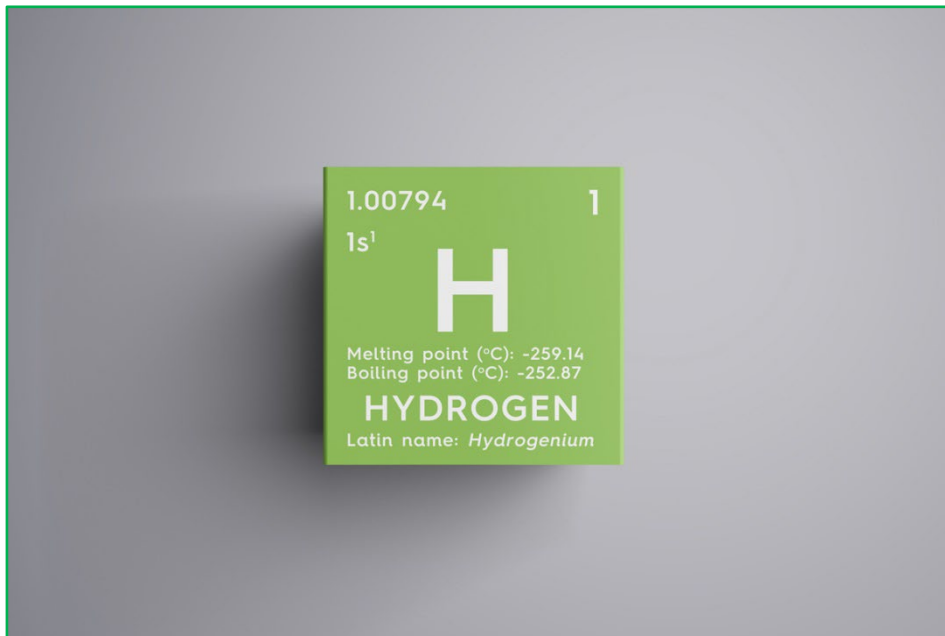


**Eastern Power Inc.**

# Hydrogen Ready Power Plant Project

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

**May 24, 2022**



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# 1 GENERAL INFORMATION CONTACTS AND LOCATION

## 1.1 Project Name and General Description

The Hydrogen Ready Power Plant (HRPP) Project involves the design, construction, operation, and eventual decommissioning of a new dual-fuelled (natural gas and/or hydrogen) electricity generating facility in St. Clair Township to be located at 477B Oil Springs Line, Courtright Ontario, as shown in Figure 1. The facility will be on existing fully serviced industrial property already complete with the key required infrastructure of natural gas supply, water supply and wastewater treatment services, as well as adjacent interconnection to the Hydro One Networks Inc. electrical transmission/distribution grid. The nearest residential property is more than 500 m from the proposed facility.

