



Standard for validation, verification, and audit

Technology Innovation and Emissions Reduction Regulation
Version 5.2

Standard for Validation, Verification and Audit (Version 5.2) | Alberta Environment and Protected Areas

© 2023 Government of Alberta | January 30, 2023

This publication is issued under the Open Government Licence – Alberta (<http://open.alberta.ca/licence>)

This publication is available online at [Standard for validation, verification and audit. Version 5 - Open Government \(alberta.ca\)](#)

Title:	Standard for Validation, Verification and Audit
Number:	5.2
Program Name:	Technology Innovation and Emissions Reduction Regulation
Effective Date:	January 1, 2023
This document was updated on:	January 2023

Summary of Revisions

Version	Date	Summary of Revisions
1.0 (CCIR)	December 2017	This is the first version of this standard. It replaces the Technical Guidance for Greenhouse Gas Verification to a Reasonable Level Assurance.
2.0 (CCIR)	June 2018	Standard for Validation, Verification and Audit provides updated requirements under the Carbon Competitiveness Incentive Regulation.
3.0 (CCIR)	December 2018	<p>Updates were made to the Standard for Validation, Verification and Audit including the following sections:</p> <ul style="list-style-type: none"> • Part 1 sections 3(1)(e), 3(1)(f), 6(e) and 6(f): verification and validation team requirements; • Part 1 sections 3(1)(i) and 6(i): documentation requirements; • Part 1 section 4: verification report requirements; • Part 1 sections 5 (c) and (d): statement of verification requirements; • Part 1 section 5(e): materiality requirements for verifications; • Part 1 section 8(c)(iii): materiality requirements for validations; • Part 2 section 3.4.6: contribution analytics; • Part 2 section 3.9: working papers; and • Part 2 section 5.1.1: quantification of total error.
4.0 (TIER)	November 2019	First version of the Standard for Validation, Verification and Audit under the Technology Innovation and Emissions Reduction Regulation.
5.0 (TIER)	July 2020	<p>The following updates and additions were made to the Standard for Validation, Verification and Audit:</p> <ul style="list-style-type: none"> • Minor updates and clarifications throughout the standard; • Verification of quantification methodologies; • Part 2 section 7: verification of benchmark applications; • Part 2 section 8: verification of aggregate facilities; and • Part 2 section 9: focused verifications.
5.1 (TIER)	December 2020	The following updates were made to the Standard for Validation, Verification and Audit:

Version	Date	Summary of Revisions
		<ul style="list-style-type: none"> • Added requirement for accredited verifiers to conduct verifications under their accreditation in sections 3(1)(j) and 6(j) of Part 1; and • Added requirements for conducting virtual site visits in lieu of physical site visits in section 4.1.5 of Part 2.
5.2 (TIER)	January 2023	<ul style="list-style-type: none"> • Designated signing authorities, lead verifiers, and peer reviewers are required to complete verification training prior to completing any verifications conducted under the TIER regulation. • Provided criteria for virtual site visits to be conducted by third party assurance providers under section h.1 of part 1. • Added new requirement for materiality assessment of individual errors, omissions, and misstatements in section 5(e) in part 1 of the standard. • Updated requirements for verification of aggregate facilities throughout document to reflected updated regulatory requirements. • Updated the terminology "assertion" to "statement."

Contents

Part 1 – Regulatory Details	10
Part 2 – Requirements for Validation, Verification and Audit.....	21
1. Introduction.....	21
1.1. Overview of Validation, Verification and Audit Requirements.....	21
1.2. Statements	21
1.3. Validation, Verification and Audit Process.....	23
2. Validation, Verification and Audit Initiation.....	26
2.1. Independence Evaluation	26
2.2. Validation, Verification, and Audit Team Evaluation	27
2.3. Finalization of Contract or Agreement	35
3. Validation, Verification, or Audit Planning and Approach	39
3.1. Kick Off Meeting	39
3.2. Initial Information and Data Request	39
3.3. Validation, Verification or Audit Plan	40
3.4. Validation, Verification or Audit Procedures	40
3.5. Validation, Verification or Audit Schedule.....	49
3.6. Risk Assessment.....	49
3.7. Sampling Plan	51
3.8. Initial Desktop Review	54
3.9. Working Papers.....	56
4. Verification, Validation, or Audit Execution.....	60
4.1. Site Visit	60
5. Data Review and Evaluation	63
5.1. Material Threshold.....	63
5.2. Update Working Paper Files.....	71
5.3. Develop a Conclusion	71
5.4. Peer Review or Independent Review	72
6. Validation, Verification or Audit Report.....	73

6.1.	Statement of Validation, Verification or Audit	73
6.2.	Modifications to the Statement of Validation, Verification or Audit.....	74
6.3.	Issuance of the Submission Documents.....	75
7.	Verification of Benchmark Applications	76
8.	Verification of Aggregate Facilities	77
8.1.	Verification requirements for aggregate facilities.....	77
8.2.	Site visit requirements for aggregate facilities	77
9.	Focused Verifications	79
10.	Government Re-Verifications	80
10.1.	Errors during Re-verification of a Facility Report or Benchmark Application	80
10.2.	Errors during Re-verification of an Offset Project	80
11.	Government Re-Validations, Re-Audits or Reviews	81
Appendix A: Glossary.....		82

Related Publications

- Technology Innovation and Emissions Reduction Regulation
- *Emissions Management and Climate Resilience Act*
- Standard for Completing Greenhouse Gas Compliance and Forecasting Reports
- Standard for Developing Benchmarks
- Standard for Greenhouse Gas Emission Offset Project Developers

Introduction

Part 1 of the Standard for Validation, Verification and Audit is adopted by the Technology Innovation and Emissions Reduction Regulation (TIER or the “Regulation”), under the authority of section 61 of *the Emissions Management and Climate Resilience Act* (the “Act”).

Part 1 of this standard is enforceable as law.

In addition to the legal requirements in Part 1 of this standard, third party assurance providers and auditors must comply with all applicable requirements of the Act, the Regulation, and all other applicable laws.

Part 2 of the Standard for Validation, Verification and Audit sets out additional requirements for third party assurance providers and auditors.

Revisions made to this standard in version 5.2 are effective January 1, 2023.

Part 1 – Regulatory Details

Division 1 Interpretation and Application

Definitions

- 1(1) Terms that are defined in the Act and Regulation are incorporated into and become part of this standard.
- (2) In this standard,
- (a) "aggregated emission offset project" means aggregated emission offset project as defined in in Part 1 of the Standard for Greenhouse Gas Emission Offset Project Developers;
 - (b) "application" means an application under section 4, 5, 7, 8, or 14 of the Regulation;
 - (c) "audit report" means a written report prepared by an auditor in providing an audit required under the Regulation;
 - (d) "audit team" means the Lead Auditor and the Independent Reviewer;
 - (e) "Designated Signing Authority" means a third party assurance provider who meets the requirements set out in section 3(1)(e) or 6(e);
 - (f) "Independent Reviewer" means a person who meets the requirements set out in section 9(e) and is assigned as the Independent Reviewer of an audit team;
 - (g) "Lead Auditor" means an auditor who meets the requirements set out in section 9(d) and is assigned as the Lead Auditor of an audit team;
 - (h) "Lead Validator" means a person who meets the requirements set out in section 6(f) and is assigned as the Lead Validator of a validation team;
 - (i) "Lead Verifier" means a person who meets the requirements set out in section 3(1)(f) and is assigned as the Lead Verifier of a verification team;
 - (j) "offset reporting period" means the period of time reported on by a project report submitted for an emission offset project in accordance with the Standard for Greenhouse Gas Emission Offset Project Developers;
 - (k) "Part 1" means the portion of this standard identified by the subtitle "Part 1 – Regulatory Details";
 - (l) "Part 2" means the portion of this standard identified by the subtitle "Part 2 – Requirements for Validation, Verification and Audit";
 - (m) "Peer Reviewer" means a person who meets the requirements set out in section 3(1)(g) or 6(g) and is assigned as the Peer Reviewer of a validation team or a verification team;
 - (n) "Project Report" means an emission offset project report as described in section 14 of Part 1 of the Standard for Greenhouse Gas Emission Offset Project Developers;
 - (o) "Regulation" means the Technology Innovation and Emissions Reduction Regulation, as amended;
 - (p) "sector" means a sector under section 4(1)(d) of the Regulation;
 - (q) "Statement of Audit" means a Statement of Audit referred to in section 10;
 - (r) "Statement of Validation" means the Statement of Validation form as prescribed by the director;
 - (s) "Statement of Verification" means the Statement of Verification form as prescribed by the director;
 - (t) "this standard" means the Standard for Validation, Verification and Audit and includes the Introduction, Part 1, and Part 2;

- (u) "validation report" means a written report prepared by a third party assurance provider in providing a validation required under the Regulation;
- (v) "validation team" means the Lead Validator, Designated Signing Authority and the Peer Reviewer;
- (w) "verification report" means a written report prepared by a third party assurance provider in providing a verification or verifying an emission offset under the Regulation;
- (x) "verification team" means the Lead Verifier, Designated Signing Authority and the Peer Reviewer; and
- (y) "verification training" means the mandatory training requirements for Lead Verifiers, Peer Reviewers and Designated Signing Authorities provided by the Government of Alberta.

