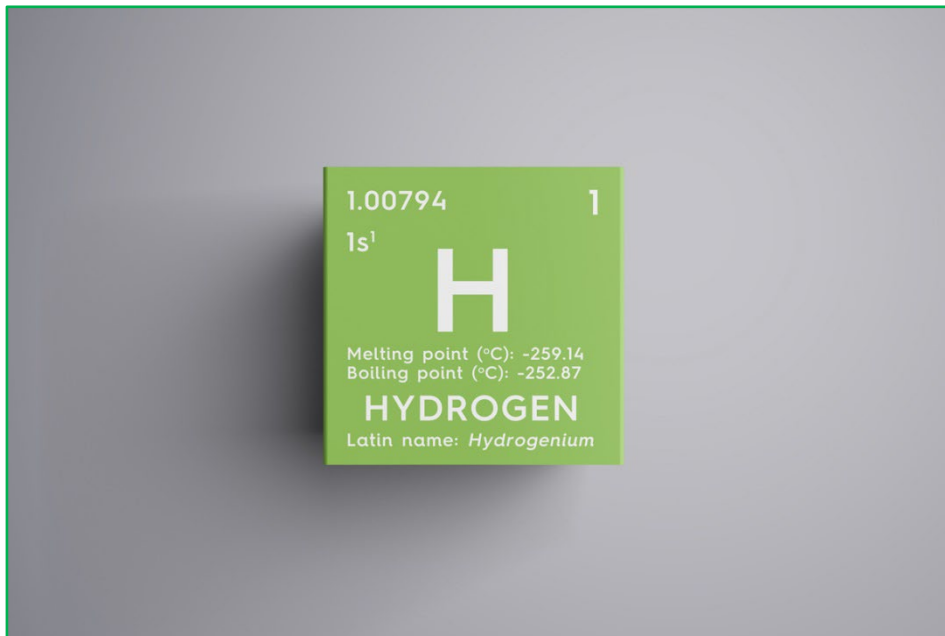


Eastern Power Inc.

Hydrogen Ready Power Plant Project

**Initial Project Description for a Designated Project under the
Impact Assessment Act**

May 24, 2022



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1 GENERAL INFORMATION AND CONTACTS

1.1 Project Name and General Description

Name of the project: **Hydrogen Ready Power Plant Project**

The Hydrogen Ready Power Plant Project involves the design, construction and operation of a new dual-fuelled, i.e., both natural gas and/or hydrogen, electricity generating facility in St. Clair Township, Ontario at 477B Oil Springs Line, Courtright, Ontario, as shown in Figure1. The facility will be constructed on existing fully serviced industrial property, complete with the required infrastructure. The property already has natural gas pipeline services, water supply pipelines service, wastewater discharge pipeline services connected to the Courtright municipal wastewater treatment facility and immediate interconnection to the Hydro One Networks Inc. electrical transmission/distribution grid. There are no permanent, seasonal or temporary residences on the property. The nearest residential property is more than 500 m from the proposed facility.

Figure 1 Hydrogen Ready Power Plant Project Location



The proposed facility will use combined cycle electrical power generation technology, i.e., combustion turbine, heat recovery steam generator and steam turbine. It will have a net electrical power output capacity of about 600 megawatts (MW). Natural gas and natural gas with added hydrogen will be provided by third party energy suppliers through one of the existing nearby pipelines. Energy suppliers and pipeline distributors are now planning for hydrogen addition to pipeline natural gas as a means to reduce combustion related GHG carbon emissions. The electricity produced by the facility will be fed into the immediately adjacent 230,000 Volt electrical transmission system of Hydro One Networks Inc.

The Project is being developed in response to the Independent Electricity System Operator's (IESO) identification of the need for >600 MW additional electricity generation capacity in Ontario's South West Region and in advance of an IESO RFP for this need as expected in 2022. The Project is designed to take advantage of lower carbon emitting hydrogen fuels as these become progressively more available over the minimum 25-year life of the Project.

The Hydrogen Energy Platform is being developed, with support of the Ontario and Federal Governments, as an important strategy for lowering Greenhouse Gas (GHG) carbon emissions and to help meet future GHG reduction targets. Hydrogen energy development strategies have now been initiated by both Ontario ([Ontario Hydrogen Strategy](#)) and Canada ([Canadian Hydrogen Strategy](#)). These provincial and federal strategies include using hydrogen for electrical power generation. The IESO has recently been asked by the Minister of Energy to investigate and propose program options to integrate low-carbon hydrogen technologies into Ontario's electricity grid for the purposes of balancing and strengthening the reliability of the electricity system and contributing to broader decarbonization ([IESO integrates hydrogen](#)).

1.2 Proponent Contact Information

Name of the proponent: Eastern Power Inc.
2275 Lake Shore Blvd. W. Suite 401,
Toronto, Ontario M8V 3Y3

Principal contact person: Bruce E. Holbein, Environmental Manager
bholbein@easternpower.on.ca
Tel. (416)-234-1301

1.3 Project Coordinates

The HRPP Project location GIS coordinates are:

Latitude: 42° 47' 6" N

Longitude: 82° 25' 40" W

Legal description of project lands:

Part Lot 26, Con 2E, Part Lot 26 & Part Road Allowance between Con 1&2 Plan 24RP 25R 1585; Parts 1 to 10, Township of St. Clair

1.4 Public and Government Agency Consultations

Nineteen governmental agencies were identified within federal, provincial, regional or municipal jurisdictions for consultation on the Project. These agencies were provided with copies of the mandatory notices in July 2021 as well as all the project information as was given to the public and to First Nations.

Local residents, as already known from the previous GEPP project since 2012, were confirmed and further identified with assistance of the municipality. These local residents, together with all eight potentially affected First Nations and the governmental agencies were notified as to the Project notice of EA commencement, provided a link to the project website (<https://hydrogenreadypowerplant.ca/>) and were invited to a virtual open house August 6-13, 2021 including a Zoom based town hall meeting August 11, 2021.

Comments received from the public and various responding Governmental agencies are summarized in section 6.2 below, together with responses from the proponent. Notable among these was support for the HRPP Project by the Director, Electricity Policy, Economics and System Planning Branch of the Ontario Minister of Energy pointing out, "Ontario is currently developing its first ever hydrogen strategy to create local jobs, attract investment and reduce greenhouse gas emissions".

1.5 First Nation Consultations

The GSPC property and the HRPP Project site on the GSPC property are not near and are not part of any First Nation reserve lands or on lands subject to any pending claims by Indigenous Peoples communities.

Eight First Nations in the overall region surrounding the Project and with potential interest in the Project were identified both from previous ongoing consultation experience of the proponent with Greenfield South Power Corporation's Green Electron Power Plant project (since 2012) and through information provided by the EA coordinator for the Ministry of Environment Conservation and Parks (MECP). The proposed Project is also subject to IAAC review as to possible need for a Federal Government impact assessment. This IAAC review also includes consultation with indigenous groups potentially affected by the project. In addition, the Project is subject to an extensive Environmental Review assessment being completed for the MECP. The proponent understands that the MECP has Crown responsibility for First Nation consultation for this Project and the MECP expects this consultation to be carried out by the proponent.

The eight First Nation reserves in the greater region of the project site include: Aamjiwnaang First Nation approximately 14 km to the north of the site; Walpole Island First Nation approximately 17 km to the south; Moravian of the Thames First Nation approximately 49 km to the southwest of the site; Chippewas of Kettle and Stony Point First Nation approximately 55

km to the northeast of the site; Chippewas of the Thames First Nation approximately 72 km to the east of the site; Munsee Delaware First Nation approximately 73 km to the east of the site; Caldwell First Nation approximately 82 km to south of the site and Oneida Nation of the Thames approximately 85 km to the east of the site.

Early consultation with each of these First Nations was undertaken starting in July 2021 with direct contact made in writing to their respective Chiefs and their Band environmental coordinators (as named by some of these First Nations). Information was provided as to the location and nature of the Project and each was directed to the HRPP Project website ([HRPP Project](#)) for additional information. Each FN was also invited to raise any questions they might have and provide any comments or concerns. Information pertaining to these First Nations, a record of the consultations and responses received from these First Nations are detailed fully in Section 5 (below).

From previous consultations with these same First Nations in 2012 for the similar GSPC GEPP project on the same overall site, only the Walpole Island First Nation (WIFN) and the Aamjiwnaang First Nation (AFN) had commented and raised concerns. For these, direct contact with WIFN and AFN band officials with responsibility for environmental matters had been established. Eastern Power has maintained ongoing consultation with these WIFN and AFN officials throughout the development of the GSPC project and with continuing contact after the GSPC project was in full commercial operation.

Details of the consultations carried with the eight First Nations are provided in section 5 (below).

1.6 Environmental Assessment and Other Regulatory Processes

1.6.1 Province of Ontario EA subject to O. Reg. 116/01

The Project is on privately owned land in Ontario and subject to the Environmental Assessment requirements of Ontario (O.Reg. 116/01) for electricity projects, i.e., as a category B project, under the Environmental Assessment Act (Ontario). Eastern Power Inc. had self-elevated the EA to an Environmental Review on the basis that detailed air and noise emission studies would better identify any impacts to the closest receptors neighbouring the HRPP Project. These studies as well as a stormwater management report and consultation reports were completed, and these became part of an Environmental Screening and Review Report (ESRR). The ESRR has been reviewed by the MECP. This MECP-required EA has now been completed to the stage of its published Notice of Completion of Environmental Review as of April 14, 2022, with the ESRR published and available for public review. Publication of the Notice of Completion of Environmental Review was made in two regional weekly newspapers, the Sarnia Observer and the Wallaceburg Courier. The complete ESRR and its supporting studies are available for public review on the Project website ([HRPP Project](#)) and are appended (see Appendices 7.1 through 7.8).

1.6.2 MECP O. Reg. 116/01 EA Environmental Screening Checklist

The environmental screening checklist ([MECP Screening](#)) included a number of environmental, technical, cultural, heritage, Indigenous Groups and socio-economic criteria and the screening

report is included in the table below. The checklist, as provided to the MECP with the ESRR, included additional direct reference to the relevant section of the ESRR (see Appendix 7.1 for details). The table below provides a list of the potential impacts as screened along with the mitigation measures, i.e., as appropriate to be taken to minimize the particular impact. The full ESRR, with all its supporting technical studies, are provided as Appendices 7.1 through 7.8 and is also available on the HRPP Project website ([HRPP Project](#)).

Table 1 MECP O. Reg. 116/01 EA Environmental Screening Checklist for HRPP Project
 (Note: this checklist, complete with reference to the relevant ESRR section, is also contained in Appendix 7.1)

CRITERION		POTENTIAL NEGATIVE EFFECTS ¹		
1.	Surface and Ground Water	Yes	No	Net effects including with Mitigation Measures Additional Information ^{1,2}
1.1	Will the project have negative effects on surface water quality, quantities or flow?	√		No surface water taking. Treatment of wastewater will mitigate impacts. Collection of stormwater for use and treatment from all facility covered surfaces will minimize impact.
1.2	Will the project have negative effects on ground water quality, quantity or movement?		√	No withdrawal from or input to groundwater. Most stormwater will continue to recharge groundwater or watershed.
1.3	Will the project cause significant sedimentation, soil erosion or shoreline or riverbank erosion on or off site?		√	No net effects.
1.4	Will the project cause potential negative effects on surface or ground water from accidental spills or releases to the environment?		√	Low potential for spills in construction, commissioning and operational phases. No net negative impacts as a result of appropriate containment and mitigation structures and procedures to be implemented.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

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2.	Land	Yes	No	Net effects including with Mitigation Measures Additional Information ^{1,2}
2.1	Will the project have negative effects on residential, commercial or institutional land uses within 500 metres of the site?		√	There are no residential building receptors within the 500-metre zone for which atmospheric emissions and noise could have impacts. The majority of land use within the 500-metre zone is industrial. There are no net impacts from noise and emissions with mitigation measures.
2.2	Will the project be inconsistent with the Provincial Policy Statement, provincial land use or resource management plans?		√	No inconsistency.
2.3	Will the project be inconsistent with municipal land use policies, plans and zoning by-laws?		√	Land for the project is on industrial land appropriately zoned by the municipality.
2.4	Will the project use hazard lands or unstable lands subject to erosion?		√	Confirmed previously by GSPC with ESA Phase I study for overall land; HRPP to use a portion of GSPC land.
2.5	Will the project have potential negative effects related to the remediation of contaminated land?		√	Project will not impair the remediation of any contaminated lands and project does not emit contaminants to land.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

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3.	Air and Noise	Yes	No	Net effects including with Mitigation Measures Additional Information ^{1,2}
3.1	Will the project have negative effects on air quality due to emissions of nitrogen dioxide, sulphur dioxide, suspended particulates, or other pollutants?	√		Emissions of nitrogen dioxide, carbon monoxide, and particulate matter (no sulphur dioxide or other pollutants) will occur from combustion of natural gas and hydrogen gas. No net impacts will occur with mitigation procedures in place. Emissions will meet MECP provincial guidelines at nearest points of impingement.
3.2	Will the project cause negative effects from the emission of greenhouse gases (CO ₂ , methane, etc.)?	√		CO ₂ emissions from burning natural gas fuel but not from hydrogen. Net Impacts of GHG emission will be progressively reduced over project life as hydrogen fuel becomes more available and utilized.
3.3	Will the project cause negative effects from the emission of dust or odour?	√		Potential dust emissions in construction phase only but no odour emissions at any phase. No Net Impacts with mitigation procedures in place.
3.4	Will the project cause negative effects from the emission of noise?	√		Turbines, transformers and cooling system will emit noise. No net Impacts due to noise with mitigation features incorporated. Noise emissions at nearest critical point of reception will meet nighttime regulatory limit of 45 dBA.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

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4.	Natural Environment	Yes	No	Net effects including with Mitigation Measures Additional Information ^{1,2}
4.1	Will the project cause negative effects on rare, threatened or endangered species of flora or fauna or their habitat?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.2	Will the project cause negative effects on protected natural areas such as ANSI's (Area of natural or Scientific Interest), ESA's (Environmentally Significant Area) or other significant natural areas?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.3	Will the project cause negative effects on wetlands?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.4	Will the project have negative effects on wildlife habitat, populations, corridors or movement?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.5	Will the project have negative effects on fish or their habitat, spawning, movement or environmental conditions (e.g., water temperature, turbidity, etc.)?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.6	Will the project have negative effects on migratory birds, including effects on their habitat or staging areas?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.7	Will the project have negative effects on locally important or valued ecosystems or vegetation?		√	Confirmed previously through a Baseline Natural and Environmental Site Impact Study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

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5.	Resources	Yes	No	Net effects including with Mitigation Measures Additional Information ^{1,2}
5.1	Will the project result in inefficient (below 40%) use of a non-renewable resource (efficiency is defined as the ratio of output energy to input energy, where output energy includes electricity produced plus useful heat captured)?		√	Project will achieve 48% efficiency (electrical) through combined cycle operation without provision for potential combined residual heat product use. Project ties directly to existing local transmission network improving net efficiency by avoiding electrical line losses.
5.2	Will the project have negative effects on the use of Canada Land Inventory Class 1, 2 or 3, specialty crop or locally significant agricultural lands?		√	Project lands are zoned industrial.
5.3	Will the project have negative effects on existing agricultural production?		√	Project lands have been used for agricultural production in spite of industrial zoning and this HRPP project land is marginal with poor crop productivity as not suited to tile drainage.
5.4	Will the project have negative effects on the availability of mineral, aggregate or petroleum resources?		√	No resource at or near facility.
5.5	Will the project have negative effects on the availability of forest resources?		√	No forest resource at or near HRPP facility
5.6	Will the project have negative effects on game and fishery resources, including negative effects caused by creating access to previously inaccessible areas?		√	No game resource at or near HRPP facility.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

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6.	Socio-economic	Yes	No	Net effects including with Mitigation Measures Additional Information ^{1,2}
6.1	Will the project have negative effects on neighbourhood or community character?		√	Project is consistent with activities of industrial neighbours.
6.2	Will the project have negative effects on local businesses, institutions or public facilities?		√	Project will provide local economic stimulus and help assure energy supply security.
6.3	Will the project have negative effects on recreation, cottaging or tourism?		√	No applicable uses near facility.
6.4	Will the project have negative effects related to increases in the demands on community services and infrastructure?		√	Requirements for water and wastewater services have been confirmed to be within existing municipal capacities.
6.5	Will the project have negative effects on the economic base of a municipality or community?		√	Project will provide industrial tax revenues, economic activity and jobs.
6.6	Will the project have negative effects on local employment and labour?		√	Project will provide local employment opportunities in all project phases
6.7	Will the project have negative effects related to traffic?		√	Municipality does not require traffic study due to light volumes expected.
6.8	Will the project cause public concerns related to public health and safety?		√	No

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

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7.	Heritage and Culture	Yes	No	Net effects including with Mitigation Measures Additional Information^{1,2}
7.1	Will the project have negative effects on heritage buildings, structures or sites, archaeological resources, or cultural heritage landscapes?		√	Previously confirmed through both Stage 1 and Stage 2 Archaeological Assessment.
7.2	Will the project have negative effects on scenic or aesthetically pleasing landscapes or views?		√	No scenic or aesthetically pleasing landscapes or views within view of the project.
8.	Indigenous	Yes	No	Net effects including with Mitigation Measures Additional Information^{1,2}
8.1	Will the project cause negative effects on First Nations or other Indigenous Communities?		√	Not on First Nation (FN) land or claimed by any FN and will not affect traditional uses by FNs
9.	Other	Yes	No	Net effects including with Mitigation Measures Additional Information^{1,2}
9.1	Will the project result in negative effects due to the creation of waste materials requiring disposal?	√		Cooling tower blowdown wastewater contains hardness and other ions and waste heat; this impact will be mitigated by treatment in a municipal WWTF.
9.2	Will the project cause any other negative environmental effect not covered by the criteria outlined above?		√	NA

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines ([MECP Screening](#))

2: Net Impacts as stated resulting from application of mitigation features and procedures; version provided to MECP included specific reference to relevant section of ESRR.

1.6.3 Province of Ontario Environmental Compliance Certificates

The Project will also be regulated in terms of air emissions and noise emissions which will be subject to a MECP Environmental Compliance Approval. The project will also be regulated as to wastewater discharge by way of a separate Environmental Compliance Approval.

The Project is also regulated in terms of zoning and site plan by St. Clair Township under the Planning Act (Ontario).

1.6.4 St. Clair Regional Conservation Authority

The Project will also be subject to use of the project lands as regulated by the Conservation Authorities Act (Ontario) in terms of impact on flooding, erosion and other watershed protection issues.

1.6.5 Ontario Independent Electricity System Operator Connection Approval

A proponent-initiated/paid IESO-conducted System Impact Assessment (SIA) for the connection of the HRPP project to the IESO-controlled grid was completed February 26, 2020. The IESO concluded in its SIA that there would no adverse impacts for the proposed connection of the HRPP Project.

1.6.6 Hydro One Networks Inc. Connection Approval

A proponent-initiated/paid Hydro One Networks Inc. conducted initial Connection Impact Assessment (CIA) for the connection of the HRPP project to Hydro One's transmission circuits was completed September 28, 2021. Hydro One Networks Inc. concluded in its CIA that the Hydro One system and area customers will not be adversely impacted by the connection of the HRPP Project.

1.6.7 Ontario Energy Board Electricity Generating License

Ontario Energy Board has granted Electricity Generator License number EG-2021-0217.

1.6.8 Impact Assessment Agency of Canada

The IAAC has confirmed that the Project is a designated physical activity as set out under section 30 of the Physical Activities Regulations: 30) The construction, operation, decommissioning and abandonment of a new fossil fuel-fired power generating facility with a production capacity of 200 MW or more. As a designated activity the IAAC will screen the project as to potential needs for an Impact Assessment.