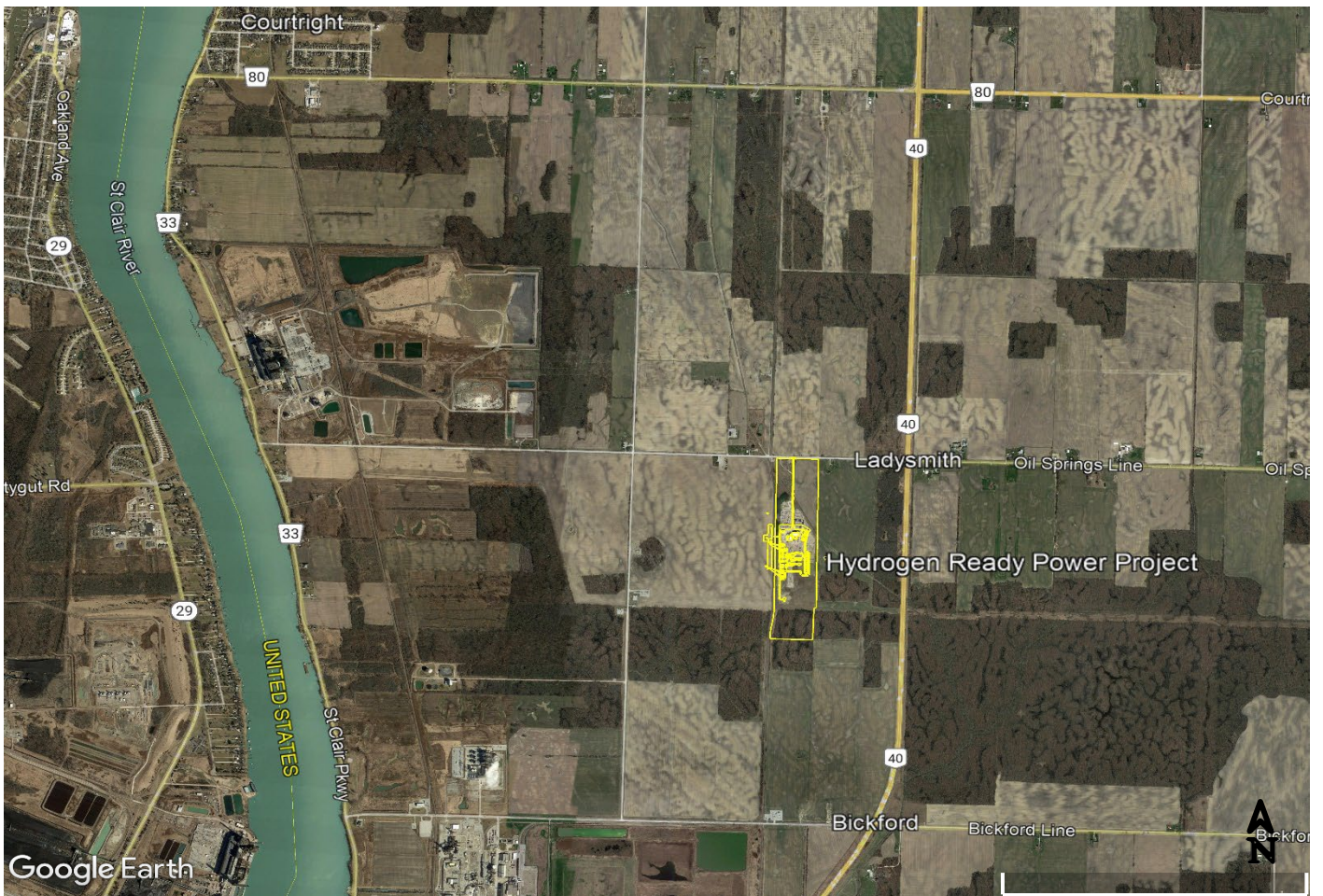


Figure 1 Hydrogen Ready Power Plant Project Location

The HRPP Project will utilize combined-cycle power generation technology with a net output capacity of 600 megawatts (MW). Electricity produced will be fed into the 230,000 Volt electrical transmission system of Hydro One Networks Inc. Natural gas and natural gas/hydrogen mixtures will be provided through existing pipelines by third party suppliers.

The Project is being developed in response to the Ontario Independent Electricity System Operator's (IESO) need for additional electricity capacity in Ontario's South West Region and in advance of an IESO request for proposals in 2022. 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 HRPP Project is designed to take advantage of lower carbon emitting hydrogen fuel to reduce GHG emissions as hydrogen becomes progressively more available over the life of the Project.

## 1.2 Proponent Contact Information

HRPP Project 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](mailto:bholbein@easternpower.on.ca)  
Tel. (416)-234-1301

## 1.3 Project Location and Coordinates

HHRP Project location GIS coordinates are:

Latitude: 42° 47' 6" N

Longitude: 82° 25' 40" W

Legal description of HRPP 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

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 HRPP Project is not on federal lands and is not funded federally. The proposed project will be totally funded privately by the proponent. 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 overall characteristics of the community.

#### **1.4 Public and Government Agency Consultations**

The Project will be on privately owned land and is subject to the Ministry of the Environment Conservation and Parks (MECP), 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). This MECP EA required completion of an Environmental Screening and Review Report (ESRR) in which comprehensive potential impacts of the HRPP Project were screened and studied in detail. The ESRR reports these impacts and details any required mitigation measures in order to limit any potential Project impact effect to the no significant net adverse effect level. The full EA ESRR with all its supporting studies is part of the full IPD.

Local residents, eight First Nations and 19 Municipal, Provincial and Federal governmental agencies, known from the proponent's previous consultation activities for a similar GEPP project on the same property, were confirmed to be currently potential affected parties. These along with the general public were informed of the Project and provided a link to information on the Project website ([HRPP Project](#)), provided copies of the published mandatory MECP EA notice in July 2021 and were invited to a virtual open house for the Project held August 6-13, 2021.

#### **1.5 First Nation Consultations**

The HRPP Project is not near and is not part of any First Nation reserve lands or on lands subject to any pending claims by any other Indigenous Peoples communities. Stage 1 and Stage 2 archaeological assessments have confirmed there are no archaeological resources from Indigenous Peoples or other occupants on the HRPP site and there is no evidence of past use of the Project lands for traditional uses by any Indigenous Peoples.

The eight potentially affected First Nations in the greater region of the HRPP 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 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.

Early consultation with these First Nations was initiated in July 2021 through direct written contact to their respective Chiefs and their Band environmental coordinators; each was directed to the HRPP project website for additional information. All were invited to raise any questions and provide any comments or concerns that they might have on the Project.

Air and noise emissions to the environment potentially affecting air quality and potential water quality impacts were identified as key issues of concern to the First Nations. These concerns were similar to those previously identified with the GEPP Project.

The WIFN requested to complete an independent review of the draft ESRR for their provision of comments both internally and through their chosen independent contractor, Neegan Burnside, 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 the 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.

Detailed technical studies as part of the required ESRR 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 points of impingement for even the nearest residential neighbours of the Project and will not significantly affect now-prevailing ambient air quality. The full EA ESRR with all its supporting studies is part of the full IPD. Stormwater from the Project site will be collected for treatment and reuse as part of a comprehensive stormwater management plan (see IPD appendix 7.4 for further details) and, since wastewater from the Project will be treated in the Courtright Municipal Sewage Treatment Facility, there will no adverse effects from the Project on the water quality.