In the event of a conflict

- 2(1) If there is any conflict between this standard and the Act or the Regulation, the Act or the Regulation prevails over this standard.
- (2) If there is any conflict between Part 1 and Part 2 of this standard, Part 1 prevails.

Requirements for verification

- 3(1) The third party assurance provider that is verifying an emission offset or providing a verification under the Regulation must comply with the each of the following requirements:
 - (a) the Lead Verifier must prepare a verification report;
 - (b) the verification report must be in the form prescribed by the director;
 - (c) the verification report must be reviewed by the Peer Reviewer;
 - (d) the verification team must include, at a minimum, all of the following roles:
 - (i) Designated Signing Authority;
 - (ii) Lead Verifier; and
 - (iii) Peer Reviewer;
 - (e) the Designated Signing Authority referred to in (d)(i) must have signing authority on behalf of the third party assurance provider that is verifying the emission offset or providing a verification under the Regulation;
 - (e.1) the Designated Signing Authority referred to in (d)(i) must have successfully completed the verification training as prescribed by the director, unless otherwise authorized in writing by the director;
 - (f) the Lead Verifier must have:
 - (i) successfully completed training on the "ISO 14064-3: 2006 Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions" standard, as amended or the "ISO 14064-3: 2019 Greenhouse gases - Part 3: Specification with Guidance for the Verification and Validation of Greenhouse Gas Statements" standard, as amended;
 - (ii) a minimum of 3 years of experience in verifying emission offsets or providing verifications;
 - (iii) technical knowledge of the quantification of the applicable:
 - (A) production;
 - (B) fuel usages;
 - (C) imported electricity;
 - (D) imported heat;
 - (E) imported hydrogen;
 - (F) carbon dioxide sequestration; and

- (G) reductions of specified gases being verified.
- (iv) technical knowledge of the process operations and production of the sector that the verification is being performed for; and
- (v) successfully completed the verification training as prescribed by the director, unless authorized in writing by the director;
- (g) the Peer Reviewer must have:
 - (i) not prepared the verification report that the Peer Reviewer is reviewing;
 - (ii) successfully completed training on the "ISO 14064-3: 2006 Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions" standard, as amended or the "ISO 14064-3: 2019 Greenhouse gases - Part 3: Specification with Guidance for the Verification and Validation of Greenhouse Gas Statements" standard, as amended;
 - (iii) a minimum of 3 years of experience verifying emission offsets or providing a verification;
 - (iv) technical knowledge of the quantification of the applicable:
 - (A) production;
 - (B) fuel usages;
 - (C) imported electricity;
 - (D) imported heat;
 - (E) imported hydrogen;
 - (F) carbon dioxide sequestration; and
 - (G) reductions of specified gases being verified.
 - (v) technical knowledge of the process operations and production of the sector that the verification is being performed for; and
 - (vi) successfully completed the verification training as prescribed by the director, unless otherwise authorized in writing by the director;
- (g.1) where the third party assurance provider is accredited as a verification body to the ISO Standard 14065:2013 by the Standards Council of Canada, the American National Standards Institute or any other accreditation organization that is a member of the International Accreditation Forum, as amended or replaced from time to time, the third party assurance provider must conduct the verification in accordance with the requirements of their accreditation;
- (h) the third party assurance provider must conduct a physical site visit at the applicable regulated facility or emission offset project site, unless otherwise authorized in writing by the director;
- (h.1) notwithstanding section (h), the third party assurance provider may conduct a virtual site visit in place of a physical site visit at the regulated facility in accordance with section 4.1.5 of Part 2 if:
 - (i) the regulated facility is
 - (A) an aggregate facility; or
 - (B) the regulated facility has total regulated emissions of less than 5,000 tonnes of CO₂e;
 - (ii) the regulated facility did not receive an adverse Statement of Verification in the two years prior to the year for which the compliance report is being verified;
 - (iii) there were no unresolved or resolved material findings identified by the third party assurance provider in the two years prior to the year for which the compliance report, application, or information is being verified; and
 - (iv) the third party assurance provider has conducted at minimum one physical site visit at the regulated facility, unless the regulated facility is an aggregate facility,

- (i) the verification must apply to all of the information, data and records for the entire reporting period.
- (2) The third party assurance provider must conduct a site visit referred to in (1)(h) or virtual site visit referred to in 1(h.1) for:
 - (a) a regulated facility after August 31 of the year for which the compliance report being verified is required and before June 30th of the subsequent year; and
 - (b) an emission offset project for each offset project reporting period of the emission offset project.

Verification report

- 4 The third party assurance provider that is providing a verification under the Regulation must include each of the following in the verification report:
 - (a) a Statement of Verification completed in accordance with this standard;
 - (b) a final verification plan including a risk assessment and sampling plan;
 - (c) the verification procedures conducted to verify the application, project report, compliance report or other information that is being verified;
 - (d) a list of:
 - (i) unresolved and resolved qualitative verification findings; and
 - (ii) unresolved and resolved quantitative verification findings of errors, omissions or misstatements;
 - (e) an assessment of the impact of:
 - (i) unresolved qualitative verification findings; and
 - (ii) unresolved quantitative verification findings of errors, omissions or misstatements;
 on the application, project report, compliance report, or other information that is being verified;
 - (f) the name and contact information for the Designated Signing Authority;
 - (g) the name and contact information for the Lead Verifier;
 - (h) the name and contact information for the Peer Reviewer;
 - (i) a Statement of Qualifications form, as prescribed by the director, that is
 - (i) prepared; and
 - (ii) signed
 by the Lead Verifier and Designated Signing Authority;
 - (j) a Conflict of Interest Checklist form, as prescribed by the director, that is signed by the Lead Verifier and Designated Signing Authority; and
 - (k) any other information required by the director.

Statement of Verification

- 5 In preparing the verification report, the third party assurance provider that is verifying an emission offset or providing a verification under the Regulation must comply with each of the following requirements:
 - (a) Subject to sections (b) through (e), the Lead Verifier and Designated Signing Authority must:
 - (i) prepare; and
 - (ii) sign
 the Statement of Verification;

- (b) The Lead Verifier and Designated Signing Authority must not sign a Statement of Verification for a verification report unless the verification report:
 - (i) has been reviewed by a Peer Reviewer; and
 - (ii) the Peer Reviewer has determined that the verification report supports the Statement of Verification;
- (c) Unless otherwise approved by the director, the Lead Verifier and Designated Signing Authority must not sign a Statement of Verification for a verification report for a regulated facility for a particular year unless, within the 6 year period immediately preceding that year, there were two consecutive years in which no member of the verification team or their respective employers conducted a verification under the Regulation, the Specified Gas Emitters Regulation, or the Carbon Competitiveness Incentive Regulation, for that regulated facility;
- (d) Unless otherwise approved by the director, the Lead Verifier and Designated Signing Authority must not sign a Statement of Verification for a verification report for an emission offset project for an offset reporting period unless, within the 6 offset reporting periods immediately preceding that offset reporting period, there were two consecutive offset reporting periods for which the third party assurance provider did not verify the project reports for that emission offset project;
- (e) In completing the Statement of Verification for the verification report, the Lead Verifier and Designated Signing Authority must provide a Statement of Verification that is adverse if:
 - (i) the qualitative findings are deemed to be material;
 - (ii) the verification was not conducted to a reasonable level of assurance;
 - (iii) the total error calculated in accordance with Equation 5-8 of section 5.1.1 of Part 2 exceeds:
 - (A) 5 percent for a regulated facility with total regulated emissions less than 500,000 tonnes of CO₂e and allowable emissions less than 500,000 tonnes of CO₂e for the reporting period being verified;
 - (B) 2 percent for a regulated facility with total regulated emissions equal to or greater than 500,000 tonnes of CO₂e or allowable emissions is equal to or greater than 500,000 tonnes of CO₂e for the reporting period being verified; or
 - (iv) the total identified quantifiable errors, omissions or misstatements exceeds:
 - (A) 5 percent of emission offsets generated for emission offset project reports if the offset project is generating less than 500,000 tonnes of emission offsets per year;
 - (B) 2 percent of emission offsets generated for emission offset project reports if the offset project is generating 500,000 tonnes of emission offsets or more per year for an emission offset project; or
 - (v) any individual identified quantifiable error, omission, or misstatement exceeds:
 - (A) 5 percent for a regulated facility with total regulated emissions less than 500,000 tonnes of CO₂e and allowable emissions less than 500,000 tonnes of CO₂e for the reporting period being verified;
 - (B) 2 percent for a regulated facility with total regulated emissions equal to or greater than 500,000 tonnes of CO₂e or allowable emissions is equal to or greater than 500,000 tonnes of CO₂e for the reporting period being verified.

