

Environment and Sustainable Resource Development—Climate Change, First Follow-up

Summary

Climate change has far-reaching impacts on Alberta's economy, infrastructure and natural environment, and on human health.

In 2008, the Alberta government released the *Climate Change Strategy* and set targets for reducing emissions intensity and absolute emissions in Alberta.¹ That same year, we audited systems the government used to develop and report on the strategy. We concluded that the targets were based on an economic model that included actions that were not part of the strategy. We also concluded that the Department of Environment and Sustainable Resource Development did not have an implementation plan with specific actions to meet targets and monitor against performance. Such a plan is key to Alberta's success in carrying out the strategy. We made three recommendations to the Department in our *October 2008 Report*.

In 2009, we audited the Department's implementation of the *Specified Gas Emitters Regulation*,² (*SGE Regulation*), a key component under the strategy. The *SGE Regulation* sets emission intensity limits for facilities that collectively produce 50 percent of greenhouse gas emissions in Alberta. Unless this regulatory program reduces emissions as expected, the government would have to obtain more reductions in other areas or amend its targets. We made seven recommendations to the Department in our *October 2009 Report*.

In this audit, we followed up on four of the ten recommendations from the 2008 and 2009 audits that the Department indicated it had implemented. See the table below for our audit conclusions on the four recommendations:

Recommendation	Status
October 2008 Report	
Public reporting (no. 11—page 101) We recommend that the Department of Environment and Sustainable Resource Development improve the reliability, comparability and relevance of its public reporting on Alberta's results and costs incurred in meeting climate change targets.	Repeated
October 2009 Report	
Data quality (page 40) We recommend that the Department of Environment and Sustainable Resource Development strengthen its guidance for baseline and compliance reporting by: <ul style="list-style-type: none"> clarifying when uncertainty calculations must be done prescribing the minimum required quality standards for data in terms of minimum required frequency of measurement and connection to the period being reported on describing the types of data controls that facilities should have in place 	Satisfactory progress

¹ *Alberta's 2008 Climate Change Strategy*: <http://environment.gov.ab.ca/info/library/7894.pdf>.

² Alta. Reg. 139/2007

October 2009 Report continued

<p>Use of offsets to meet compliance obligations (no. 4—page 46)³</p> <p>We recommend that the Department of Environment and Sustainable Resource Development:</p> <ul style="list-style-type: none"> strengthen its offset protocols to have sufficient assurance that offsets used for compliance are valid assess the risk of offsets applied in Alberta having been used elsewhere in the world 	Satisfactory progress
<p>Error correction threshold (page 50)</p> <p>We recommend the Department of Environment and Sustainable Resource Development establish an error correction threshold that considers not only the percentages of emissions or production, but also the dollar impact on the Climate Change and Emissions Management Fund.</p>	Implemented

The Department has not implemented our recommendation to improve its public reporting on climate change. The Department needs to both improve the clarity of public reports on progress toward emission reduction targets and report on government-wide spending on climate change activities. Without clear public reporting on the results and costs of the government's climate change actions, Albertans cannot assess the impact of these actions.

The Department has improved its:

- guidance for facilities on the quality of greenhouse gas data they submit under the *SGE Regulation*
- guidance for offsets and processes that confirm their validity

The Department must assess—based on the 2011 and 2012 compliance periods' results—if it needs to further strengthen its guidance to ensure that the reported data is accurate and reliable. A lack of accurate and reliable data will hinder the Department's ability both to assess whether facilities comply with the *SGE Regulation* and to monitor and evaluate progress toward Alberta's emission reduction targets.

To fully implement the recommendations on data quality and the use of offsets, the Department must:

- assess if it needs to clarify guidance to facilities on the greenhouse gas data uncertainty calculations, on the frequency of data measurement and on data controls, based on the 2011 compliance period's results
- strengthen its conservation cropping protocol by defining data management controls project developers must have
- assess whether it needs to further strengthen the conservation cropping protocol's evidence requirements, based on the 2012 compliance period's results

The Department stated that it will be ready in 2013 for an audit of the remaining six recommendations.

³ In our *November 2011 Report* (no. 1—page 15), we consolidated this recommendation into a broader recommendation on the Department's guidance. We again recommended that the Department of Environment and Sustainable Resource Development clarify the guidance it provides to facilities, verifiers, offset project developers and offset protocol developers, to ensure they consistently follow the requirements in place to achieve the Alberta government's emission reduction targets. In this audit, we followed up on the tillage offsets portion of the *November 2011 Report's* recommendation.

Audit objectives and scope

Our audit objective was to determine if the Department has implemented the following four recommendations:

- public reporting (*October 2008 Report*, no. 11—page 101)
- guidance on greenhouse gas data quality (*October 2009 Report*, page 40)
- use of offsets (*October 2009 Report*, no. 4—page 46)
- error correction threshold (*October 2009 Report*, page 50)

In performing the audit, we:

- examined internal and publicly available documentation related to all four recommendations
- interviewed management and staff
- examined a sample of compliance reports⁴ for the 2010 compliance period and baseline applications⁵ the Department assessed in 2010, and the associated verification reports and technical review documentation
- examined Alberta's Quantification Protocol for Conservation Cropping

We conducted our fieldwork from November 2011 to April 2012 and focused on the Department's actions since our 2008 and 2009 public reports.