Given these findings and since the nearest First Nation, the Aamjiwnaang FN, is about 14 km away from the Project site, no materially adverse effects are expected on Indigenous Peoples as a result of any changes to the environment that may be caused by the Project, including materially adverse effects on health and socio-economic conditions, as well as physical and cultural heritage. Additional details of the consultations carried with the First Nations are provided in section 5 of the IPD. The proponent plans to continue its consultations with First Nations during the various development phases of the Project, should the Project advance beyond planning.



## **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. 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 an environmental baseline and impact assessment and mitigation study, a stormwater management plan and various consultation reports were completed and became part of an Environmental Screening and Review Report (ESRR). The ESRR also included environmental screening with a checklist report ([MECP Screening](#)) covering a number of environmental, technical, cultural, heritage, Indigenous Groups and socio-economic impact criteria. Each screening criterion was reviewed as to its potential impact along with the appropriate mitigation measures as identified, i.e., to be taken to minimize the particular impact to the level of no net adverse effect. Comments on the draft ESRR received from the public, the First Nations and the various Governmental agencies are summarized in sections 5 and 6 of the IPD and these were utilized to finalize the ESRR. The ESRR has been finalized to the stage of its published Notice of Completion of Environmental Review as of April 14, 2022, and is available for public review on the project website ([HRPP Project](#)) and also as part of the IPD.

### **1.6.2 Province of Ontario Environmental Compliance Certificates**

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

### **1.6.3 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. The project is also regulated in terms of zoning and site plan approval by St. Clair Township under the Planning Act (Ontario).

### **1.6.4 Ontario Independent Electricity System Operator Connection Approval**

A proponent-initiated/paid IESO-conducted System Impact Assessment 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 be no adverse impacts for the proposed connection of the HRPP project.

### **1.6.5 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.

### **1.6.6 Ontario Energy Board Electricity Generating License**

The Ontario Energy Board has granted Electricity Generator License number EG-2021-0217 for the Project.

### **1.6.7 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 IPD 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.