Requirements for validation

- 6 The third party assurance provider that is validating an emissions reduction plan or updated emissions reduction plan under the Regulation must comply with the each of the following requirements:
 - (a) the Lead Validator must prepare a validation report;
 - (b) the validation report must be in the form prescribed by the director;
 - (c) the validation report must be reviewed by the Peer Reviewer;
 - (d) the validation team must include, at a minimum, all of the following roles:

- (i) Designated Signing Authority;
 - (ii) Lead Validator; and
 - (iii) Peer Reviewer;
- (e) the Designated Signing Authority referred to in (d)(i) must have signing authority on behalf of the third party assurance provider that is validating an emissions reduction plan or updated emissions reduction plan under the Regulation;
- (f) the Lead Validator must have:
- (i) successfully completed training on the "ISO 14064-3: 2006 Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions" standard, as amended or "ISO 14064-3: 2019 Greenhouse gases - Part 3: Specification with Guidance for the Verification and Validation of Greenhouse Gas Statements" standard, as amended;
 - (ii) a minimum of 3 years of experience in providing validations;
 - (iii) technical knowledge of the quantification of the applicable:
 - (A) production;
 - (B) fuel usages;
 - (C) imported electricity;
 - (D) imported heat;
 - (E) imported hydrogen;
 - (F) carbon dioxide sequestration; and
 - (G) reductions of specified gases being validated; and
 - (iv) technical knowledge of the process operations and production of the sector that the validation is being performed for;
- (g) the Peer Reviewer must have:
- (i) not prepared the validation report that the Peer Reviewer is reviewing;
 - (ii) successfully completed training on the "ISO 14064-3: 2006 Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions" standard, as amended or "ISO 14064-3: 2019 Greenhouse gases - Part 3: Specification with Guidance for the Verification and Validation of Greenhouse Gas Statements" standard, as amended;
 - (iii) a minimum of 3 years of experience in providing validations;
 - (iv) technical knowledge of the quantification of the applicable:
 - (A) production;
 - (B) fuel usages;
 - (C) imported electricity;
 - (D) imported heat;
 - (E) imported hydrogen;
 - (F) carbon dioxide sequestration; and
 - (G) reductions of specified gases being validated; and

- (v) technical knowledge of the process operations and production of the sector that the validation is being performed for;
- (g.1) where the third party assurance provider is accredited as a validation body to the ISO Standard 14065:2013 by the Standards Council of Canada, the American National Standards Institute or any other accreditation organization that is a member of the International Accreditation Forum, as amended or replaced from time to time, the third party assurance provider must conduct the validation in accordance with the requirements of their accreditation;
- (h) the third party assurance provider must conduct a site visit at the applicable regulated facility unless otherwise authorized in writing by the director; and
- (i) the validation must apply to all of the information, data and records submitted for an emissions reduction plan or updated emissions reduction plan.

Validation report

- 7 The third party assurance provider that is validating an emissions reduction plan or updated emissions reduction plan under the Regulation must include each of the following in the validation report:
- (a) a Statement of Validation completed in accordance with this standard;
 - (b) a final validation plan including a risk assessment and sampling plan;
 - (c) the validation procedures conducted to validate the emissions intensity reduction claimed by the proponent;
 - (d) a list of:
 - (i) unresolved and resolved qualitative validation findings; and
 - (ii) unresolved and resolved quantitative validation findings of errors, omissions or misstatements; with respect to the emissions reduction plan that is being validated;
 - (e) an assessment of the impact of:
 - (i) unresolved qualitative validation findings, and
 - (ii) unresolved quantitative validation findings of errors, omissions or misstatements with respect to the emissions reduction plan that is being validated;
 - (f) the name and contact information for the Designated Signing Authority;
 - (g) the name and contact information for the Lead Validator;
 - (h) the name and contact information for the Peer Reviewer;
 - (i) a Statement of Qualifications form, as prescribed by the director, that is
 - (i) prepared; and
 - (ii) signed
 by the Lead Validator and Designated Signing Authority;
 - (j) a Conflict of Interest Checklist, as prescribed by the director, that is
 - (i) prepared; and
 - (ii) signed
 by the Lead Validator and Designated Signing Authority; and
 - (k) any other information required by the director.

Statement of Validation

- 8 In preparing the validation report, the third party assurance provider that is validating an emissions reduction plan or updated emissions reduction plan under the Regulation must comply with the each of the following requirements:
- (a) subject to subsections (b) and (c), the Lead Validator and Designated Signing Authority must:
 - (i) prepare; and
 - (ii) signthe Statement of Validation;
 - (b) the Lead Validator and Designated Signing Authority must not sign a Statement of Validation for a validation report unless the validation report:
 - (i) has been reviewed by a Peer Reviewer; and
 - (ii) the Peer Reviewer has determined that the validation report supports the Statement of Validation;
 - (c) in completing the Statement of Validation for the validation report, the Lead Validator and Designated Signing Authority must provide a Statement of Validation that is adverse if:
 - (i) the qualitative findings are deemed to be material;
 - (ii) the validation was not conducted to a reasonable level of assurance;
 - (iii) the emissions reduction plan or updated emissions reduction plan does not reasonably demonstrate that the emissions reductions targeted will be achieved for the project period; or
 - (iv) the total error calculated in accordance with Equation 5-7 of section 5.1.1 of part 2 exceeds 5 percent if the corrected forecasted emissions intensity is greater than the reported forecasted emissions intensity.

Requirements for audit

- 9 The auditor that is providing an audit under the Regulation must comply with each of the following requirements:
- (a) the Lead Auditor must prepare an audit report;
 - (b) the audit report must be reviewed by the Independent Reviewer;
 - (c) the audit team must include, at a minimum, both of the following roles:
 - (i) Lead Auditor; and
 - (ii) Independent Reviewer;
 - (d) the Lead Auditor must have:
 - (i) signing authority on behalf of their employer;
 - (ii) a minimum of 5 years of experience in auditing financial statements;
 - (iii) technical knowledge of the Canadian Auditing Standards and the Chartered Professional Accountants Canada Handbook;
 - (e) the Independent Reviewer must have:
 - (i) not prepared the audit report that the Independent Reviewer is reviewing;
 - (ii) a minimum of 5 years of experience in auditing financial statements;
 - (iii) technical knowledge of the Canadian Auditing Standards and Chartered Professional Accountants Canada Handbook; and
 - (f) the auditor must conduct a site visit of the regulated facility or where the financial records are stored for an audit of any financial statement contained in a cost containment application or report with respect to that regulated facility, unless otherwise authorized in writing by the director.

Audit report

- 10 The auditor that is providing an audit under the Regulation must include each of the following in the audit report:
- (a) a Statement of Audit that is:
 - (i) completed in accordance with this standard; and
 - (ii) in a form prescribed by the director;
 - (b) a final audit plan including a risk assessment and sampling plan;
 - (c) the audit procedures conducted for the audit;
 - (d) a list of audit criteria used for the audit;
 - (e) a list of:
 - (i) unresolved and resolved qualitative audit findings; and
 - (ii) unresolved and resolved quantitative audit findings of errors, omissions or misstatements; with respect to the financial statements being audited;
 - (f) an assessment of the impact of:
 - (i) unresolved qualitative audit findings; and
 - (ii) unresolved quantitative audit findings of errors, omissions or misstatements; with respect to the financial statements being audited;
 - (g) the name and contact information for the Lead Auditor;
 - (h) the name and contact information for the Independent Reviewer;
 - (i) a Statement of Qualifications form, as prescribed by the director, that is:
 - (i) prepared; and
 - (ii) signed by the Lead Auditor;
 - (j) a Conflict of Interest assessment conducted by the Lead Auditor; and
 - (k) any other information required by the director.

