



Ministry of
Energy and
Climate Solutions

British Columbia Greenhouse Gas Offset Protocol: Carbon Capture and Sequestration

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Greenhouse Gas Industrial Reporting and Control Act

August 6, 2025

Version 1.0

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GUIDANCE

This document contains both a protocol for the carrying out of certain emission offset projects that capture or remove and sequester (permanently store) greenhouse gas emissions, and guidance associated with such projects. The Protocol is established under section 10 of the Greenhouse Gas Industrial Reporting and Control Act (“GGIRCA”). It creates legal requirements that Project Proponents, Validation Bodies and Verification Bodies must follow for the proponent to obtain Offset Units under GGIRCA. This document also contains guidance which is intended to assist Project Proponents, Verification Bodies and Validation Bodies. Such guidance is not a legal requirement imposed, although it may refer to binding legal requirements. For example, guidance may explain implications of a Protocol requirement or reminding Project Proponents that they may be subject to other legislation or regulations, and that nothing in this Protocol affects those obligations.

Text in this document which is italicized is guidance and is not part of this Protocol. Text in this document which is not italicized is part of this Protocol. Terms that are capitalized, other than for grammatic purposes, have the definitions ascribed to them in this Protocol, GGIRCA, the Emission Offset Project Regulation (“EOPR”), the Greenhouse Gas Emission Reporting Regulation (“GGERR”), the Petroleum and Natural Gas Act (“PNGA”), or the Energy Resource Activities Act (“ERAA”).

The guidance included within this Protocol is for the purpose of providing additional information only and may not be applicable to specific Projects. Project Proponents are responsible for ensuring compliance with all applicable laws, including, but not limited to, this Protocol, EOPR, GGIRCA, ERAA, PNGA, and associated British Columbia Energy Regulator (BCER) requirements or other regulations as applicable.

The Protocol expands on EOPR requirements for Eligible Projects and provides detailed rules for quantification of Project Reductions from Eligible Projects. The Protocol must be read in conjunction with EOPR, as most of the requirements of EOPR apply fully to Eligible Projects.

Simply meeting the eligibility requirements in this Protocol does not guarantee a Project will be able to generate Offset Units. Project Proponents are advised to confirm that the rules for calculating Baseline Emissions under this Protocol will allow for generation of Offset Units. Project Proponents are also advised to confirm that the required assertions related to additionality of the Project can be made.

Project Proponents are further responsible for understanding the interaction of Projects under this Protocol with other regulatory and funding programs. This will vary according to the rules of EOPR, this Protocol and the rules applicable to other programs.

Project Proponents are also responsible to ensure that the Validation Body or Verification Body used is accredited in relation to projects in the sector covered under this Protocol (i.e. accreditation by the Standards Council of Canada to Technical Sector D: Carbon Capture and Storage or by the American National Standards Institute (ANSI) to Sector Group 4: Carbon Capture and Storage).

Project Proponents are strongly encouraged to assess the feasibility of potential projects prior to developing a Project Plan under this Protocol. Project Proponents assume all risk if the emission reductions estimated during a feasibility study or any other means of estimation are different from those calculated using the quantification methodology contained in the Protocol.

The Province has an important role in ensuring activities under this Protocol comply with broader constitutional, legal, and regulatory frameworks, including the Province's obligations under section 35 of the Constitution Act, 1982, and the Declaration on the Rights of Indigenous Peoples Act (Declaration Act).

Section 35

The Province's conduct and implementation of this Protocol must uphold the honour of the Crown and the Aboriginal and treaty rights of First Nations, including the inherent right of self-government and the Province's legal duty to consult and accommodate.

Declaration Act

The United Nations Declaration on the Rights of Indigenous Peoples (UN Declaration) sets out the universal minimum human rights standards of Indigenous peoples. The provincial Declaration Act was passed in 2019 in consultation and cooperation with First Nations. It affirms that the UN Declaration applies to the laws of BC. The human rights standards of the UN Declaration are an interpretive lens for every BC law and regulation, including the Greenhouse Gas Industrial Reporting and Control Act under which this Protocol is established.

Distinctions-based Approach

The implementation of this Protocol must take a distinctions-based approach that is responsive to the inherent title and rights of First Nations in British Columbia, particularly their distinct cultures, legal orders, practices, traditions, institutions, governance structures, relationships to territories, and knowledge systems.

