

## Carbon Capture and Storage Projects Funding Agreements

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The sharing of these consolidated, unofficial copies of the agreements that have been signed for carbon capture and storage projects in Alberta is part of the ongoing effort to provide information about carbon capture and storage projects and their development. The agreements are posted for information purposes only and shall not be reproduced in any manner, in whole or in part, except with the prior written consent of the Alberta Government and the appropriate project.

The agreements are legal documents and are separated into a number of sections that cover a range of complex issues that may or may not arise through the course of project development, deployment, and operation.

The agreements are based on the carbon capture and storage program's principles, which were laid out in the 2008 Full Project Proposal the first document in this collection. The goal of the project selection process, which was completed in 2009, was to encourage the development of integrated carbon capture and storage facilities that will capture and permanently store up to five million tonnes of carbon dioxide per year in 2015.

Unofficial copies included are:

Quest Project Funding Agreement

Quest Project Knowledge Sharing Schedule

**Alberta Department of Energy**

# **Carbon Capture and Storage Program**

***Full Project Proposals  
Information Package***



## **Carbon Capture and Storage Fund Full Project Proposal Process**

The purpose of the Full Project Proposal (FPP) process is to allow the evaluation team to review project proposals under the Carbon Capture and Storage Fund (CCSF) in a consistent, fair, and transparent manner in order to identify those projects that best fit with the fund's objectives.

The deadline for submission of FPPs is March 31, 2009. Submission of a FPP does not imply that the proposed project will be approved for funding under the CCSF.

This information package provides guidance on the requisite contents of a project proposal and necessary supporting documentation. Proposals will be evaluated and ranked according to the criteria outlined in this document. Failure to provide requested information may lead to the rejection of the proposal. The project proposal process is a competitive process as it is expected that more eligible projects will be submitted than there is funding available.

The decision to support specific projects from the CCSF will be announced by June 30, 2009. Such approvals will be conditional upon the execution of a grant agreement; no funding commitments are binding until a grant agreement is in place. The project approval decisions of the Alberta Department of Energy (ADOE) are final and not subject to appeal.

ADOE reserves the right to alter or cancel the currently envisaged process and deadlines at its sole discretion. Any changes will be communicated by formal addendum to this document.

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## 1. Introduction

In January 2008, the Government of Alberta (GOA) released Alberta's new Climate Change Strategy. The objective of the Strategy is to ensure that the province remains at the forefront of achieving significant reductions in greenhouse gas (GHG) emissions.

The Strategy takes action on three fronts: implementing carbon capture and storage (CCS); greening energy production; and conserving and using energy efficiently. CCS technology involves capturing carbon dioxide emissions from industrial sources and transporting them by pipeline to sites where they are injected into deep rock formations for permanent storage.

The GOA recognizes that industry's ability to undertake novel and innovative processes such as CCS is often limited by the related technical and financial risk. Given these risks, support is necessary to demonstrate large-scale CCS. On July 8, 2008, \$2 billion was allocated to the CCS Fund (CCSF) to support demonstration projects that undertake to advance the broader adoption of CCS technologies in Alberta.

## 2. Program Goal and Objectives

The ultimate goal of the CCSF is to encourage the development of three to five large scale integrated CCS facilities that will capture and permanently store up to five million tonnes of carbon dioxide per year by 2015, for a period of at least 10 years. This initiative is an important first step in the broader adoption of CCS in the province and will create the momentum for private sector investment in CCS. By encouraging CCS in Alberta, the CCSF will contribute to the solution for climate change and GHG emission reductions while maintaining Albertans' quality of life and allowing continued economic growth. In reaching this goal, GHG emissions at facilities such as coal-fired electricity plants, oil sands extraction sites, upgraders, and other large scale industrial facilities will be reduced.

The CCSF provides, in addition to the advancement of CCS, an opportunity to advance additional objectives including:

- Encouragement of new value-added projects to proceed in Alberta on the basis that they will be able to meet the province's emissions standards for large industrial facilities;
- Enabling the province to take the lead in advancing CCS technology. This leadership will allow Alberta's CCS industry to market this expertise to other jurisdictions;
- Dissemination of learnings and information developed through the projects supported by the CCSF, which will assist in moving CCS implementation on a wider scale beyond the initial 3 – 5 projects;
- Launch an integrated CCS sector in the province;

- Reduce natural gas consumption for industrial purposes to allow more for export;
- Unlock the energy from low value natural resources and waste products; and
- Achieve additional environmental benefits such as lowering water usage, reducing NOx and SOx emissions and reducing land disturbance.

The general objectives of the CCSF are aligned with the GOA's priorities plan and specifically the plan's energy-related priorities<sup>1</sup>:

- Ensure that Alberta's energy resources are developed in an environmentally sustainable way; and
- Enhance value-added activity, increase innovation, and build a skilled workforce to improve the long-run sustainability of Alberta's economy.

These objectives will be advanced by encouraging a large scale integrated CCS network through the development of successful CCS projects within Alberta. The GOA desires the CCSF to support CCS projects from more than one sector. Alberta has a vast coal, oil sands and conventional hydrocarbon resource base; the GHG challenge is an issue for all of these sectors.

### 3. Description of the Program

This program has the following features:

- All projects must be located in Alberta. Any portion of a project outside the boundaries of Alberta will be ineligible under the program.
- Program administration is in two parts: (1) Submission of a full project proposal for consideration and (2) entering into a grant agreement in a form acceptable to ADOE.
- Financial support for projects is constrained by total program funding, the time limit for the program's results, and project selection criteria.
- The evaluation team comprised of individuals from the Departments of Energy, Environment, Finance and Enterprise, Advanced Education and Technology (AERI), Sustainable Resource Development and Treasury Board, will review the FPPs and advise on the merits of the projects in the context of the project selection criteria. External experts may be consulted on specific aspects of the submitted proposal (technical, financial, etc.) on a confidential basis.
- The Minister of Energy will make the final decision on which projects will receive funding under this program and the level of support that will be available to each.

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<sup>1</sup> Government of Alberta, Strategic Business Plan 2008 – 2011  
<http://www.finance.alberta.ca/publications/budget/budget2008/govbp.pdf>

- Only the incremental CCS costs directly related to the approved project will be eligible under the program. Any costs not directly related to the CCS component of the project will be the sole responsibility of the project proponents. Only those costs specifically approved and detailed in the grant agreement will be eligible under the program, to a maximum funding cap set out in the grant agreement.
- A Fairness Auditor will oversee the full project proposal evaluation phase. The Fairness Auditor will provide a final report to the Minister of Energy before the announcement of successful applicants.

## 4. Confidentiality and Knowledge Transfer

The ADOE will exercise reasonable efforts to keep the disclosure of information confidential. However, the ADOE is subject to the provisions of the *Freedom of Information and Protection of Privacy Act* (FOIP Act). Information held within ADOE's custody or control may be requested under the access provisions (Part I) of the FOIP Act. All access requests submitted to the ADOE must be acknowledged and evaluated against specific exceptions to disclosure outlined in the legislation. One such exception prohibits ADOE from disclosing certain information supplied explicitly or implicitly in confidence where disclosure could reasonably be expected to, among other things, harm significantly the project proponent's competitive position or would be an unreasonable invasion of your personal privacy (FOIP Act, sections 16 and 17 respectively). If, in response to a request under the FOIP Act, ADOE is considering disclosing a document that may contain information that affects the project proponent's interests under section 16 or may be an unreasonable invasion of privacy under section 17, the ADOE is required to notify the proponent in advance and provide an opportunity to object. All decisions in relation to a FOIP Access request are reviewable by the Alberta Office of the Information and Privacy Commissioner, upon request of the third party or the applicant.

Nevertheless, knowledge transfer will be a condition of approval under the program, interim and final technical reports and presentations must be submitted to ADOE and will be made available to the public. You may claim confidentiality for such reports for a period of two years from the date the report is required by ADOE, subject to the above noted FOIP requirements.

ADOE requires that technology supported with funding from this program will be widely available. To meet this objective, terms related to intellectual property will be included in the grant agreement.

## 5. Project Approval

Once projects have been selected for funding, a Letter of Intent, offered by the Minister of Energy and formally accepted by the proponents, will be required prior

to the announcement by the Minister of Energy of the successful projects. The Letter of Intent will not constitute a legally binding funding commitment, but will provide the basis for a grant agreement. The grant agreement must be signed before any funds can be released. Failure of the proponent to enter into a grant agreement in a form acceptable to ADOE by December 31, 2009 will result in the cancellation of the project approval.

## 6. Funding Principles

In order to manage the Crown's risk, and to ensure that the program objectives are achieved, the following principles with respect to grant commitments and the disbursement of funds under this program will apply:

- The percentage of total CCS related costs supported by the program will be limited to a maximum of up to 75% of total incremental CCS costs. The actual percentage of incremental costs that the ADOE is willing to support in respect of a particular proposal under the program will be determined during the review of the proposal.
- The initial approved incremental CCS costs and the percentage of costs approved to be supported by the program will determine the maximum total dollar funding for a particular project.
- Increases in costs from the initially established amount will not be eligible for funding under the program.
- Funds disbursed prior to commencement of operations will be limited to a maximum of up to 40% of the total approved funding for the project and will be paid on specific project milestones, as specified in the grant agreement. These funds will only be disbursed when the ADOE is satisfied with the progress of the project's milestones. Prior to completion of construction, any funds disbursed will be in the form of a conditional grant that will be fully repayable if construction is not completed by a date specified in the grant agreement. The amount of the conditional grant will be backed either an on-sight letter of credit or by providing credit assurances deemed to be acceptable by the Crown. If the Crown is not satisfied with the credit assurances provided then the default option is the on-sight letter of credit.
- A maximum of up to 20% of the total approved funding for the project will be paid on commencement of operations.
- The remaining percentage of approved funding (at least 40%) will be disbursed as CO<sub>2</sub> is captured and disposed, over a maximum of 10 years. The calculation of funds to be disbursed will be based on each project's remaining grant contribution, divided by the expected CO<sub>2</sub> capture volumes (defined in the grant agreement) over a ten year period, and will be disbursed as volumes of CO<sub>2</sub> stored are confirmed by the GOA.
- Total incremental CCS costs upon which funding is determined will be reviewed in the event that other government grants are received to support the project.



- After all incremental CCS costs, plus a mutually accepted rate of return have been recovered by the proponent, revenue from the sale of emissions credits, CO<sub>2</sub> for EOR, and other revenue streams generated by the capture, transport and storage of CO<sub>2</sub> will reduce allowable costs upon which the grant is based.

## 7. General Conditions Applying to Approved Projects

The following general conditions will apply to all approvals under the program:

- The project proponents must submit annual reports for the duration of the project and as long as injection of CO<sub>2</sub> is continuing. Additionally, ADOE has the right to make specific (reasonable) requests for information outside these annual reports. The reports must be written according to professional standards and acceptable to ADOE and include information on progress relative to milestones, construction costs, operational experience and environmental impacts and monitoring, measurement and verification of CO<sub>2</sub> storage by the project.
- A final report will also be required at the end of the payment period or at the end of 10 years of CO<sub>2</sub> injection.
- The project proponents must provide annual presentations on project construction and operations to ADOE.
- ADOE will be given timely notification of all senior level technical and management meetings related to the project and ADOE or its representatives will have the right to attend these meetings.
- A steering committee including representation from ADOE or its representatives must be set up to oversee the project. .
- ADOE will have the right to visit and inspect all project sites upon providing reasonable notice to the project proponents.
- ADOE will have the right to audit records and documents of all approved projects upon the provision of reasonable notice to the project proponents.
- Each grant agreement will include an indemnification for any claims against the Crown arising from an approved project.

## 8. Evaluation Process

### 8.1 Full Project Proposal Submission & Evaluation Process

The following is the process for FPP submission and evaluation:

1. FPPs must be received by ADOE by 4:30 p.m. (MST), March 31, 2009, to be considered for evaluation.
2. The Evaluation Team (see 8.2 below) will review the FPPs in the context of the project selection criteria described below. There will be an initial screening (see 8.4 below) followed by an in-depth review.
3. The Evaluation Team provides advice to the Governance Committee (see 8.3 below) on the merits of the proposals.
4. The highest ranked projects from the evaluation criteria may not be accepted given that the Fund's objective is to support 3 – 5 projects

with the \$2 billion committed. These features of the Fund require some flexibility with respect to the amount that may be committed to any one project. Prior to the final selection, ADOE will negotiate funding amounts with the top ranking projects. If agreement cannot be reached that will allow the objective of 3 – 5 projects within the total Fund limit, the ADOE will move to the next ranked project to attempt to reach a funding agreement.

5. The Minister of Energy will make a decision on projects to approve as well as the specific terms and conditions of approval.
6. The applicant will be advised, in writing, of the decision.
7. A Letter of Intent (LOI) including the details of the terms of the funding commitment, project scheduling, as well as the performance objectives will be offered by the Minister of Energy and accepted by the proponent.
8. The Government of Alberta will announce the successful projects that will receive funding (subject to entering into a grant agreement) by June 30, 2009.
9. A grant agreement is entered into by December 31, 2009. In any event, no funds can be disbursed before a contract has been signed. Failure to sign an agreement by December 31, 2009 will result in the expiration of the LOI and the cancellation of any Government of Alberta commitment to the project.

During the evaluation process, the project proponents may be asked to provide additional information, to respond to questions about the project proposal, or to be available for meetings.

All project proponents who get through the initial screening may be asked to make a presentation to the Evaluation Team. The presentation will be scheduled subsequent to the FPP submission deadline and is intended to provide clarification to questions that the Evaluation Team might have.

A proponent may withdraw its proposal at any stage of the evaluation process.

All communication in relation to this FPP process, including the evaluation process, with the Government of Alberta must be in writing, addressed to Mr. David Breakwell (see section 13 for the address). **Any breach of this requirement may result in the disqualification of your proposal.**

## 8.2 Evaluation Team

An Evaluation Team will be composed of representatives from the Departments of Energy, Advanced Education and Technology (AERI), Environment, Sustainable Resource Development, Treasury Board and Finance and Enterprise. The Evaluation Team may request independent external experts to provide expert evaluation and advice on a confidential basis. The Evaluation Team will review all FPPs in detail, meet with project proponents as necessary, and prepare recommendations to the Governance Committee.

### 8.3 Governance Committee

Program oversight and support to the Minister of Energy will be provided by a Cross-Ministry Governance Committee chaired by the Deputy Minister of Energy with the Deputy Ministers of Environment, Sustainable Resource Development, Treasury Board, Finance and Enterprise, and Advanced Education and Technology participating. This Committee will oversee the evaluation process to ensure that it occurs in a consistent, fair and transparent manner, and will make the final recommendation of projects to be selected for funding to the Minister of Energy. This Committee will also oversee the ongoing, post-selection phase of the program.

### 8.4 Initial Screening Criteria

To be considered for evaluation, the project must meet the following mandatory criteria:

1. All integrated components must be located in Alberta;
2. Be sufficiently advanced for CCS to be operational by 2015;
3. Be of sufficient size to contribute significantly to the objective of 5Mt annually of CO<sub>2</sub> stored by 2015; and
4. Be a fully integrated capture to storage process.

### 8.5 Evaluation Criteria and Project Ranking

The FPPs will be evaluated using ten evaluation criteria by the Evaluation Team (see Sections 9 and 11 below).

Each FPP must provide information demonstrating how the proposal fits each particular criterion. Each reviewer on the Evaluation Team will assess the proposal against the same performance criterion. The Evaluation Team's assessment scores will then be used to rank the proposals.

Each criterion consists of four performance levels: D (criterion not met), C (criterion partially met), B (criterion met) and A (criterion exceeded). Each level has an associated allotted weight relative to the maximum score of each of the ten desired criteria. These weights are;

|   |    |  |
|---|----|--|
| A | 80 | – 100% of the points available for that criterion. |
| B | 65 | – 79% of the points available for that criterion.  |
| C | 50 | – 64% of the points available for that criterion.  |
| D | 0  | – 49% of the points available for that criterion.  |

### 8.6 Process Amendments

The Minister of Energy reserves the right to alter or cancel the currently envisaged process and deadlines at his sole discretion. The Minister of Energy may, at any time prior to March 31, 2009 amend this FPP by issuing one or more addenda.

## 8.7 Communications

To manage communications with the project proponents, the Department of Energy has established a share point site. A share point site is a browser-based collaborative tool/workspace and document-management platform that will allow project proponents to view documents. The Department of Energy will provide project proponents with a link and user name. Alberta Energy's Communication Office will provide the passwords separately (via fax or telephone) to ensure security is maintained. Proponents are encouraged to check the Share Point site regularly for updates. For information regarding this site please contact:

Karen Karbasheski  
Public Affairs Officer, Communications  
Alberta Energy  
Office: 780-644-1773  
Fax: 780-422-0698

## 9. Evaluation Criteria/Weightings

Proposals for integrated CCS projects will first be evaluated using the following mandatory criteria:

| Mandatory Criteria  | Yes | No |
|---|-----|----|
| The project is sufficiently advanced for CO <sub>2</sub> disposal to occur by 2015  |     |    |
| The project is of sufficient size to contribute significantly to the objective of 5Mt of CO <sub>2</sub> stored annually, beginning with 2015 |     |    |
| The project involves a fully integrated capture to storage process.   |     |    |

Those FPPs that meet all the mandatory criteria listed above will then be evaluated using the following criteria:

| No. | Desired Criteria                    | Score      |
|-----|-------------------------------------|------------|
| 1   | Project partners                    | 10         |
| 2   | Base facility                       | 10         |
| 3   | Capture facility                    | 10         |
| 4   | Proponent's capability and capacity | 20         |
| 5   | Project plan                        | 20         |
| 6   | Financial structure and risks       | 30         |
| 7   | Cost sharing structure              | 15         |
| 8   | Efficiency                          | 15         |
| 9   | Ancillary benefits and synergies    | 10         |
| 10  | Portfolio contribution              | 15         |
|     | <b>Total Score (Maximum 155)</b>    | <b>155</b> |

## 10. Project Overview

This section contains requirements for specific project information. The proponents are required to fill out the project overview form and attach additional supporting information with the FPP.

### **Confidentiality**

**Please note that the proponents' names, organizations, project title, non-confidential overview, expected benefits and amount awarded will be public information if the proposal is successful.**

|   |  |
|---|--|
| 1. Project Title  |  |
| 2. Project proponent(s) (legal names of companies)  |  |
| 3. Project Location: (attach relevant maps)<br>a. Capture plant<br>b. Pipeline<br>c. Storage area |  |
| 4. Storage zone (attach relevant maps)  |  |
| 5. Abstract: (max. ½ page)  |  |
| 6. Non-Confidential Overview: (max 1 page)  |  |
| 7. Expected Benefits to Alberta: (max. ½ page)  |  |
| 8. Key Words: (prioritized, max. 15)  |  |
| 9. Total Incremental CCS Project Cost:  |  |
| 10. Funding amount Requested from the CCS Fund:   |  |
| 11. Anticipated start of CO <sub>2</sub> capture.   |  |

|   |   |
|---|---|
| 12. Project Start Date: (year/month/day)  | 13. Project Completion Date: (year/month/day) |
| 14. Has this proposal been submitted to other funding organizations? (Y/N), if Y, please list their names and contact information)                    |   |
| <p>ADOE may contact the other funders listed. If you do not want the ADOE to contact these other organizations, please give your reasoning below:</p> |   |

**Information supplied on this page may be used in public summaries and abstracts of CCSF sponsored activities. Do not provide confidential information.**

**Title** (*Maximum ten words*)

**Abstract** (*Maximum 100 words*)

**Confidentiality**

**Any confidential or proprietary information contained in the project proposal should be specifically identified. Information provided will be subject to the access and privacy provisions of the *Freedom of Information and Protection of Privacy Act (FOIP)*.**

## 11. Detailed Evaluation

Proponents must address all items in these criteria, providing supporting documentation for all assertions.

### 11.1 Project Partners

This section of the FPP outlines the requirement of the program that the proposed CCS project be a fully integrated capture, transportation and storage project, and the project includes qualified partners for the different aspects of the project. Documentation of all third party agreements governing these relationships must be provided.

The project proposal has:

- D. ...not identified partners and is not a fully integrated CCS project.
- C. ...identified partners but agreements do not exist for all levels of the integrated project.
- B. ...demonstrated that the project is fully integrated, MOUs satisfactory to the ADOE are in place among all levels of the integrated project; and each partner has demonstrated a capability of fulfilling its obligation.
- A. ...demonstrated that the project is fully integrated and formal contracts acceptable to ADOE between the partners are in place.



## 11.2 Base Facility

This section of the FPP describes the process and technology of the base facility. If the base facility is in place, technology risks related to adding capture facilities should be described. The description of the operational impact of adding capture to existing facilities should be described along with potential costs, components timelines and risk mitigation provided. For new base facilities, a description of its technical challenges, its uniqueness and risks should be described. The selection criteria used to decide on the base technology should be provided. If the technology selected was preferred because of reduced CO<sub>2</sub> production or other emissions, documentation supporting these assertions should be provided. Feedstock required should be described, as well as the security of supply. Energy requirements to run the base facility should be provided and properly documented. If the base facility includes new power generation capacity, a description of necessary transmission capacity should be included.

The base facility:

D. ...

- i) is at a conceptual design phase and or there is no assurance that the project will be operational by 2015;
- ii) will be based on commercially unproven technology;
- iii) technical challenges and construction/operational risks are not described;
- iv) has not secured a reliable source of feedstock; and
- v) the proposal does not include a description of the operational impact of incorporating the carbon capture technology into the base facility.

C. ...

- i) is not expected to be operational until 2016;
- ii) technology has been proven at a pilot stage but has yet to be proven at an industrial scale;
- iii) has technical challenges and construction/operational risks which are described at a high level;
- iv) regulatory approvals have not been submitted ;
- v) has identified but not yet secured a reliable source of feedstock ; and
- vi) the proposal includes an incomplete description of the operational impact of incorporating the carbon capture technology into the base facility.

B. ...

- i) is expected to be operational by 2015;
- ii) is based on commercially proven technology;
- iii) technical challenges and construction/operational risks are fully described and matched with appropriate mitigation strategies;
- iv) has obtained regulatory approvals or a plan is in place to manage the regulatory process;
- v) has a secure source of feedstock to sustain CO<sub>2</sub> capture levels; and

- vi) the project plan includes an extensive description of the operational impact of incorporating the carbon capture technology into the base facility.
- A. ...
- i) and, the base facility will be built and operational in advance of 2015.

### 11.3 Capture Facility

This section of the proposal describes the process and technology of the capture facility. It includes an overview of capture technology options with strengths and weaknesses, as well as the rationale used for selecting the proposed technology. It also includes a description of its technical construction challenges; its uniqueness and risks are described. Additional energy requirements to run capture and compression are discussed, with a description of the source. The proponent specifies whether or not the technology has been proven at the pilot stage and presents any operational data deemed necessary to understand and evaluate the capture technology. The proponent also specifies the percentage of CO<sub>2</sub> captured from the gas stream.

The capture facility:

- D. ...
  - i) has not been selected or has been selected but the technology has not been tested in a pilot project;
  - ii) additional energy requirements and source have not been discussed; and
  - iii) the capture process from the gas stream has not been described.
  
- C. ...
  - i) has been tested at the pilot stage but substantial technical hurdles have yet to be resolved;
  - ii) additional energy requirements and source have been partially discussed;
  - iii) the rationale for technology selection has not been thoroughly explained; and
  - iv) the capture process from the gas stream, including purity levels, has been partially described.
  
- B. ...
  - i) has been proven at the pilot stage;
  - ii) additional energy requirements and source have been fully discussed;
  - iii) the rationale for technology selection has been thoroughly explained;
  - iv) the proponent has submitted a competitive analysis of the capture options currently available and risk mitigation strategies are fully identified; and
  - v) the capture process from the gas stream, including purity levels, has been fully described.
  