We also examined the Department's action plans for implementing the other six recommendations from our 2008 and 2009 reports:

- planning (*October 2008 Report*, no. 9—page 97)
- monitoring processes (*October 2008 Report*, no. 10—page 100)
- guidance to verifiers of facility baseline and compliance reports (*October 2009 Report*, no. 3—page 42)

- technical review (*October 2009 Report*, page 45)
- outsourced service providers (*October 2009 Report*, page 49)
- cost-effectiveness of regulatory processes (*October 2009 Report*, no. 5—page 51)

Our examination of the Department's action plans was not a follow-up audit; we did not perform detailed testing to conclude whether the recommendations were fully implemented. Instead, we set out to answer three questions:

- Does the Department have plans to implement our recommendations and is it tracking its own progress?
- Do these plans target key risk areas identified in our reports?
- Is action taking place?

Findings and recommendations

Public reporting—recommendation repeated

Background

In our *October 2008 Report* (no. 11—page 101), we recommended that the Department of Environment and Sustainable Resource Development improve the reliability, comparability and relevance of its public reporting on Alberta's results and costs incurred in meeting climate change targets.

Alberta's 2008 *Climate Change Strategy* identified the following targets:

- 2010—reduce emissions by 20 Mt⁶ below business as usual⁷
- 2020—reduce emissions by 50 Mt below business as usual
- 2050—reduce emissions by 200 Mt below business as usual and 14 percent below 2005 emissions

⁴ A compliance report compares a facility's annual emission intensity against its emissions intensity limit.

⁵ A facility's baseline emissions intensity is an emissions intensity that represents the facility's normal operating conditions in a given year and is used to develop a facility's emissions intensity limit.

⁶ One megatonne (Mt) equals one million tonnes.

⁷ Business as usual means emission levels in the absence of any new government policy.

With the *Climate Change Strategy*, the government expects Alberta's absolute emissions⁸ to increase until 2020 and then begin to decline (see Appendix B, Table 2). The economic modeling done in 2008 to develop the strategy targeted Alberta's emissions to be as follows:

- 2010—235 Mt
- 2020—260 Mt
- 2050—184 Mt

The Department of Environment and Sustainable Resource Development is updating the 2008 modeling⁹ and expects to complete its analysis of the results in 2012. The Department will then assess whether the actions in the strategy need to be updated to meet the targets.

The *Climate Change and Emissions Management Act*¹⁰ sets a 2020 target for Alberta to reduce greenhouse gas emissions intensity¹¹ by 50 percent below 1990 levels.¹²

Criteria: the standards for our audit

The Department of Environment and Sustainable Resource Development should report on climate change results, evaluate the results and provide feedback to decision makers. The Department should:

- publicly and promptly report progress against overall targets and goals
- implement a system to measure and report—accurately and completely—on climate change policy spending

Recommendation: Public reporting

10 RECOMMENDATION

We again recommend that the Department of Environment and Sustainable Resource Development improve the reliability, comparability and relevance of its public reporting on Alberta's results and costs incurred in meeting climate change targets.

Our audit findings

Key findings

- The Department has not publicly reported on progress against the legislated emissions intensity target.
- Public reporting against the 2008 strategy uses interim targets not comparable to the reported results
- There is no public reporting either on government-wide spending or on emission reductions from climate change actions.

Emissions reporting against legislated target

Since 2007, the government has not reported on the province's progress against the emissions intensity target established by the *Act*.

⁸ Absolute emissions are the total greenhouse gas emissions produced, usually measured annually.

⁹ Economic modeling was done in 2008 to develop the Strategy. Previous modeling was done in 2002 to develop Alberta's 2002 climate change action plan.

¹⁰ SA 2003, c C-16.7v

¹¹ Greenhouse gas emissions divided by gross domestic product.

¹² SA 2003, c C-16.7v, Section 3(1)

Emissions reporting against the strategy

The Department reports Alberta's absolute emissions in the ministry's annual report and, starting in 2012, in *Measuring Up*.¹³ These 2012 reports showed that Alberta's absolute emissions declined between 2007 and 2010. The reports compared actual emissions against an interim target the Department derived from modeling done to develop the strategy. Clarity would improve if the reports:

- disclosed information such as the source for the interim target and how the target relates to the targets in the strategy
- included the long term—2020 and 2050—targets from the strategy, stated in megatonnes of emissions

The Ministry Annual Report Standards¹⁴ require comparison of reported results against a comparable target. The 2012 Ministry annual report and *Measuring Up* report used estimated 2012 emissions as an interim target. This target is not comparable to the reported (2010) results, as the target relates to a different (2012) reporting period.

The Department did not report on the 2010 target stated in the strategy because the business-as-usual for the 2010 target was based on economic modeling done in 2002¹⁵ using data, such as the price of oil, that are now out of date. The Department did not disclose this information in its public reporting.

Notwithstanding the decline in absolute emissions and management's decision not to report against the 2010 target, the Minister of Environment and Sustainable Resource Development publicly acknowledged in May 2012 that Alberta likely did not meet the 2010 target from the strategy.¹⁶ This acknowledgement created additional inconsistencies and confusion about Alberta's emission targets and the government's progress in meeting them.

Absolute emissions versus reductions from climate policies

Reporting absolute emissions alone does not inform Albertans about changes in Alberta's emissions as a result of the government's climate change policies. Absolute emissions are subject to factors such as economic growth or decline, population and weather. Relevant public reporting should include reports on the actual effects—in terms of reduced emissions—of the government's climate change policies and actions, in addition to reporting on absolute emissions. We recommended in our *October 2008 Report* that the Department develop a system for evaluating the effects of its climate change policies. We plan to follow up on this recommendation in 2013.