1.7 IAAC Regional Study

The IAAC informed the proponent that the HRPP Project is not located within an area that is undergoing or has undergone a Regional Assessment under the Impact Assessment Act. The Strategic Assessment of Climate Change (SACC) under section 95 of the Impact Assessment Act will apply to the Project.

1.8 IAAC Strategic Assessment

The IAAC informed the proponent that the Project being an IAAC-designated activity should include a Strategic Assessment of Climate Change (SACC) as the SACC is a strategic assessment covered under section 95 of the Impact Assessment Act. This SACC is addressed further in section 4.1.2 (below).

2 PROJECT INFORMATION

2.1 Project Summary

The Hydrogen Ready Power Project proponent is Eastern Power Inc. and this report has been prepared by Eastern Power Inc. The Hydrogen Ready Power Plant Project involves the design,

construction and operation of a new hydrogen and natural gas fuelled electricity generating industrial facility in St. Clair Township, Ontario at 477B Oil Springs Line, Courtright, Ontario. The Project is being developed in response to the Independent Electricity System Operator's (IESO) identification of the need for ≥ 2000 MW of additional electricity generation capacity in Ontario's South West Region and in advance of the IESO RFP for this need as expected in 2022.

The Project is designed to take advantage of low GHG carbon emitting hydrogen fuels, as these become progressively more available over the life of the Project. Eastern Power has been involved in the design, construction and operation of electrical power generating plants in Ontario since 1988. Its affiliated company GSPC owns, operates and maintains the Green Electron Power Plant (GEPP) and a portion the GSPC property immediately south of the Green Electron Power plant will be used for the HRPP Project, as shown in Figure 2.

The Hydrogen Energy Platform is being encouraged broadly through support of the Ontario and Federal Governments as an important strategy for lowering Greenhouse Gas (GHG) carbon emissions and to help meet future GHG reduction targets. Hydrogen energy development strategies have now been initiated by both Ontario ([Ontario Hydrogen Strategy](#)) and Canada ([Canadian Hydrogen Strategy](#)). These provincial and federal strategies both include using hydrogen for decarbonizing electrical power generation. The IESO has recently been asked by the Minister of Energy to investigate and propose program options to integrate low-carbon hydrogen technologies into Ontario's electricity grid for the purposes of balancing and strengthening the reliability of the electricity system and contributing to broader decarbonization ([IESO integrates hydrogen](#)). The proposed HRPP Project can address this IESO initiative. The HRPP Project offers advantages for implementation of the developing hydrogen energy platform. The hydrogen-ready equipment to be utilised has been designed to take advantage of hydrogen supply from various industrial energy suppliers as it becomes progressively more available over the lifetime of the project. Thus, the HRPP Project can initially use natural gas with this being progressively displaced by hydrogen over the lifetime of the project with correspondingly reduced combustion related GHG carbon emissions.

The HRPP Project is not on federal lands and is it not funded federally. The proposed Project will be totally funded privately by the proponent. The Project is a designated activity for IAAC review, at least early in its project lifetime, as it is a new fossil fuel-fired power generating facility with a production capacity of 200 MW or more. The Project is subject to an Ontario Regulation 116/01 Environmental Assessment, the results of which have been reported in an Environmental Screening and Review Report (ESRR). The ESRR included comprehensive detailed studies and findings that essentially cover the same items of interest for the IAAC, and these have been instrumental for the completion of this Preliminary Project Description. The HRPP project takes advantage of existing infrastructure and with the identified mitigation measures in place, it will not cause any significant net negative environmental effects. The complete ESRR and all its supporting studies are provided in Appendices 7.1 through 7.8.

The facility will have a net generation capacity of 600 MW (nominal) depending on prevailing weather conditions, manufacturers' design margins, equipment condition, etc. The facility will

include two gas turbogenerator sets both designed to run on either 100% Natural Gas (NG) or up to 65% Hydrogen/balance Natural Gas fuel blend. Currently equipment suppliers have equipment rated to 65% blend of Hydrogen but are waiting commercial applications to allow installation of 100% Hydrogen rated equipment of this size. The use of H₂ versus NG fuel substantially reduces power plant combustion related GHG CO₂ emissions as hydrogen combustion does not emit carbon dioxide. Additionally, a steam turbogenerator set configured in combined cycle will be utilized.

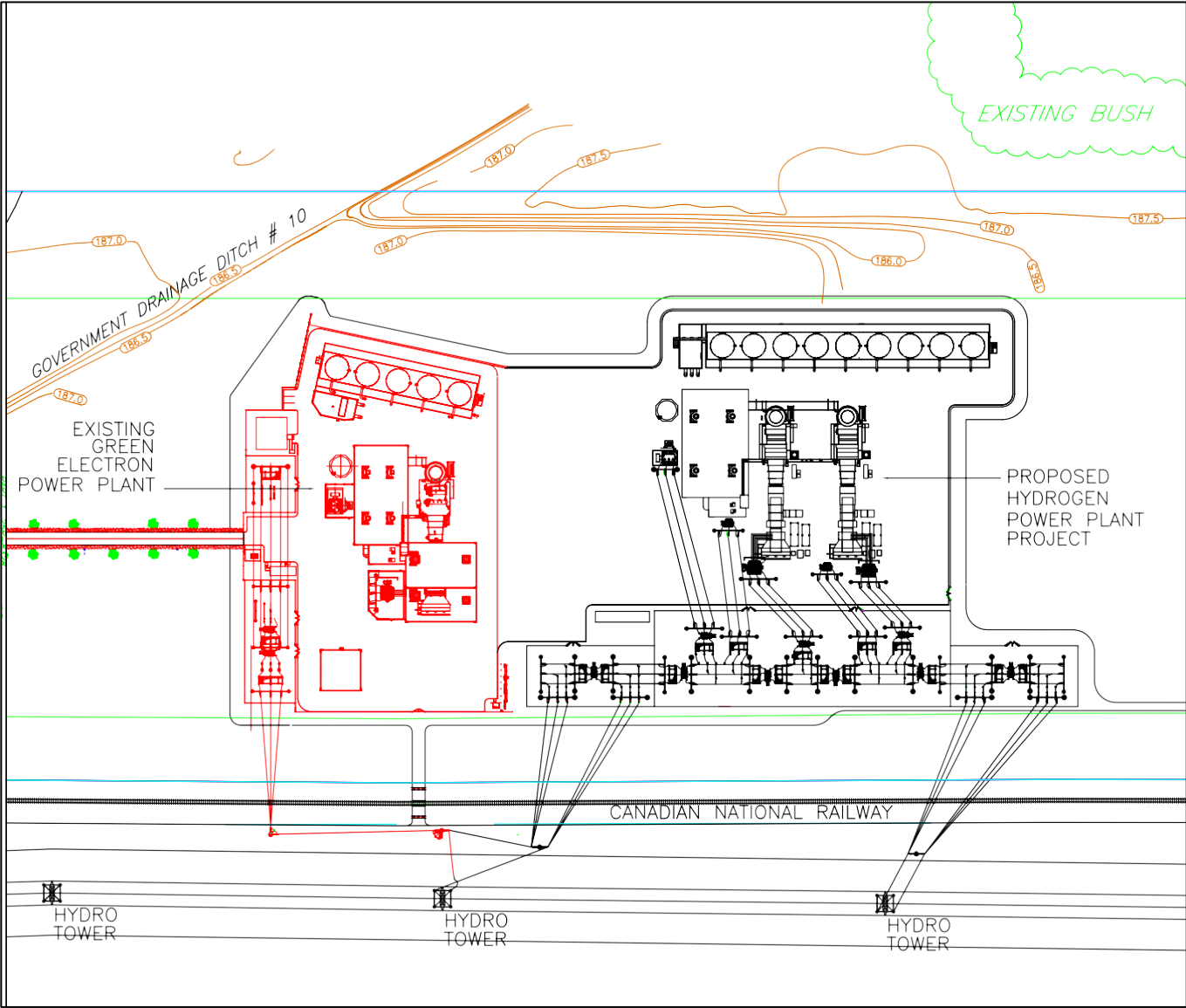
The HRPP Project represents an important new approach to low carbon electrical power generation by utilizing advanced power generation equipment that can utilize natural gas and non-GHG-emitting hydrogen fuel both initially and as it becomes progressively more available. Analyses have shown that hydrogen use to replace natural gas provides substantial net GHG reductions and a substantially reduced emissions intensity even with relatively modest (5-20%) hydrogen replacement. i.e., as compared to the business-as-usual base case of natural gas use. By mid-project life with use of 65% H₂, net HRPP Project GHG emissions intensity falls to zero (-0.0961 t CO₂eq/GWh) and by 2050 the HRPP Project will have no GHG emissions. The HRPP Project design with its advanced fuel-flexible technology makes these GHG reductions possible by allowing progressively increased hydrogen use without equipment technology changes.

Hydrogen has high potential for decarbonizing electrical power generation and the HRPP project represents an early adopter project as part of the Ontario and the Federal Governments' development initiatives for the hydrogen energy platform. This Project can be an early example of developing both the Federal Government's and the Ontario Government's strategies of using hydrogen to decarbonize electrical power production and for meeting our GHG reduction targets.

The initial operating pattern of the HRPP will likely be primarily during "shoulder" and "peak" electricity demand periods. The peak and shoulder demand periods occur typically between morning and evening on summer and winter business days. The HRPP plant will provide flexible dispatch being able to start-up and reach full load status within 3 hours of request.

All of the plant's electrical output is to be delivered to the existing adjacent transmission circuits L28C and L29C. In addition, natural gas supply and water supply infrastructure are already located at the site.

Figure 2 HRPP project located on existing GSPC property



Final configuration and/or sizing of key plant equipment may require some adjustment during the final engineering and procurement phases of the project. However, any such engineering optimizations would be expected not to materially affect the scope or the conclusions of this report since appropriate “worst case” parameters and assumptions have been used in evaluating the environmental impact of the Project.

2.2 Regulation Designating Physical Activities

The Project is an IAAC designated physical activity as set out under section 30 of the Physical Activities Regulations: 30) The construction, operation, decommissioning and abandonment of a new fossil fuel-fired power generating facility with a production capacity of 200 MW or more.

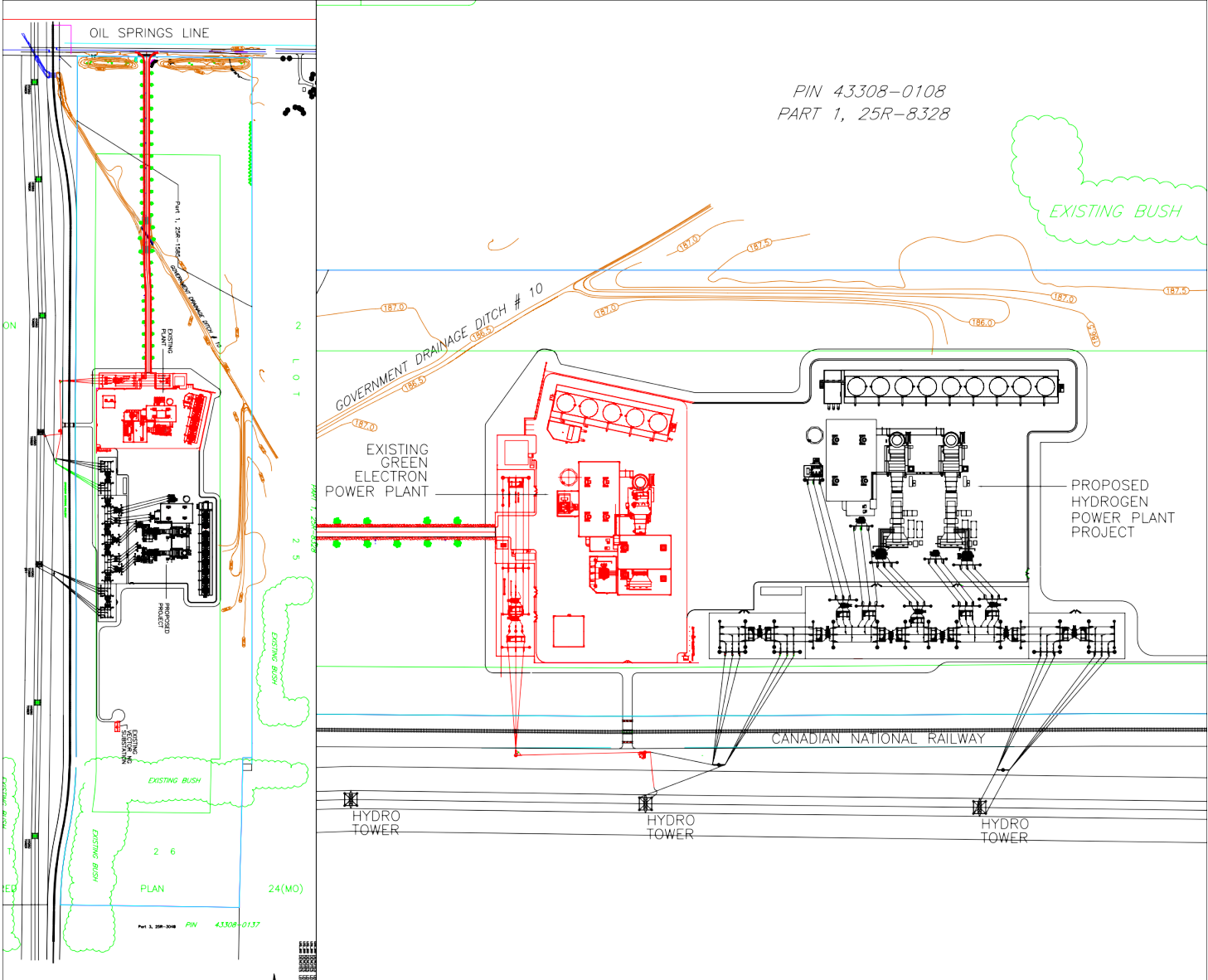
2.3 Components and Activities

2.3.1 Physical Works

The Hydrogen Ready Power Plant Project will be located on a 2-hectare portion of land, immediately south of the existing Green Electron Power Plant on Greenfield South Corporation’s property at 477 Oil Springs Line in St. Clair Township. The site is located immediately east of Hydro One’s 230 kV transmission corridor. The HRPP facility will have its own connections to circuits L28C and L29C through which the plant’s electrical output will be delivered to the existing provincial transmission grid.

Natural gas will be supplied on the GSPC property from an existing lateral tap line on the Vector/ Enbridge pipeline. It is expected that as Hydrogen fuel blends become available, the existing gas pipeline infrastructure will also be utilized. The site plan (inset) on the overall property is shown in Figure 3 below.

Figure 3 Site Plan Showing HRPP on GSPC Property



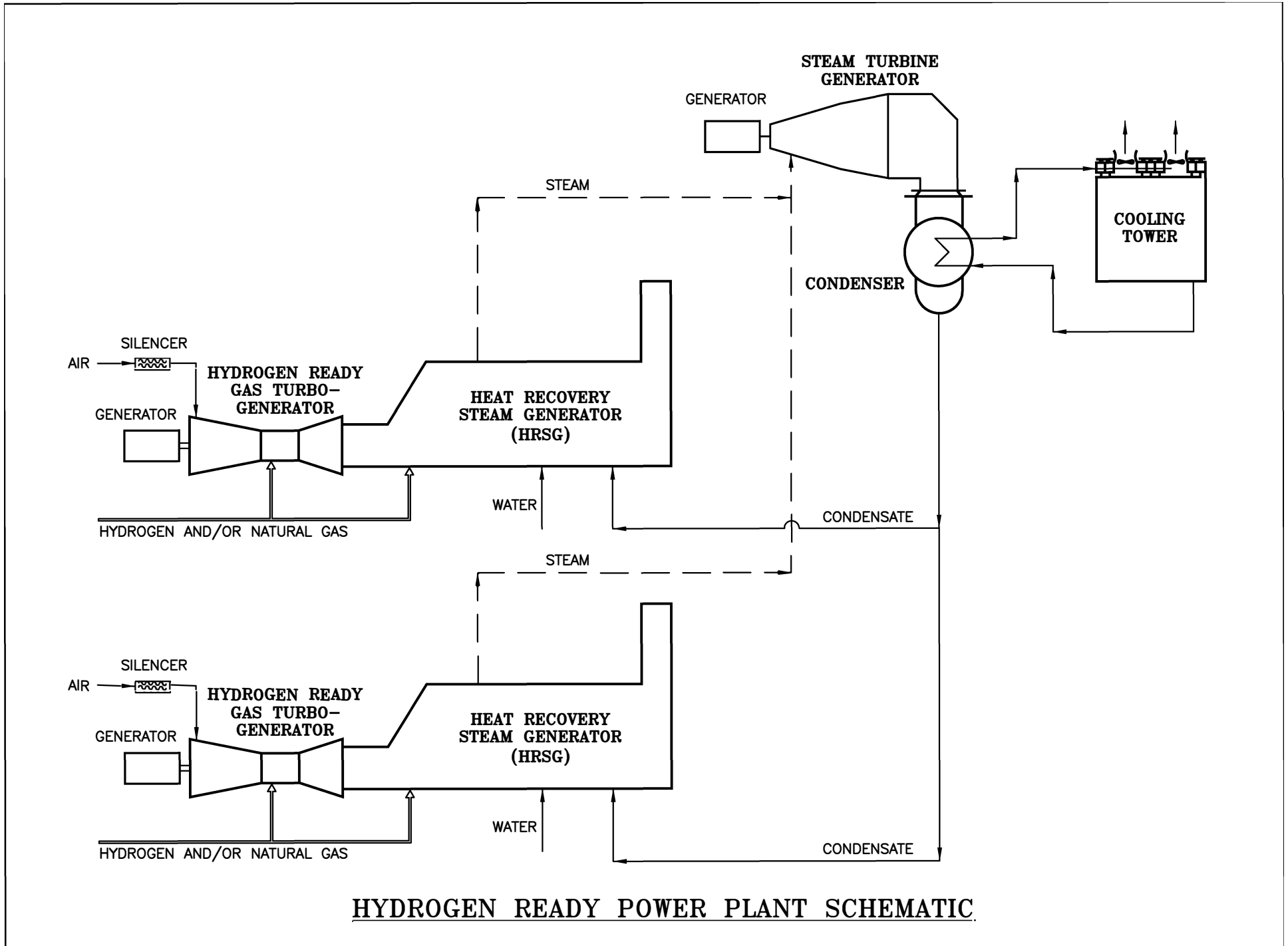
Water for process cooling will be supplied by the existing municipal 12" lateral line from the Lambton Area Water Supply System (LAWSS) and from a new 14" lateral line from a local industrial supplier to the south/west (under construction for service in 2022).

Excess blowdown cooling and process wastewater will be discharged through an existing forcemain pipeline on the property for treatment at the Courtright municipal wastewater treatment facility. This line may require upgrading which will be determined through discussions with St. Clair township officials.

2.3.1.1 Description of Project Facilities

The HRPP design is based on the established and successful combined cycle technology and used for natural gas combined cycle power generation throughout the world. However, the new generation gas combustion turbines will be capable of using hydrogen/natural gas mixtures immediately as they become available from pipeline and energy providers and can ultimately utilize 100% hydrogen as it becomes available in the future. Currently, equipment suppliers have equipment rated to 65% blend of Hydrogen but are waiting for commercial applications to allow installation for 100% Hydrogen on equipment of this size. A simplified process flow diagram of the process for the power plant is shown below as Figure 4 below.

