Hydrogen Ready Power Plant Project

477 Oil Springs Road, B
Courtright Ontario N0N 1H0

ENVIRONMENTAL SCREENING

AND

REVIEW REPORT

March 30, 2022

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Overview

This Environmental Screening/Review Report (ESRR) provides the findings of both an environmental screening and review (following additional studies) pursuant to the Ministry of Environment Parks and Conservation (MECP) Ontario regulation 116/01 for the Hydrogen Ready Power Plant (HRPP) project. The proponent of the HRPP project is Eastern Power Inc. (Eastern Power or EP). EP plans to construct, own and operate a hydrogen/natural gas fueled electricity generating facility (nominal capacity 600 MW) at 477B Oil Springs Line, Courtright ON N0N 1H0 on existing serviced industrial land as currently owned by an affiliated company, Greenfield South Power Corporation (GSPC). The site is a portion of GSPC's overall property at 477 Oil Springs Line that already has an operating electrical power generation facility and which was subjected to a previous Environmental screening and Review in 2013 (see Figure 1 for location).

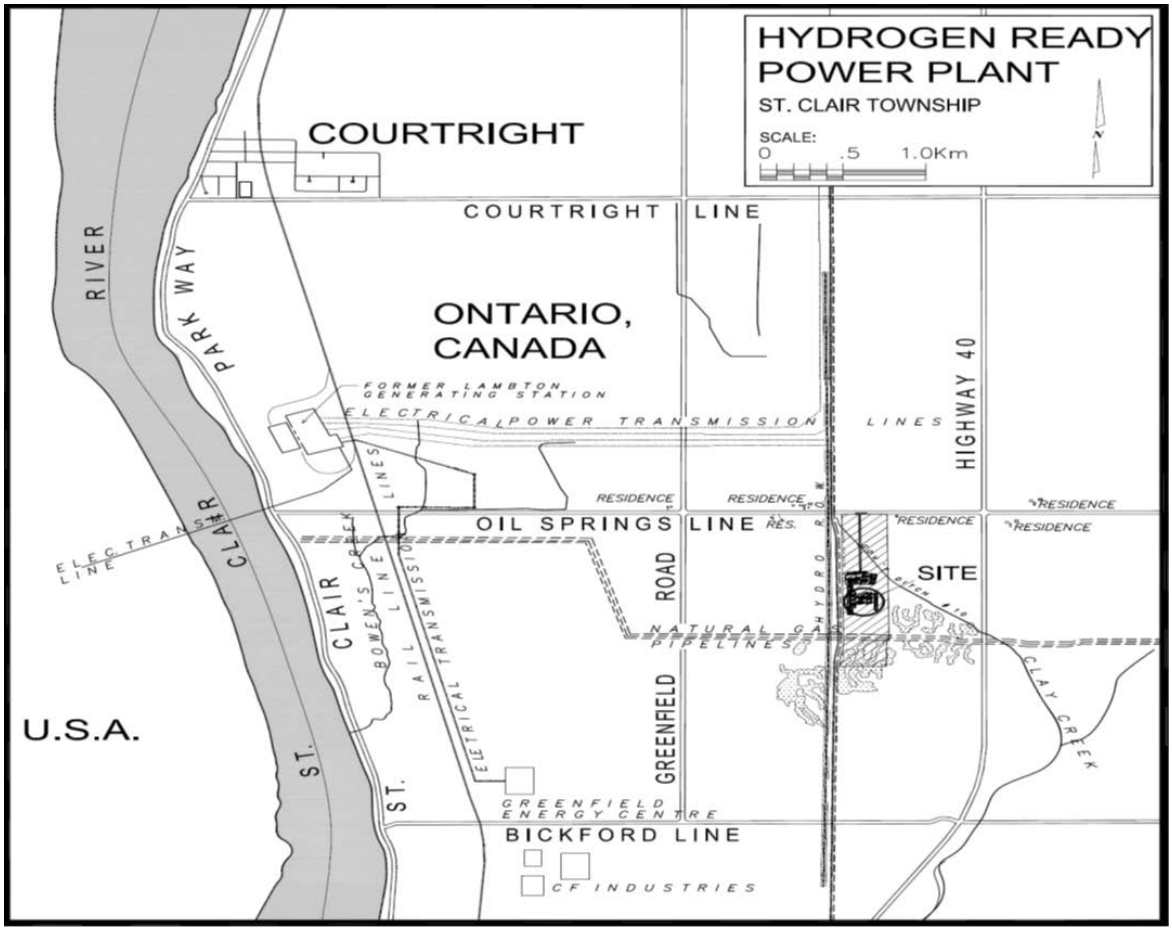

Figure 1 Location of Hydrogen Ready Power Plant

The MECP environmental screening process is applicable to the HRPP project because it is classified as a Category B electricity project under Ontario Regulation 116/01 of the Environmental Assessment Act. After preliminary environmental screening the

proponent, EP advanced the project to the Environmental Review Stage in which air and noise emissions were subjects of more detailed studies. This ESRR includes results and reports from those detailed studies.

This HRPP facility will address needs for additional electricity generating capacity in Ontario's South-West region as identified by the Independent Electricity System Operator (IESO). The facility will have new connections to the IESO-controlled 230 kV Hydro One electricity transmission grid directly adjacent to the project site. Water will also come from existing supply lines on the GSPC property. The main components of this combined cycle facility include two advanced-design gas turbines capable of using new hydrogen fuel mixtures planned by local gas suppliers.

HRPP will be able to use hydrogen-enriched natural gas or natural gas from gas lines currently on the site. Various energy producers and local gas suppliers now have programs under way to develop the hydrogen energy platform to achieve lower GHG emissions as part of the overall commitment to help Ontario meet its carbon emission reduction targets.

The Hydrogen Energy Platform is being developed through support of the Ontario and Federal Governments as an important strategy for lowering Greenhouse Gas (GHG) carbon emissions and to help meet future GHG reduction targets. Hydrogen energy development strategies have now been initiated by both Ontario (Ontario Hydrogen Strategy) and Canada (Canadian Hydrogen Strategy). These strategies include using hydrogen for electrical power generation.

The latter aspect is important as the IESO has recently assessed the impact of phasing out natural gas generation (IESO NG generation) and has concluded that dependence on natural gas power generation will continue well beyond 2030. In this same IESO report the IESO has also indicated that hydrogen provides a pathway to decarbonization of the industry through integration of hydrogen into natural gas for use in natural gas power generation turbines. There are various pathways for the hydrogen platform for decarbonizing gas electricity generating power plants as shown conceptually in Figure 2. Various aspects presented here have been discussed in more detail in the above references on the hydrogen energy platform.

Hydrogen is already widely used in industry typically being produced by steam reforming of natural gas. Carbon (CO_2) recovery for direct reuse or sequestration and storage offers large scale potential for low carbon hydrogen production, especially given the concentrated CO_2 stream provided by steam reforming/H_2 production. Hydrogen produced by this route or from electrolysis would have a low carbon footprint.

The design approach for the Hydrogen Ready Power plant is to include advanced power production equipment that is able to utilize fuel supplies ranging from 100% NG to 100% Hydrogen and in any blend ratio. Currently, equipment suppliers have developed equipment rated to utilize up to a 65% blend of Hydrogen with NG but are awaiting commercial applications of equipment of the size planned for the HRPP project. That would then facilitate further refinements to enable use of 100% Hydrogen.

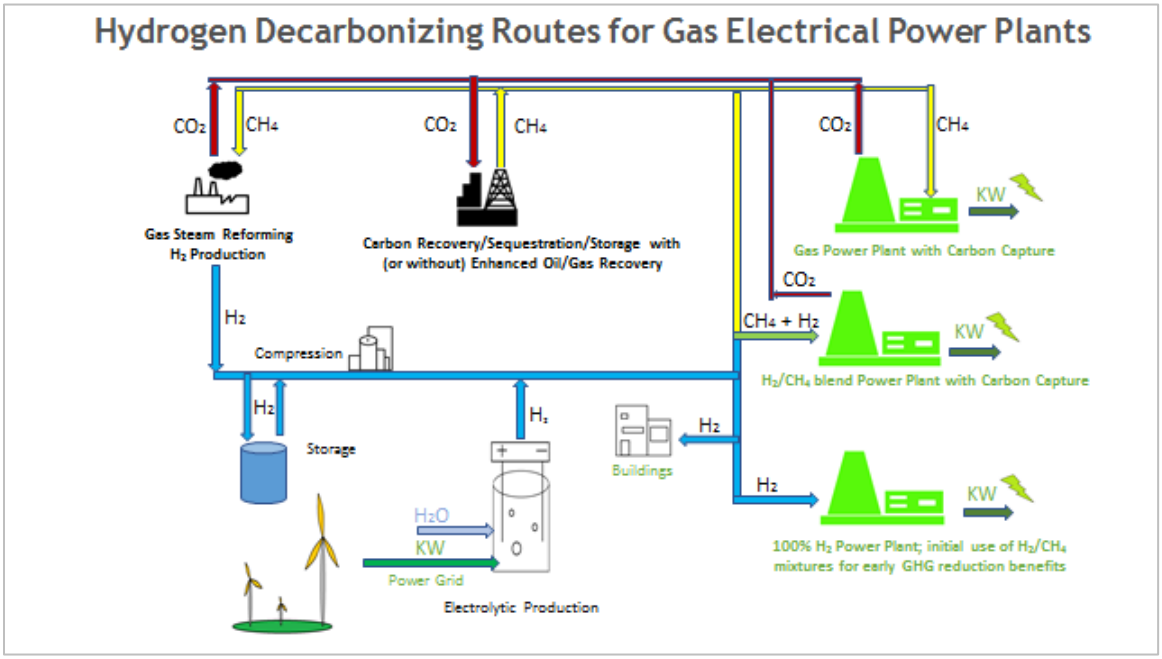

Figure 2 Hydrogen Decarbonizing of Gas Power Plants

1. Executive Summary of Findings

This Environmental Screening and Review Report (ESRR) assesses the potential environmental impacts and provides appropriate mitigation measures for the Hydrogen Ready Power Plant project, to be located at 477B Oil Springs Line St. Clair Township, County of Lambton, Province of Ontario, Canada. This ESRR has been prepared in accordance with the requirements of a Category B electrical power project of Ontario Regulation 116/01. This project is for a new hydrogen and natural gas-fueled electrical generation facility of approximately 600 MW. The proponent is Eastern Power, the only Ontario based engineering company to build, own and operate Ontario Power Plants.

An initial environmental screening, direct previous experience (2013) of Eastern Power with the similar GSPC project and early direct consultation with the MECP and other affected agencies, was utilized by Eastern Power to identify impacts or potential impacts associated with the project in all its life cycle phases of construction, commissioning, operation and decommissioning.