- A. ... and, the chosen capture technology has been proven at an industrial scale.

## 11.4 Proponent's Capability and Capacity

This section of the proposal outlines the proponent's competency and experience in dealing with the capture and compression, pipelines, and injection processes, assessing reservoir suitability for storage, using CO<sub>2</sub> for enhanced oil recovery (EOR) and any other ability deemed critical for the successful implementation and operation of in an integrated CCS project.

The proponents have:

- D. ...limited competency in the areas listed above; the proponents have not demonstrated experience with projects of this scale;
- C. ...competency in most of areas necessary to implement an integrated CCS project; the proponents have limited demonstrated experience with projects of this scale;
- B. ...demonstrated knowledge and experience in the areas listed above and experience with projects of this scale has been supported;
- A. ...demonstrated significant experience and a proven track record in all of the areas required to implement an integrated CCS project of this scale.

## 11.5 Project Plan

This section of the proposal includes a description of the systems in place to manage project design, construction and operation of an integrated CCS project. The proponents are expected to outline the mitigating measures for risks during the construction and operation phases for all aspects of the project – capture, transportation and storage. It includes a description of the project management processes such as a steering committee with regular meetings and reporting processes and specified roles and responsibilities. It includes a description of the decisions to be made by the project proponent and partners throughout the design and construction phase that could impact project completion and its composition. Details of the pipeline and storage aspects of the project should be included here. The plan for pipeline design, size, capacity, right-of-way and route need to be provided, with risks to this plan detailed and mitigation strategies articulated. For the storage component, EOR or disposal options should be detailed, with plans provided on pore space access, ownership, surface access, production profiles for EOR and monitoring systems for storage integrity; risks and mitigation strategies should also be provided.

The Project Plan:

D. ...

- i) does not include milestones and risks are not identified;
- ii) does not refer to the establishment of a steering committee; and
- iii) does not address reporting requirements to the ADOE.
- iv) provides inadequate details of the pipeline component including costs; and
- v) storage options have not been described.

C. ...

- i) includes milestones however they not in sufficient detail to manage a projects of this scale and scope; risks are partially identified;
- ii) does not include a steering committee with all partners participating; and
- iii) only partially addresses reporting requirements to the ADOE.
- iv) includes partial pipeline details and costs for the project; and
- v) storage options have been partially described.

B. ...

- i) includes detailed milestones; risk mitigation strategies are fully identified;
- ii) includes a steering committee with fully developed terms of reference and decision making processes; and
- iii) addresses reporting requirements to the ADOE.
- iv) pipeline details and costs are provided for a specific project; and
- v) storage options have been fully described.

- A. ...
- i) includes detailed milestones and risk mitigation strategies are extensively identified;
  - ii) includes a steering committee with regular reporting sessions, specified roles and responsibilities, a fully developed terms of reference and decision making process;
  - iii) reporting requirements are fully addressed and the project plan is exceptionally clear and of high quality.
  - iv) pipeline description includes details and costs for both a project specific line and an integrated pipeline considering potential available CO<sub>2</sub> in the region; and
  - v) storage options have been thoroughly discussed targeting specific storage sites.

## 11.6 Financial Structure and Risk

This section of the proposal includes a description of the financial structure and risk mitigation strategies set in place for all the components of the project. It includes a detailed cost overview of the all components of the CCS project with a discussion of the level of confidence in all cost estimates. It also includes any factors that might influence the boards of directors' decision to go ahead with the project. Careful consideration is given to the proponents' financial ability to manage the project and the financial contingency plan. Operating revenue from the facility must be described and estimates supported; customers for process output should be identified.

For the project:

D. ...

- i) financing is only in place for part of the project and risk mitigation strategies are not included;
- ii) the proponents lack sufficient financial strength to be able to secure financing in the short-term; and
- iii) costs estimates are only at a high level.

C. ...

- i) financing for the integrated CCS project base facility is not complete and risk mitigation strategies have been partially developed;
- ii) the proponent has limited financial ability to secure financing in the short term; and
- iii) costs estimates have been supported by appropriate analysis.

B. ...

- i) financing for the integrated CCS project base facility has been arranged and a fully formulated financing plan for the project is in place; a risk mitigation strategy is well developed,
- ii) the project proponents have the financial strength to manage project financing and contingencies; and
- iii) costs estimates for the project have been thoroughly developed.

A. ...

- i) financing for the entire life cycle of the integrated CCS project is in place and risk mitigation strategies are extensively developed;
- ii) the project proponents have extensive financial strength to manage project financing and contingencies. The proponent also includes a discussion considering how possible market externalities and tightening credit markets could impact the project's financial viability, with mitigating strategies developed; and
- iii) costs estimates for the project have been extensively developed.

## 11.7 Cost Sharing Structure

This section of the proposal describes the proponents' expectations with respect to the contributions of the Government of Alberta necessary for the CCS project to proceed. Section 6, Funding Principles, outlines the Government of Alberta's cost sharing agreement as: a maximum of up to 75 percent of the total incremental cost to capture, transport and store CO<sub>2</sub>; a maximum of up to 40 percent of the approved CCSF funding for the pre-completion stage based on achieved milestones; up to an additional 20 percent of the approved CCSF funding upon construction completion, with the remaining 40 percent of the CCSF funding support to be paid as CO<sub>2</sub> is captured and stored over a maximum period of 10 years. Security to the Crown during construction should be provided by either an on-sight letter of credit or by providing credit assurances deemed to be acceptable by the Crown.

The proposed cost sharing arrangement:

- D. ...does not meet all the terms outlined in the Funding Principles.
- C.... meets all the terms in the Funding Principles but introduces conditions or uncertainties.
- B. ...meets all the terms outlined in the Funding Principles.
- A...provides more favourable cost sharing terms and security (to the Government of Alberta) than those outlined in the Funding Principles.



## 11.8 Efficiency

This section of the proposal evaluates the efficiency of the project relative to the requested financial support from the CCSF. The measure for efficiency is the level of CO<sub>2</sub> reductions relative to the requested CCSF contribution and it is relative to other CCS solutions within the proponent's industry.

The requested contribution from the fund, calculated on a per tonne of emissions stored basis, is:

- D....of extremely high cost, for the specific industry.
- C. ...of higher than average cost, for the specific industry.
- B. ...of average cost, for the specific industry.
- A. ...of below average cost, for the specific industry.

## 11.9 Ancillary benefits and synergies

This section of the proposal high-lights the expectations of the Government of Alberta that the CCS Fund, and the projects it will support, will create ancillary benefits and synergies with respect to government's strategic goals. There is a desire to support projects from more than one sector, to develop value added processing in Alberta and to disseminate learnings and information developed through the projects supported. The Fund has been established to initiate a wide-scale implementation of CCS in Alberta; where opportunities exist, projects supported should contribute to creating an integrated CCS sector in the province. This section includes a description of the following project characteristics:

- Natural gas consumption for industrial purposes;
- Potential to unlock low-value natural resources and waste products;
- Water usage;
- Potential reductions in NO<sub>x</sub> and SO<sub>x</sub> emissions; and
- Potential reductions in land disturbance.

The project's ancillary benefits and synergies provide:

- D. ...limited expectations of furthering the Government of Alberta's strategic goals in addition to CCS.
- C. ...some expectations of furthering the Government of Alberta's strategic goals in addition to CCS.
- B. ...significant expectations of furthering the Government of Alberta's strategic goals in addition to CCS.
- A. ...will further the Government of Alberta's strategic goals in addition to CCS implementation.

## 11.10 Portfolio Contribution

Government's objective is to have the CCS Fund support projects from more than one sector. A specific project's alignment with this objective would mean that:

- The project contributes to portfolio diversification
- The project fits within the desire to fund 3 – 5 projects which in total will result in 5 million tonnes of CO<sub>2</sub> annually being stored, within the \$2 billion available in the fund.

D ... The project does not fit with government's diversification objectives and /or funding it will not allow 3 – 5 projects to be funded within the \$2 billion limit.

C ... The project challenges government's diversification objectives and risks the ability to fund 3 – 5 projects.

B ... The project fits with government's diversification objectives and will contribute to meeting the volume objectives within the \$2 billion commitment.

A ... The project has a superior fit with government's diversification objectives.

## 12. Project Proponents' Certification and Signature

The undersigned hereby:

- a) verifies the accuracy of their proposal;
- b) consents, and has obtained the written consent of any individuals identified in the FPP, to the use of the information in the proposal by the Government of Alberta, employees of the Government of Alberta, and individuals and organizations under contract to provide services to the Alberta Department of Energy, for the purpose of evaluating this application and for any other purpose related to the Carbon Capture and Storage Fund;
- c) consents to the proponents names, organizations, project title, abstract, overview, expected benefits and approved funding amount being publicly disclosed if the proposal is selected for funding; and
- d) confirms that the Boards of Directors of the proponent corporations have approved the submission and the information contained herein.

|                                   |                     |
|-----------------------------------|---------------------|
| Proponent's Name – <b>Capture</b> | Title/Organization: |
| Authorized Signature:             | Date:               |

|  |                     |
|--|---------------------|
| Proponent's Name - <b>Transportation</b> | Title/Organization: |
| Authorized Signature:                    | Date:               |

|                                   |                    |
|-----------------------------------|--------------------|
| Proponent's Name - <b>Storage</b> | Title/Organization |
| Authorized Signature:             | Date:              |

## 13. Submission

In submitting a project proposal, please note the following:

- a) Proposals received unsigned, by facsimile, by electronic mail, or after 4:30 p.m. (MST), March 31, 2009, **will be rejected**.
- b) Ambiguous, incomplete, unclear or unreadable applications may also be rejected.
- c) Proponents must submit three paper copies of the proposal (including all supporting documentation), and one electronic copy.
- d) Proposals must be submitted to either the Calgary or Edmonton office of ADOE and addressed to:

Mr. David Breakwell  
Assistant Deputy Minister  
Alberta Department of Energy  
North Petroleum Plaza  
10th Floor, 9945 – 108 Street  
Edmonton, Alberta T5K 2G6  
[ccseoi.energy@gov.ab.ca](mailto:ccseoi.energy@gov.ab.ca)

Mr. David Breakwell  
Assistant Deputy Minister  
Alberta Department of Energy  
AMEC Place  
Suite 300, 801 6<sup>th</sup> Avenue S.W.  
Calgary, Alberta T2P 3W2  
[ccseoi.energy@gov.ab.ca](mailto:ccseoi.energy@gov.ab.ca)

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**CCS FUNDING AGREEMENT – QUEST PROJECT**

**BETWEEN:**

**HER MAJESTY THE QUEEN IN RIGHT OF ALBERTA**, as represented by the Minister of Energy

**AND:**

**SHELL CANADA ENERGY**, a partnership registered under the laws of Alberta, as operator of the Project and as agent for and on behalf of the AOSP Joint Venture and its participants, comprised of **SHELL CANADA ENERGY**, **CHEVRON CANADA LIMITED**, a body corporate incorporated under the laws of Canada, and **MARATHON OIL CANADA CORPORATION**, a body corporate incorporated under the laws of Alberta

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## **CCS FUNDING AGREEMENT – QUEST PROJECT**

**made as of the 24<sup>th</sup> day of June, 2011**

BETWEEN:

**HER MAJESTY THE QUEEN IN RIGHT OF ALBERTA**, as represented by the  
Minister of Energy

(the “**Province**”)

AND:

**SHELL CANADA ENERGY**, a partnership registered under the laws of Alberta, as operator of the Project and as agent for and on behalf of the AOSP Joint Venture and its participants, comprised of **SHELL CANADA ENERGY, CHEVRON CANADA LIMITED**, a body corporate incorporated under the laws of Canada, and **MARATHON OIL CANADA CORPORATION**, a body corporate incorporated under the laws of Alberta

(the “**Project Operator**”)

### **PREAMBLE:**

In response to the Full Project Proposals Information Package issued by the Province under its Carbon Capture and Storage Program, the Recipients submitted a proposal in respect of their proposed “Quest Project”. The Province has agreed to contribute funding of up to \$745 million towards the Recipients’ cost of carrying out the Quest Project, and the Province and the Recipients have reached agreement on the terms and conditions upon which such funding will be provided.

The Province and the Project Operator therefore agree as follows:

### **1. INTERPRETATION**

#### **1.1 Defined Terms**

In this Agreement, the following expressions have the following meanings (and where applicable, the plural or the singular thereof have corresponding meanings):

**"1745844 Alberta"** means 1745844 Alberta Ltd, formerly called Marathon Oil Canada Corporation, being one of the Recipients;

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“**Affiliate**” means, with respect to any Person, any other Person which is affiliated with such Person, and for the purposes hereof:

- (a) two Persons will be considered to be affiliated with one another if one of them controls the other, or if both of them are controlled by a common third Person; and
- (b) one Person will be considered to control another Person if it has the power to direct or cause the direction of the management and policies of the other Person, whether directly or indirectly through one or more intermediaries, and whether by virtue of the ownership of shares or other equity interests or the holding of voting rights or contractual rights, and, in respect of a body corporate, it will be considered to be controlled by another Person if:
  - (i) the securities of the body corporate to which are attached more than 50% of the votes that may be cast to elect directors of the body corporate are held, other than by way of security only, by or for the benefit of that Person, and
  - (ii) the votes attached to those securities are sufficient, if exercised, to elect a majority of the directors of the body corporate.

“**AOSP Joint Venture**” means the Athabasca Oil Sands Project Joint Venture, comprising, prior to May 31, 2017, Shell, Chevron and Marathon, and, as of May 31, 2017, CNUL, Chevron and 1745844 Alberta Ltd. and their respective assigns in respect of their ownership interest in such joint venture;

“**Applicable Law**” means, in relation to any Party or the Project, all applicable provisions, whether now or hereafter in effect, of any:

- (a) laws, statutes, rules, regulations, official directives and orders of any competent Governmental Authority; and
- (b) judgements, orders and decrees of competent courts, arbitrators and commissions, or any other bodies exercising similar functions, in any actions or proceedings by which a Party is legally bound;

“**Business Day**” means a day other than a Saturday, Sunday or statutory holiday in Alberta;

“**CCS**” means carbon capture and storage, being the capture, transportation and geological sequestration of carbon dioxide;

“**Chevron**” means Chevron Canada Limited, being one of the Recipients;

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"CNUL" means Canadian Natural Upgrading Limited, being one of the Recipients;

"**Commercial Operation**" means achievement of successful culmination of the commissioning process for the Project, such that the Project has achieved CCS operations on the basis described in Schedule "F";

"**Commercial Operation Date**" means the date on which Commercial Operation is achieved if it is the first day of a calendar month or, if it is not, then the first day of the calendar month following the date on which Commercial Operation is achieved;

"**Commercial Operation Extension Period**" means the amount of the delay in the Recipients' ability to achieve Commercial Operation on or before December 31, 2017 arising from a Force Majeure Event or Force Majeure Events, provided that:

- (a) for a Force Majeure Event described in clause (e)(i) or (ii) in the definition of Force Majeure Event, the amount of the delay will be equal to the delay specified in the applicable clause; and
- (b) the sum of all delays arising from the events set out in clause (e) of the definition of Force Majeure Event cannot exceed the maximum period specified in clause (e);

"**Default**" means any non-trivial breach of this Agreement by the Recipients, or the Project Operator, as applicable, but does not include any breach caused by a Force Majeure Event for so long as the effects of the Force Majeure Event continue to operate to prevent, delay or interrupt the performance of the Recipients', or the Project Operator's, as applicable, obligations under this Agreement, and provided that the sum of all delays arising from the events set out in clause (e) of the definition of Force Majeure Event cannot exceed the maximum period specified in clause (e);

"**Final Investment Decision**" has the meaning ascribed to it in Section 6.1;

"**Fiscal Year**" means the fiscal year of the Province, being the period from April 1 of a calendar year to March 31 of the following calendar year;

"**FOIP Act**" means the *Freedom of Information and Protection of Privacy Act* (Alberta), including any amendments from time to time;

"**Force Majeure Event**" means any of the following events that prevents, delays or interrupts:

- (a) the performance of any obligation of the Recipients or the Project Operator, as applicable, under this Agreement;

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- (b) the Recipients' ability to achieve Commercial Operation on or before December 31, 2017; or
- (c) the conduct of the Project after Commercial Operation in a material and adverse manner;  
provided that any such event does not occur by reason of the negligence or wilful act of the Recipients, or Project Operator, as applicable (or any person for whom the Recipients, or the Project Operator, as applicable, or any of them are legally responsible) or by reason of any lack of financial resources of the Recipients, or the Project Operator, as applicable, and provided that the Project Operator has promptly notified the Province of the circumstances constituting such event upon its occurrence and thereafter take all commercial reasonable measures to rectify or mitigate the circumstances giving rise to the or following from such event;
- (d) any war, insurrection, armed conflict, act of foreign enemy, revolution, terrorist act, interference by military authorities, sabotage, vandalism, other unlawful acts of a third party, strike, lockout or other labour disturbance (but for greater certainty excluding any labour shortages), explosion, epidemic, fire, flood, act of God, natural disaster, weather event, breakdown or failure of machinery or equipment;
- (e) any of the following events:
  - (i) a delay past February 28, 2012, to the extent of the delay, in the enactment by the Province of applicable regulations under the *Mines and Minerals Act* (Alberta) or, as an alternative, in the exercise by the Province of any authority it may have to enter into binding obligations with the Recipients, that addresses the responsibility for and the terms of long term liability for carbon dioxide injected into subsurface saline aquifers in Alberta;
  - (ii) a delay past February 28, 2012, to the extent of the delay, in the Recipients obtaining all Regulatory Approvals with conditions acceptable to the Recipients, acting reasonably, but excluding any delay in obtaining Regulatory Approvals occurring after the Final Investment Decision;
  - (iii) any material (A) change in, or (B) newly issued, Applicable Law that occurs and becomes in force after the Final Investment Decision that prevents, delays or interrupts the Recipients' ability to carry out the Project; and
  - (iv) any other events which are not otherwise set out in clauses (d), (e)(i), (ii) and (iii) above that are beyond the control of the Recipients;

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but only to the extent that the sum of all delays arising from the events set out in this clause (e) does not exceed a total period of two years;

**“FPP Information Package”** means the document dated December 2008 entitled “Carbon Capture and Storage Program: Full Project Proposals Information Package” issued by the Province (as supplemented by Addendum 1 issued March 17, 2009) with respect to full project proposals for funding under the Province’s Carbon Capture and Storage Program as more particularly described in such document;

**“Funding”** means the grant funding to be contributed by the Province under this Agreement, as more particularly described in Section 4.1;

**“Governmental Authority”** means any federal, provincial, municipal or local government or any department, agency, board, court, tribunal or authority thereof or other political subdivision thereof (whether administrative, legislative, executive or otherwise) and any Person exercising executive, legislative, judicial, regulatory or administrative functions of, or pertaining to, government or the operation thereof;

**“Incurable Default”** means a Default that is by its nature or by reason of prevailing circumstances incapable of being cured in all material respects, but does not include any Default that is a failure to carry out a particular obligation by a particular date or within a particular time where it is possible to subsequently perform that obligation, albeit not by or within the relevant date or period;

**“Independent Engineer”** means an independent engineering firm as more particularly described in Section 4.3;

**“Instalments”** means the instalments of the Funding contemplated by Section 4.2;

**“Letters of Credit”** means the letters of credit described in Section 4.5;

**“Marathon”** means Marathon Oil Canada Corporation, being one of the Recipients;

**“Notice of Default”** means a notice by the Province to the Project Operator specifying a Default of the Recipients, or the Project Operator, as applicable;

**“Operating Phase Extension Period”** means an extension past December 31, 2025 equal to:

- (a) the duration of any Commercial Operation Extension Period; plus
- (b) the amount of time during which the operation of the Project is materially adversely affected and delayed due to a Force Majeure Event or Force Majeure Events occurring after Commercial Operation,

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provided that the aggregate amount of the extension arising from the events set out in clause (e) of the definition of Force Majeure Event cannot exceed the maximum period specified in clause (e);

**“Other Public Funding”** means, at any time, the amount of funding that has been contributed or committed in respect of the Project (applying, where appropriate, a reasonable allocation of such funding if it is partly in respect of the Project and partly in respect of operations or activities outside or beyond the Project), by any entity that is a government or a not for profit entity that is funded primarily by government (including without limitation in each case the Province and the Government of Canada), but excluding any such funding provided to the Recipients: (i) pursuant to this Agreement, or (ii) for greater certainty, any credits, allowances, offsets and other consideration of any kind whatsoever that the Recipients receive or earn based upon the Recipients achieving reductions in the emission of carbon dioxide into the atmosphere due to the sequestration of carbon dioxide under the Project;

**“Parties”** means the Province and the Project Operator;

**“Person”** means an individual, a partnership, a corporation, a trust, a joint venture, an unincorporated organization, a union, a government or any department or agencies thereof and the heirs, executors, administrators or other legal representatives of an individual;

**“Project”** means the “Quest Project” described in the Project Plan;

**“Project Costs”** means all capital and operating costs of the Project from January 1, 2009 to the end of the Term, determined in accordance with Section 3.5;

**“Project Milestones”** are the events specifically listed as Project Milestones in Schedule “C”;

**“Project Operator”** means Shell Canada Energy, or a permitted assignee pursuant to Section 2.4(a), in its capacity as operator of the Project and as agent for and on behalf of the Recipients;

**“Project Plan”** is the document attached as Schedule “A” to this Agreement, and includes any amendments made in accordance with Section 3.2;

**“Project Results”** means the information to be provided pursuant to Section 5.1 in the form prescribed by Schedule “D”;

**“Project Revenues”** means revenues of the Project during the Term, determined in accordance with Section 3.6;

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**“Project Timeline”** is the document attached as Schedule “B” to this Agreement, and includes any updated Project Timeline delivered in accordance with Section 3.3;

**“Projected Payment Schedule”** is the document attached as Schedule “C” to this Agreement, as amended annually in accordance with Section 3.4;

**“Proportionate Interest”** means, for any Recipient, that Recipient’s interest from time to time in respect of the Project and this Agreement, which interests at the date of this Agreement are specified in Section 2.3;

**“Recipients”** means, prior to May 31, 2017, Shell, Chevron and Marathon and, as of May 31, 2017, Canadian Natural Upgrading Limited, Chevron Canada Limited and 1745844 Alberta Ltd., as joint venture participants in the AOSP Joint Venture;

**“Regulatory Approvals”** means all governmental permits, licenses, approvals and authorizations required to be obtained under Applicable Law in connection with the Project;

**“Reports”** has the meaning ascribed to it in Section 5.1, and **“Report”** means any one of them;

**“Shell”** means Shell Canada Energy, being one of the Recipients;

**“Term”** means the period from and including the date of execution of this Agreement to and including the date that is the earlier of (i) ten years after the Commercial Operation Date plus the period of any applicable Force Majeure Event or Force Majeure Events occurring after Commercial Operation, or (ii) the date of termination of this Agreement;

**“Termination Event”** means any of the following:

- (a) if the Project Operator or any of the Recipients is adjudged a bankrupt or makes a general assignment for the benefit of creditors, or takes the benefit of any legislation for protection against creditors, orderly payment of debts, or winding up or liquidation;
- (b) if a receiver or receiver-manager is appointed for the business of the Project Operator or any of the Recipients, unless the appointment is cancelled within 10 Business Days;
- (c) if the Recipients abandon the Project or the Project Operator announces a present intention to abandon the Project;
- (d) if the Recipients fail to achieve Commercial Operation by December 31, 2017 (plus any applicable Commercial Operation Extension Period);



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- (e) if the Project Operator or any of the Recipients assign their obligations contrary to Section 2.4;
- (f) if the Project Operator:
  - (i) is Shell Canada Energy or its Affiliate, it ceases to be controlled, directly or indirectly, by Royal Dutch Shell plc, unless the Province agrees in writing that such a change of control will not constitute a Termination Event; or
  - (ii) is an assignee pursuant to Section 2.4(a), there is a change in control of the Project Operator such that:
    - (A) the Project Operator has disposed of all or substantially all of its assets;
    - (B) if the Project Operator is a corporation, a change in its shareholdings has occurred such that any Person who, prior to such change in shareholdings, was not the owner, directly or indirectly, of a majority of the issued and outstanding voting shares of the corporation, becomes the owner, directly or indirectly, of a majority of its issued and outstanding voting shares; or
    - (C) if the Project Operator is a partnership, any change in the general partners of the partnership such that any Person who did not, prior to such a change in general partners, have the power to direct or cause the direction of, directly or indirectly, the management and policies of the partnership, subsequently possesses such power, unless the Province agrees in writing that any such event will not constitute a Termination Event;
- (g) if the Project Operator or any of the Recipients, upon receiving a Notice of Default from the Province:
  - (i) fail to, within 30 days, cure each Default specified in the Notice of Default; or
  - (ii) where the Default can be remedied but not within 30 days, fail to:
    - (A) promptly commence to cure such Default;
    - (B) thereafter diligently pursue such cure; and

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- (C) cure such Default in any event within 90 days from the date of receipt of the Notice of Default; or
- (iii) where the Default is an Incurable Default, fail to, within 10 days, communicate to the Province and initiate a commercially reasonable course of action designed to mitigate the consequences of the Incurable Default to the maximum extent practicable, and thereafter diligently pursue that course of action until the consequences of the Incurable Default have been so mitigated;
- (h) a course of repeated and serious Defaults that in aggregate demonstrate a marked or persistent inability or unwillingness on the part of the Recipients to perform their obligations under this Agreement; and

“**Upgrader**” means, collectively, the bitumen upgrader commissioned in 2002 and the bitumen upgrader currently being constructed, both of which are located near Fort Saskatchewan, Alberta and are part of the AOSP Joint Venture project.