Figure 4 Process Flow Diagram of HHRP



Hydrogen Ready Gas Turbo Generator Sets:

The power plant will utilize two GE 7FA hydrogen ready gas turbine generator sets, fuelled by natural gas or hydrogen/natural gas mixtures. The gas turbine driven generator sets will be rated nominally at 217 MVA. Low NO_x technology has been selected to reduce NO_x emissions when using natural and/or hydrogen gas.

Heat Recovery Steam Generators:

The power plant design is based on the use proven heat recovery technology using a water-tube, heat recovery steam generator (HRSG) for each combustion turbine exhaust flow, equipped with supplementary duct burners. The HRSG's will be rated to deliver all of the steam capacity requirements of the steam turbine generator.

The steam generating system will include an economizer, multiple pressure cycles (high pressure, intermediate pressure and low-pressure steam re-heaters), pressure relief valves as well as other "trim" valves and piping.

Steam Turbine Generator Set:

The power plant will utilize one steam turbine generator set. The unit is "packaged" with all accessories so as to reduce site installation time. The steam turbine driven generator will have a nominal rating of 390 MVA.

Condenser and Boiler Feed Water Systems:

The condenser will be a shell and tube unit, designed to maintain the backpressure required by the full load on the steam turbine. A wet surface versus a dry condenser design was selected on the basis of lower noise emissions with the wet design, i.e., reduced requirement for air volume and associated noise-emitting blower fans.

The boiler make-up water treatment system will use reverse osmosis, softener, and deionizer units to upgrade city water to the needed high purity. The use of advanced electro-deionizer regeneration technology largely eliminates the need for sulphuric acid and caustic soda chemical feeds. The closed-loop condensate and boiler feed-water system will consist of a condensate receiver, a holding ejector, boiler feed pumps and condensate return pumps.

Electrical System:

The electricity will be generated at 18 kV by the combustion turbine generators and the steam turbine generator. This power will flow through generator step up transformers to feed the power plant's small internal loads (via station service transformers) and the majority of the power will be exported to the Hydro One transmission system at 230 kV via the facility's high voltage switchyard.

The high voltage substation will include hot-dip galvanized steel terminal structures with circuit breakers, disconnect switches, bus, bus supports, lightning arrestors, connectors, cables, trays, etc., as well as the main output transformers. The substation will be located adjacent to the generating plant and will be enclosed by a security fence.

The main output transformers will be oil-filled and rated at about 250 MVA and 450 MVA respectively with two stages of fan/forced circulation cooling. The transformers will be equipped with a no-load tap changer, as well as temperature, pressure and oil level instrumentation.

Switchgear line-ups will include electrically operated generator circuit breakers and medium and low voltage circuit breakers and fused disconnects to isolate the medium voltage and low voltage switchgear and motor control centres. Current transformers and potential transformers for metering and protection will also be mounted in the switchgear. Cables or bus bars meeting the electrical safety codes will be used to connect the generators, switchgear, and transformers.

A relaying and metering panel will be provided to house the relaying and protection equipment, which will meet the requirements of Hydro One Networks Inc. and the IESO. The medium voltage station service transformers will be of a dry-type and will be located indoors. Low Voltage Switchgear will be provided on the secondary side of the unit auxiliary transformers to feed power to the motor control centres.

Civil Works:

The plant building will be a braced steel structure enclosed with pre-finished metal siding. The roof will consist of a metal roof and/or built-up membrane roofing. The operating floor and mezzanine floors will be of reinforced concrete construction, and the other platforms and walkways will be of steel grating. The steam turbine bay will be served by an electrically-operated, overhead crane. Windows and louvers will be provided as required for appearance and function. The gas turbo-generators will be fitted with their own integral enclosures and will not be placed within a building envelope, thus allowing direct interconnection to their respective HRSGs. Acoustical and/or weather enclosures will be provided where required.

The area surrounding the plant will be graded to facilitate proper drainage of rainwater. Asphalt pavement will be provided. A chain link fence will be provided around the plant area and electrical substation. Stormwater flows on all non-developed areas of the site will not be collected and existing natural flows will be retained as per pre-existing conditions. Stormwater collected from covered surfaces will be routed to the basin of the facility cooling system for use/treatment. This is more fully described in the HRPP Stormwater Management Plan. Thus, the stormwater management system as related to covered surface collection will not be subject to a separate MECP compliance approval permit for discharge, i.e., as affected stormwater requiring collection and potential treatment will be covered as part of the MECP sewage discharge permit (see below).

The developed area for the HRPP facility together with the existing Green Electron Power Plant facility represents 20% of overall GSPC site property. Importantly, the existing woodland area at the south end of the property will not be developed or disturbed.

Water Supply and Wastewater discharge:

Building supply water will be from the existing 12” municipal lateral supply line on the GSPC property. Water for process cooling will be supplied by the existing municipal line and from a new 14” lateral line from a local industrial supplier to the south/west (under construction for service in 2022).

Domestic sewage (toilets, showers) will be combined with industrial wastewater for conveyance through an existing forcemain routed to the Courtright Waste Water Treatment Facility (WWTF).

Instrumentation and Controls:

The plant control system will be designed so that the plant can be operated fully from the control room, where the status of all systems can be monitored.

Electrical, Natural Gas and Hydrogen Interconnections:

The plant will be electrically interconnected with the 230 kV circuits L28C and L29C of Hydro One immediately west of the HRPP site as shown in Figure 3 (inset), and for back-up power, it will also be interconnected with the distribution circuits of Hydro One Networks Inc.

The plant will receive natural gas from one or more of TransCanada Pipelines Limited or Vector Pipeline Limited Partnership with connection(s) directly on the GSPC site via an existing lateral line or via a new lateral line connection. It is anticipated that hydrogen will become available during the project’s lifetime both through natural gas/hydrogen fuel mixtures available in third party energy supplier pipelines or from other delivery.

2.3.2 Anticipated Size or Production Capacity

600 MW is the nominal net power output to the electrical transmission grid of the proposed HRPP facility as based on its planned configuration and depending on prevailing weather conditions, manufacturers’ design margins, equipment condition, etc. The rated capacity of the project is 824 MVA.

2.3.3 Project Life phases

The key phases of the project and relative timing for these are shown in Table 2 table below

Hydrogen Ready Power Project IAAC Initial Project Description

Project Phase	Activity Description	Estimated Duration	Comment
Construction	grading, excavation, building erection, equipment installation	21 months	Typical industrial construction methods; Construction laydown areas to be landscaped (trees/grass) at end of construction
Commissioning	testing and first operation of equipment	3 months	frequent start and stops and episodic noise from line cleanings etc
Operation	operation and maintenance of equipment	Expected minimum 25 years	Peaking operation mode expected early years, increased running expected later years
Decommissioning	removal of equipment	1 year	Plant and equipment potentially recyclable

Additional information regarding the project and its various life phases can be found in the MECP EA ESRR (appendix 7.1). While it is not possible to predict precisely when decommissioning will occur since it depends on the provincial needs for operation of the facility, the decommissioning will consist of removal of some or all of the equipment, buildings and structures, depending on the plans for future use of the site. The greatest impact would likely be as a result of full removal of equipment and remediation of the site for future uses. The Environmental Management Plan as prepared for the MECP EA ESRR (appendix 7.7) outlines key environmental aspects to be addressed during the various project phases of Table 2. These aspects which will be reviewed in detail and taken up into a comprehensive project decommissioning plan for implementation at the project life's end and this plan will be designed to address and mitigate decommissioning effects related to:

1. Erosion and Siltation
2. Demolition or Construction Noise, Odour and Dust
3. Decommissioning Traffic
4. Decommissioning of Service Connections
5. Natural Environment
6. Waste Generation and Disposal
7. Spills and Emergencies
8. Preparation of Project lands for continuing alternative industrial uses, as appropriate

The HRPP Project lands are zoned for industrial use and following potential facility decommissioning and removal, the site, at minimum, would be readied for other industrial uses.

2.4 Alternative Designs /Justification for Selection of Preferred Design

2.4.1 The Need

Ontario's electricity needs, in real time as well as procurement of capacity, energy and ancillary services for the future, are managed by the Independent Electricity System Operator (IESO). IESO procures capacity through capacity auctions, medium-term contracts and long-term contracts. In their 2021 Annual Acquisition Report, IESO projects that Ontario is entering a period of growing electricity needs and in the near term, new capacity will be required to meet peak demand and to meet longer term energy shortfalls.

With the economic recovery post the pandemic induced recession well under way, the IESO projects that the primary factors driving demand are emerging electrification initiatives and growth of the economy leading to higher demand in the short, medium, and longer terms. The forecast projects steady growth overall, including the residential, commercial, and agricultural sectors. Needs for new capacity are projected to emerge as early as 2025 and grow over the next few years, while increased energy needs will emerge in the middle of the decade and continue to grow beginning 2029.

The procurement action being initiated by the IESO is based on a directive dated January 27, 2022, from the Minister of Energy, Ontario, instructing IESO to:

- To procure at least 1000 MW of capacity.
- Issue a Request for Qualification (RFQ) in advance on the Request for Proposals, on or before 30 June 2022.

The mandatory requirements for the procurement are:

- At least 1000 MW of new capacity with a minimum of 4+ hours of energy duration; preferably ability to deliver 8 or more consecutive hours of energy.
- In service date as early as 2025 with preference to locations in the West transmission zone and East of FETT, with a common commercial operation date not beyond May 1, 2027.
- Minimum term length of 10 years plus options for longer commitments.
- Capacity and revenue payment options for energy and Environmental Attributes.
- Fully dispatchable generators, hybrids or storage resources directly connected to the transmission system with the desired ability to ramp up and down quickly and with a large operating range.

The proposed Project can meet all these IESO requirements, contributing to Ontario's long-term capacity, energy and ancillary services needs. Additionally, the Project will be sited in the Sarnia area, an area which has the potential to be the Ontario hydrogen hub of the future. The HRPP Project will have the capability to provide sustained energy over long periods of time and with the ability to ramp up and down quickly. The Project's ability to be powered by hydrogen fuel, as it becomes available, is discussed in the section below.

2.4.2 Hydrogen for Power Generation

As stated in the Hydrogen Strategy for Canada ([Canadian Hydrogen Strategy](#)), Canada aims to power its future economy using low carbon electricity with the stated goal to achieve net-zero emissions by 2050. This strategy recognizes Canada's competitive edge in development and sustainable use of hydrogen, with the expectation that up to 30% of Canada's end use energy will be powered by hydrogen. This includes the use of hydrogen as a fuel for power generation using combustion turbine technology or electrochemical conversion in stationary fuel cell power plants.

Combustion turbines have very high fuel flexibility, operating on fuels such as low calorific value blast furnace gas, coke oven gas and syngas that contain varying amounts of hydrogen. The hydrogen content in these fuels can range from 20% to 50% by volume, depending on the feedstock and gasification process. The millions of hours of operation accumulated on such fuels have presented the turbine manufacturers and owner/operators with valuable experience in safe and reliable operations of hydrogen powered combustion turbine equipment. Today's F class combustion turbine technology can operate on up to 65% of hydrogen/natural gas fuel mix. With 65% of hydrogen in the fuel mixture for electrical power generation, a 40% reduction in combustion GHG emissions can be achieved.

Combined cycle power generation, using hydrogen/hydrogen-natural gas mixed fuel will provide significant reductions in GHG emissions while at the same time providing the flexibility to respond to changing electrical system needs on a cost effective and sustained basis as required by the IESO.

2.4.3 Proposed Technology

Power generation facilities are built in Ontario based on the system demand projections of the Independent Electricity System Operator. In their Annual Acquisition Report of July 2021, IESO has projected long term new capacity needs of >1000 MW starting from the year 2026.

The proponent proposes to use the mature combined cycle power generation technology that has remained the workhorse of peaking power generation for several decades but with added capability for using hydrogen fuel. Combined cycle power generation consists of high efficiency combustion turbines that can fire a variety of fuels, supplemented by a heat recovery generator that convert the exhaust heat from the combustion turbine to high pressure, high temperature steam that is used in a steam turbine. Together, a combined cycle power plant can achieve production efficiencies as high as 60 percent.

Several large combustion turbine manufacturers now have expertise in manufacture and operations of large combustion turbines on a variety of fuels, including hydrogen. The F class combustion turbines, which are the workhorse of peaking power generation, are currently capable of operating with as much as 65% hydrogen by volume. Experience operating on such high hydrogen/natural gas mixtures will incentivize the investment needed to further develop to 100 per cent hydrogen fuel capability.

The proposed power generation technology using hydrogen provides all the following advantages of natural gas fired power generation but without its inherent disadvantage of high GHG emissions:

- The proposed facility can provide continuous uninterrupted energy when needed as it will be available when needed as it is generally available at all times of the day throughout the year and under all weather conditions.
- With the operating flexibility, the power generation can be ramped up or down within minutes to follow sudden or unexpected changes in demand. This flexibility is extremely important to manage the ebb and flow of wind and solar generation and the constant changes in system demand.
- Sited in a desirable transmission zone, the facility will support local power needs.

2.4.4 Comparison of Power Generation Technologies

The Proponent has closely followed the IESO's developing RFQ and RFP process requirements for IESO-identified new generation capacity needs in the geographical region of the proposed HRPP project. This has been through various IESO publication and webinars and their release of draft documents for review. The IESO has recently been asked by the Minister of Energy to investigate and propose program options to integrate low-carbon hydrogen technologies into Ontario's electricity grid for the purposes of balancing and strengthening the reliability of the electricity system and contributing to broader decarbonization ([IESO hydrogen](#)).

The IESO has released a draft RFQ and expects to soon finalize its RFQ and then follow with an RFP for new generation capacity in the summer of 2022. The chosen technology must meet the criteria specified by the IESO, including availability of commercialized and proven technology. Table 3 below evaluates the different technological options based on these requirements.

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Table 3 Comparison of Power Generation Options

Technology	Target Date of 2025-2027	Capacity	Energy over sustained periods	Flexibility to Ramp	GHG Emissions
Nuclear	Small nuclear generators are still under development and the permitting process will not allow to meet target dates of 2025-2027	Can meet capacity requirements	Can provide sustained energy over long periods of time	Limited ability ramp	None
Hydroelectric	Permitting process will not allow to meet target dates of 2025-2027	Can meet capacity requirements. However, western Ontario does not have water resources to support hydroelectric power generation	Limited ability to provide sustained output over long periods of time	Ability to ramp	None
Wind	Can meet target dates	Limited ability to meet capacity requirements since output depends on availability of wind	Limited ability to provide sustained energy over long periods since generation depends on wind availability	Can ramp quickly when operating	None
Solar	Can meet target dates	Limited ability to meet capacity requirements since output depends on availability of sunlight	Limited ability to provide sustained energy over long periods since generation depends on sunlight	Can ramp quickly when operating	None
Storage	Large scale storage facilities have not yet been operationalized commercially	Limited ability to meet capacity requirements since output depends on state of charge	Limited ability to provide sustained energy over long periods	Can ramp quickly	GHG impact depends on the source of electricity used for charging the batteries
Natural gas	Can meet target dates	Ability to meet capacity requirements	Ability to provide sustained energy over long periods	Can ramp quickly	Will contribute to GHG emissions
Hydrogen fuel mix	Can meet target dates	Ability to meet capacity requirements	Ability to provide sustained energy over long periods	Can ramp quickly	Will minimally contribute to combustion GHG emissions based on the percentage of natural gas (methane) in the fuel mix. In the long term, GHG emissions would be zero. i.e., with full replacement of natural gas by hydrogen

Based on the requirements specified by the IESO and, Canada's and Ontario's commitments to achieve net zero GHG emissions by 2050, the proponent proposes to use hydrogen or hydrogen + natural gas fired combined cycle technology. The proponent believes the proposed Project can meet the IESO stated requirements for both capacity and early IESO timelines for implementation.

The IESO has requirements for at least 2000 MW of substantial flexible and available-on-demand new capacity and has stated that natural gas fuelled electrical generation will be needed to meet its needs well beyond 2030. From the above options, the preferred technology of natural gas/hydrogen fuel mix is evident and has been selected as being the only option to best meet the various IESO power generation needs for capacity, reliability, availability and flexibility. Beneficially, this selected option through using new generation hydrogen capable combustion technology will provide progressively increasing GHG emission reductions over the life of the project, i.e., as hydrogen becomes progressively available to displace natural gas. The IESO has expressed interest in the proposed HRPP Project. A System Impact Assessment (SIA) for the proposed project has been completed by the IESO.

The HRPP Project offers advantages for implementation of the developing hydrogen energy platform. The hydrogen-ready equipment to be utilised has been designed to take advantage of hydrogen supply from various industrial energy suppliers as it becomes progressively more available over the lifetime of the project. Thus, the HRPP can initially use natural gas with this being progressively displaced by hydrogen over the lifetime of the project with correspondingly reduced combustion related GHG carbon emissions.

3 FEDERAL INVOLVEMENT

3.1 Federal Financial Support

The Project has no proposed or anticipated Federal financial support.

3.2 Federal Lands

The Project will not use any Federal lands nor require any Federal granting of interest i.e., easement, right of way, or transfer of ownership. The nearest Federal lands within the meaning of the *Impact Assessment Act* are the Aamjiwnaang First Nation lands, 14 km north of the HRPP Project.

3.3 Federal Legislative or Regulatory Requirements

There will be no Federal licenses or permits required for the Project.

4 ENVIRONMENTAL EFFECTS

4.1 Physical, Biological and Human Environment Impacts

4.1.1 Air Quality and Noise

The HRPP facility will combust natural gas and blended mixtures of hydrogen with natural gas and eventually only pure hydrogen, resulting in relatively few and well described low emissions of air pollutants to the atmosphere, i.e., primarily NO_x, CO, CO₂ and PM but virtually no SO_x or heavy metal emissions.

The facility will utilize low NO_x technology which minimizes NO_x production during combustion. By employing low NO_x burners, the HRPP facility will avoid the need for selective catalytic reduction (SCR) technology and thus avoid SCR co-product emissions, consisting of particulates of various ammonium compounds. This approach to lowering NO_x emissions with low NO_x technology has been successfully established in other similar facilities including the established GEPP facility.

As a result of NO_x mitigation, the HRPP will emit reduced quantities of NO_x, low amounts of CO, low amounts of particulate matter (PM). Hydrogen utilization will reduce facility combustion GHG emissions in direct proportion to the amount of hydrogen used (see section 4.1.2 below for further details).

The emissions from the facility to the atmosphere have been assessed in a site-specific study of the air quality impacts from the HRPP facility using the latest MECP-approved USA EPA AERMOD dispersion modelling tools with site-specific topographical and meteorological information. The full AQIS report is included as Appendix 7.2. This analysis has indicated low concentrations of contaminants at all relevant Points of Impingement (POI) as summarized in Table 4. Maximum POIs for NO_x and CO were below the MECP maximum allowable POI concentrations (29.3% and 2.7%, respectively).

Importantly, the emissions shown in Table 4 have been modeled under the worst-case emission scenario to account for the variation in output due to seasonal variations and design margins. These represent the Maximum Emission Scenario, i.e., start-up followed by full load using Natural Gas and Hydrogen mixtures as shown separately.