During the screening process some potential impacts were identified as requiring further assessment, i.e., as related to combustion emissions to the atmosphere and noise emissions.

Consequently, Eastern Power chose to self-elevate and proceed directly to the environmental review stage and has now completed studies of air emissions, noise and other potential environmental impacts, i.e., stormwater management. These detailed studies were instrumental in identifying impacts and for providing effective mitigation

strategies for these impacts, so as to ensure that there would be no net negative effects from the HRPP project.

The proponent has consulted directly with eight First Nations, has made outreach to 19 potentially affected municipal, provincial and federal agencies and has contacted the public near the project. This consultative outreach has included publication of project details in local newspapers, letters of request for comments and provision of information packages, a week-long virtual open house on the project web site (HRPP site) and two town hall style virtual meetings of interested parties with senior Eastern Power officials.

This ESRR concludes that, with appropriate mitigation measures being identified and implemented the HRPP project will not have negative environmental effects.

The HRPP project represents an important new approach to electrical power generation by utilizing advanced power generation equipment that can utilize both natural gas and non-GHG-emitting hydrogen fuel. Hydrogen energy has high potential for decarbonizing electrical power generation and the HRPP project will represent an early adopter project as part of the Ontario and the Federal governments' development of the hydrogen energy platform for meeting our provincial and national GHG reduction targets. It is expected that current Carbon tax costing and projected increased carbon costs will promote increased Hydrogen availability and use. Uniquely, the HRPP project thus provides potential to increasingly reduce GHG emissions and further lessen climate change impact during its entire project lifetime.

2 Introduction

2.1 Hydrogen Ready Power Project

The Hydrogen Ready Power Project involves the construction and operation of a new hydrogen and natural gas fueled, electricity generating plant. The initial operating pattern of HRPP will likely be primarily during "shoulder" and "peak" electricity demand periods. The peak and shoulder demand periods occur typically between morning and evening on summer and winter business days. The HRPP plant will provide flexible dispatch being able to start-up and reach full load status within 3 hours of request.

The project proponent is Eastern Power and this report has been prepared by Eastern Power. 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 and operates the Green Electron Power Plant and a portion the of GSPC property immediately south of the Green Electron Power plant will be used for the HRPP project, as shown in Figure 3.

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 infrastructures are already located at the site.

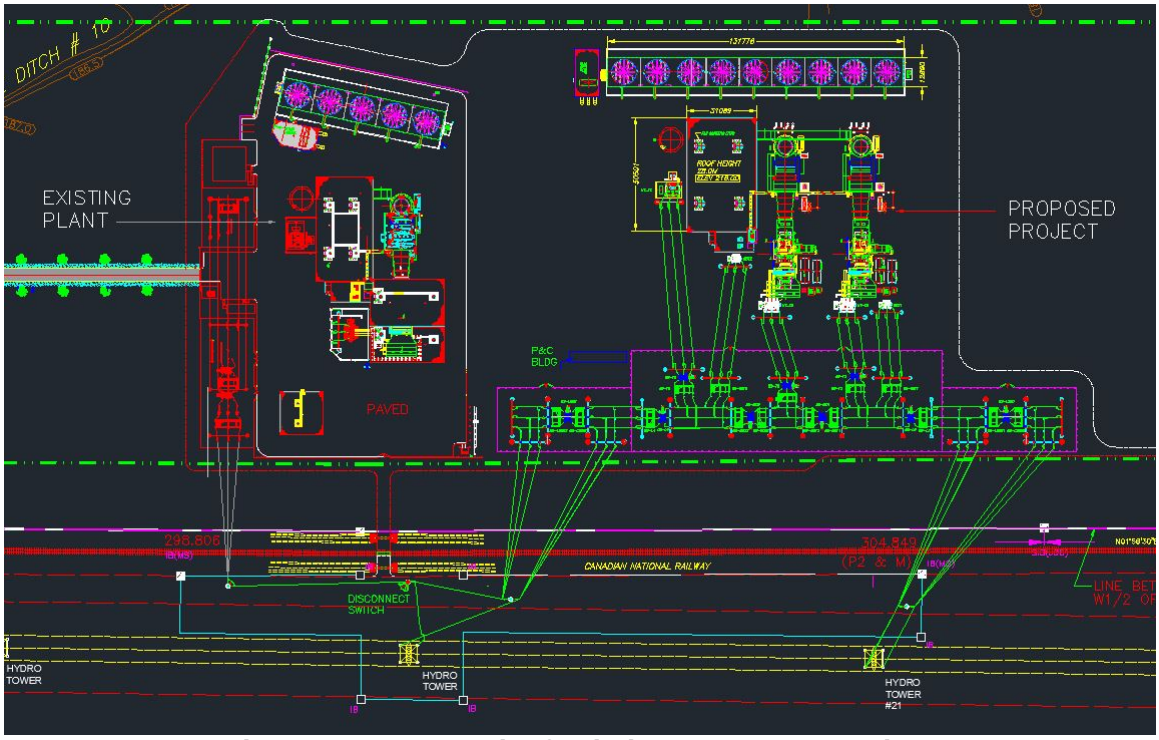

Figure 3 HRPP south of existing GSPC power plant

The facility will have a net, combined cycle generation capacity of approximately 600 MW 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 65% Hydrogen blend. Currently equipment suppliers have equipment rated to 65% blend of Hydrogen but are waiting for commercial applications to allow installation of 100% Hydrogen rated equipment of this size. The use of H_2 versus NG fuel substantially reduces power plant combustion related GHG CO_2 emissions as hydrogen combustion does not emit carbon dioxide. Additionally, a steam turbogenerator set configured in combined cycle will be utilized.

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 Environmental Screening and Review since appropriate "worst case" parameters and assumptions have been used in evaluating the environmental impact of the project.

2.2 Environmental Screening and Review

This report assesses the environmental impact of the Hydrogen Ready Power Plant project in compliance with Ontario Regulation 116/01 under the Environmental Assessment Act. The project is Category B for O.Reg. 116/01 requiring the project to go through the screening process so as to ensure acceptable overall environmental

impact as per the various criteria set out for O.Reg. 116/01.

Screening included initial consultation with the Ministry of Environment and key affected agencies including St. Clair Township, Lambton County and the St. Clair Region Conservation Authority (SRCA). Based on this and direct experience with an earlier similar project (2013, Greenfield South Power Corporation) the proponent elected to self-elevate and advance from Screening to Environmental Review in order to further assess (through studies) emissions to the air and noise from the project.

The notice of Commencement of Environmental Review was first published in the Sarnia Observer on July 16, 2021 and the Wallaceburg Courier on July 21, 2021 (see publication tear sheets in Appendix 17.5, Public Consultation Report). An information package presentation of the project was provided for receipt by St. Clair Township Council. Planning staff had recommended this approach over a direct delegation by the proponent to the Council.

A project website was established by July 15, 2021 and this provided similar information to that provided to St. Clair Township and to the SCRCA. Early consultation with First Nations was initiated prior to publication of the Notice of Commencement. Once the Notice of Commencement was published a follow-up letter was sent to these First Nations providing them information as posted on the website and seeking any questions or comments they might have. From previous consultations with First Nations in 2012 for the similar GSPC project on the same site, only the Walpole Island First Nation (WIFN) and the Aamjiwnaang First Nation (AFN) had commented and raised concerns. For these, direct contact with WIFN and AFN band officials with responsibility for environmental matters had been established. Eastern Power had maintained informal ongoing consultation with these WIFN and AFN officials throughout the development of the GSPC project and with continuing contact after the GSPC project was in full commercial operation.

Immediate neighbors to the project, other local area residents, St. Clair Township and SCRCA officials, First Nations officials as well as any other interested individual who had visited the project website were invited to a week-long (August 6-13, 2021) virtual open house as hosted on the project website. COVID-19 restrictions precluded in-person consultation meetings. In addition, two virtual town hall style live meetings were advertised on the website and hosted by senior Eastern Power officials on August 11, 2021 at 2PM and 8PM.

Additional details of the public and government/agency consultations together with comments and inputs as obtained are included in Appendices 17.5 and 17.6, respectively.

As mentioned above, the proponent had identified some impacts of the project during the MECP screening process (MECP checklist, see Appendix 17.1, Screening Criteria Results) that required further assessment, namely air and noise emissions. The proponent therefore decided to proceed directly to the environmental review stage without first issuing a finalized screening report. The further review and assessment was achieved through separate studies of air emissions, noise emissions, water vapour discharge to the atmosphere, as well as storm water impact and management. These studies as completed for this ESRR can be found as appendices (17.2, Air Quality

Impact Study that also included a water vapour plume study; 17.3, Noise Impact & Mitigation Study Report; 17.4, Stormwater Management Study).
The public, First Nations and various affected public agencies were notified of the commencement of the review stage as per the MECP guideline and all input received by the proponent was incorporated into this ESRR report (see Appendices 17.5 and 17.6 for details).

The results of the initial environmental screening (Regulation 116/01 checklist) can be found in Appendix 17.1. This screening checklist reflects an indication of potential environmental impact of the project at any phase in its life cycle, but prior to applying any mitigation measures. The 'Additional Information' section of the checklist provides direct reference to the appropriate section in this report and to supporting documentation (appended materials), thereby allowing ready review of the impact, the choice of appropriate mitigation strategy and the net impact after mitigation. Net impacts are also summarized in the 'Additional Information' section of the checklist, with these reflecting the overall net impact once the appropriate mitigation measure has been implemented.

3. Project Description

3.1 Project Location

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 (LAWSS) and from a new 14" lateral line from a local industrial supplier to the south/west (under construction for service in 2022).

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

3.2 Description of Project Facilities

The HRPP design is based on the established and successful combined cycle technology and used for natural gas combined cycle power generation throughout the world. However, the new generation gas combustion turbines will be capable of using hydrogen/natural gas mixtures immediately as they become available from pipeline and energy providers and can ultimately utilize 100% hydrogen as it becomes available in

the future. Currently equipment suppliers have equipment rated to 65% blend of Hydrogen but are waiting for commercial applications to allow installation for 100% Hydrogen on equipment of this size. A simplified process flow diagram of the process for the power plant is shown below as Figure 4.