## 1.2 Section References

References in this Agreement to Sections of this Agreement are to the correspondingly numbered provisions of this Agreement. References to Schedules are to the corresponding Schedules listed in Section 1.3.

## 1.3 Schedules

The following Schedules attached to this Agreement are part of this Agreement:

Schedule “A” – Project Plan

Schedule “B” – Project Timeline

Schedule “C” – Projected Payment Schedule

Schedule “D” – Form of Project Results

Schedule “E” – Categories of Costs and Revenues

Schedule “F” – Commercial Operation

Schedule “G” – Alternative Security

In addition, the documents which are expressly incorporated by reference in the Schedules are a part of the respective Schedule (and therefore a part of this Agreement).

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In the event of any conflict or inconsistency between any of the Schedules and any provision of the body of this Agreement, the body of this Agreement shall prevail.

#### **1.4 Entire Agreement**

This Agreement is the entire agreement between the Province, the Project Operator and the Recipients regarding the Project and the Funding, and supersedes any previous agreements, negotiations and understandings. There are no agreements, representations, warranties, terms, conditions or commitments regarding the subject matter of this Agreement except as expressed in this Agreement.

#### **1.5 Currency**

In this Agreement, all references to dollar amounts are in Canadian currency.

#### **1.6 Full Project Proposal Process**

By entering into this Agreement, the Recipients waive any objection to the process followed by the Province pursuant to the FPP Information Package, including any variance between this Agreement and any other funding arrangements entered into by the Province pursuant to the FPP Information Package.

#### **1.7 Section Headings**

Section headings will not be considered in interpreting the text of this Agreement.

## **2. THE RECIPIENTS**

### **2.1 Project Operator**

The Parties mutually acknowledge and intend that the Project will be directly carried out by the Project Operator, and therefore, subject to Section 2.2 regarding certain several obligations of the Recipients, agree as follows:

- (a) as between the Province and the Recipients, all obligations of the Recipients under this Agreement will be carried out by the Project Operator as agent for and on behalf of the Recipients, and the Province will look only to the Project Operator to carry out those obligations of the Recipients;
- (b) the Province shall have no obligation to look beyond the Project Operator or to have regard to contractual arrangements among the AOSP Joint Venture or to communicate with the Recipients other than through the Project Operator as contemplated by Sections 7.5 and 7.6, except as specified in Section 7.5; and

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- (c) all payments of the Funding shall be made solely to the Project Operator on behalf of the Recipients.

Shell Canada Energy represents and warrants to the Province that its execution of this Agreement has been duly authorized both in its own behalf and on behalf of and as agent for the Recipients.

## **2.2 Several Obligations**

Notwithstanding Section 2.1, the following obligations are the several obligations of the Recipients, and the Province may only pursue any remedy directly against the several Recipients in respect of their applicable Proportionate Interest share of such obligations:

- (a) the Letters of Credit or alternative forms of security contemplated by Section 4.5;
- (b) the repayment of Funding contemplated by Section 4.4; and
- (c) indemnification pursuant to the indemnity provided by Section 5.7.

## **2.3 Upgrader and Project Ownership Interests**

The Recipients represent and warrant to the Province that:

- (a) the ownership interests of the original Recipients in the Upgrader and the Project, prior to May 31, 2017, were as follows:
  - (i) Shell Canada Energy – 60%;
  - (ii) Chevron – 20%; and
  - (iii) Marathon (now called 1745844 Alberta Ltd.) – 20%.
- (b) the ownership interests of the Recipients in the Upgrader and the Project, as of and subsequent to May 31, 2017, are as follows:
  - (i) CNUL – 60%;
  - (ii) Chevron – 20%; and
  - (iii) 1745844 Alberta Ltd. – 20%.

In the event of any changes to the Upgrader or the Project ownership interests, the Project Operator shall provide notice of such changes to the Province within 30 days thereafter.

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## 2.4 Assignment

The Parties mutually acknowledge that (i) the Province's decision to contribute the Funding to the Project was premised upon the Project being that of the Recipients, and (ii) the Recipients should not be hampered in effecting certain corporate reorganizations and other assignments that do not materially affect the Province's interests under this Agreement. The Parties therefore agree as follows:

- (a) the Project Operator may assign its interest in this Agreement, but only insofar as it relates to its role and obligations as Project Operator, if:
  - (i) the assignee (or a guarantor in respect of the obligations hereunder to be assumed by the assignee) has an investment grade credit rating as determined and published by one of either Moody's Investor Services, Inc. or Standard & Poor's Financial Services LLC (or their successors) as of the date of such assignment;
  - (ii) the assignor Project Operator and the assignee have established to the satisfaction of the Province that the assignee has the knowledge, expertise and intent to carry out the obligations of the Project Operator under this Agreement; and
  - (iii) the Recipients have confirmed in writing to the Province that they have appointed the assignee as its agent to carry out the obligations of the Recipients under this Agreement, subject to Section 2.2;
- (b) subject to clause (a) above, any of the Recipients may assign all or any part of its interest in this Agreement to any third party if:
  - (i) the Recipient also assigns a corresponding interest in the Upgrader and the Project,
  - (ii) the assignee (or a guarantor in respect of the obligations hereunder to be assumed by the assignee) has an investment grade credit rating as determined and published by one of either Moody's Investor Services, Inc. or Standard & Poor's Financial Services LLC (or their successors) as of the date of such assignment; and
  - (iii) the Province is satisfied, acting reasonably, that there is no legal impediment, or legal conflict under legislation such as *Conflicts of Interest Act* or *Lobbyists Act*, or legal dispute such as significant arrears or judicial reviews, that prevents the Province from entering into an agreement with the assignee; and

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- (c) except as provided in clauses (a) and (b) above, neither this Agreement nor any right or benefit or payment under it will be assignable by any of the Recipients or the Project Operator, except with the prior consent of the Province, which consent may not be unreasonably withheld or delayed; and
- (d) any assignment of an interest in this Agreement by a Recipient or the Project Operator in accordance with the foregoing clauses shall be subject to the assignee undertaking in writing to assume and carry out the obligations of such Recipient or the Project Operator, as applicable, under this Agreement in respect of the assigned interest.

## **2.5 Contractual Relationships**

The Project Operator shall, upon execution of this Agreement and thereafter on an ongoing basis (and in any event within 30 days of a request from the Province from time to time), provide to the Province a summary (in reasonable detail but without the obligation to provide copies of contracts or otherwise disclose specific contractual provisions) of key contractual relationships (excluding the agreement or agreements establishing and governing the AOSP Joint Venture) anticipated to be integral to the carrying out of the Project that have been entered into by the Project Operator.

## **3. THE PROJECT**

### **3.1 Recipients' Project**

This Agreement is not intended to create and does not create any relationship of joint venture, partnership or agency between the Province and the Recipients (or, for greater certainty, between the Province and the Project Operator). The Project is solely the undertaking and enterprise of the Recipients, and the Province will not by this Agreement acquire any right, title, interest or security interest (other than rights arising under the Letters of Credit and any alternative security pursuant to Section 4.5) in the Project or any assets comprising the Project. Except as expressly set out in this Agreement, the Province does not by this Agreement assume any risk, liability, duty of care or obligation in respect of the Project.

### **3.2 Changes to Project Plan**

The Parties mutually intend and agree that (i) the Project Plan defines for various purposes the boundaries of the Project in respect of which the Province has agreed to provide the Funding, and (ii) the Recipients should have an adaptive capacity to make modifications to the Project Plan that do not materially affect the Province's interests under this Agreement. The Parties therefore agree as follows:

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- (a) the Project Operator shall notify the Province of all proposed material changes to the Project Plan;
- (b) the Province shall agree to amend the Project Plan in accordance with changes proposed by the Project Operator if:
  - (i) the proposed changes are not material to the interests of the Province under this Agreement; or
  - (ii) the proposed changes, although potentially material to the interests of the Province under this Agreement, are such that, in the circumstances and having regard to the intentions of the Parties as expressed in this Agreement and the expressed objectives of the Province's Carbon Capture and Storage Program as set out in the FPP Information Package, it would be unreasonable for the Province not to agree to such changes.

### **3.3 Changes to Project Timeline**

Throughout the Term, the Project Operator shall deliver to the Province an updated Project Timeline highlighting changes from the previous Project Timeline or else affirming the absence of changes,

- (a) in a timely manner upon the Project Operator becoming aware of material changes in the expected schedule for the Project, as well as
- (b) in any event at the end of each quarter of the calendar year.

### **3.4 Projected Payment Schedule**

On or before December 1 of each Fiscal Year during the Term, the Project Operator shall deliver to the Province an amended Projected Payment Schedule highlighting changes in the expected timing and amount of requests for the payment of any Instalments or else affirming the absence of changes, as reasonably determined by the Project Operator having regard to the state and progress of the Project, except that:

- (a) the Project Operator shall not amend the expected timing and amount of Instalment payments that fall within the then current Fiscal Year if such amendment would project a greater total amount of Instalments during such Fiscal Year than the total amount originally forecasted in the preceding Projected Payment Schedule;
- (b) amendments to the Projected Payment Schedule shall not change:
  - (i) the Project Milestones which are required to be met in order for each Instalment to be paid, except with the consent of the Province; or

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- (ii) the calculation of the actual amount of such Instalment;  
as determined in accordance with Section 4.2; and
- (c) amendments to the Projected Payment Schedule shall have regard to the provisions of Section 4.2(a) with respect to the timing of requests and other requirements for the payment of Instalments prior to Commercial Operation.

In addition to the foregoing, for the purposes of the Province's cash management planning within each Fiscal Year the Project Operator shall provide an update to the Province in respect of the expected timing and amount of requests for the payment of any Instalments within such Fiscal Year as set out in the Projected Payment Schedule,

- (c) in the event that the Project Operator become aware of any material changes, as well as
- (d) on or before March 31, June 30 and September 30 of the applicable Fiscal Year.

Such updates shall not constitute an amendment to the Projected Payment Schedule.

### **3.5 Project Costs**

Project Costs are costs that have been expended or incurred by the Recipients and the Project Operator or any of them from January 1, 2009 to the end of the Term directly in furtherance of the Project, and shall be limited to and determined in accordance with the following:

- (a) the Project Plan, including without limitation the facilities, activities and operations identified in the Project Plan, sets out the boundaries of the Project for the purpose of determining the scope and range of Project Costs;
- (b) subject to clause (a) above, a cost is a Project Cost only to the extent that:
  - (i) the cost reflects the actual cost of the Recipients and the Project Operator in respect of the Project, net of any bonuses, allowances, rebates or other collateral consideration returned to the Recipients and the Project Operator;
  - (ii) the cost has been paid by or on behalf of the Recipients and the Project Operator or any of them;
  - (iii) the cost is in respect of goods or services actually received (and not pre-paid) by the Recipients and the Project Operator, and such costs may include reasonable travel, food and lodging costs necessary for and directly related to Project activities;



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- (iv) the cost has been prudently incurred and does not exceed the fair market value for the goods or services received by the Recipients and the Project Operator;
  - (v) if the cost was incurred in a transaction with a person who is not “at arm’s length” (as defined in the *Income Tax Act* (Canada)) to the Recipients and the Project Operator, the amount of the cost does not exceed the fair market value of the goods or services thereby provided to the Project; and
  - (vi) if the cost is in respect of the Recipients’ overhead, including without limitation all “corporate” and other general costs, the cost (or proportion thereof as allocated in accordance with clause (c)(i) below) is reasonable and is reasonably and directly attributable to the Project; provided, however, that the total of all such costs at the applicable time of determination shall not exceed 15% of the then aggregate Project Costs;
- (c) subject to clauses (a) and (b) above, where a cost is incurred partly for purposes of the Project and partly for purposes outside or beyond the Project, then:
- (i) subject to subclause (ii) below, such cost must be reasonably allocated between the Project and the non-Project use, having regard to the amount of such cost that would have been incurred had the Recipients and the Project Operator not pursued the Project; and
  - (ii) a cost in respect of the salary or benefits of an employee shall be allocated based upon the time spent by the employee during the relevant period in furtherance of the Project relative to the total time spent in providing services to the Recipients and the Project Operator, as supported by timesheets maintained and submitted by the employee;
- (d) notwithstanding any of the foregoing, Project Costs must not include any of the following:
- (i) any costs incurred prior to January 1, 2009;
  - (ii) goods and services tax or any other value-added tax paid by or on behalf of the Recipients and the Project Operator;
  - (iii) any payment to a director, or any remuneration, bonus or benefits paid to any executive officer (including any chief executive officer, chief operating officer or chief financial officer by whatever title that position is held, and any vice-president) of any of the Recipients and the Project Operator or of any Affiliate of any of the Recipients and the Project Operator;

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- (iv) any payments in the nature of termination or severance pay and any benefits under a stock option plan;
- (v) costs of litigation, judgments, interest on judgments, penalties or fines;
- (vi) entertainment costs, sponsorship fees, charitable donations or any other costs incurred to generate goodwill or promote good community relations in respect of the Project (with the exception of costs incurred to promote public education and public confidence in regard to CCS in Alberta);
- (vii) opportunity costs (and the monetary value thereof, if any) in respect of other activities that might have been pursued by the Recipients and the Project Operator if the Recipients and the Project Operator had not pursued the Project, including the opportunity costs of capital invested by the Recipients and the Project Operator in the Project; and
- (viii) costs incurred in the investigation, removal, decommissioning or remediation of environmental contaminants or hazards.

The onus shall at all times and for all purposes be exclusively on the Recipients and the Project Operator to affirmatively demonstrate to the satisfaction of the Province, acting reasonably, that a particular cost qualifies as a Project Cost in accordance with the foregoing, and the Province in that regard may require such explanations, supporting documentation and other evidence as it is reasonable to require in relation to any particular Project Cost or class or category of Project Costs.

### **3.6 Project Revenues**

Project Revenues are revenues received or earned by the Recipients and the Project Operator or any of them during the Term directly arising from the Project, and shall be determined in accordance with the following:

- (a) the Project Plan, including without limitation the facilities, activities and operations identified in the Project Plan, sets out the boundaries of the Project for the purpose of determining the revenues received by the Recipients and the Project Operator or any of them that constitute Project Revenues;
- (b) Project Revenues include:
  - (i) all Funding, Other Public Funding, monetary credits, contractual payments, sale proceeds, commissions, bonuses and other payments or consideration of any kind whatsoever that become due and payable to the Recipients and the Project Operator or any of them in respect of the Project; and

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- (ii) the monetary value of all credits, allowances, offsets and other consideration of any kind whatsoever that the Recipients and the Project Operator receive or earn based upon the Recipients and the Project Operator achieving reductions in the emission of carbon dioxide into the atmosphere due to the sequestration of carbon dioxide under the Project. Such monetary value will be as determined by the Recipients and the Project Operator on a reasonable and good faith basis, provided that if the Province does not agree with the Recipients' determination, the monetary value will be determined by an independent valuator selected in accordance with Section 4.3;
- (c) amounts that, although due and payable to the Recipients and the Project Operator or any of them in respect of the Project, are written off reasonably as being uncollectible, shall thereupon no longer be included in Project Revenues; provided, however, that in the event any such amounts are subsequently collected, the amount collected shall then be included in Project Revenues;
- (d) where payment for goods, services or anything generated by the Recipients and the Project Operator is structured over time rather than becoming payable as such consideration is delivered, whether through leases or any other deferral arrangements, the consideration payable to the Recipients and the Project Operator shall be deemed to be received in proportion to and concurrently with delivery of the consideration provided by the Recipients and the Project Operator; and
- (e) where amounts are received or earned pursuant to a transaction with a person who is not "at arm's length" (as defined in the *Income Tax Act* (Canada)) to the Recipients and the Project Operator, the greater of (i) the amount received or earned and (ii) the fair market value of the consideration provided by the Recipients and the Project Operator shall be included in Project Revenues.

### **3.7 Carbon Dioxide Sequestration**

Upon Commercial Operation and until the end of the Term, the Project Operator shall implement a measurement, monitoring and verification plan as part of the Project, and as more particularly described in the Project Plan, that will:

- (a) measure the mass of carbon dioxide injected into the target geological formation (as identified in the Project Plan);
- (b) monitor and track the location and movement of the sequestered carbon dioxide plume, including any movement of carbon dioxide out of the target geological formation; and
- (c) monitor for and measure the mass of injected carbon dioxide that:

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- (i) fails to reach the target geological formation upon injection; or
- (ii) escapes or is extracted from the subsurface;

in accordance with prevailing standards established by Applicable Law. Such measurement, monitoring and verification plan may continually evolve during the conduct of the Project to account for the Project Operator's experiences and learnings in carrying out the Project and must account for any changes in standards established by Applicable Law.

#### **4. THE FUNDING**

##### **4.1 Province's Obligation**

In consideration of the Recipients carrying out the Project, the Province agrees, subject to the provisions of this Agreement, to contribute to the Recipients in respect of the Project grant funding (the "**Funding**") that is the lesser of \$745 million and 75% of Project Costs; provided that the Province may at any time in its discretion by notice to the Project Operator reduce the amount of the Funding to the extent (and by the amount) that the Funding at any time exceeds: (i) 75% of Project Costs, less (ii) Other Public Funding.

##### **4.2 Instalments of the Funding**

Subject to Sections 4.3 through 4.8, the Province shall pay the Funding to the Project Operator in the following instalments (collectively, the "**Instalments**"):

- (a) subject to clause (b) below, 40% of the Funding (in this Section 4.2(a), the "**First Funding Amount**") will become payable in the following instalments and amounts upon the Recipients achieving the following Project Milestones (as specifically identified in Schedule "C") and satisfying the following requirements:
  - (i) Project Milestone #1 – \$30 million, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the provision of security in accordance with Section 4.5, both occurring within Fiscal Year 2011-12;
  - (ii) Project Milestone #2 – \$40 million, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the provision of security in accordance with Section 4.5, both occurring within Fiscal Year 2012-13;
  - (iii) Project Milestone #3 – \$115 million less the amount paid upon achieving Project Milestone #2, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the

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provision of security in accordance with Section 4.5, both occurring within Fiscal Year 2012-13;

- (iv) Project Milestone #4 – \$100 million, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the provision of security in accordance with Section 4.5, both occurring within Fiscal Year 2013-14;
- (v) Project Milestone #5 – \$115 million less the amount paid upon achieving Project Milestone #4, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the provision of security in accordance with Section 4.5, both occurring within Fiscal Year 2013-14;
- (vi) Project Milestone #6 - \$38 million, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the provision of security in accordance with Section 4.5, both occurring no earlier than Fiscal Year 2014-15;
- (vii) Project Milestone #7 – any remaining amount of the First Funding Amount, subject to a request for payment in respect thereof being received by the Province in accordance with Section 4.3(a) and the provision of security in accordance with Section 4.5, both occurring no earlier than Fiscal Year 2014-15;

and for greater certainty if the Recipients fail to satisfy a requirement set out above for the payment of any of the above Instalments or the amount of any Instalment is reduced pursuant to clause (b) below, the amount or remaining amount of such Instalment, as the case may be, will subsequently become payable, either upon satisfying the requirements specified for the next Project Milestone if that next Project Milestone occurs in the same Fiscal Year or, if not, then in accordance with clause (a)(vii) above;

- (b) the aggregate Instalments paid and payable to the Recipients pursuant to clause (a) above must not at any time exceed:
  - (i) the then aggregate Project Costs; less
  - (ii) the then total amount of any Other Public Funding received or receivable by the Recipients;

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- (c) subject to clause (d) below, an amount equal to 60% of the Funding less all Instalments paid pursuant to clause (a) above will become payable upon the Recipients achieving Commercial Operation;
- (d) the aggregate Instalments paid and payable upon the Recipients achieving Commercial Operation shall not exceed:
  - (i) 75% of the aggregate Project Costs; less
  - (ii) the total of any Other Public Funding received or receivable in respect of the Project;as of the time Commercial Operation is achieved;
- (e) subject to clauses (f) and (g) below, the remaining balance of the Funding (in this Section 4.2, the “**Remaining Funding**”), comprising at least 40% of the Funding, will become payable in up to 10 annual Instalments on the anniversary date of the Commercial Operation Date or by a date mutually agreed upon by the Province and the Project Operator, each of which annual Instalments shall be calculated as follows:
  - (i) the Remaining Funding;  
*multiplied by:*
  - (ii) the net tonnes of carbon dioxide sequestered in year;  
*divided by:*
  - (iii) 10.8 million tonnes of carbon dioxide;wherein the “net tonnes of carbon dioxide sequestered in year” shall be calculated based upon the following:
  - (iv) the total mass of carbon dioxide injected into the target geological formation (as identified in the Project Plan) in the immediately preceding year; less
  - (v) the total mass of carbon dioxide that has escaped or has been extracted from the subsurface during such year;all as measured in accordance with the measurement, monitoring and verification plan described in Section 3.7;

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- (f) in the event that the calculation of “net tonnes of carbon dioxide sequestered in year” is a negative amount for any year, no Instalment shall be payable for such year and the absolute value of such amount shall be deducted in calculating the “net tonnes of carbon dioxide sequestered in year” for the following year; and
- (g) no Instalment shall in any event become payable beyond December 31, 2025 (plus any applicable Operating Phase Extension Period), and the total of all Instalments shall not exceed the amount of the Funding set out in Section 4.1.