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Table 4. HRPP Project Air Emissions Summary

100 % Natural Gas							
Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m³)	Averaging Period	MECP POI Limit (µg/m³)	Percentage of MECP POI limit
NO ₂	10102-44-0	24.25	AERMOD	63.92	1 h	400	16.0%
		11.01		12.13	24 h	200	6.1%
CO	630-08-0	38.36	AERMOD	121.34	0.5 hr	6000	2.0%
SO ₂	7446-09-05	0.00	AERMOD	0.00	1 h	690	0.0%
		0.00		0.00	24 h	275	0.0%
PM	NA	2.13	AERMOD	2.35	24 hr	120	2.0%
Benzene	71-43-2	0.00215	AERMOD	0.0000209	Annual	0.45	0.0%
1,3 Butadiene	106-99-0	0.0000770	AERMOD	0.00000749	Annual	2	0.0%
Ethyl Benzene	100-41-4	0.00573	AERMOD	0.00631	24 h	1000	0.0%
Xylenes	1330-20-7	0.0115	AERMOD	0.0126	24 h	730	0.0%
80 % Natural Gas, 20% Hydrogen Gas							
Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m³)	Averaging Period	MECP POI Limit (µg/m³)	Percentage of MECP POI limit
NO ₂	10102-44-0	31.17	AERMOD	82.16	1 h	400	20.5%
		14.16		15.59	24 h	200	7.8%
CO	630-08-0	19.18	AERMOD	60.66	0.5 hr	6000	1.0%
SO ₂	7446-09-05	0.00	AERMOD	0.00	1 h	690	0.0%
		0.00		0.00	24 h	275	0.0%
PM	NA	2.13	AERMOD	2.35	24 hr	120	2.0%
Benzene	71-43-2	0.00172	AERMOD	0.0000167	Annual	0.45	0.0%
1,3 Butadiene	106-99-0	0.0000616	AERMOD	0.00000599	Annual	2	0.0%
Ethyl Benzene	100-41-4	0.00458	AERMOD	0.00505	24 h	1000	0.0%
Xylenes	1330-20-7	0.00916	AERMOD	0.0101	24 h	730	0.0%
35 % Natural Gas, 65% Hydrogen Gas							
Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m³)	Averaging Period	MECP POI Limit (µg/m³)	Percentage of MECP POI limit
NO ₂	10102-44-0	44.51	AERMOD	117.32	1 h	400	29.3%
		20.22		22.27	24 h	200	11.1%
CO	630-08-0	51.17	AERMOD	161.84	0.5 hr	6000	2.7%
SO ₂	7446-09-05	0.00	AERMOD	0.00	1 h	690	0.0%
		0.00		0.00	24 h	275	0.0%
PM	NA	2.13	AERMOD	2.35	24 hr	120	2.0%
Benzene	71-43-2	0.000752	AERMOD	0.00000731	Annual	0.45	0.0%
1,3 Butadiene	106-99-0	0.0000269	AERMOD	0.00000262	Annual	2	0.0%
Ethyl Benzene	100-41-4	0.00200	AERMOD	0.00221	24 h	1000	0.0%
Xylenes	1330-20-7	0.00401	AERMOD	0.0044	24 h	730	0.0%

The facility will emit water vapour emissions from its stack and more so from the cooling tower which will be visible (as fog vapour) under certain conditions of ambient air temperature and relative humidity. These water vapour emissions, while non-toxic, have potential for causing off-property visibility and icing problems, i.e., depending on prevailing weather conditions. On the basis of the plant location, stack and cooling tower heights and their location relative to the facility, the distances to potential points of off-property impingement, as well as prevailing wind conditions, etc. it has been determined that these water vapour emissions will not cause off-property impacts related to visibility. The vapour plume study (see Appendix 7.2) also concluded that icing risk would be negligible.

Cumulative impact assessments for air quality have also been made using the latest Environment Canada Guidelines (Environment Canada, 1999). The analysis of the HRPP facility's contribution and cumulative impact to the local and regional airshed quality, based on its specific emissions (summarized in Table 4 above) have been assessed. For this cumulative impact assessment, actual historical and prevailing MECP and Sarnia-Lambton Environmental Association (CASA) collected air quality data as measured over the last five years at the MECP air monitoring Station ID# 1411, at 700 Christina St. North and at the CASA monitoring stations at Aamjiwnaang, LaSalle Line, Moore Line and River Bend, closest to the HRPP site were utilized as the pre-existing ambient condition to then assess the cumulative impacts resulting from the addition of the HRPP emissions.

Studies of the current ambient air quality in the vicinity of the proposed facility, together with an analysis for the project's emissions, have indicated that the project's emissions will have only minor influence on the air shed's ambient air quality for nitrogen dioxide and even less for the other contaminant emissions shown in Table 4. This cumulative impact analysis has revealed that any measurable increases to air contaminant concentrations above actual pre-existing ambient levels (i.e., that include all other relevant existing sources) will be slight, primarily only for NO_x, will be highly localized in effect and all within the existing normal variability of the current ambient air quality parameters. Importantly, the cumulative impact analysis has shown that the increases to air contaminant concentration meets the MECP regulatory limits (see Appendix 7.2).

On the basis of these cumulative impact analyses, the HRPP facility will not contribute significantly to smog in either the local or regional air sheds.

Therefore, on the basis of all of the above findings and with mitigation measures in place, there will be no net negative impacts from the HRPP due to air pollutant emissions to the atmosphere.

An independent study of noise and vibration emissions and their potential impacts from the HRPP project as based on actual noise emissions from similar equipment and with modelling of the project site, its terrain and off-site receptors were completed as part of the MECP EA ESRR (see Appendix 7.3 for details). This study concluded there would be no off-property exceedances of the MECP noise guidelines for the closest neighbouring receptors to the HRPP facility.

There are no permanent, seasonal or temporary residences on the HRPP Project property. The nearest residential property is more than 500 m from the proposed facility. The distances of the proposed HRPP Project air and noise emission sources to the closest receptors (as identified in Appendices 7.2 and 7.3) are summarized below.

Residential Receptor	Distance from HRPP (m)
R1	749
R2	888
R3	1073
R4	1031
R5	880
R6	1043

^a distance from centre of HRPP source to nearest property edge for Receptor

Based on the “Air Quality in Ontario 2018 Report” ([Ontario Air Quality](#)) section ‘Transboundary influences on Ontario’s smog’, during the smog season, the prevailing winds are southwesterly, which results in the transport of smog pollutants from the US into Ontario, including the Sarnia area. From this, the HRPP will have insignificant environmental/transboundary impact across the St. Clair River to the State of Michigan, USA.

4.1.2 Climate Change Impact

Ontario’s electrical power generation GHG emissions currently represent only 3% of the total provincial GHG emissions and these are substantially lower on an intensity basis than those for the rest of Canada and for other jurisdictions ([IESO NG generation](#)). Nonetheless, further decarbonizing of electrical power generation remains a useful strategy.

The HRPP Project represents an important new approach to low-carbon electrical power generation by utilizing advanced power generation equipment that can utilize both natural gas and non-GHG-emitting hydrogen fuel. Hydrogen energy has high potential for decarbonizing electrical power generation and the HRPP Project will represent an early adopter project as part of the Ontario and the Federal governments’ development of the hydrogen energy platform for meeting our provincial and national GHG reduction targets. This will also provide a flexible source of low GHG emitting energy to balance out the substantial variability of wind and solar power generation. It is reasonable to expect that current carbon tax costs and projected increased carbon tax costs will promote increasing hydrogen availability and use. Uniquely, the HRPP Project provides potential to increasingly reduce GHG emissions and further lessen climate change impact during its entire project lifetime.

The HRPP Project will use hydrogen-enriched natural gas or natural gas from gas lines currently on the site and ultimately 100% hydrogen as this becomes available over its estimated 25 -year project life (estimated end 2050). Various energy producers and local gas suppliers now have programs under way to develop the hydrogen energy platform. The move to the hydrogen energy platform is to achieve lower GHG emissions and is part of the overall commitment to help Ontario and in turn Canada meet our carbon emission reduction targets.

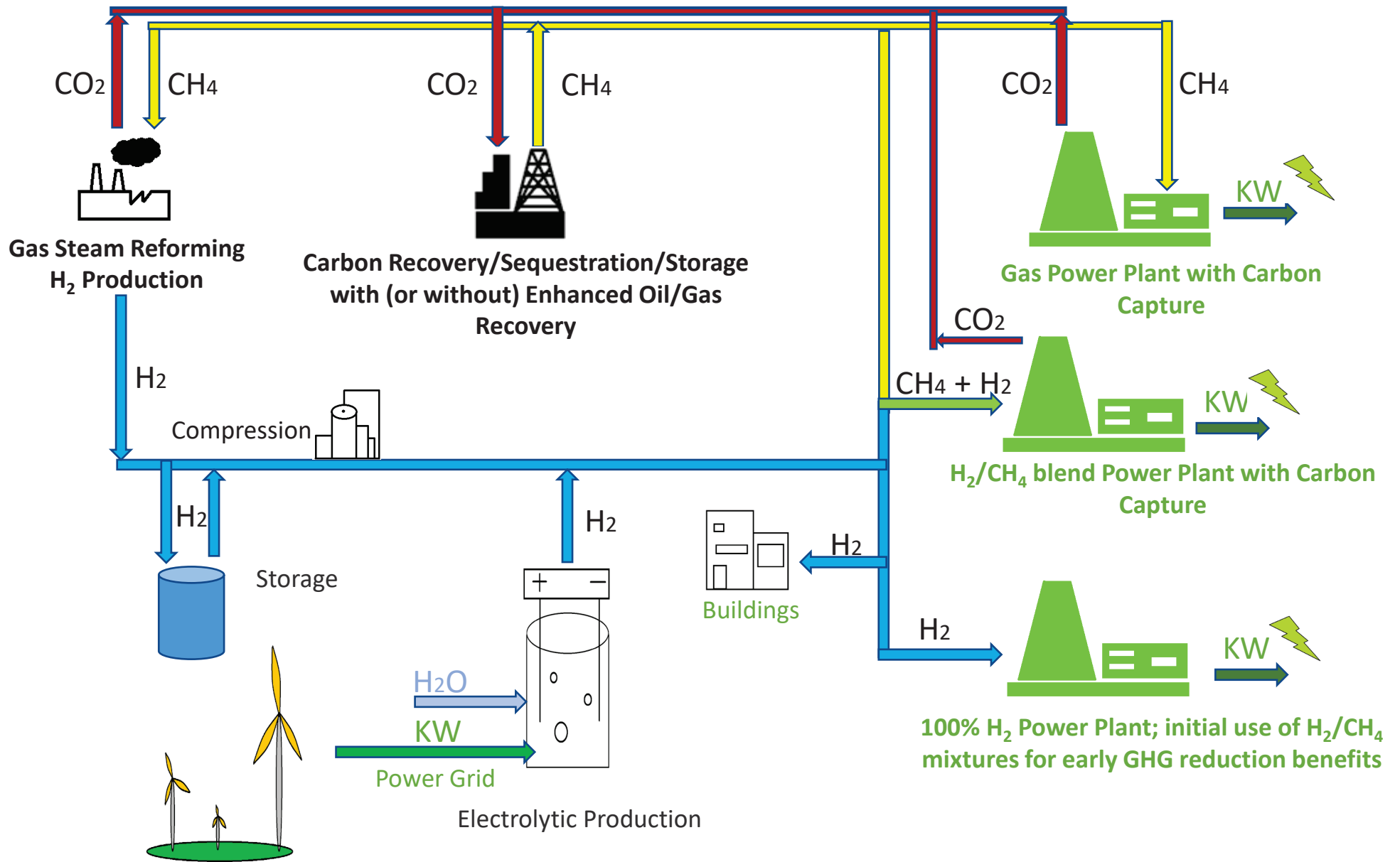
The Hydrogen Energy Platform is being developed through support of the Ontario and Federal Governments as an important strategy for lowering Greenhouse Gas (GHG) carbon emissions and to help meet future GHG reduction targets. Hydrogen energy development strategies have

now been initiated by both Ontario ([Ontario Hydrogen Strategy](#)) and Canada ([Canadian Hydrogen Strategy](#)). These strategies include using hydrogen for electrical power generation.

The latter aspect is important as the IESO has recently assessed the impact of phasing out natural gas power generation ([IESO NG generation](#)) and has concluded that dependence on natural gas will continue well beyond 2030. In this same IESO report the IESO has also indicated that hydrogen provides a pathway to decarbonization of the industry through integration of hydrogen into natural gas for use in natural gas power generation turbines.

There are various pathways for the hydrogen platform to decarbonize gas fuelled electricity generating power plants as shown conceptually in Figure 5. Various aspects presented here have been discussed in more detail in the above references on the hydrogen energy platform.

Figure 5 Hydrogen decarbonizing of gas-fueled electricity generation



Hydrogen is already widely used in industry typically being produced by conventional steam reforming of natural gas. Carbon (CO₂) recovery for direct reuse or sequestration and storage offers large scale potential for low carbon hydrogen production. Hydrogen produced by this route or through thermal reforming or from electrolysis would have a low overall carbon footprint. Combustion of Hydrogen produces no direct carbon GHG emissions.

While the Proponent is not a hydrogen energy producer or supplier, it seems reasonable that the recognized high potential for hydrogen along with the current carbon tax costing and projected increased carbon emission costs will promote and incentivize increased low carbon hydrogen availability and use. Thus, a foreseeable energy supply enabling 20% hydrogen use for the HRPP Project between 2025 and 2031, followed by 65% hydrogen supply by 2040 seems feasible. Later in the HRPP Project life, 100% hydrogen could become available by 2050. Uniquely, the HRPP Project, due to its chosen advanced and flexible technology, provides potential to progressively and increasingly reduce and offset GHG emissions over its entire project lifetime.

In its October 2021 report ([IESO NG generation](#)), the IESO concluded that electricity generation using natural gas-fuelled facilities will be important after 2030 to avoid blackouts because renewable sources of wind and solar electricity are not always available when they are most needed. This serious problem has already been experienced in other jurisdictions such as California. The IESO also specifically identified the use of hydrogen in gas-fuelled facilities as a pathway to decarbonize electrical power production. It is important to note in this regard that new combustion turbine technology is well positioned for this decarbonization transition, as it is capable of utilizing both natural gas and hydrogen and thus, represents the best practical available technology. The IESO has recently been asked by the Minister of Energy to investigate and propose program options to integrate low-carbon hydrogen technologies into Ontario's electricity grid for the purposes of balancing and strengthening the reliability of the electricity system and contributing to broader decarbonization ([IESO integrates hydrogen](#)).

The proponent has selected the best available technology in relation to lowering climate change impacts of the Hydrogen Ready Power Plant Project. The design approach includes the latest advanced design power production equipment that is able to utilize fuel supplies ranging from 100% NG to 100% Hydrogen and with any blend ratio of these fuels. Currently, equipment suppliers have developed equipment rated to utilize up to a 65% blend of Hydrogen with Natural Gas. Once this equipment is established for larger commercial applications such as for the HRPP project, further refinements are expected to enable use of 100% Hydrogen later in the Project's life.

Potential emissions including GHGs from the HRPP Project have been studied in detail as part of the ESRR, Air Quality Impact Study (AQIS, see Appendix 7.2 for further details). All potential GHG emissions including CO₂, CH₄ and N₂O have been assessed and these were expressed as CO₂-equivalents for assessment of total GHG emissions and for assessment of potential climate change impact of the Project. Table 3 of Appendix 7.2 Air Quality Impact Study shows

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a potential of a 56% reduction of GHG emissions when using 65% Hydrogen gas as fuel with the proposed facility operating 25% of the yearly hours.

The potential climate change impact of the HRPP Project has been further assessed using the IAAC Strategic Assessment of Climate Change guidelines ([SACC guidelines](#)). For this assessment the following assumptions were made:

1. Gross HRPP gross output 614 MW
2. Operation: 10.9 h, 5 days/week, 52 weeks/yr.
3. Yearly electricity purchases based on previous GEPP project average of 3700 MWh
4. Construction phase emissions based on GEPP project construction history (inputs for diesel fuel, propane gas, electricity purchases)
5. Decommissioning GHG assumed to be 1/3 (construction emissions - construction electricity)
6. Global Warming Potentials: CH₄ = 25, N₂O = 298
7. Base case 100% Natural Gas use
8. Hydrogen source ATR with CCS.
9. 5%H₂/95%NG used 2025-2030
10. 20%H₂/80%NG used 2031-2040
11. 65%H₂/35%NG used 2041-2049
12. 100% H₂ used 2050
13. Net HRPP project GHG emissions = (Direct GHG + Acquired GHG) - Avoided GHG as per equation 1 of the SACC guidelines.
14. Net project emissions in #13 do not include provision for possible HRPP offset credits
15. The emission factors as obtained from the SACC guidelines and as used for the GHG emission analysis are summarized in Table 5 below.

Table 5. Emission Factors Used in GHG Emission Analyses

Fuel	CO ₂	CH ₄	N ₂ O	Notes/source
Diesel Fuel (g/L)	2680.5	0.068	0.21	National Inventory Report 1990-2019: Greenhouse Gas Sources and Sinks Canada Annex 6 Emissions Factors, A6.1 Fuel Combustion Table A6.1-14
Propane (g/L)	1515	0.64	0.028	National Inventory Report 1990-2019: Greenhouse Gas Sources and Sinks Canada Annex 6 Emissions Factors, A6.1 Fuel Combustion Table A6.1-15
Natural Gas (g/m ³)	1888	0.49	0.049	National Inventory Report 1990-2019: Greenhouse Gas Sources and Sinks Canada Annex 6 Emissions Factors, A6.1 Fuel Combustion Table A6.1-1
Hydrogen Production	CO ₂	CH ₄	N ₂ O	Notes/source
ATR with CCS (t/t H ₂)	0.45	N/A	N/A	Technical Guide Related to the Strategic Assessment of Climate Change, Table 5

Table 6 (below) summarizes the HRPP Project direct GHG emissions, acquired GHG emissions and avoided GHG emissions, together providing net GHG emissions over the entire Project lifetime, i.e., as Hydrogen is progressively introduced to replace Natural Gas.

These analyses have shown that hydrogen use to replace natural gas provides substantial potential net GHG reductions and a substantially reduced GHG emissions intensity even with only relatively modest hydrogen replacement (5-20% hydrogen), i.e., as compared to the business-as-usual base case of sole natural gas use.

By mid-project life with potential use of 65% H₂, net HRPP project GHG emissions intensity could fall to zero (-0.0961 t CO₂eq/GWh) and by 2050 with 100% hydrogen availability, the HRPP Project will have no GHG emissions. The HRPP Project design with its advanced fuel-flexible technology makes these GHG reductions possible by allowing progressively increased hydrogen use without equipment technology changes.

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Table 6. HRPP Project Lifetime GHG Emissions							
<i>Direct GHG Emissions</i>							
Type	Total GHG (t CO _{2e})	Construction phase (2022-2025) (t CO _{2e})	Operations phase				Decommissioning Phase
			2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	
			95% NG / 5% H ₂	80% NG / 20% H ₂	35% NG / 65% H ₂	0% NG / 100% H ₂	
Construction / Operation	9395542	2625	529522	445913	195087	0	875
<i>Acquired Energy GHG Emissions – Electricity used in operations</i>							
Type	Total GHG (t CO _{2e})	Construction phase (2022-2025) (t CO _{2e})	Operations phase				Decommissioning phase
			2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	
			95% NG / 5% H ₂	80% NG / 20% H ₂	35% NG / 65% H ₂	0% NG / 100% H ₂	
Electricity	2217	249	126	61	61	61	N/A
<i>Acquired Energy GHG Emissions - Hydrogen Gas Used as Fuel</i>							
Type	Total GHG (t CO _{2e})	Construction phase (2022-2025) (t CO _{2e})	Operation phase				Decommissioning phase
			2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	
			95% NG / 5% H ₂	80% NG / 20% H ₂	35% NG / 65% H ₂	0% NG / 100% H ₂	
ATR with CCS	122	0	1	3	9	13	N/A
<i>Base Case Natural Gas GHG Emissions and Avoided GHG Emissions using Hydrogen</i>							
Type	Total GHG (t CO _{2e})	Construction phase (2022-2025) (t CO _{2e})	2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	Decommissioning phase
Base case (100% NG)	14497889	2873	557517	557452	557452	557452	875
Avoided GHG with H ₂	5102973		27995	111539	362365	557452	
<i>Net Project GHG Emissions (as per assumption #13 above)</i>							
Type	Total GHG (t CO _{2e})	Construction phase (2022-2025) (t CO _{2e})	2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	Decommissioning phase
NG/H ₂ (ATR/CCS)	4295783	2873	501653	334437	-167209	-557378	875
<i>Project GHG Emission Intensity (t CO_{2eq}/GWh)</i>							
Type	Construction phase (2022-2025) (t CO _{2e})	2025 - 2030 (average)	2031 - 2040 (average)	2041 - 2049 (average)	2050	Decommissioning	
H ₂ ATR with CCS	N/A	0.2883	0.1922	-0.0961	-0.3203	N/A	
Gross Electrical Energy Output (GWh)	N/A	1740076	1740076	1740076	1740076	N/A	

4.1.3 Baseline Environmental Conditions of Project Site

The HRPP Project site occupies only 10% of the overall GSPC property and the entire GSPC property is industrially zoned. During the development of the GEPP project by GSPC in 2012-2013, an independent Natural Resources Baseline Report and Environmental Impact Study (EIS) was conducted in relation to the GSPC property development with this study including the land portion now proposed for the HRPP facility. The EIS described the baseline environmental conditions with respect to surface water, aquatic habitat, fish, plant communities, general wildlife, terrestrial habitat and species at risk. The complete EIS is appended (appendix 7.8).