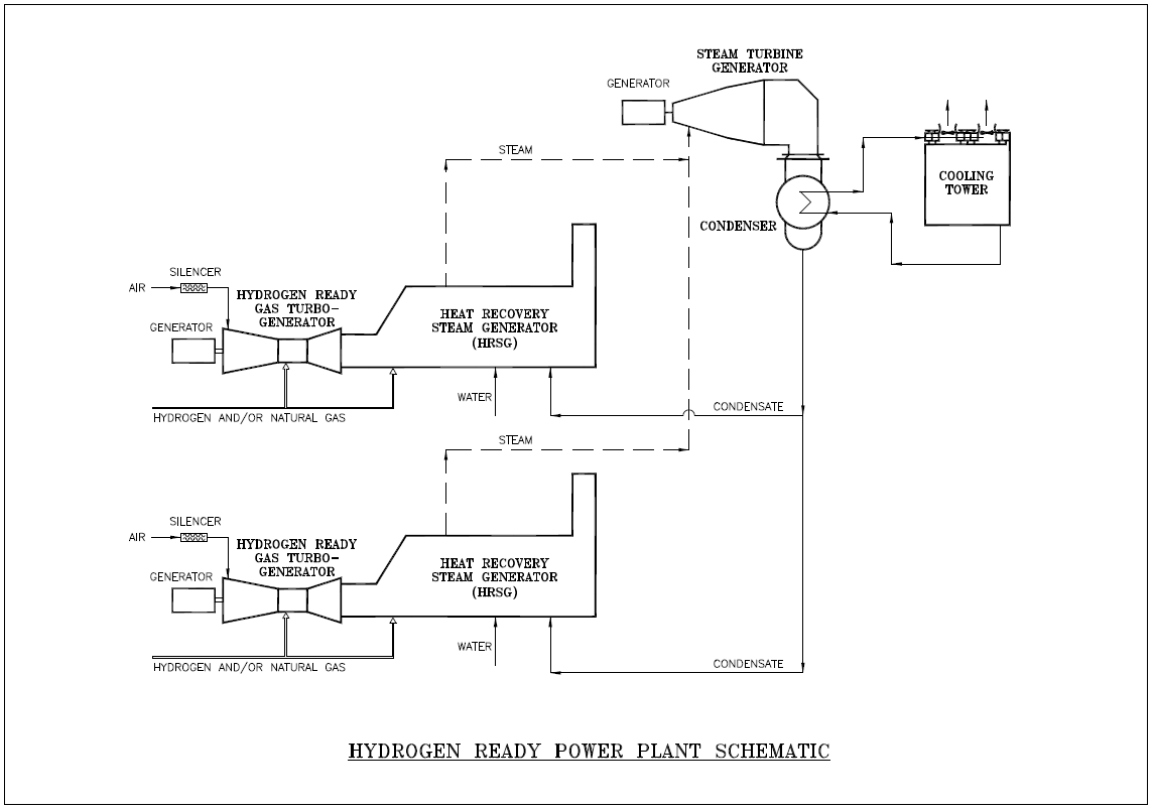

Figure 4 Process Flow Diagram for Hydrogen Ready Power Plant

Hydrogen Ready Gas Turbo Generator Sets:

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

Heat Recovery Steam Generators:

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

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

Steam Turbine Generator Set:

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

Condenser and Boiler Feed Water Systems:

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

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

Electrical System:

The electricity will be generated at 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.

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

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

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

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

Civil Works:

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

The area surrounding the plant will be graded to facilitate proper drainage of rainwater. Asphalt pavement will be provided. A chain link fence will be provided around the plant area and electrical substation. Stormwater flows on all non-developed areas of the site will not be collected and existing natural flows will be retained as per pre-existing conditions. Stormwater collected from covered surfaces will be routed to the basin of the facility cooling system for use/treatment. This is more fully described in the HRPP Stormwater Management Plan (Appendix 17.4) Thus, the stormwater management system as related to covered surface collection will not be subject to a separate MECP compliance approval permit for discharge, i.e., as affected stormwater requiring collection and potential treatment will be covered as part of the MECP sewage discharge permit (see below).

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

Industrial sewage wastewater will be discharged for treatment into the municipal wastewater treatment facility in Courtright

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 and Natural Gas Interconnection:

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 5 (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/hydrogen fuel mix from one or more of Union Gas Limited, 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.

3.3 Site Layout Constraints

The GSPC property comprises approximately 45 hectares and the HRPP project site on this property represents approximately 2 hectares immediately south of GSPC's Green Electron Power Plant (GEPP). The location on the property of the new HRPP facility in relation to the existing GEPP facility has been optimized to address several important considerations, including: the lay-down and staging areas required during construction (2 hectares); access drives; set-backs; distances to the nearest residential points of impingement and reception for air emissions and noise and, visual site lines. Importantly siting has included not disturbing and maintaining the ecological function of the natural areas in the south of the GSPC property. The overall site plan is shown in Figure 5 (the inset figure provides facility and interconnection details).

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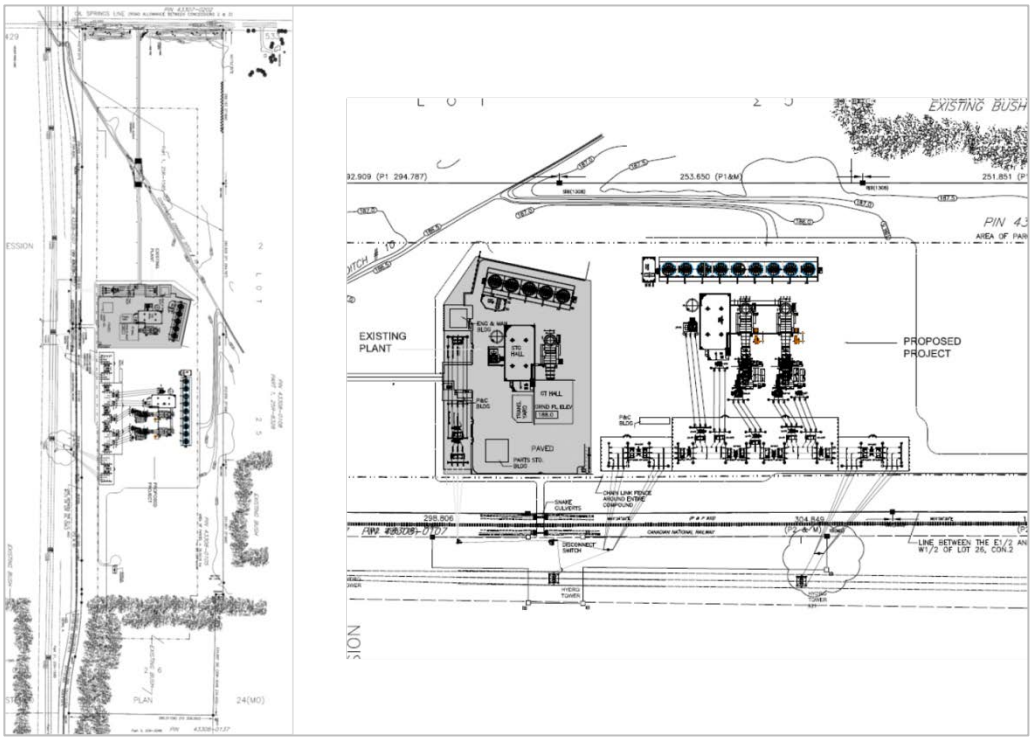

Figure 5 Site Plan Showing HRPP on GSPC Property

The site plan layout with services interconnections may be adjusted as the design is finalized and site plan approval is obtained. Any such adjustments will not negatively affect the conclusions of this Environmental Screening and Review Report.

3.4 Project Life Cycle Phases

The key phases of the project and relative timing for these are shown in Table 3.1.

Table 3.1 Hydrogen Ready Power Plant Project Phases

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	Minimum 25 years	Peaking operation mode expected early years, increased running expected later years
Decommissioning	removal of equipment	-	Plant and equipment potentially recyclable

4. Surface and Ground Water Impacts

4.1 Source Water Protection

There are no source waters used for drinking on or near the HRPP project site and the project will not have negative impacts to any source waters.

4.2 Surface Water

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 to ensure structures had elevations

above the regional flood plain elevation and so there would be net impact to surrounding lands in the event of flooding.

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 SCRCA has been consulted.

The project site is not near any source water taking sites and therefore will have no direct impact on source water. The facility will consume water supplied from the Lambton Area Water Supply System (LAWSS), supplied by the existing or an upgraded municipal line. Additional non municipal water supply will be from a new 14" lateral line from a local industrial supplier to the south/west (under construction for service in 2022).

The water quantity to be used by the HRPP facility will be <19 million liters per day. In addition this water will be supplied from existing municipal and industrial sources and thus, will not require notification under the Great Lakes Charter (GL Charter).

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 on or off the site will occur.

A comprehensive stormwater management plan has been developed for the HRPP project as provided in Appendix 17.4. The stormwater control methods used by the project are in accordance with the MECP's "Stormwater Management Planning and Design Manual" (MECP manual). Further specifications details for this will be part of final design at a later stage pending project implementation.

Stormwater collected from impervious surfaces will be collected into the basin of the cooling tower 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.

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 a developed Environmental Impact Management Plan as provided in Appendix 17.7.

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

4.3 Ground Water

There is no plan for any taking of groundwater by the project.

Neither the construction nor the operation of the plant is expected to result in the release of any substances that could infiltrate and impact ground water. The built-upon, plus non-porous paved footprint of the project will be about 2 hectares. The majority of the GSPC property surrounding the HRPP, excluding the adjacent 2 hectare GEPP facility site, comprises landscaped and cultivated areas with natural drainage and infiltration for natural groundwater recharge.

Tile drainage with outflow of collected excess surface and excess near-surface groundwater 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 field cropping by a tenant farmer.

Given these various provisions, the project will not have negative impacts to ground water.

4.4 Sedimentation and Soil, Shoreline or Riverbank Erosion

Prudent measures in accordance with the Ontario "Guidelines on Erosion and Sediment Control for Urban Construction Sites" and for "Evaluating Construction Activities Impacting Water Resources" (B6 guidelines) will be taken to prevent sedimentation and/or erosion of soil during construction, including appropriate run-off control, grading and paving practices, and the use of geo-fabrics.

These measures will be detailed in an erosion control plan to be completed prior to the commencement of site civil works and construction. Stormwater drainage works for the project will be engineered to prevent significant sedimentation or erosion of soil. Details on stormwater management can be found in Appendix 17.4. All site works will conform to the regulatory requirements of the St. Clair Region Conservation Authority in terms of fill placement as well as prevention of sedimentation or erosion.

With the above measures, the project will not have negative impacts related to soil erosion.

4.5 Accidental Spills

The project will use a variety of liquids during construction and operation. Some liquids will be used in such small quantities so as not to pose a significant risk of environmental impact. An example of this is the use of small amounts of incidental cleaning solvents such as varsol. Other liquids will be used in larger quantities but will be stored indoors in suitable label-identified storage tanks that will be designed to prevent accidental spills, (e.g. turbine lubricating oil tank and sodium hypochlorite tank). The main output transformers will each be equipped with a concrete spill containment structure so that the risk of environmental damage due to oil spills will be virtually eliminated.