#### 4.3 Certification as Precondition to Payment

The following shall be conditions to the obligation of the Province to pay the Instalments:

- (a) the obligation of the Province to make payment of Instalments upon the Recipients achieving the respective Project Milestones shall be conditional on the Project Operator delivering to the Province a request for payment accompanied by:
  - (i) certification by an independent engineering firm (the “**Independent Engineer**”) selected by the Province in consultation with the Project Operator, both acting reasonably, that the Project Milestone has been achieved; and
  - (ii) a detailed line item statement (by category as set out in Schedule “E”) of Project Costs and Project Revenues together with certification as contemplated by Section 7.7 of such Project Costs and Project Revenues, as well as the total of Other Public Funding that has been paid or has become payable in respect of the Project;
- (b) the obligation of the Province to make payment of an Instalment upon the Recipients achieving Commercial Operation shall be conditional on the Project Operator delivering to the Province a request for payment accompanied by:
  - (i) certification by the Independent Engineer that Commercial Operation has been achieved; and
  - (ii) a detailed line item statement (by category as set out in Schedule “E”) of Project Costs and Project Revenues, together with certification as contemplated by Section 7.7 of such Project Costs and Project Revenues, as well as the total of Other Public Funding that has been paid or has become payable in respect of the Project;

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- (c) the obligation of the Province to make payment of any annual Instalment described in Section 4.2(e) shall be conditional on the Project Operator delivering to the Province a request for payment accompanied by:
- (i) certification by
    - (A) a “third party auditor” within the meaning and for the purposes set out in the *Specified Gas Emitters Regulation*, A.R. 139/2007, as may be amended or replaced from time to time, or
    - (B) another person as may be mutually agreed by the Parties,as to the mass of carbon dioxide (as measured in tonnes):
    - (C) that has been injected in the target geological formation (as identified in the Project Plan) through the Project in the immediately preceding year (calculated from the anniversary of the Commercial Operation Date), and
    - (D) that has escaped or is extracted from the subsurface during such year;as determined in accordance with the measurement, monitoring and verification plan described in Section 3.7; and
  - (ii) a detailed line item statement (by category as set out in Schedule “E”) of Project Costs and Project Revenues, together with certification as contemplated by Section 7.7 of such Project Costs and Project Revenues, as well as the total of Other Public Funding that has been paid or has become payable in respect of the Project.

Following execution of this Agreement, the Parties shall engage in discussions with a view to arranging in advance the selection and retainer of the Independent Engineer, the “third party auditor” and the independent valuator as referred to in, and for the purposes of, Section 3.6(b)(ii) (collectively referred to in this Section 4.3 as the “**Independent Verifiers**”). Both Parties shall do all things reasonably necessary to facilitate completion of the work of the Independent Verifiers, including without limitation the Project Operator providing to the Independent Verifiers all access and information as may reasonably be required in order for the Independent Verifiers to carry out their functions as set out in clauses (a)(i), (b)(i) and (c)(i) above and in Section 3.6(b)(ii), as applicable. The Independent Verifiers shall be required to: (i) complete its work in relation to each request for certification or determination within a reasonable period of time; and (ii) be bound by non-disclosure and confidentiality obligations with respect to the information of the Parties, with obligations substantially similar to the obligations of the Province to



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the Recipients and the Project Operator as set out in Section 7.4. The fees of the Independent Verifiers to carry out such functions shall be borne solely by the Province.

#### 4.4 Repayment of Funding

Each of the Recipients shall repay its Proportionate Interest share of Funding to the Province in the event of the following:

- (a) if this Agreement is terminated under and in accordance with Section 6.1 or 6.2 prior to the Recipients achieving Commercial Operation, the amount of all Instalments previously paid to the Recipients (if any) shall be repaid to the Province within 10 Business Days thereafter; and
- (b) subject to clause (a) above, if the total of all Instalments paid to the Recipients exceeds the amount of the Funding set out in Section 4.1 as of the end of the Term, the excess amount shall be repaid to the Province within 10 Business Days thereafter.

Any repayment of Funding made by the Project Operator shall be deemed to be allocated and credited to each of the Recipients in proportion to their ownership interests in the Project (as set out or updated in accordance with Section 2.3) unless otherwise expressly stated by the Project Operator in the correspondence accompanying the repayment (which statement the Province shall be entitled to rely upon without any further inquiry).

#### 4.5 Security

The obligation of the Province prior to Commercial Operation to make payment of an Instalment under Section 4.2 (in this Section 4.5, the “**Next Instalment**”) is conditional on the Province having in hand, prior to such payment, the following security for the repayment of Instalments pursuant to Section 4.4(a):

- (a) an irrevocable on-sight letter of credit from each of the Recipients (collectively, the “**Letters of Credit**”) with a value equal to such Recipient’s Proportionate Interest share of the sum of the aggregate Instalments already paid to the Recipients, plus the amount of the Next Instalment, each in a form acceptable to the Province, presentable in Canada at a Canadian chartered bank or another financial institution acceptable to the Province; or
- (b) such other alternative security as the Province agrees to accept from each Recipient in lieu of a Letter of Credit as set out in Schedule “G”,

In the event the Recipients do not provide the Letters of Credit or alternative security agreed to by the Province, Instalments withheld by the Province in consequence shall become payable upon the Recipients achieving Commercial Operation.

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The Province shall surrender any Letters of Credit and release any alternative security provided by a Recipient within 10 days after the occurrence of either of the following events: (i) the Recipients achieving Commercial Operation, or (ii) such Recipient repaying its Proportionate Interest share of Instalments in accordance with Section 4.4(a).

#### **4.6 Time of Payment**

Where an Instalment becomes payable, the Province shall make payment within 30 days thereafter, subject to the following:

- (a) subject to clause (b) below, the Province may, by notice to the Project Operator, extend such 30 day period for up to an additional 90 days in respect of an Instalment that becomes payable at a time materially earlier than, or in an amount materially greater than, that forecasted by:
  - (i) the then current Projected Payment Schedule; and
  - (ii) any updates to the then current Projected Payment Schedule submitted in accordance with Section 3.4 at least 90 days prior to the date that such Instalment becomes initially payable; and
- (b) in the event that the amount of any Instalment would cause the total amount of Instalments paid in a Fiscal Year to exceed the total amount forecasted to be paid during such Fiscal Year as set out in the then current Projected Payment Schedule, the Province shall be entitled to delay payment of such excess amount until April 30 of the following Fiscal Year.

For greater certainty, if the total amount of Instalments that become payable in any Fiscal Year is less than the total amount forecasted to be paid during such Fiscal Year in the then current Projected Payment Schedule, there will be no reduction in the total amount of Funding available hereunder, and the shortfall may be claimed by the Project Operator in subsequent Fiscal Years in accordance with this Agreement.

#### **4.7 Net Revenue Position**

If at any time (i) aggregate Project Revenues exceed (ii) aggregate Project Costs plus a return allowance on Project Costs equal to the “return allowance rate” (as defined in the *Oil Sands Allowed Costs (Ministerial) Regulation* (excluding any amendments made after the date of this Agreement) made under the *Mines and Minerals Act (Alberta)* plus 2% per annum, the Project shall be considered to be in a “**Net Revenue Position**”.

The Province may hold back from any Instalment:

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- (a) any or all of the Instalment if the Project is in a Net Revenue Position; or
- (b) such portion of the Instalment as would cause the Project to be in a Net Revenue Position.

In the event of any such holdback from an Instalment, the amount so held back shall become payable when the Recipients establish that the Project is no longer in a Net Revenue Position and the payment would not cause the Project to be in a Net Revenue Position.

#### 4.8 Withholding of Funding

The Province will be entitled to withhold payment of any instalment of the Funding, whether before or after Commercial Operation, for so long as the Recipients or the Project Operator, as applicable, are in Default of any obligation under Section 3.3, 3.4, 3.7 and 5.1 through 5.8; provided that if the Default is an Incurable Default, the Recipients or the Project Operator, as applicable, shall be deemed to no longer be in Default when the Recipients or the Project Operator, as applicable, have (i) communicated to the Province, (ii) initiated, and (iii) diligently pursued to completion, a commercially reasonable course of action designed to mitigate the consequences of the Incurable Default to the maximum extent practicable.

### 5. RECIPIENTS' OBLIGATIONS

#### 5.1 Knowledge Sharing

The Project Operator acknowledges that the public dissemination of learning, knowledge and information developed through the Project (collectively referred to in this Section 5.1 as the “**CCS Information**”) in order to advance the state of knowledge of CCS and to advance future CCS projects is fundamental to the willingness of the Province to enter into this Agreement and to provide the Funding, and therefore the Project Operator shall provide to the Province such CCS Information as described in Schedule “D” (the “**Project Results**”) in accordance with and subject to the following:

- (a) Project Results shall be compiled:
  - (i) for each calendar year during the Term (or part thereof in respect of the first and last year of the Term), and a report in respect thereof containing the information prescribed in Schedule “D” shall be delivered annually to the Province on or before April 1 of the following calendar year, and
  - (ii) in response to a specific request of the Province from time to time in relation to any aspect of Project Results, and a report in respect thereof (which together with the reports described in clause (a)(i) above are

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referred to individually as a “**Report**” and collectively as the “**Reports**”) shall be delivered to the Province within 90 days of such request; and this obligation to provide information in response to a specific request of the Province will continue in effect after the termination of this Agreement:

- (A) for five years following the date of termination, if termination takes place after Commercial Operation; or
  - (B) for two years following the submission of the final Report if termination takes place before Commercial Operation;
- (b) the Project Operator may exclude from any Report the following:
- (i) the true proprietary information of another Person that is subject to a bona fide written contractual obligation of confidentiality owing by the Recipients or the Project Operator, as applicable, except that the Project Operator shall report the following in respect of such proprietary information:
    - (A) a general description of the nature and purpose of the proprietary information;
    - (B) as applicable, basic process flow diagrams in respect of the proprietary information;
    - (C) as applicable, the rationale for selecting or using the proprietary information in the Project; and
    - (D) the name of, and contact information for, the Person that owns the proprietary information or otherwise has the right to authorize the Recipients to use such information;
- and provided that the Project Operator shall:
- (E) include in all Reports any information in the nature of performance data, results or lessons learnt, whether technical, economic or otherwise, arising from the use of any proprietary information in the conduct of the Project and relating to the Project’s physical facilities, except any such information that relates to modifications to the existing base plant facility and that is subject to such obligation of confidentiality; and

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- (F) not rely upon its foregoing right of exclusion to exclude any information which is not in its true nature proprietary information of another Person, regardless of whether the Recipients or the Project Operator, as applicable, are bound by a general, broad or over-riding obligation of confidentiality in respect of such information;
- (ii) technical information which discloses a patentable invention under Applicable Law which if made public would jeopardize the novelty of the invention such that the inventor (or an assignee or successor of the inventor) would not be entitled to obtain a patent in respect of the invention, except that the Project Operator shall subsequently include in its report of Project Results such information if:
  - (A) the inventor (or an assignee or successor of the inventor) fails to file an application for a patent in any jurisdiction in the world within 2 years after the creation or development of such invention; or
  - (B) in the event that an application for a patent has been filed in any jurisdiction in the world, upon such application being laid open for public inspection;
- (iii) any CCS Information which if made public could reasonably jeopardize the safety and security of any Project facilities, unless previously or subsequently made public by the Recipients or otherwise required by Applicable Law to be disclosed to any Governmental Authority;
- (iv) any subsurface data (including without limitation well data) in relation to a geological formation until the Recipients have either:
  - (A) secured all of the subsurface rights to inject carbon dioxide for sequestration into such geological formation that are required to undertake the Project; or
  - (B) made its Final Investment Decision;except to the extent any such subsurface data must be made publicly available pursuant to Applicable Law;
- (v) any detailed forecast of Project activities or operations the disclosure of which would reasonably impact upon the Recipients' negotiation of commercial arrangements for the supply of any goods or services for the

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Project in a direct and negative manner, except that the Project Operator shall report such information after the supply of such goods or services has been arranged;

- (vi) any CCS Information in relation to the release of any substances to the environment which would not be required to be disclosed to any Governmental Authority pursuant to Applicable Law, with the meaning of “release”, “substances” and “environment” being as defined in the *Environmental Protection and Enhancement Act* (Alberta), as amended or replaced from time to time; and
- (vii) any CCS Information that is prohibited from being disclosed to the public pursuant to Applicable Law;

and in the event that any such CCS Information is excluded from a Report, the Project Operator shall provide written notice to the Province concurrently with the delivery of the Report and such notice shall generally describe the nature of the information excluded and shall set out the grounds relied upon for such exclusion;

- (c) with the delivery of each Report, the Project Operator shall and does hereby:
  - (i) represent and warrant to the Province that:
    - (A) to the best of the Project Operator’s knowledge, the CCS Information set out in the Report is accurate and valid as at the date of the Report;
    - (B) the Recipients own any and all intellectual property rights in the Report, or have secured the necessary licenses in respect of such intellectual property rights in order to comply with their obligations under this Section 5.1;
    - (C) to the best of the Project Operator’s knowledge, the creation and delivery of the Report does not infringe upon:
      - (I) the intellectual property rights; or
      - (II) the contractual or other legal or equitable rights;of any Person;
    - (D) the Project Operator has acquired from all authors of the Report a waiver of any and all moral rights that such authors may have over

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the Report (or any part thereof) which will operate to the benefit of the Province; and

(E) the Project Operator has the right and authority on behalf of the Recipients to grant the licence set out in clause (ii) below;

(ii) grant to the Province a non-exclusive, perpetual, worldwide and royalty free licence to produce, reproduce and publish the Report or any part thereof, with the right to sublicense the foregoing rights to any other Person without limitation;

and the above representations, warranties and licence grant shall survive the termination of this Agreement;

(d) the Province acknowledges and agrees that the Project Operator shall provide the Reports to the Province for the purpose of enabling the Province to fulfill the policy objectives set out in the first paragraph of this Section 5.1, and that in respect of any Report and the CCS Information therein:

(i) the representations and warranties set out in clause (c)(i) above are made solely in favour of the Province and no other representation or warranty is made in favour of the Province or any third party to whom a Report is provided or licensed by or through the Province, either directly or indirectly;

(ii) the Project Operator and the Recipients hereby disclaim all implied warranties, conditions and other terms, whether statutory, arising from a course of dealing or otherwise; and

(iii) except for any liability to the Province arising from a breach of the representations and warranties set out in clause (c)(i) above, neither the Project Operator nor the Recipients shall have any liability whatsoever to the Province, either directly or indirectly, for any damages which may be sustained by the Province in connection with the Report or the CCS Information therein (and use thereof), including but not limited to loss of revenue, profit, reputation or opportunity whether such liability arises out of contract, tort (including negligence), strict liability, warranty or other legal theory whether at law, in equity or otherwise;

(e) subject to the exclusions set out in clause (b) above, the Parties intend that the Reports will present a comprehensive report on the state of the Project; and

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- (f) in the event that the Project Plan is amended in accordance with Section 3.2, and such amendment expands the scope of the Project, the Province shall be entitled to require the Project Operator to provide CCS Information in respect of such expanded scope in consultation with the Project Operator, with the Parties acting reasonably.

The Project Operator acknowledge that the Province may disseminate into the public domain all or any portion of the Project Results provided to the Province by the Project Operator by way of a Report at the discretion of the Province, at such times and in such manner as the Province sees fit, subject to the following:

- (g) the Project Operator shall make reasonable efforts to ensure that any Report provided to the Province is accompanied by a disclaimer of the Recipients' and the Project Operator's liability in respect of the use by and/or reliance upon the information contained in the Report by any Person;
- (h) the Province shall make reasonable efforts to ensure that any initial public dissemination of a Report by the Province (or by any sublicensee of the rights granted to the Province pursuant to clause (c)(ii) above other than pursuant to any implied licence) is accompanied by the disclaimer included on said Report provided by the Project Operator;
- (i) the obligations set forth in clauses (g) and (h) above shall not apply to any of the following:
  - (i) any Report, or part thereof, which is provided by the Project Operator in satisfaction of the requirements of Division A of Schedule "D", regardless of whether such information is also contained within any other Report;
  - (ii) information contained in any other Report when such information is provided by the Project Operator in response to a specific request of the Province to satisfy or respond to any of the requirements of Division A of Schedule "D";
- (j) the obligation set forth in clause (h) above shall not apply to the dissemination of any information contained within a Report where such information cannot reasonably be used by or relied upon by any Person in a manner that would create a reasonable risk of a claim or demand being made against the Recipients or the Project Operator, as applicable, as a result of such use or reliance by any Person absent any disclaimer provided by the Project Operator.

The Recipients and the Project Operator further agree to generally promote public education and public confidence in regard to CCS in Alberta (either directly or through



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their affiliates), through such initiatives, actions and activities as the Recipients and the Project Operator consider suitable.

## 5.2 Reporting

In addition to the Reports, the Project Operator shall provide the following reporting during the Term:

- (a) within 90 days after the end of each calendar year, an annual report and presentation providing an overview of the state and progress of the Project; and
- (b) on a timely basis having regard to the nature of the circumstances of a particular request, but in any event within 90 days, a response to any specific inquiry reasonably made by the Province regarding any aspect of the Project in relation to any provision of this Agreement.

Subject to Section 5.5, the foregoing shall be subject to the Project Operator's right of exclusion in respect of any proprietary or technical information of another Person described in Section 5.1(b)(i) and 5.1(b)(ii), respectively.

## 5.3 Records, Inspection and Audit

The Project Operator shall, during the Term and for a period of five years thereafter, maintain in an appropriate form full accounting and other records of any nature or kind whatsoever (collectively, in this Section 5.3, the "**Records**") relating to the Project, including but not limited to Project Results (and the reporting thereof), Project Costs, Project Revenues and the amounts of carbon dioxide injected and sequestered pursuant to the Project. The Project Operator shall make the Records available for inspection and audit at all reasonable times upon reasonable notice by the Province or any representatives appointed by the Province (which may include the Auditor General of Alberta), subject to such arrangements for ensuring confidentiality as may reasonably be required in order to allow the Project Operator to comply with commercially suitable undertakings of confidentiality reasonably granted by the Recipients or the Project Operator, as applicable, to third parties in furtherance of the Project, and provided that the Records made available for inspection and audit will be subject to the Project Operator's right of exclusion in respect of the proprietary or technical information of another Person described in Section 5.1(b)(i) and 5.1(b)(ii), respectively (which shall be further subject to Section 5.5). The Project Operator shall take reasonable steps to facilitate such inspection and audit, and the Province shall ensure that such inspection and audit is carried out in a manner that does not excessively or unnecessarily interfere with the Project Operator's business operations and that any representatives it appoints to conduct any such inspection or audit are bound by non-disclosure and confidentiality obligations substantially similar to the obligations of the Province to the Recipients and the Project Operator as set out in Section 7.4. Such right of inspection and audit may be

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exercised by the Province solely for the purpose of assuring itself of compliance by the Recipients and the Project Operator with the provisions of this Agreement, and apart from such right of inspection and audit, the Records shall be in the exclusive custody and control of the Recipients and the Project Operator, and the Province shall have no general right to the Records. The Province acknowledges that the Government of Canada is also funding the Project and has audit rights under the agreement between the Government of Canada and the Recipients or the Project Operator, as applicable, for such funding. The Province shall make reasonable efforts to conduct audits hereunder simultaneously with the audits conducted by the Government of Canada under such other funding agreement in a manner that will minimize interference with the Project Operator's business operations.

Notwithstanding the foregoing, the Project Operator shall not be obligated to maintain any specific Record for a period exceeding 10 years from: (i) if the Record was created by any of the Recipients or the Project Operator, applicable, the date of its creation, or (ii) if the Record was created by a third party, the date of its receipt by any of the Recipients or the Project Operator, as applicable.

#### **5.4 Quarterly Project Construction Update Meetings**

During the construction phase of the Project, the Project Operator shall hold quarterly project update meetings with the Province to discuss the status of the Project, key Project activities of the past quarter and those planned for the next quarter, and key risks and mitigation plans to deal with such risks. In the event that the Province, acting reasonably, requests any additional information or documents arising from such meetings, the Project Operator shall provide such additional information or documents within 30 days of such request. Subject to Section 5.5, the foregoing shall be subject to the Project Operator's right of exclusion in respect of any proprietary or technical information of another Person in accordance with the provisions of Section 5.1(b)(i) and 5.1(b)(ii).

#### **5.5 Request for Disclosure of Proprietary or Technical Information**

If the Recipients or the Project Operator, as applicable, exclude proprietary or technical information of another Person from a Report under Section 5.1 or a report or response to any inquiry or request under Section 5.2 or Section 5.4, or do not make such information available for inspection and audit under Section 5.3, upon the Province's reasonable written request, the Recipients shall make commercially reasonable efforts to obtain the consent of such other Person to disclose such information to the Province and where applicable, to its representatives, subject to the Province and, where applicable, its representatives being bound by non-disclosure and confidentiality obligations owing to such other Person that are substantially similar to the obligations owing by the Province to the Recipients and the Project Operator under Section 7.4.

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## 5.6 Evaluation

The Project Operator shall provide all reasonable cooperation in conjunction with any evaluation or assessment of the Project or the Province's Carbon Capture and Storage Program being carried out by or on behalf of the Province; provided, however, that such cooperation shall not excessively or unnecessarily interfere with the Recipients' or the Project Operator's, as applicable, business operations.

## 5.7 Indemnification

Subject to Section 5.1(d)(iii), the Recipients shall indemnify the Province against third party claims (including legal costs, on a solicitor and client basis, incurred in defending such claims) arising from any negligence or other tortious action or inaction during the Term by the Recipients or the Project Operator, as applicable, or any of them (including any person for whom they are legally responsible) in respect of the Project or arising from any breach of this Agreement by the Recipients or the Project Operator, as applicable; provided that such indemnity shall not extend to any liabilities or obligations that are expressly assigned to or assumed by the Province by Applicable Law.

The obligations of the Recipients under this Section 5.7 shall be the several obligations of the Recipients, determined in accordance with their respective Proportionate Interest in the Project at the time of the event or occurrence that led to the third party claim; provided however that the Province shall be entitled to set-off any amount for which it is entitled to be indemnified under this Section 5.7 against any payment of the Funding that otherwise would be due and payable under this Agreement (and for the purposes of the other provisions of this Agreement it shall be deemed that the amount of any such set-off has been paid to the Recipients).

## 5.8 Compliance with Laws

At all times the Recipients and the Project Operator shall perform their obligations under this Agreement in accordance with all Applicable Laws that are material to the conduct of the Project.

# 6. TERMINATION

## 6.1 Recipients' Right to Terminate

The Province acknowledges that: (a) the Project is subject to the respective internal governance processes of each of the Recipients and the governance processes of the AOSP Joint Venture, including a final investment decision (the "**Final Investment Decision**"), currently anticipated to be made on or about March 1, 2012 following completion of front-end engineering and design in respect of the Project, on whether to proceed with the construction phase of the Project; and (b) the Recipients may decide not

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to proceed with the Project at any stage of its development or operation. If the Recipients decide to terminate the Project at any time, including at the time the Final Investment Decision is made, the Project Operator shall immediately communicate that decision to the Province, and this Agreement shall terminate immediately thereafter.

## **6.2 Termination by Province**

Subject to Section 6.3, the Province may terminate this Agreement by notice to the Project Operator only upon or within 120 days after the Province becomes aware of a Termination Event.

## **6.3 Insolvency of a Participant**

In the event that a Termination Event occurs due to a Recipient or the Project Operator being adjudged a bankrupt or making a general assignment for the benefit of creditors, or taking the benefit of any legislation for protection against creditors, orderly payment of debts, or winding up or liquidation, or having a receiver or receiver manager appointed for its business (in this Section 6.3, an "**Insolvent Participant**"), the Province shall not terminate this Agreement, if within 30 days after such Termination Event:

- (a) if the Insolvent Participant is a Recipient, the other AOSP Joint Venture participants, or their Affiliates, individually or collectively, agree in writing to assume all of the obligations of the Insolvent Participant under this Agreement; and
- (b) if the Insolvent Participant is the Project Operator, one of the AOSP Joint Venture participants agrees in writing to assume the role and all of the obligations of the Project Operator under this Agreement, with the written consent of the other AOSP Joint Venture participants.