Statement of Audit

- 11 In preparing the audit report, the auditor that is providing an audit under the Regulation must comply with each of the following requirements:
- (a) subject to subsections (b) and (c), the Lead Auditor must:
 - (i) prepare; and
 - (ii) sign the Statement of Audit;
 - (b) the Lead Auditor must not sign a Statement of Audit for an audit report unless the audit report:
 - (i) has been reviewed by a Independent Reviewer; and
 - (ii) the Independent Reviewer has determined that the audit report supports the Statement of Audit;
 - (c) in completing the Statement of Audit for the audit report, the Lead Auditor must provide a Statement of Audit that is adverse if:
 - (i) the qualitative findings are deemed to be material;

- (ii) the financial statement does not meet the audit criteria;
- (iii) there is evidence of fraudulent activities;
- (iv) the audit was not conducted to a reasonable level of assurance;
- (v) the total identified quantifiable errors, omissions or misstatements exceed:
 - (A) 5 percent of the amount of products sold for a regulated facility whose total regulated emissions is less than 500,000 tonnes of CO₂e for the period being audited; or
 - (B) 2 percent of the amount of products sold for a regulated facility whose total regulated emissions is equal to or greater than 500,000 of CO₂e for the period being audited;
- (vi) the total identified quantifiable errors, omissions or misstatements result in a difference in the regulated facility sales ratio equal to or greater than 0.0006; or
- (vii) the total identified quantifiable errors, omissions or misstatements result in a difference in the regulated facility profit ratio equal to or greater than 0.002.

Conflict of interest

- 12 If the completed Conflict of Interest Checklist required under sections 4 and 7 of Part 1 contains any answers that are indicated as “TRUE” to any of the questions in the Conflict of Interest Checklist, the third party assurance provider must not:
- (a) provide a verification;
 - (b) provide a validation; or
 - (c) verify an emission offset
- unless otherwise authorized in writing by the director.
- 13 If the auditor determines that there is a potential conflict of interest in their assessment, the auditor must not provide an audit unless otherwise authorized in writing by the director.

Records and information

- 14 The third party assurance provider must retain all records and information respecting
- (a) a verification report; and
 - (b) a validation report
- including the working papers, for at least 7 years after the date on which the records or information are created.
- 15 The third party assurance provider must provide any records and information upon request by the director respecting a verification report including:
- (a) working papers as described in sections 3.9 of Part 2;
 - (b) peer review documentation as described in section 5.4 of Part 2; and
 - (c) evidence of the qualifications and experience of the Lead Verifier and Peer Reviewer as required under (1)(f) and (1)(g), respectively.
- 16 The third party assurance provider must provide any records and information upon request by the director respecting a validation report including:
- (a) working papers as described in sections 3.9 of Part 2;
 - (b) peer review documentation as described in section 5.4 of Part 2; and
 - (c) evidence of the qualifications and experience of the Lead Verifier and Peer Reviewer as required under (1)(f) and (1)(g), respectively.

- 17 The auditor must retain all records and information respecting the the audit report, including the working papers, for at least 7 years after the date on which the records or information are created.
- 18 The auditor must provide any records and information respecting the audit report, including the working papers, to the director upon request.

Termination of re-verification

- 19 The third party assurance provider that is providing a re-verification may terminate the re-verification if:
 - (a) the third party assurance provider is not able to access the emission offset project site or regulated facility, whichever is applicable; or
 - (b) the information required for re-verification is:
 - (i) incomplete;
 - (ii) insufficient;
 - (iii) unavailable;
 - (iv) not accessible by the third party assurance provider; or
 - (v) of insufficient quality or condition.

Part 2 – Requirements for Validation, Verification and Audit

1. Introduction

Part 2 of this standard provides third party assurance providers and auditors with information and guidance to conduct the following activities under the Technology Innovation and Emissions Reduction Regulation (TIER or the Regulation):

- validate an emissions reduction plan (ERP);
- verify a compliance report or emissions reduction plan report (facility report);
- verify a facility specific benchmark application;
- verify an emission offset project report (project report);
- complete a focused verification of a portion of a facility report, benchmark application or data submission requested by the department; and
- audit a financial statement contained in a cost containment application or emission reduction plan report.

This standard may also be informative to regulated facilities, emission offset project developers or other stakeholders to understand the validation, verification, and audit processes. If further information is required, please contact Alberta Environment and Protected Areas via email: AEP.GHG@gov.ab.ca.

1.1. Overview of Validation, Verification and Audit Requirements

In Alberta, the Regulation and standards set requirements for regulated facilities, emission offset project developers, third party assurance providers (validators and verifiers), and auditors. Validators and verifiers are required to adhere to this standard, which is based on the International Standard ISO 14064-3, to conduct validations and verifications under the Regulation. Auditors are required to adhere to this standard and the Canadian Auditing Standards (CAS) to conduct audits.

This standard also prescribes other elements specific to validations, verifications and audits that are conducted in Alberta. Other resources and standards that are deemed relevant to conduct third party validations, verifications, or audits may also be used. Additional procedures may also be undertaken based on professional judgment or if mandated by professional or corporate standards.

Regulated facilities, including aggregate facilities, large emitters, and opted-in facilities, are subject to reporting and verification requirements under TIER. Benchmark application and compliance reporting requirements for these facilities are provided in the Standard for Developing Benchmarks, and Standard for Completing Greenhouse Gas Compliance and Forecasting Reports.

For facilities seeking a cost containment designation or have received a cost containment designation, cost containment application, and reporting requirements are outlined in the Regulation and the Standard for Developing Benchmarks. For an audit of a financial statement in the cost containment application, section 1.3.3 outlines additional activities that should be conducted as part of the audit process.

An independent third party verifier must verify emission offset project reports prior to submission to Alberta Emissions Offset Registry (the Registry). Emission offsets are tradable units that can be bought and sold after they are registered and serialized on the registry.

1.2. Statements

For validations and verifications, the statement is the claim that must be validated or verified, respectively. The statement for an emissions reduction plan (ERP) contained in a cost containment application is the claim of emissions intensity reductions that will be achieved as part of the implementation of the ERP. The statement for regulated facilities is the facility report or benchmark application, which includes the total regulated emissions (TRE), production quantities, calculated allowable

emissions (AE), true-up obligation, and other reporting requirements specified in the Regulation, Standard for Developing Benchmarks, and Standard for Completing Greenhouse Gas Compliance and Forecasting Reports.

For large emitters and opted-in facilities, the emissions by specified gas and source category, imported and exported CO₂, hydrogen, heat and electricity, and CO₂ consumed by urea process (if applicable) must also be verified as part of the overall statement. For aggregate facilities, verifications would include emissions and exports from emission sources required under Part 1 of this standard and Chapter 15 of the Alberta Greenhouse Gas Quantification Methodologies (AQM). In addition, the Emission Performance Credits (EPCs) Request Form, which provides a description of activities conducted at the facility that resulted in emissions intensity improvements, should be reviewed for reasonableness by the verifier, if applicable.

There are no verification requirements for forecasting reports submitted by forecasting facilities (facilities that have a TRE equal to or greater than 1 megatonne).

The statement for offset projects is in the project report and includes the stated emission offsets generated from the emissions reduction or sequestration activity over a period of time (or the offset reporting period). All components of the reduction or net sequestration calculation must be verified. Where a protocol requires the separation of priced and non-priced emissions, both values require verification.

For an audit conducted for a cost containment application, the statement is the financial statement for the facility as outlined in Part 1 of the Standard for Developing Benchmarks. For an audit conducted for an emissions reduction plan report, the statement is the financial statement for the facility as outlined in Part 2 of the Standard for Completing Greenhouse Gas Compliance and Forecasting Reports. The auditor is required to assess quantitative errors and compare the error with the materiality thresholds outlined in Part 1 of this standard and qualitative errors such as identifying whether the facility has met all of the application and reporting requirements outlined in the respective standards.

Validations, verifications, and audits involve three parties: the responsible party (facility or project developer), the intended user (the department), and the third party assurance provider or auditor. (See Figure 1 below).

