electricity is purchased from Enersource. Consumption is measured from 1 meter.

4.5 BASE YEAR GHG INVENTORY

The building was originally certified with a base year of October 1, 2011 to September 30, 2012. However, due to change of management, consequent management decisions and better data quality, the building is updating its performance period to the current performance period and the previous 12 months as the base-line year.

Emissions are calculated for the accounting period May 01,2017 to April 30,2018 to meet LEED EB's 12-month performance period requirement.

This GHG inventory describes the building's new "base year"[7] emissions. Future annual inventories should be compared to this year to track the results of emission reduction efforts.

4.6 BASE YEAR RECALCULATION POLICY

Future inventories should be informed by the following base year recalculation policy. Inventories will recalculate baseline activity data and emissions to account for changes to the following factors:

1 Changes to operational boundaries (see 4.2)
2 Changes to the ownership and control of GHG sources or sinks transferred into or out of organizational boundaries
3 Changes to GHG quantification methodologies that result in significant changes to quantified GHG emissions or removals.

The base year GHG inventory will not be recalculated to account for changes in facility use or occupancy.

5 INVENTORY QUANTIFICATION

Measuring GHG emissions directly is impractical for a project of this size. As such, we obtained the appropriate GHG emissions using activity data and emission factors, per CAN/CSA-ISO Standard 14064-1-06 Section 4.3.6, to apply to the following equation:

Activity data x emission factor = GHG emissions

Activity data was collected from site natural gas and electricity bills. Emission factors from Canada's most recent annual National Inventory Report (1990-2017) were used.

5.1 NATURAL GAS

5.1.1 Activity Data

Activity data for natural gas is based on Enbridge monthly natural gas bills. Natural gas consumption is metered and reported by the natural gas provider in meters cubed (m^3).

[7] The base year is the first reporting period for which a GHG inventory is reported.

5.1.2 Emission Factor

Triovest used the National Inventory Report (1990-2017)[7] natural gas emission factors to calculate building's GHG emissions. Ontario specific CO_2 emission factors from Part 2, Annex 6, Table A6-1 were used. Since CH_4 and N_2O emissions are dependent on a specific sector rather than regional fuel properties, national commercial CH_4 and N_2O data from Part 2, Annex 6, Table A6-2 were used.

The natural gas emission factor units are measured in metric kilograms of emission per cubic metre (kg of emission/m^3) of natural gas.

5.2 REFRIGERANTS

5.2.1 Activity Data

Activity data for refrigerant(s) R-134a is based on the estimated leakage from the heat pumps refrigerant loop. A leakage rate of 2% of the total refrigerant charge is assumed based on default rates required by LEED-EB credit EAc5: Enhanced Refrigerant Management.

5.2.2 EMISSION FACTOR

Triovest used the global warming potential (GWP) factors from the IPCC Fourth Assessment Report[8] for 6880 Financial Drive GHG calculations. The refrigerant GWP factor compares the amount of heat trapped by a gas relative to a similar mass of carbon dioxide, and is 1430 for R-134a as per the IPCC Fourth Assessment Report.

5.3 DIESEL

5.3.1 Activity Data

Activity data for diesel is based on length of time the generator is tested per year as provided by Triovest and the usage rage (L/min) as provided in manufacturer's sheet.

5.3.2 Emission Factor

Triovest used the National Inventory Report (1990-2017)[7] diesel emission factors. The calculations used CO_2, CH_4 and N_2O emission factors from the National Inventory Report's Part 2, Annex 6, Table A6-4. The diesel emission factor is measured in metric tonnes emission per litre (tonnes/L).

5.4 ELECTRICITY

5.4.1 Activity Data

Activity data for electricity is based on Enersource monthly electricity bills. Electricity is provided through 1 main meter to the building. Electricity bills report actual metered consumption in kilowatt hours (kWh).