## **6.4 Effect of Termination**

Upon any termination of this Agreement under Section 6.1 or 6.2, the following shall apply:

- (a) the Province shall have no obligation to pay any further Instalment or any amount withheld from any Instalment or otherwise make any further payment to the Recipients on account of the Funding;
- (b) the Recipients shall remain obligated to make repayment in accordance with Section 4.4, if applicable;
- (c) if termination takes place prior to Commercial Operation, the Province may present and claim under the applicable Letters of Credit or any alternate security

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accepted pursuant to Section 4.5 (as the case may be) in the event that any of the Recipients fail to repay the amounts set forth in Section 4.4 in accordance with the provisions therein;

- (d) the rights and obligations of the Parties, and the representations and warranties of the Project Operator, as set out in Section 5.1 shall continue, including without limitation the Project Operator's obligation to deliver reports of Project Results in respect of the period of time up to and including the date of termination;
- (e) the Recipients' and the Project Operator's obligations under Section 5.3 shall continue in effect:
  - (i) for five years following the date of termination, if termination takes place after Commercial Operation; or
  - (ii) for two years following the submission of the final Project Results if termination takes place before Commercial Operation, for the limited purpose of the Province assuring itself of compliance by the Recipients and the Project Operator with Section 5.1;
- (f) the Recipients' obligation to indemnify the Province under Section 5.7 shall continue to apply in respect of events occurring up to and including the date of termination; and
- (g) the obligations of confidentiality as set forth in Sections 7.1 and 7.4 shall continue.

## **7. COMMUNICATIONS**

### **7.1 Public Disclosure of Agreement**

The Recipients and the Project Operator agree that the Province shall be at liberty to make public disclosure of this Agreement, excepting only any portion of Schedules "A", "B", "C", "F" and "G" that: (i) the Recipients and the Project Operator have, prior to the signing of this Agreement, established to the satisfaction of the Province, acting reasonably, that such portion would be exempted from disclosure under Part 1, Division 2 of the FOIP Act by the provisions thereof governing third party confidential information, or (ii) may otherwise be excluded from such public disclosure as determined by mutual agreement, subject always to the access to information provisions (and exceptions thereto) of the FOIP Act.

The Province acknowledges that the financial, commercial and technical information contained in the Recipients' proposal submitted in response to the FPP Information Package was provided to the Province in confidence, subject to the FOIP Act.

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Until such time as the Province has made public disclosure of this Agreement in accordance with the foregoing, the Recipients and the Project Operator shall maintain in confidence and not disclose: (i) this Agreement (and the contents thereof including without limitation all schedules to this Agreement), and (ii) the letter of intent between the Parties dated September 23, 2009 (and the contents thereof) unless such documents or any part thereof:

- (a) are compelled by law to be disclosed;
- (b) have been or are subsequently received from another person absent an obligation of confidentiality; or
- (c) are or become part of the public domain other than in breach of the foregoing obligations;

provided, however, that the Recipients and the Project Operator shall be entitled to disclose such documents to its legal, accounting and financial advisors, and to its Affiliates, lenders, investors and consultants, on a need-to-know basis subject to such persons being bound by written confidentiality obligations which are consistent with the foregoing, or in the alternative, professional duties that impose a duty of confidentiality upon such persons with respect to such documents (and the Recipients and the Project Operator shall not waive any such duties), and further provided that any disclosure by such persons in breach of their confidentiality obligations owing to the Recipients and the Project Operator shall be deemed to be a breach by the Recipients and the Project Operator of their foregoing confidentiality obligations owing to the Province.

## **7.2 Public Announcements**

Except as otherwise required by applicable laws or by any regulatory authorities, including without limitation any securities commission or other securities regulatory authority or any stock exchange, the Parties shall not issue any news releases or other formal public announcements regarding this Agreement (including but not limited to upon execution of this Agreement) without first consulting with the other regarding the timing and content of the news release or announcement.

## **7.3 Publications**

Subject to Section 7.2, in the event that the Recipients or the Project Operator, as applicable, publish or submit for publication any articles, papers or other publications relating to the Project (excluding general interest summaries of the Project), or otherwise become aware of any such publications by another person involved in the Project, the Recipients or the Project Operator, as applicable, shall:

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- (a) if authored by the Recipients or the Project Operator, as applicable, (including any of its employees), provide the Province reasonable notice of such publication prior to its dissemination to the public together with a copy of such publication; and
- (b) if authored by another person, promptly provide the Province with notice of the details of such publication within the Recipients' or the Project Operator's, as applicable, knowledge, subject to any obligation of confidentiality owed by the Recipients or the Project Operator, as applicable, in relation thereto.

#### 7.4 Confidentiality

Except for Reports (and the information contained therein), and subject to Section 7.1, the Province will maintain confidentiality in respect of information communicated to it in connection with this Agreement and the Project by the Recipients and the Project Operator, unless such information:

- (a) is compelled by law to be disclosed (including without limitation in accordance with the provisions of the FOIP Act);
- (b) has been or is subsequently received from another person absent an obligation of confidentiality;
- (c) is subject to an obligation of confidentiality in accordance with this Agreement for a period of time that has since expired; or
- (d) is or becomes part of the public domain other than in breach of the foregoing obligations.

Notwithstanding the foregoing, the Province shall be entitled to disclose:

- (e) any such information to any consultant or professional advisor retained by the Province in relation to the administration, monitoring or enforcement of this Agreement; and
- (f) information relating to the Project to the Government of Canada for the purposes of jointly reviewing the status and progress of the Project, including without limitation with respect to Project Results, Project Costs, Project Revenues, Other Public Funding and the amount of funding allocated, paid and payable to the Recipients and the Project Operator, but only to the extent reasonably necessary for such purposes;

provided that any such disclosure to any consultant or professional advisor or to the Government of Canada shall be made in confidence subject only to exclusions substantially similar to those set out in clauses (a), (b) and (d) above, and further

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provided the Province will be liable for any breach of the foregoing confidentiality requirements by any such consultant or professional advisor.

## 7.5 Notices

Any notice, consent, request, approval or other communication under any provision of this Agreement must be in writing to be effective, and is effective when delivered by any means, including fax transmission or e-mail, to the following respective addresses:

- (a) if to the Province:

Alberta Energy  
Resource Development Policy Division  
Program Design, Implementation and Monitoring Section  
Floor 12, Petroleum Plaza, North Tower  
9945 108 Street  
Edmonton, Alberta T5K 2G6  
Attention: Stephen Wills, Director  
Fax: 780-422-3044  
Email: Stephen.Wills@gov.ab.ca

- (b) if to the Project Operator or the Recipients:

Shell Canada Energy, as Project Operator  
400 – 4th Avenue SW  
Calgary, AB T2P 2H5  
Attention: Tim, Wiwchar, Business Opportunity Manager, Scotford  
Email: Tim.Wiwchar@shell.com

With a copy to each of the Recipients if it pertains to any of the several obligations described in Section 2.2, as follows:

Canadian Natural Upgrading Limited  
c/o Canadian Natural Resources Limited  
Suite 2100, 855 – 2<sup>nd</sup> Street SW  
Calgary, Alberta T2P 4J8  
Attention: Vice President, Commercial Operations  
Fax: (403) 517-7410  
Email: Kara.Slemko@cnrl.com



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Chevron Canada Limited  
500 Fifth Avenue SW  
Calgary, AB T2P 0L7  
Attention: Manager, Oil Sands  
Fax: (403) 234-5947  
Email: DavidBFuhr@chevron.com

1745844 Alberta Ltd.  
c/o Canadian Natural Resources Limited  
Suite 2100, 855 - 2<sup>nd</sup> Street SW  
Calgary, Alberta T2P 4J8  
Attention: Chief Operating Officer – Oil Sands  
Fax: (403) 517-6975  
Email: Scott.Stauth@cnrl.com

Either Party may change its address information by giving notice to the other in the above manner.

The onus shall be on a Party asserting delivery of a notice, consent, approval or other communication to establish that it was delivered in accordance with the foregoing, provided that in the case of e-mail such onus shall be discharged by proof that an e-mail sent to the designated e-mail address was received and opened at that e-mail address.

#### **7.6 Authority to Give Notices**

The Parties respectively designate for the time being the following individuals as having authority to communicate to the other any notice, approval, consent, waiver or other communication under this Agreement:

(a) in the case of the Province:

Sandra Locke, Executive Director,  
Carbon Capture and Storage (CCS) Development

(b) in the case of the Recipients:

Ian Silk  
Manager, Quest Venture

In the absence of any further designation or limitation communicated with reference to this Section 7.6, each Party may assume that any notice, approval, consent, waiver or other communication under this Agreement given by the above individual has been duly authorized and is binding upon the Party providing the communication.

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## **7.7 Certification on Behalf of Recipients**

All Reports to be delivered by the Project Operator under Section 5.1 shall be certified on behalf of the Recipients by the individual manager of the Project (whether referred to by the Recipients as the “Quest Venture Manager” or by any other name or title), and all statements of Project Costs and Project Revenues shall be certified on behalf of the Recipients by the chief financial officer of the Project Operator, or, in each such case, such other executive or officer of the Project Operator as is acceptable to the Province, acting reasonably, in the following form:

CERTIFIED on behalf of the Recipients named in the “CCS Funding Agreement – Quest Project” to be true, accurate and complete, to the best of my knowledge, based on reasonable inquiry and due diligence, as of the date of this certification.

Such certification shall not establish a duty of care owed to the Province personally by the individual providing the certification or otherwise establish a foundation for personal liability on the part of such individual, but shall constitute a representation on behalf of the Recipients.

## **8. GENERAL**

### **8.1 Dispute Resolution**

Immediately following execution of this Agreement, the Parties shall establish a protocol and procedure governing contract administration. In the event that disputes arise out of or in connection with this Agreement that are not resolved through such protocol and procedure, all such disputes shall be finally resolved by arbitration pursuant to the then current National Arbitration Rules of the ADR Institute of Canada Inc. or, if the Parties so agree with respect to a particular dispute, the then current Simplified Rules of the ADR Institute of Canada Inc. The place of the arbitration hearing shall be Edmonton, Alberta.

### **8.2 Applicable Law and Jurisdiction**

This Agreement shall be governed by the laws in force in Alberta, including the federal laws of Canada applicable therein. Subject to Section 8.1, Alberta Courts shall have exclusive jurisdiction over all matters arising in relation to this Agreement.

### **8.3 Amendment and Waiver**

Subject to Section 3.3 in regard to updating of the Project Timeline and to Section 3.4 in regard to amendments to the Projected Payment Schedule, no amendment of this Agreement is effective unless made in writing and signed by a duly authorized representative of each of the Parties. No waiver of any provision of this Agreement is

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effective unless made in writing, and any such waiver has effect only in respect of the particular provision or circumstance stated in the waiver. No representation by any Party with respect to the performance of any obligation under this Agreement is capable of giving rise to an estoppel unless the representation is made in writing.

#### **8.4 Further Assurances**

The Parties each agree to from time to time do all such acts and provide such further assurances and instruments as may reasonably be required in order to carry out the provisions of this Agreement according to their spirit and intent; but this Section 8.4 shall not in any event be construed as obligating the Province to amend or enact any statute or regulation.

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## 8.5 Counterpart Execution

This Agreement may be executed in counterparts, in which case (i) the counterparts together shall constitute one agreement, and (ii) communication of execution by fax transmission or electronically in portable document format (PDF) shall constitute good delivery.

The Parties have therefore signed this Agreement, each by their respective duly authorized officers, as of the date and year first above written.

**HER MAJESTY THE QUEEN IN RIGHT OF ALBERTA,**  
as represented by the Minister of Energy

Per: \_\_\_\_\_  
C. Peter Watson, Deputy Minister of Energy

**SHELL CANADA ENERGY**, as operator of the Project and as  
duly authorized agent for the AOSP Joint Venture and its  
participants, comprised of **SHELL CANADA ENERGY,**  
**CHEVRON CANADA LIMITED,** and **MARATHON OIL**  
**CANADA CORPORATION,**  
by its Managing Partner, **SHELL CANADA LIMITED**

Per: \_\_\_\_\_

Per: \_\_\_\_\_

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## **SCHEDULE “D”**

To the Agreement dated June 24, 2011, between HER MAJESTY THE QUEEN IN RIGHT OF ALBERTA and SHELL CANADA ENERGY as operator of the Project and as agent for and on behalf of the AOSP Joint Venture and its participants, comprised of SHELL CANADA ENERGY, CHEVRON CANADA LIMITED, AND MARATHON OIL CANADA CORPORATION.

### **Form of Project Results**

#### **Preamble**

1. This Schedule “D” is comprised of three parts: (i) this preamble, (ii) Division A: Summary Report, and (iii) Division B: Detailed Report.
2. In this Schedule “D”, defined terms have the meanings set out in Section 1.1 of the main body of this Agreement. In addition, the following expressions have the following meanings (and where applicable, the plural or singular thereof have corresponding meanings):
  - (a) “Base Facility” means the equipment, facilities and processes used in the production of end products generated, all as referenced in the Project Plan, but excludes the CCS Facilities;
  - (b) “Capture System” means the equipment, facilities and processes used in the capture, separation, dehydration and compression of carbon dioxide, as described in the Project Plan;
  - (c) “Detailed Report Reference Chart” means the chart set out below in Division B of this Schedule “D”;
  - (d) “CCS Facilities” means the equipment, facilities and processes used in the capture, separation, dehydration, compression, transportation, sequestration and monitoring of carbon dioxide as described in the Project Plan, including the Capture System; and
  - (e) “Summary Report Reference Chart” means the chart set out below in Division A of this Schedule “D”.
3. Subject to and in accordance with Section 5.1 of the main body of this Agreement, the Project Operator shall deliver to the Province its reports with respect to the Project by providing the information requested in the Summary Report Reference Chart and the Detailed Report Reference Chart, together with all relevant documents. The Project Operator’s reports shall be organized using the topical headings and section numbers set out in the charts. With respect to the information required in the Detailed Report

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Reference Chart, such information may be provided by reference to the appropriate documents listed in the “Recipients Documents” part of each section of the chart, as applicable.

4. Each individual response in the reports shall identify, where applicable, any changes or updates from the preceding report of such information. Where there are no changes or updates from the preceding report of such information, state as such and do not repeat information previously provided.
5. All data and calculations derived there from which constitute measurements shall be presented (i) in appropriate units of measurement having regard to the type of data, purpose of measurement and applicable industry standard, and (ii) on an average daily basis over the course of each calendar month, based upon actual measurements or extrapolations from measurements conducted during sampling periods in each calendar month, as appropriate, or as otherwise may be specified in the Summary Report Reference Chart or the Detailed Report Reference Chart (with the basis of each measurement being stated in the response).
6. If the Province is not satisfied with the content and level of detail in the responses set out in any report, the Recipients may be required to provide further details, explanations or clarifications to the data or qualitative information provided.

**Division A: Summary Report**

| Summary Report Reference Chart |         |                          |   |
|--------------------------------|---------|--------------------------|---|
| Part                           | Section | Knowledge Category       | Description   |
| A                              |         | <b>Executive Summary</b> | Provide a summary of the information contained in the report. |
|                                |         |                          |   |

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| Summary Report Reference Chart |          |   |  |
|--------------------------------|----------|---|--|
| Part                           | Section  | Knowledge Category                            | Description  |
| B                              |          | <b>Project Status Overview and Commentary</b> | <p>The purpose of Part B is to provide an overview and summary of the successes and challenges of the Project (with comparative reference to the expectations inherent in the Project Plan). Each individual response to the information requested in Part B (as set out in the sections below) shall include, without limitation, a discussion of the following in summary form (as applicable):</p> <ul style="list-style-type: none"> <li>(a) any unexpected and significant successes or problems encountered;</li> <li>(b) any variations or refinements made to the project (original, and as may be amended from time to time) and the reasons for such changes;</li> <li>(c) any technological or other scientific advancements arising;</li> <li>(d) the impacts of the above upon the Project, including without limitation in relation to Project risks and economics; and</li> <li>(e) any other matter specifically required as set out below.</li> </ul> |
|                                | <b>1</b> | <b>Facility Design</b>                        | <p>Provide a commentary on the design of the CCS Facilities to date. Include a discussion on the key results of the front-end engineering and design study (as applicable) and the impacts upon the Project.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Plot plan</li> <li>• Facility locations</li> <li>• Separation process type and description</li> <li>• Sequestration location and type</li> </ul>  |
|                                | <b>2</b> | <b>Facility Construction</b>                  | <p>Provide a commentary on the construction, installation and commissioning of the CCS Facilities to date. Include a discussion on any significant changes made to the project management approach implemented.</p>  |

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| Summary Report Reference Chart |          |                                       |  |
|--------------------------------|----------|---------------------------------------|--|
| Part                           | Section  | Knowledge Category                    | Description  |
|                                | <b>3</b> | <b>Geological Formation Selection</b> | <p>Provide a commentary on the evaluation and selection of the geological formations for sequestration of carbon dioxide to date. Include a discussion on: (i) the key reasons for selection, (ii) the key characteristics of the geological formations, and (iii) the risks of sequestration into the geological formations and the measures implemented to manage and reduce such risks.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Location of injection reservoir</li> <li>• Depth of reservoir</li> <li>• Thickness of reservoir</li> <li>• Injectivity of reservoir</li> <li>• Porosity of reservoir</li> <li>• Permeability of reservoir</li> <li>• Initial pressure and temperature</li> <li>• Estimate of storage potential</li> </ul> |
|                                | <b>4</b> | <b>Facility Operations – Capture</b>  | <p>Provide a commentary on the operation of the Capture System during the reporting period. Include a discussion on: (i) the efficiency of each step – capture, separation, dehydration and compression, (ii) the impacts upon the operating efficiency of the Base Facility, and (iii) the purity of the carbon dioxide stream and how any impurities are being addressed.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Energy demand</li> <li>• Heat or energy recovered</li> <li>• CO<sub>2</sub> capture ratio</li> <li>• Total CO<sub>2</sub> captured</li> <li>• CO<sub>2</sub> emissions to atmosphere</li> <li>• Other emission to air, soil or water</li> </ul>  |



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| Summary Report Reference Chart |          |   |  |
|--------------------------------|----------|---|--|
| Part                           | Section  | Knowledge Category                          | Description  |
|                                | <b>5</b> | <b>Facility Operations – Transportation</b> | <p>Provide a commentary on the transportation of carbon dioxide during the reporting period. Include a discussion on the characteristics of the carbon dioxide within the pipeline.</p> <p>Specific information (design):</p> <ul style="list-style-type: none"> <li>• Flow capacity</li> <li>• Pipeline diameter</li> <li>• Design pressure and temperature</li> <li>• Wall thickness</li> <li>• Length</li> <li>• Material</li> <li>• Expected lifetime</li> <li>• Cathodic protection</li> </ul> <p>Specific information (operating):</p> <ul style="list-style-type: none"> <li>• CO<sub>2</sub> composition</li> <li>• Water content</li> <li>• CO<sub>2</sub> emissions to atmosphere</li> <li>• Energy consumption</li> <li>• CO<sub>2</sub> volume/mass transported</li> </ul> |

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| Summary Report Reference Chart |          |   |   |
|--------------------------------|----------|---|---|
| Part                           | Section  | Knowledge Category  | Description   |
|                                | <b>6</b> | <b>Facility Operations – Sequestration and Monitoring</b> | <p>Provide a commentary on:</p> <p>(i) the injection and sequestration of carbon dioxide during the reporting period, including a discussion on: (A) the total mass of carbon dioxide injected, (B) the operating parameters of injection (i.e., injection rate and pressure), and (C) the characteristics of the carbon dioxide injected; and</p> <p>(ii) the monitoring of sequestered carbon dioxide for leakage and seepage during the reporting period, including a discussion on: (A) the monitoring activities and results, and (B) any remedial actions required to address carbon dioxide leakage and seepage.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Injection rates (total and per well)</li> <li>• Injection stream composition</li> <li>• Pressure and temperature of injection stream</li> <li>• Monitoring techniques employed</li> <li>• CO<sub>2</sub> emissions to atmosphere</li> <li>• CO<sub>2</sub> recycle rates</li> <li>• Incremental oil production (if applicable)</li> </ul> |
|                                | <b>7</b> | <b>Facility Operations – Maintenance and Repairs</b>      | Provide a commentary on the maintenance and repair activities conducted during the reporting period.  |
|                                | <b>8</b> | <b>Regulatory Approvals</b>                               | <p>Provide a commentary on any particular challenges encountered during the reporting period in obtaining the required regulatory approvals to pursue the Project.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Status of regulatory approvals submitted/approved.</li> </ul>  |
|                                | <b>9</b> | <b>Public Engagement</b>                                  | <p>Provide a commentary on public consultation and outcomes.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Summary of public concerns raised and how they were resolved</li> <li>• Summary of open houses and any public meetings held; include a record of specific comments or issues raised.</li> </ul>  |

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| Summary Report Reference Chart |           |                                   |   |
|--------------------------------|-----------|-----------------------------------|---|
| Part                           | Section   | Knowledge Category                | Description   |
|                                | <b>10</b> | <b>Costs and Revenues</b>         | <p>Provide a commentary on the costs and revenues of the Project.</p> <p>Specific information:</p> <ul style="list-style-type: none"> <li>• Aggregate OPEX and CAPEX costs on each component for capture, transportation, storage and CCS value chain</li> <li>• OPEX and CAPEX spent to date</li> <li>• Aggregate revenues generated and received</li> <li>• Forecast of aggregate costs and aggregate revenues</li> <li>• Cost per tonne of CO<sub>2</sub></li> </ul> |
|                                | <b>11</b> | <b>Project Timeline</b>           | Identify any significant deviations that have occurred during the reporting period from the schedule set out in the Project Timeline and explain the reasons for the deviations.  |
|                                | <b>12</b> | <b>General Project Assessment</b> | Provide a commentary on the general successes and failures of the Project, and the learnings arising from the Project, to date. Include a discussion about the indirect economic benefits of the Project for Alberta and Canada.  |
|                                | <b>13</b> | <b>Next Steps</b>                 | Discuss any changes in the Project Plan or Project Timeline expected or being considered in light of the results of the Project to date.  |

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**Division B: Detailed Report**

| <b>SECTION 1 CAPTURE</b>  |   |                                    |
|---|---|------------------------------------|
| <b>Section 1.1 Specifications and formulation of chemicals – design</b> |   |                                    |
| <b>Description:</b>   | The energy requirement of the capture process is strongly related to the performance of the solvent. Moreover, Health, Safety and Environmental (HSE) properties of solvents, and degradation products formed within the process itself, or if released to the atmosphere, is another important performance parameter for solvents. A lot of R&D work has been put into solvent development. Capture of CO <sub>2</sub> is mainly achieved by either using a chemical or physical solvent. Some solvents need different types of additives in order to enhance their performance, e.g., related to reaction rate (activators) or corrosivity (inhibitors). All chemicals used in the process should be described. |                                    |
| <b>Purpose:</b>   | The value of getting detailed information on this would benefit the advancement of CCS technology. Today, the major capture vendors have licensed their solvents. Knowledge of solvent compositions would also be valuable to assess lifecycle performance in terms of energy and environmental impacts of the CCS value chain. Also, HSE issues related to the release of substances originating from the solvents would educate the public, and potentially increase the trust in CCS.  |                                    |
| <b>Reporting Requirements:</b>  | Quantitative<br>Data/Information  | Qualitative<br>Knowledge           |
| <b>During Concept phase</b>   | Solvent description.<br>General type of solvents (chemical or physical).  | Design rationale<br>Design details |
| <b>During Design and construction phase</b>                             | Composition of solvent.<br><br>Solvent regeneration:<br>- energy used<br>- performance<br>- cycles and impact on solvent capacity to extract CO <sub>2</sub><br><br>Detailed description of solvent including type and concentration of:<br>- inhibitors (foaming or corrosion inhibitions)<br>- activators<br>- other additives  |                                    |
|   | Data capture frequency  | Annually                           |
| <b>After start-up</b>   | Describe any changes to composition or type of solvent and rationale for the change.  |                                    |
|   | Data capture frequency  | Annually                           |
| <b>Recipients Documents</b>   | To be determined, if any  |                                    |