### **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 of the IPD.

## **2 PROJECT INFORMATION**

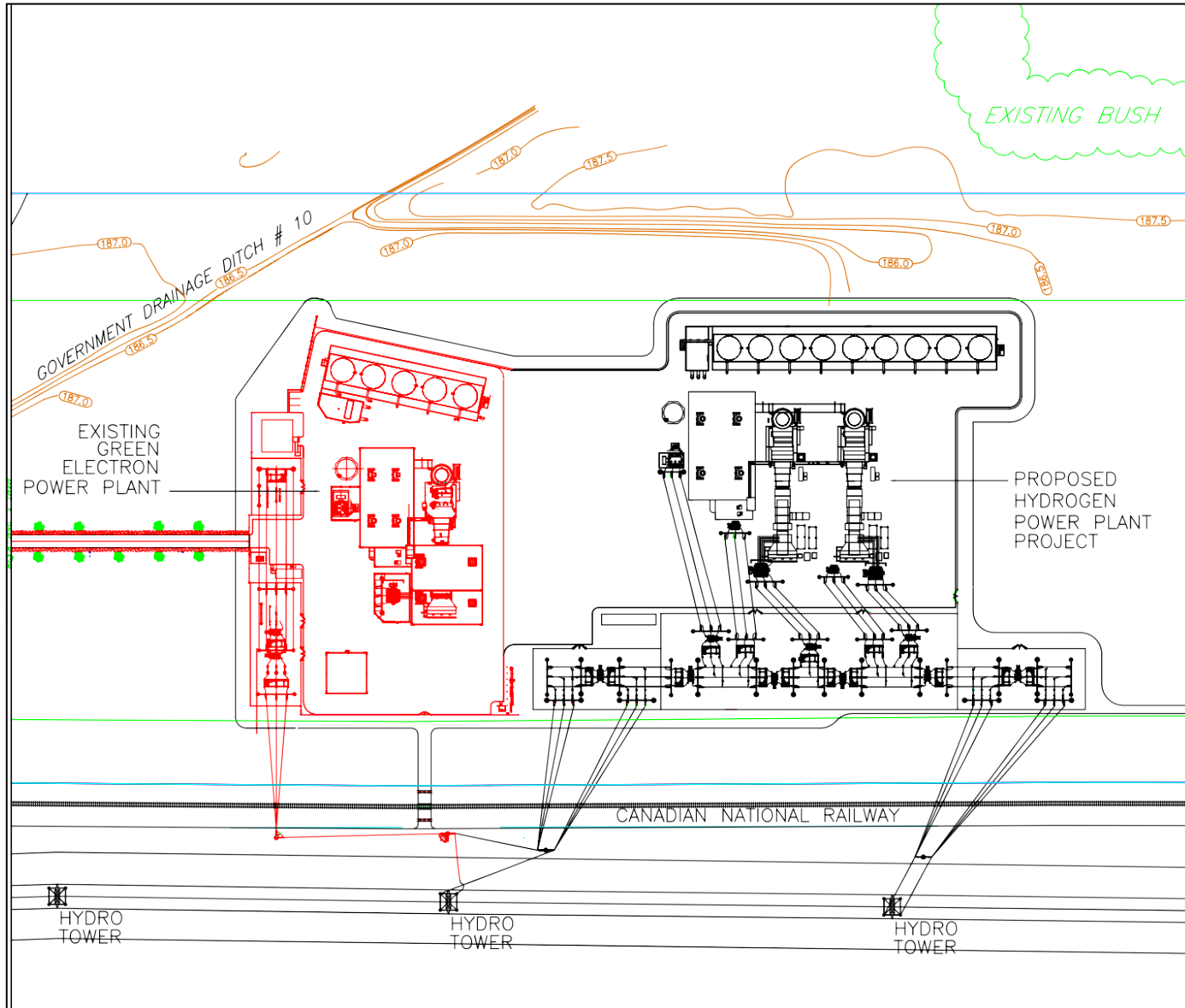
### **2.1 Project Summary**

The Hydrogen Ready Power Plant Project includes the planning, approvals, design, construction, operation and eventual decommissioning, or re-use, of a new hydrogen- and natural gas-fuelled electricity generating facility with a generation capacity of 600MW (nominal). The Project facility is to be located 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 needs for  $\geq 2000$  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.

Figure 2 HRPP project located on existing GSPC property



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 federal and provincial 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 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. 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 H<sub>2</sub> versus NG fuel substantially reduces power plant combustion related GHG CO<sub>2</sub> emissions as hydrogen combustion does not emit carbon dioxide. Additionally, a steam turbogenerator set configured in combined cycle will be utilized obtain the highest possible efficiency.

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.

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% H<sub>2</sub>, net HRPP Project GHG emissions intensity falls to zero (-0.0961 t CO<sub>2</sub>eq/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.

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 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.

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 impacts 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". Therefore, as a designated activity, at least early in its project lifetime when using natural gas, the Project is subject to IAAC review

The Project is also 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 aspects of interest for the IAAC and, these have been instrumental for the completion of the Preliminary Project Description (IPD). 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 the IPD.

## **2.3 Components and Activities**

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. 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

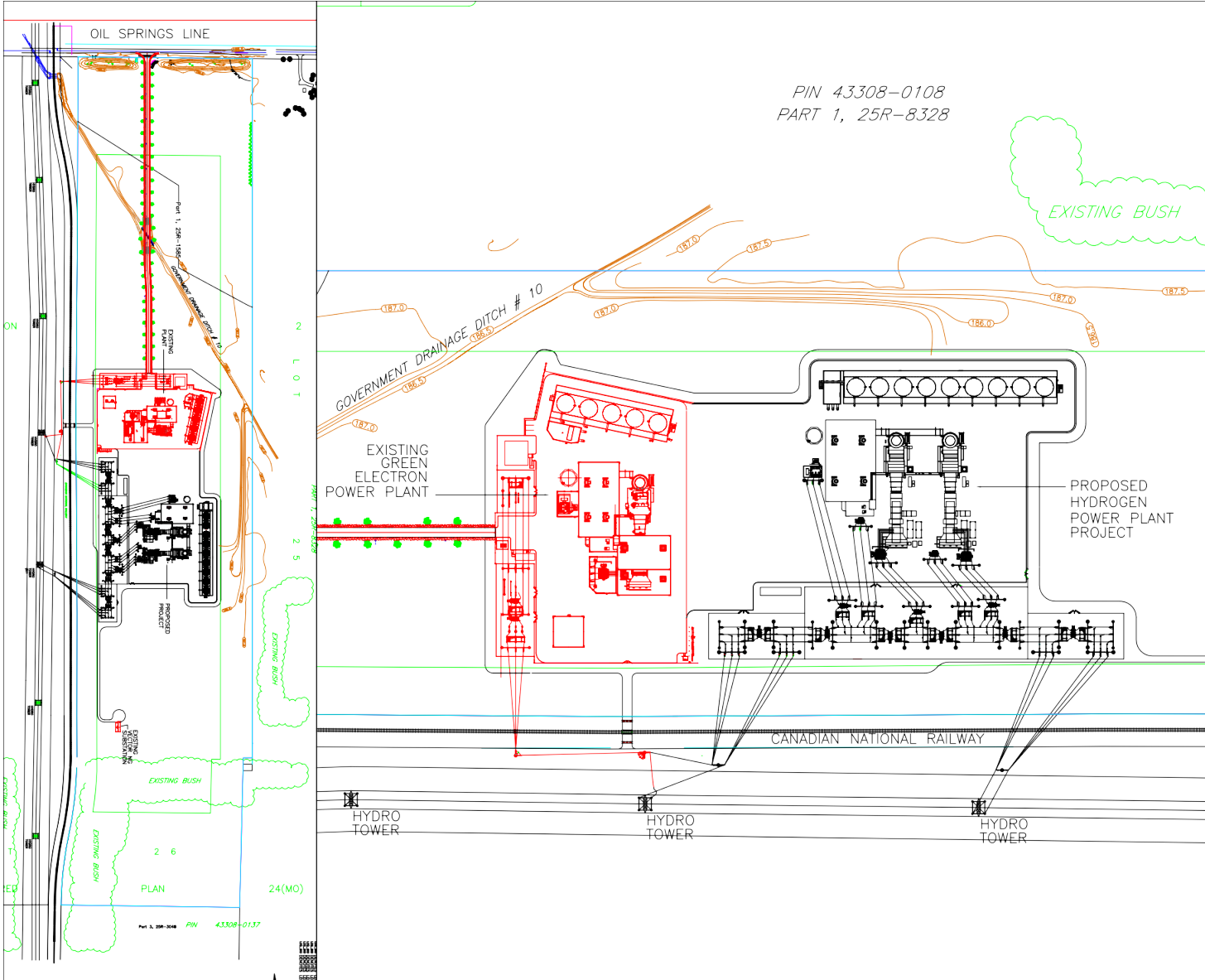
## Hydrogen Ready Power Project IAAC Initial Project Description Summary