The responsible party is the person making the statement (either the person responsible for a facility or the project developer for an emission offset project). The responsible party is accountable for the information used to compile the statement and for reporting the information to the department or the registry, even if they may contract a different third party to compile the statement. The responsible party is also required to engage a qualified third party assurance provider or auditor to obtain and provide an independent validation, verification, or audit report, showing the statement has been validated, verified, or audited to a reasonable level of assurance.

The intended user is the entity that receives the statement from the responsible party. In Alberta, the intended user is the department, which includes the director appointed under the Act. The department sets out the criteria to be used to assess the statement. It is noted that all validations, verifications, and audits involve three parties with the department as the intended user.

The validator, verifier, and auditor is an independent third party that provides assurance on the statement. The validator, verifier, and auditor have skills and expertise that allow them to evaluate the integrity of the statement to ensure conformance with program requirements. The validator, verifier, or auditor cannot have been involved in the compilation of the statement.

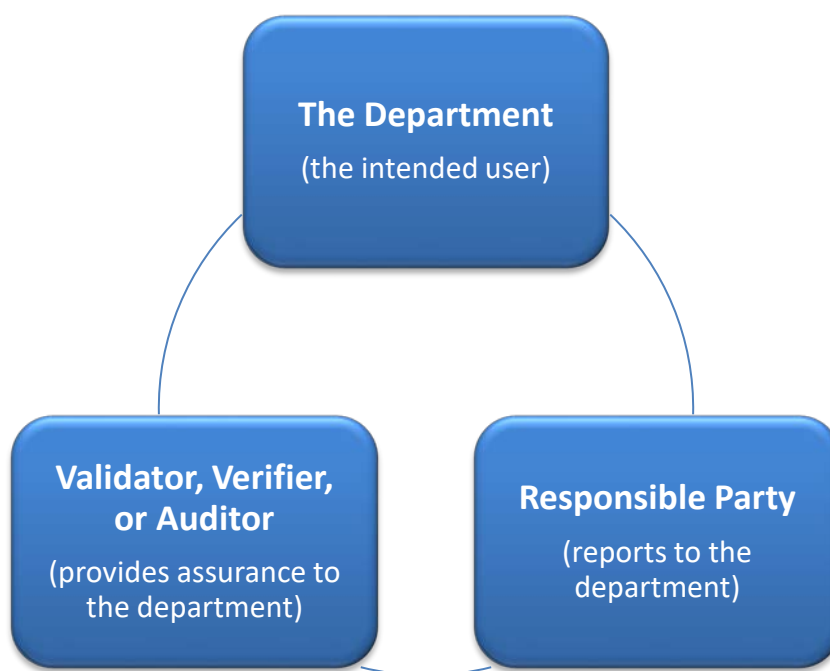


FIGURE 1: THREE PARTY RELATIONSHIP

(Adapted from ISO 14064-3 Specification with guidance for the validation and verification of greenhouse gas statements, Figure A.1 — roles and responsibilities)

In some situations, such as during emission offset sales, a potential purchaser may engage a professional services company to perform a review of the emission offsets as part of the purchase decision. This service may be part of a due diligence process. While this review may have many aspects of a verification, it does not provide assurance to the department. Rather, it is used to inform the purchase of the emission offsets.

1.3. Validation, Verification and Audit Process

Validation, verification, and audit is a systematic, independent, and documented process for the evaluation of a program statement against a set of criteria. It is a carefully planned review in order to enhance the department's degree of confidence that an statement meets the requirements of the Regulation and standards, and is materially correct.

1.3.1. Validation

Validation applies to facilities that are submitting an ERP as part of their application for cost containment or updating an ERP as part of their ERP report. The process to undertake a validation is similar to a verification, but unlike verification, validation is a forward-looking process to validate the statement made by the facility to reduce emissions intensity from the implementation of their proposed plan. Components of the validation process include, but are not limited to the following:

- Assessing whether the implementation of the ERP will reasonably achieve the emissions intensity reductions that are asserted by the facility including recalculation of the emissions intensity reductions asserted by the facility;
- Assessing the facility's baseline scenario of emissions as defined in the Standard for Developing Benchmarks (years prior to proposed year of implementation of ERP);
- Data and information completeness, consistency, accuracy, transparency, relevance, and conservativeness;
- Consistency with validation criteria; and
- Whether there is sufficient and appropriate evidence to support the statement.

1.3.2. Verification

Verification applies to facility and offset project statements and occurs after emissions or emission reductions have occurred. It focuses on:

- Historical data;
- Completeness, consistency, accuracy, transparency, relevance, and conservativeness of the submission;
- Consistency with the verification criteria; and
- Whether there is sufficient and appropriate evidence to support the statement.

1.3.3. Audit

An audit is required for the facility's financial statement as part of a facility's application for cost containment and facility ERP reporting. Annual financial statements are only required for those facilities that have cost containment designation. The annual financial statements are submitted as part of the emissions reduction plan report. The requirements of the application for cost containment and annual reporting is provided in the Standard for Developing Benchmarks and the Standard for Completing Greenhouse Gas Compliance and Forecasting Reports.

For audits of financial statements in the cost containment application, the department strongly recommends that the facility and auditor allow the department to:

1. Participate in opening, closing, and other key meetings during the audit process; and
2. Review the audit plan ahead of the audit process.

The department's participation is strictly to provide guidance and clarity on the audit criteria and process. Any participation or guidance provided by the department shall have no bearing on the outcome of the audit or the decision of the Minister to issue a cost containment designation. If the facility and auditor allow participation of the department and the department provides guidance on the audit process, the cost containment application may still be refused or deemed insufficient. Should the facility choose not to allow the department's participation, there may be a higher risk that a re-audit of the facility's financial statement will be required.

The department recognizes that auditors are bound to regulatory requirements prescribed under the Chartered Professional Accountants (CPA) Regulation. If there is a conflict between this standard and the audit requirements specified in the CPA Regulation, the CPA Regulation prevails. The department may request additional requirements to be conducted as part of the audit. Figure 2 illustrates the validation, verification, and audit process.