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| <b>SECTION 1 CAPTURE</b>   |  |                  |
|--|--|------------------|
| <b>Section 1.2 Process heat integration and configuration – design</b>   |  |                  |
| <b>Description:</b> The energy requirements of the capture process can be reduced by optimizing heat integration of unit processes and streams within the capture plant. |  |                  |
| <b>Purpose:</b> Sharing this information could trigger increased awareness, and new ideas, of potential energy saving process integration concepts.                      |  |                  |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative      |
|  | Data/Information   | Knowledge        |
| <b>During Concept phase</b>  | Identify all heat recovery streams (either into or out of the capture process) that are utilized for process heat integration.<br>Provide a basic design flow diagram and overview.<br>Block diagrams.   | Design rationale |
| <b>During Design and construction phase</b>  | Stream properties (temperature, pressure, enthalpy) of these streams.<br>Heat recovery efficiency (heat transfer or electricity generation).<br>Solvent regeneration method (pressure swing/temperature swing configuration).<br>Detailed design.<br>Process flow diagrams.  |                  |
| Data capture frequency   | Annually   |                  |
| <b>After start-up</b>  | Actual installed process heat integration configuration.   |                  |
| Data capture frequency   | Annually   |                  |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- 251 GHG &amp; Energy Efficiency Report</li> <li>- 238 BDEP will contain the heat and mass balance for the major operating cases</li> <li>- 242 Process Flow Schemes</li> <li>- 1390 Utilities Flow Schemes</li> </ul> |                  |

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| <b>SECTION 1 CAPTURE</b>  |   |  |
|---|---|--|
| <b>Section 1.3 Detailed process design</b>  |   |  |
| <b>Description:</b> In addition to the process heat integration described in Section 1.2 there might be other process configurations. This can be related to e.g., reactor and vessel details, absorber internals, catalysts, flash vessel configuration, novel distributors and demisters. Detailed design data about these processes should be given. |   |  |
| <b>Purpose:</b> These detailed process design information enables an increased understanding of state-of-the art process design. Moreover, this can be a potential area where R&D could contribute in developing new technical solutions and materials that can improve performance of the technology.  |   |  |
| <b>Reporting Requirements:</b>  | Quantitative<br>Data/Information  | Qualitative<br>Knowledge                         |
| <b>During Concept phase</b>   | Basic process design.<br>Block diagrams.  | Design rationale<br>Updated rationale for design |
| <b>During Design and construction phase</b>   | Material selection for all process units and rationale for selection.<br>Basic process design.<br>Block diagrams.<br>Process unit design capacities.<br>General piping layout and interconnectivity.<br>Detailed design.<br>Process flow diagram.<br>Process and instrumentation diagram. |  |
| <b>After start-up</b>   | Actual installed process design.  |  |
| Data capture frequency  | Annual (report changes/modifications)   |  |
| <b>Recipients Documents</b>   | The information contained within the following documents are expected to address some of the requirements of this section:<br>- 243 Process P&ID's<br>- 1391 Utilities P&ID's   |  |

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| <b>SECTION 1 CAPTURE</b>  |  |   |
|---|--|---|
| <b>Section 1.4 Energy consumption (energy penalty of capture) – performance</b> |  |   |
| <b>Description:</b>   | The capture process will pose an energy penalty to the power production. The boundaries for energy balance will be submitted based on the project and the Department of Energy and an overall figure for the energy of capture should be reported as MJ/kg CO <sub>2</sub> captured.   |   |
| <b>Purpose:</b>   | There is a lack of real data for energy consumption, and information would be valuable for benchmarking performance and as a driver for developing more energy efficient processes.  |   |
| <b>Reporting Requirements:</b>  | Quantitative   | Qualitative   |
|   | Data/Information   | Knowledge   |
| <b>Before Operation</b>   | Estimates of energy penalty of capture expressed as MJ/kg CO <sub>2</sub> captured.<br>Mass and energy balance.<br>Summary report explaining parasitic losses.   | Benchmarking estimate<br>Reports<br>Lessons learned<br>Best practices |
| <b>During Operation</b>   | Actual energy penalty of captured expressed as MJ/kg CO <sub>2</sub> captured, split into (as applicable):<br><ul style="list-style-type: none"> <li>- steam consumption</li> <li>- cooling requirement</li> <li>- water consumption</li> <li>- electricity usage (including compression of CO<sub>2</sub> to export pressure)</li> <li>- electrical recovery</li> <li>- compression requirements</li> <li>- air separation energy</li> <li>- any other relevant indicators</li> </ul><br>Summary report |   |
|   | Data capture frequency   | Daily average   |
| <b>Recipients Documents</b>   | The information contained within the following document is expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- 251 GHG &amp; Energy Efficiency Report</li> </ul>   |   |

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| <b>SECTION 1 CAPTURE</b>   |  |                       |
|--|--|-----------------------|
| <b>Section 1.5 CO<sub>2</sub> capture ratio – performance</b>  |  |                       |
| <b>Description:</b> The performance of the process in terms of amount of CO <sub>2</sub> captured should be reported by reference to the CO <sub>2</sub> capture ratio, which is defined as the fraction of the formed CO <sub>2</sub> which is captured, on an annual basis, taking the availability of the plant into account. |  |                       |
| <b>Purpose:</b> Valuable for the purpose of benchmarking technologies.   |  |                       |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative           |
|  | Data/Information   | Knowledge             |
| <b>Before Operation</b>  | Estimates on the fraction of the formed CO <sub>2</sub> which is captured, on an annual basis. Provide an overview of the design basis and mass and energy balance.  | Benchmarking estimate |
| <b>During Operation</b>  | Actual fraction of the formed CO <sub>2</sub> which is captured, on an annual basis.   |                       |
|  | Data capture frequency   | Daily average         |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- 332 RAM Report</li> <li>- 238 BDEP for process summary and H&amp;M balance</li> </ul> |                       |



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| <b>SECTION 1 CAPTURE</b>                     |  |   |
|--|--|---|
| <b>Section 1.6 Reliability – performance</b> |  |   |
| <b>Description:</b>                          | The reliability of the capture process and operational interference with the base facility is important information for potential project developers. As these technologies, at this scale, have no track record there is great uncertainty on the expected reliability of capture processes. Component failure rate data should be given for all relevant components affecting the overall reliability in the capture plant (pumps, compressors, blowers, heat exchangers).   |   |
| <b>Purpose:</b>                              | Dissemination of reliability data should be provided to inform relevant stakeholders of the operational risks of the base facility caused by CO <sub>2</sub> capture. The dissemination should be done on a detailed level, in order to provide failure rate data on a component level (e.g., pumps, compressors, blowers etc). Furthermore, this will enable selection of facilities, systems, equipment, configuration and capacities based on economic optimization assessments. Also, this would provide input to other activities, such as risk analyses or maintenance and spare-parts planning. As well, on stream factor/annual availability is important for business decisions, if the operation philosophy is based on prices (switching the plants on and off based on market conditions). |   |
| <b>Reporting Requirements:</b>               | Quantitative<br>Data/Information   | Qualitative<br>Knowledge  |
| <b>Before Operation</b>                      | Estimated annual availability measured in percentage of time when capture process is operational.<br>Explanation of expected down-time.  | Rationale for estimated availability<br>Outline of operation philosophy<br>Summary of lessons learned from operational experience |
| <b>During Operation</b>                      | Actual failure rate of processes (the frequency should be expressed as failure per year with a description of the failure).<br>Actual annual availability measured in percentage of time when system is operational (accounting for expected and unexpected down-time).  |   |
|  | Data capture frequency   | Annual failure rate and availability  |
| <b>Recipients Documents</b>                  | The information contained within the following document is expected to address some of the requirements of this section:<br>- 332 RAM Report   |   |

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| <b>SECTION 1 CAPTURE</b>   |  |  |
|--|--|--|
| <b>Section 1.7 Emissions to air, soil or water – performance</b> |  |  |
| <b>Description:</b>  | All emissions (non-CO <sub>2</sub> ) to air, soil and water caused by the introduction of a CO <sub>2</sub> capture process should be identified and reported by its concentration measured. Concentration measured in the streams to the environment from the capture facilities. The most relevant emissions from a CO <sub>2</sub> capture process could be, but not limited to, the following compounds: SO <sub>x</sub> , NO <sub>x</sub> , Sulphur, PFCs, HFCs, SF <sub>8</sub> , particulates, solids heavy metals, emissions of solvent and catalysts (amines, ammonia or physical solvents such as methanol), nitrosamines, nitramines, formaldehyde, formic acid, nitric acid, sulphuric acid, corrosion or foaming inhibitors and activators. The most relevant emissions from technologies that are treating the process wastes, e.g., from incinerators, should also be identified and reported, with identification of the ultimate waste products (list of compounds with data sheets). Any substances that might have harmful environmental or HSE effects if released to atmosphere should be identified. |  |
| <b>Purpose:</b>  | These emissions should be documented and disseminated for the case of transparency in the interest of the wider public domain. This will imply a transparent process to increase the confidence among the public that introducing CCS do not cause any new emission of harmful substances. In addition, it will be useful for technology developers to know the emissions from a process, in order to focus on developing improved new processes and absorbents, from both a HSE and cost perspective, and to provide valuable information to other project developers that are considering different methods for waste handling.  |  |
| <b>Reporting Requirements:</b>                                   | Quantitative<br>Data/Information   | Qualitative<br>Knowledge   |
| <b>Before Operation</b>  | Estimated non-CO <sub>2</sub> emissions to air, soil and water reported by its concentration measured in parts per million (ppm).<br>Properties of all the major non-CO <sub>2</sub> emissions (data sheets).<br>Quantities of emissions.  | Identify substances that may have environmental or HSE effects<br>Report properties and potential consequences of emissions from capture plant<br>Report summarising emissions and potential negative consequences for the environment |
| <b>During Operation</b>  | Actual non-CO <sub>2</sub> emissions to air, soil and water reported by its concentration measured in ppm.<br>Aggregated data.<br>Data analysis.<br>Data visualisation.<br>Benchmarks.   |  |
|  | Data capture frequency   | Daily average  |
| <b>Recipients Documents</b>                                      | The information contained within the following document is expected to address some of the requirements of this section:<br>- 392 E, S & H Impact Assessment (the environmental section only)  |  |

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| <b>SECTION 1 CAPTURE</b>                    |  |                                  |
|---|--|----------------------------------|
| <b>Section 1.8 Land Use – Plot Plan</b>     |  |                                  |
| <b>Description:</b>                         | The footprint of the capture plant will determine the feasibility of the capture concepts for “brown field” projects, where there is limited available space. Information on typical layout and land use, taken the utility requirements into account.   |                                  |
| <b>Purpose:</b>                             | This will provide valuable information for other CCS project developers. The plot plan will provide valuable information with respect to the total footprint of the capture process.   |                                  |
| <b>Reporting Requirements:</b>              | Quantitative<br>Data/Information   | Qualitative<br>Knowledge         |
| <b>During Concept phase</b>                 | A plot plan, which should include: <ul style="list-style-type: none"> <li>- identification of all process units</li> <li>- identification of all access roads</li> <li>- all piping and interconnectivity</li> <li>- import routes (natural gas lines into plant)</li> <li>- placement of CO<sub>2</sub> export system (compressors)</li> <li>- placement of utility systems</li> <li>- tie-in and piping</li> <li>- square footage requirement</li> <li>- spacing required between units</li> </ul> |                                  |
| <b>During Design and construction phase</b> | Any variations from original design and rationale for the change.  |                                  |
|   | Data capture frequency   | Annually and update as necessary |
| <b>After start-up</b>                       | Any changes (including modifications, expansions, etc.).   |                                  |
|   | Data capture frequency   | Annually                         |
| <b>Recipients Documents</b>                 | The information contained within the following documents are expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- 267 Mechanical GA's</li> <li>- 289D GA's</li> <li>- 265D Facilities Layout Design</li> <li>- 245D Hazardous Area Drawings</li> <li>- 247 Tie-in List &amp; Schedule</li> <li>- 355 Logistics Plan</li> </ul>   |                                  |

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| <b>SECTION 1 CAPTURE</b>                             |   |  |
|--|---|--|
| <b>Section 1.9 Dehydration technology – approach</b> |   |  |
| <b>Description:</b>                                  | Keeping the level of water at a minimum level prior to entering the pipeline is essential for corrosion control. Documentation of the drying philosophy would be valuable.      |  |
| <b>Purpose:</b>                                      | Sharing of best available technologies and knowledge on this issue is valuable for future CCS projects, in order to choose cost efficient and dependable solutions.             |  |
| <b>Reporting Requirements:</b>                       | Quantitative<br>Data/Information  | Qualitative<br>Knowledge   |
| <b>Before start-up</b>                               | Describe the drying technology and level of drying required (ppm water).  | Rationale for chosen dehydration technology and level of drying required<br>Evaluation of selected technology<br>Lessons learned |
| Data capture frequency                               | Annually and updated as necessary   |  |
| <b>After start-up</b>                                | Actual level of drying (ppm water).   |  |
| Data capture frequency                               | Annually  |  |
| <b>Recipients Documents</b>                          | The information contained within the following document is expected to address some of the requirements of this section:<br>- 238 BDEP (sub-section of the process description) |  |

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| <b>SECTION 1 CAPTURE</b>   |  |                                  |
|--|--|----------------------------------|
| <b>Section 1.10 Scale-up experience and methodology – approach</b>   |  |                                  |
| <b>Description:</b> One of the largest technological risks of building a commercial scale CO <sub>2</sub> capture system relates to the lack of experience with design and operation of CCS-scale plants. These risks are normally handled by a combination of pilot-scale testing and modelling. It would be valuable to share the scale-up philosophy applied and the experience gained during process development, such as modelling tools used for verification of piloting, reference plants, lab-tests, mock-up studies, use of scale-up correlations, use of rules of thumb for scale-up, dimension analysis, principles of similarities. |  |                                  |
| <b>Purpose:</b> Sharing information may reduce project lead time for other CCS project.  |  |                                  |
| <b>Reporting Requirements:</b>   | <b>Quantitative<br/>Data/Information</b>   | <b>Qualitative<br/>Knowledge</b> |
| <b>Before start-up</b>   | Describe the scale-up methodology used for arriving at the full scale plant design, including references to all relevant test activities used to gain confidence in the functionality of the technology.<br><br>Alternatively, describe why no scale up experience is gained from the project. |                                  |
| Data capture frequency   | Annually   |                                  |
| <b>After start-up</b>  | Report on performance (capture rate, energy penalties, emissions) of full scale plant compared with pilot plants, initial modelling and tests done at a smaller scale should be documented, in order to provide insight in the nature of scale-up of CO <sub>2</sub> capture technologies.     |                                  |
| <b>Recipients Documents</b>  | To be determined, if any   |                                  |

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| <b>SECTION 2 TRANSPORTATION</b>  |  |             |
|--|--|-------------|
| <b>Section 2.1 General description of pipeline system phases</b>   |  |             |
| <b>Description:</b> Describe the pipeline system, including a detailed routing map and description of the leak detection system. Identify who the owner of the pipeline system is and who is liable for operation and maintenance of the pipeline system.                          |  |             |
| <b>Purpose:</b> Share general information describing the pipeline. Relevant for industry and R&D building competence on pipeline transport of CO <sub>2</sub> . Some of this information is also relevant for building public awareness on pipeline transport of CO <sub>2</sub> . |  |             |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative |
|  | Data/Information   | Knowledge   |
| <b>During Design</b>   | Provide a description of the pipeline design, including (but not limited to the following): <ul style="list-style-type: none"> <li>- is the CO<sub>2</sub> transported as a gas, liquid or dense phase</li> <li>- seals (type, e.g., elastomers)</li> <li>- fracture arrestors</li> <li>- compressor/pump station (number and location)</li> <li>- block valves (number and location)</li> <li>- check valves (number and location)</li> <li>- vent stations (number and location)</li> <li>- pigging stations (number and location)</li> <li>- cathodic protection system [coating and Impressed Current Cathodic Protection (ICCP)]</li> <li>- pipeline routing, with a detailed routing map</li> <li>- is the pipeline buried or exposed</li> <li>- battery limits (interface between capture and storage)</li> <li>- leak detection system</li> <li>- risk analysis as applicable</li> </ul> |             |
| <b>During Construction phase</b>   | Deviations and changes from detailed design.<br>Results from pre-commissioning (pressure testing).<br>Reports from installation.<br>Pre-commissioning (pressure testing) overview report.  |             |

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|  |  |  |
|--|--|--|
| <p><b>After start-up (operation)</b></p> | <p>Results from commissioning deviations, incidents, changes in operational parameters, including:</p> <ul style="list-style-type: none"> <li>- deviations and changes from detailed design</li> <li>- accidental events and damages to the pipeline system during operation shall be reported, including any leaks/spills</li> <li>- results from maintenance shall be reported</li> <li>- results from inspection and repair shall be reported</li> <li>- final DFI (design, fabrication and installation report) shall be in place</li> <li>- operation performance</li> </ul> <p>As a part of the commissioning (filling of CO<sub>2</sub>) the documentation made available shall include, but not be limited to:</p> <ul style="list-style-type: none"> <li>- procedure and results from fluid filling operations with special emphasis on design parameters having an impact on the integrity of the pipeline system such as temperature, pressure and dew points</li> <li>- procedure and results from operational verification activities (e.g., start-up inspection). Important parameters to document are typically:               <ul style="list-style-type: none"> <li>- expansion</li> <li>- movement</li> <li>- wall thickness/metal loss</li> <li>- inspection plans covering the future external and internal inspections of the pipeline system</li> </ul> </li> </ul> <p>The in-service file shall as a minimum contain documentation regarding:</p> <ul style="list-style-type: none"> <li>- results and conclusions from the in-service inspections</li> <li>- accidental events and damages to the pipeline system</li> <li>- intervention, repair, and modifications</li> <li>- operational data (fluid composition, flow rate, pressure, temperature) affecting corrosion and other deterioration mechanisms</li> </ul> |  |
| <p><b>Recipients Documents</b></p>       | <p>The information contained within the following documents are expected to address some of the requirements of this section:</p> <ul style="list-style-type: none"> <li>- 315 Pipeline Design Report</li> <li>- D56 submitted with regulatory application</li> <li>- 297 Materials Selection Report</li> <li>- 300 Corrosion Management Framework</li> <li>- 363 Operations and Maintenance Philosophy</li> <li>- 314 Pipeline Route Survey Report</li> </ul>   |  |

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| <b>SECTION 2 TRANSPORTATION</b>   |  |  |
|---|--|--|
| <b>Section 2.2 Capacity</b>   |  |  |
| <b>Description:</b> Describe the capacity requirements steady state and/or cyclic (known as transient operation for pipelines) depending on the operation of the plant and the chosen transport solution, and describe pre-build capacity vs. initial capacity.<br><ul style="list-style-type: none"> <li>- Start-up procedures</li> <li>- Design capacity vs. realized capacity</li> </ul> |  |  |
| <b>Purpose:</b> Information relevant for building competence in industry on pipeline transport of CO <sub>2</sub> .   |  |  |
| <b>Reporting Requirements:</b>  | Quantitative   | Qualitative  |
|   | Data/Information   | Knowledge  |
| <b>During Design</b>  | Reports from basic and detailed design of the CO <sub>2</sub> stream, should include, but not limited, to the following: <ul style="list-style-type: none"> <li>- pressure (bar)</li> <li>- temperature (°C)</li> <li>- flow capacity (Sm<sup>3</sup>/day)</li> <li>- fluid composition (% by volume)</li> </ul> | Design details<br>Deviations from concept phase to basic design<br>Changes in capacity during operation and/or after commissioning |
| <b>After start-up (operation)</b>   | Reports from the deviations and changes from the detailed design (pipeline capacity) should, but not limited, to the following: <ul style="list-style-type: none"> <li>- commissioning (filling of CO<sub>2</sub>)</li> <li>- operation</li> <li>- maintenance</li> <li>- inspection and repair</li> </ul>       |  |
| Data capture frequency  | Daily  |  |
| <b>Recipients Documents</b>   | The information contained within the following document is expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- 315 Pipeline Design Report</li> </ul>  |  |



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| <b>SECTION 2 TRANSPORTATION</b>  |  |                                  |
|--|--|----------------------------------|
| <b>Section 2.3 Characteristics of transported CO<sub>2</sub></b>   |  |                                  |
| <p><b>Description:</b> Characteristics of the transported CO<sub>2</sub> should be stated (both inlet and outlet since the characteristics may change because of integrated networks). In operational phase these characteristics should be monitored since this may change during time.</p> <p>Is single pipeline used or is it planned for integrated networks (e.g., use of trunk lines). If trunk lines are used, how is the CO<sub>2</sub> composition from the different sources monitored. If a pipeline is later to become part of an integrated network with several CO<sub>2</sub>-sources as well as several CO<sub>2</sub>-sinks (including possibly enhanced oil recovery), it is important to know the CO<sub>2</sub>-specification from the different sources in order to avoid undesirable cross-effects. The specifications to enter the pipeline will be set by the trunk pipeline.</p> <p><b>Purpose:</b> Information relevant for building competence in industry on pipeline transport of CO<sub>2</sub>. This information is also relevant for other CCS or EOR projects in Alberta, mainly for planning purposes.</p> |  |                                  |
| <b>Reporting Requirements:</b>   | <b>Quantitative<br/>Data/Information</b>   | <b>Qualitative<br/>Knowledge</b> |
| <b>During Design</b>   | <p>Reports from basic and detailed design should include, but not limited, to the following:</p> <ul style="list-style-type: none"> <li>- flow (volumetric or mass)</li> <li>- temperature (°C)</li> <li>- pressure (bar)</li> <li>- composition (% by volume) including CO<sub>2</sub> and impurities</li> <li>- water content (specified in terms of parts per million on mass bases ppm)</li> <li>- fluctuations of composition over time due to new sources or change in operational process or due to several sources (cross effects of e.g., impurities)</li> <li>- composition ranges (specifically for trunk pipelines)</li> <li>- changes through pump stations, characteristics of the stream through these systems</li> <li>- additional chemicals used in the CO<sub>2</sub> composition (inhibitors, other chemicals)</li> <li>- internal corrosion control (e.g., off-spec operations may occur and the likelihood of such events should be evaluated as part of the system design)</li> </ul> |                                  |
| <b>After start-up (operation)</b>  | <p>Deviations and changes from detailed design and changes in characteristics during operation and/or after commissioning.</p> <p>Annual reports on the following:</p> <ul style="list-style-type: none"> <li>- commissioning (filling of CO<sub>2</sub>)</li> <li>- operation</li> <li>- maintenance</li> <li>- inspection and repair</li> <li>- impact on CO<sub>2</sub> characteristics</li> </ul>  |                                  |

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|                             |   |  |
|-----------------------------|---|--|
|                             | <ul style="list-style-type: none"> <li>- range during the year</li> <li>- impact on operations</li> </ul>   |  |
| Data capture frequency      | Daily   |  |
| <b>Recipients Documents</b> | <p>The information contained within the following documents are expected to address some of the requirements of this section:</p> <ul style="list-style-type: none"> <li>- 248 Pipeline Flow and Flow Assurance Report</li> <li>- 240 Integrated Production System Model</li> </ul> |  |

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| <b>SECTION 2 TRANSPORTATION</b>  |   |             |
|--|---|-------------|
| <b>Section 2.4 Emissions from transportation</b>   |   |             |
| <b>Description:</b> Describe fugitives and fuel emissions during transportation. This is required to determine the total system emissions reduction. |   |             |
| <b>Purpose:</b> Share data with industry for benchmarking purposes.  |   |             |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative |
|  | Data/Information  | Knowledge   |
| <b>Before Operation</b>  | Based on basic/detailed design what are the expected fugitives and fuel emissions during transportation.<br>Estimated CO <sub>2</sub> emissions (tonne).  |             |
| <b>During Operation</b>  | Based on operation what are the actual fugitives and fuel emissions during transportation.<br>Actual CO <sub>2</sub> emissions (tonne).   |             |
| Data capture frequency   | Monthly averages  |             |
| <b>Recipients Documents</b>  | The information contained within the following document is expected to address some of the requirements of this section:<br>- 251 GHG & Energy Efficiency Report (a sub-section of such report) |             |