Reporting on climate change costs

In its 2012 annual report, the Ministry reported the costs incurred by the Department in implementing the *SGE Regulation*. Some costs were reported as part of the Department's expenses of \$36 million, while others were reported as part of the Climate Change and Emissions Management Fund's expenses of \$76 million. This reporting does not allow the public to know the total spending to implement the *SGE Regulation*.

¹³ The *Measuring Up* report is a component of the Government of Alberta's annual report. It provides information on the government's progress in meeting social and economic goals published in the previous year's government business plan.

¹⁴ The Ministry Annual Report Standards are issued by the Ministry of Treasury Board and Finance and support the reporting requirements of the *Government Accountability Act* and the *Legislative Assembly Act*.

¹⁵ Economic modeling was done in 2008 to develop the Strategy. Previous modeling was done in 2002 to develop Alberta's 2002 climate change action plan.

¹⁶ Calgary Herald. May 18, 2012. Alberta admits it likely missed its greenhouse gas reduction targets.

The 2012 *Measuring Up* report reported costs of some of the climate change actions being implemented under the strategy. There was no public reporting in the *Measuring Up* report or elsewhere on government-wide spending on climate change. The Department is implementing a system for capturing information on climate change spending by the government.

The Department intends to publish a report in 2013 on government-wide spending and performance information on climate change activities.

Implications and risks if not implemented

Without clear public reporting of results in relation to comparable targets and total costs, Albertans cannot assess the government's progress toward Alberta's climate change goals or determine whether the overall investment in climate change actions is yielding the expected results.

Error correction—implemented

Findings

The Department implemented our *October 2009 Report* recommendation on error corrections (*October 2009 Report*, page 50), which asked the Department to consider not only the percentages of emissions or production in its decisions on error corrections, but also the dollar impact on the Climate Change and Emissions Management Fund.

The Department set the threshold for errors in facility baseline or compliance reports at two different levels, depending on the facility's total annual emissions. The Department lowered the threshold to two percent for large facilities—with total annual emissions above 500,000 tonnes of CO₂e¹⁷—and maintained the five percent threshold for all other facilities.

When errors are identified—whether by facilities, third-party verifiers or the Department's verification process—the Department determines the required corrective action based on the nature and magnitude of the error, including the error's effect on the Climate Change and Emissions Management Fund. The Department's guidance for facility baseline and compliance reports describes the standard error correction decision process and acknowledges that the required correction may deviate from the standard in specific situations.

The Department followed these processes for a sample we tested.

Greenhouse gas data quality—satisfactory progress

Background

In our *October 2009 Report* (page 40), we recommended that the Department of Environment and Sustainable Resource Development strengthen its guidance for baseline and compliance reporting by:

- clarifying when uncertainty calculations must be done
- prescribing the minimum required quality standards for data in terms of minimum required frequency of measurement and connection to the period being reported on
- describing the types of data controls that facilities should have in place

Greenhouse gases and uncertainty

Measurement of greenhouse gases is by nature subject to uncertainty, including scientific as well as estimation uncertainty.¹⁸

¹⁷ CO₂e is an abbreviation of 'carbon dioxide equivalent' and is the internationally recognized measure of greenhouse gas emissions. Using CO₂e as a measure of greenhouse gas emissions allows comparison of the greenhouse impact of a variety of greenhouse gas emission sources.

¹⁸ International Standard on Assurance Engagements (ISAE) 3410, *Assurance Engagements on Greenhouse Gas Statements*: <http://www.ifac.org/>

Scientific uncertainty

This type of uncertainty arises from incomplete scientific knowledge about how to accurately measure greenhouse gases. For example, there is inherent uncertainty in measuring the rate of greenhouse gas sequestration in biological carbon sinks¹⁹ or combining emissions of different gases and reporting them as carbon dioxide equivalents. The degree to which scientific uncertainty affects the quantification of emissions is beyond the control of the facility reporting on its emissions.

Estimation uncertainty

This type of uncertainty results from the measurement and calculation processes used to quantify emissions within the bounds of existing scientific knowledge. Estimation uncertainty may relate to the data on which an estimate is based or to the estimation method itself. The facility reporting on emissions can often control the degree of estimation uncertainty. Reducing the uncertainty ordinarily involves greater cost.

Uncertainty may be very high if, for example, a significant proportion of the entity's reported emissions are from fugitive²⁰ sources (such as tailings ponds) that are not monitored or estimation methods are not sufficiently sophisticated.

Department's guidance

The Department has identified six data measurement and six calculation method categories that facilities may use for estimating emissions (see Appendix A). Each has an associated level of

accuracy, depending on the measured data (such as fuel consumption) and the calculation method (such as mole balance).²¹ The data and method a facility uses will affect the degree of uncertainty in the calculation, which in turn can make a material difference on the calculated emissions. For example, measurements taken once a year might not accurately represent variations in fuel composition during the year.

Facilities can use the two data measurement and one calculation methods that are the least accurate (see Appendix A—methods below solid line) only when they can clearly demonstrate that the level of uncertainty in the calculation would not materially affect the calculated emissions. Facilities may also use facility or sector-specific calculation methods when they can demonstrate these methods will result in a higher accuracy of reported emissions. Facilities using these alternative calculation methods must explain the uncertainty associated with the method. The Department stated that facilities used alternative methods only for negligible emissions sources.

International standards

The International Organization for Standardization is a worldwide federation of national standards bodies. ISO has developed standards for the measurement of greenhouse gases (ISO 14064-1)²² and for their verification (ISO 14064-3).²³ ISO 14064-1 requires organizations to assess the impact of uncertainty on the data they submit and advocates inclusion of the uncertainty assessments in organizations'

¹⁹ Carbon sinks are a physical unit or process that removes greenhouse gases from the atmosphere. The main natural sinks are oceans and plants and other organisms that use photosynthesis to remove carbon from the atmosphere.