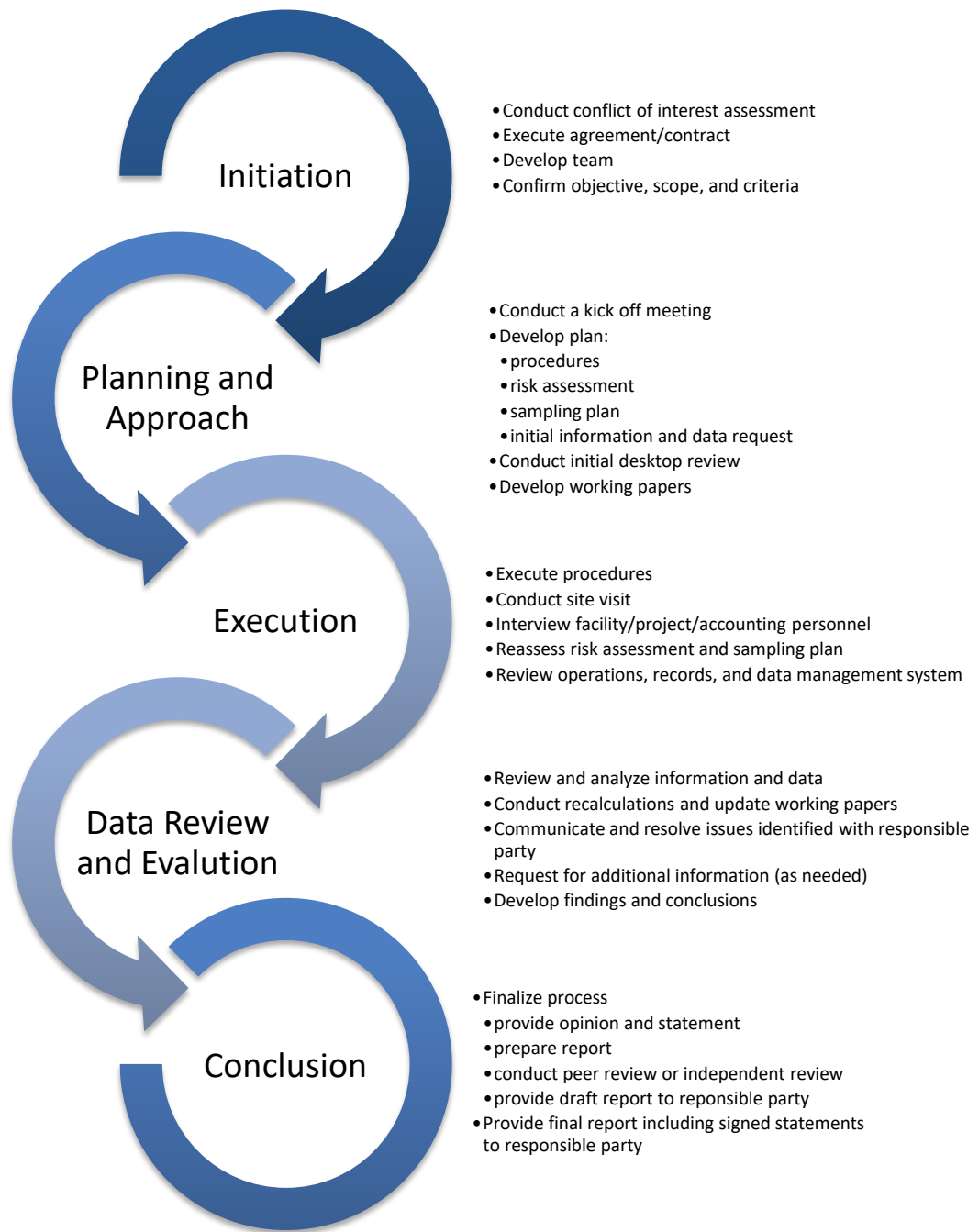


FIGURE 2: SCHEMATIC OF VALIDATION, VERIFICATION OR AUDIT PROCESS

2. Validation, Verification and Audit Initiation

The third party assurance provider and auditor is required to assess relevant factors to determine whether to enter into a contract with the responsible party. If issues are identified such as a conflict of interest for a validation, verification, or audit, and the third party assurance provider or auditor and responsible party wishes to proceed with the validation, verification, or audit, the third party assurance provider or auditor must develop a plan to mitigate any issues prior to finalizing a contract or agreement to proceed with the validation, verification, or audit. The mitigation plan must be submitted to the director for approval prior to the start of the validation, verification, or audit. The department may reject a validation, verification, or audit report if it is determined that any issues were not effectively managed. For audits conducted under this Regulation, auditors must adhere to this standard, CAS, and regulatory requirements specified under the CPA Regulation as it pertains to auditing financial statements.

2.1. Independence Evaluation

Third party assurance providers and auditors must ensure they have true independence from the facility, emission offset project, ERP, financial statement, or the company related to the statement they are validating, verifying, or auditing and must monitor their independence throughout the validation, verification, or audit. Independence must be documented in the conflict of interest form, which is included as part of the verification or validation report. There will not be a prescribed form for a conflict of interest assessment for audits; however, auditors are required to document this process and provide this documentation as part of the audit report. The verifier, validator, or auditor's internal conflict of interest assessment must be documented to evaluate each of the threats listed below.

If it is determined there is a potential or perceived threat to independence, and both parties wish to continue with the validation, verification, or audit, written evidence describing the actions that will be taken to mitigate the potential or perceived threat to independence must be provided to the department prior to the validation, verification, or audit. In cases where the department determines that there is a true conflict of interest, the responsible party will be required to select an alternate third party assurance provider or auditor. If the director is satisfied that potential for a perceived conflict can be effectively managed, the third party assurance provider or auditor will be notified in writing that they may proceed.

If a potential conflict of interest develops during the validation, verification or audit, the third party assurance provider or auditor must notify the department and determine actions to mitigate the potential or perceived conflict of interest.

Independence is an indicator of objectivity and is evaluated based on five threats to independence at both the validation, verification, or audit company and individual team member level. These threats are: self-interest, self-review, advocacy, familiarity, and intimidation or economic implications. Each threat is discussed in more detail below.

2.1.1. Self Interest

In the context of a validation, verification, or audit, self-interest is when the third party assurance provider or auditor, a member of the validation, verification, or audit team, or a person in the chain of command for the validation, verification, or audit team can directly benefit, financially or otherwise, based on the conclusion of the validation, verification, or audit. For example:

- Owning shares of the company being validated, verified or audited;
- Having a close business relationship with the client;
- Contingent fees relating to the results of the validation, verification or audit; or

Consulting vs. Verification or Validation

- **Consulting** is the use of professional knowledge to make recommendations for a future event or a procedure such as the design of an information system or control system.
- **Verification** is used to test the validity of past data. The verifier may provide observations on areas for improvement, but cannot provide specific corrective actions.
- **Validation** is used to evaluate the validity of proposed plan to achieve the target emissions intensity reduction by the proponent.

The same company cannot provide both services for the same statement or related statements.

- The third party assurance provider or auditor is seeking potential employment with the client.

2.1.2. Self-Review

Self-review is when a member of the validation, verification, or audit team could be in a position of reviewing their own work. For example:

- Involvement of the validation, verification or audit organization in the compilation of the data, quantification, documentation or reporting of information contained in the statement;
- A member of the validation, verification or audit organization performed non-validation, non-verification, or non-auditing services (e.g. consulting) that directly impinge on the responsible party's statement, such as implementing the facility's greenhouse gas, production data management systems, or financial data management systems; or
- A member of the validation, verification, or audit team having previously been a greenhouse gas, production data compiler, or financial data compiler for the responsible party (facility or offset project or offset project developer) or who was employed by the responsible party in a position to exert direct and significant influence over the statement being validated, verified, or audited.

2.1.3. Advocacy

Advocacy is when the validation, verification, or audit organization or a member of the validation, verification, or audit team promotes, or may be perceived to promote, a responsible party's position or opinion to the point that objectivity may, or may be perceived to be, compromised. For example:

- Dealing in, or being a promoter of, emission performance credits or emission offsets on behalf of a responsible party;
- Advocating on behalf of the responsible party to advance a particular position or point of view on an issue that directly affects the statement; or
- Acting as an advocate on behalf of the responsible party in litigation or in resolving disputes with other third parties.

2.1.4. Familiarity

Familiarity is when, by virtue of a close relationship with a responsible party, its directors, officer, or employees, the validation, verification, or audit firm or a member of a validation, verification, or audit team becomes too sympathetic to the responsible party's interests. For example:

- A person on the validation, verification, or audit team has a close personal relationship with a person who is in a critical greenhouse gas, production, or financial compilation role at the responsible party; or
- Acceptance of significant gifts or hospitality from the responsible party.

2.1.5. Intimidation or Economic Implications

Intimidation or economic implications affect independence. If a member of the validation, verification, or audit team is deterred from acting objectively and exercising professional skepticism because of threats, actual or perceived, from the directors, officers or employees of the responsible party, their independence is potentially threatened. For example:

- The threat of being replaced as third party assurance provider due to a disagreement with the application of greenhouse gas quantification methodology;
- Fees from the responsible party represent a large percentage of the overall revenues of the third party assurance provider or auditor;
- The application of pressure to inappropriately reduce the extent of work performed in order to reduce or limit fees; or
- Threats arising from litigation with a responsible party.

2.2. Validation, Verification, and Audit Team Evaluation

For a validation or verification, the validation or verification team must include the roles of a designated signing authority, a lead validator or verifier, and a peer reviewer, at minimum, where the lead validator or verifier may also be the designated

signing authority. Technical competence in the industry, sector, and the specific technology is also required. Therefore, additional validators or verifiers and subject matter experts may also be included as part of the validation or verification team, as needed. It is vital that the proposed validation or verification team will be available to conduct the validation or verification, that the team composition includes all of the roles listed further below, that an independent and qualified peer reviewer is available, and that the individuals and the team have not performed more than the allowed number of consecutive verifications as outlined in Part 1.

For audits, the audit must include the roles of lead auditor and independent reviewer as a minimum. Auditors are required to assess team competencies against the requirements prescribed in Part 1 of this standard, CAS, and CPA Regulation.

2.2.1. Third Party Assurance Provider Eligibility

In order to perform verifications or validations in Alberta, the third party assurance provider must meet the requirements outlined in section 27 of the Regulation and Part 1 of this standard.

In efforts to align with federal and other jurisdictional requirements for verifier and validator qualifications, Alberta is phasing in the requirement for verification and validation bodies to become accredited by a member of the International Accreditation Forum (IAF).

2.2.1.1 Verification Training

Third party assurance providers are required to complete the verification training as prescribed by the Government of Alberta to conduct verifications under the TIER Regulation. The training consists of the following modules amended from time to time:

- a) Course Overview and TIER Regulation Background
- b) Overview of TIER Regulation and Standards
- c) TIER Verification Requirements
- d) Alberta Greenhouse Gas Quantification Methodologies
- e) Verification of Benchmark Applications
- f) Verification of Compliance Reports
- g) Emission Offset Project Developers

Third party assurance providers are expected to complete the training modules once every 5 years, unless updated. The table below presents the training modules that must be completed by the third party assurance providers in order to conduct certain types of verifications. In the table, a check mark "✓" indicates that the module must be completed, but the knowledge check does not count towards the completion (i.e. a passing grade is not a criteria for completing the module). A "Pass" denotes that a passing grade on the knowledge check is required to complete the module.