PART 1: DEFINITIONS AND INTERPRETATION

Definitions and Interpretation

1 (1) The definitions set out below apply to this Protocol, and, if an expression in this Protocol is capitalized other than for grammatic purposes and not defined below, it has the same meaning as in GGIRCA, EOPR, GGERR, ERRA or PNGA:

“Assurance Period”, in relation to a Subsurface CCS Project, means the period referred to in section 28;

“BCER” means the BC Energy Regulator;

“Calendar Year” means a period of twelve consecutive months, beginning on January 1 and ending on December 31;

“Capture Facility” means a facility capable of capturing CO₂ directly from an emission source before it enters the atmosphere, or capturing CO₂ already present in ambient air, via a technology that includes a mechanical system;

“Captured CO₂” means

- (a) CO₂ that is captured from an emission source by a Capture Facility before it is released into ambient air, or
- (b) CO₂ that was already present in ambient air and is subsequently captured by a Capture Facility;

“CARB CCS Protocol” means California Air Resources Board’s “Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard”, 2018, available from [here](#);

“Carbon Capture and Sequestration Project” or **“CCS Project”** means a Project that Sequesters Captured CO₂;

“Chemical Transformation CCS Project” means an above-ground CCS Project for which Sequestration is achieved

- (a) by chemically transforming carbon in Captured CO₂ into a compound or form capable of permanently storing the carbon, and
- (b) by permanently storing the carbon in a compound or form not available to the atmosphere;

“CO₂e” or **“Carbon Dioxide Equivalent”** means carbon dioxide equivalent as determined in accordance subsection (5) of this section;

“Effective Date” means the date on which public notice of this Protocol was provided under section 10 (3) of GGIRCA [*as shown for guidance purposes on the cover page of this protocol*];

“Eligible Project” means a Project that is eligible under section 4;

“EOPR” means the *Emission Offset Project Regulation*, B.C. Reg 250/2015;

“ERAA” means the *Energy Resource Activities Act*;

“**GGERR**” means the Greenhouse Gas Emission Reporting Regulation, B.C. Reg 249/2015;

“**GGIRCA**” means the *Greenhouse Gas Industrial Reporting and Control Act*;

“**GHG**” means Greenhouse Gas;

“**Monitoring Report Period**” means, for the purposes of EOPR and this Protocol, the period referred to in section 31 of this Protocol;

“**New Regulatory Requirement**”, in relation to a Project, means a Regulatory Requirement that arises during a Project Report Period;

“**PNGA**” means the *Petroleum and Natural Gas Act*;

“**Primary Project Activities**” means the Sequestration of Captured CO₂;

“**Program of Activities**” means a Project made up of activities occurring at multiple facilities or operations that each would individually constitute an Eligible Project;

“**Project**” means an offset project that results in reductions in GHG emissions or increases in GHG removals that are quantified and applied toward a Regulatory Requirement, or are recognized under a voluntary or regulatory program, for the purposes of offsetting GHG emissions;

“**Project Instance**” means an individual Eligible Project within a Program of Activities;

“**Regulatory Requirement**” means a requirement related to the regulating of Sequestration management practices or facilities in an enactment, legislation, regulation, order, or other instrument that

- (a) is enacted or issued by, or entered into with, the government, BCER or federal government, and
- (b) requires, directly or indirectly, a Project Proponent to take action to bring the Project Proponent’s Sequestration practices or facilities into compliance with a law that relates to the Sequestration of CO₂;

“**Sequester**” or “**Sequestration**”, means doing one of the following in British Columbia:

- (a) injecting and permanently storing Captured CO₂ or carbon in Captured CO₂ in a Storage Reservoir, or
- (b) chemically transforming carbon in Captured CO₂ into a compound or form capable of permanently storing the carbon and, subsequently, permanently storing the carbon;

“**Stand-Alone Project**” means an Eligible Project in which the Primary Project Activities are limited to a single facility or operation;

“**Storage Reservoir**” means a Storage Reservoir (as defined in the PNGA) where, in relation to a Greenhouse Gas or a component of Greenhouse Gas, trapping mechanisms suitable for permanent storage exist;

“Subsurface CCS Project” means a Project for which Sequestration is achieved by injecting and permanently storing Captured CO₂ or carbon in Captured CO₂ in a Storage Reservoir;

“WCI Methodologies” means the Western Climate Initiative emission quantification methodologies incorporated by reference in the GGERR and, if applicable, as modified by the GGERR.

As of the Effective Date, WCI Methodologies consist of the Western Climate Initiative’s 2011 Final Essential Requirements for Mandatory Reporting Amended for Canadian Harmonization, in combination with the 2012 and 2013 amendments, as applicable per activity and emission source type, available from [here](#).

- (2) Text in this Protocol that is italicized, other than a reference to an Act, is for guidance only and is not part of this Protocol.
- (3) The *Interpretation Act* applies to this Protocol.
- (4) The terms “includes” and “including” are not intended to be limiting.
- (5) Section 1 (3) and (4) of the GGERR, applies to the calculation of carbon dioxide equivalent and, for that purpose,
 - (a) the global warming potential that applies to a calculation contained in a Project Plan is the global warming potential in effect as of the date of the Project Plan, and
 - (b) the global warming potential that applies to a calculation contained in a Project Report is the global warming potential in effect as of the date of the Project Report.
- (6) For certainty, unless a contrary intention appears, a requirement imposed by this Protocol applies to Eligible Projects.
- (7) For certainty, an assertion required by this Protocol to be included in a Project Plan, Project Report or Monitoring Report is
 - (a) an assertion of the Project Proponent,
 - (b) in the case of a Project Plan, an assertion for the purposes of section 15 (1) (a) of EOPR, and
 - (c) in the case of a Project Report or Monitoring Report, an assertion for the purposes of section 21 (1) (a) of EOPR.
- (8) The Appendices to this Protocol form part of this Protocol.