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| <b>SECTION 2 TRANSPORTATION</b>  |  |                       |
|--|--|-----------------------|
| <b>Section 2.5 Energy consumption</b>  |  |                       |
| <b>Description:</b> Describe the energy used during the transportation; these data are used to align with the requirements of the capture portion. |  |                       |
| <b>Purpose:</b> Share data with industry for benchmarking purposes.  |  |                       |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative           |
|  | Data/Information   | Knowledge             |
| <b>Before Operation</b>  | Based on basic/detailed design the energy used during the transportation should be described. This data is used to align with the requirements of the capture portion.<br>Estimated energy consumption (MWh).        | Benchmarking estimate |
| <b>During Operation</b>  | Based on operation the energy used during the transportation (for pump stations) should be described. These data are used to align with the requirements of the capture portion.<br>Actual energy consumption (MWh). |                       |
|  | Data capture frequency   | Daily average         |
| <b>Recipients Documents</b>  | To be determined, if any   |                       |

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| <b>SECTION 2 TRANSPORTATION</b>   |   |                                   |
|---|---|-----------------------------------|
| <b>Section 2.6 Integrity management plan</b>  |   |                                   |
| <b>Description:</b> In order to have good control on the integrity of the pipeline, the pipelines can be inspected inside and outside with an in-line inspection tool (ILI). Is there an inspection pig developed and qualified for the pipeline? What type of ILI inspection tool is used? In case of ILI-pigging, how often shall the pipeline be inspected? Is there planned for a base line (first inspection, initial inspection). If pigging is not feasible how is the pipeline monitored? This is valuable information for other project developers, since safe CO <sub>2</sub> operation is still an immature knowledge. These elements should be described in an overall operational philosophy plan (document) and should also be described in a separate overall inspection program document. |   |                                   |
| <b>Purpose:</b> Information relevant for building competence in industry on pipeline transport of CO <sub>2</sub> .   |   |                                   |
| <b>Reporting Requirements:</b>  | Quantitative  | Qualitative                       |
|   | Data/Information  | Knowledge                         |
| <b>Before start-up</b>  | Describe the following programs:<br><ul style="list-style-type: none"> <li>- integrity management process (risk assessment, inspection, maintenance programs/plans, monitoring, testing, mitigations, interventions, repairs, etc.)</li> <li>- emergency preparedness plans</li> <li>- operating philosophies</li> <li>- company policy</li> <li>- organization and personnel</li> <li>- operational controls and procedures</li> <li>- reporting and communication</li> <li>- management of change</li> <li>- contingency plans</li> <li>- information management</li> </ul> |                                   |
|   | Data capture frequency  | Annually and updated as necessary |
| <b>After start-up</b>   | Describe any material updates to the programs above and any issues/incidents that occur during the commissioning and operation.<br>Results from the integrity management process.   |                                   |
| <b>Recipients Documents</b>   | The information contained within the following documents are expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- 1413 HAZOP Report</li> <li>- 298 Corrosion Inhibition System Design</li> <li>- 409 Maintenance Integrity Strategies</li> <li>- 1406 Ops Org Design</li> <li>- 363 Ops &amp; Maint Strategy</li> <li>- 369 Ops &amp; Management System</li> <li>- 337 Asset Reference Plan</li> <li>- 354 Ops Readiness Plan</li> <li>- 599 Technical Integrity Plan</li> </ul>   |                                   |

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| <b>SECTION 3 STORAGE</b>   |   |                                   |
|--|---|-----------------------------------|
| <b>Section 3.1 Screening criteria</b>  |   |                                   |
| <b>Description:</b> List the specific criteria used for selecting a CO <sub>2</sub> storage and/or EOR site.   |   |                                   |
| <b>Purpose:</b> Industry and R&D capacity building within methodologies for screening of storage sites. This is important information in developing methodologies for screening potential storage sites. |   |                                   |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative                       |
|  | Data/Information  | Knowledge                         |
| <b>Before start-up</b>   | Distance to CO <sub>2</sub> sources.<br>Type of geological formation.<br>Capacity (see Section 3.2).<br>Injectivity.<br>Pressure and temperature.<br>Containment, including description of all geologic barriers.<br>Conflict with other subsurface users.<br>EOR potential.<br>Population density.<br>Knowledge of well locations including old, abandoned wells.<br>Ability to be monitored.<br>Data access (well log information, geological description, subsurface structure, geological and flow models, 2D and/or 3D seismic). |                                   |
|  | Data capture frequency  | Annually and updated as necessary |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section:<br>- 335 Field Development Plan<br>- D65 Regulatory Application  |                                   |

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| <b>SECTION 3 STORAGE</b>   |   |             |
|--|---|-------------|
| <b>Section 3.2 Methodology for calculating capacity</b>  |   |             |
| <b>Description:</b> Describe the methodology for estimating storage and/or EOR injection capacity.   |   |             |
| <b>Purpose:</b> Industry and R&D capacity building within methodology for screening of storage sites. This is important information in developing methodologies for screening potential storage sites. |   |             |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative |
|  | Data/Information  | Knowledge   |
| <b>Before start-up</b>   | Volumetric.<br>Flow simulations.<br>Sensitivity to different injectivities, injection strategies, well type (vertical/horizontal) in a multi-well system.<br>Active engineering for maintaining pressure below a certain limit without limiting capacity (e.g., water pumping).<br>Model identification and validation.               |             |
| Data capture frequency   | Annually and updated as necessary   |             |
| <b>After start-up</b>  | Estimated remaining capacity.<br>Explanation/rationale for any changes to the method used to estimate capacity.   |             |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- Integrated Modelling Report</li> <li>- 335 Field Development Plan</li> <li>- D65 Regulatory Application</li> <li>- External Expert Panel Report by DNV</li> </ul> |             |

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| <b>SECTION 3 STORAGE</b>   |  |  |
|--|--|--|
| <b>Section 3.3 Candidate storage sites</b>   |  |  |
| <b>Description:</b> List of candidate sites for storage and/or EOR selected by the Recipients in view of the results and conclusions of the analysis described in Section 3.1 and 3.2 above. A justification for the candidate selection should be given as well as the reasons for rejecting the other sites. |  |  |
| <b>Purpose:</b> Industry and R&D capacity building within methodology for screening of storage sites.  |  |  |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative  |
|  | Data/Information   | Knowledge  |
| <b>Before start-up</b>   | Supporting data.   | Justification for the selection<br>Lessons learned during the<br>operation stage |
| Data capture frequency   | Annually   |  |
| <b>After start-up</b>  | Variances from the original analysis.  |  |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- 335 Field Development Plan</li> <li>- D65 Regulatory Application</li> </ul> |  |



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| <b>SECTION 3 STORAGE</b>  |  |  |
|---|--|--|
| <b>Section 3.4 Screening and characterization results</b>   |  |  |
| <b>Description:</b> Data collected to finalize selection of storage site including data collected from rejected storage sites.  |  |  |
| Describe the candidate sites for storage and/or EOR. Describe the exploration activities performed at the selected storage and/or EOR sites along with an activity justification, and provide the results of these activities. The activities include data acquisition and interpretation as well as modelling.     |  |  |
| <b>Purpose:</b> Industry and R&D capacity building within methodologies for screening of storage sites. Access to data from storage projects – R&D purposes. Information is also relevant to stakeholders (local communities, NGOs). In describing the geological storage site, these data are of general interest. |  |  |
| <b>Reporting Requirements:</b>  | <b>Quantitative Data/Information</b>   | <b>Qualitative Knowledge</b>   |
| <b>During Concept phase/storage site screening</b>  | <p>Geographical and property maps of the candidate sites for storage and/or EOR showing:</p> <ul style="list-style-type: none"> <li>- well locations and strategy</li> <li>- reservoir location (top depth) and thickness</li> <li>- pressure and temperature</li> <li>- porosity</li> <li>- permeability</li> <li>- injectivity</li> <li>- estimate of the storage potential (and then the actual results to compare to the estimates)</li> </ul> <p>Summary of reasons for selecting the final site to be further explored:</p> <ul style="list-style-type: none"> <li>- geographical and practical suitability for implementing the whole CCS chain</li> <li>- potential EOR benefits, if considered</li> <li>- highest scores of the screening criteria in 3.1</li> <li>- governmental regulations/requirements</li> </ul> <p>Reasons for rejecting any other candidate sites.<br/>           General geological description of target formation and cap rock.<br/>           Locations of planned wells/facilities as well as design plan, including injection and monitoring wells and other facilities.</p> | <p>Summary of rationale for site selection</p> <p>Report describing the exploration activities performed at the selected storage site and characterization results</p> |
| <b>During Design and construction phase/storage site characterization</b>   | <p>Characterization report including:</p> <ul style="list-style-type: none"> <li>- cap rocks and existence of secondary barriers</li> <li>- reservoir and cap rock mineralogy</li> </ul>   |  |

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|                             |  |  |
|-----------------------------|--|--|
|                             | <p>Updated storage site data:</p> <ul style="list-style-type: none"> <li>- depths</li> <li>- thicknesses</li> <li>- lithologies</li> <li>- porosities</li> <li>- permeabilities</li> <li>- calculated storage capacity</li> <li>- salinity</li> <li>- water chemistry</li> <li>- presence of H<sub>2</sub>S and other dissolved gases</li> <li>- presence of free gas or oil</li> </ul> <p>Field development design.<br/>Monitoring results.</p> |  |
|                             | Data capture frequency   | Data captured during exploration and characterization activities |
| <b>Recipients Documents</b> | <p>The information contained within the following document is expected to address some of the requirements of this section:</p> <ul style="list-style-type: none"> <li>- 335 Field Development Plan</li> </ul>   |  |

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| <b>SECTION 3 STORAGE</b>   |                                  |   |
|--|----------------------------------|---|
| <b>Section 3.5 Baseline monitoring results for shallow groundwater aquifers, soil and air</b>  |                                  |   |
| <p><b>Description:</b> These measurements provide a reference that future measurements can be compared against. Depending on the monitoring method, chemical (mass and/or fraction) and isotopic measurements will be made. A suite of measurements should be made in order to assess the temporal variations (daily, seasonable, etc) variations present at the surface and near surface (atmosphere), soil and in shallow ground water zones prior to injection activities.</p> <p>The monitoring techniques potentially include:</p> <ul style="list-style-type: none"> <li>- surface gas fluxes and chemical/isotopic composition</li> <li>- soil gas flux and chemical/isotopic composition</li> <li>- ecosystem surveys</li> <li>- groundwater quality (chemical and isotopic composition)</li> <li>- atmospheric quality and composition</li> </ul> <p>There are a number of “shallow” geophysical and other techniques which may be appropriate. Depending on the location or season - not all monitoring methodologies may be possible. The selection of measurement techniques are made as part of the MMV process described in 3.12. They may be made in conjunction with the deep baseline measurements. These measurements are made prior to and independently of the monitoring activities described in 3.13.</p> <p><b>Purpose:</b> Essential baseline for measuring any changes in the local environment from CO<sub>2</sub> storage. Important in building confidence in CO<sub>2</sub> storage as safe and without (major) negative effects locally.</p> |                                  |   |
| <b>Reporting Requirements:</b>   | Quantitative<br>Data/Information | Qualitative<br>Knowledge                    |
| <b>Early in characterization of the storage site</b>   | Results from monitoring.         | Report describing the monitoring techniques |
| <b>Recipients Documents</b>  | To be determined, if any         |   |

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| <b>SECTION 3 STORAGE</b>   |   |   |
|--|---|---|
| <b>Section 3.6 Baseline monitoring results for deep aquifers and the injection horizon</b> |   |   |
| <b>Description:</b>  | <p>These measurements provide a reference that future measurements can be compared against. There are four primary suites of measurements: (1) Pressure (and temperature), (2) fluid (water and gas/oil if present) composition, (3) surface imaging (different geophysical methods) and (4) well based imaging (RST, bond logs, etc). Depending on the monitoring method, a full suite of chemical (mass and/or fraction) and isotopic measurements should be made. Depending on the specific geological structures, aquifers below the injection horizon may have to be sampled/imaged. Under certain circumstances, lateral variation of the data may have to be established.</p> <p>The exploration activities performed at the selected storage and/or EOR sites should be described along with an activity justification. The activities include data acquisition and interpretation as well as modelling. Examples of results are:</p> <ul style="list-style-type: none"> <li>- geology/ geophysics/geomechanics/petrophysics/geochemistry/ microbiology</li> <li>- simulation of plume and pressure front migration</li> <li>- use of analog data</li> <li>- interpretation of monitoring data</li> </ul> |   |
| <b>Purpose:</b>  | Essential baseline for measuring injected volume/mass/location of CO <sub>2</sub> in the injection formation. Important for verification to establish carbon credits or something similar. Essential baseline for measuring any changes in the surrounding environment from CO <sub>2</sub> storage. Important in building confidence in CO <sub>2</sub> storage as safe and without (major) negative effects locally.  |   |
| <b>Reporting Requirements:</b>   | Quantitative<br>Data/Information  | Qualitative<br>Knowledge                    |
| <b>Early in characterization of the storage site</b>                                       | Results from monitoring.<br>Seismic characterization.<br>Initial structural model.  | Report describing the monitoring techniques |
| <b>Recipients Documents</b>  | To be determined, if any  |   |

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| <b>SECTION 3 STORAGE</b>   |   |                              |
|--|---|------------------------------|
| <b>Section 3.7 Injectivity and draw down tests</b>   |   |                              |
| <b>Description:</b> Well test description and interpretation.  |   |                              |
| <b>Purpose:</b> Industry and R&D competence building within methodologies for characterizing storage sites. Access to data from storage projects – R&D purposes. |   |                              |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative                  |
|  | Data/Information  | Knowledge                    |
| <b>During characterization of storage site</b>   | Well test data and information: <ul style="list-style-type: none"> <li>- injected fluid/water/tracer volume, rate and duration</li> <li>- initial pressure build up curve</li> <li>- pressure drop off curve</li> <li>- connected pore volume estimate</li> <li>- compartmentalization evaluation</li> <li>- initial water test</li> <li>- injectivity of the water</li> <li>- rock permeability</li> <li>- other, such as temperature if measured</li> </ul> | Summary report of well tests |
| <b>Recipients Documents</b>  | The information contained within the following document is expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- 335 Field Development Plan</li> </ul>   |                              |

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| <b>SECTION 3 STORAGE</b>   |   |  |
|--|---|--|
| <b>Section 3.8 Planned injection stream composition</b>  |   |  |
| <p><b>Description:</b> Identify the planned and observed stream composition of the injection stream of CO<sub>2</sub>. Assess the risks associated with the impurities identified and the methods to avoid adverse effects of the impurities.</p> <p>Record the evolution of the identified significant risks along with corresponding safeguards as the monitoring activities progresses. Also record the impact of identified risks on the MMV plan in 3.12.</p> <p><b>Purpose:</b> The composition is relevant to the public in order to know what is being stored in the reservoir and for R&amp;D/industry to understand reservoir behaviour and selection of materials in wells.</p> |   |  |
| <b>Reporting Requirements:</b>   | Quantitative<br>Data/Information  | Qualitative<br>Knowledge   |
| <b>During screening and characterization of storage site (before injection)</b>  | <p>Estimated injection stream:</p> <ul style="list-style-type: none"> <li>- expected composition</li> <li>- expected mass flow</li> <li>- expected variation of above factors</li> </ul> <p>Assessments:</p> <ul style="list-style-type: none"> <li>- reactivity of impurities</li> <li>- impact on phase behaviour of impurities</li> <li>- risk and uncertainty assessments</li> <li>- identify safeguards for the significant risks</li> <li>- down-hole water chemistry and composition</li> <li>- required pressure and temperature for injection</li> </ul> | <p>Summary report with assessments and lessons learned</p> <p>Summary of risk assessment including ranking of risks and associated uncertainties</p> |
| <b>Storage site injection and post-injection</b>   | <p>Actual injection stream composition:</p> <ul style="list-style-type: none"> <li>- measured composition</li> <li>- measured mass flow</li> <li>- measured variation of above factors</li> </ul> <p>Assessments:</p> <ul style="list-style-type: none"> <li>- reactivity of impurities</li> <li>- impact on phase behaviour of impurities risk and uncertainty assessments</li> <li>- identify safeguards for the significant risks</li> <li>- down-hole water chemistry and composition</li> <li>- required pressure and temperature for injection</li> </ul>   |  |
|  | Data capture frequency  | Daily average  |
| <b>Recipients Documents</b>  | <p>The information contained within the following document is expected to address some of the requirements of this section:</p> <ul style="list-style-type: none"> <li>- 335 Field Development Plan</li> </ul>  |  |

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| <b>SECTION 3 STORAGE</b>  |   |             |
|---|---|-------------|
| <b>Section 3.9 Safeguard Plans</b>  |   |             |
| <b>Description:</b> Describe the action plans for dealing with undesirable events (based on the risk assessment).   |   |             |
| <b>Purpose:</b> Share experience with other project developers, R&D and other stakeholders on developing safeguard plans. Building confidence among stakeholders, but these plans have to be communicated carefully to the public to avoid misinterpretation. |   |             |
| <b>Reporting Requirements:</b>  | Quantitative  | Qualitative |
|   | Data/Information  | Knowledge   |
| <b>Before start-up</b>  | Risks addressed based on results of assessment.<br>Describe the corrective and/or preventive measures (mitigation and remediation).<br>Basic cost/benefit analysis. |             |
| Data capture frequency  | Annually and updated as necessary   |             |
| <b>After start-up</b>   | Describe actual corrective and/or preventive measures employed (mitigation and remediation), if applicable.   |             |
| <b>Recipients Documents</b>   | The information contained within the following document is expected to address some of the requirements of this section:<br>- MMV Plan                              |             |

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| <b>SECTION 3 STORAGE</b>  |  |             |
|---|--|-------------|
| <b>Section 3.10 Conclusion from risk assessment</b>   |  |             |
| <b>Description:</b> Report covering the conclusions of risk assessment.   |  |             |
| <b>Purpose:</b> Share experiences with assessing the risks and uncertainties of a geological storage site. Industry and R&D competence building within methodologies for characterizing storage sites. The conclusions from risk assessments are important in building public awareness and confidence in geological storage of CO <sub>2</sub> . |  |             |
| <b>Reporting Requirements:</b>  | Quantitative   | Qualitative |
|   | Data/Information   | Knowledge   |
| <b>Before start-up</b>  | Report.  |             |
| Data capture frequency  | Annually and updated as necessary  |             |
| <b>After start-up</b>   | Updates to Report.   |             |
| <b>Recipients Documents</b>   | The information contained within the following documents are expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- MMV Plan</li> <li>- D65 chapter on MMV</li> </ul> |             |



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| <b>SECTION 3 STORAGE</b>   |  |  |
|--|--|--|
| <b>Section 3.11 Storage site operation and CO<sub>2</sub> injection</b>  |  |  |
| <b>Description:</b> Planned injection rates, volumes, operating strategy, HSE, pressure management.  |  |  |
| <b>Purpose:</b> Industry and R&D competence building within development of a geological storage site. Information of general interest to R&D and industry as part of competence building on geological storage of CO <sub>2</sub> . Openness on what is being injected is essential in building confidence for geological storage of CO <sub>2</sub> . |  |  |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative  |
|  | Data/Information   | Knowledge  |
| <b>During screening and characterization of storage site (before injection)</b>  | Planned injection in total and per well: <ul style="list-style-type: none"> <li>- rates</li> <li>- volumes</li> <li>- rates and volumes per injection well</li> <li>- pressure and temperature</li> <li>- well specific injection activity</li> <li>- composition and isotopic make-up of the injected stream</li> <li>- pressure and temperature both at the well head and at down-hole perforations</li> </ul> Storage performance forecast. | Report describing operating strategy, HSE, pressure management |
| <b>Storage site injection and post-injection</b>   | Actual injection in total and per well: <ul style="list-style-type: none"> <li>- rates</li> <li>- volumes</li> <li>- rates and volumes per injection well</li> <li>- pressure and temperature</li> <li>- well specific injection activity</li> <li>- composition and isotopic make-up of the injected stream</li> <li>- pressure and temperature both at the well head and at down-hole perforations</li> </ul>                                |  |
|  | Data capture frequency   | Daily average  |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- 335 Field Development Plan</li> <li>- Integrated Modelling Report</li> <li>- 336 Well &amp; Reservoir Management Plan</li> </ul>   |  |

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| <b>SECTION 3 STORAGE</b>   |   |   |
|--|---|---|
| <b>Section 3.12 Monitoring, measurement and verification (MMV) plan and revisions</b>  |   |   |
| <b>Description:</b> List of relevant data and information from the MMV plan. The MMV plan should address monitoring during the pre-injection and injection phase, as well as the post injection stages. An overview of revised MMV plan if required by the regulatory agency or by changes in project circumstances. |   |   |
| <b>Purpose:</b> Information on planned monitoring is relevant to stakeholders (NGOs, local communities) in building awareness of CO <sub>2</sub> storage and for R&D/industry to gain knowledge of planning monitoring programs.   |   |   |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative   |
|  | Data/Information  | Knowledge   |
| <b>Before injection</b>  | Relevant information from the MMV plan: <ul style="list-style-type: none"> <li>- screening of monitoring techniques and technologies for suitability to the selected site</li> <li>- verification plan</li> <li>- accounting and reporting plan</li> </ul> Locations of particular importance from a risk viewpoint: <ul style="list-style-type: none"> <li>- description of the site-specific monitoring targets</li> <li>- ground water quality monitoring</li> <li>- leakage surveillance of wells</li> </ul> Information mainly relevant for R&D and industry: <ul style="list-style-type: none"> <li>- statement of relevant regulations and precedents</li> </ul> List of monitoring techniques considered. | MMV plan and revisions of plan<br>Describe the assessment of monitoring techniques<br>Lessons learned |
|  | Data capture frequency  | Annually and updated as necessary   |
| <b>Storage site injection and post-injection</b>   | Description of data collection mechanisms to verify that storage is contained.  |   |
| <b>Recipients Documents</b>  | The information contained within the following document is expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- MMV Plan</li> </ul>   |   |

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| <b>SECTION 3 STORAGE</b>   |   |  |
|--|---|--|
| <b>Section 3.13 Monitoring results</b>   |   |  |
| <b>Description:</b> Specific data to be acquired will be described in MMV plan (see Section 3.12). This plan will be updated regularly throughout the operation phase, particularly during storage permit renewals.  |   |  |
| <b>Purpose:</b> Information and data from monitoring is relevant to stakeholders (NGOs, local communities) in building awareness of CO <sub>2</sub> storage. Industry and R&D competence building within monitoring a geological storage site. Access to data from monitoring. |   |  |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative  |
|  | Data/Information  | Knowledge  |
| <b>During screening and characterization of storage site (before injection)</b>  | <p>Actual data from monitoring (techniques described in the MMV plan):</p> <ul style="list-style-type: none"> <li>- seismic imaging (e.g., cross-hole tomography, 3D and 4D seismic surveys, VSPs)</li> <li>- chemical tracers</li> <li>- well logs</li> <li>- down hole fluid chemistry</li> <li>- surface gas fluxes (compare to baseline monitoring Section 3.5)</li> <li>- soil gas flux (compare to Section 3.5)</li> <li>- ecosystem surveys (compare to Section 3.5)</li> <li>- tilt meters or equivalent</li> <li>- groundwater (compare to Section 3.5)</li> <li>- atmospheric monitoring (compare to Section 3.5)</li> <li>- static geologic model as a starting model as well as its' input data</li> <li>- from below (case-by-case) the injection unit to the surface</li> <li>- pressure, temperature, fluid saturations</li> <li>- aeromagnetics</li> <li>- ground level motion</li> </ul> <p>Data examples could include:</p> <ul style="list-style-type: none"> <li>- seismic imaging</li> <li>- well logs</li> <li>- down hole fluid chemistry</li> <li>- surface gas fluxes</li> <li>- soil chemistry</li> <li>- ecosystem surveys</li> <li>- passive seismic monitoring for induced seismicity</li> <li>- pressure</li> <li>- groundwater</li> <li>- additional data as in Section 3.5</li> </ul> | <p>Report with assessment of monitoring results</p> <p>Lessons learned from monitoring</p> |