Type of Submission Being Verified	Verification Training Modules						
	Course Overview and TIER Regulation Background	Overview of TIER Regulation and Standards	TIER Verification Requirements	Alberta Greenhouse Gas Quantification Methodologies	Verification of Benchmark Applications	Verification of Compliance Reports	Emission Offset Project Developers
Mandatory Training Requirements for Lead Verifiers and Peer Reviewers for 2022 compliance period submitted for June 30, 2023 and benchmark applications submitted by September 1, 2023							
Compliance Reports	✓	✓	Pass	NR	NR	Pass	NR
Mandatory Training Requirements for Lead Verifiers and Peer Reviewers for verifications of offset project reports completed after June 30, 2023							
Emission Offset Project Reports	✓	✓	Pass	NR	NR	NR	Pass
Mandatory Training Requirements for Lead Verifiers and Peer Reviewers for 2023 compliance period and subsequent and benchmark applications submitted after September 1, 2023							
Compliance Reports and Data Reports	✓	✓	Pass	Pass	NR	Pass	NR
Benchmark Applications	✓	✓	Pass	Pass	Pass	NR	NR
Mandatory Training Requirements for Designated Signing Authorities							
All Submission Types	✓	✓	NR	NR	NR	NR	NR

Notes:

- ✓ Completion of the module is required; however, a passing grade on the knowledge check is not a criteria.
- Pass Completion of the module requires a passing grade on the knowledge check.
- NR Not required for the type of verification being conducted.

2.2.2. Limit on Verifications

The department recognizes that some familiarity with a facility or offset project and its processes is helpful in reviewing the statement; however, the department also recognizes that a close relationship between the verifier and the facility or emission offset project developer can compromise the third party verifier's impartiality over the long term. Consequently, limitations on the number of verifications that can be conducted by the same verifier or verification firm have been implemented and are outlined in Part 1 of this standard and the Standard for Completing Greenhouse Gas Compliance and Forecasting Reports. Currently, limitations on the number of validations are not prescribed as it is not anticipated that consecutive validations are required under the Regulation.

A verifier may only perform a maximum of 5 verifications for a facility's compliance reports or a project developer's offset project reports, before taking a break of at least two consecutive verifications of the facility's compliance reports or the project developer's offset project reports.

2.2.3. Designated Signing Authority

For validations and verifications, the designated signing authority must have the qualifications listed in Part 1 of this standard. This individual is bound by legal responsibility and the professional code of conduct of their respective associations. In the context of a validation, verification, or revalidation the designated signing authority is responsible for:

- Representing the third party assurance provider (the validation or verification company) and having the ability to bind the company;
- Ensuring the validation or verification requirements have been met. If concerns are identified, the designated signing authority will ensure appropriate mitigation measures are put in place and documented;
- Selecting the validation or verification team and ensuring the team has the appropriate skill sets, experience and qualifications to complete the validation or verification;
- Ensuring the validation or verification was conducted according to the appropriate standards and that the validator's or verifier's management system for quality and independence has been applied during the validation or verification;
- Ensuring that the validation or verification was conducted in a professional manner; and
- Signing the statement of validation or verification, the statement of qualification and the conflict of interest forms.

2.2.4. Lead Validator or Lead Verifier

For validations and verifications, the lead validator or verifier must have the qualifications and experience listed in Part 1 of this standard. The lead validator or verifier is responsible for:

- Managing, leading, and executing the overall validation or verification process;
- Evaluating the technical competence and experience of the team in the industry, sector and/or the specific technology and if one or more subject matter experts are needed on the validation or verification team;
- Communicating the objectives, requirements and the results of the validation or verification to the responsible party;
- Having detailed knowledge of the standard and the validation or verification process;
- Preparing the verification plan and verification reports; and
- Signing the statement of validation or verification, the statement of qualification and the conflict of interest forms.

The designated signing authority and lead validator or lead verifier roles can be filled by the same person if they meet the qualifications of both roles as prescribed in Part 1 of this standard.

2.2.5. Lead Auditor

The lead auditor must have the qualifications and experience listed in Part 1 of this standard. This individual is bound by legal responsibility and the professional code of conduct of their respective regulation and associations. In particular, auditors are subject to the Chartered Professional Accountants Regulation. In the context of an audit, the lead auditor is responsible for:

- Ensuring the audit acceptance requirements have been met. If concerns are identified, the lead auditor will ensure appropriate mitigation measures are put in place and documented, as well as, ensuring that all applicable regulatory requirements are met;
- Selecting the audit team and ensuring the team has the appropriate skill sets, experience, and qualifications to complete the audit;
- Ensuring the audit was conducted according to the appropriate standards and regulations and that the auditor's management system for quality and independence has been applied during audit;
- Ensuring that the audit was conducted in a professional manner; and
- Signing the statement of audit and other forms, as prescribed by the director. The statement of audit provides an opinion to the audit that is conducted.

2.2.6. Subject Matter Experts

The role of a subject matter expert is defined by the lead validator, verifier, or auditor and will be unique to each validation, verification, or audit. For example, a lead validator or verifier who does not have sufficient agriculture experience may determine that a subject matter expert such as a Professional Agrologist with greenhouse gas experience is needed for a verification of a conservation cropping project. Since the subject matter expert may be external to the verification company some description of the specific actions expected of the subject matter expert are useful.

The following is typical work scope information that may be communicated to the subject matter expert:

- Objective and scope of the subject matter expert's work in the context of the validation, verification, or audit;
- Access to data, for the subject matter expert;
- Form and general content of the subject matter expert's input, including what may be disclosed in the final validation, verification, or audit report;
- Intended use of the subject matter expert's work;
- Extent of access to the subject matter expert's working papers required by the validation, verification, or audit team;
- Follow-up access to the subject matter expert's work that may be required by the department; and
- Information regarding assumptions and methods intended to be used by the subject matter expert and their consistency with those used in previous periods.

In evaluating the subject matter expert's work, the lead validator, verifier, or auditor should consider the appropriateness of the work as evidence to support a conclusion on the statement. This may include evaluating the source data used and the assumptions and methods used by the subject matter expert. Additional follow-up may be required by the validation, verification, or audit team if the subject matter expert's work does not provide sufficient and appropriate evidence, or if it is not consistent with other validation, verification, or audit evidence.

2.2.7. Peer Reviewer

For a validation or verification, the peer reviewer must have the qualifications and experience listed in Part 1 of this standard and be able to provide an objective and independent evaluation of the validation or verification process, findings and conclusions. As such, the peer reviewer must not have been involved with the core validation or verification activities such as conducting the site visit, corresponding with the responsible party or reviewing facility data and information. The peer reviewer must be able to objectively assess the work of the validation or verification team from the initial contact with the responsible party to the completion of the validation or verification process and report. The peer reviewer is not permitted to sign the conflict of interest form, statement of qualifications, or statement of validation or verification.

The peer reviewer is responsible for assessing:

- The evaluation of independence conducted by the validation or verification team;

- The planning process, including the analysis of the key components of validation or verification risk and the adequacy of the responses to those risks including the validation or verification team's assessment of and response to the risk of material misstatements;
- The results of the validation or verification and the appropriateness of the key judgments made by the validation or verification team;
- Whether appropriate consultation has taken place on difficult or contentious issues and is appropriately documented;
- The presentation of the statement is covered by the validator or verifier's statement of validation or verification;
- The presentation of significance of any misstatements that the responsible party has declined to correct;
- Whether the validation or verification team has appropriately communicated key issues to the responsible party during the course of the validation or verification;
- The accuracy and appropriateness of the validator or verifier's report; and
- Whether the documentation reviewed supported the conclusions reached and stated in the statement and report.

2.2.8. Independent Reviewer

For an audit, the independent reviewer must have the qualifications and experience listed in Part 1 of this standard and be able to provide an objective and independent evaluation of the audit process, findings and conclusions. As such, the independent reviewer must not have been involved with the audit activities such as conducting the site visit, corresponding with the responsible party or reviewing facility data and information. The independent reviewer must be able to objectively assess the work of the audit team from the initial contact with the responsible party to the completion of the audit process and report. The independent reviewer must follow the requirements of the Chartered Professional Accountants Regulation and is not permitted to sign the statement of audit.