The EIS concluded that the overall environmental effects of the GSPC project land development with respect to the terrestrial and aquatic components to be minimal with the implementation of the proposed mitigation measures as detailed in the EIS. All EIS recommended mitigation measures were implemented by GSPC during property development and this included the proposed HRPP project land area. The EIS mitigation measures were followed through to final site grading of the GSPC property in 2017 after completion of construction and commissioning of the existing GEPP project. The land area for the proposed HRPP project has been maintained free of any returning naturalizing vegetation to the present and therefore ready to develop for the HRPP project.

The undisturbed woodland area on the south of the GSPC property is located approximately 250 m south of the proposed HRPP facility footprint and it, in turn, connects further south of the GSPC property, to the Clay Creek Woodland, Area of Natural Scientific Interest (ANSI). The minor portion of the ANSI area lying within the southern boundary of the overall GSPC property has not been developed by GSPC and is not planned for development for the HRPP Project.

4.1.4 Surface Water Quality, Sedimentation and Groundwater Quality

The land to be developed for the HRPP facility lies fully within the St. Clair Region Conservation Authority (SCRCA) regulated zone. The Green Electron Power Plant (GEPP) project footprint developed by GSPC was also within the regulated zone and was developed subject to a permit from the SCRCA. This was to ensure structures had elevations above the regional flood plain elevation and so there would be no net impact to surrounding lands such as the Clay Creek Watershed in the event of regional flooding. All the SCRCA permit conditions were fully met on completion of final GSPC site grading in 2017 and the SCRCA acknowledged completion with permit closure in 2018.

The elevation grade level of the HRPP facility will be raised to a similar elevation as for GEPP and similar to the existing elevation of Oil Springs Line.

The Project site is not near any source water taking sites and therefore will have no direct impact on source water.

Industrial wastewater combined with sanitary sewage will be routed to the sewage collection and treatments facility in Courtright. This will be subject to an MECP sewage treatment

Environmental Compliance Approval. Thus, no negative impacts to surface or groundwater either on or off the site will occur.

A comprehensive stormwater management plan has been developed for the HRPP project. The stormwater control methods used by the Project are in accordance with the MECP's "Stormwater Management Planning and Design Manual".

Stormwater collected from impervious surfaces will be collected into the basin of the cooling tower basin for use while stormwater on the balance of the site will be allowed to drain as to pre-existing conditions. These provisions are similar to those already successfully implemented by GSPC for its GEPP project.

Stormwater from the non-developed portions (80% area) of GSPC's overall property will remain routed as to pre-existing natural conditions. Tile drainage with outflow to Government Drain #10 on GSPC's land areas north of the GEPP facility and extending to the berm along Oil Springs Line has been implemented to improve crop productivity with annual cropping by a tenant farmer. This area to the north of the GEPP facility does not include the HRPP lands which are to the south of the GEPP facility.

Additionally, any accidental releases of contaminants to the environment including to surface water in Government Drain #10 will be prevented over the entire project life through adherence to an Environmental Impact Management Plan as provided to the MECP as part of its EA requirements. The stormwater management plan report is an integral component of the Environmental Review conducted for the MECP as part of the required Ontario Regulation 116/01 Environmental Assessment for the HRPP Project.

Given all the various provisions above, the Project will not have net negative impacts on surface waters.

4.1.5 Aquatic Resources

The overall GSPC property on which the HRPP Project site is located was previously evaluated in 2012 through an independent Natural Resources Baseline Report and Environmental Impact Study (EIS) (see Appendix 7.8) as to its aquatic resources. No aquatic resources other than a manmade government field drainage ditch (Government Drainage Ditch #10) can be found on the GSPC property. The drainage ditch traverses the GSPC property well north of the HRPP Project lands and it conveys primarily spring agricultural land runoff water to the south of the GSPC property and it is predominantly near-dry or dry in the summer months. Please refer to Appendix 7.8 for more details.

The woodland area to the south of the HRPP site is approximately 250 m south of the facility footprint. This woodland area has not been developed as it connects to the Clay Creek Woodland Area of Natural and Scientific Interest (ANSI). The ANSI area lying within the most southern boundaries of the property has not been developed. The HRPP facility footprint will

be >250m from the ANSI to the south of the GSPC property boundaries and therefore, will have minimal potential impact.

Therefore, based on previous field investigations of the overall GSPC property and the proposed location of the HRPP facility on the GSPC property, the overall environmental effects of the HRPP Project with respect to the terrestrial and aquatic components are expected to be minimal with the proper implementation of typically employed mitigation measures.

4.1.6 Vegetation Communities

The bulk of the GSPC property and the entirety of the area to be developed for the HRPP Project are not part of any locally important or valued ecosystem, nor is there any locally important or valued vegetation on the GSPC property or the HRPP site. The original ecology of the Project site has been disturbed by agriculture since the 1800s. The wooded area to the south of the HRPP site but well outside the project footprint area to be developed does have a valued ecosystem being part of a connected ANSI (see section 4.1.5 above).

Ecologically relevant emissions from the facility will be primarily oxides of nitrogen (nitrogen oxide and lesser amounts of nitrogen dioxide) and carbon monoxide which will be fully dispersed to the atmosphere from two 43 m high stacks. The absence of metal and sulphur dioxide emissions indicates that ecological impacts from terrestrial deposition of contaminants (toxic heavy metal or acidic rain) at or in the areas surrounding the site will be very small and acceptably low. Appendix 7.2 addresses Project emissions to the air in detail.

Given the above mitigation measures, the Project will have no net impacts to locally important ecosystems or vegetation.

4.1.7 Wildlife

The previous independent Natural Resources Baseline Report and Environmental Impact Study (EIS, see Appendix 7.8 for further details), concluded there were no wildlife reserves on the overall GSPC property site as based on actual field observations.

4.1.8 Species at Risk and Critical Habitat

The previous independent Natural Resources Baseline Report and Environmental Impact Study (EIS, see Appendix 7.8 for further details) concluded there were no rare, threatened or endangered species of plants or animals (SAR) on the overall GSPC property site as based on actual field observations.

Given that the HRPP Project will affect only 10% of the entire GSPC site area and site alterations to the existing natural environment will not be made to the woodlot area at the south of the GSPC property, any risk to any potential SAR or to the Clay Creek ANSI will be minimal and adequately mitigated through proactive project design. Therefore, the Project will not have negative impacts on rare, threatened or endangered species of flora or fauna.

The woodland area on the south of the GSPC property located approximately 250 m south of the HRPP facility footprint connects further south to the Clay Creek Woodland ANSI. The woodland portion within the boundaries of the GSPC property has not been developed by GSPC and is not planned for development for the HRPP project.

The St. Clair Township Official Plan designates all mature wooded lands as “natural area”, and this would include the wooded southern portion of the GSPC property (about 10 ha). This wooded area has remained undeveloped by GSPC and will remain undeveloped and undisturbed by the HRPP Project.

Given the above and the mitigation measures to be implemented, the Project will have no impacts to species at risk or to any off-property critical habitats that are closest to the Project site, i.e., the ANSI >250m from the HRPP site and outside (south) of the overall GSPC property boundaries.

4.1.9 Human Environment

The incremental cumulative impact assessment for the HRPP facility (4.1.1 above) has found that the project will not contribute to any exceedances over the pre-existing ambient air quality and will not exceed the MECP established air quality targets for contaminant concentrations called Ambient Air Quality Criteria (AAQC) that are considered as acceptable concentration of an air contaminant to protect human health or the environment. These analyses have shown that for all operating scenarios and environmental conditions, including conditions conducive to producing worst-case contaminant concentrations, the HRPP project’s contaminant concentrations will be below the prescribed maximum limits detailed in Ontario Regulation 419/05. The project will also not contribute to any exceedances of the Ambient Air Quality Criteria (AAQC) even on those occasional upset days of poor background ambient air quality. Please refer to Appendix 7.1 ESRR Main Report and Appendix 7.2 Air Quality Impact Study for more details.

It can therefore be concluded that based on HRPP site specific emission modelling and established health science affects, the HRPP project will not have significant negative human health impacts.

4.2 Potential Effects Related to Federal Legislation

4.2.1 Fish and Fish Habitat (Fisheries Act)

Government Drain #10 traverses the site, north of the existing GSPC footprint, in a northwest to southeast direction. Long term site reconnaissance of Government Drain #10 within the sections transecting the GSPC property had indicated a permanent feature with intermittent / ephemeral reaches in summer drought conditions. Government Drain #10 is a Type C Drain under the DFO drain classification system and no aspect of Drain #10 is on the HRPP project land. The GSPC section of Drain #10 is likely to freeze to its bottom in the winter therefore providing no potential for an overwintering habitat for fish. Prior to the construction of the existing GSPC facility, an

existing farm access culvert was upgraded to meet hydrologic requirements of the drainage. During the HRPP project construction and operation, there is no plan for taking water, process water discharge, or site stormwater discharge to Government Drain #10.

Project construction and operation will also not affect downstream Clay Creek fish or fish habitat through the use of appropriate mitigation measures to control erosion and sedimentation, mitigating possible impacts to off property (i.e., downstream) fish habitats in the Clay Creek watershed area to the south of the GSPC property. Appendix 7.8 provides further information on the implementation of these mitigation measures. A summary of the mitigation measures include:

- No work is required to be performed on Government Drain #10
- All materials and equipment used for site preparation, construction and operation will be stored in a manner that prevents any detrimental effects in Government Drain #10 or downstream
- Sediment and erosion control measures would be implemented prior to construction and maintained through the construction phase to prevent entry of sediment into the water

Given the above, the Project will have no significant impacts on fish habitats in Government Drain #10 or outside the Project lands.

4.2.2 Aquatic Species at Risk (Species at Risk Act)

A Natural Resources Baseline Report and Environmental Impact Study (EIS, see Appendix 7.8) of the GSPC property including the HRPP project site concluded there were no rare, threatened or endangered aquatic species of plants or animals on the overall GSPC property including the HRPP site.

The HRPP Project lands represent only 10% of the entire GSPC property and these lands have been deliberately kept clear and non-naturalized and therefore ready to develop. Therefore, the HRPP lands do not provide suitable habitats for any potential SAR moving onto the project site.

Project development will continue to utilize the same mitigation measures as were specified in the EIS (see Appendix 7.8 for details). No disturbance will occur to the woodlot area at the south of the GSPC property, and therefore, any risk to potential SAR or to the Clay Creek ANSI south of the project site will be minimal and adequately mitigated through proactive project design.

Given the above, the Project will not have negative impact on rare, threatened or endangered species of flora or fauna.

4.2.3 Migratory Birds (Migratory Birds Convention Act)

A Natural Resources Baseline Report and Environmental Impact Study (EIS, see appendix 7.8 for further details) of the overall GSPC property including the HRPP Project site and, within 10 square kilometers of the Project site, identified potential breeding occurrence in the GSPC property, including the HRPP Project area for four species of birds. The study also concluded

that none of the eight species identified in the review of the ABBO (Atlas of the Breeding Birds of Ontario) as SAR (Species at Risk) under the provincial Endangered Species Act are expected to be present at the GSPC and HRPP site. There are no trees or other vegetation to be cleared from the HRPP project lands for development as these lands were developed during the construction of GSPC, including construction of Vector's natural gas supply station at the south end of the property, natural gas supply lines from Vector's station to GPSC and access roads. The Project lands have since been deliberately kept clear and ready for construction, thereby precluding any potential for chance nesting activity of migratory birds.

Additionally, during the construction and operation phase of HRPP, the following measures will be implemented to mitigate possible adverse effects from construction and operation:

- Comply with the Migratory Birds Convention Act (MBCA) regulations and guidelines for vegetation clearing recommended by Environment Canada, if required. Such work will be undertaken only outside of the breeding season. Clearing will be avoided from 1 May to 1 August. If any clearing work is required during the nesting season, a nest survey will be conducted by a qualified avian biologist within two days prior to the commencement of such clearing work. If required, a mitigation plan will be developed to address potential impacts on migratory birds or the active nests and will be submitted to Environment Canada for review prior to implementation.
- Timing and duration of work activity will be limited, with construction occurring primarily during daylight hours
- To minimize potential effects, including sensory disturbances due to noise and light from plant operations:
 - Plant maintenance will generally be limited to daylight hours
 - Facility lighting will be installed in areas required for safety and security
 - Lighting will be directed to where it is needed
 - Appropriate technology such as sodium lighting will be used

Given the above, the Project will have no net impacts on migratory birds.

4.3 Potential Effects to Federal Lands and Jurisdictions Outside Canada

The Project site is not on or near any Federal Lands. The nearest Federal Lands within the meaning of the Impact Assessment Act, are the Aamjiwnaang First Nation lands, 14 km north of the HRPP Project site.

Detailed technical studies as part of the required, now-completed MECP ESRR addressing air and noise emissions (see Appendices 7.2 and 7.3, respectively for further information) as well as for stormwater impacts and their management (see Appendix 7.4 for further details) have shown no net adverse effects with the implementation of the identified mitigation measures, i.e., should the project proceed to implementation. In particular, HRPP Project air and noise emissions will be within MECP regulatory requirements at points of impingement for even the nearest project residential neighbours and will not significantly affect now-prevailing ambient air quality. Based on the "Air Quality in Ontario 2018 Report" ([Ontario Air Quality](#)) section

'Transboundary influences on Ontario's smog', during the smog season, the prevailing winds are southwesterly, which results in the transport of smog pollutants from the US into Ontario, including the Sarnia area. From this, the HRPP will have insignificant environmental/transboundary impact across the St. Clair River to the State of Michigan, USA.

Given these findings, the Project will have no effects on Federal Lands or present any potential for trans-boundary or trans-border environmental impacts.

4.4 Socio-Economic Impacts

4.4.1 Neighbourhood or Community Character

The HRPP Project is within St. Clair Township that already hosts several similar electricity generating facilities as well as petrochemical and related heavy industrial facilities. The Sarnia area regional industrial complex is already a substantial producer and user of hydrogen and is well positioned to become a significant participant and leader in Ontario's move to the hydrogen energy platform. The HRPP Project, as an early user of hydrogen for electrical power production, will add to this regional expertise and effort. Thus, the HRPP facility is in keeping with the general character of the overall community.

Closer to the HRPP site itself, the neighbouring lands are zoned either industrial or agricultural with an expectation for continued industrial growth displacing present agricultural uses. Given that the plant is to be located adjacent to an existing 230 kV electrical transmission line and an adjacent natural gas pipeline corridor, as well as a railway line, the HRPP location is highly suitable from a land use planning perspective.

The new plant will be visually compatible with the existing GEPP facility and the tall and visually significant galvanized steel towers of the electrical transmission lines adjacent to the site. The existing 230 kV transmission towers just west of the site are about 25 m in height, whereas the proposed HRPP power plant stacks will be 43 m high, and the plant buildings and structures will be about 20 m high.

The proposed plant location will also avoid the need for a new electrical transmission corridor to connect the Project to the Provincial electrical grid.

The closest schools to the HRPP site are Mooretown-Courtright Public School about 6 km to the north west and Brigden Public School about 14 km to the northeast. The closest post-secondary education facility is the Lambton College of Applied Arts and Technology about 22 km to the north in Sarnia. Given the distances to the Project site, there will be no significant impact on any of these facilities.

The site is zoned for industrial activity and is designated for employment uses in official plans of both St. Clair Township and Lambton County. The closest hospital to the HRPP site is the Bluewater Health Hospital in Sarnia about 23 km to the north.

There are no residential dwellings, nursing homes or other long-term care facilities within 500 metres of the project site as shown in both the Air Quality Impact Assessment Study (Appendix 7.2) and the Noise Impact Assessment Study (Appendix 7.3).

Given the above, the Project will have no net negative impacts on neighborhood or community character.

4.4.2 Local Businesses, Institutions or Public Facilities

The HRPP Project will purchase about \$ 20 million of goods and services from local businesses during construction and contribute approximately \$ 4.5 million annually to the local economy once the plant is in operation. Given that the total value of industrial construction in Lambton County in 2019 was about \$ 200 million, the impact of the HRPP project on local businesses will be incremental but positive and should cause no distortions (shortages or surpluses) in the local or regional economy.

The approximately 250 person years of construction employment created by the project will have only a minor impact on local public institutions such as schools, hospitals and public facilities. Most of the construction and skilled trades workers are expected to be from the local and broader area of the project and likely commute to the site, e.g., from Sarnia or Chatham for the various phases of the Project.

The approximately 25 full time operating and maintenance jobs created by the project will have only a minor impact on local public institutions and facilities given that the population of Lambton County in 2020 was about 132,972 and is forecast to grow.

Therefore, the Project will have no net adverse impacts on local businesses, institutions or public facilities.

4.4.3 Recreation, Cottaging or Tourism

The HRPP is in an industrial area, not close to and will not have any significant impact on any nearby recreation, cottaging or tourism.

Therefore, the Project will have no impacts on recreation, cottaging or tourism.

4.4.4 Community Services or Infrastructure

The HRPP Project will require water supply of up to about 200 liters per second for boiler feed-water and condenser cooling circuit make-up. This need will be met from the existing Lambton Area Water Supply service and from a new 14" lateral line from a local industrial supplier to the south/west (under construction for service in 2022). There will be water discharge of up to approximately 30 liters per second of cooling tower and boiler blowdown wastewater. The Courtright WWTF has available capacity to receive and treat the HRPP wastewater using an existing forcemain from the GSPC property, subject to review and finalization with St. Clair Township officials. The existing forcemain discharge line from the GSPC property to the Courtright WWTP may require upgrading.

The HRPP Project is about 25 km from Chris Hadfield Airport in Sarnia and thus the maximum height of buildings and structures on the project is not limited by regulations issued under the Aeronautics Act and therefore the project will have no impact on aviation infrastructure.

The approximately 250 person years of construction employment created by the project will have only a minor impact on community services or infrastructure as most of the construction workers are expected to be from the local and broader area of the project.

Therefore, the Project will have no net adverse impacts on community services or infrastructure.

4.4.5 Economic Base of Community

The HRPP Project will inject approximately \$4.5 million annually into the local economy over its minimum 25-year operating life in the form of salaries, procurement of local service and supplies and taxes. Economic positive ripple effects of up to 4X these direct economic benefits can also be expected. Given that the total value of industrial construction in Lambton County in 2019 was about \$ 200 million, the impact of the project on local businesses will be positive and should cause no distortions from shortages or surpluses in the economic base of the community.