²⁰ Fugitive sources are intentional or unintentional release of gases from human-caused activities, excluding the combustion of fuels. Source: International Panel on Climate Change Guidelines. http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_6_Fugitive_Emissions_from_Oil_and_Natural_Gas.pdf

²¹ Mole balance with efficiency factors is a method of quantifying greenhouse gas emissions. It determines an emission factor based on the mole balance of carbon between the input and the output of a source, with some assumed efficiency factor: <http://ccemc.ca/uploads/CEMC-458-Validation-Guidance3.pdf>

²² ISO 14064-1 International standard: Greenhouse gases—Specifications with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals: <http://www.iso.org>

²³ ISO 14064-3 International standard: Greenhouse gases—Specification with guidance for the validation and verification of greenhouse gas assertions: <http://www.iso.org>

greenhouse gas reports.²⁴ ISO 14064-3 provides guidance on the validation and verification requirements for greenhouse gas reporting. We consider these standards to be best practices.

International Standard on Assurance Engagements (ISAE 3410)²⁵ was approved by the International Auditing and Assurance Standards Board in March 2012. This assurance standard provides requirements and guidance specific to assurance engagements on greenhouse gas statements. ISAE 3410 requires that, in forming assurance conclusions on greenhouse gas statements, practitioners consider whether the statements provide adequate disclosure of uncertainties so that intended users can understand the significant judgements made in quantifying emissions.

The Department is working with the Alberta Institute of Chartered Accountants and the Association of Professional Engineers and Geoscientists of Alberta to develop:

- verification requirements to a reasonable level of assurance
- accreditation requirements for verifiers

The new verification requirements will apply starting with the 2012 compliance period. The Department is considering the ISO 14064-3 and ISAE 3410 standards to assist with this process.

Criteria: the standards for our audit

The Department of Environment and Sustainable Resource Development should clearly define and communicate the methods it expects facilities to use for calculating emissions and production.

Our audit findings

Key findings

- The Department strengthened its guidance by requiring the disclosure of detailed information on data and methods facilities use for their estimates.
- The Department clarified the guidance it provides facilities on the required accuracy of quantification methods but has to assess whether additional guidance is needed for uncertainty calculations and frequency of emissions measurement.
- The Department continues to develop guidance for quantifying emissions from tailings ponds and around facility data controls but needs to update its guidance for any new requirements.

Uncertainty calculations for emissions estimates

The Department revised its guidance to facilities by stating it expects them to use the most accurate methods available for reporting their emissions estimates. If the most accurate method is one of those the Department specifically supports (see Appendix A—methods above solid line), it does not expect facilities to assess the impact of uncertainty related to the method. The Department concluded that this is acceptable because it understands the uncertainty associated with those methods.

The Department requires facilities to assess the impact of uncertainty associated with the method used only when facilities use alternative methods. Since facilities have used such methods only for reporting negligible emission sources, the Department did not enforce its guidance requiring uncertainty calculations. Nor did the Department revise its guidance accordingly.

²⁴ Section 5.4 ISO 14064-1 International standard: Greenhouse gases—Specifications with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals: The organization should complete and document an uncertainty assessment for greenhouse gas emissions and removals, including the uncertainty associated with emission and removal factors. Section 7.3.2 ISO 14064-1: International standard: Greenhouse gases—Specifications with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals: The organization should consider including in the greenhouse gas report: uncertainty assessment description and results, including measures to manage or reduce uncertainties.

²⁵ International Standard on Assurance Engagements ISAE 3410—Assurance Engagements on Greenhouse Gas Statements: <http://www.ifac.org>

Previously, the Department stated which methods it allowed, but did not explicitly require that facilities use the most accurate method available. As a result, verifiers²⁶ identified instances where facilities used less accurate, but allowed methods even though they had the facility-specific data needed to apply a more accurate method. In those cases, the Department has required facilities to resubmit their baseline—and compliance reports, if necessary—using the more accurate method. The revised guidance applied starting with the 2011 compliance period.

Uncertainty calculations for tailings pond emissions

Verifiers for two facilities with tailings ponds emissions reported significant uncertainty associated with facility measurement of their 2010 fugitive emissions from tailings ponds. The facilities used the most accurate method available at that time for estimating these emissions. The Department is working with industry and university researchers to develop a better method for estimating these emissions. In the meantime, the Department focuses on ensuring that all facilities with tailings ponds use the same method to measure the emissions from their tailings ponds and apply it consistently. The Department is developing specific requirements by the end of 2012 for frequency of measurement and the number of samples collected. The new requirements will apply for the 2013 compliance period. We will follow up on how the Department implemented the new requirements in a separate audit.

Disclosure of data and methods in compliance reports

Starting with the 2012 compliance period, facilities must disclose more detailed information on data and methods in their compliance reports. This information includes:

- measurement methods
- measurement frequency
- meter calibration schedule
- explanations for assumptions used
- emission factors

This additional information will allow the Department to better understand the uncertainties and variability associated with the quantities reported in facility reports, whether a facility's selected approach is reasonable in the circumstances, and will reasonably minimize the uncertainties in data to meet the Department's requirements.

Guidance on data quality

The Department continues to strengthen its guidance on data quality. In addition to developing requirements for the minimum frequency of measurement and sampling for tailings pond emissions, the Department clarified the minimum required frequency of measurement for facilities using the intermittent measurement method.²⁷ However, the guidance does not clearly define the appropriate frequency of measurement when facilities use other methods and when their emissions data varies during the period.