PART 2. APPLICABILITY AND ELIGIBILITY

Applicability of Protocol

- 2 (1)** This Protocol applies to Carbon Capture and Sequestration Projects.

- (2) For certainty, in accordance with section 10 (4) of GGIRCA, this Protocol does not apply to a Project if the Project Plan was validated before the Effective Date.

Eligibility Assertion

- 3 A Project Plan must contain an assertion that the Project is an Eligible Project under this Protocol.

Eligible CCS Projects

- 4 A CCS Project is eligible under this Protocol if
- (a) the Project involves the Sequestration of Captured CO₂ or carbon in Captured CO₂ in British Columbia, and
 - (b) the Project is not excluded under section 5.

Excluded Projects

- 5 A Project is not eligible under this Protocol if
- (a) the Project Start Date was before January 1, 2022, or
 - (b) the Project is not likely to result in Project Reductions, as determined in the Project Plan in accordance with this Protocol.

PART 3. GENERAL RULES

EOPR applies unless expressly disallowed or varied

- 6 Unless this Protocol specifically states that a requirement under EOPR is inapplicable, all Project Plans, Validation Statements, Project Reports, Verification Statements and Monitoring Reports must meet the requirements of both this Protocol and EOPR.

Note regarding consequences of failure to comply with GGIRCA or EOPR: failure to meet such requirements may result in a Project Plan not being accepted under GGIRCA or Offset Units not being issued.

Determination of Project Start Date

- 7 A Project Start Date is the earliest date on which there is an increase in the Sequestration of Captured CO₂ or carbon in Captured CO₂ relative to the Baseline Scenario.

Crediting Period

- 8 The Crediting Period for a Project
- (a) begins, in accordance with section 18 (1) (a) of EOPR, on the earlier of
 - (i) the date the Project Plan is accepted by the Director, and
 - (ii) the Project Start Date, and

- (b) ends on the earlier of the following:
 - (i) in accordance with section 18 (1) (b) (ii) (A) of EOPR, the date that is 25 years after the Project Start Date, unless the Project Crediting Period is extended under section 18 (2) of EOPR, in which case the end date of the extension of the Crediting Period;
 - (ii) in the case of a Stand-Alone Project, the date on which injection is completed for the Project;
 - (iii) in the case of a Program of Activities, the date on which injection is completed for all Project Instances.

Notes regarding Crediting Periods: while the crediting period is twenty-five years from the Project start date, the Baseline Emissions of the Project will be adjusted to reflect increased Regulatory Requirements over time, if any.

While there is a possibility that a Project may receive a revalidation based on any applicable protocol in effect at the end of the Crediting Period, this will be based on the continuation of the project meeting all EOPR and protocol requirements in place at that time, e.g. that the continuation of the Project exceeds regulatory requirements and requires the financial incentives of credits.

Quantification of Project Reductions

- 9 Project Reductions must be quantified in accordance with the Appendices.

Crediting of Offset Units to Contingency Account.

- 10 For the purposes of section 24 (2) of EOPR, up to 16.44% of offset units issued in relation to a Project must be credited to the Contingency Account, as determined in accordance with the Appendices.

PART 4: GENERAL PROJECT PLAN REQUIREMENTS

Additional Project Plan Requirements

- 11 (1) A Project Plan for a Subsurface CCS Project must include assertions that the Project Proponent
- (a) holds all Storage Reservoir Licenses or Leases under the PNGA necessary for the purposes of using the Storage Reservoirs associated with the Primary Project Activities,
 - (b) has complied with financial security requirements under section 30 of ERAA in relation to the Primary Project Activities, as applicable, and

- (c) holds a special project permit under section 75 (1) (c.1) of ERAA in relation to the Primary Project Activities.
- (2) A Project Plan for a Chemical Transformation CCS Project must include an assertion that the Project Proponent has provided sufficient evidence to demonstrate a reasonable likelihood for CO₂ Sequestration.

Technical Descriptions in Project Plan

- 12 The technical description referred to in section 14 (3) (c) of EOPR must include a detailed description of the Primary Project Activities, including the following:
 - (a) where the Captured CO₂ originates from;
 - (b) how Captured CO₂ is transported to the Project site;
 - (c) in relation to a Subsurface CCS Project, the locations of the Storage Reservoirs into which Captured CO₂ is injected;
 - (d) in relation to a Chemical Transformation CCS Project, the processes by which the Captured CO₂ will be chemically transformed, and the substance into which the carbon in Captured CO₂ will be transformed.

Project Identification Information

- 13 The Project identification information referred to in section 14 (3) (d) of EOPR must include one of the following:
 - (a) in the case of a Stand-Alone Project, the street address, GPS coordinates, and latitude and longitude of the Project's facilities as of the date of the Project Plan;
 - (b) in the case of a Program of Activities, the street address, GPS coordinates, and latitude and longitude of all Project's facilities for known Project Instances as of the date of the Project Plan.

