

Carbon Capture and Sequestration Offset Protocol

Technical Discussion Paper

February 4, 2025

Note that this document provides summaries and simplified explanation of B.C.'s draft Carbon Capture and Sequestration Offset Protocol. Where there are differences between the Protocol and this document, defer to the Protocol.

Purpose of the document

This document is intended to serve as a guide for interested parties to provide feedback on monitoring and maintenance requirements within BC's Carbon Capture and Sequestration Offset Protocol (CCSP).

This discussion document:

- Provides a brief overview of the carbon market and B.C.'s Offset Program,
- Outlines how to participate in this engagement,
- Describes how CCSP functions, and
- Identifies outstanding policy considerations and solicits input on options.

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Inviting your input

The Government of British Columbia (B.C.) is sharing information to industry, Indigenous peoples, validation and verification bodies, and environmental non-government organizations on proposed revisions to monitoring and maintenance requirements within the draft CCSP.

This discussion paper is a follow-up to the initial round of engagement on the CCSP that took place between September 16, 2023 and December 14, 2023, and followed by a 'What We Heard Report' released on June 5, 2024. This paper has been specifically drafted in response to comments received on the 100-year monitoring period for subsurface storage in conventional (oil/gas or saline) reservoirs within the CCSP and provides several options to ensure that carbon sequestration in B.C. is permanent, aligned with best practices, and that projects are able to proceed.

Providing feedback

- Feedback may be submitted starting February 4, 2025, until March 4, 2025.
- Please send your submission to GHGRegulator@gov.bc.ca with CCS Feedback as the email subject. When providing feedback, please indicate the applicable section and line number in the draft protocol.

Background on B.C.'s carbon market

In 2018, the Government of B.C. released the CleanBC Plan, with goals to reduce greenhouse gas emissions and create a stronger future for British Columbia. Carbon offsets are tradable certificates representing the reduction or removal of greenhouse gas (GHG) emissions. The sale of offsets provides another funding source for innovative emissions reduction work across all sectors, as well as economic diversification opportunities within the province.

For carbon offsets to be recognized as B.C. offset units, projects must meet provincial regulations and use an approved protocol. Protocols are standards approved by the Province which projects must adhere to in order to generate offsets. The protocols include the methodology for calculating offsets as well as features to ensure their integrity, such as specific time requirements for permanence of the sequestered carbon dioxide equivalent (CO₂e). The Province issues offset units through the B.C. Carbon Registry and can be transferred to other parties for voluntary or compliance purposes. Currently, the Government of B.C. purchases offset units as part of its Carbon Neutral Government Program and regulated operations under the [B.C. Output-Based Pricing System](#) may also purchase offsets to satisfy a portion of their compliance obligation. At this time, regulated operations in the B.C. OBPS have a credit usage limit of 50% in 2024, 40% in 2025, and 30% in each year thereafter. Other organizations may purchase offset units for their own voluntary emission-reduction objectives.

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B.C.'s CCS Protocol

B.C.'s draft CCSP specifies quantification requirements for greenhouse gas emission reductions and removal enhancements from projects sequestering captured carbon within British Columbia. Greenhouse gas reduction and removal enhancements recognized by the draft protocol include:

- injecting and permanently storing captured carbon in a subsurface storage reservoir within a storage complex, or,
- chemically transforming captured carbon into a compound or form that is capable of permanently storing captured carbon, and,
- subsequently, permanently sequestering the captured carbon.

The protocol outlines requirements for developing the offset project plan and reports, and associated validation and verification requirements.

A minimum practical standard for permanence for high-quality offsets was indirectly established under the Kyoto protocol's offset mechanism, which required at least 100-years of GHG reduction or sequestration. Offset protocols for projects with an inherent risk of reversal need long-term monitoring and liability requirements proportionate to the assessed project-specific risk to ensure that the permanence standard for high-quality offsets is met. These requirements may be for up to 100 years.

However, the monitoring period for CCS projects, depending on assessed risk, can be much less than 100 years while still meeting the same practical standard for permanence. BC's offset protocols are regulated under the Emission Offset Project Regulation (EOPR); the regulation defers to approved protocols for specific monitoring period requirements. BC's protocols are approved by the Director, a statutory decision-maker under the Greenhouse Gas Industrial Reporting and Control Act (GGIRCA), appointed by the Minister for the purpose of regulating and approving offset protocols and projects.

For CCS projects, the EOPR will defer to the CCSP. The CCSP will define requirements for monitoring, reporting, and maintenance post-injection (after projects are no longer receiving credits), including the required length of the monitoring period. The draft CCSP was released publicly for comments and feedback between September 13 and December 14, 2023.