may require upgrading which will be determined through discussions with St. Clair township officials.

The HRPP facility will be on a portion of industrially-zoned land, to be leased from Greenfield South Power Corporation (GSPC, a corporate affiliate of the Proponent). GSPC already operates a physically similar facility on its property (the GEPP facility) and the HRPP facility will be immediately adjacent to the GEPP.

The site plan (inset) of the HRPP facility on the overall GSPC property is shown in Figure 3.

Figure 3 HRPP Project Site Plan Details





The HRPP Project 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 of 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 use on equipment of this size. The major components of the facility are summarized below:

**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<sub>x</sub> technology has been selected to reduce NO<sub>x</sub> 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.

**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.

**Electrical System:**

The electricity will be generated at 18kV 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.

**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. 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.

The developed area for the HRPP facility together with the existing Green Electron Power Plant facility represents less than 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).

Industrial sewage wastewater will also be conveyed through a forcemain pipeline for treatment at the Courtright 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.

**Project Life phases**

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

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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/Reuse	removal of equipment	1 year	Plant and equipment potentially reusable or 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. These aspects 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.

## **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 of >2000 MW will be required to meet peak demand and to meet longer term energy shortfalls.

Given the need for at least 2000 MW of substantial flexible and available—on-demand new capacity, the IESO has stated that natural gas fuelled electrical generation will be needed to meet its needs well beyond 2030. 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 proposed Project has been designed to meet these IESO needs and requirements for near and long-term capacity, flexible and dispatchable supply 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 facility will have the capability to provide sustained energy over long periods of time and have ability to ramp up and down quickly. The Project's ability to be powered by hydrogen fuel, as it becomes available, is discussed below.

## **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.

## **Proposed Technology**

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.

**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 publications and webinars and their release of draft documents for review.

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. The table below evaluates the different technological options based on these requirements.

Hydrogen Ready Power Project IAAC Initial Project Description Summary

**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.

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**

##### **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<sub>x</sub>, CO, CO<sub>2</sub>, and PM but virtually no SO<sub>x</sub> or heavy metal emissions.



The facility will utilize low NO<sub>x</sub> technology which minimizes NO<sub>x</sub> production during combustion. By employing low NO<sub>x</sub> 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<sub>x</sub> emissions with low NO<sub>x</sub> technology has been successfully established in other similar facilities including the established GEPP facility.

As a result of NO<sub>x</sub> mitigation, the HRPP will emit reduced quantities of NO<sub>x</sub>, low amounts of CO and low amounts of particulate matter (PM). Hydrogen utilization will reduce facility combustion GHG emissions in direct proportion to the amount of hydrogen used (for additional details see below and section 4.1.2 of the IPD).

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 Air Quality Impact Study (AQIS report) is included as Appendix 7.2 of the IPD. The analyses have indicated low concentrations of MECP regulatory scheduled contaminants at all relevant Points of Impingement (POI). Maximum POIs for NO<sub>x</sub> and CO will be below the MECP maximum allowable POI concentrations (29.3% and 2.7% of allowed, respectively).

Importantly, all emissions have been modeled under the worst-case emission scenario to account for the variation in output due to seasonal variations and design margins. Therefore, the Maximum Emission Scenarios, i.e., start-up followed by full load using only Natural Gas, Hydrogen/Natural Gas mixtures or Hydrogen only have been modelled separately. See Table below.

**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	MECPI POI Limit (µg/m³)	Percentage of MECPI POI limit
NO <sub>2</sub>	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 <sub>2</sub>	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	MECPI POI Limit (µg/m³)	Percentage of MECPI POI limit
NO <sub>2</sub>	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 <sub>2</sub>	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	MECPI POI Limit (µg/m³)	Percentage of MECPI POI limit
NO <sub>2</sub>	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 <sub>2</sub>	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 also 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 IPD Appendix 7.2) also concluded that icing risk would be negligible.