5.4.2 Emission Factor

Triovest used the National Inventory Report (1990-2017)[7] electricity emission factors.
As Triovest is reporting on one building in Ontario, the calculations used provincial CO_2, CH_4 and N_2O emission factors from the National Inventory Report's Part 3, Annex 13, Table A13-6. The electricity emission factor is measured in metric grams emission per kilowatt-hour (g/kWh).

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[8] IPPC Fourth Assessment Report (AR4), 2007

Published electricity grid emission factors do not account for Transmission and Distribution (T & D) losses. As noted in section 5.3.1, per the Greenhouse Gas Protocol, guidance indicates that organizations that purchase electricity from a T & D grid but do not own any part of the system should not include T & D losses in their scope 2 inventory. For this reason, T & D losses have not been included in the calculations for this building.

6 GHG INVENTORY RESULTS

6.1 EMISSIONS

The total emissions from direct and indirect GHG emissions sources during the reporting year are 1924.8 tonnes of CO_2e. Building natural gas, diesel, refrigerant leakage and electricity account for 100% of building's emissions. The breakdown is as shown in Figure 1. The emissions relate to the approximately 32,722 million ekWh consumed over the course of the reporting year.

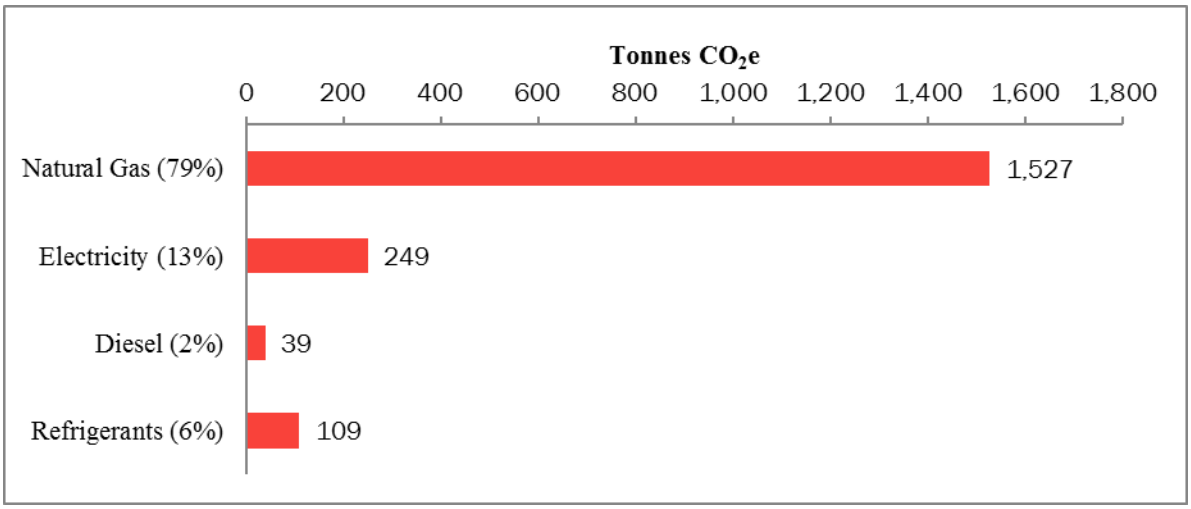

Figure 1: Greenhouse Gases by Emission Source

CO_2 emissions account for 100% of the total GHG emissions. CH_4 and N_2O emissions account for less than 1% of total GHG emissions. However, to meet CAN/CSA-ISO 14064-1-06 requirements, they have been included in the greenhouse gas inventory.

6.2 EMISSION REDUCTIONS

6880 Financial Drive is focusing on Energy Conservation Measures (ECMs) to achieve GHG reductions. During May 1, 2018 to April 30, 2019 reporting period, the building showed almost 64.5 tonnes of CO_2e savings compared to the buildings base year of May 1, 2017 to April 30, 2018.

The following table outlines ECMs that 6880 Financial Drive is considering undertaking and the associated annual emissions savings estimates.