To ensure expeditious response to any spill, a spill response contingency plan will be developed and followed. Eastern Power has previous experience with such response plans as it developed a comprehensive Emergency Response Plan that met IESO requirements and was reviewed by the IESO for implementation at the GSPC GEPP project. The ERP plan includes prompt notification of any spills to the Ministry of the Environment Spills Action Centre and municipal authorities as required, specific mitigation measures for various possible scenarios, protocols for maintenance of spill response supplies and equipment, and training for operating staff on spill response procedures. A similar Emergency Response Plan including provisions for spill response will be developed for the HRPP project.

In addition, accidental releases of contaminants to the environment including surface water in Government Drain #10 will be prevented through adherence to the HRPP Environmental Impact Management Plan provided in Appendix 17.7. This plan covers the HRPP project through all phases of its project life.

The above measures will ensure the project will not have net negative impacts arising from accidental spills.

5. Land Use Impacts

5.1 Residential, Commercial and Institutional Land Uses within 500 metres

None of the land area within a 500 metre radius zone surrounding the project has designated residential land uses or zoning (see Figure 6). There are no institutional or commercial land uses within 500 metres of the project.

Most of the land uses within the 500 metres radius zone of the project are zoned for agricultural and industrial uses. There are also infrastructure uses including electrical transmission corridors, a single track railway line, as well as roads such as Oil Springs Line. Lesser amounts of green- and open-space are in the area within the 500 m zone.

All of the agriculturally zoned lands located within 500m of the project site are designated for heavy industrial use by the existing official plan of St. Clair Township, reflecting the expectation that these lands would all eventually be used for heavy industrial activities. In November 2006 Shell Oil had proposed a large scale, 1000 Ha, bitumen-based oil refinery that included these lands but in July 2008 it discontinued this project.

There are two (2) single residential dwellings outside the 500m zone fronting on the south side of Oil Springs Line (both are original farm property homes) and both of these are located around 750m from the center of the proposed HRPP facility.

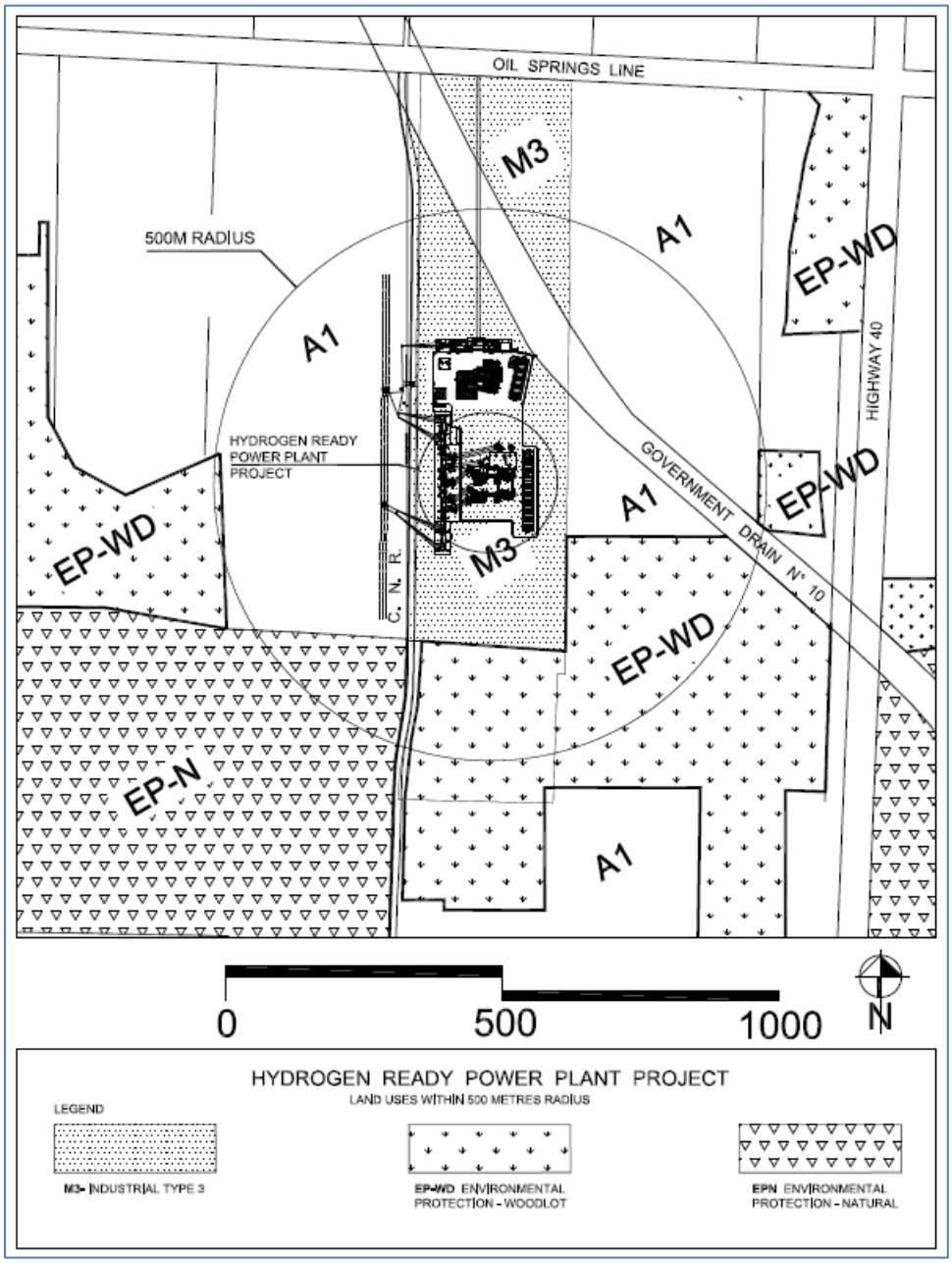

Figure 6 Land use surrounding HRPP site

Compatibility of the facility with residential and commercial land uses within the prescribed 500 meter zone was achieved through design and mitigation features, specifically implemented to minimize the key impact factors including; noise emissions, odour emissions, dust release, vibration transmission, aesthetics and operational intensity.

Prevailing background noise was assessed through continuous sound monitoring over several days as part of a Noise Impact & Mitigation Study. Given the prevailing traffic noise the acoustic environment for the receptors of interest was determined as Class 2.

(see appendix 17.3 for full report). The project's operating noise impacts with identified mitigation measures will meet the both the MECP class 2 daytime and nighttime noise criteria (see Appendix 17.3 for details).

The impact of the facility on surrounding land uses was also evaluated against the criteria set out in Ontario Guideline D–6, "Compatibility Between Industrial Facilities and Sensitive Land Uses" (ON D6).

The HRPP facility's net mitigated noise level at any sensitive receptor will not be audible above local background noise during the day time on non-holiday weekdays, which is when the plant is primarily expected to operate so as to meet the peak and shoulder demand for electricity. Therefore the project's noise impacts are characteristic of a Class II industrial facility under Ontario Guideline D–6.

The project's odour and dust emissions impacts are detailed in Section 6.3 and these are expected to be infrequent and not intense. For comparison purposes, Class II industrial facilities under the Guideline D–6 include even those with frequent and occasionally intense odour and/or dust emissions.

The plant's primary rotating equipment will be highly balanced and will not cause any ground-borne vibration that would be perceived off-property. Class II industrial facilities under Ontario Guideline D–6 include those with possible ground-borne vibrations that are not perceived off property.

The height and massing of the project's buildings and structures achieves a massing that is acceptable given the zoning and set-backs. The building height and stack height will also be in character with surrounding industrial and high voltage transmission corridor uses as is detailed in Section 9.1.

The project will not include outside processing or outside storage of raw materials, finished products or waste materials. Class II industrial facilities under Guideline D–6 permit outside storage and open processing.

The plant will result in visible water vapour plumes from its stack and condenser circuit during colder weather, the impact of which is assessed and detailed in Section 6.1 and Appendix 17.2. Given that the water vapour plumes will not be visible in warmer weather, the project will have only periodic outputs of minor annoyance that are characteristic of a Class II industrial facility under Ontario Guideline D–6.

The project's operational intensity will be a function of the timing, quantity and characteristics of personnel and vehicle movements due to plant staffing, plant deliveries and plant shipping. The personnel and vehicle movements due to the project are detailed in Section 9.7. Vehicle movements due to the project will occur predominantly during the daytime on non-holiday weekdays, and will typically only use Oil Springs Line and Highway 40. These impacts are characteristic of a Class II industrial facility under Ontario Guideline D–6, which allows for shift operations and frequent movement of heavy trucks primarily during daytime hours.

Based on the application of all of the criteria set out in Guideline D–6, the HRPP facility is a Class II Industrial Facility by virtue of its medium scale, the periodic outputs of minor annoyance (i.e. vapour plume visibility only during colder weekday hours and noise occasionally audible off property) and truck movements during daytime hours only.

Guideline D–6 indicates that a Class II industrial facility is expected to have a zone of potential influence of 300 m and recommends a minimum of 70 m separation from sensitive land uses. The HRPP facility sources of emissions will be at least 500m from the closest sensitive land use, which is therefore greater than the minimum separation distance recommended in Guideline D–6.

Therefore, through appropriate design and the HRPP site layout features and through the incorporation of the mitigation measures as described above, the project will have no net negative impact on the residential and commercial land uses within 500 metres of the project. The project will also meet the separation distance from sensitive land uses as recommended in Guideline D-6.

5.2 Consistency with Provincial Planning Policies and Objectives

The project is consistent with the 2014 Provincial Policy Statement (PPS), Part V building strong healthy communities (PPS) issued under Section 3 of the Planning Act, effective April 30, 2014.

The HRPP project is also being developed to meet current and projected electricity generation needs identified by the IESO and to be financially viable over its entire project life consistent with the policy objectives.

The PPS promotes optimum use of existing infrastructure, and preservation of employment areas. These policy objectives will be met, as the project is to be located so as to provide optimum use of the existing infrastructure for both high voltage electricity transmission and high pressure natural gas supply.

The PPS also promotes the protection and wise use of the natural environment, water, agriculture, minerals, petroleum, aggregates and cultural resources. Sections 7, 8, 9 and 10 of this report further describe how the project is consistent with these policy objectives.

The PPS further directs development away from natural or human-made hazards, and the project will not be located in any area of known flooding, erosion, or human-made hazards.

The project is therefore in line with Ontario’s planning policies and objectives.

5.3 Consistency with Municipal Land Use Plans, Policies and By-Laws

The site is currently zoned for manufacturing (M3) by St. Clair Township and designated for employment uses in its official plan and that of Lambton County.