Chronological plan for the Project

- 14 A chronological plan referred to in section 14 (3) (e) of EOPR must set out:
 - (a) the key events in the development of the Project that occurred before the Start Date, and
 - (b) the dates on which those events occurred.

PART 5: GENERAL PROJECT REPORT REQUIREMENTS

Assertions in Project Reports apply to the Project Report Period

- 15 An assertion that this Protocol requires in a Project Report is an assertion for the Project Report Period.

Project Report Period

- 16 (1) The first Project Report Period
- (a) begins on the Project Start Date, and
 - (b) ends on December 31 of the Calendar Year immediately after the Calendar Year that includes the Project Start Date.
- (2) Each subsequent Project Report Period is one Calendar Year.

Project Reports for Programs of Activities

- 17 (1) If a Project is a Program of Activities, the Project Report must include
- (a) a list of all Project Instances not described in the Project Plan, and
 - (b) a list of all Project Instances described in the Project Plan that have not proceeded.
- (2) If, under subsection (1) (a), a Project Report identifies a Project Instance that was not described in the Project Plan, the Project Report must include an assertion that the revenue from the sale of Offset Units was or will be required to implement the Project Instance and a justification for that assertion.

Additional Project Report Requirements

- 18 A Project Report for a Subsurface CCS Project must include the following assertions:
- (a) carbon dioxide storage progress reports have been submitted to the BCER in accordance with the requirements that apply to the carbon dioxide storage progress reports, as applicable;
 - (b) the Project Proponent
 - (i) continues to hold all Storage Reservoir Licenses or Leases under the PNGA necessary for the purposes of using the Storage Reservoirs associated with the Primary Project Activities,
 - (ii) has continued to comply with financial security requirements under section 30 of ERAA in relation to the Primary Project Activities, as applicable, and
 - (iii) continues to hold a special project permit under section 75 (1) (c.1) of ERAA in relation to the Primary Project Activities.

PART 6: ADDITIONALITY AND DOUBLE COUNTING

Financial Additionality Assertion

- 19** A Project Plan
- (a) is not required to include the assertion in section 14 (3) (n) (xi) of EOPR, but
 - (b) must include an assertion that the revenue from the sale of Offset Units was or will be required to implement the Project and a justification for that assertion.

Historic Practice Assertion

- 20** A Project Plan must include an assertion that the Project involves the installation and operation of new or additional infrastructure, or modifications to existing infrastructure, for the Sequestration of CO₂ relative to the Baseline Scenario.

Double Counting

- 21** A Project Proponent must ensure, and the Project Plan and every Project Report must include assertions, that the Emissions Reductions and Removal Enhancements included in the determination of Project Reductions have not also been, and will not also be, counted
- (a) towards any legal obligation of the facility, which was the source of the emissions, to reduce or limit GHG emissions from industrial processes or from the combustion of fuels, or to reduce the emissions intensity of their product suite,
 - (b) as an emission reduction from Accepted Emission Offset Projects or offset projects under other voluntary or regulatory programs, including being considered in determining carbon intensity of a fuel for the purpose of those projects,
 - (c) for the purpose of determining carbon intensity of a fuel under the *Low Carbon Fuels Act* or the Clean Fuel Regulations under the *Canadian Environmental Protection Act*, or
 - (d) towards any legal obligation of a utility to capture CO₂ or reduce the carbon intensity of fuel sold by the utility.

Captured and transported CO₂ data and data sharing agreements

- 22** (1) In each Project Report, the Project Proponent must identify all of the following:
- (a) all Capture Facilities from which all of the Captured CO₂ was sourced and all transportation service providers that transported the Captured CO₂;
 - (b) for each Capture Facility and each transportation service provider referred to in paragraph (a), location, ownership, quantity of gas received or transported, CO₂ concentration, and quantity of CO₂;
 - (c) a breakdown by amount of gas supplied from each Capture Facility as a portion of the whole;
 - (d) a breakdown by amount of gas transported by each transportation service provider as a portion of the whole.

- (2) A Project Report must include an assertion that the Project Proponent has or had during the Project Report Period an agreement with respect to each Capture Facility referred to in subsection (1) from which Captured CO₂ is supplied for the purposes of obtaining the following in relation to the Capture Facility:
 - (a) the data described in subsection (1);
 - (b) all data necessary to quantify the Project Emissions according to Sub-Appendix A.1 or A.2.
- (3) A Project Report must include an assertion that the Project Proponent has or had during the Project Report Period an agreement with respect to each transportation service provider referred to in subsection (1) from whom Captured CO₂ is transported for the purposes of obtaining the following in relation to the transportation service provider:
 - (a) the data described in subsection (1);
 - (b) all data necessary to quantify the Project Emissions according to Sub-Appendix A.1 or A.2.

Regulatory Additionality – Project Plans

- 23** (1) A Project Plan must include either
- (a) an assertion that the Primary Project Activities are not required, directly or indirectly, by a Regulatory Requirement, or
 - (b) an assertion that the Primary Project Activities are required, directly or indirectly, by a Regulatory Requirement, but the Primary Project Activities exceed the standards required by the Regulatory Requirement.
- (2) For the purposes of validation of a Project Plan, if a Project Plan includes an assertion referred to in subsection (1) (b), the Project Proponent must demonstrate in the Project Plan that the Primary Project Activities exceed the standards required by the Regulatory Requirement.