Table 1: GHG Emissions Reduction Strategies

Energy Conservation Measures	Potential Electricity Savings (kWh/yr)	Potential Natural Gas Savings (m^3/yr)	Estimated Emissions Savings (tCO_2e/yr)
Disable Lobby AHU During Unoccupied Periods	99,000		1.71
Raise Condenser Water Temperature Setpoint	63,000		1.09
Operate Cooling Towers in Parallel	150,000		2.59
Install VSD on Chilled Water Pumps	480,000		8.30
Install VSD on Primary Hot Water Pumps	51,000		0.88
Install VSD on Secondary Hot Water Pumps (P-16, P-17)	48,000		0.83
Install New VSD Domestic Cold-Water Booster Pumps	54,000		0.93
Install Occupancy Sensors in Washrooms & Elevator Lobbies	50,000		0.86
Replace Common Area CFL Lighting with LED	33,000		0.57
Replace Parking Garage Lighting with LED	160,000		2.77
Replace Pole Light Fixtures with LED	33,000		0.57
Total Savings	1,221,000	-	21

6.3 INVENTORY UNCERTAINTY

Table 2: Uncertainty Ranking

MAJOR EMISSION CATEGORY	CERTAINTY RANKING
Natural Gas	High – The meter is calibrated and verified by Enbridge. Natural gas emission factors are less dependent on location and are almost always standard and accurate. Uncertainty may be derived from fluctuations in measurement equipment.
Refrigerant	Fair – The refrigerant charge and refrigerant type is taken from manufacturer's sheet. A leakage rate of 2% of the total refrigerant charge is assumed based on default rates required by LEED-EB credit EAc5: Enhanced Refrigerant Management.
Diesel	Fair – The consumption is based on length of time the generator is tested per year as provided by Triovest and the usage rage (L/min) as provided in manufacturer's sheet.
Electricity	Fair – The emission factor is based on an annual provincial grid average, containing multiple fuel sources such as coal, natural gas, hydro and nuclear.

7 QUALITY MANAGEMENT

7.1 INFORMATION MANAGEMENT

In an effort to maintain a credible GHG inventory, roles and responsibilities were assigned to ensure consistency, accuracy, completeness, transparency and conformance with *CAN/CSA-ISO Standard 14064-1-06*.

NAME	ROLE	COMPANY
Suraiya Tasnim	Sustainability Analyst	WSP
Tofayel Hussain	Project Manager	WSP

Responsibilities:

- To collect required energy data via natural gas, diesel and electricity bills
- To collect refrigerant data information
- To approve and sign the CSA CleanStart™ Registry application form
- To request and analyze received activity data for acceptable accuracy, to collect appropriate emission factors and perform GHG calculations
- To produce a report consistent with both the CSA CleanStart™ Registry requirements and *CAN/CSA-ISO Standard 14064-1-06*

NAME	ROLE	COMPANY
Evan Jones	Verifier	3P Analysis and Consulting

Responsibilities:

- To verify that the report meets CSA CleanStart™ Registry requirements and *CAN/CSA-ISO Standard 14064-3-06*
- To issue a verification statement

7.2 DOCUMENT RETENTION AND RECORD KEEPING

The following activities will be conducted by our team to maintain a credible GHG inventory and reporting:

- Continue to record building's natural gas, electricity, diesel and refrigerant cost and consumption
- Keep this GHG inventory report for our records as it contains boundary definitions, emission factors, activity data, refrigerant history, and GHG emission quantities. This information is required should we choose to again register 6880 Financial Drive with the CSA CleanStart™ Registry or externally report on its emissions.

8 GHG INVENTORY VERIFICATION

Evan Jones from 3PAnalysis and Consulting was engaged to provide independent third-party verification as per *CAN/CSA-ISO Standard 14064-3-06*. The verification is completed at a reasonable level of assurance.