The draft CCSP (which determines the monitoring, reporting, and verification requirements for CCS offset projects) proposed a monitoring period of 100 years if the reservoir is an oil and gas reservoir or a saline formation such as those found in BC's northeast region (the proposed monitoring period was 20 years if the reservoir is a mafic rock [basalt] formation reflecting its lower risk – an initial version of the idea that monitoring length is risk-dependent and can be less than the length of the permanence standard).

For the monitoring period, the draft CCSP requirements included:

- A stabilization period determined by the BCER (in which the CO₂ settles);
- Requirements for leak detection monitoring;

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- Mitigation actions upon discovery of a CO₂ release from the storage reservoir; and
- Requirements to provide monitoring reports every five years for the remainder of the 100-year (or 20-year) monitoring period.

The draft CCSP's design is visually represented in Figure 1.

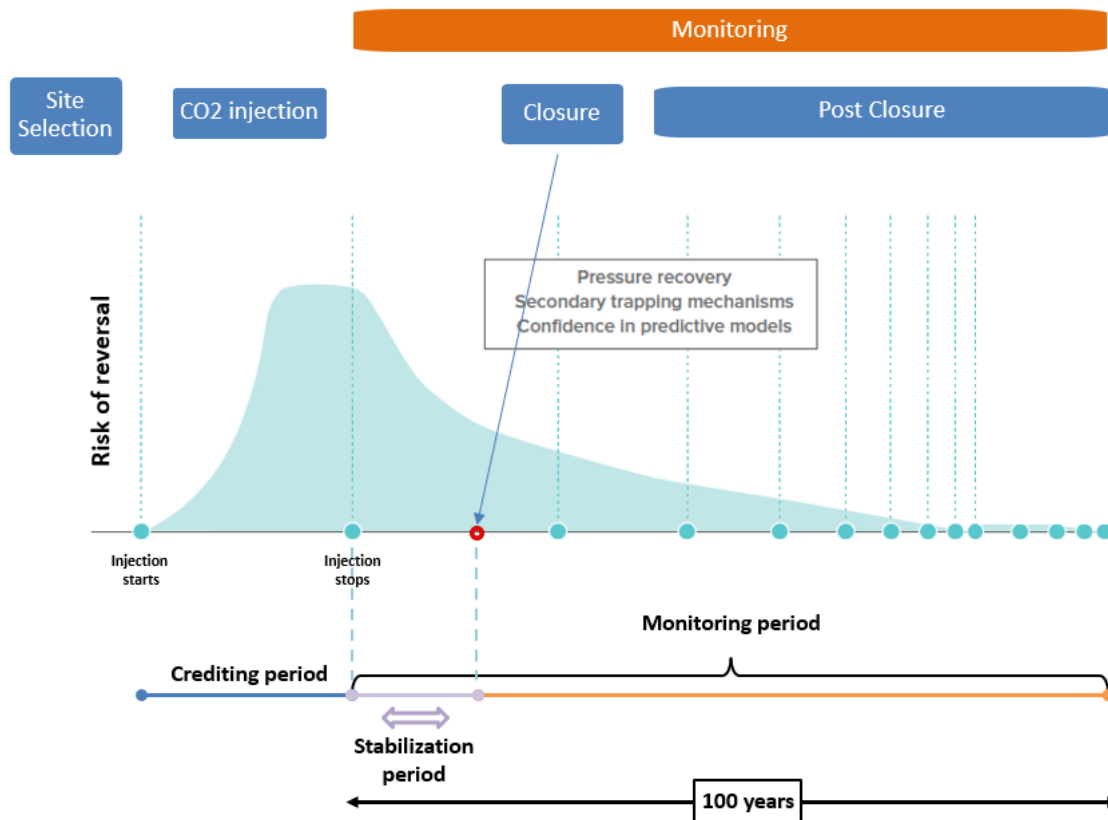


Figure 1: Current definition of Monitoring Period in draft CCSP

The theme most clearly stated in the feedback received during the engagement on the draft CCSP was that the post-crediting monitoring periods for CCS projects are too long. Comments mentioned that although robust monitoring is critical to ensure no physical leakage occurs, the 100-year monitoring requirement is prohibitively long, likely to greatly impact the ability of proponents to make investment decisions in the near-term, and will deter project developers due to liability concerns and administrative burden for smaller projects. It was also mentioned that requiring aerial or ground-based inspections annually for leak detection is onerous, and instead recommended that monitoring requirements should be as risk-based, data-informed and adapted as appropriate.

