

Preliminary Assessment Public Summary

This is a *Preliminary Assessment Public Summary* prepared by Puro.earth, which contains general information about the CO₂ Removal Supplier, a non-technical summary of the project, and a table containing details about the criteria assessed. The CO₂ Removal Supplier has received an extended Preliminary Assessment Report that includes additional remarks and recommendations for the continuation of the certification journey.

1. Supplier and project information

CO ₂ Removal Supplier	
Company name	Aeon Blue INC.
Company address	Canada
Business ID	4608790
KYC status	Completed (2024-02-28)
CO ₂ Removal Project	
Methodology	Geological Carbon Storage, Edition 2022 (Assessment adjusted to Edition 2024)
Production Facility name	Aeon Blue Cape Breton Project
Facility registration date	2024-10-29
Production Facility ID	938534
Production Facility location	2865-2889 Hinchey Avenue, New WaterfordB1H 2M4, Canada
Host Country of removal	Canada
Has this facility been registered in another registry?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, additional information:
Assessment details	
Date of assessment	2024-11-27
Status of assessment	Final
Conclusion of assessment	Passed

2. Non-technical project summary*

Aeon Blue's Cape Breton Project is an innovative First-of-a-Kind facility that combines Direct Air Capture (DAC) with sustainable fuel production in Nova Scotia, Canada.

This zero-waste facility will use renewable energy from an on-site 20MW solar farm to power a proprietary seawater reactor, simultaneously producing hydrogen from seawater while over-capturing a surplus of atmospheric CO₂, all in the same energy step. By combining these processes, the carbon impact includes both capturing and storing carbon from air (legacy emissions) while also displacing fossil fuels in the energy mix (avoided emissions).

The facility will capture 10,444 tons of atmospheric CO₂ annually, sequestering it in the underlying Horton Group rock formation. 3,376 tons of additional air captured CO₂ will be combined with green hydrogen to produce carbon-neutral eNatural Gas. The project site's geological storage viability has been validated by Black & Veatch, a global leader in carbon sequestration. Beyond carbon impact, the project delivers significant co-benefits to the community, including local job creation with priority hiring for Mi'kmaq First Nations, student internships, and production of distilled water for community use. The facility is scheduled to begin operations in Q2 2027, marking a significant milestone in sustainable fuel production and carbon dioxide removal.

*Added by the supplier. Between 150-200 words

The definition of CO₂ Removal Supplier and Production Facility can be found in the Puro Standard.

3. Criteria assessment report

Reminder: Sub-criteria either concern the Production Facility's technical eligibility or its maturity and quality. There are three types of sub-criteria:

- **Required to be passed:** These correspond to the core criteria related to the eligibility of a Production Facility. Suppliers must meet these criteria, as they may otherwise be impossible or costly to change at a later stage of the certification journey.
- **Required to be assessed:** These criteria are important for evaluation but do not necessarily determine pass or fail at this stage, as it is understood that the suppliers may be at different stages of development.
- **Not required:** These criteria are optional at this stage. They may provide additional information about the project maturity but are not essential for passing the preliminary assessment.

For a facility to be considered eligible for listing, all the sub-criteria that condition eligibility must be met (i.e. passed or assessed). If one of those sub-criteria is not met, the facility in its current state of development is not eligible for listing.

Disclaimer: The assessment has been made against the criteria in the current version of the methodology. Puro.earth relied on the CO₂ Removal Supplier for the correctness of the provided information during the time of the preliminary assessment and will make no representation as to the accuracy or completeness of this report. The CO₂ Removal Supplier must undergo a third-party audit before issuing CO₂ Removal Credits (CORCs). **Passing the preliminary assessment does not guarantee a success in the third-party audit.**

Table 1. Criteria and sub-criteria assessment by Puro based on the documents submitted.

ID	Criteria / Sub-criteria	Outcome	Comment	Evidence received	Required to be listed	Purpose of criteria
c1	Planned CO₂ source(s) is(are) eligible	Passed			Passed if required sub-criteria are met	
c1.1	CO ₂ sources are either atmospheric or biogenic	Passed	CO ₂ source is atmospheric.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be passed	Technical eligibility
c1.2	Sourcing of CO ₂ is secured (e.g. letters of intent, contracts)	Assessed	Aeon Blue owns the intellectual property of the direct air capture technology and will conduct its own capture operations. Thus, sourcing is secured.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c2	Planned CO₂ capture technology is technically sound	Passed			Passed if required sub-criteria are met	
c2.1	One or several options of capture technology have been identified	Passed	The capture technology selected by the supplier relies on sodium hydroxide as a capture agent, coupled with an electrolysis system. The capture technology also produces co-products (e.g. methane, rocket fuel, desalinated water).	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be passed	Technical eligibility