St. Clair Township will benefit from the economic activity flowing from the construction and operation of the project,

Therefore, the Project will have no net adverse impacts on the economic base of the community.

4.4.6 Labour Supply and Employment

The HRPP Project will result in about 250 person years of construction employment as well as 25 skilled, full-time jobs once the plant is in operation. Given that Lambton County had total employment of about 132,972 in 2020 and a total value of industrial construction of about \$ 200 million in 2019, the impact of the project on local businesses will be positive and should not cause any distortions through shortages or surpluses in the labour markets of Lambton County, Ontario or Canada. Based on prior experience with the similar GEPP Project this is expected to include a number of workers from both the Walpole Island First Nation and the Aamjiwnaang First Nation both of which are <20km from the project site.

Therefore, the Project will have no net negative impacts on labour supply and employment.

4.4.7 Motor Vehicle Traffic

The HRPP Project will cause only a short-term increase in local vehicle traffic during the construction period that will be noticed primarily by other users of Oil Springs Line and Highway 40. Highway 40 is a major through road serving many industrial establishments north of Oil Springs Line with two lanes in each direction with a design capacity of about 2000 vehicles per hour. The section nearest the HRPP site has a single lane in each direction. The most recent 2016 Ontario data for annual average daily traffic volume on Highway 40 at the Courtright Line

and Bentpath Line intersections (i.e., north and south of the Oil Springs Line intersection) were 5050 and 3400 vehicle movements, respectively.

Construction of the HRPP Project will cause a short-term addition of an estimated 400 vehicle movements per day primarily on Oil Springs Line and Highway 40 within a range between 15 and 100 peak vehicles movements per hour. Once in operation, the project will cause an addition of only about 50 vehicle movements per day, within a range of between 2 and 10 peak vehicle movements per hour. The peak vehicle movements will almost exclusively occur during the daytime and on workdays. Therefore, existing design of both Oil Springs Line and Highway 40 and current traffic volumes on these can readily accommodate both the short-term and long-term increases in vehicle traffic by the HRPP Project.

Therefore, the Project will have no net negative impacts on motor vehicle traffic.

4.4.8 Public Health and Safety

There are no residential dwellings, nursing homes or other long-term care facilities within 500 metres of the project site as shown in Appendix 7.1 ESRR Main Report and both the Air Quality Impact Assessment Study (Appendix 7.2) and the Noise Impact Assessment Study (Appendix 7.3).

Analyses of HRPP emissions to the atmosphere and the existing air quality data in the region of the project have concluded that HRPP will not result in any significant increases in NO_x, CO or PM to the local airshed (see section 4.1.1 and Appendix 7.2 for further details). Given this the HRPP Project will not have any measurable impact on public health or on public safety.

Therefore, the Project will have no net adverse impacts on public health and safety

4.5 Heritage and Culture Impacts

4.5.1 Heritage Buildings, Structures, Sites

The site is not itself and has no buildings on it of significance from a heritage perspective as was determined through independent Site Heritage/ Archaeological Stage 1 and Stage 2 Assessments, concluding that the site did not contain physical and cultural heritage features or structures of historical or archaeological significance and there was no evidence of the use of the lands for any traditional indigenous group purposes. The project site has continued in uninterrupted use solely as an industrial site since that time, so these findings and conclusions remain valid. The Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) who we consulted on the HRPP project, confirmed on Sept 1, 2021, "Due diligence has been achieved as the Stage 2 archaeological assessment (Project Information Form Number: P077-008-2013) has been entered into the Ontario Public Register of Archaeological Reports indicating no further archaeological assessments are required for the study area."

Therefore, the Project will have no negative impacts on heritage buildings, structures or sites.

4.5.2 Archaeological Resources or Cultural Heritage Landscapes

Site Heritage/ Archaeological Stage 1 and Stage 2 Assessments concluded that the site did not contain physical and cultural heritage features or structures of historical or archaeological significance and there was no evidence of the use of the lands for any traditional indigenous group purposes. The project site has continued in uninterrupted use solely as an industrial site since that time, so these findings and conclusions remain valid. The Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) who were consulted on the HRPP project, confirmed on Sept 1, 2021, “Due diligence has been achieved as the Stage 2 archaeological assessment, (Project Information Form Number: P077-008-2013) has been entered into the Ontario Public Register of Archaeological Reports indicating no further archaeological assessments are required for the study area.”

In addition, detailed technical studies conducted as part of the required, now-completed MECP ESRR addressing air and noise emissions (see Appendices 7.2 and 7.3, respectively for further information) as well as for stormwater impacts and their management (see Appendix 7.4 for further information) have shown no net effects with the implementation of the identified mitigation measures, i.e., should the project proceed to implementation. In particular, HRPP project air and noise emissions will be within MECP regulatory requirements at points of impingement for even the nearest project residential neighbours and will not significantly affect now-prevailing ambient air quality.

Given these findings, the Project will have no adverse impacts on archaeological resources, heritage landscapes or use of the Project lands and resources for traditional purposes by Indigenous groups.

4.5.3 Scenic Views or Aesthetically Pleasing Landscapes

The HRPP Project will not have any impact on scenic views since the site does not have, nor form part of, any scenic views. The project will not have any impact on aesthetically pleasing landscapes since the site is not a component of an aesthetically significant landscape. The proposed site is adjacent to a rail line and a 230 kV electrical transmission line corridor. The new facility will not further disturb the landscape at the site because of the existence of several tall, visually significant, galvanized steel electrical transmission towers, and the industrial facilities near to the site to the west and to the south of the site.

Therefore, the Project will have no impacts on aesthetically pleasing landscapes.

4.6 Potential Effects on Indigenous Peoples from Changes to the Environment

The Project site is within the traditional territory of eight First Nations in southwestern Ontario. The GSPC property and the HRPP project site on the GSPC property are not near and are not part of any First Nation (FN) or other Indigenous Groups reserve lands or on lands subject to any pending claims by Indigenous Groups.

There is no evidence of any current use of the HRPP Project lands and resources for traditional purposes by any First Nations or other Indigenous Groups. The overall GSPC property was assessed for the presence of archaeological resources through a Site Heritage/ Archaeological Assessment and was determined not to contain or to have potential to contain any heritage landscapes or archaeological resources. The HRPP project area represents only around 10% of the overall GSPC property immediately south of GSPC's existing GEPP facility. This land area was extensively disturbed through excavation and earth moving during the GEPP project development and no archaeological resources were uncovered in those previous site works.

There is no present use or any evidence of past use of the project lands and resources for traditional purposes by any First Nation or any other Indigenous Groups. There are also significant distances of all the First Nations Reserve Lands from the project site, i.e., all eight First Nations reserves are ≥ 14 km from the HRPP project.

Potential impacts to both air quality and water quality had been identified earlier, during previous consultation activities with First Nations for the similar, now successfully operating GEPP project. Similar concerns were again expressed in relation to the HRPP Project by the same First Nations. The concerns were that potential adverse impacts from both air and water quality could have possible negative effects on health as well as social and economic conditions for First Nations, especially for those nearest to the HRPP Project. Consequently, these potential impacts were prioritized for technical assessment for the HRPP Project environmental assessment. Detailed technical studies of potential HRPP Project impacts to air quality, including air pollutants and noise were addressed in detailed technical studies, using the latest modelling techniques and current regulatory limits as provided by the MECP. These modelling studies (see Appendices 7.2 and 7.3 for further details) have demonstrated that the Project will not significantly contribute to any exceedances over the pre-existing ambient air quality with respect to any air pollutants. Predicted emissions for air pollutants and noise are predicted to be within the MECP regulatory criteria for even the nearest residential neighbours to the HRPP project, i.e., those that reside < 1 km from the Project.

Wastewater from the Project will also be routed for treatment to the Courtright Municipal Treatment Facility. This along with the on-site stormwater management plan (see Appendix 7.4 for details) will avoid potential impacts to off-property water resources or to fish habitats that are well south of the HRPP Project, such as those in the in the Clay Creek watershed.

On the basis of the above, it can be concluded that the Project will not have significant environmental, health or socio-economic impacts that could potentially affect First Nations.

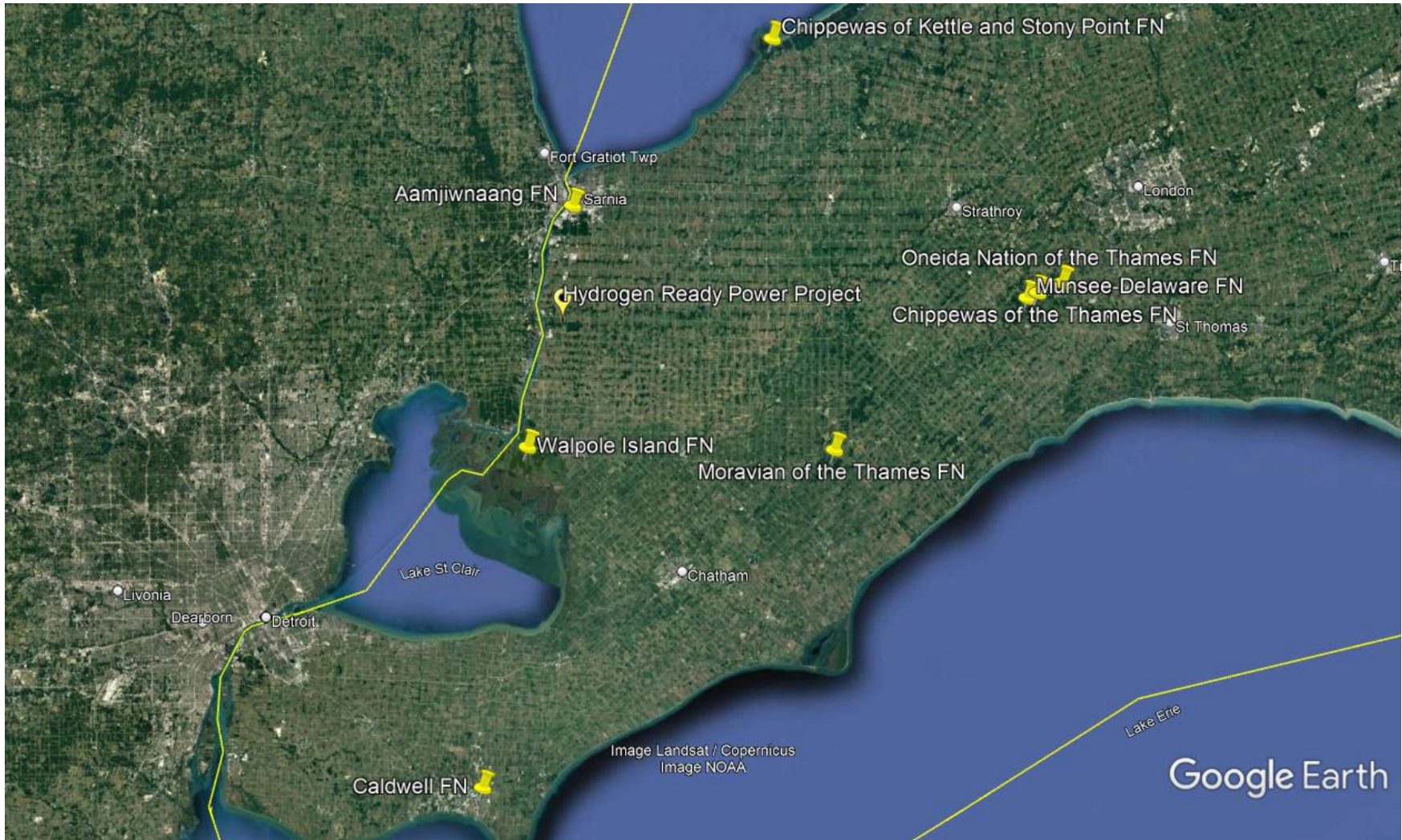
5 ENGAGEMENT OF INDIGENOUS GROUPS

5.1 Potentially Affected and Interested Indigenous Groups

The proposed project is within the traditional territory of eight First Nations in southwestern Ontario. These eight First Nations in the overall surrounding region of the Project and with potential interest in the project were identified both from previous consultation experience of the proponent with Greenfield South Power Corporation's Green Electron Power Plant project (2012- present) and through information provided by the EA coordinator for the Ministry of Environment Conservation and Parks (MECP). The proponent understands that the MECP has Crown responsibility for First Nation consultation for this Project and the MECP expects this consultation to be carried out by the proponent.

The eight First Nation reserves in the greater region of the project site include: Aamjiwnaang First Nation approximately 14 km to the north; Walpole Island First Nation approximately 17 km to the south; Moravian of the Thames First Nation approximately 49 km to the south east of the site; Chippewas of Kettle and Stony Point First Nation approximately 55 km to the north east of the site; Chippewas of the Thames First Nation approximately 72 km to the east of the site; Munsee Delaware First Nation approximately 73 km to the east of the site; Caldwell First Nation approximately 82 km south of the site and Oneida Nation of the Thames approximately 81 km east of the site. The locations of these First Nation Reserves are shown in Figure 6.

Figure 6 Locations of First Nation Reserves in Relation to HRPP



5.2 Overview of Indigenous Engagement Activities to Date

The engagement activities with Indigenous Groups are summarized in detail in section 5.6 and together with engagement responses in section 5.7, below. The full engagement consultation report is also attached as appendix 7.6, providing additional information.

5.3 Key Comments and Concerns by Indigenous Groups

Air and noise emissions to the environment potentially affecting air quality and potential water quality impacts were identified as issues of concern. These concerns are similar to those identified previously with the similar GEPP Project and which was developed on the same overall property. Sections 5.6 and 5.7 below provide further details and how these issues were addressed, including through an independent review of the project draft ESRR as conducted by Walpole Island First Nation.

5.4 Current Indigenous Traditional Land Use

The project is within the traditional territory of eight First Nations in southwestern Ontario as detailed in section 5.1. The GSPC property and the HRPP project site on the GSPC property are not near and are not part of any First Nation reserve lands or on lands subject to any pending claims by any indigenous peoples.

Stage 1 and Stage 2 archaeological assessments have confirmed there was no evidence of past use of the project lands for traditional uses by any First Nations. Furthermore, during the previous 2012-2013 MECP EA and impact assessment by the CEEA (now IAAC) for the GEPP project on the same GSPC property, the same eight First Nations were consulted. It was confirmed at that time there were no traditional land uses by First Nations on the project lands. The Project site has continued in uninterrupted use solely as an industrial site since that time, so these findings and conclusions remain valid. In this regard, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) who was consulted on the HRPP project, confirmed on Sept 1, 2021, “Due diligence has been achieved as the Stage 2 archaeological assessment (Project Information Form Number: P077-008-2013) has been entered into the Ontario Public Register of Archaeological Reports indicating no further archaeological assessments are required for the study area.”

The HRPP project area represents only around 10% of the overall GSPC property immediately south of GSPC’s existing GEPP facility. This land area was extensively disturbed through excavation and earth moving during the GEPP project development, a natural gas tap station was constructed at the southern end of the developed lands, along with installation of natural gas supply lines and access roads and no archaeological resources were uncovered in those previous site works.

Detailed technical studies as part of the required, now-completed MECP EA addressing air and noise emissions, as well as stormwater impacts and their management have shown no net adverse effects with the implementation of the identified mitigation measures, i.e., should the project proceed to implementation. In particular, HRPP Project air and noise emissions will be within MECP regulatory requirements at all points of impingement for the nearest Project

residential neighbours and will not significantly affect now-prevailing ambient air quality. Moreover, the AERMOD modelling (see Appendix 7.2) shows that the maximum air emission concentrations will occur about 1.8 km southwest of the Project site but that these concentrations will remain within the MECP regulatory requirements.

Since the nearest First Nation, the Aamjiwnaang FN, is about 14 km away and north of the Project site, no significant adverse effects are expected on Indigenous peoples as a result of any changes to the environment that may be caused by the project, including adverse effects on health and socio-economic conditions, physical and cultural heritage. For additional details see section 5.6.

5.5 Historical Basis of Potential Interest

The Project is within the traditional territory of eight First Nations in southwestern Ontario as detailed in section 5.4. The GSPC property and the HRPP Project site on the GSPC property are not near and are not part of any First Nation (FN) reserve lands or on lands subject to any pending claims by Indigenous peoples communities. The HRPP project is ≥ 14 km away from the nearest First Nations, i.e., Aamjiwnaang FN and Walpole Island FN.

Site Heritage/ Archaeological Stage 1 and Stage 2 Assessments concluded that the site did not contain physical and cultural heritage features or structures of historical or archaeological significance and there was no evidence of the use of the lands for any traditional purposes by indigenous groups. The HRPP project area represents only around 10% of the overall GSPC property immediately south of GSPC's existing GEPP facility. This land area was extensively disturbed through excavation and earth moving during the GEPP project development and no archaeological resources were uncovered in those previous site works.

5.6 Indigenous Consultation and Information Gathering

Information gathering and identification of potential concerns to First Nations benefited greatly from previous and ongoing consultations with the two main First Nations (i.e., Walpole Island FN and Aamjiwnaang FN) that are nearest to the HRPP project. The earlier GEPP project with GSPC included the same First Nations and these consultations had provided sufficient background and information as to potential issues with the HRPP project, i.e., given its similar nature and its location on the same property as GEPP.

Consultations were initiated in July 2021 by directly contacting Band Council Chiefs and Band environmental coordinators, providing the MECP EA official Notice of Commencement of the HRPP project, provision of project specific information as to its nature, size etc. and through extending an invitation for discussions, questions and comments. This was followed up by additional letters and invitations to discuss, through providing status updates as to the MECP EA process and ESRR readiness and additional requests to provide input and comments to assist the finalization of the ESRR. Meetings for presentation and discussion were arranged with four of the eight First Nations; Walpole Island First Nation; Aamjiwnaang First Nation;

Chippewas of the Thames First Nation and the Chippewas of Kettle & Stony Point First Nation. Direct meetings were held using virtual conferencing to review and discuss the project (see section 5.7 for details). A virtual presentation of the project was also made by proponent officials to the Aamjiwnaang First Nation environmental committee, providing a useful opportunity for discussion and for answering to comments and questions from the entire committee. The other First Nations that had not responded are either smaller in population or at greater distance distances from the Project site.

The issues identified related primarily to emissions to the air and noise and potential impacts to water quality. The WIFN requested to complete an independent review of the draft ESRR for their provision of comments both internally and thorough their chosen independent contractor, Neegan Burnside. Neegan Burnside is an environmental consulting firm with experience working on behalf of First Nations. All eight First Nations were made aware of the WIFN/Neegan Burnside Review. The WIFN also agreed to share their ESRR review report with the other potentially affected First Nations and the review report was sent to each of these, inviting their review and comments, i.e., to assist finalization of the ESRR. The independent WIFN/Neegan Burnside review provided productive comments which were used, along with various others received from both public and governmental agency stakeholders, to finalize the ESRR. The ESRR was finalized, and the project Notice of Completion was published in local newspapers (Sarnia Observer and Wallaceburg Courier) and the complete ESRR along with its supporting studies were posted for public review/comment on the project website as of April 14, 2022. The Notice of Completion was also sent directly to all the First Nations that had been included in the consultation process. The complete ESRR and its supporting studies are included as appendices in section 7, below.

5.7 Consultation Responses from First Nations

These are summarized below.