Cumulative impact assessments for air quality have also been made. The analysis of the HRPP facility's contribution and cumulative impact to the local and regional airshed quality, based on its specific emissions have been assessed. For this cumulative impact assessment, actual historical and prevailing MECP-collected air quality data as measured over the last five years at the Aamjiwnaang air monitoring station which is 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 a minor influence on the air shed's ambient air quality for nitrogen dioxide and less for the other scheduled contaminant emissions. 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<sub>x</sub>, will be highly localized in effect and all within the existing normal variability of the current ambient air quality parameters.

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.

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 was completed as part of the MECP EA ESRR (see Appendix 7.3 of the IPD for further 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 of the IPD) are summarized below.

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

<sup>a</sup> 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.

### **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 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 yr. 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 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. 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](#)).

Hydrogen is already widely used in industry typically being produced by conventional steam reforming of natural gas. Carbon (CO<sub>2</sub>) 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.

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 of the IPD for further details). All potential GHG emissions including CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O have been assessed and these were expressed as CO<sub>2</sub>-equivalents for assessment of total GHG emissions and for assessment of potential climate change impact of the Project.

The potential climate change impact of the HRPP Project has been further assessed using the IAAC Strategic Assessment of Climate Change guidelines ([SACC guidelines](#)).

The HRPP project direct GHG emissions, acquired GHG emissions and avoided GHG emissions, together providing net GHG emissions have been assessed by modelling 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% H<sub>2</sub>, net HRPP Project GHG emissions intensity could fall to zero (-0.0961 t CO<sub>2</sub>eq/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. Refer to table below.

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<b>HRPP Project Lifetime GHG Emissions</b>							
<i>Direct GHG Emissions</i>							
Type	Total GHG (t CO <sub>2e</sub> )	Construction phase (2022-2025) (t CO <sub>2e</sub> )	Operations phase				Decommissioning Phase
			2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	
			95% NG / 5% H <sub>2</sub>	80% NG / 20% H <sub>2</sub>	35% NG / 65% H <sub>2</sub>	0% NG / 100% H <sub>2</sub>	
Construction / Operation	<b>9395542</b>	2625	529522	445913	195087	0	875
<i>Acquired Energy GHG Emissions – Electricity used in operations</i>							
Type	Total GHG (t CO <sub>2e</sub> )	Construction phase (2022-2025) (t CO <sub>2e</sub> )	Operations phase				Decommissioning phase
			2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	
			95% NG / 5% H <sub>2</sub>	80% NG / 20% H <sub>2</sub>	35% NG / 65% H <sub>2</sub>	0% NG / 100% H <sub>2</sub>	
Electricity	<b>2217</b>	249	126	61	61	61	N/A
<i>Acquired Energy GHG Emissions - Hydrogen Gas Used as Fuel</i>							
Type	Total GHG (t CO <sub>2e</sub> )	Construction phase (2022-2025) (t CO <sub>2e</sub> )	Operation phase				Decommissioning phase
			2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	
			95% NG / 5% H <sub>2</sub>	80% NG / 20% H <sub>2</sub>	35% NG / 65% H <sub>2</sub>	0% NG / 100% H <sub>2</sub>	
ATR with CCS	<b>122</b>	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 <sub>2e</sub> )	Construction phase (2022-2025) (t CO <sub>2e</sub> )	2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	Decommissioning phase
Base case (100% NG)	<b>14497889</b>	2873	557517	557452	557452	557452	875
Avoided GHG with H <sub>2</sub>	<b>5102973</b>		27995	111539	362365	557452	
<i>Net Project GHG Emissions (as per assumption #13 in the IPD)</i>							
Type	Total GHG (t CO <sub>2e</sub> )	Construction phase (2022-2025) (t CO <sub>2e</sub> )	2025 - 2030 (ave/yr)	2031 - 2040 (ave/yr)	2041 - 2049 (ave/yr)	2050	Decommissioning phase
NG/H <sub>2</sub> (ATR/CCS)	<b>4295783</b>	2873	501653	334437	-167209	-557378	875
<i>Project GHG Emission Intensity (t CO<sub>2eq</sub>/GWh)</i>							
Type	Construction phase (2022-2025) (t CO <sub>2e</sub> )	2025 - 2030 (average)	2031 - 2040 (average)	2041 - 2049 (average)	2050	Decommissioning	
H <sub>2</sub> 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	

### **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 2012-2017, 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 part of the IPD (see IPD appendix 7.8 for additional details).

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.

### **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. (for details see IPD appendix 7.4) 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 the various provisions above, the project will not have net negative impacts on surface waters.

### **Aquatic Resources**

The overall GSPC property on which the HRPP Project site is located was previously evaluated through an independent Natural Resources Baseline Report and Environmental Impact Study (see IPD appendix 7.8 for details) 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.

The woodland area to the south of the HRPP site is approximately 250 m south of the HRPP 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 GSPC 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 implementation of the specified mitigation measures (see IPD appendix 7.8 for details).

### **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 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 IPD appendix 7.8 for details).

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 (see IPD appendix 7.2 which addresses all emissions to the air in detail).

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

### **Wildlife**

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

### **Species at Risk and Critical Habitat**

The previous independent Natural Resources Baseline Report and Environmental Impact Study (see IPD 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 occupy 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 impact 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 (see IPD appendix 7.8 for details) 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.