The GSPC property already has the GEPP facility. St. Clair Township has confirmed that the power plant use is permitted on the site as currently zoned, and that no amendment to the official plan or zoning bylaw will be needed. The project will therefore have no net impact due to any lack of consistency with existing land use plans, policies and by-laws.

5.4 Impact on Hazardous, Unstable or Contaminated Lands

The project will not utilize or result in any hazardous unstable or contaminated lands.

The project site is on the GSPC property that previously was found to be free of environmental hazards through an independent environmental site assessment (ESA Phase I study/report; LVM Sept 14, 2012). That ESA was completed in accordance with CSA 768/01 and found there to be no potential for contamination from one closed waste site in the vicinity and only low potential for contamination due to a lack of information about the quality of fill associated with the nearby rail line, and thus it concluded, “Based on the findings of this investigation, it is our opinion that no further assessment of the subject site is warranted.” Subsequent to the ESA, no hazardous unstable or contaminated lands were found during the development of GSPC’s GEPP facility and the overall property 2013-2017, these aspects having involved extensive site civil works, with excavation and earth moving. Any excess soil to be removed from the HRPP project site for on or off-site reuse will be managed pursuant to ON reg. 406/19 “On-site and excess soil management”

Therefore, the HRPP project will not be affected by nor have negative impacts related to the use of hazardous, unstable or contaminated lands.

6. Air and Noise Emissions

6.1 Air Quality Impacts

The HRPP facility will combust natural gas and blended mixtures of hydrogen with natural gas and eventually only hydrogen, resulting in relatively few and well described low emissions of air pollutants to the atmosphere, i.e., primarily NO_x, CO, CO_2 and PM but virtually no SO_x or heavy metal emissions.

The facility will utilize low NO_x technology which minimizes NO_x production during combustion. By employing low NO_x technology, 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 NOx emissions with low NOx technology has been established in other similar facilities including the GEPP facility.

As a result of NO_x mitigation, the HRPP will emit reduced quantities of NO_x, low amounts of CO, low amounts of particulate matter (PM). Hydrogen utilization will reduce facility GHG emissions in direct proportion to the amount of hydrogen used (see section 6.2 for further details).

The emissions from the facility to the atmosphere have been assessed in a site-specific study of the air quality impacts from HRPP using the latest MECP-approved USA EPA AERMOD dispersion modelling tools with site-specific topographical and meteorological information and as reported fully in the Air Quality Impact Study (Appendix 17.2). This analysis has indicated low concentrations of contaminants at all relevant Points of Impingement (POI) as summarized in Table 6.1. Maximum POIs for NOx and CO were below of the MECP maximum allowable POI concentrations (29.3% and 2.7%, respectively).

Importantly, the emissions shown in Table 6.1 have been modeled under the worst case emission scenarios to account for the variation in output due to seasonal variations and design margins. At start-up of the facility, a yellow plume may be visible for a relatively brief interval of time which is expected and normal for this type of facility. In this regard, it is important to note that all startup, emissions that are briefly higher are included in the air emission assessments with the worst case emissions of startup followed by full load provided in the report and as shown in Table 6.1.

Table 6.1 - Emission Summary Table (Maximum Emission Scenario - Startup followed by Full Load using Natural Gas and Hydrogen gas mixtures)

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	MOE POI Limit [µg/m3]	Percentage of MOE POI limit
NOx	10102-44-0	24.25	AERMOD	63.92	1 h	400	16.0%
		11.01		12.13	24 h	200	6.1%
CO	630-08-0	38.36	AERMOD	121.34	0.5 hr	6000	2.0%
SO_2	7446-09-05	0.00	AERMOD	0.00	1 h	690	0.0%
		0.00		0.00	24 h	275	0.0%
PM	NA	2.13	AERMOD	2.35	24 hr	120	2.0%
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	MOE POI Limit [µg/m3]	Percentage of MOE POI limit
NOx	10102-44-0	31.17	AERMOD	82.16	1 h	400	20.5%
		14.16		15.59	24 h	200	7.8%
CO	630-08-0	19.18	AERMOD	60.66	0.5 hr	6000	1.0%
SO_2	7446-09-05	0.00	AERMOD	0.00	1 h	690	0.0%
		0.00		0.00	24 h	275	0.0%
PM	NA	2.13	AERMOD	2.35	24 hr	120	2.0%
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	MOE POI Limit [µg/m3]	Percentage of MOE POI limit
NOx	10102-44-0	44.51	AERMOD	117.32	1 h	400	29.3%
		20.22		22.27	24 h	200	11.1%
CO	630-08-0	51.17	AERMOD	161.84	0.5 hr	6000	2.7%
SO_2	7446-09-05	0.00	AERMOD	0.00	1 h	690	0.0%
		0.00		0.00	24 h	275	0.0%
PM	NA	2.13	AERMOD	2.35	24 hr	120	2.0%

The facility will emit water vapour emissions from its stack and more so from the cooling tower which will be visible (as fog vapour) under certain conditions of ambient air temperature and relative humidity. These water vapour emissions, while non-toxic, have potential for causing off-property visibility and icing problems, i.e. depending on prevailing weather conditions. On the basis of the plant location, stack and cooling tower heights and their location relative to the facility, the distances to potential points of off-property impingement, as well as prevailing wind conditions, etc, it has been determined that these water vapour emissions will not cause off-property impacts related to visibility (see Appendix 17.2 for further details). The vapour plume study also concluded that icing risk would be negligible.

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

6.2 Cumulative Impact Assessment of Air Emissions

Cumulative impact assessments for air quality have been made using the latest Environment Canada Guidelines (Environment Canada, 1999). The analysis of the HRPP facility's contribution and cumulative impact to the local and regional airshed quality, based on its specific emissions (summarized in section 6.1 above) 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 air monitoring station closest to the HRPP site were utilized as the pre-existing ambient condition to then assess the cumulative impacts resulting from the addition of the HRPP emissions.

Studies of the current ambient air quality in the vicinity of the proposed facility, together with an analysis for the project's emissions, have indicated that the project's emissions will have only minor influence on the air shed's ambient air quality for nitrogen dioxide and even less for other contaminant emissions shown in section 6.1 and the report in Appendix 17.2. This cumulative impact analysis has revealed that any measurable increases to air contaminant concentrations above actual pre-existing ambient levels (i.e., that include all other relevant existing sources) will be slight, primarily only for NO_X, will be highly localized in effect and all within the existing normal variability of the current ambient air quality parameters. These findings are reported in Appendix 17.2 and are consistent with the findings of others for similar facilities including the existing GEPP facility on the same property (also reviewed and discussed in Appendix 17.2).

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

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

The HRPP project will require an MECP-issued Environment Compliance Approval under Section 9 of the Environmental Protection Act, in relation to the air emissions as detailed in this report (as well as for noise emissions reported in section 6.5), prior to

construction and operation of the facility. In accordance with Ontario Regulation 379/01, the HRPP facility will have an emissions monitoring program in place that will include continuous emissions monitoring and/or source testing stack sampling.

6.3 Greenhouse Gas Emissions and Climate Change Impact

Table 6.2 summarizes the total CO_2 (equivalents) emissions with the HRPP facility using hydrogen/natural gas fuel mixtures, as compared to natural gas only (base case). The HRPP project will provide substantial electrical power generation related GHG emission reductions as compared to natural gas. Importantly, HRPP will provide increasing GHG reductions over the project life as hydrogen fuel becomes increasingly commercially available for use, with an ultimate target of 100% hydrogen use and thus, no combustion related GHG emissions. Hydrogen use in place of natural gas for electrical power generation has potential for lowering GHG emissions and lessening climate change impacts of fossil fuel utilization. It is expected that current Carbon tax costing and projected increased carbon costs will promote increased Hydrogen availability and use. Uniquely, the HRPP project provides potential to increasingly reduce GHG emissions and further lessen climate change impact during its entire project lifetime.

Table 6.2 – GHG Emissions

Greenhouse Gas	100% Natural Gas Emissions (tonne)	35% Natural Gas - 65% Hydrogen Emissions (tonne)	80% Natural Gas - 20% Hydrogen Emissions (tonne)	Global Warming Potential	100% Natural Gas Emissions CO_2e (tonne)	35% Natural Gas - 65% Hydrogen Emissions CO_2e (tonne)	% GHG Reduction 35:65 NG:H_2	80% Natural Gas - 20% Hydrogen Emissions CO_2e (tonne)	% GHG Reduction 80:20 NG:H_2
Carbon Dioxide (CO_2)	262122	115229	216955	1	262122	115229		216955	
Methane (CH_4)	132	58	109	25	3296	1449		2728	
Nitrous Oxide (N_2O)	13	6	11	298	3929	1727		3251	
Total GHG					269347	118405	56.0	222934	17.2

6.4 Dust or Odour Emissions

The project will not emit any significant amounts of dust or odour. During construction, potential dust emissions will be mitigated by good construction practice and dust suppression techniques. During operation there will be no material emissions of dust. Neither the construction nor the operation of the project will result in the emission of any significant odours. Minor and transient emissions of odour due to asphalt paving during

the construction phase are not considered as significant. Therefore, there will be no net negative impacts related to dust or odour from the project.

6.5 Noise Impacts

The pre-existing on-site acoustical environment was measured for the HRPP site and consequently the MECP Class 2 exclusionary nighttime limit of 45dBA (L_{EQ}) was applied for assessment of noise impacts. The significant potential sound sources of project facility and all buildings near the project have been acoustically modeled in three dimensions taking into account the levels and qualities of noise emitted from all sources (Noise Impact & Mitigation Study report in Appendix 17.3).

The HRPP facility includes a number of noise sources, which in combination may not be allowed to exceed the acceptable levels at critical receptors. The project will achieve this through a variety of strategies including optimized distance from off-property noise receptors, use of a wet surface air cooled condenser rather than a dry air cooled condenser, use of inlet and exhaust silencers on the gas turbine, acoustic enclosures and insulation, sound barriers and optimized plant layout.

Appropriate noise mitigation measures as described in appendix 17.3 have been identified and will be applied to ensure the facility noise emissions are at or below the MECP criteria for all significant off-site receptors during both daytime and nighttime facility operation. Noise emissions are subject to MECP review and issuance of compliance approvals prior to project construction and operation.

Therefore, with the above-referenced mitigation measures employed noise emissions from the project will meet MECP limits and will have no net negative impacts.

7. Human Health

Studies from similar facilities in Ontario including the GEPP facility have concluded that incremental quantities of additional emissions from natural gas facilities will not be measureable within the natural variations of the current background ambient air quality. This will hold equally true for facilities utilizing hydrogen/natural gas mixtures.

Consistent with these earlier findings, an incremental cumulative impact assessment for the HRPP facility has found that the project will not contribute to any exceedances over the pre-existing ambient air quality (see Appendix 17.2). 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.