First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
Aamjiwnaang First Nation (14 km north)	July 9, 2021; Courier Letter to Band Council Chief informing of project and wish to discuss. July 9: email letter to Band Council Chief and Band Environmental Coordinator July 21, 2021; Courier letter to Band Chief July 21, 2021; email letter to Band Chief Plain and environmental coordinator	

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First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
	<p>Nov 1, 2021; telephoned Band Environmental Coordinator-no answer and voice-messaged requesting return call.</p> <p>Dec 12, 2021; resent letter and project information to Band Council Chief and Environmental Coordinator.</p> <p>Feb 7, 2022; sent email letter and previous information to new Band Environmental Coordinator and Band Chief informing of ESRR review for input and comments by WIFN consultants and IAAC review with request for comments.</p> <p>March 4, 2022; email response from AFN Environmental Coordinator re presentation to Environmental Committee.</p> <p>March 11, 2022 made ESRR and reports available to consultation officer for review</p> <p>March 14, 2022; met with environmental coordinator and reviewed and discussed project in preparation for presentation to environmental committee.</p>	<p>March 29, 2022, WIFN/Neegan Burnside Review Report of ESRR was shared</p> <p>Presentation made to Environmental Committee April 5, 2022.</p>
Walpole Island First Nation (17 km south)	<p>July 9, 2021; Courier Letter to Band Council Chief with information on project and request to discuss.</p> <p>July 9, email letter to Band Council Chief and Band Environmental Coordinator</p> <p>July 21, 2021 Courier letter to Band Council Chief</p> <p>July 21, 2021, email letter/information to Band Council Chief and Band</p>	

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First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
	<p>Environmental Coordinator with request to discuss project and get input.</p> <p>Nov 1, 2021, telephoned Band Environmental Coordinator-no answer and voice-messaged for return call Nov 1, 2021, emailed new Band Environmental Coordinator</p> <p>Dec 22, 2021; emailed Band Environmental Coordinator informing of MECP ESRR progress and request for input to finalize ESRR</p> <p>Feb 11, 2022; meeting (ZOOM) with former and current Environmental Coordinators to discuss project and get input and comments as to review for ESRR finalization, Independent review of ESRR arranged with WIFN/Neegan Burnside (WIFN's independent consultants)</p>	<p>Email Nov 1, 2021, from Band Environmental Coordinator, indicating new Band Environmental Coordinator</p> <p>Jan 6, 2022- Environmental Coordinator requested review of ESRR by WIFN and independent consultants – focus on emissions and noise Feb 7, confirmed review underway Feb 4-9, 2022; Environmental Coordinator arranged discussion with IAAC</p> <p>Feb 23, 2022; WIFN Environmental Coordinator agreed to share Neegan Burnside Review of ESRR with other First Nations; final report shared with the other FNs March 29, 2022</p>

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First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
<p>Chippewas of Kettle & Stoney Point First Nation (55 km northeast)</p>	<p>July 9, 2021 Courier Letter to Band Chief; announcement of project and information provided July 9, email letter to Band Chief</p> <p>July 21, 2021 Courier letter to Band Chief - follow-up request for comments and questions July 21, 2021, email letter to Band Chief Henry Nov 1, 2021, telephoned Band Chief - no answer and voice-messaged requesting return call Dec 22, 2021; follow-up letter to Band Chief inviting comments and questions Feb 7, 2022; letter to Band Chief – follow-up request, informed of ESRR review and invitation for comments, informed of IAAC review</p> <p>Feb 18, 2022- meeting arranged to discuss project, ESRR review/finalization and IAAC review</p>	<p>Feb 11, email from consultant advisor requesting a meeting to discuss project</p> <p>Feb 18, 2022; discussion of HRPP project – expressed desire to obtain Neegan Burnside Review Report of ESRR.</p> <p>March 29, 2022, WIFN/Neegan Burnside Review Report of ESRR was shared</p>
<p>Caldwell First Nation (82 km south)</p>	<p>July 9, 2021, Courier Letter to Acting Council Chief July 9, email letter to Acting Council Chief – advising of project and invitation to discuss.</p>	

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First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
	<p>July 21, 2021 Courier letter to Acting Council Chief - follow-up request for any comments or questions July 21, 2021, email letter to Acting Council Chief</p> <p>Nov 2, 2021, telephoned for Acting Chief - informed of new Council Chief Nov 2, 2021, emailed new Council Chief including all info as had sent in July to Acting Chief</p> <p>Dec 22, 2021; follow-up request to Council Chief, informing of ESRR and desire for any comments to finalize ESRR</p> <p>Feb 07, 2022; follow-up informing of WIFN/consultant review of ESRR for finalization, IAAC review and request for any comments or questions.</p>	<p>March 29, 2022, WIFN/Neegan Burnside Review Report of ESRR was shared</p>
<p>Chippewas of the Thames First Nation (72 km east)</p>	<p>July 9, 2021; Courier Letter to Council Chief informing of project and provided information July 9, email letter to Council Chief invitation for comments or questions</p> <p>July 21, 2021 follow-up Courier letter to Council Chief July 21, 2021, email letter to Council Chief</p>	<p>August 4, 2021, letter from coordinator, indicating minimal concerns and desire to review electronic copy</p>

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First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
	<p>August 5, 2021, emailed coordinator thanking for response and plan to meet by Zoom once ESRR report available to send and discuss.</p> <p>Dec 22, 2021; letter to coordinator re invitation for comments on ESRR, comments received from MECP. WIFN/consultants review of ESRR</p> <p>Jan 18, 2022; meeting (Zoom) with coordinators to discuss ESRR status; ESRR files sent via FTP link.</p>	<p>of ESRR once available.</p> <p>Jan 13, 2022- response from energy sector consultation coordinator requesting copy of Draft ESRR for review and comments</p> <p>Jan 18, 2022; consultation coordinator confirmed has ESRR files for their review.</p> <p>March 29, 2022, WIFN/Neegan Burnside Review Report of ESRR was shared</p>
<p>Munsee-Delaware First Nation (73 km east)</p>	<p>July 9, 2021, Courier Letter to Council Chief; announcing project and provided information and invitation to discuss. July 9, email letter to Council Chief July 21, 2021 Courier follow-up letter to Council Chief July 21, 2021, email letter to Chief Peters</p> <p>Feb 2, 2022; follow-up letter to Band Council Chief re ESRR comments received from MECP, WIFN/consultants review of ESRR, IAAC review and request for any comments or questions on project.</p>	<p>March 29, 2022, WIFN/Neegan Burnside Review Report of ESRR was shared</p>

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First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
<p>Moravian of the Thames First Nation (49 km southwest)</p>	<p>October 7, 2021 courier letter to Council Chief – announced project, invited comments questions October 7, 2021, email to Council Chief</p> <p>Nov 2, 2021, called Council Chief and messaged requesting a call Nov 2, 2021, follow-up email to Council Chief with copy of letter sent Oct 7, with invitation to discuss or answer questions.</p> <p>Dec 22, 2021; follow-up letter to Council Chief re draft ESRR and invitation to discuss and provide input to finalize ESRR,</p> <p>Feb 7, 2022; follow-up on ESRR review/finalization, comments received from MECP, WIFN/consultants review of ESRR and IAAC review of project; invitation for comments or questions.</p>	<p>March 29, 2022, WIFN/Neegan Burnside Review Report of ESRR was shared</p>
<p>Oneida Nation of the Thames (81 km southeast)</p>	<p>October 7, 2021, courier letter to Council Chief; announcement of Project and MECP EA; invitation for comments October 7, 2021, email to Council Chief; project information provided</p> <p>Nov 2, 2021, called Council Chief and messaged him requesting a return call</p> <p>Dec 22, 2021: follow-up informed of ESRR and invited comments to finalize.</p> <p>Feb 07, 2022; updated on ESRR comments received from MECP. WIFN/Neegan Burnside consultants review of ESRR to finalize, IAAC review and invitation to provide any questions or comments,</p>	<p>March 29, 2022, WIFN/Neegan Burnside Review</p>

First Nation (Distance from HRPP site)	Consultative Outreach	Response (As of April 1, 2022)
		Report of ESRR was shared

In summary productive consultations have been achieved from July 2021 through to April 2022 with the various potentially affected First Nations, especially with those First Nations nearest to the Project site. These four First Nations actively responded with productive dialogue and input. The WIFN-led independent review of the draft ESRR with their independent consulting firm Neegan Burnside and their willingness to share the resultant independent review report with all the other seven First Nations was very useful to obtain informed productive comments for finalization of the ESRR. This was completed prior to the issuance of the ESRR Notice of Completion. This WIFN initiative also helped ensure that the smaller First Nations who are more geographically distanced from the Project or had yet to respond to outreach efforts had received the benefit of the WIFN ESRR review comments. Further information on these consultations can be found in Appendix 7.6.

The results of the studies undertaken, and the consultation process can be summarized as:

- The project site does not contain physical and cultural heritage features or structures of historical or archaeological significance and there is no evidence of the use of the lands for any traditional purposes by indigenous groups (Stage 1 and Stage 2 Archaeological Assessments)
- Emissions from the proposed project will meet MECP Guidelines A-5 for limits of oxides of Nitrogen, carbon monoxide and sulphur dioxide (Appendix 7.2)
- Emissions from HRPP will be below the Ontario Regulation 419/05 Point of Impingement Criteria under all normal operating conditions, during start-up conditions followed by full load operations and under worst-case meteorological conditions (Appendix 7.2)
- The proposed power plant’s air emissions, in terms of their influence on local ambient air quality data, will be only slight and only in the local vicinity of the facility and unlikely to contribute to any short-term exceedances of MECP Ambient Air Quality Criteria (Appendix 7.2)
- The impact of the proposed facility on air quality will not result in any exceedances of the MECP Ambient Air Quality Criteria. However, occasional and very small exceedances of the interim 24 h PM2.5 standards could occur, since the existing ambient levels is slightly over the MECP AAQC (Appendix 7.2)
- Existing ambient air quality will be affected only slightly in close proximity to the project (Appendix 7.2)
- The Project has the potential to significantly reduce greenhouse gas emissions. A 35:65 natural gas to hydrogen fuel ratio will result in a 56% reduction in GHG emissions and 80:20 natural gas to hydrogen fuel ratio will result in a 17% reduction in GHG emissions (Appendix 7.2)

- The project, with the identified mitigation measures adopted, will not have significant adverse impact on plant communities, wildlife and habitat (Appendix 7.8)

6 STAKEHOLDER CONSULTATION (NON-INDIGENOUS)

6.1 Stakeholders and Related Consultation Activities

6.1.1 Potentially Affected and Interested Stakeholders

The potentially affected public stakeholders as well as the federal, provincial and municipal government agency stakeholders were the same as had been identified and consulted through a previous ON Reg. 116/01 EA and a Canadian Environmental Assessment Agency (now IAAC) screening for the Green Electron Power Project (GEPP). The GEPP Project was similar in nature to the proposed HRPP Project and on the same overall GSPC property. The consultation process for the public and government agency stakeholders is described below.

6.1.2 Overview of Stakeholder Consultation Activities to Date

The major components of the consultation process in summary are:

1. Establishing the Project Website: <https://hydrogenreadypowerplant.ca>
2. Publication of the Notice of Commencement in local new papers (July 16 and July 22, 2021) and its posting on the Project Website.
3. Hand delivered the Notice of Commencement to the 9 residential neighbours within a 2 km radius of the project site.
4. Written information on the Project and request for questions or comments was e-mailed to the 19 various governmental agencies with a request for any comments to be returned by August 21, 2021.
5. Virtual open house hosted on the project website August 6-13, 2021 (retained these presentation materials on the Project website after August 13, 2021, to present).
6. Town Hall meetings were held; two Zoom internet-based town hall meetings as advertised on the Project web site two weeks in advance for attendance by any interested parties, were hosted on August 11, 2021, at both 3PM EDT and 7PM EDT by senior officials of the proponent;
7. Follow up telephone calls and email correspondence with individuals or agencies that had raised questions or made comments.
8. Provision of the Draft Environmental Screening and Review Report to the Ministry of the Environment Conservation and Parks (MECP) for review and comments.
9. Finalization of ESRR with comments received from MECP, other stakeholders and from First Nations (First Nations conducted independent review of ESRR with their consulting firm Negan Burnside, see section 5 above).
10. Publication of the Notice of Completion of Environmental Screening and Review April 14, 2022, as per Ontario Reg. 116/01 requirements, providing 30-day public review period;

11. Provision of completed ESRR on the HRPP Project Web site: <https://hydrogenreadypowerplant.ca/>
12. Field and respond to any questions comments or concerns raised during the Ontario Regulation 116/01 prescribed 30-day review period, ending May 15, 2022.

6.2 Key Comments and Concerns by Stakeholders

These are summarized below for public and government agency respondents,

Public:

Participant	Comment	Response
Journalist Independent of Petrolia and Central Lambton	I read with interest your report sent to St. Clair Council about the proposed hydrogen ready power plant. I would love to talk to one of you, by phone, about the project, why hydrogen energy is important right now, and the time lines you're looking at.	B. Holbein spoke with journalist about the need for power in SW region of Ontario and how hydrogen use for electrical power generation can lower GHG emission in the near future as combustion of hydrogen does not release GHG carbon. Information was also provided on Ontario's hydrogen hub initiative.
HRPP project neighbour	I called and left message for a call back but nobody has called yet. I would like to speak to someone in power about your planned expansion on Oil Springs Line. When someone with knowledge gets to read this please respond or call me	B. Holbein called neighbour and discussed the project with him. He had been concerned about more industry coming to the region and taking up lands for industrial use. It was related to him that the HRPP project will be on existing industrial land alongside an existing similar facility and that neighbouring lands were planned for future industrial development by St. Clair Township.
Environmental Advisor, Environmental Operations Support / Renewable Generation	I work for Ontario Power Generation and we are currently in an active demolition project at the former Lambton Generating Station Site (1886 St Clair Pkwy, Courtright, ON). The demolition project will be followed by site remediation (forecasted for the spring of 2023).	B. Holbein responded by email: Thank you for your message re the Lambton Station demolition/site remediation. Based on your present schedule and our expected project

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Participant	Comment	Response
Ontario Power Generation	<p>In general, OPG does not have a concern with Eastern Power’s proposed the new hydrogen plant, however based on the information on the project website we noticed that you are planning on starting construction in 2023 (no specific date is provided). This could cause a traffic issue on Oil Springs Line as it is the only way OPG’s construction vendors for our site activities can access the site. OPGs site remediation work is currently planned to run until the end of 2023. OPG would like to request to review their traffic control plan and traffic volume projections once available to ensure that Eastern Power’s Project does not constrict or delay truck traffic from OPGs Projects on Oil Springs Line.</p> <p>Please respond back and tell us if this is possible. Feel free to call me should you have any questions.</p>	<p>schedule, these should not create significant impacts to traffic flows on Oil Springs Line.</p> <p>With regard to your site remediation activities, we do expect to have a significant volume of clean soil (fill) available from our project. This material might be of interest to OPG in relation to your site remediation needs and we would be pleased to discuss this aspect with you.</p> <p>I look forward to hearing from you,</p>
Rural Planner, Ontario Ministry of Agriculture, Food and Rural Affairs	Thanks to you and your team for hosting the informative Virtual Information Session this afternoon. This email is to indicate as prime agricultural areas will not be affected by the proposed project, OMAFRA will not be issuing comments.	B Holbein responded by email: Thanks for your reply. The property being developed was zoned Type 3 industrial in 2012 for the existing power plant now on the site (see attached general arrangement key plan drawing). The land immediately surrounding the project lands is scheduled for Type 3 industrial development by the Township of St. Clair as you can see in the attached Schedule A from the official plan of St. Clair.

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Participant	Comment	Response
<p>Economic Development Officer Sarnia-Lambton Economic Partnership</p>	<p>Thank you so much for sharing the information at your open house last week. I would love to connect with Eastern Power to better understand what the current operation is doing as I am the Economic Development Officer for St Clair Township and would love to be able to support your current operation as well as your proposed expansion.</p> <p>Just to give you a bit of background on what the Sarnia-Lambton area is looking at for hydrogen:</p> <p>https://thesarniajournal.ca/push-on-to-make-sarnia-hub-of-ontarios-hydrogen-economy/</p> <p>https://www.theobserver.ca/news/local-news/sarnia-area-seeking-to-be-named-ontarios-hydrogen-hub</p> <p>https://thesarniajournal.ca/opinion-why-sarnia-lambton-should-become-a-hydrogen-powerhouse/</p> <p>I look forward to connecting with you and or Greg to chat more. Again, thank you for sharing what you are doing with the community.</p>	<p>B Holbein had follow-up discussions re hydrogen expertise in the Sarnia area industrial complex and initiatives to develop the hydrogen energy platform.</p>

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Government Agency:

Agency comment date	Comment	Response
<p>Ministry of Heritage, Sport, Tourism and Culture Industries</p> <p>August 16, 2021,</p>	<p>Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources. This EA project may impact archaeological resources and should be screened using the MHSTCI criteria.</p> <p>If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the complete checklist and supporting documentation in the EA report or file.</p>	<p>Proponent advised August 23, 2021, that GSPC had previously completed a Stage 2 archaeological assessment of the entire site.</p> <p>MHSTCI responded Sept 1, 2021.</p> <p>Due diligence has been achieved as the Stage 2 archaeological assessment (Project Information Form Number: P077-008-2013) has been entered into the Ontario Public Register of Archaeological Reports indicating no further archaeological assessments are required for the study area.</p> <p>The screening checklist Appendix 17.1 of the ESRR documents and addresses these points.</p>
<p>Ontario Ministry Agriculture Food and Rural Affairs</p> <p>July 27, 2021,</p>	<p>Based on the mapping provided, it is challenging to tell if OMAFRA will have a commenting role, however, based on the geography of the proposed Project, it is probable that prime agricultural lands (specialty crop areas and/or Canada Land Inventory Class 1-3) or prime agricultural areas (areas where prime agricultural lands predominate) may be affected. If you could please confirm whether prime agricultural areas or lands will be affected, that would guide our Ministry's response as to whether we would have an interest, as requested in your initial email.</p>	<p>Responded July 27, 2021: The property being developed was zoned Type 3 industrial in 2012 for the existing power plant now on the site (see attached general arrangement key plan drawing). The land immediately surrounding the project lands is scheduled for Type 3 industrial development by the Township of St. Clair as you can see in the attached Schedule A from the official plan of St. Clair.</p> <p>Sarah Kielek-Caster Rural Planner Land Use Policy and Stewardship Unit attended HRPP Zoom town hall and was satisfied that no prime agricultural land would be affected.</p>
<p>Ministry of Energy Northern Development and Mines</p> <p>August 18, 2021</p>	<p>I understand you have communicated with IESO regarding your proposal. I would encourage you to continue to engage with IESO to seek input.</p> <p>As you may be aware, Ontario is currently developing its first ever hydrogen strategy to create local jobs,</p>	<p>Continued ongoing consultation with IESO; IESO indicated interest in hydrogen electrical power generation.</p>

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	<p>attract investment and reduce greenhouse gas emissions. Details about Ontario's plans for a hydrogen strategy are available online: https://www.ontario.ca/page/low-carbon-hydrogen.</p> <p>Tim Christie Director Electricity Policy, Economics and System Planning Branch</p>	
<p>Canadian Energy Regulator</p> <p>July 29, 2021</p>	<p>Should the proposed project fall under CER jurisdiction, Eastern Power Inc. would apply to us and we would review under our quasi-judicial process.</p>	<p>The CER regulations as provided were reviewed. Given the project does not involve construction of a pipeline, noting it will connect to an existing pipeline already on the property and that the electrical interconnection will be to the immediately adjacent existing Provincial IESO transmission grid, it was concluded that the CER would not have jurisdictional concerns with the project.</p>
<p>Impact Assessment Agency of Canada</p> <p>September 16, 2021</p> <p>Dec 22, 2021</p> <p>March 3, 2022</p>	<p>Thank you for your response, dated September 1, 2021, which indicated that no material part of the existing Green Electron Project will be used for, spatially overlap, or be designed to be materially or spatially connected with any component of the Hydrogen Ready Power Plant Project. Your response also indicated that the Hydrogen Ready Power Plant Project (the Project) would not be located on federal lands</p> <p>The Project, as proposed, appears to be a designated physical activity as set out under section 30 of the <i>Physical Activities Regulations</i>:</p> <p>30) The construction, operation, decommissioning and abandonment of a new fossil fuel-fired power generating facility with a production capacity of 200 MW or more</p> <p>As a result, Eastern Power Incorporated would be required to submit an Initial Project Description in accordance with the requirements of the IAA.</p> <p>Comments on the preliminary draft IPD were received from IAAC</p>	<p>After discussion with IAAC officials it was agreed that a draft initial project description would be prepared using the results of this ESRR and submitted for their review as the ESRR would appear to address many of the concerns and questions that the IAAC might have.</p> <p>IAAC officials were provided lists of First Nations consulted and put in contact with Mark Badali, the MECP EA coordinator for the HRPP project.</p> <p>A draft Initial Project Description (IPD) was submitted to the IAAC for comment as to completeness to IAAC guidelines Nov 30, 2022</p> <p>A detailed response to IAAC comments on the Nov 30, 2021, draft IPD and a revised draft IPD</p>