Guidance on data controls

Once the Department has updated its verification guidance, it must decide whether to give additional guidance to facilities on data controls they should have in place, such as calibration of equipment or checks over manual calculations.

²⁶ Independent third parties hired by facilities or the Department to check reported emissions information.

²⁷ Intermittent (periodic) direct measurements use source (stack) testing, which is a "snapshot measurement in time." Several measurements are taken periodically over the year, and each measurement is extrapolated over a period of time to determine emission values for that period: http://ccemc.ca/_uploads/CCEMC-458-Validation-Guidance3.pdf

To fully implement our recommendation, the Department must:

- decide whether it needs to further clarify its guidance to facilities on completing and disclosing uncertainties, based on the results of the Department's assessment for the 2011 compliance period and in consideration of the ISAE 3410 standard
- identify what additional guidance it needs to provide facilities on the frequency of emissions measurement and the types of data controls facilities should have, and update the facility guidance documents accordingly

Implications and risks if not implemented

Without robust guidance, the Department will miss the opportunity to obtain more accurate and reliable emissions reports from facilities. Lack of accurate and reliable reports will hinder the government's ability to make informed decisions and to monitor and evaluate progress toward targets.

Use of offsets to meet compliance obligations—satisfactory progress

Background

In our *October 2009 Report* (no. 4—page 46), we recommended that the Department of Environment and Sustainable Resource Development:

- strengthen its offset protocols to have sufficient assurance that offsets used for compliance are valid
- assess the risk of offsets applied in Alberta having been used elsewhere in the world

In our 2010 management letter, we recommended the Department collect sufficient evidence for tillage offsets submitted for the 2009 compliance. During the audit of the financial statements of the Climate Change and Emissions Management Fund for the year ended March 31, 2011, we found that the Department did not instruct its verifiers on the specific evidence to obtain for the 2009 tillage offsets. For this reason, we considered the Department's progress in implementing the 2009 and 2010 recommendations unsatisfactory.

In our *November 2011 Report* (no. 1—page 15), we therefore consolidated our recommendation on the use of offsets from our *October 2009 Report* (no. 4—page 46) into a broader recommendation on the Department's guidance. We again recommended that the Department of Environment and Sustainable Resource Development clarify the guidance it provides to facilities, verifiers, offset project developers and offset protocol developers, to ensure they consistently follow the requirements in place to achieve the Alberta government's emission reduction targets. In this audit, we followed up the tillage offsets portion of this recommendation.

In April 2012, the Department issued its protocol for the quantification of the offsets²⁸ from conservation (no-till) farming. This protocol²⁹ applies to no-till offsets³⁰ starting on January 1, 2012.

The underlying source data for no-till projects is maintained by several parties—farmers, landowners,

²⁸ Government of Alberta, February 2012, *Technical Guidance for Offset Project Developers*. Facilities and sectors not subject to the *SGE Regulation* that are able to reduce their greenhouse gas emissions according to a government approved protocol and that meet the requirements of section 7 of the *SGE Regulation* are eligible to generate offset credits. These credits, once registered and serialized on the *Alberta Emissions Offset Registry*, become a tradable unit that can be bought and sold in the Alberta offset market. Credits remain active until such time as they are submitted to the Department of Environment and Sustainable Resource Development for compliance by a regulated facility, or sold outside the Alberta market place. Credits submitted to the Department are subject to the Department's review and may be verified by verifiers the Department hires.

²⁹ Government of Alberta, April 2012, *Quantification Protocol for Conservation Cropping*. The protocol merges the *Quantification Protocol for Tillage System Management* and the draft *Quantification Protocol for Summerfallow Reduction*. <http://environment.gov.ab.ca/info/library/8561.pdf>

³⁰ Tilling is the act of disturbing the soil in order to place seeds and fertilizer in it, and to aerate it. Tilling results in a more rapid breakdown of organic matter in the soil, and a loss of carbon dioxide from the soil into the atmosphere. Tilling, in addition to the emissions from the farm equipment itself, increases carbon dioxide levels in the atmosphere. No-till farming has the potential to remove carbon dioxide from the atmosphere through the storage of organic matter in the soil. No-till offsets are emissions reductions resulting from shifting from conventional (full till) farming to conservation (no-till) farming.

field agents and project developers.³¹ In some instances the farmer and the landowner may be the same individual. Similarly, the field agent and project developer may be the same individual.

The previous protocol³² allowed project developers and verifiers³³ to rely on farmer affirmations³⁴ and farm records as a source of evidence to substantiate no-till practices. It did not define the records each party must have to support the claim of no-till practices by the farmer. As a result, the amount of information collected and maintained by project developers was inconsistent.

The Department requires verifiers to assess whether projects comply with the protocol and the project plans.³⁵ Starting January 1, 2012, the Department requires verification of offset projects to be completed to a reasonable level of assurance³⁶ rather than the previous limited level of assurance.³⁷ The Department is updating its guidance for verifiers, including the offset verifiers, for verifications at a reasonable level of assurance.

To form a conclusion at a reasonable level of assurance, verifiers must collect sufficient and appropriate evidence.³⁸ Different sources of evidence have different inherent levels of reliability. For example, evidence from an external source is more reliable than internally generated evidence.

The Department allows a report signed by a professional agrologist as corroborating evidence of farm management practices. The agrologist may work for the farm or the project developer, or may be an independent party hired as a consultant. The protocol requires that agrologists have specific knowledge of farm cropping systems.