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

8. Existing Natural Environment and Impacts

The HRPP project will be situated on a small portion (10% of total) of the overall larger GSPC property. The HRPP land portion is immediately south of the existing GSPC GEPP facility. This land had been retained as a prepared but non-developed industrial area for future development purposes. Portions of this land had been used for construction laydown and storage during the development of GSPC's GEPP project.

The overall GSPC property including the proposed HRPP project land has been evaluated as to its natural environment baseline and potential impacts of project development through a Natural Resources Baseline Report and Environmental Impact Study (EIS) as provided in Appendix 17.8.This EIS with its recommended mitigation measures, guided both the overall GSPC property and the GEPP project land developments from 2013 through to final grading of the GSPC property in 2018. This EIS remains current for HRPP project development, noting the following. GSPC had set aside this readily developable land for future project development needs and this land area representing only 10% of the overall GSPC property is immediately south and abutting the current GEPP facility footprint. This relatively small land area has been kept ready to develop and thus, has not been allowed to naturalize and has been kept free of weeds and other ground vegetation cover.

The woodland area to the south of the HRPP site is well away, i.e., approximately 250m south, from the proposed HRPP project facility footprint and this has area not been developed as it connects further south to the Clay Creek Woodland ANSI. This woodland area will not be disturbed as part of the HRPP project development.

8.1 Rare, Threatened or Endangered Species

The previous Ecological and Environmental Impact Study (2012) concluded there were no rare, threatened or endangered species of plants or animals on the overall GSPC property site as based on actual field observations.

Given that the HRPP project will affect only 10% of the entire GSPC site area and site alterations to the existing natural environment will not be made to the woodlot area at the south of the GSPC property, any risk to any potential SAR or to the Clay Creek ANSI (see 8.2 below) 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.

8.2 Protected Natural Areas (ANSI or ESA)

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 portion of the ANSI area lying within the boundaries of the GSPC property has not been developed by GSPC and is not planned for development for the HRPP

project. Given the HRPP project footprint will be well beyond 120 m of the ANSI, a species inventory will not be undertaken.

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 mitigation measures, the project will have no impacts on protected, sensitive or scientifically significant natural areas.

8.3 Wetlands

There are no Provincially significant or protected wetlands on the overall GSPC property. The woodlot to the south of the property does have minor wetland features that connect to the wooded ANSI corridor system south and west of the GSPC property. There are significant wetland and water features in this ANSI. MNR’s Land Information Ontario (LIO) database Provincially Significant Wetland (PSW) layer indicates that the Clay Creek Woodland ANSI is also part of the Bickford Oak Woods (BOW) Wetland Complex.

Given the wooded areas of the GSPC property site will not be developed for the HRPP facility, the project will have no significant net impact on wetlands.

8.4 Wildlife Habitat, Population, Corridors or Movement

The woodland area on the south of the GSPC property is likely part of a wildlife movement corridor given its connection to adjacent areas to the south and west. Thus, this area has not been developed by GSPC and will not be developed for the HRPP project.

During the planning and construction phases of the project, appropriate measures as in accordance with the MECP “Guidelines for Evaluating Construction Activities Impacting on Water Resources” (MOE, 1995) will be implemented so as to minimize ecological disturbances to Government Drain #10 and its downstream connections.

These will include measures required to prevent erosion and sedimentation as detailed in Section 4.3 of this report, measures to minimize mud tracking onto adjacent municipal roads, measures to re-use fill materials wherever possible, and measures to protect any mature trees wherever possible.

Therefore, given the above mitigation methods, the project will have no net negative impacts on wildlife habitat, population, corridors or movement.

8.5 Fish Habitats

Previous 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. This earlier work had confirmed the designation of Government Drain #10 as a Type C Drain under the DFO drain classification system. This section of the Drain is likely to freeze to bottom in the winter therefore providing no

overwintering habitat for fish. Project construction and operation will not affect downstream Clay Creek fish or fish habitat through use of proper mitigation measures to control erosion and sedimentation on the HRPP project site as described in section 8.4.

During the planning and construction phase of the project, appropriate measures will be implemented to prevent any erosion or sedimentation which could significantly impact Government Drain #10. Section 4.3 of this report provides further details on prevention of erosion and sedimentation.

Given the above mitigation measures, the project will have no significant impacts on fish habitats.

8.6 Migratory Birds

The overall GSPC property including the HRPP project site is not known to be part of the critical habitat or staging area for any migratory birds.

Therefore, the project will have no net impacts on migratory birds.

8.7 Locally Important or Valued Ecosystems or Vegetation

The bulk of the GSPC property and the entirety of the area to be developed for the HRPP project is 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 section 8.2 above).

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

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

9. Natural Resources and Potential Impacts

9.1 Efficient use of Non-renewable Resources

The HRPP Project will have an electrical generation efficiency of approximately 48%. The MECP (Ontario Regulation 116/01) defines efficiencies of over 40% as being an “efficient use of non-renewable resources”. The facility will utilize natural gas which is fossil-sourced and non-renewable. However at 48% efficiency, the project will meet the MECP guideline criteria in terms of efficient use on non-renewable resources.

In addition, the HRPP facility will use hydrogen admixed with natural gas and eventually use hydrogen exclusively. To the extent that externally sourced hydrogen is made with renewable resources its use at HRPP will reduce dependence on non-renewable resources.

The connection of the HRPP facility to the immediately adjacent electrical transmission lines also minimizes potential electrical line losses in the electrical distribution system for this new electrical generation capacity. This aspect also enhances efficient use on non-renewable resources.

Although future higher energy efficiency is technically possible via cogeneration with by-product hot water usage by nearby institutions or industries, this is not currently feasible, as the facility is expected to only operate during periods of peak and intermediate peak demand for electricity. The future feasibility of adding a cogeneration component could be re-evaluated at a future date, i.e., should the operating basis of the facility change so as to enable this option and depending on the arrival of local industrial energy users in for example the neighbouring industrial lands.

Therefore, the project will minimize its impact on the use of non-renewable resources by efficient use of currently available non-renewable fuel sources and the use of renewable resources over it project life.

9.2 Agricultural Lands

The project site is zoned for industrial uses and therefore, the project will have no impacts to the use of agriculturally zoned lands.

9.3 Existing Agricultural Production

The GSPC property, although zoned for industrial uses, is currently used by tenant farmers for agricultural crop production primarily to conserve soil, increase overall property aesthetics and for noxious weed control. The GSPC land to the north of the GEPP facility has been successfully fitted with field tile drainage to enhance its crop productivity.

The HRPP project site land area is marginal for crop production given its poor water drainage characteristics that cannot be improved due to available drainage outfall elevations but has been cropped with cover or cash crops to control weeds.

9.4 Mineral, Aggregate or Petroleum Resources

There are no known mineral or petroleum resources on the site and therefore, the project will have no material impacts on mineral, aggregate or petroleum resources.

9.5 Forest Resources

There are no merchantable forest resources on the site, and therefore the project will have no material impacts on forestry resources.

9.6 Fish and Game Resources

There are no fish or significant game resources on or nearby the HRPP project site. However, there are fish resources in Clay Creek that is connected to Government Drain #10 south of the GSPC property and fish resources downstream of Clay Creek in the St. Clair River. Section 8.5 above described mitigation measures to ensure no impacts to off-site fish resources.

Therefore, with the above mitigation measures, the project will have no net impacts on either fish or game resources.

10. Socio-Economic Impacts

10.1 Neighbourhood or Community Character

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

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

The new plant will be visually compatible with the existing 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 the creation of new transmission corridors.

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 closest hospital to the HRPP site is the Bluewater Health Hospital in Sarnia about 23 km to the north. There are no nursing homes, or other long-term care facilities within 500 metres of the project site.

The site is zoned for industrial activity and is designated for employment uses in official plans of both St. Clair Township and Lambton County.

Therefore, given the above, the project will have no net negative impacts on neighborhood or community character.

10.2 Local Businesses, Institutions or Public Facilities

The HRPP Project will purchase about $ 20 million of goods and services from local businesses during construction and contribute approximately about $ 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 only 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 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 several months that such a typical skilled trades worker may be employed at the site.

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 impacts on local businesses, institutions or public facilities.

10.3 Recreation, Cottaging or Tourism

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

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

10.4 Community Services or Infrastructure

The HRPP project will require water supply of up to about 200 liters per second for boiler feed-water and condenser cooling circuit make-up. This will be met from the existing 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). 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 impacts on community services or infrastructure.

10.5 Economic Base of Community

The HRPP project will inject approximately $4.5 million annually into the local economy over its 25 year minimum operating life in the form of salaries, procurement of local service and supplies and taxes. Economic ripple effects of up to 4X these direct economic benefits can also be expected. Given that 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 impacts on the economic base of the community.

10.6 Labour Supply and Employment

The HRPP Project will result in about 250 person years of construction employment as well as 25 skilled, full-time jobs once the plant is in operation. Given that Lambton County had total employment of about 132,972 in 2020 and a total value of industrial construction of about $ 200 million in 2019, the impact of the project on local businesses will be positive, and should not cause any distortions through shortages or surpluses in the labour markets of Lambton County, Ontario or Canada.

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

10.7 Motor Vehicle Traffic

The HRPP Project will cause only a short-term increase in local vehicle traffic during the construction period that will be noticed primarily by other users of Oil Springs Line and Highway 40. Highway 40 is a major through road serving many industrial establishments north of Oil Springs Line with two lanes in each direction with a design capacity of about 2000 vehicles per hour. The section nearest the HRPP site has a single lane in each direction. The most recent 2016 Ontario data for annual average daily traffic volume on Highway 40 at the Courtright Line and Bentpath Line intersections (i.e., north and south of the Oil Springs Line intersection) were 5050 and 3400 vehicle movements, respectively.

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

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

10.8 Public Health and Safety

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 NOx, CO or PM to the local airshed. 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 impacts on public health and safety.

11. Heritage and Culture Impacts

11.1 Heritage Buildings, Structures, Sites

The site is not and has no buildings on it of significance from a heritage perspective.

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

11.2 Archaeological Resources or Cultural Heritage Landscapes

The overall GSPC property was assessed previously for the presence of archaeological resources through a Site Heritage/ Archaeological Assessment (2012) and was determined not to contain or to have potential to contain any heritage landscapes or archaeological resources. The HRPP project area represents 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.

Therefore, the project will have no impacts on archaeological resources or heritage landscapes.

11.3 Scenic Views or Aesthetically Pleasing Landscapes

The HRPP Project will not have any impact on scenic views since the site does not have, nor form part of, any scenic views. The project will not have any impact on

aesthetically pleasing landscapes since the site is not a component of an aesthetically significant landscape. The proposed site is adjacent to a rail line and a 230 kV electrical transmission line corridor. The new plant 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.