Triovest prepared for 6880 Financial Drive verification by:

- Engaging a third-party verifier to provide a reasonable level of assurance
- Agreeing to verification objectives, scope, materiality and criteria with the verifier
- Reviewing each section using the CSA Registry checklist
- Using an internal review process for quality control for the inventory and the document
- Clarifying anomalous data with the Triovest Team

Third-party verification is required by LEED-EB. This provides an impartial and objective review of the reported GHG emissions.

Reporting content summary for declarations to the CSA standard is presented in Appendix C.

APPENDIX A
GREENHOUSE GAS INVENTORY

APPENDIX A

Table A-1: Summary by Source Greenhouse Gas Inventory, Performance Period (May 1, 2018 to April 30, 2019)

Source and Fuel	Quantity of Activity	Activity Unit	Emissions (t CO_2e)
DIRECT GHG EMISSIONS			
Natural Gas			
May-18	4,046	m^3	8
Jun-18	3,456	m^3	7
Jul-18	3,524	m^3	7
Aug-18	3,071	m^3	6
Sep-18	8,938	m^3	17
Oct-18	50,726	m^3	97
Nov-18	97,979	m^3	188
Dec-18	116,682	m^3	223
Jan-19	181,734	m^3	348
Feb-19	152,365	m^3	292
Mar-19	107,838	m^3	206
Apr-19	67,093	m^3	128
Total Natural Gas	**797,452**	**m^3**	**1,527**
Diesel			
May-18	1,172.7	L	3.3
Jun-18	1,172.7	L	3.3
Jul-18	1,172.7	L	3.3
Aug-18	1,172.7	L	3.3
Sep-18	1,172.7	L	3.3
Oct-18	1,172.7	L	3.3
Nov-18	1,172.7	L	3.3
Dec-18	1,172.7	L	3.3
Jan-19	1,172.7	L	3.3
Feb-19	1,172.7	L	3.3
Mar-19	1,172.7	L	3.3
Apr-19	1,172.7	L	3.3
Total Diesel	**14,072**	**L**	**39**
Refrigerant			
Annual Estimated Leakage	0.07620	t	109
Total Refrigerant	**0.07620**	**t**	**109**
ENERGY INDIRECT EMISSIONS			
Electricity - Mixed Fossil Fuels			
May-18	1,214,364	kWh	21.0

Jun-18	1,216,640	kWh	21.0
Jul-18	1,333,705	kWh	23.1
Aug-18	1,352,711	kWh	23.4
Sep-18	1,204,998	kWh	20.8
Oct-18	1,209,343	kWh	20.9
Nov-18	1,161,508	kWh	20.1
Dec-18	1,169,999	kWh	20.2
Jan-19	1,233,269	kWh	21.3
Feb-19	1,055,593	kWh	18.3
Mar-19	1,163,445	kWh	20.1
Apr-19	1,101,651	kWh	19.1
Total Electricity	**14,417,226**	**kWh**	**249**
TOTAL EMISSIONS			**1,925**
CARBON INTENSITY	**24.58**		**kg CO_2e/sq.ft.**
	0.18		**t CO_2e/FTE**

Table A-2: Summary by Emission Type Greenhouse Gas Inventory, Performance Period (May 1, 2018 to April 30, 2019)

Source and Fuel	**Quantity of Activity**	**Activity Unit**	**CO_2 Emissions**		**CH_4 Emissions**		**N_2O Emissions**	
DIRECT GHG EMISSIONS								
Natural Gas								
Breakdown Conversion	797,452	m^3	1,506	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	1,527	tCO_2e	1,506	tCO_2e	10	tCO_2e	12	tCO_2e
Diesel								
Breakdown Conversion	14,072	L	38	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	40	tCO_2e	38	tCO_2e	0	tCO_2e	2	tCO_2e
Refrigerants								
Breakdown Conversion	0	t						
CO_2e emissions	109	tCO_2e						
ENERGY INDIRECT EMISSIONS								
Electricity - Mixed Fossil Fuels								
Breakdown Conversion	14,417,226	kWh	245	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	249	tCO_2e	245	tCO_2e	0	tCO_2e	4	tCO_2e
Chilled Water								
Breakdown Conversion	0	TnHr	0	tCO_2	0	tCH_4	0	tN_2O