Regulatory Additionality – Project Reports

- 24** (1) A Project Report for a Project Report Period must include either
- (a) an assertion that the Primary Project Activities are not required, directly or indirectly, by a New Regulatory Requirement that arose during the Project Report Period, or
 - (b) an assertion that the Primary Project Activities are required, directly or indirectly, by a New Regulatory Requirement that arose during the Project Report Period but the Primary Project Activities exceed the standards required by the New Regulatory Requirement.

- (2) If a Project Report includes an assertion referred to subsection (1) (b), the Project Proponent must demonstrate, in the Project Report, that the Primary Project Activities exceed the standards referred to in that subsection.

PART 7: HISTORICAL PRACTICES

- 25 For a CCS Project that involves the expansion of existing storage capacity, the technical description required by section 12 of this Protocol must clearly distinguish between the elements of the Sequestration system in place prior to the Start Date and those established on, or started after, the Start Date.

PART 8: MATERIALITY THRESHOLDS

Materiality Threshold for Validation

- 26 For the purposes of sections 15 (3) (c) of EOPR, errors, omissions or misrepresentations are considered material if the net effect of all errors, omissions and misrepresentations results in an overstatement of the Project Reductions of more than 5%.

Materiality Threshold for Verification

- 27 For the purposes of sections 21 (4) (c) of EOPR, errors, omissions or misrepresentations are considered material if the net effect of all errors, omissions and misrepresentations results in
 - (a) an overstatement of the Project Reductions in a Project Report Period of more than 1%, or
 - (b) an overstatement of the total injected or chemically transformed CO₂, as calculated in the Appendices, of more than the lesser of 0.1% or 10 tonnes CO₂.

PART 9: MONITORING

Assurance Period

- 28 (1) An Assurance Period applies to a Stand-Alone Subsurface CCS Project and begins on the first day of the Monitoring Period.
- (2) An Assurance Period applies to each Project Instance of a Program of Activities and, for that Project Instance, begins on the earlier of the following:
 - (a) the first day of the Monitoring Period;
 - (b) the day after the date on which injection is completed for the Project Instance.

- (3) The length of the Assurance Period is,
- (a) in the case of a Project or Project Instance that consists of injection of Captured CO₂ into a formation other than a mafic or ultramafic rock formation, 15 years, and
 - (b) in the case of a Project or Project Instance that consists of injection of Captured CO₂ into a mafic or ultramafic rock formation, 5 years.

Monitoring Period for Stand-Alone Subsurface CCS Projects

- 29** (1) A Monitoring Period applies for the purposes of EOPR to a Stand-Alone Subsurface CCS Project, and, in accordance with section 25 (1) of EOPR, begins on the day after the end of the Crediting Period.
- (2) Subject to subsection (3), the Monitoring Period for a Stand-Alone Project ends on the earlier of the following:
- (a) when the BCER determines that the risk of reversal of stored CO₂ has decreased to an extent ensuring Sequestration;
 - (b) 100 years after the Crediting Period for the Project ends.
- (3) Despite subsection (2), the minimum duration of the Monitoring Period is the duration of the Assurance Period.

Monitoring Period for Subsurface CCS Projects that are Programs of Activities

- 30** (1) A Monitoring Period applies for the purposes of EOPR to a Subsurface CCS Project that is a Program of Activities, and, in accordance with section 25 (1) of EOPR, begins on the day after the end of the Crediting Period.
- (2) Subject to subsection (3), the Monitoring Period for a Subsurface CCS Project that is a Program of Activities ends on the earlier of the following:
- (a) when the BCER determines that, for all Project Instances, the risk of reversal of stored CO₂ has decreased to an extent ensuring Sequestration;
 - (b) 100 years after the Crediting Period for the Project ends.
- (3) Despite subsection (2), the minimum duration of the Monitoring Period for a Subsurface CCS Project that is a Program of Activities is the date on which all Assurance Periods of all Project Instances have ended.

Monitoring Report Periods for Subsurface CCS Projects

- 31** (1) The first Monitoring Report Period for a Subsurface CCS Project
- (a) begins on the first day of the Monitoring Period, and
 - (b) ends on December 31 of the Calendar Year immediately after the Calendar Year that includes the first day of the Monitoring Period.

- (2) Each subsequent Monitoring Report Period for the Project is one Calendar Year.

Requirements for Monitoring Reports for Stand-Alone Projects

- 32** For the purposes of section 26 (3) (i) of EOPR, a Monitoring Report for a Stand-Alone Project must include
- (a) an assertion that the Project Proponent has complied with all applicable monitoring and maintenance requirements under ERAA, including any requirements under a permit under section 75 (1) (c.1) of ERAA or requirements imposed by the BCER, that apply in relation to the Project,
 - (b) an assertion that the leak detection strategies under section 35 (1) of this Protocol have been carried out, and, if applicable, the corrective actions referred to under section 35 (2) were carried out,
 - (c) evidence to support the assertions in paragraphs (a) and (b), and
 - (d) an assertion that if leaking CO₂ was detected that it was quantified with reasonable accuracy.