Criteria: the standards for our audit

The Department's guidance for offset projects and for the verification of reductions from offsets should be sufficiently robust to ensure the offsets are valid.

³¹ Farmer: Individual responsible for operating tillage equipment and managing field activity; Landowner: Individual who has legal ownership rights of field; Field Agent: Individual—contractor or an employee of the project developer—who is responsible for visiting the field, interacting with the farmer and/or landowner and inspecting tillage equipment; and Project Developer: An entity that is responsible for collecting, registering and verifying more than one individual farmer's tillage offset projects and that submits the request for the offset credits registration on the Alberta Emissions Offset Registry. <http://environment.gov.ab.ca/info/library/8561.pdf>

³² Government of Alberta. February 2009. *Quantification Protocol for Tillage System Management*.

³³ A verifier is a third party who is responsible for performing a verification engagement over the greenhouse gas offset credits to a specified level of assurance (limited or reasonable) in accordance with specified verification criteria.

³⁴ An affirmation is a positive verbal or written statement that an activity occurred.

³⁵ Project plan explains how the project will meet the requirements of the *SGE Regulation* and the protocol. The project developer prepares this before project implementation. The project developer must implement the project according to the conditions described in the project plan.

³⁶ In a reasonable level of assurance engagement, a verifier provides an opinion on the relevant information stating that the information is prepared in accordance with specified criteria in all material respects. The nature, timing and extent of procedures performed by a verifier for a reasonable assurance engagement will be more comprehensive than those performed in limited assurance engagement.

³⁷ In a limited level type of assurance engagement, a verifier provides a conclusion on the relevant information, stating that nothing has come to the verifier's attention that would indicate that the information contains a material error in accordance with specified criteria. The nature, timing and extent of procedures performed by a verifier for a limited assurance engagement will be more limited than those performed in a reasonable level of assurance engagement.

³⁸ *CICA Handbook-Assurance*, Canadian Auditing Standard 500, Audit Evidence. Sufficiency of evidence is the measure of the quantity of evidence. Appropriateness of evidence is the measure of the quality of evidence; that is, its relevance and its reliability in providing support for the practitioner's conclusion.

Our audit findings

Key findings

- The Department improved its guidance for offset protocol and project developers and processes to check for duplicate offsets.
- The conservation cropping protocol describes the records required to support no-till practice but allows some key field activities to be supported by farm records and supporting evidence that may not be from an independent source.
- The Department did not specify the minimum required data management controls no-till project developers must have to support reasonable assurance verifications.
- The Department did not specify the required competencies for professional agrologists providing opinion on farming practices.

Conservation Cropping Protocol

The protocol defines the minimum evidence project developers must collect and maintain to support the claim of no-till practices. The protocol's evidence requirements for soil disturbance activities (such as seeding, reseeding and manure spreading), their extent (determined by the number of equipment passes on the field and the equipment opener width and shank spacing) and the occurrence of irrigation allow project developers to use farm records with corroborating evidence that is not necessarily from an independent source. Independent corroborating evidence, such as equipment purchase receipts or crop insurance records are not a requirement.

As a result, there is a risk that offset claims will be posted to the registry without independent evidence confirming the accuracy of key data such as equipment specifications and irrigation practices. It is our view that such evidence is required to support offset verifications at a reasonable level of assurance.

The protocol allows sign-off by professional agrologists to corroborate farm records for crop type, equipment used, amount of land disturbance, reseeding events and use of irrigation. To confirm these practices would require not only knowledge of cropping systems but also relevant skills and experiences related to such systems. Some professional agrologists may not have all of these competencies. The Department did not identify the required competencies for agrologists providing professional opinion on farming practices or require project developers to maintain evidence validating the agrologist's expertise. The Department has contracted the Alberta Institute of Agrologists to develop—by January 2013—the knowledge and practice standards for agrologists providing opinion on farm management practices.

The protocol and the Department's guidance for offset project developers encourage project developers to have robust data management systems and provide examples of good data controls (such as restricted access to offset data). Individual project developers could have significantly varying interpretations of the data management guidance. A strong control environment will ensure the existence and accuracy of the offset claims and minimize the risk that the offsets are not verifiable to a reasonable level of assurance.

The Department's updated guidance for verifiers is expected to provide more guidance on data controls.

Guidance for protocol and project developers

In 2012, the Department revised its guidance documents for offset protocols and for offset project developers and clarified the areas we identified as ambiguous in our October 2009 audit. In our follow-up audit, we found the following improvements:

- Guidance documents clearly state project eligibility requirements.
- Project guidance requires project plans to disclose any changes in the project relative to the protocol and assumptions about the project.
- Project guidance states the evidence project developers or their agents must have and the procedures verifiers should use to support offset project ownership.
- The ISO 14064-2 standard's principle of conservativeness is incorporated into the Department's guidance to project developers.
- The Department requires protocol developers to demonstrate that the offset activities being quantified in the protocol result in a reduction in greenhouse gas emissions that are additional.³⁹ The Department assesses additionality prior to approving the protocol and monitors whether an activity continues to be additional, as part of its protocol review.