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CO_2e emissions	0	tCO_2e	0	tCO_2e	0	tCO_2e	0	tCO_2e
Steam								
Breakdown Conversion	0	Mlb	0	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	0	tCO_2e	0	tCO_2e	0	tCO_2e	0	tCO_2e
TOTAL Breakdown Conversion			**1,897**	**tCO_2**	**0**	**tCH_4**	**0**	**tN_2O**
TOTAL CO_2e emissions	**1,925**	**tCO_2e**	**1,897**	**tCO_2e**	**10**	**tCO_2e**	**18**	**tCO_2e**

Table A-3: Summary by Source Greenhouse Gas Inventory, Base Year Period (May 1, 2017 to April 30, 2018)

Source and Fuel	Quantity of Activity	Activity Unit	Emissions (t CO_2e)
DIRECT GHG EMISSIONS			
Natural Gas			
May-17	19,100	m^3	37
Jun-17	3,945	m^3	8
Jul-17	3,682	m^3	7
Aug-17	3,667	m^3	7
Sep-17	3,194	m^3	6
Oct-17	39,109	m^3	75
Nov-17	100,355	m^3	192
Dec-17	192,767	m^3	369
Jan-18	149,677	m^3	287
Feb-18	115,723	m^3	222
Mar-18	133,562	m^3	256
Apr-18	133,562	m^3	256
Total Natural Gas	**826,452**	**m^3**	**1,720**
Diesel			
May-17	1,172.7	L	3.3
Jun-17	1,172.7	L	3.3
Jul-17	1,172.7	L	3.3
Aug-17	1,172.7	L	3.3
Sep-17	1,172.7	L	3.3
Oct-17	1,172.7	L	3.3
Nov-17	1,172.7	L	3.3
Dec-17	1,172.7	L	3.3
Jan-18	1,172.7	L	3.3
Feb-18	1,172.7	L	3.3
Mar-18	1,172.7	L	3.3
Apr-18	1,172.7	L	3.3
Total Diesel	**14,072**	**L**	**39**
Refrigerant			
Annual Estimated Leakage	**0.07620**	**t**	**109**
Total Refrigerant	**0.07620**	**t**	**109**
ENERGY INDIRECT EMISSIONS			
Electricity - Mixed Fossil Fuels			
May-17	1,308,151	kWh	22.6

Jun-17	1,277,889	kWh	22.1
Jul-17	1,342,188	kWh	23.2
Aug-17	1,340,718	kWh	23.2
Sep-17	1,257,999	kWh	21.8
Oct-17	1,141,068	kWh	19.7
Nov-17	1,208,820	kWh	20.9
Dec-17	1,218,906	kWh	21.1
Jan-18	1,284,174	kWh	22.2
Feb-18	1,123,546	kWh	19.4
Mar-18	1,238,177	kWh	21.4
Apr-18	1,192,209	kWh	20.6
Total Electricity	**14,933,846**	**kWh**	**258**
TOTAL EMISSIONS			**2,127**
CARBON INTENSITY	**27.16**		**kg CO_2e/sq.ft.**
	0.20		**t CO_2e/FTE**

Table A-4: Summary by Emission Type Greenhouse Gas Inventory, Base Year Period (May 1, 2017 to April 30, 2018)