Requirements for Monitoring Reports for Projects that are Programs of Activities

- 33** (1) For the purposes of section 26 (3) (i) of EOPR, a Monitoring Report for a Project that is a Program of Activities must include the following for each Project Instance:
- (a) an assertion that the Project Proponent has complied with all applicable monitoring and maintenance requirements under ERAA, including any requirements under a permit under section 75 (1) (c.1) of ERAA or requirements imposed by the BCER, that apply in relation to each Project Instance;
 - (b) an assertion of one of the following:
 - (i) that the leak detection strategies under section 35 (1) of this Protocol have been carried out in relation to the Project Instance, and, if applicable, the corrective actions referred to under section 35 (2) were carried out;
 - (ii) that, pursuant to subsection (2) of this section, leak detection strategies do not need to be carried out in relation to the Project Instance;
 - (c) evidence to support the assertions in paragraphs (a) and (b) (i) of this subsection, as applicable;
 - (d) an assertion that if leaking CO₂ was detected that it was quantified with reasonable accuracy.
- (2) For the purposes of subsection (1) (b) (ii), leak detection strategies do not need to be carried out under section 35 in relation to a Project Instance if

- (a) the BCER determines that, for the Project Instance, the risk of reversal of stored CO₂ has decreased to an extent ensuring Sequestration, and
- (b) the Assurance Period for the Project Instance has ended.

Additional Project Report Requirements for Subsurface CCS Projects that are Programs of Activities

- 34** (1) This section includes additional Project Report requirements that apply to Subsurface CCS Projects that are Programs of Activities.
- (2) If injection is completed for a Project Instance before the end of the Crediting Period, a Project Report must include the following for each Project Instance:
- (a) an assertion that the Project Proponent has complied with all applicable monitoring and maintenance requirements under ERAA, including any requirements under a permit under section 75 (1) (c.1) of ERAA and requirements imposed by the BCER, that apply in relation to the Project Instance;
 - (b) an assertion of one of the following:
 - (i) that the leak detection strategies under section 35 (1) of this Protocol have been carried out in relation to the Project Instance, and, if applicable, the corrective actions referred to under section 35 (2) were carried out;
 - (ii) that, pursuant to subsection (3) of this section, leak detection strategies do not need to be carried out in relation to the Project Instance;
 - (c) evidence to support the assertions in paragraphs (a) and (b) (i) of this subsection, as applicable;
 - (d) an assertion that if leaking CO₂ was detected that it was quantified with reasonable accuracy.
- (3) For the purposes of subsection (2) (b) (ii), leak detection strategies do not need to be carried out under section 35 in relation to a Project Instance if
- (a) the BCER determines that, for the Project Instance, the risk of reversal of stored CO₂ has decreased to an extent ensuring Sequestration, and
 - (b) the Assurance Period for the Project Instance has ended.

Leak Detection Strategies

- 35** (1) For the purposes of sections 32 (b), 33 (1) (b) and 34 (2) (b), the Project Proponent must implement leak detection strategies as follows:
- (a) the Project Proponent must use ground-based methods in the near-surface strategically located near plugged and abandoned wells; however, aerial

technologies with a likelihood of detecting leaking from wells in the near-surface equivalent to that of ground-based methods may be used, with approval of the BCER;

- (b) the Project Proponent must model potential pathways for the preferential migration of CO₂ to the surface to determine areas of concern, at a frequency based on monitoring and verification data collected during injection and using methods approved by the BCER, at minimum once every Monitoring Report Period;
 - (c) the Project Proponent must use methods that can be verified and provide the following data, at a minimum:
 - (i) date and time of site visit or visual inspection;
 - (ii) GPS coordinates for any samples collected, measurements recorded, and locations of pertinent areas/points of concern (e.g., plugged and abandoned wells);
 - (iii) photographs documenting site conditions on date of inspection;
 - (iv) appropriate baseline and background measurements collected;
 - (d) if the inspection checks suggest a potential leak may have occurred, the Project Proponent must perform continuous and intermittent geochemical monitoring of the relevant area, including sampling of CO₂, ratios of CO₂ to other gases, natural chemical tracers, and introduced tracers;
 - (e) if leaking is detected, it must be attributed, quantified, and assessed for potential corrective action, and the Project Proponent must appropriately manage, stop, and mitigate leaks.
- (2) A Project Plan must include a plan for the corrective actions that will be taken for the purposes of subsection (1) (e) to manage, stop and mitigate leaks.

Monitoring Period for Chemical Transformation CCS Projects

36 There is no Monitoring Period for a Chemical Transformation CCS Project.

APPENDIX A: QUANTIFICATION

Section A.1 Applicability

- (1) This Appendix sets out the methods for calculating Project Reductions and the amounts to be credited to the Contingency Account.