During our work related to the Climate Change and Emissions Management Fund attest audit, we identified other areas where the Department's guidance documents for offset project and offset protocol developers remain unclear. In our *November 2011 Report*, we reported that the Department's processes for developing offset protocols need improvement. We will follow up, in a separate audit, on these findings and on our recommendations to the Department to:

- clarify the guidance it provides to facilities, verifiers, offset project developers and offset protocol developers (*November 2011 Report*, no. 1—page 17)
- implement processes to ensure that approved offset system protocols meet its protocol development standard (*November 2011 Report*, no. 1—page 17)
- improve transparency of its protocol development process (*November 2011 Report*, no. 2—page 23)

Processes to check for duplicate offsets

The Department relies on the following processes to ensure offsets used for compliance under the *SGE Regulation* are used only once in Alberta and have not been posted to another registry and sold elsewhere in the world:

- Climate Change Central⁴⁰ performs an annual process to check for duplicate offsets within the Alberta Emissions Offset Registry. The Department is working with Climate Change Central and the Canadian Standards Association⁴¹ to automate the process and perform the checks in real time, as projects are registered, rather than at the end of each compliance period.
- The Department has implemented a requirement that project developers must declare, in writing, that the offset they are registering have not been posted to another registry. The statutory declaration requirement became effective for projects submitted to the registry after August 1, 2012.

³⁹ Government of Alberta, February 2012. *Technical Guidance for Offset Project Developers*. The additionality principle requires that greenhouse gas emissions reductions or removals resulting from an offset project are beyond business-as-usual or sector common practice and all regulatory requirements. That is, the implementation of the project must result in emissions that are lower than what would have occurred otherwise.

⁴⁰ <http://www.climatechangecentral.com/>

⁴¹ <http://www.csa.ca/cm/ca/en/home>

- Currently, there is no international registry platform that would allow for assessing whether projects are double counted outside of the Alberta registry system. To mitigate the risk that Alberta's offsets have been sold elsewhere in the world, Climate Change Central implemented a quarterly process to scan projects registered on key offset registries. Climate Change Central follows up all identified Alberta projects to ensure they have not also been posted to the Alberta registry.
- The Department's system to detect duplicate offsets relies on project developers to notify the Department and Climate Change Central when they become aware of duplicate offsets.
- The Department continues to monitor other jurisdictions' offset systems. As systems mature, the Department will look at ways to automate the duplication checks between and across systems.

To fully implement our recommendation, the Department must:

- assess whether it needs to further strengthen record requirements in the conservation cropping protocol, based on the results of the Department's assessment for the 2012 compliance period
- define the required data management controls for project developers and the required competencies for professional agrologists
- document its activities to check for duplicate offsets

Implications and risks if not implemented

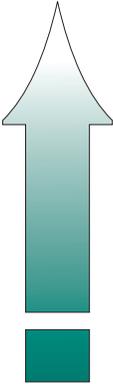
Without robust systems that confirm the validity of offsets, the Department cannot know if facilities are purchasing invalid offsets to meet their compliance obligations. Invalid offsets mean the emission reductions are not real. Lack of reliable data will impede the government's ability to make informed decisions and to monitor and evaluate progress toward targets.

Outstanding recommendations

We examined the Department's action plans for implementing the remaining six recommendations from our *October 2008 and October 2009* reports (see table below). In each case, we found that the Department has a plan that targets the key risk areas we reported on, is taking action on it, and the implementation timeframe is reasonable. We will complete a follow-up audit on these six recommendations in 2013.

Recommendations
October 2008 Report
<p>Planning (no. 9—page 97)</p> <p>We recommend that the Department of Environment and Sustainable Resource Development improve Alberta's response to climate change by:</p> <ul style="list-style-type: none"> • establishing overall criteria for selecting climate change actions • creating and maintaining a master implementation plan for the actions necessary to meet the emissions-intensity target for 2020 and the emissions-reduction target for 2050 • corroborating—through modeling or other analysis—that the actions chosen by the Ministry result in Alberta being on track for achieving its targets for 2020 and 2050
<p>Monitoring processes (no. 10—page 100)</p> <p>We recommend that for each major action in the 2008 <i>Climate Change Strategy</i>, the Department of Environment and Sustainable Resource Development evaluate the action's effect in achieving Alberta's climate change goals.</p>
October 2009 Report
<p>Guidance to verifiers of facility baseline and compliance reports (no. 3—page 42)</p> <p>We recommend that the Department of Environment and Sustainable Resource Development strengthen its baseline and compliance guidance for verifiers by improving the description of the requirements for:</p> <ul style="list-style-type: none"> • the nature and extent of testing required • the content of verification reports • assurance competencies
<p>Technical review (page 45)</p> <p>We recommend that the Department of Environment and Sustainable Resource Development strengthen its technical review processes by:</p> <ul style="list-style-type: none"> • requiring facilities to provide a process map with their compliance reporting and • ensuring staff document their follow-up activity and decisions in the Department's regulatory database
<p>Outsourced service providers (page 49)</p> <p>We recommend that the Department of Environment and Sustainable Resource Development develop controls to gain assurance that data hosted or processed by third parties is complete, accurate and secure.</p> <p>We also recommend that the Department of Environment and Sustainable Resource Development formalize its agreement with its service provider for the Alberta Emissions Offset Registry.</p>
<p>Cost-effectiveness of regulatory processes (no. 5—page 51)</p> <p>We recommend that the Department of Environment and Sustainable Resource Development assess the cost-effectiveness of the <i>Specified Gas Emitters Regulation</i>.</p>

Appendix A: Emission estimation methodologies—relative accuracy

Measured Data	Accuracy	Calculation
Monitoring or direct measurement	 <p>Most</p>	Mole balance with efficiency factors
Intermittent (periodic) direct measurement		Equipment-specific emission factors
Calculated based on measured surrogate parameters		Manufacturer's emission factors
Extrapolated from historical data		Models based on surrogate parameters
Estimated from design requirements		Generic emission factors
Estimated from agreements		Least