### **Human Environment**

The incremental cumulative impact assessment for the HRPP facility (see Emissions, above) has found that the project will not contribute to any exceedances over the pre-existing ambient air quality. 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.

Given these findings, it can 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**

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

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

#### **Aquatic Species at Risk (Species at Risk Act)**

A Natural Resources Baseline Report and Environmental Impact Study (see IPD appendix 7.8 for details) 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.

#### **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 initially 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 and, since then have been deliberately kept clear and ready for construction. These steps have thereby precluded any potential for chance nesting activity of migratory birds.

Nonetheless, 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 May 1 to August 1. If any clearing work is required during this 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 active nests as may be present. Any such required plan 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 only where it is needed
  - Appropriate technology such as sodium lighting will be used

Given the above conditions and measures, 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 IPD appendices 7.2 and 7.3, respectively for further information) as well as for stormwater impacts and their management (see IPD 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**

##### **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 for industrial or agricultural use 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 very 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 (see IPD Appendix 7.2 for details) and the Noise Impact Assessment Study (see IPD Appendix 7.3 for details).

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

#### **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.

#### **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.

#### **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.

### **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.

### **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.

### **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.

### **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 both the Air Quality Impact Assessment Study (see IPD appendix 7.2 for details) and the Noise Impact Assessment Study (see IPD appendix 7.3 for details).

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<sub>x</sub>, CO, or PM to the local airshed (see emissions section above and also IPD 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**

### **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.

### **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 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.”

In addition, detailed technical studies conducted as part of the required, now-completed MECP ESRR addressing air and noise emissions (see IPD appendices 7.2 and 7.3, respectively for further information) as well as for stormwater impacts and their management (see IPD appendix 7.4 for further information) 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.

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

### **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  $\geq 14$ 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 IPD 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 IPD 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.

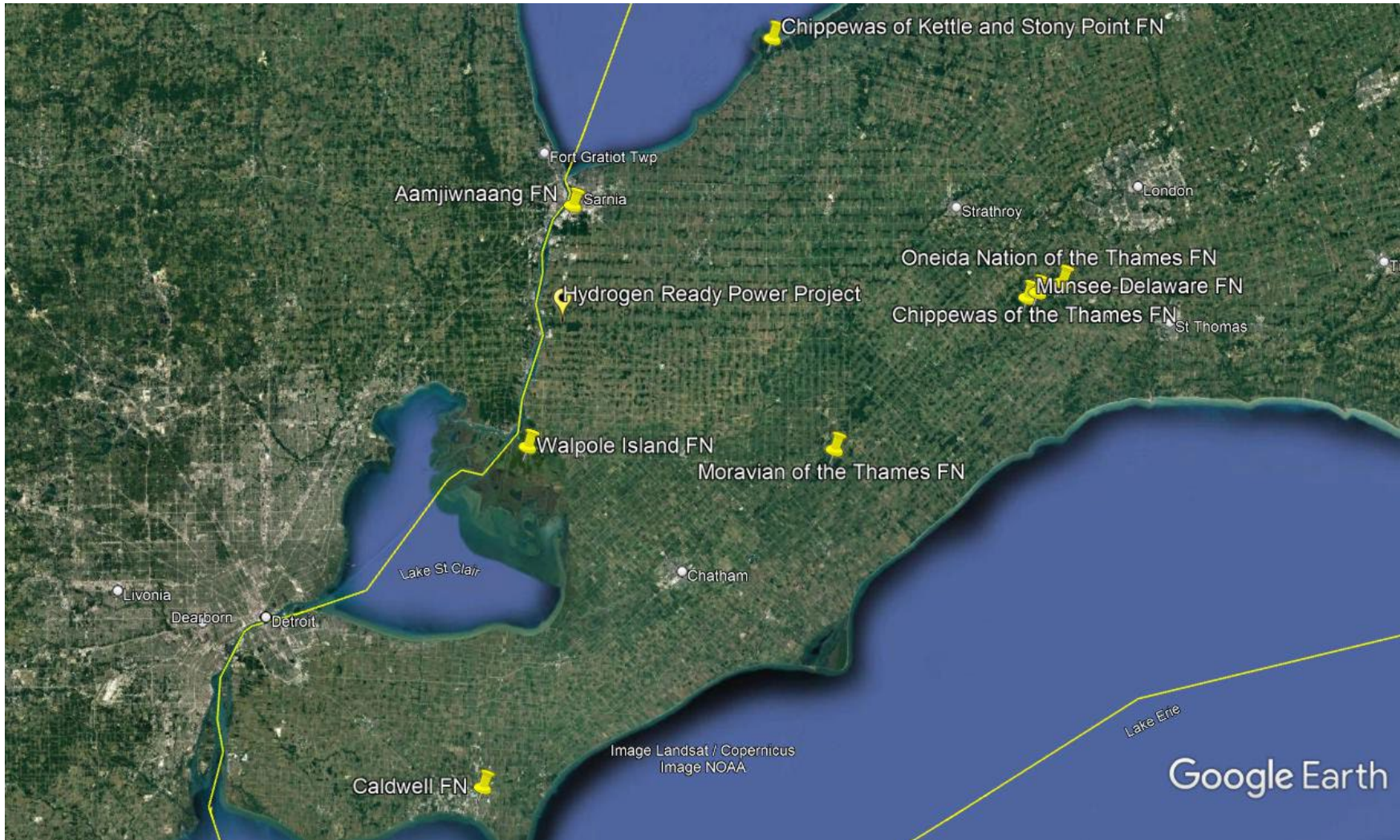
## **5 ENGAGEMENT OF INDIGENOUS GROUPS**

### **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 (GEPP) project (2012- present) and through information provided by the EA coordinator for the Ministry of Environment Conservation and Parks (MECP).