Section A.2 Quantification of Emissions Reductions plus Removal Enhancements (ERRE), Project Reductions and amounts to be credited to the Contingency Account

- (1) For each Project, ERRE for a Project Report Period must be calculated by using Equation 1.

Equation 1 - Total Emissions Reductions in a Project Report Period

$$ERRE = (CO2_{Sequestered} - PE) \times (\text{Adjustment}) \quad (1)$$

Where,

Variable	Description	Units
ERRE	= means the sum of Emissions Reductions and Removal Enhancements in the Project Report Period and is the value being calculated	t CO ₂ e
CO ₂ _{Sequestered}	= means the total injected or chemically transformed CO ₂ in the Project Report Period as calculated in accordance with the methodology referred to in Sub-Appendix A.1 or A.2, as applicable.	t CO ₂ e
PE	= means the total of all Project Emissions in the Project Report Period as calculated in accordance with the methodology referred to in Sub-Appendix A.1 or A.2, as applicable.	t CO ₂ e
Adjustment	= means the Adjustment determined under subsection (2)	Unitless

- (2) The Adjustment in Equation 1 must be calculated by using Equation 2.

Equation 2 - Adjustment Factor

$$\text{Adjustment} = (1 - \text{Supplied}_{\text{Credited}}) \quad (2)$$

Where,

Variable	Description	Units
Supplied _{Credited}	= the fraction of the total CO ₂ that may reasonably be expected to be, or have been <ol style="list-style-type: none"> a. recognized or claimed in relation to a regulatory requirement related to greenhouse gas reductions under another enactment, b. submitted for recognition under a voluntary or mandatory emission offset scheme, or 	Unitless

c. used for determining carbon intensity of a fuel under the *Low Carbon Fuels Act* or the Clean Fuel Regulations under the *Canadian Environmental Protection Act*, and includes, without limitation, any CO₂ referred to in section 21 of this Protocol [*Double Counting*].

Adjustment = the value being calculated Unitless

(3) For each Project, Project Reductions for a Project Report Period must be calculated by using Equation 3.

Equation 3 - Total Project Reductions in a Project Report Period

$$PR = ERRE \tag{3}$$

Where,

Variable	Description	Units
PR	= means Project Reductions in the Project Report Period and is the value being calculated	t CO ₂ e
ERRE	= means the sum of Emissions Reductions and Removal Enhancements in the Project Report Period calculated using Equation 1	t CO ₂ e

Equation 4 - Total Project Reductions to be credited to the Contingency Account

$$CA = PR \times RiskRating \tag{4}$$

Where,

Variable	Description	Units
CA	= Means the number offset units generated in the Project Report Period to be credited to the Contingency Account by the Director and is the value being calculated	t CO ₂ e
PR	= means the Project Reduction determined under Equation 3	t CO ₂ e
RiskRating	= means the overall Project risk rating factor determined under subsection (4)	Unitless

(4) The RiskRating factor in Equation 4 must be calculated using CARB Equation G.1 in the CARB CCS Protocol.

(5) Baseline Emissions and Project Emissions must be calculated in accordance with the applicable Sub-Appendix in this Appendix.

(6) Project Reports must show each equation applicable to the quantification of Project Reductions and, for the relevant Project Report Period, how the inputs into those equations were derived, and the outputs from those equations.

- (7) For a Project which is a Program of Activities, the Project Reductions must be calculated by applying subsections (1) to (6) to each Project Instance as if each instance was a Stand-Alone Project and totaling the result.

SUB-APPENDIX A.1: SUBSURFACE CCS PROJECTS

Section A1.1 Application of Sub-Appendix

This Sub-Appendix applies only to Subsurface CCS Projects.

Section A1.2 Emission sources and sinks

Figure 2 of section B.1 of the CARB CCS Protocol [*System Boundary*] sets out the emission sources and sinks that must be used, as applicable, in relation to the assessment of reductions in emissions associated with Subsurface CCS Projects.

Section A1.3 When sharing a CO₂ Pipeline

If a Project Proponent is one of several utilizing a shared pipeline for transporting CO₂ for injection into Storage Reservoirs, then

- (a) upstream of the tie-in point, emissions from all applicable sources and sinks are allocated to each Project Proponent in proportion to the fraction of pipeline CO₂ injected by each out of the total,
- (b) downstream of the tie-in point, each Project Proponent is allocated 100% of the Project Proponent's respective emissions, and
- (c) for each Project Proponent, the total Project Emissions are the sum of emissions in (a) and (b).

Section A1.4 Project Emissions Quantification Methodology

The quantification of Project Emissions (PE) for Subsurface CCS Projects must follow the method outlined in Section B.2.2 of the CARB CCS Protocol [*Greenhouse Emissions Reductions Calculation*] as described and modified below.

References in this Sub-Appendix to specific equations from the CARB CCS Protocol will include the prefix "CARB".

Section A1.5 Emission factors and default values, when applicable

- (1) Global Warming Potentials for GHGs must be taken from column 4 of the Schedule in the Carbon Neutral Government Regulation, available [here](#).
- (2) Emission Factors for fuels and grid electricity must be taken from the following:
 - Grid Electricity – B.C. Grid Factors are available [here](#).
 - Fuels – Tables in part WCI.20 of the WCI Methodologies, available [here](#).