To address concerns heard during the engagement, the Ministry is considering revisions to the draft protocol. The proposed pathway is to require that the monitoring period length is commensurate with the project-specific risk of the sequestration not being permanent, rather than requiring a pre-determined fixed total length of time. The Ministry is exploring the existing regulatory framework *Note that this document provides summaries and simplified explanation of B.C.'s draft Carbon Capture and Sequestration Offset Protocol. Where there are differences between the Protocol and this document, defer to the Protocol.*

under the British Columbia Energy Regulator (BCER) for consideration in the CCSP monitoring period requirement. The BCER regulates and issues permits and orders under the [Regulatory framework](#) for all storage reservoir activities. Under this new proposal, the CCSP would establish requirements for all reservoir sites, and an additional project-specific variable length monitoring period determined by the BCER. The BCER's determination for the total monitoring period length requirement would be based on the remaining reversal risk meeting a 100-year permanence standard. Potential project proponents would be required to follow a BCER application and approval process that includes consultation with potentially impacted First Nations.

Other questions from the consultation period in 2023 related to whether wording in the draft CCSP meant that receiving funding from the Clean Industry Fund would invalidate a project, and suggested this may have implications for project development.

The CCSP currently requires that Project Reports be submitted by March 18 of the year immediately following the period for which the Project Report applies. Several comments expressed that this timeline is too short to complete the required reporting, quantification, quality assurance and verification activities.

The Ministry is also considering removing:

- Specific reference to the Clean Industry Fund in the context of financial additionality to enable proponents to stack incentive funding, and
- The reporting deadline in the CCSP.

The Ministry will welcome feedback on monitoring requirements and other proposed revisions within the CCSP until March 4, 2025.

CCS Q&A

- Q: Why is the monitoring period for conventional underground reservoirs in the CCSP going to be different/less than the 100-year monitoring requirement of the Forest Carbon Offset Protocol (FCOP) if both types of offsets are held to the same 100-year integrity standard?
 - A: CCS risk of reversal is highest the moment CO₂ injection of captured carbon is completed, and afterwards decreases over the 100-year integrity standard timeframe, whereas forest carbon's risk of reversal, in both frequency and magnitude, increases as a forest matures (e.g., natural and climate-induced disturbances such as wildfires, insects). Because the length of monitoring has to correspond to reversal risk, CCS does not generally require a 100-year monitoring period to ensure the same level of certainty of the offsets over the 100-year integrity standard, in contrast to FCOP.
- Q: Will the reduced monitoring period in the CCSP apply to other B.C. offset protocols, like the Forest Carbon Offset Protocol?
 - A: FCOP's risk of reversal may increase over time due to the likelihood of a natural or climate-induced disturbance to the project area. FCOP and the CCSP are two very different

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protocols in terms of risk profile, and, consequently, the MRV requirements cannot be the same between these two types of protocols. The CCSP is the only protocol the Ministry is receiving feedback on during this engagement period.

CCS project implementation

- Q: What consultation is required for CCS projects being developed in B.C.? Who is responsible for this consultation and how does it meet obligations under the UN Declaration on the Rights of Indigenous Peoples Act?
- A: The [Petroleum and Natural Gas Act](#) (PNGA) provides the authority to the Ministry of Energy and Climate Solutions to issue carbon storage rights to subsurface storage in the form of a storage reservoir exploration licence or a storage reservoir licence. See the Ministry's regulatory framework here: [Regulatory framework - Province of British Columbia](#).

BC's page on [Storage Reservoir](#) lists current storage reservoir licence applications and their status.

Under the [Energy Resource Activities Act](#) (ERAA), permits or orders are required for storage reservoir activities. The [British Columbia Energy Regulator \(BCER\)](#) regulates (<https://www.bc-er.ca/how-we-regulate/>) and issues these permits or orders. The BCER performs the role of a single regulator for projects. See: [Carbon Dioxide Storage Application Guide](#) and [Carbon Capture and Storage | BC Energy Regulator \(BCER\)](#).

Proponents submit a licence application to Ministry of Energy and Climate Solutions staff. If the request has passed the Ministry's internal review, information on the licence is sent out as a referral to potentially impacted First Nations, Provincial agencies and local governments to discuss any concerns raised. At the end of the referral period, all comments are assessed and inform the decision.

Proponents may then submit a validated project plan under the CCSP to the Climate Action Secretariat via the BC Carbon Registry to seek approval for the offset project.

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