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	<p>One of the federal reviewers has requested to see the 2012-13 Natural Resources Baseline Report and Environmental Impact Study (EIS) project to assist their review and feedback.</p>	<p>was submitted for IAAC and technical review Feb 16, 2022.</p> <p>This was sent and the report, Natural Resources Baseline Report and Environmental Impact Study (EIS) has also been added as Appendix 17.8 of the ESRR.</p>
<p>Ministry of the Environment Conservation and Parks (MECP) August 13, 2021</p>	<p>MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.</p> <p>A draft copy of the Screening/Environmental Review Report should be sent directly to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments.</p> <p>Please also ensure a copy of the final notice is sent to the ministry's Southwest Region EA notification email account (eanotification.swregion@ontario.ca) after the draft report is reviewed and finalized.</p> <p>Additional Areas of interest to be addressed in ESRR:</p> <ol style="list-style-type: none"> 1. Planning and Policy 2. Source Water Protection 3. Climate Change 4. Air Quality, Dust and Noise 5. Ecosystem protection and Restoration 6. Species at Risk 7. Surface Water 8. Groundwater 9. Excess Materials Management 10. Contaminated Sites 11. Servicing Utilities and Facilities 12. Mitigation Monitoring 13. Consultation 14. Environmental Screening Process 	<p>This consultation report documents the consultation with 8 First Nations that may have interests or concerns with the project and as identified by the MECP.</p> <p>The draft ERR and all its appendices will be sent to the MECP project EA coordinator Mark Badali for internal MECP review and comment before finalizing.</p> <p>Once the ESRR is finalized it will be posted on the project website and a Notice of Completion will be published as start of a 30-day public review period for question and comments</p> <ol style="list-style-type: none"> 1. addressed in section 5.2 of ESRR 2. addressed in section 4.1 of ESRR 3. addressed in section 6.3 of ESRR 4. addressed in section 6 of ESRR 5. addressed in section 8 of ESRR 6. addressed in section 8.1 of ESRR 7. addressed in section 4 of ESRR 8. addressed in section 4 of ESRR 9. addressed in section 13 of ESRR 10. addressed in section 5.4 of ESRR 11. addressed in section 10 of ESRR 12. addressed in 17.7 of ESRR 13. addressed in 17.5 and 17.6 ESRR 14. addressed in 17.1 of ESRR
<p>Ministry of the Environment Conservation</p>	<p>General</p> <p>1) In Section 3.1 of the Report, the first use of the acronym LAWSS should</p>	<p>1) LAWSS has been defined in revised Air Quality Impact Assessment Report</p>

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<p>and Parks (MECP)</p> <p>Comments on review of Draft ESRR January 6, 2022</p>	<p>be clarified as meaning Lambton Area Water Supply System.</p> <p>Indigenous Consultation 2) The proponent should continue to reach out to all communities identified in the Report by providing this draft Report for their consideration, in order to ensure that they have had an opportunity to provide any further input to the final Report.</p> <p>Air Quality 3) The Appendix 17.2 Air Quality Impact Assessment (AQIA) of the Report should include an AERMOD input summary table and details on how the input parameters were derived. The Report should also include details of the emission calculations completed for each contaminant and source.</p> <p>4) Please submit the electronic AERMOD input and output files for ministry review.</p> <p>5) The London regional meteorological data set is acceptable at the EA stage for screening purposes, as noted in Section 2.1 of the AQIA. However, because of the unique meteorological conditions near the St. Clair River, site-specific meteorological data will be required for modelling at the Environmental Compliance Approval stage. Site-specific meteorological data is provided by the ministry. Please complete a Request for Approval under s.13(1) of O. Reg. 419/05 for use of Site-Specific Meteorological Data to avoid any delays in the processing of your request. For guidance on complying with the dispersion model requirements of O. Reg. 419/05: Air Pollution – Local Air Quality, including the use of site-specific meteorological data, refer to the Guideline A-11: Air Dispersion Modelling Guideline for Ontario (www.ontario.ca/document/guideline-11-air-dispersion-modelling-guideline-ontario-0).</p>	<p>2) All 8 First Nations have been made aware of the draft ESRR and their comments have been invited. WIFN has been engaged to provide an independent review of the draft ESRR for comments using their outside review contactor Neegan Burnside (N-B). WIFN has agreed to share the N-B report with the other 7 First Nations.</p> <p>3) The AERMOD input summary table and details on how the input parameters have been added to the revised Air Quality Impact Assessment Report. Sample calculations for the emission rates used in the report are included in Appendix B of the revised Air Quality Impact Assessment Report</p> <p>4) These have been supplied to the MECP Jan 13, 2022</p> <p>5) Acknowledged.</p>

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<p>MECP</p> <p>Comments on review of Draft ESRR January 6, 2022</p>	<p>6) Section 2.2 of the AQIA states that the ministry’s Sarnia Air Quality Health Index Station 14111 “...at 700 Christina St. North, Centennial Park...” was used for background air quality concentrations between 2016 and 2020. For clarity, please remove “Centennial Park” from this statement. Station 14111 was located at Centennial Park until December 2015 before being relocated approximately 500 metres to 700 Christina St. North.</p> <p>7) Section 2.2 of the AQIA states: “This value represents the average of the highest concentrations of the contaminant detected in the ambient air at the 2 sampling stations over a sampling interval representing 90% of the total sampling time.” Please clarify what is meant by “2 sampling stations”. Typically, the highest 90th percentile value of the air stations reviewed would be used as the background concentration.</p> <p>8) Please clarify why Table 2a of the AQIA provides the 90th percentile concentration for the 1-hour averaging periods but not the 8-hour or 24-hour averaging periods.</p> <p>9) Table 2a of the AQIA should include a 1-hour averaging period for SO2 for comparison against the existing revised hourly Ambient Air Quality Criteria (AAQC) and upcoming (2023) revised hourly O. Reg. 419/05 Schedule 3 air standard of 40 ppb</p> <p>10) Please clarify the following information pertaining to Table 2b of the AQIA:</p> <p>a. Please confirm that each value represents data from one station rather than an average of several stations.</p>	<p>6) “Centennial Park” has been deleted.</p> <p>7) The statement indicates that the 90th percentile represents the average of the highest concentration of the contaminant individually reported by the MECP and CASA sampling stations. It is recognized and agreed that the highest 90th percentile would be used as the background concentration.</p> <p>8) The 90th percentile for both of the 8-hour and 24-hour averaging periods has now been included in Table 2a of the AQIA.</p> <p>9) The SO2 1-hour averaging period (90th percentile) has been added to Table 2a</p> <p>10)a. For NO2 1 h – the Aamjiwnaang station value was used since LaSalle Line and Moore Line did not have NO2 data; For N02 24 h – the Aamjiwnaang station value was used since it reported the highest reading (LaSalle Line had no reported reading); For PM2.5 for both averaging periods, the highest reading between Aamjiwnaang and Moore Line was used (no information for LaSalle Line); SO2, maximum value between Aamjiwnaang and LaSalle Line was used (no information for Moore Line)</p>

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	<p>b. Please include a footnote to indicate which Clean Air Sarnia and Area (CASA) stations the data represents and why that station was selected.</p> <p>c. An additional footnote should be added to include the following wording from the CASA web page: <i>“Air quality data on this website are automatically polled from the Clean Air Sarnia and Area monitoring network and are intended for public awareness. Because the data is real time, they have not undergone complete quality control and quality assurance procedures, and so they may contain errors and are subject to change. The real-time air quality data on this web page are considered “unverified data” and should not be used in published documents.”</i></p> <p>d. It appears that 1-hour PM2.5 and NO2 data from the Aamjiwnaang station has been included under the “24 h Maximum” rows for these parameters. Please revise.</p>	<p>b. The suggested footnote has been added.</p> <p>c. The suggested footnote has been added.</p> <p>d. The correction has been made in the report.</p>
<p>MECP</p> <p>Comments on review of Draft ESRR January 6, 2022</p>	<p>11) Section 8.1 of the AQIA states, “Volatile Organic Compounds (VOCs) emissions will be very small, but they were also modelled. However, since no AAQC for VOCs have been established, their impact on ambient air quality cannot be determined directly.” While there isn’t an AAQC for total VOCs, AAQCs for individual VOCs are available and should be included in this report for assessment of impacts on air quality. Please also note the Environment and Climate Change Canada Sarnia air monitoring station 61009, also located at 700 Christina St. N, measures VOCs. Data for select VOCs including benzene, 1,3-butadiene, ethylbenzene, isomers of xylene and toluene is available online at National Air Pollution Surveillance (NAPS) Program - Environment and Climate Change Canada Data. Please include this data as part of Table 2a.</p> <p>12) Please include VOCs in the point of impingement and combined effect assessment sections of the AQIA.</p> <p>13) Please note that the Ambient Air Quality Criteria (AAQCs) and</p>	<p>11) Benzene, benzene, 1,3-butadiene, ethylbenzene, isomers of xylene and toluene AAQC’s have been included in the Table 2a. NAPS data has been included in the revised AQIA report.</p> <p>12) VOCs POI and the combined effect assessment has been included in the revised AQIA</p>

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	<p>Canadian Ambient Air Quality Standards (CAAQS) apply to NO₂ rather than NO_x.</p> <p>14) The combined effect assessment section of the AQIA should also include the 1-hour and annual 2025 NO₂ CAAQS (Air Quality (ccme.ca)) for comparison purposes only. It appears that 90th percentile NO₂ combined effect concentrations for some scenarios at the POI and at receptor 1 will be above the 1-hour CAAQS value using a direct comparison. However, predicted adherence with the CAAQS using the CAAQS metrics of the three-year average of the annual 98th percentile of the daily maximum 1-hour average concentration is not required for this assessment. Including the 1-hour and annual CAAQS values as a direct comparison will provide additional context for potential air quality impacts.</p> <p>15) The AQIA should include a description of any predicted air quality impacts during construction as well as proposed mitigation measures.</p>	<p>13) Acknowledged. NO_x has been changed to NO₂ in the revised AQIA</p> <p>14) The 1 h and annual 2025 NO₂ have been added to the revised assessment in the AQIS sections 8.1 and 9.4.</p> <p>It is acknowledged that the CAAQS air quality criteria are for comparison purposes only. It appears that 90th percentile NO₂ combined effect concentrations and for some scenarios at the POI and at receptor 1 will be above the 1-hour CAAQS value using a direct comparison. It is also acknowledged that predicted adherence with the CAAQS using the CAAQS metrics of the three-year average of the annual 98th percentile of the daily maximum 1-hour average concentration is not required for this assessment. Including the 1-hour and annual CAAQS values as a direct comparison will provide additional context for potential air quality impacts.</p> <p>15) A new Section has been added to the AQIA report: 9.7 Potential Air Quality Impacts During Construction to address these comments</p>
<p>MECP</p> <p>Comments on review of Draft ESRR January 6, 2022</p>	<p>Surface Water</p> <p>16) The proponent should ensure that any relevant requirements for a Permit to Take Water (PTTW) will be met, and the means by which any applicable PTTW requirements will be met should be addressed in the Report. Section 3.1 of the Report states that the Hydrogen Ready Power Plant (HRRP) will be receiving water for process cooling, "...from a new 14" lateral line from a local industrial supplier to the south/west (under construction for service in 2022)". If the local industrial supplier being referred to is Terra, which has approval to provide water to Greenfield South Power Corp. (i.e. the Green Electron Power Plant) under their PTTW No. 1721-BLQM8C, then the proponent should consider whether the HRRP will have to</p>	<p>16) Acknowledged.</p>

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	<p>be approved under Terra's PTTW as a new Authorized User, or alternatively, if the HRRP will also be under the ownership of the proponent's affiliated company Greenfield South Power Corp., whether the HRRP will not be exceeding the amount of 10,200,000 L/day between the two power plants as required by the conditions in the PTTW.</p> <p>17) The Report indicates that no water (sanitary, industrial sewage or stormwater) will be leaving the site via natural drainage. Provided that the proponent's proposal to discharge sanitary sewage and industrial stormwater to the municipal wastewater treatment facility for treatment is acceptable to the municipality, the ministry has no concerns in this matter.</p> <p>18) The Report indicates that stormwater for the undeveloped portion of the site will remain as per predevelopment conditions, whereas the stormwater from the developed portion of the site will be collected and conveyed to the cooling water basin and used as makeup water for the cooling process. Calculations indicate that the cooling water basin, in addition to pipes and surface storage will contain the major storm events (up to the 1:100-year storm). Calculations also indicate that the volume of water stored within the cooling tower basin will be used within 8 hours of normal production. At this point in the Class EA process the ministry is unable to confirm the validity of the calculations – this will occur during the Environmental Compliance Approval application stage under engineer review.</p>	<p>17) Acknowledged.</p> <p>18) Acknowledged</p>
<p>MECP</p> <p>Comments on review of Draft ESRR January 6, 2022</p> <p>Additional MECP comments</p>	<p>Thank you for circulating this draft Report for the ministry's consideration. Please document the provision of the draft Report to the ministry as well as this Project Review Unit Comments letter in the final report, and please provide an accompanying response letter to support our review of the final report. A copy of the final Notice should be sent to the ministry's Southwest Region EA notification email account (eanotification.swregion@ontario.ca).</p>	<p>This response table including those for March 14, 2022, will also be included as a separate file to accompany the cover letter for submission of the final ESRR files to the MECP.</p>

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<p>received March 14, 2022</p>	<p>1) The fourth column of Table 6.2 – GHG Emissions in Section 6.3 of the Report is labeled “20% Natural Gas – 80% Hydrogen Emissions (tonne)”. Should this instead be “80% Natural Gas – 20% Hydrogen Emissions (tonne)” to be consistent with the scenarios detailed in Table 6.1 – Emission Summary Table presented in Section 6.1?</p> <p>2) The air dispersion modelling for the Hydrogen Ready Power Project, as operated by Eastern Power, was conducted based only on the emission sources from the Project. Although the stack at the Greenfield South Power Corporation (Greenfield South Power) facility was included in the source list in the model, this stack’s emissions were given as 0.0 g/s. The entire property boundary of the site where both facilities will be situated, however, was used as the property boundary for the Hydrogen Ready Power Project.</p> <p>3) For the purposes of the Environmental Compliance Approval (ECA) for the Project, there are three options for defining the appropriate property boundary for the air dispersion modelling:</p> <p>a. If Eastern Power and Greenfield South Power want to be considered as separate entities, then an internal boundary within the property needs to be defined in order to separate the two facilities. Eastern Power would only need to model its own emissions, but the internal boundary would now form part of its property line for the purposes of air dispersion modelling. Similarly, Greenfield South Power would need to update its Emission Summary and Dispersion Modelling (ESDM) report to reflect the new internal boundary.</p> <p>b. If Eastern Power and Greenfield South Power want to be considered as a single property with a single property boundary for the purposes of air dispersion modelling, then both facilities would need to notify the ministry under Section 4 of O. Reg. 419/05 Air Pollution – Local Air Quality that they are</p>	<p>1) Table 6.2 of ESRR has been revised accordingly.</p> <p>2) Acknowledged</p> <p>3) Option 3a has been selected as these are separate entities and based on previously established GHG reporting boundaries. The AERMOD emission modelling has been updated to reflect this internal boundary within the overall property for the purpose of air dispersion modeling.</p>

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	<p>adjacent properties. In this case, the facilities would need to prepare a joint ESDM report including all sources that emit the air contaminants that they have in common.</p> <p>c. However, if Eastern Power and Greenfield South Power have the same legal name, then there is only one property and one property boundary. In doing the air dispersion modelling, all on-site sources would need to be included in the modelling and a single ESDM report would be prepared.</p> <p>4) Section 8.2 of Appendix 17.2 Air Quality Impact Assessment Report (the AQIA) of the Report states that the anemometer height for the 5-year regional meteorological data set that was used was 278 meters. This height is actually the elevation of the base of the anemometer, and the anemometer height is 10 m.</p> <p>5) Section 9.1 of the AQIA identifies sources as STK 2003 and STK 2004, whereas in Table 6a, Table 6b and Table 6c they are identified as STK 2002 and STK 2003, which is consistent with the names used in the modelling. In any case, the names used for the sources should be consistent.</p>	<p>4) The anemometer height has been corrected to 10 m.</p> <p>5) STK 2003 has been changed to STK 2002. STK 2004 has been changed to STK 2003</p>
<p>St. Clair Township August 4, 2021</p>	<p>Thank you for sending along the attached information package for Council. I know that we had discussed having your team on the agenda as a delegation to speak with Council, however this meeting agenda currently has an extremely high volume of items as well as deputations to Council so I was wondering if we could include your information package on the agenda as an information item for the Mayor and Council to review and funnel any questions that they may have through Staff. If need be, we could always add your team to the next upcoming agenda in September should they wish to do so. Does that work? This way, Council gets this information in a timely manner.</p>	<p>Agreed as useful approach; package was sent for distribution to Council</p>
<p>St. Clair Region Conservation Agency July 26, 2021</p>	<p>Thank you, your email has been received. Due to an unprecedented number of applications being received, I am unable to respond immediately.</p>	<p>Discussion with SCRCA as to possible need for fill permit to be determined later</p>

In summary, the stakeholders including the general public in the local region of the proposed project and governmental agencies including the St. Clair Township Municipal Government, the MECP, and the SCRA, either did not raise any objections to the proposed HRPP Project or, were generally supportive of the proposed HRPP Project. The use of an appropriately zoned industrial site with a similar existing power generation facility, already having the required infrastructure and, the demonstration of no net adverse environmental or other effects through use of identified mitigation measures, were found favourable. The opportunity to be an early project taking advantage of use of the developing hydrogen energy platform over the expected minimum 25-year project life also had appeal to some of the stakeholders. The Ontario MENDM (Energy) is supportive of the project as the Independent Electricity System Operator (IESO) has identified an urgent need for new generation capacity in the region of the proposed project, has encouraged the use of hydrogen and expects to make a call for proposals for new generation projects by mid-2022. On the basis of the above, the proposed project has potential to meet the IESO needs. Further details of stakeholder responses can be found in the consultation reports (Appendices 7.5 and 7.6).

6.3 Overview of Ongoing and Proposed Stakeholder Consultation Activities

These are outlined as items in 6.1 above

6.4 Consultation with Other Jurisdictions

No requirements for consultations with other jurisdictions have been identified.

7 Appendices

7.1 HRPP ESRR Main Report

7.2 HRPP ESRR Air Quality Impact Study

7.3 HRPP ESRR Noise Impact Study

7.4 HRPP ESRR Stormwater Plan

7.5 HRPP ESRR Public Consultation Report

7.6 HRPP ESRR Government /First Nations Consultation Report

7.7 HRPP ESRR Environmental Management Plan

7.8 HRPP ESRR Environmental Impact Study Report