c2.2	Capture technology design has been decided, contracted, or purchased	Assessed	Aeon Blue's technology is wholly owned and designed by the company and will be built to scale by its own engineers.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c2.3	Capture technology is vetted, regarding technical performance	Assessed	The technology was vetted by external laboratories, other companies, and published in peer-reviewed scientific journals. It is a first of its kind facility. Actual performance (energy and material efficiencies) will have to be further measured once operations have started. <i>It is noted that the operations (capture to storage) will be powered by an off-grid solar farm; hence adequately mitigating renewable energy leakage under Edition 2024 of the methodology.</i>	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf Comparative analysis of Benchmark and Aeon Blue Technologies for sustainable Fuel production - Integrating Direct Air Capture and Green Hydrogen approaches (with supplemental material).pdf LANL Preliminary Lifecycle Analysis for Aeon Blue (Alkalinity Enhancement at Navajo Reservation Use Case).pdf Technical Summary for Aeon Blue Cape Breton Project.pdf (Kumar et al., 2024)	Required to be assessed	Maturity & Quality
c2.4	Capture technology is vetted, regarding environmental and health risks	Passed	Environmental and health risks in relation to chemical usage will have to be assessed and monitored during operations, and approval from local authorities needs to be obtained.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf EA-Timelines-FULL-Presentation, Nova Scotia Department of Environment and Climate Change.pdf	Required to be passed	Technical eligibility
c3	Planned CO₂ logistics are technically sound	Passed			Passed if required sub-criteria are met	
c3.1	Full logistics chain has been identified	Passed	The storage site is co-located with the capture facility. Hence, little to no CO ₂ transport is required. Intermediary storage may be required before injection.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf Aeon Blue Carbon Dioxide Logistics.pdf	Required to be passed	Technical eligibility
c3.2	Properties of the CO ₂ stream to be transported are compatible with the logistics chain	Assessed	The CO ₂ stream processing plan (dehydration and compression) is expected to meet the necessary requirements for transport and injection.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c3.3	CO ₂ transport logistics is secured (e.g. letters of intent, contracts)	Assessed	All logistics will be part of the Production Facility. Thus, all transport will be managed internally.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality

c4	Planned CO ₂ storage site(s) is(are) eligible	Passed			Passed if required sub-criteria are met	
c4.1	One or several options for CO ₂ storage sites have been identified	Passed	The CO ₂ will be stored in the Horton Group geological formation, located underneath the Production Facility. Feasibility studies that include both empirical data and model simulations have deemed this formation to be viable for carbon storage.	<p>Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf</p> <p>Alluvial Fan Deposits of the Carboniferous Grantmire Formation in Drill Hole PE 83-1, Sydney Basin, Nova Scotia.pdf</p> <p>Schlumberger 2012 Sydney Sub-basin feasibility study for CO₂ storage.pdf</p> <p>Schlumberger Carbon Services Rock Analysis Final Report.pdf</p> <p>Summary of Previous Assessments for the Geologic Sequestration of Carbon Dioxide (2024).pdf</p> <p>Offshore Carbon Storage Poster.pdf</p>	Required to be passed	Technical eligibility
c4.2	Appropriate classification and permitting of CO ₂ Storage site(s) have been identified	Passed, with remarks regarding Edition 2024	<p>Aeon Blue has started legal procedures that will be submitted in Q1 2025 to obtain approval for exploratory drill, well construction and operations related to carbon storage in the Horton Group formation.</p> <p><i>In alignment with Edition 2024 of the methodology, the supplier has confirmed that the storage site will not be used for enhanced hydrocarbon recovery.</i></p> <p><i>It must be noted that the storage site is not located in a jurisdiction pre-approved by Puro. Thus, it remains to be demonstrated that the legal framework for the environmentally safe geological storage of carbon dioxide, in Nova Scotia, is sufficiently robust as per rule 3.2.11 in Edition 2024 of the methodology. The supplier has already started work with local authorities to develop such framework.</i></p>	<p>Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf</p> <p>Class VI Permitting Workshop Day 1.pdf</p> <p>Class VI Permitting Workshop Day 2.pdf</p>	Required to be passed	Technical eligibility
c4.3	Storage site for CO ₂ is secured (e.g. letters of intent, contracts)	Assessed	The CO ₂ storage site area is owned by Public Services and Procurement Canada. Negotiations are in place for the supplier to buy the site.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c5	Additionality is demonstrated	Passed			Passed if required sub-criteria are met	