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 east; Chippewas of Kettle and Stony Point First Nation approximately 55 km to the north; Chippewas of the Thames First Nation approximately 72 km to the east; Munsee Delaware First Nation approximately 73 km to the east; Caldwell First Nation approximately 82 km to the east and Oneida of the Thames First Nation approximately 81 km to the east. The locations of these First Nation Reserves are shown in Figure 4.

**Figure 4 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 part in sections 1.5 and 4.6 (above) and in more detail in sections 5.3 through 5.7 (below). The complete engagement and consultation report, providing additional information is available for further details (see IPD appendix 7.6).

## **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 GSPC property. These previous consultations on the earlier GEPP project by the proponent had included the same eight First Nations. Sections 5.6 and 5.7 below provide further details and how these issues were identified and 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 CEAA (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 these 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 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 for details) shows that the maximum air emissions will occur about 1.8 km southwest of the project site but these will remain within the MECP regulatory requirements. The full EA ESRR with its supporting studies are appended to Section 7 of the Initial Project Description (IPD).

Since the nearest First Nation, the Aamjiwnaang FN, is about 14 km away 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 no adverse effects on health and socio-economic conditions, physical and cultural heritage. For additional details see section 5.6 of the IPD.

### **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  $\geq 14$  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 any 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 the previous and ongoing consultations on the similar GEPP project with the two key First Nations, i.e., Walpole Island FN and Aamjiwnaang FN, that are nearest to the HRPP Project. The earlier GEPP project consultations had provided sufficient background and information as to potential issues with the HRPP Project, i.e., given its generally similar nature (natural gas fuelled electricity generation) and its location on the same GSPC property.

Given this background and understanding, the proponent elected to self-elevate the MECP EA process from Screening to Environmental Review and therefore carry out comprehensive technical studies as to potential Project emissions to the air and to water.



Consultations for the HRPP Project 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 with 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. 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 through 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 other comments and input 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 in the IPD (see appendices section 7).

## **5.7 Consultation Responses from First Nations**

A complete record of consultation and responses is included in the IPD (also see IPD appendix 7.6 for further details).

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 key issues identified related primarily to emissions to the air and noise and potential impacts to water quality. 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 were 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.

The detailed technical studies completed as part of the ESRR have addressed HRPP Project air and noise emissions (see IPD appendices 7.2 and 7.3 for details), as well as stormwater impacts and their management (see IPD appendix 7.4 for details). These studies have shown there will be 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 the nearest residential neighbours. The studies have also shown that HRPP emissions to the air will not significantly affect now-prevailing ambient air quality.

Stormwater from the Project site will be collected for treatment and reuse as part of a comprehensive stormwater management plan and, since wastewater from the Project will be treated in the Courtright Municipal Sewage Treatment Facility, there will be no adverse effects from the Project on local or regional water quality.

Given these findings and since the nearest First Nation, the Aamjiwnaang FN, is about 14 km away from the Project site, no materially adverse effects are expected on any Indigenous Peoples as a result of any changes to the environment that may be caused by the Project, including no materially adverse effects on health and socio-economic conditions, physical and cultural heritage. Additional details on the consultations carried out with the First Nations are provided in section 5 of the IPD.

The proponent plans to continue its consultations with the First Nations during the various development phases of the Project, should the Project advance beyond planning.

## **6 STAKEHOLDER CONSULTATION (NON-INDIGENOUS)**

### **6.1 Stakeholders and Related Consultation Activities**

#### **Potentially Affected and Interested Stakeholders**

The potentially affected public stakeholders as well as the federal, provincial, and municipal government agency stakeholders were essentially 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 (GEPP) project. 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.

## 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 2km 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 the 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

Full details of stakeholder comments received and responses made to these can be found in the full consultations reports (see IPD appendices 7.5 and 7.6)

In summary, the stakeholders, including the general public in the local region of the proposed project and governmental agencies including the MECP, the St. Clair Township Municipal Government and the SCRA, provided valuable input useful to finalize the MECP ESRR. None raised any objections to the proposed HRPP Project and on the whole, stakeholders 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 also found favourable.

The opportunity to be an early project taking advantage of use of the developing hydrogen energy platform over the expected minimum 25year 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 electricity generation projects by mid-2022.

### **6.3 Consultation with Other Jurisdictions**

No requirements for consultations with other jurisdictions have been identified.

## **7 APPENDICIES**

These as listed below are available in the IPD.

### **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**