Section A1.6 Baseline Scenario Emissions

The Baseline Emissions and Baseline Removals are zero.

Section A1.7 Project Scenario Emissions

Project Removals are equal to the total amount of injected CO₂ as measured directly at the point of injection.

Project Emissions (PE) are the sum of the individual terms on the right-hand-side of CARB Equation 2 as the terms are defined therein.

The $\text{GHG}_{\text{capture}}$ emissions are the sum of the individual terms on the right-hand-side of CARB Equation 3 as the terms are defined therein. However, the quantification of the individual terms must follow the WCI Methodologies as applicable to specific activities and emission source types.

The $\text{GHG}_{\text{transport}}$ emissions are the sum of the individual terms on the right-hand-side of CARB Equation 4 as the terms are defined therein. However, the quantification of the individual terms must follow the WCI Methodologies as applicable to specific activities and emission source types.

The $\text{GHG}_{\text{injection}}$ emissions are the sum of the individual terms on the right-hand-side of CARB Equation 6 as the terms are defined therein. However, the quantification of the individual terms must follow the WCI Methodologies as applicable to specific activities and emission source types.

To be conservative, the term $\text{CO2}_{\text{leakage}}$ in CARB Equation 6 must equal half the detection limit of the method used to detect leaks deployed in the Project's monitoring and testing plan, or the volume of leakage detected, whichever is larger. The Project Proponent must provide a description and justification for the method used to calculate the detection limit.

Section A1.8 Measurement and Data

Project Proponents must follow the data sampling, analysis, and measurement requirements of the WCI Methodologies as applicable to the specific activities and emission source types they are quantifying.

Section A1.9 Missing Data

Project Proponents must follow the procedures for estimating missing data of the WCI Methodologies as applicable to the specific activities and emission source types they are quantifying.

Section A1.10 References to Storage Complexes

References in the CARB CCS Protocol to storage complexes are to be read as though they refer to Storage Reservoirs.

SUB-APPENDIX A.2: CHEMICAL TRANSFORMATION CCS PROJECTS

Section A2.1 Application of Sub-Appendix

This Sub-Appendix applies only to Chemical Transformation CCS Projects.

Section A2.2 Emission sources and sinks

Figure 2 of section B.1 of the CARB CCS Protocol [*System Boundary*] sets out the emission sources and sinks that must be used in relation to the assessment of reductions in emissions associated with CO₂ capture, transportation, and transformation associated with Chemical Transformation CCS Projects (to the extent that they are applicable to a particular project), where references to “injection” are to be read as references to “chemical transformation”, references to “oil and gas reservoirs” or to “saline formations” are to be read as references to “chemical compound or form”, and references to “leakage” are to be read as references to “chemical reversal”.

Section A2.3 Project Emissions Quantification Methodology

The quantification of Project Emissions must follow the WCI Methodologies as applicable to specific activities and emission source types.

References in this Sub-Appendix to specific equations from the CARB CCS Protocol will include the prefix “CARB”.

Section A2.4 Emission factors and default values, when applicable

- (1) Global Warming Potentials for GHGs must be taken from column 4 of the Schedule in the Carbon Neutral Government Regulation, available [here](#).
- (2) Emission Factors for fuels and grid electricity must be taken from the following:
 - Grid Electricity – B.C. Grid Factors are available [here](#).
 - Fuels – Tables in part WCI.20 of the WCI Methodologies, available [here](#).

Section A2.5 Baseline Scenario Emissions

The Baseline Emissions and Baseline Removals are zero.

Section A2.6 Project Scenario Emissions

Projects Removals are equal to the total amount of Captured CO₂ that is chemically transformed into a compound or form capable of permanently storing the carbon in Captured CO₂.

Project Emissions (PE) are the sum of the individual terms on the right-hand-side of CARB Equation 2 as the terms are defined therein except as modified above.

The GHG_{capture} emissions are the sum of the individual terms on the right-hand-side of CARB Equation 3 as the terms are defined therein. However, the quantification of the individual terms must follow the WCI Methodologies as applicable to specific activities and emission source types.

The $\text{GHG}_{\text{transport}}$ emissions are the sum of the individual terms on the right-hand-side of CARB Equation 4 as the terms are defined therein. However, the quantification of the individual terms must follow the WCI Methodologies as applicable to specific activities and emission source types.

The $\text{GHG}_{\text{transformation}}$ emissions are the sum of the relevant individual terms on the right-hand-side of CARB Equation 6 as the terms are defined therein except as modified above. However, the quantification of the individual terms must follow the WCI Methodologies as applicable to specific activities and emission source types.

Section A2.7 Measurement and Data

Project Proponents must follow the data sampling, analysis, and measurement requirements of the WCI Methodologies as applicable to the specific activities and emission source types they are quantifying.

Section A2.8 Missing Data

Project Proponents must follow the procedures for estimating missing data of the WCI Methodologies as applicable to the specific activities and emission source types they are quantifying.