12. Indigenous Peoples Impacts

12.1 Impacts on First Nations

The GSPC property and the HRPP project site on the GSPC property are not part of any First Nation (FN) reserve lands or on lands subject to any pending claims by indigenous peoples communities.

There are First Nation reserves in the greater region of the project site including: Aamjiwnaang First Nation approximately 20 km to the north of the site; Walpole Island First Nation approximately 20 km to the south; Moravian of the Thames First Nation approximately 47 km from the site; Chippewas of Kettle and Stony Point approximately 55 km from the site; Chippewas of the Thames First Nation approximately 79 km from the site; Munsee Delaware First Nation approximately 79 km from the site; Caldwell First Nation approximately 82 km from the site and Oneida Nation of the Thames approximately 85 km from the site.

Early consultation with these First Nations was undertaken with direct contact made in writing to their respective Chiefs and their band environmental coordinators (as named by some of these First Nations). Information was provided as to the location and nature of the project and each was directed to the HRPP project website for additional information. Each FN was also invited to raise any questions they might have and provide any comments or concerns.

Follow-up telephone calls were made November and December, 2021 and February and March 2022.

This early and ongoing consultation effort which was built upon previous experience and relationships developed through the earlier Green Electron Power project, has led to productive responses by the two First Nations closest to the HRPP project as well as a number of the others further afield from the site.

This has led to an independent peer review of the ESRR and its component study reports as arranged by the WIFN using an independent consultant firm Neegan Burnside.

Details of the consultations with First Nations are provided in detail in Appendix 17.6.

The project reflects appropriate stewardship of natural resources as detailed throughout this ESRR and the proponent will continue its dialogue with First Nations to ensure that

the impact on First Nations is net positive to them. In this regard, the project will provide new employment opportunities for the region, including to First Nations. Eastern Power had continued to maintain an ongoing consultation with both the Walpole Island First Nation and the Aamjiwnaang First Nation for the GSPC GEPP project after GEPP project completion and commercial operation had begun.

13. Other Potential Impacts

13.1 Waste Materials Requiring Disposal

Waste materials created by the project include non-hazardous solid waste and non-hazardous liquid waste. During construction, waste materials will be substantially similar to those that are created at the majority of other industrial construction sites. These wastes consist mainly of packaging materials, excess or spoiled construction materials, and incidental wastes (e.g. from workers meals, and job site administration).

During operation the waste material will be substantially similar to those created at the majority of light industrial establishments. These wastes are low in volume and incidental to the clean electricity generation process which itself creates no solid waste stream. Typical wastes will include broken or worn out equipment parts, packaging materials associated with repair parts and consumables such as air filter elements

Wherever economically feasible or mandated by law, solid waste materials will be recycled. During operation the plant will also create a small quantity of liquid wastes that require specialized disposal, including lubricating oil and cleaning solvents. Any such hazardous wastes will be handled only by MECP licensed recycling or hazardous waste disposal companies.

Therefore, the project will not have net negative impacts due to the generation of wastes requiring disposal off-site.

13.2 Mitigation Implementation, Monitoring and Feedback

A HRPP project Environmental Impact Management plan has been developed for use during all phases of the project and this is provided in Appendix 17.7.

All HRPP project staff and external contractors will be made aware of their individual responsibilities for implementing the necessary mitigation and impact management measures and, their responsibilities for regularly monitoring the implementation of these measures during all phases of the project to ensure that all mitigation measures are being applied as required and that they are performing adequately. Monitoring will also be required to identify unforeseen environmental impacts, which may require additional mitigation or impact management. Implementation of these possible additional mitigation and/or impact management measures will then be required.

13.3 Sustainability Aspects of the Project Design

The HRPP Project concept and design, in addition to the features described above, includes provisions for practical inclusion of a number of sustainability criteria as summarized below:

a) Sustainable Community Design

There is a potential for future energy cogeneration from the HRPP project (as described in section 9.1, above). Should the future operations of the facility permit useful supply of cogenerated energy, the proponent would explore the potential for a nearby industrial use of this cogeneration energy with potential users.

b) Sustainable Technologies

The proponent has chosen state of the art electrical power production equipment capable of utilizing hydrogen fuel along with natural gas (and their mixtures), i.e., to provide the most efficient and cleanest technology practically attainable at present.

Hydrogen fuel provides a new energy platform and a pathway for decarbonizing gas-fueled electrical power generation. Based on projections for hydrogen fuel availability from energy suppliers, hydrogen has the potential to provide not only immediate and near term significant GHG emission reductions but ultimately, net zero GHG emissions from gas-fueled electrical power generation, i.e., use of hydrogen on its own by 2050.

The proponent is working closely with power generation equipment suppliers and is committed to bringing future innovations to the facility in relation not only to emissions reduction but also with energy efficiency and water conservation, i.e., as proven and practically appropriate to the facility and its design and operational requirements.

c) Pollution Prevention

The proponent is committed to minimizing all emissions through a strong and rigorous program of plant maintenance, monitoring and operating procedures as more fully discussed in section 13.2 (above).

d) Sustainable Design

The facility buildings and its equipment will comprise recyclable and reusable materials to the extent practically possible. All waste lubricants, oils etc from operations and maintenance will be recycled through licensed off-site service suppliers.

e) Eco-efficiency Programs

The HRPP Project achieves a substantial measure of eco-efficiency. This is achieved through obtaining at least 48% efficiency with the use of natural gas fuel and also through the use of hydrogen with natural gas and ultimately, hydrogen alone, i.e., as it becomes increasingly available from energy fuel suppliers. Hydrogen use reduces

electrical power generation GHG emissions in direct proportion to the hydrogen content used, as combustion of hydrogen releases no GHG emissions.

14. MECP and Other Approvals

14.1 MECP Compliance Approvals

At completion of this ESRR, application for compliance approvals for both air/noise and wastewater treatment will be made to the MECP. The air quality impact assessment report (Appendix 17.2) and the Noise Impact & Mitigation Study report (appendix 17.3) provide required information to support these applications.

14.2 IESO System Impact Assessment (SIA)

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 the SIA that there would no adverse impacts for the proposed connection of the HRPP project.

14.3 Hydro One Networks Connection Impact Assessment (CIA)

A proponent-initiated/paid Hydro One Networks Inc,-conducted 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 the CIA that the Hydro One system and area customers will not be adversely impacted by the connection of the HRPP project.

14.4 Electricity Generator Licence

An application (fee paid) for a generator license has been made to the OEB and this pending application been has assigned file number EB-2021-0217.

In addition to the above, the SRCA has been contacted in relation to any requirement for a Ontario Regulation 97/04 permit for the placement of fill in the HRPP project area to be developed.

15. Conclusions

The Hydrogen Ready Power Plant Project includes the construction and operation of a new, clean, natural gas/hydrogen fuelled, electricity generating facility. The HRPP facility will feature new generation power turbine technology designed to utilize hydrogen both with natural gas and on its own. Hydrogen use provides decarbonization of gas fuelled electrical power generation as hydrogen combustion releases no GHG emissions.

This advanced power project will play an early role as part of the hydrogen energy platform being advanced by the energy industry as well as by both the Ontario and Federal governments as a major plank in the initiative of achieving net zero GHG emissions by 2050.

The HRPP facility will address needs for additional electricity generating capacity in Ontario's South-West region as identified by the Independent Electricity System Operator (IESO). The facility will have new connections to the IESO-controlled 230 kV

Hydro One electricity transmission grid directly adjacent to the project site and will utilize natural gas from existing pipelines already on the project site.

Eastern Power, the proponent identified some potential impacts of the project that required further assessment, namely air and noise emissions and therefore, chose to proceed directly to the environmental review stage without first issuing the environmental screening report. The environmental screening report is included in this ESRR (appendix 17.1)

The further environmental assessments are detailed in reports of separate studies as appended to this ESRR and include air emissions (appendix 17.2) and noise emissions (appendix 17.3). Additional studies and plans supporting this ESRR include a stormwater management plan (appendix 17.4) and an environmental impact management plan (appendix 17.7). In preparation of this ESRR, the public and various potentially affected government agencies and First Nations were notified of the commencement of the review stage and were consulted for comments and concerns. These various consultations are further documented in Appendices 17.5 and 17.6.

Based on the results of the environmental screening and review of the HRPP Project, the HRPP facility can be constructed, operated and eventually decommissioned such that there will be no net negative effects to the environment or to the community. This acceptable result will be achieved by appropriate facility design and through implementing the mitigation and impact management measures identified in this ESRR, including good power plant engineering, construction, operation and maintenance practices.

16. Additional References

Environment Canada. Cumulative Effects Assessment Practitioners' Guide Prepared for: Canadian Environmental Assessment Agency by: The Cumulative Effects Assessment Working Group (Hegmann, G., C. Cocklin, R. Creasey, S. Dupuis, A. Kennedy, L. Kingsley, W. Ross, H. Spaling and D. Stalker) and AXYS Environmental Consulting Ltd., February 1999
https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/cumulative-effects-assessment-practitioners-guide.html

MECP. B-6 Guidelines for Evaluating Construction Activities Impacting on Water Resources
https://www.ontario.ca/page/b-6-guidelines-evaluating-construction-activities-impacting-water-resources

MECP. Stormwater Management Planning and Design Manual
https://www.ontario.ca/document/stormwater-management-planning-and-design-manual-0

Ontario Municipal Affairs and Housing, Provincial Policy Statement, 2020
https://www.ontario.ca/page/provincial-policy-statement-2020

Ontario Regulation 116/01

https://www.ontario.ca/laws/regulation/010116

O. Reg. 406/19: ON-SITE AND EXCESS SOIL MANAGEMENT
https://www.ontario.ca/laws/regulation/r19406

17. Appendices

Note: Appendix 17.1 screening checklist is included here. For the others, page dividers follow. For electronically transmitted copies of this ESRR separate PDF attachments of each appendix 17.2- 17.7 are supplied separately.

17.1 APPENDIX 17.1 - Screening Criteria Results

The HRPP Project is defined as a Category B project and therefore subject to environmental screening so as to meet the Environmental Assessment requirements for new electricity generating projects (Ontario Regulation 116/01 and MOE guide PIBS 4021e, revised January 2011).

The Checklist responses provided below were based on current knowledge or preliminary investigations. If there was uncertainty as to the response to a criterion question, further studies or consultation was conducted to answer the question.

On the basis of the screening results (below) and early public consultation, the Proponent elected to self-elevate the overall environmental assessment process to an environmental review. Therefore, the screening criteria checklist is included below for reference and to indicate what additional studies were performed. This checklist provides the relevant information and cross reference to appropriate sections in the Environmental Review Report.