Source and Fuel	**Quantity of Activity**	**Activity Unit**	**CO_2 Emissions**		**CH_4 Emissions**		**N_2O Emissions**	
DIRECT GHG EMISSIONS								
Natural Gas								
Breakdown Conversion	826,452	m^3	1,560	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	1,583	tCO_2e	1,560	tCO_2e	10	tCO_2e	12	tCO_2e
Diesel								
Breakdown Conversion	14,072	L	38	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	39	tCO_2e	38	tCO_2e	0	tCO_2e	2	tCO_2e
Refrigerants								
Breakdown Conversion	0	t						
CO_2e emissions	109	tCO_2e						
ENERGY INDIRECT EMISSIONS								
Electricity - Mixed Fossil Fuels								
Breakdown Conversion	14,933,846	kWh	254	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	258	tCO_2e	254	tCO_2e	0	tCO_2e	4	tCO_2e
Chilled Water								

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Breakdown Conversion	0	TnHr	0	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	0	tCO_2e	0	tCO_2e	0	tCO_2e	0	tCO_2e
Steam								
Breakdown Conversion	0	Mlb	0	tCO_2	0	tCH_4	0	tN_2O
CO_2e emissions	0	tCO_2e	0	tCO_2e	0	tCO_2e	0	tCO_2e
TOTAL Breakdown Conversion			**1,961**	**tCO_2**	**0**	**tCH_4**	**0**	**tN_2O**
TOTAL CO_2e emissions	**1,989**	**tCO_2e**	**1,961**	**tCO_2e**	**10**	**tCO_2e**	**18**	**tCO_2e**

APPENDIX B
ACTIVITY DATA AND EMISSION FACTORS

APPENDIX B

Table B-1: Activity Data

ACTIVITY DATA	COLLECTION METHODOLOGY
Natural Gas	Enbridge provided 6880 Financial Drive Enbridge monthly natural gas bills.
Refrigerant	Triovest provided the number of refrigerant-containing base building systems. Chiller leakage rates were not provided; Triovest assumed a conservative 2% estimate.
Diesel	Triovest provided number of times generators are tested each month and usage rate from manufacturer's sheet.
Electricity	Enersource provided 6880 Financial Drive Enersource monthly electricity bills.

Table B2 summarizes the emission factors and sources used in the calculations completed for 6880 Financial Drive GHG Inventory.

Table B-2: Emission Factors

EMISSION SOURCE	EMISSION FACTOR	SOURCE OF EMISSIONS FACTOR
Natural gas, Carbon Dioxide (CO_2), Ontario	1.888 kg CO_2/m^3	Canada's National Inventory Report 1990-2017, Part 2, Annex 6, written in 2019
Natural gas, Methane (CH_4), National	0.00049 kg CH_4/m^3	Canada's National Inventory Report 1990-2017, Part 2, Annex 6, written in 2019
Natural gas, Nitrous Oxide (N_2O), National	0.000049 kg N_2O/m^3	Canada's National Inventory Report 1990-2017, Part 2, Annex 6, written in 2019
Electricity, Carbon Dioxide (CO_2), Ontario	17 g CO_2/kWh	Canada's National Inventory Report 1990-2017, Part 3, Annex 11, written in 2019
Electricity, Methane (CH_4), Ontario	0 g CH_4/kWh	Canada's National Inventory Report 1990-2017, Part 3, Annex 11, written in 2019
Electricity, Nitrous Oxide (N_2O), Ontario	0.001 g N_2O/kWh	Canada's National Inventory Report 1990-2017, Part 3, Annex 11, written in 2019
Diesel, Carbon Dioxide (CO_2)	2681 g CO_2/L	Canada's National Inventory Report 1990-2017, Part 2, Annex 6, written in 2019
Diesel, Methane (CH_4)	0.133 g CH_4/L	Canada's National Inventory Report 1990-2017, Part 2, Annex 6, written in 2019
Diesel, Nitrous Oxide (N_2O)	0.4 g N_2O/L	Canada's National Inventory Report 1990-2017, Part 2, Annex 6, written in 2019

Table B3 summarizes the Global Warming Potentials (GWP) and sources used in the calculations completed for the 6880 Financial Drive GHG Inventory.