Source: Government of Alberta's *Technical Guidance for Completing Specified Gas Baseline Emission Intensity Applications*.
<http://environment.alberta.ca/documents/Technical-Guidance-for-Completing-Specified-Gas-Baseline-Emission-Intensity-Applications.pdf>

Appendix B: Alberta's total greenhouse gas emissions and emission reduction commitments

Table 1—Alberta's Greenhouse Gas Emissions

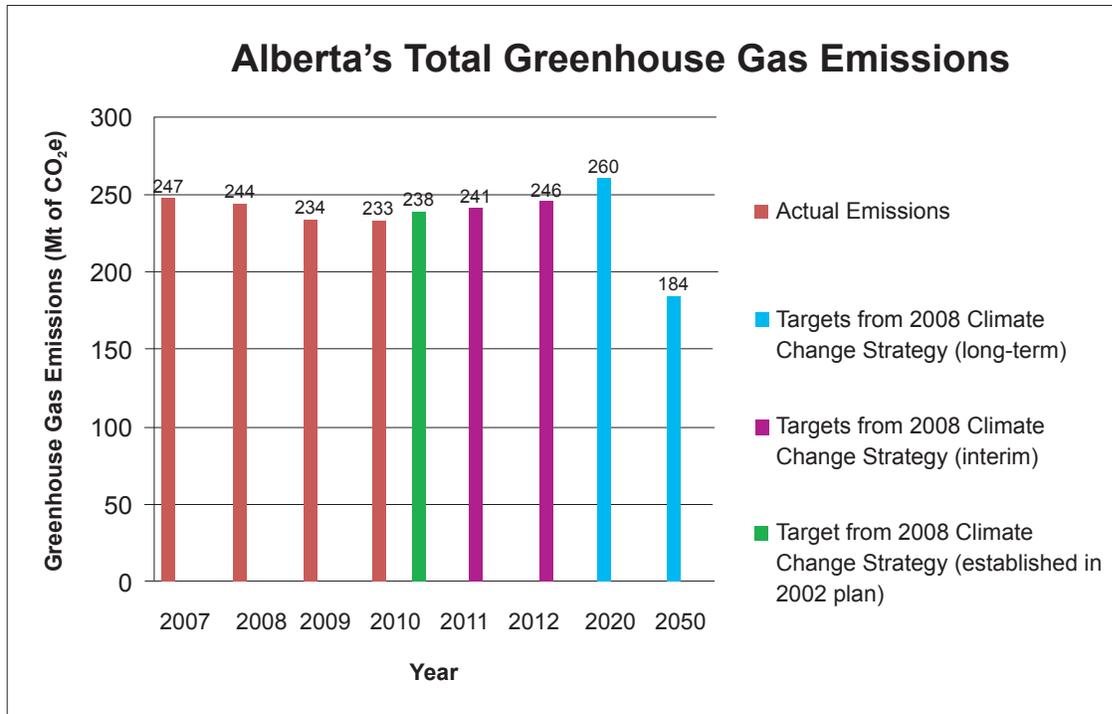
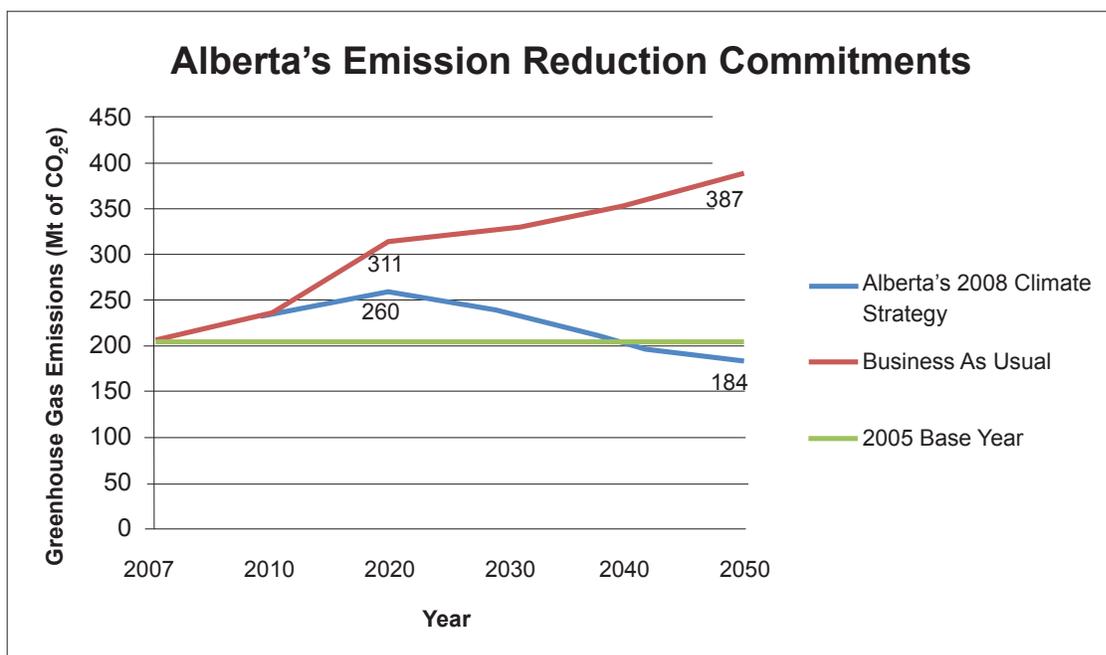


Table 2—Alberta's Emission Reduction Commitments



Source: Alberta's 2008 Climate Change Strategy, page 24. <http://environment.gov.ab.ca/info/library17894.pdf>