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|   |   |  |
|---|---|--|
| <p><b>Storage site injection and post-injection</b></p> | <p>Actual data from monitoring (techniques described in the MMV plan):</p> <ul style="list-style-type: none"> <li>- seismic imaging (e.g., cross-hole tomography, 3D and 4D seismic surveys, VSPs)</li> <li>- chemical tracers</li> <li>- well logs</li> <li>- down hole fluid chemistry</li> <li>- surface gas fluxes (compare to baseline monitoring Section 3.5)</li> <li>- soil gas flux (compare to Section 3.5)</li> <li>- ecosystem surveys (compare to Section 3.5)</li> <li>- tilt meters or equivalent</li> <li>- groundwater (compare to Section 3.5)</li> <li>- atmospheric monitoring (compare to Section 3.5)</li> <li>- static geologic model as a starting model as well as its' input data</li> <li>- from below (case-by-case) the injection unit to the surface</li> <li>- pressure, temperature, fluid saturations</li> <li>- aeromagnetics</li> <li>- ground level motion</li> </ul> <p>Data examples could include:</p> <ul style="list-style-type: none"> <li>- seismic imaging</li> <li>- well logs</li> <li>- down hole fluid chemistry</li> <li>- surface gas fluxes</li> <li>- soil chemistry</li> <li>- ecosystem surveys</li> <li>- passive seismic monitoring for induced seismicity</li> <li>- pressure</li> <li>- groundwater</li> <li>- additional data as in Section 3.5</li> </ul> |  |
| <p>Data capture frequency</p>                           | <p>Daily/monthly average, yearly (differ between monitoring techniques).</p>  |  |
| <p><b>Recipients Documents</b></p>                      | <p>The information contained within the following documents are expected to address some of the requirements of this section:</p> <ul style="list-style-type: none"> <li>- MMV Plan</li> <li>- D65 chapter on MMV</li> </ul>  |  |

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| <b>SECTION 3 STORAGE</b>   |   |  |
|--|---|--|
| <b>Section 3.14 Well design</b>  |   |  |
| <b>Description:</b> The provided data should be relevant for identifying weak spots with potential leaks as well as potentials for design improvement for performance enhancement. This data should describe the existing and planned wells at the CCS and/or EOR sites. |   |  |
| <b>Purpose:</b> Industry and R&D competence building. Access to data from CO <sub>2</sub> wells.   |   |  |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative  |
|  | Data/Information  | Knowledge  |
| <b>During screening and characterization of storage site (before injection)</b>  | Type/purpose (exploration, monitoring, injection, producer).<br>Trajectory and position.<br>Completion intervals.<br>Casing and cement type and dimensions.<br>Corrosion issues.<br>Injection facility specs.<br>Other technical specs.   | Design rationale<br>Report summarising operational experience<br>Lessons learned |
| <b>Storage site injection and post-injection</b>   | Operational experience.   |  |
|  | Data capture frequency  | Daily average  |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address some of the requirements of this section:<br><ul style="list-style-type: none"> <li>- 376 Well Programme</li> <li>- 661 Well Technical Spec</li> <li>- 1160 Well Tech Spec for Intervention</li> </ul> |  |

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| <b>SECTION 3 STORAGE</b>   |   |   |
|--|---|---|
| <b>Section 3.15 CO<sub>2</sub> injection for EOR only *(if applicable)</b>   |   |   |
| <b>Description:</b> Additional information to that in 3.11, the following data/information are EOR specific.   |   |   |
| <b>Purpose:</b> Building competence in industry and R&D on enhanced oil recovery with CO <sub>2</sub> injection. Provide insights in a potential commercial driver for CCS projects. |   |   |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative                                       |
|  | Data/Information  | Knowledge   |
| <b>During screening and characterization of storage site (before injection)</b>  | Estimates of: <ul style="list-style-type: none"> <li>- incremental oil production (production profiles)               <ul style="list-style-type: none"> <li>o expected production profiles</li> <li>o actual production profiles</li> </ul> </li> <li>- CO<sub>2</sub> recycle rates</li> <li>- produced gas – rates and composition</li> <li>- water injection</li> </ul> Estimates: <ul style="list-style-type: none"> <li>- CO<sub>2</sub> used per barrel of oil produced (recycled CO<sub>2</sub> and new CO<sub>2</sub> variation in time)</li> <li>- recovery factor</li> </ul> | Report summarising EOR project<br>Lessons learned |
| <b>Storage site injection and post-injection</b>   | Actual data: <ul style="list-style-type: none"> <li>- incremental oil production (production profiles)               <ul style="list-style-type: none"> <li>o expected production profiles</li> <li>o actual production profiles</li> </ul> </li> <li>- CO<sub>2</sub> recycle rates</li> <li>- produced gas – rates and composition</li> <li>- water injection</li> </ul> Actual: <ul style="list-style-type: none"> <li>- CO<sub>2</sub> used per barrel of oil produced (recycled CO<sub>2</sub> and new CO<sub>2</sub> variation in time)</li> <li>- recovery factor</li> </ul>     |   |
| Data capture frequency   | Daily average   |   |
| <b>Recipients Documents</b>  | To be determined, if any  |   |

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| <b>SECTION 3 STORAGE</b>  |  |             |
|---|--|-------------|
| <b>Section 3.16 Workflow description for technical work</b>   |  |             |
| <b>Description:</b> General methodology description of contractor work:   |  |             |
| <ul style="list-style-type: none"> <li>- drilling of wells</li> <li>- drilling work completion</li> <li>- discussion of pre-existing and new well needs (CO<sub>2</sub>)</li> <li>- well workovers if existing wells are converted to either injection or monitoring wells</li> </ul> |  |             |
| <b>Purpose:</b> Industry and R&D competence building within developing and operating a geological storage site.   |  |             |
| <b>Reporting Requirements:</b>  | Quantitative   | Qualitative |
|   | Data/Information   | Knowledge   |
| <b>Before start-up</b>  | Report.  |             |
| Data capture frequency  | Annually and updated as necessary  |             |
| <b>After start-up</b>   | Update report and conclusions.   |             |
| <b>Recipients Documents</b>   | The information contained within the following document is expected to address some of the requirements of this section: |             |
|   | <ul style="list-style-type: none"> <li>- 376 Well Programme</li> </ul>   |             |

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| <b>SECTION 3 STORAGE</b>   |   |             |
|--|---|-------------|
| <b>Section 3.17 Illustration summarizing site geology and modelling work</b>   |   |             |
| <b>Description:</b> Illustration of site geology and modelling work to highlight key parameters.                                     |   |             |
| <b>Purpose:</b> Industry and R&D competence building within modelling and monitoring a geological storage site. Access to data/maps. |   |             |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative |
|  | Data/Information  | Knowledge   |
| <b>Before start-up</b>   | Illustration/map includes: <ul style="list-style-type: none"> <li>- 2D cross sections through structure</li> <li>- Stratigraphic columns</li> </ul> Well trajectories of injectors and producers.       |             |
| Data capture frequency   | Annually and updated as necessary   |             |
| <b>After start-up</b>  | Updates to illustrations/maps as necessary.   |             |
| <b>Recipients Documents</b>  | The information contained within the following document is expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- 335 Field Development Plan</li> </ul> |             |



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| <b>SECTION 4 CCS VALUE CHAIN</b>   |  |             |
|--|--|-------------|
| <b>Section 4.1 Project schedule</b>  |  |             |
| <b>Description:</b> The project schedule gives information on the status of the project and on each building block (capture, transport and storage) and changes in the plan. What are the time critical items in the plan? |  |             |
| <b>Purpose:</b> Sharing schedules are relevant for other CCS projects for benchmarking purposes.   |  |             |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative |
|  | Data/Information   | Knowledge   |
| <b>Before start-up</b>   | Project schedule overview that identifies milestones for capture, transport, storage, MMV, regulatory components (Gantt Chart or similar).                   |             |
| <b>After start-up</b>  | Updates to the project schedule with explanations for each change in timing.   |             |
| Data capture frequency   | Annually and updated as necessary  |             |
| <b>Recipients Documents</b>  | The information contained within the following document is expected to address some of the requirements of this section:<br>- 395 Project Schedule (Level 2) |             |

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| <b>SECTION 4 CCS VALUE CHAIN</b>   |  |                                   |
|--|--|-----------------------------------|
| <b>Section 4.2 Stakeholder dialogue and public awareness</b>   |  |                                   |
| <b>Description:</b> Documentation of the stakeholder dialogue and consultation process.  |  |                                   |
| <b>Purpose:</b> Sharing these experiences is highly relevant to other CCS projects and may help these projects developing a successful stakeholder engagement strategy and stakeholder engagement. |  |                                   |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative                       |
|  | Data/Information   | Knowledge                         |
| <b>Before start-up</b>   | Summary report outlining the stakeholder consultation process and outcomes, including: <ul style="list-style-type: none"> <li>- list of stakeholders the project has a structured dialogue and/or communication with (NGOs, local communities, R&amp;D, industry, international organizations)</li> <li>- description of stakeholder consultation (e.g., media, open houses, public meetings, etc.)</li> <li>- other stakeholder activities</li> </ul> |                                   |
| <b>After start-up</b>  | Updates to the stakeholder consultation and ongoing discussions.   |                                   |
|  | Data capture frequency   | Annually and updated as necessary |
| <b>Recipients Documents</b>  | The information contained within the following documents are expected to address the requirements of this section: <ul style="list-style-type: none"> <li>- 400 Stakeholder Engagement Plan</li> <li>- 1385 Social Performance Plan</li> </ul>   |                                   |

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| <b>SECTION 4 CCS VALUE CHAIN</b>   |  |                          |
|--|--|--------------------------|
| <b>Section 4.3 Cost per tonnes of CO<sub>2</sub> emissions avoided</b>   |  |                          |
| <p><b>Description:</b> Using the agreed upon methodology, calculate the cost per tonnes of CO<sub>2</sub> emissions avoided by implementing CCS:</p> <ul style="list-style-type: none"> <li>- include full CCS value chain costs and avoided CO<sub>2</sub> emissions</li> <li>- exclude incremental oil produced by EOR with CO<sub>2</sub> injection is not part of the equation</li> </ul> <p>Methodologies for calculating cost per tonnes of CO<sub>2</sub> emissions have to be harmonized across the CCS projects being funded by the Province for comparison purposes.</p> |  |                          |
| <p><b>Purpose:</b> Benchmarking cost of the CCS project with the price of carbon and other measures reducing CO<sub>2</sub> emissions.</p>   |  |                          |
| <b>Reporting Requirements:</b>   | Quantitative<br>Data/Information   | Qualitative<br>Knowledge |
| <b>Before start-up</b>   | Estimated full CCS value chain cost per tonnes of CO <sub>2</sub> emissions avoided by implementing CCS based upon the methodology directed by the Province. |                          |
| <b>After start-up</b>  | Actual cost per tonnes of CO <sub>2</sub> emissions avoided by implementing CCS.   |                          |
| Data capture frequency   | Annually   |                          |
| <b>Recipients Documents</b>  | To be determined, if any   |                          |

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| <b>SECTION 4 CCS VALUE CHAIN</b>   |  |                        |
|--|--|------------------------|
| <b>Section 4.4 Governmental funding</b>  |  |                        |
| <b>Description:</b> Yearly governmental funding of project – this is public information. |  |                        |
| <b>Purpose:</b> Relevant for industry players for benchmarking purposes.                 |  |                        |
| <b>Reporting Requirements:</b>   | Quantitative   | Qualitative            |
|  | Data/Information   | Knowledge              |
| <b>Before start-up</b>   | Governmental funding granted: <ul style="list-style-type: none"> <li>- full CCS value chain project governmental funding (total)</li> <li>- annual governmental funding</li> <li>- governmental funding relative to industry funding (per cent)</li> </ul> Governmental funding profile.   | Report lessons learned |
| <b>After start-up</b>  | Actual Governmental funding granted: <ul style="list-style-type: none"> <li>- full CCS value chain project governmental funding (total)</li> <li>- annual governmental funding</li> <li>- governmental funding relative to industry funding (per cent)</li> </ul> Governmental funding profile.<br>Updated expected funding profile.<br>Calculation of a government funding efficiency metric based upon the methodology directed by the Province. |                        |
|  | Data capture frequency   | Annually               |
| <b>Recipients Documents</b>  | To be determined, if any   |                        |

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| <b>SECTION 4 CCS VALUE CHAIN</b>  |   |             |
|---|---|-------------|
| <b>Section 4.5 CO<sub>2</sub> emissions per year</b>  |   |             |
| <b>Description:</b> CO <sub>2</sub> emitted from the CO <sub>2</sub> source, capture plant, pipelines and storage. Include an overview of sources of fugitive emissions throughout the value chain. Oil produced in EOR projects excluded, but additional CO <sub>2</sub> emissions from incremental oil production should be included. |   |             |
| <b>Purpose:</b> Document the climate benefit of the CCS project.  |   |             |
| <b>Reporting Requirements:</b>  | Quantitative  | Qualitative |
|   | Data/Information  | Knowledge   |
| <b>Before Operation</b>   | Estimated yearly CO <sub>2</sub> emissions from the full CCS value chain (aggregated from CO <sub>2</sub> source, capture, transport and storage).<br>Oil produced in EOR projects excluded, but additional CO <sub>2</sub> emissions from incremental oil production should be included. |             |
| <b>During Operation</b>   | Actual yearly CO <sub>2</sub> emissions from the full CCS value chain (aggregated from CO <sub>2</sub> source, capture, transport and storage).<br>Oil produced in EOR projects excluded, but additional CO <sub>2</sub> emissions from incremental oil production should be included.    |             |
|   | Data capture frequency  | Annually    |
| <b>Recipients Documents</b>   | The information contained within the following document is expected to address some of the requirements of this section:<br>- 251 GHG & Energy Efficiency Report  |             |

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| <b>SECTION 4 CCS VALUE CHAIN</b>  |  |                         |
|---|--|-------------------------|
| <b>Section 4.6 CO<sub>2</sub> emissions avoided</b>   |  |                         |
| <b>Description:</b> CO <sub>2</sub> that would have been emitted if CCS had not been implemented vs. CO <sub>2</sub> emitted after CCS implementation. Include CO <sub>2</sub> source, capture plant, pipeline and storage. Oil produced in EOR projects excluded, but additional CO <sub>2</sub> emissions from incremental oil production should be included. |  |                         |
| <b>Purpose:</b> Document the climate benefit of the CCS project.  |  |                         |
| <b>Reporting Requirements:</b>  | Quantitative   | Qualitative             |
|   | Data/Information   | Knowledge               |
| <b>Before Operation</b>   | Estimated CO <sub>2</sub> emitted from source if CCS has not been implemented vs. estimated CO <sub>2</sub> emitted with CCS implemented.<br>- full project life-cycle<br>- annually<br>Downstream emissions of oil produced in EOR projects excluded, but additional CO <sub>2</sub> emissions from incremental oil production facilities should be included. | Rationale for estimates |
| <b>During Operation</b>   | Updated estimates of emissions avoided based on project experience and actual data.<br>Downstream emissions of oil produced in EOR projects excluded, but additional CO <sub>2</sub> emissions from incremental oil production facilities should be included.  |                         |
|   | Data capture frequency   | Annually                |
| <b>Recipients Documents</b>   | The information contained within the following documents are expected to address some of the requirements of this section:<br>- 251 GHG & Energy Efficiency Report<br>- Blue Source Report submitted with Regulatory Application   |                         |

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| <b>SECTION 5 REGULATORY APPROVALS - CAPTURE, TRANSPORTATION, STORAGE &amp; CCS VALUE CHAIN</b>   |   |             |
|--|---|-------------|
| <b>Section 5.1 List of standards and rules relevant for the construction of the project</b>  |   |             |
| <b>Description:</b> List and description of relevant requirements and standards required in the construction of the project and identify any gaps.   |   |             |
| <b>Purpose:</b> Overview of laws and regulations, standards and rules will be valuable for other CCS projects in Alberta and reduce project lead times. It will also help other stakeholders (NGOs, local communities); transparency is important for public engagement. |   |             |
| <b>Reporting Requirements:</b>   | Quantitative  | Qualitative |
|  | Data/Information  | Knowledge   |
| <b>Before start-up</b>   | List and description of all requirements and standards to be adhered to in the construction of the project:<br>-<br>- identification of regulatory body for each identified above<br>- identification of additional hurdles encountered |             |
| Data capture frequency   | Annually and updated as necessary   |             |
| <b>After start-up</b>  | Updates as required.  |             |
| <b>Recipients Documents</b>  | The information contained within the following document is expected to address some of the requirements of this section:<br>- 590 Permits & Consents Plan   |             |

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| <b>SECTION 5 REGULATORY APPROVALS - CAPTURE, TRANSPORTATION, STORAGE &amp; CCS VALUE CHAIN</b>  |  |             |
|---|--|-------------|
| <b>Section 5.2 List of consents/permits relevant for the construction and operation of the project</b>  |  |             |
| <b>Description:</b> List of regulatory requirements that have been granted or are needed to be obtained for the construction and operation of the project.  |  |             |
| <b>Purpose:</b> Overview of consents/permits and approvals will be valuable for other CCS projects in Alberta and reduce project lead times. It will also help other stakeholders (NGOs, local communities); transparency is important for public engagement. |  |             |
| <b>Reporting Requirements:</b>  | Quantitative   | Qualitative |
|   | Data/Information   | Knowledge   |
| <b>Before start-up</b>  | List of all consents/permits and approvals submitted and received during the year including: <ul style="list-style-type: none"> <li>-</li> <li>- identification of regulatory body for each identified above</li> <li>- general timelines of receiving approval of these items</li> <li>- identification of additional hurdles encountered while applying</li> </ul> |             |
| Data capture frequency  | Annually and updated as necessary  |             |
| <b>After start-up</b>   | Updates as required.   |             |
| <b>Recipients Documents</b>   | The information contained within the following document is expected to address some of the requirements of this section: <ul style="list-style-type: none"> <li>- 590 Permits &amp; Consents Plan</li> </ul>   |             |



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| <b>SECTION 6 COSTS AND REVENUES – CAPTURE, TRANSPORTATION, STORAGE &amp; CCS VALUE CHAIN</b>  |   |  |
|---|---|--|
| <b>Section 6.1 CAPEX and OPEX</b>   |   |  |
| <p><b>Description:</b> Cost estimates on capture, with consistent methodology for all projects, both investment (capital) and operational costs, should be provided. Break-down of cost structure: capture technology, utility systems (technology building blocks). Estimates on the total cost and total yearly operational cost of the pipeline. The interfaces between capture and pipeline, and between pipeline and storage, have to be clearly defined. Describe cost of material, labour, engineering, installation and contingency. Total investment in storage site including surface facilities and wells. Total operational cost of storage activities per year. Data including labour costs, maintenance and energy consumption. Full CCS value chain investment. Yearly operational cost of full CCS value chain. Capex and Opex to be reported on same level of detail as specified in the tables for capture, pipeline and storage.</p> <p><b>Purpose:</b> Important to get real cost data available in the public domain. Relevant for benchmarking different technologies in other CCS projects. Inform the public of the cost of capturing CO<sub>2</sub>. Also relevant for benchmarking different technologies and project costs. Inform stakeholders, industry and R&amp;D of the total cost of a full CCS project.</p> |   |  |
| <b>Reporting Requirements:</b>  | <b>Quantitative<br/>Data/Information</b>  | <b>Qualitative<br/>Knowledge</b>   |
| <b>Before start-up</b>  | <p>Capex estimates for full capture plant, pipeline and storage site including facilities and wells and full CCS value chain can be broken down into:</p> <ul style="list-style-type: none"> <li>- capture technology</li> <li>- compression facilities</li> <li>- support systems</li> <li>- total cost of utilities, pipes, engineering, surface facilities, wells and monitoring program</li> <li>- civic work</li> <li>- materials</li> <li>- cost of labour</li> <li>- contingency</li> <li>- capital spending profile</li> <li>- exchange rate effects</li> <li>- estimated Canada industry content relative to foreign content (in percent of total Capex)</li> </ul> <p>Opex estimates for full capture plant (expressed as \$/kg CO<sub>2</sub> captured), pipeline and full storage operation can be broken down into:</p> <ul style="list-style-type: none"> <li>- cost of steam and cost of electricity (per MWh)</li> <li>- total cost of all chemicals used (including solvent replacement cost) and waste disposal</li> <li>- labour and maintenance costs</li> <li>- insurance</li> <li>- turnarounds</li> <li>- direct vs. indirect costs</li> </ul> | <p>Rationales for the financial estimates of the capture plant, and the full value chain</p> <p>Explain impacts upon base facility</p> <p>Report lessons learned</p> |

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|                             |   |          |
|-----------------------------|---|----------|
|                             | - tariffs<br>- spending profile   |          |
| <b>After start-up</b>       | Actual Capex and Opex (same breakdown as for before start-up reporting).<br>Actual Capex and Opex spending profile, exchange rate effects and Canadian content of investment (in percent of total Capex and Opex).<br>Estimated Opex for next operational year. |          |
|                             | Data capture frequency  | Annually |
| <b>Recipients Documents</b> | The information contained within the following documents are expected to address some of the requirements of this section:<br>- 396 Capex Estimate<br>- 397 Opex Estimate   |          |

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| <b>SECTION 6 COSTS AND REVENUES – CAPTURE, TRANSPORTATION, STORAGE &amp; CCS VALUE CHAIN</b>   |  |  |
|--|--|--|
| <b>Section 6.2 Revenues for Capture, Transportation and Storage</b>  |  |  |
| <b>Description:</b> Revenues generated from capture operations, pipeline transport, and storing CO <sub>2</sub> . Revenues from base plant operations are not required (e.g. power plant, upgrader or industry process revenues are not included). |  |  |
| <b>Purpose:</b> Relevant for understanding the financial drivers in CCS projects. Inform stakeholders, industry and R&D of the potential incomes of a full CCS project.  |  |  |
| <b>Reporting Requirements:</b>   | Quantitative<br>Data/Information   | Qualitative<br>Knowledge   |
| <b>Before start-up</b>   | Full CCS value chain revenues estimates – based on data from capture, transport and storage (broken down for each category and allocated to a specific action), including: <ul style="list-style-type: none"> <li>- revenues from CO<sub>2</sub> sold (EOR projects or other purposes)</li> <li>- transport tariff (CAD per tonne of CO<sub>2</sub> transported)</li> <li>- pipeline tolls</li> <li>- revenues from incremental oil production due to CO<sub>2</sub> injection</li> <li>- revenues for providing storage services</li> <li>- other incomes</li> </ul> Estimated revenue profile. | Rationales for the financial estimates of the capture plant<br>Lessons learned |
| Data capture frequency   | Annually and updated as necessary  |  |
| <b>After start-up</b>  | Actual full CCS project revenues (same breakdown as before start-up reporting).<br>Updated revenue profile.  |  |
| Data capture frequency   | Annually   |  |
| <b>Recipients Documents</b>  | To be determined, if any   |  |