Preliminary Assessment Public Summary

This is a *Preliminary Assessment Public Summary* prepared by Puro.earth, which contains general information about the CO_2 Removal Supplier, a non-technical summary of the project, and a table containing details about the criteria assessed. The CO_2 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	Carbon Alpha, 707 5 Street SW, Suite 700
Company address	Calgary T2P1V8, Alberta, Canada
Business ID	780676540
KYC status	Pending (as of 2024-09-13)
CO_2 Removal Project	
Methodology	**Geologically Stored Carbon, Edition 2022** *(assessment partly adjusted to Edition 2024)*
Production Facility name	**North Star**
Facility registration date	2024-05-06
Production Facility ID	684035
Production Facility location	Meadow Lake, Saskatchewan, S9X 1T8
Host Country of removal	Canada
Has this facility been registered in another registry?	☒No ☐Yes, additional information:
Assessment details	
Date of assessment	2024-09-05
Status of assessment	Final
Conclusion of assessment	Passed

2. Non-technical project summary*

North Star is a Bioenergy with Carbon Capture and Storage (BECCS) carbon removal project located in Meadow Lake, Saskatchewan, Canada. The new carbon capture and storage (CCS) facility will capture biogenic emissions from the existing MLTC Bioenergy Centre, which currently produces renewable heat and power from residues generated by the NorSask Forest Products sawmill. The biomass that feeds the sawmill is sustainably harvested and managed. The captured biogenic CO2 will be transported via pipeline to a nearby geological storage site where it will be injected into the Basal Cambrian Sandstone formation. The entire CCS process will be operated by Carbon Alpha and co-owned with Meadow Lake Tribal Council, who represent 9 First Nations in NW Saskatchewan. Revenues will support local communities by fostering local economic growth and enhancing on-reserve education, healthcare, youth and elder programs, housing and other community social and infrastructure needs. The project is currently in the design phase and is planned to be operational by mid-2027. Approximately 70,000 CORCs will be available annually once the project is operational.

*Written by the Supplier. Between 150-200 words.

The definition of CO_2 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 CO_2 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 CO_2 Removal Supplier must undergo a third-party audit before issuing CO_2 Removal Credits (CORCs). **Passing the preliminary assessment does not guarantee a success in the third-party audit.**

Disclaimer: This specific assessment has been adjusted to reflect some important changes in the updated GSC methodology (Edition 2024).

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 CO_2 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 biogenic, derived from forest biomass, primarily residues from sawmill operations.	Puro additionality questions to suppliers v1.8.pdf, Biomass types and origins list.xlsx	Required to be passed	Technical eligibility
c1.2	Sourcing of CO_2 is secured (e.g. letters of intent, contracts)	Assessed	The bioenergy facility is already operational and has biomass supply-chains in place. Hence, CO_2 sourcing is deemed secure.	Biomass types and origins list.xlsx	Required to be assessed	Maturity & Quality
c2	**Planned CO_2 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	An amine-based technology was chosen by the supplier as the most appropriate capture technology for this flue gas.	North-Star-Feasibility-Study.pdf	Required to be passed	Technical eligibility
c2.2	Capture technology design has been decided, contracted, or purchased	Assessed	The design has been decided. Vendors were contacted for collecting cost and delivery time information (Table 2-4).	North-Star-Feasibility-Study.pdf	Required to be assessed	Maturity & Quality
c2.3	Capture technology is vetted, regarding technical performance	Assessed	The use of amine-based capture, dehydration and compression equipment was vetted by the supplier in a feasibility study. Further evaluation is planned at later stages of project development.	North-Star-Feasibility-Study.pdf	Required to be assessed	Maturity & Quality
c2.4	Capture technology is vetted, regarding environmental and health risks	Passed	Specifically for the capture process, an approval of the facility by competent authorities will be obtained, although it may not necessarily require an Environmental Impact Assessment (EIA). Any potential environmental and health risks related to the use and disposal of the selected sorbent (amine-based) remain to be clarified.	Environmental permits and studies.pdf	Required to be passed	Technical eligibility
c3	**Planned CO_2 logistics are technically sound**	**Passed**			Passed if required sub-criteria are met	
c3.1	Full logistics chain has been identified	Passed	The planned logistic chain includes mainly pipeline transport up to the injection well. Design for the pipeline (to be built) has been proposed.	North-Star-Feasibility-Study.pdf, CO2-Logistics_Puro	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 planned processing of the CO_2 stream (dehydration and compression) is meant to meet transportation specifications. Specifications have been defined. Pre-treatment of the flue gas might also be needed.	North-Star-Feasibility-Study.pdf (Table 1-2), CO2-Logistics_Puro	Required to be assessed	Maturity & Quality
c3.3	CO_2 transport logistics is secured (e.g. letters of intent, contracts)	Assessed	The supplier will own and operate the pipeline. The pipeline remains to be built.	North-Star-Feasibility-Study.pdf, CO2-Logistics_Puro	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	One option has been identified, namely the Basal Cambrian Sandstone (BCS) storage reservoir.	North-Star-Feasibility-Study.pdf	Required to be passed	Technical eligibility
c4.2	Appropriate classification and permitting of CO_2 Storage site(s) have been identified	Passed	The storage site is in a jurisdiction allowed by Puro's Edition 2024 GSC methodology (rule 3.2.11), namely Alberta, Saskatchewan. *It must be confirmed that the storage site will not be used for enhanced hydrocarbon recovery.*	North-Star-Feasibility-Study.pdf	Required to be passed	Technical eligibility