Table B-3: Global Warming Potentials (GWP)

EMISSION TYPE	GWP (GCO_2E/G)	SOURCE
CO_2	1	Intergovernmental Panel on Climate Change, fourth assessment report.
CH_4	25	
N_2O	298	

APPENDIX C
STANDARD REPORTING DECLARATION

APPENDIX C

The following table provides a summary of the reporting information required by CAN/CSA-ISO Standard14064-1-06. Provided in the 'declaration' column is Triovest assertion of 6880 Financial Drive inventory.

Table C-1: Reporting Information

NO.	CSA REPORTING REQUIREMENT	DECLARATION
A	Description of the reporting organization.	Triovest is 6880 Financial Drive's owner and manager. Triovest has registered the building in the Canada Green Building Council's LEED-EB Program and is targeting LEED-EB Energy and Atmosphere credit 6: Emission Reduction Reporting Recertification. As part of Triovest initiative to green this building, they are reporting 6880 Financial Drive's GHG emissions with the CSA CleanStart Registry. 6880 Financial Drive emits GHGs through their use of natural gas, refrigerants, diesel and electricity.
B	Person responsible.	Tofayel Hussain, Project Manager, WSP and agent to Lello Gugliucciello, General Manger
C	Reporting period covered.	May 1, 2018 to April 30,2019
D	Documentation of organizational boundary.	"Physical facility approach" defined by the LEED-EB Canada Energy and Atmosphere credit 6 Emission Reduction Reporting Program; this is a different consolidation methodology than typically defined, however still within CSA/ISO 14064-1 guidelines.
E	Direct GHG emissions, quantified separately for each GHG, in tonnes of CO_2e.	See Appendix A.
F	A description of how CO_2 emissions from the combustion of biomass are treated in the GHG inventory.	Not applicable to this inventory.
G	If quantified, GHG removals, quantified in tonnes of CO_2e.	Not applicable to this inventory.
H	Explanation for the exclusion of any GHG sources or sinks from quantifications.	This inventory includes all energy indirect GHG emissions, GHG sinks are not applicable to this inventory.
I	Energy indirect GHG emissions associated with the generation of imported electricity, heat or steam, quantified separately in tonnes of CO_2e.	See Appendix A
J	The historical base year selected and the base-year GHG inventory.	Base year for 6880 Financial Drive is May 1, 2017 to April 30, 2018. This base year was chosen due to the performance period requirements of the Canada Green Building Council LEED-program, it was listed as a starting point for future GHG inventories. See Appendix A for the CSA CleanStart Registry's base year GHG emission summary.

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NO.	CSA REPORTING REQUIREMENT	DECLARATION
K	Explanation of any change to the base year or other historical GHG data, and any recalculation of the base year or other historical GHG inventory.	Not applicable to this inventory
L	Reference to, or description of, quantification methodologies including reasons for their selection.	Calculations are based on GHG activity data multiplied by GHG emission factors.
M	Explanation of any change to quantification methodologies previously used.	Not applicable to this inventory
N	Reference to, or documentation of, GHG emission or removal factors used.	See Appendix B for details
O	Description of the impact of uncertainties on the accuracy of the GHG emissions and removals data.	Uncertainties in calculations include error margins in emission factors and measured activity data. Emission factors were determined by the most local and credible sources available at the time of reporting. Activity data is based on utility bills consumption and top up bills received by Triovest. Refrigerant data is based on default leakage rates. Based on these sources, the level of uncertainty is assumed to be fair.
P	A statement that the GHG report has been prepared in accordance with ISO Standard 14064-1.	This report has been prepared in accordance with the following standard: CAN/CSA-ISO Standard 14064-1-06-Part 1: Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.
Q	A statement describing whether the GHG inventory, report or assertion has been verified, including the type of verification and level of assurance achieved.	Evan Jones at 3PAnalysis and Consulting provided third party verification for this GHG Inventory report and provided it with a reasonable level of assurance. See third party verification report for further details.