Negative environmental effects were defined to include the negative effects that the project would have, or potentially could have, either directly or indirectly on the environment at any stage in the project life cycle, i.e., including all project phases of construction, commissioning, operational life and final decommissioning. Negative environmental effects were taken to include, but were not limited to the harmful alteration, disruption, destruction, or loss of:

1. natural features;
2. flora or fauna and their habitat;
3. ecological functions;
4. natural resources;
5. air or water quality, and
6. cultural or heritage resources.

Negative environmental effects were also assumed to include the displacement, impairment, conflict or interference with existing land uses, approved land use plans, businesses or economic enterprises, recreational uses or activities, cultural pursuits, social conditions or economic structure.

This Checklist as reported below does not take credit for mitigation or impact management measures, which are reported in detail in the Environmental Screening and Review Report. However, Net Effects are defined as the negative environmental effects that would remain after mitigation and impact management measures have been taken and such net effects are summarized in the Additional Information section of the Checklist.

Environmental Screening Checklist

CRITERION		POTENTIAL NEGATIVE EFFECTS[1]		
1.	**Surface and Ground Water**	**Yes**	**No**	**Net effects including with Mitigation Measures Additional Information[1,2]**
1.1	Will the project have negative effects on surface water quality, quantities or flow?	√		No surface water taking Treatment of wastewater will mitigate impacts as reported in section 4
1.2	Will the project have negative effects on ground water quality, quantity or movement?		√	No withdrawal from or input to groundwater. Most stormwater will continue to recharge groundwater or watershed as detailed in Section 4.2 and in Appendix 17.4
1.3	Will the project cause significant sedimentation, soil erosion or shoreline or riverbank erosion on or off site?		√	See Section 4.3
1.4	Will the project cause potential negative effects on surface or ground water from accidental spills or releases to the environment?		√	Low potential for spills in construction, commissioning and operational phases. No net negative impacts as a result of appropriate containment and mitigation structures and procedures to be implemented; see Section 4.4 and 13.1 for details.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MOE Screening criteria and guidelines; http://www.ene.gov.on.ca/envision/gp/4021e.pdf

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

2.	Land	Yes	No	Net effects including with Mitigation Measures Additional Information[1,2]
2.1	Will the project have negative effects on residential, commercial or institutional land uses within 500 metres of the site?		√	There are no residential building receptors within the 500 metre zone for which atmospheric emissions and noise could have impacts. The majority of land use within the 500 metre zone is industrial. There are no net impacts from noise and emissions with mitigation measures in place as detailed in Sections 6.1, 6.2, 6.4 and in Appendices 17.2 and 17.3.
2.2	Will the project be inconsistent with the Provincial Policy Statement, provincial land use or resource management plans?		√	No inconsistency; see section 5.2 for details
2.3	Will the project be inconsistent with municipal land use policies, plans and zoning by-laws?		√	Land for the project is on industrial land appropriately zoned by the municipality; see Section 5.3 for details
2.4	Will the project use hazard lands or unstable lands subject to erosion?		√	Confirmed previously by GSPC with ESA Phase I study for overall land; HRPP to use a portion of GSPC land.
2.5	Will the project have potential negative effects related to the remediation of contaminated land?		√	Project will not impair the remediation of any contaminated lands and project does not emit contaminants to land; see Section 5.4 for details

1: Impacts include potential impacts for all phases of Project Life: In accordance with MECP Screening criteria and guidelines; http://www.ene.gov.on.ca/envision/gp/4021e.pdf

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

3.	Air and Noise	Yes	No	Net effects including with Mitigation Measures Additional Information[1,2]
3.1	Will the project have negative effects on air quality due to emissions of nitrogen dioxide, sulphur dioxide, suspended particulates, or other pollutants?	√		Emissions of nitrogen dioxide, carbon monoxide, and particulate matter (no sulphur dioxide or other pollutants) will occur from combustion of natural gas and hydrogen gas. No net impacts will occur with mitigation procedures in place. Emissions will meet provincial guidelines at nearest point of impingement. See Section 6.1 and Section 7 and Appendix 17.2 for details as to emissions and their mitigation.
3.2	Will the project cause negative effects from the emission of greenhouse gases (CO_2, methane, etc.)?	√		CO_2 emissions from burning natural gas fuel but not from hydrogen. Net Impacts of GHG emission will be progressively reduced over project life as hydrogen fuel becomes more available and utilized. See Section 6.3.
3.3	Will the project cause negative effects from the emission of dust or odour?	√		Potential dust emissions in construction phase only but no odour emissions at any phase. No Net Impacts with mitigation procedures in place; see Section 6.3 and Appendix 17.2 for details.
3.4	Will the project cause negative effects from the emission of noise?	√		Turbines, transformers and cooling system will emit noise. No net Impacts due to noise with mitigation features incorporated,; see Section 6.4 and Appendix 17.3. Noise emissions at nearest critical point of reception will meet nighttime regulatory limit of 45dBA.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MOE Screening criteria and guidelines; http://www.ene.gov.on.ca/envision/gp/4021e.pdf

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

4.	Natural Environment	Yes	No	Net effects including with Mitigation Measures Additional Information[1,2]
4.1	Will the project cause negative effects on rare, threatened or endangered species of flora or fauna or their habitat?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land.
4.2	Will the project cause negative effects on protected natural areas such as ANSI's (Area of natural or Scientific Interest), ESA's (Environmentally Significant Area) or other significant natural areas?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is small portion (10%) of overall GSPC land.
4.3	Will the project cause negative effects on wetlands?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land
4.4	Will the project have negative effects on wildlife habitat, populations, corridors or movement?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land
4.5	Will the project have negative effects on fish or their habitat, spawning, movement or environmental conditions (e.g., water temperature, turbidity, etc.)?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land
4.6	Will the project have negative effects on migratory birds, including effects on their habitat or staging areas?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land
4.7	Will the project have negative effects on locally important or valued ecosystems or vegetation?		√	Confirmed previously (2012) through an Environmental Site Impact study of entire GSPC property; HRPP site is portion (10%) of overall GSPC land

1: Impacts include potential impacts for all phases of Project Life: In accordance with MOE Screening criteria and guidelines; http://www.ene.gov.on.ca/envision/gp/4021e.pdf

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

5.	Resources	Yes	No	Net effects including with Mitigation Measures Additional Information[1,2]
5.1	Will the project result in inefficient (below 40%) use of a non-renewable resource (efficiency is defined as the ratio of output energy to input energy, where output energy includes electricity produced plus useful heat captured)?		√	Project will achieve 48% efficiency (electrical) through combined cycle operation without provision for potential combined residual heat product use; see report Section 3.2 for details. Project ties directly to existing local transmission network improving net efficiency by avoiding electrical line losses.
5.2	Will the project have negative effects on the use of Canada Land Inventory Class 1, 2 or 3, specialty crop or locally significant agricultural lands?		√	Project lands are zoned industrial.
5.3	Will the project have negative effects on existing agricultural production?		√	Project lands have been used for agricultural production in spite of industrial zoning and this on marginal land with poor productivity and not suited to tile drainage.
5.4	Will the project have negative effects on the availability of mineral, aggregate or petroleum resources?		√	No resource at or near facility.
5.5	Will the project have negative effects on the availability of forest resources?		√	No forest resource at or near HRPP facility
5.6	Will the project have negative effects on game and fishery resources, including negative effects caused by creating access to previously inaccessible areas?		√	No game resource at or near HRPP facility.

1: Impacts include potential impacts for all phases of Project Life: In accordance with MOE Screening criteria and guidelines; http://www.ene.gov.on.ca/envision/gp/4021e.pdf

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

6.	Socio-economic	Yes	No	Net effects including with Mitigation Measures Additional Information[1,2]
6.1	Will the project have negative effects on neighbourhood or community character?		√	Project is consistent with activities of industrial neighbours see Section 10.1 for details
6.2	Will the project have negative effects on local businesses, institutions or public facilities?		√	Project will provide local economic stimulus and help assure energy supply security; see Section 10.2 for details
6.3	Will the project have negative effects on recreation, cottaging or tourism?		√	No applicable uses near facility.
6.4	Will the project have negative effects related to increases in the demands on community services and infrastructure?		√	Requirements for water and wastewater services have been confirmed to be within existing municipal capacities; see Section 10.4 for details
6.5	Will the project have negative affects on the economic base of a municipality or community?		√	Project will provide industrial tax revenues, economic activity and jobs.
6.6	Will the project have negative affects on local employment and labour?		√	Project will provide local employment opportunities in all project phases
6.7	Will the project have negative effects related to traffic?		√	Municipality does not require traffic study due to light volumes expected
6.8	Will the project cause pubic concerns related to public health and safety?		√	No; see Section 10.8 for details

1: Impacts include potential impacts for all phases of Project Life: In accordance with MOE Screening criteria and guidelines; http://www.ene.gov.on.ca/envision/gp/4021e.pdf

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

7.	Heritage and Culture	Yes	No	Net effects including with Mitigation Measures Additional Information[1,2]
7.1	Will the project have negative effects on heritage buildings, structures or sites, archaeological resources, or cultural heritage landscapes?		√	Previously confirmed (2012) through Archaeological Assessment; see Section 11
7.2	Will the project have negative effects on scenic or aesthetically pleasing landscapes or views?		√	No scenic or aesthetically pleasing landscapes or views within view of the project.
8.	**Aboriginal**	**Yes**	**No**	**Net effects including with Mitigation Measures Additional Information[1,2]**
8.1	Will the project cause negative effects on First Nations or other Aboriginal Communities?		√	Not on First Nation (FN) land or claimed by any FN and will not affect traditional uses by FNs
9.	**Other**	**Yes**	**No**	**Net effects including with Mitigation Measures Additional Information[1,2]**
9.1	Will the project result in negative effects due to the creation of waste materials requiring disposal?	√		Cooling tower blowdown waste water contains hardness and other ions and waste heat; this impact will be mitigated by treatment in a municipal WWTF. see Section 10.4 for details
9.2	Will the project cause any other negative environmental effect not covered by the criteria outlined above?		√	NA

1: Impacts include potential impacts for all phases of Project Life: In accordance with MOE Screening criteria and guidelines.

2: Net Impacts as stated resulting from application of mitigation features and procedures as referenced

17.2 APPENDIX 17.2 – Air Quality Impact Assessment Report

17.3 APPENDIX 17.3 – Noise Impact & Mitigation Study Report

17.4 APPENDIX 17.4 - Stormwater Management Study Report

17.5 APPENDIX 17.5 - Public Consultation Report

17.6 APPENDIX 17.6 - Government Agency/ First Nations Consultation Report

17.7 APPENDIX 17.7 – Environmental Impact Management

17.8 APPENDIX 17.8- Natural Resources Baseline Report and Environmental Impact Study (EIS)