c4.3	Storage site for CO_2 is secured (e.g. letters of intent, contracts)	Assessed	The supplier will be the owner and operator of the storage site. Legal procedures have started to obtain all necessary authorizations to build and operate a storage site at the identified location (e.g. lease of space was granted as of April 2024).	Saskatchewan Lease of Space Disposition for Storage Site.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	In the baseline (current scenario), biogenic carbon dioxide from biomass burning is fully released to the atmosphere.	Puro additionality questions to suppliers v1.8.pdf	Required to be passed	Technical eligibility
c5.2	Financial additionality of facility	Passed	Without carbon credits, the project does not have the financial possibility to operate the capture and storage systems.	Puro additionality questions to suppliers v1.8.pdf	Required to be passed	Technical eligibility
c5.3	Regulatory additionality	Passed	There are no local laws requiring the bioenergy facility to install and operate a capture unit for subsequent storage.	Puro additionality questions to suppliers v1.8.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 both monitoring of the whole removal activity and specific monitoring of the storage site. The feasibility study also includes details about monitoring necessities. Further work is needed.	MRV-Plan.pdf, North-Star-Feasibility-Study.pdf	Required to be assessed	Maturity & Quality
c6.2	Measurement devices needed for monitoring have been identified	Assessed	A preliminary table listing devices needed for monitoring operations was presented. Further work is needed.	MRV-Plan.pdf, List of devices requiring calibration.xlsx	Required to be assessed	Maturity & Quality
c6.3	An LCA model specific to the facility's operation is prepared	Assessed	An extract of a spreadsheet model was provided, illustrating that LCA modelling has started. The modelling however needs to be revised for compliance with Edition 2024 of the GSC methodology.	LCA Calculations.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	A stakeholder mapping exercise has been made, and templates for receiving feedback were drafted. The presence of indigenous communities requires special attention, and actions for this are planned. Further work remains to be conducted.	North-Star-Feasibility-Study.pdf (Page 42-43), Engagement-Appendix-A-Stakeholder-Mapping.pdf, Engagement-Appendix-B-Key-Stakeholders.pdf, Engagement-Appendix-C-Engagement-Template.pdf	Required to be assessed	Maturity & Quality
c7.2	Regulation applicable to facility has been identified	Assessed	Relevant policies related to CO_2 capture practices and utilization of wells and pipes have been identified, as well as environmental regulations applicable to the activity.	Environmental permits and studies.pdf and North-Star-Feasibility-Study.pdf (Table 4-2 and 5.7).	Required to be assessed	Maturity & Quality
c7.3	Procedures to acquire relevant permits have been identified, started, or completed	Assessed	The process for obtaining licenses and permits has started, for the capture, pipelines and injection wells. It remains to be determined whether an EIA will need to be conducted for the capture, based on governmental decision. Further work remains to be conducted.	Environmental permits and studies.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 related to innovation, local employment opportunities, and improved energy systems. In particular, explicit social benefits to indigenous communities are reported (child and family services, education, and health and youth development programs), continuing from existing activities of the bioenergy and sawmills associated to the BECCS facility.	North-Star-Feasibility-Study.pdf (Page 42-43)	Required to be assessed	Maturity & Quality
c8.2	Facility-specific SDG targets or indicators have been identified	Assessed	Identified SDGs include SGD 7,8, 9, and 11, beside SDG 13. Individual SDG targets or indicators have not been explicitly mapped out.	North-Star-Feasibility-Study.pdf (Page 43)	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 is relatively large (about 25 full-time equivalents) including specialists in different areas relevant to the project. The team also relies on external expertise, as necessary. The team has also previous experience in deployment of similar technologies.	Carbon_Alpha_Facility_Team_Experience.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

c10	For biogenic CO_2: Planned biomass source(s) is(are) eligible	Passed			Passed if required sub-criteria are met	
c10.1	Biomass feedstock is eligible as per EU directive RED II or similar	Passed	Feedstock sustainability and traceability (Canadian forest residues) is deemed possible to demonstrate under the new Puro Biomass Sourcing Criteria. Feedstock is sourced from forest that are FSC or SFI certified.	2023-Mistik-Management-FSC-Certification.pdf, 2023-Mistik-Management-FSC-Controlled-Wood-Due-Diligence-System-Summary.pdf, Biomass types and origins list.xlsx	Required to be passed	Technical eligibility
c10.2	Biomass feedstock sustainability and chain-of-custody can be demonstrated, if applicable	Passed			Required to be passed	Technical eligibility
c10.3	Leakage related to feedstock use is minimal	Assessed	Leakage will need to be assessed following the rules of GSC Edition 2024. Here, this does not seem to affect eligibility of the project but may result in a reduced number of removals, if not mitigated.	LCA Calculations.pdf, Renewable energy inputs from a grid.docx	Required to be assessed	Technical eligibility
c10.4	Land use change related to feedstock use is minimal	Assessed			Required to be assessed	Technical eligibility
c10.5	Sourcing of biomass is secured (e.g. letters of intent, contracts)	Assessed	The bioenergy facility is already operational and has biomass supply-chains in place. Hence, biomass sourcing is deemed secure.	Biomass types and origins list.xlsx	Not required	Maturity & Quality