c5.1	Carbon storage additionality to baseline	Passed	Without the project activity there would be no carbon capture, as the carbon would stay in the atmosphere.	Aeon Blue Baseline and Additionality Assessment.pdf	Required to be passed	Technical eligibility
c5.2	Financial additionality of facility	Passed	A techno-economic analysis was conducted, building on results of chemical modelling software (Aspen+) and market price assumptions. The analysis included revenues from co-products. The IRR is negative without revenues from carbon finance. Investment Tax Credits (Bill C-59) were deemed to not affect the conclusion of the financial analysis.	Aeon Blue Baseline and Additionality Assessment.pdf Aeon Blue Cape Breton Project Techno-economic Analysis.xlsx	Required to be passed	Technical eligibility
c5.3	Regulatory additionality	Passed	The carbon removal activity is not mandated or required in their jurisdiction.	Aeon Blue Baseline and Additionality Assessment.pdf Capturing the opportunity A Carbon Management Strategy for Canada.pdf	Required to be passed	Technical eligibility
c6	Facility has monitoring, reporting, and LCA capabilities or tangible plans	Passed			Passed if required sub-criteria are met	
c6.1	A monitoring-reporting-verification (MRV) protocol has been drafted	Assessed	A preliminary plan that identifies the main criteria and parameters needed to be monitored during operations was provided, specifying the whole removal activity and monitoring of the storage site. Further work is needed.	Aeon Blue Cape Breton Project MRV Protocol.pdf Aeon Blue Class IV Monitoring Equipment (identified).xlsx	Required to be assessed	Maturity & Quality
c6.2	Measurement devices needed for monitoring have been identified	Assessed	The supplier has identified the measurement devices needed for carbon accounting monitoring and monitoring of mechanical, environmental and operational integrity of the storage site. Further work is needed.	Aeon Blue Cape Breton Project MRV Protocol.pdf Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c6.3	An LCA model specific to the facility's operation is prepared	Assessed	A preliminary LCA model was provided, estimating project emissions. Project emissions seem to mainly arise from equipment manufacturing (in relation to the off-grid PV installation) and certain fugitive emissions. Conservatively, emissions from co-products usage were included and attributed to the removals. Certain emission sources have however been neglected. Emission factors and calculations details need to be better presented for verification purposes. <i>Overall, the LCA model will need to be revised to be in line with Edition 2024 of the GSC methodology.</i>	puro_LCA_Aeon Blue Cape Breton Project.xlsm Carbon Intensity Comparison of E-Natural Gas Trucks, Battery Electric Trucks, and Existing Diesel Rail for Short-Haul Transportation.pdf Table of Natural Gas Freight Truck Manufacturers and Embedded Emissions.pdf	Not required	Maturity & Quality
c7	Environmental and social safeguards	Passed			Passed if required sub-criteria are met	

c7.1	Stakeholder consultations have been planned or conducted	Assessed	Local invitations were sent to local organizations (universities, companies, governmental, marine, consultants). Town halls are planned for 2025 to engage with the local community, which is required when building the target well type. The presence of indigenous communities requires special attention, and actions for this are planned. Further work is needed.	Aeon Blue Stakeholder Engagement Report.pdf Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c7.2	Regulation applicable to facility has been identified	Assessed	The supplier has identified the necessary permits and environmental legislation pertinent to its activities.	Aeon Blue Stakeholder Engagement Report.pdf	Required to be assessed	Maturity & Quality
c7.3	Procedures to acquire relevant permits have been identified, started, or completed	Assessed	Procedures to acquire all necessary permits and regulatory procedures have started and are planned to be completed in Q2-2025, aiming at facility operations start in Q2-2027.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c8	Facility has likely co-benefits and positive SDG impacts	Passed			Passed if required sub-criteria are met	
c8.1	Facility-specific co-benefits have been identified	Assessed	The main co-benefits identified by the supplier are the production of distilled water that can potentially be used for drinking or irrigation, the production of a renewable high-value fuels, job creation and internships offered to the local communities.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c8.2	Facility-specific SDG targets or indicators have been identified	Assessed	Identified SDGs include SGD 5, 6, 7, 8, 9, 12, 13, 14, and 15; but no specific targets or indicators were identified. Aeon Blue plans to register SDG co-benefits with the United Nations' SDG Actions Platform.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Required to be assessed	Maturity & Quality
c9	Facility team has access to relevant knowledge and skills	Passed			Passed if required sub-criteria are met	
c9.1	Relating to CO ₂ capture	Assessed	The team preparing the facility has two years of experience in developing a point source capture device. The team is being supported by EPC Black & Veatch, a geologic storage engineering company. The executive team has experience in renewable energy and electrochemistry, as well as project development and management.	Aeon Blue Cape Breton Project Preliminary Assessment Report.pdf	Not required	Maturity & Quality
c9.2	Relating to CO ₂ logistics	Assessed			Not required	Maturity & Quality
c9.3	Relating to geological storage of CO ₂	Assessed			Not required	Maturity & Quality
c9.4	Relating to monitoring and emission accounting	Assessed			Not required	Maturity & Quality