The independent reviewer is responsible for assessing:

- The evaluation of independence conducted by the audit team;
- The planning process, including the analysis of the key components of audit risk and the adequacy of the responses to those risks including the audit team's assessment of and response to the risk of material misstatements;
- The results of the audit and the appropriateness of the key judgments made by the audit team;
- Whether appropriate consultation has taken place on difficult or contentious issues and is appropriately documented;
- The presentation of the statement is covered by the auditor's statement of audit;
- The presentation of significance of any misstatements that the responsible party has declined to correct;
- Whether the audit team has appropriately communicated key issues to the responsible party during the course of the audit;
- The accuracy and appropriateness of the auditor's report; and
- Whether the documentation reviewed supported the conclusions reached and stated in the statement of audit.

It is noted that the function of a peer reviewer and an independent reviewer is similar. These individuals are assigned to provide an independent review of the validation, verification, or audit conducted. The primary difference between these roles are defined by their qualifications as prescribed in Part 1 of this standard.

2.2.9. Using the Work of Other Third Party Assurance Providers or Auditors

A third party assurance provider or auditor may use the work of other independent assurance providers or auditors (such as a financial auditor), to further support the validation, verification, or audit, with the conditions clearly documented and presented in the procedures. The conditions for using the work are:

- The nature and scope of the procedures performed by the other third party assurance provider or auditor align with areas of the validation, verification, or audit plan (e.g., production audits can overlap in nature and scope with the production values included in a verification of a facility);
- The objectives of the other validation, verification, and audit, in the context of materiality and risk, align with areas of the validation, verification, or audit plan (e.g., materiality for the production audit is compatible with the materiality values for production in the validation, verification, or audit plan);
- The technical or other standards used to perform the other validation, verification, or audit meet or exceed the standards for the validation, verification, or audit (e.g., the audit of revenue meters for calibration is performed to a technical standard appropriate for the validation, verification, or audit);
- The criteria used in the other validation, verification, or audit is consistent with the criteria for the validation, verification, or audit;
- The period addressed by the other validation, verification, or audit includes the period for the validation, verification, or audit;
- The conclusion of the other third party assurance provider or auditor is clear, or if corrections were required, these modifications do not have relevance to the validation, verification, or audit;
- The other validation, verification, or audit was performed by a competent third party assurance provider or auditor with equivalent qualifications as required by the Regulation and this standard; and
- The other validation, verification, and audit was conducted by an independent, external third party assurance provider or auditor (i.e., met the independence requirements for validations, verifications, or audit in accordance with the Regulation and this standard).

Work conducted by a contractor or external assurance provider or auditor must be documented in the validation, verification, or audit plan and report. The third party assurance provider or auditor is responsible for all work for the validation, verification, or audit including any work conducted by the other validator, verifier, or auditor (e.g. external contractor).

2.2.10. Internal Audit

The purpose of an internal audit is to evaluate the effectiveness and potentially improve on the risk management, controls, and governance processes within the organization. These internal audits primarily assess internal controls, but occasionally evaluate risk management and control processes for facility data and information. The third party assurance provider and auditors cannot rely upon but could consider the results of internal audits if objectivity, scope of the work, technical competence, and due professional care can be established.

2.2.11. Validation, Verification, and Audit Team Qualifications

Validations, verifications, and audits typically require a range of skills, training and experience that may not be held by a single individual. In general, the validation and verification team needs to have:

- A base of scientific and technical understanding relevant to the topic as to the facility or offset project processes and methodology used to compile the statement;
- Validation or verification experience in the industry, sector, or process; and
- Training to assess the data and the overall statement against the principles of; completeness, consistency, accuracy, transparency, relevance, and conservativeness.

In general, the audit team needs to have:

- Experience, knowledge, and training in the accounting and auditing of financial statements including, but not limited to:
 - CPA Regulation;
 - Canadian Auditing Standards; and
 - Canadian Standard for Review Engagements.

- Accounting and auditing experience in the applicable industry and sector.

Table 1 sets out the qualifications that the validation, verification, and audit team is expected to have.

TABLE 1: SUMMARY OF VALIDATION, VERIFICATION AND AUDIT TEAM REQUIREMENTS

Qualification	Description
Validations and Verifications	
Understanding of greenhouse gas regulatory program requirements	<p>The regulatory requirements under which the validation or verification is being undertaken (e.g., the Act, regulations, standards, guidance documents, quantification methodologies and protocols, and other related documents).</p> <p>Any specific principles or requirements of the relevant standards that fall within the scope of the validation or verification.</p>
Understanding of greenhouse gas science	<p>The processes that generate greenhouse gas emissions and removals including technical issues associated with their quantification (e.g., emission factors, emission inventories, production, etc.), monitoring, and reporting.</p> <p>Applicability and limits of quantification methodologies.</p> <p>The types of greenhouse gas sources and sinks associated with equipment, technologies and industries.</p> <p>Prescribed quantification methodologies and commonly referenced emission factors for fuels and the applicable requirements.</p>
Understanding of validation and verification processes	<p>Concepts of validating and verifying data and information, including roles and responsibilities, level of assurance, materiality, and regulatory criteria.</p> <p>Processes for validating and verifying data and information, including review planning, data sampling, risk assessment methodologies, uncertainty assessment techniques, and sensitivity analysis.</p> <p>Application of data and information assurance to the greenhouse gas validation and verification.</p> <p>The activities and procedures needed to identify failures in reporting systems and data management systems and any potential impacts on the statement.</p> <p>The types of statements of validation or verification, including acceptable reservation in the statement.</p> <p>Presentation and disclosure, including quantitative and qualitative components and the principle of conservativeness.</p>

Qualification	Description
Technical expertise on the subject matter	<p>Technical competence in the industry, sector, equipment, processes, and the specific technology.</p> <p>An understanding of the greenhouse gas sources and sinks common to the industry, sector, and technology.</p> <p>Greenhouse gas emission and/or removals quantification, monitoring, and reporting methodologies used, including inherent uncertainties in the quantification process (e.g., measurements and calculations).</p> <p>Understanding of the operational processes and production.</p>
Offset project specific requirements	<p>Baseline selection and evaluation process, additionality and the principle of conservativeness in estimating emission reduction, removal, or sequestration.</p> <p>Functional equivalence and the establishment of offset project boundaries.</p> <p>Uncertainty in offset projects.</p>
Audit	
Understanding of regulatory requirements	<p>Understanding of regulatory requirements as it pertains to cost containment applications and annual reporting.</p> <p>Understanding and training of CPA Regulation and CAS.</p>
Understanding of related facilities and sectors	<p>Understanding of typical accounting and financial practices of related facilities and sectors.</p>

2.3. Finalization of Contract or Agreement

The validation, verification, or audit contract or agreement allows the third party assurance provider or auditor to ensure the responsible party is aware of, understands and agrees on the fundamental aspects of the validation, verification, or audit. It also allows the third party assurance provider or auditor to ensure the validation, verification, or audit can be completed without undue risk to either the third party assurance provider, auditor, or the responsible party. Since the third party assurance provider or auditor will list these fundamental items in the validation, verification, or plan and report, it is suggested the third party assurance provider and auditor document these and discuss them with the responsible party early in the validation, verification, or audit.

The four key aspects of validation, verification, or audit agreement include the assurance level, objectives and criteria, scope, and materiality.

2.3.1. Assurance Level

The department requires a reasonable level of assurance on validations, verifications, and audits of facility reports, benchmark applications, project reports, restatements, and financial statements. A reasonable level assurance requires a higher level of review than a limited level of assurance.

2.3.2. Objectives

The third party assurance provider or auditor is required to identify the objectives of the validation, verification, or audit and define what is required to be reviewed and how the data, evidence, and calculations behind the statement are assessed in order to meet the objectives.

2.3.3. Validation, Verification or Audit Scope

At the agreement phase, the third party assurance provider and auditor is required to define the scope or bounds of the validation, verification, or audit and ensure the responsible party agrees. For a validation or verification, the scope must identify the operational boundaries, activities and processes, the expected sources and sinks, GHG types, and timeframe for which the validation or verification will cover. For an audit, the scope must identify the facility boundary in relation to financial accounting for the facility.

2.3.4. Validation, Verification, and Audit Criteria

The third party assurance provider and auditor is required to assess whether the statement was made in conformance with the validation, verification, or audit criteria. The criteria are used to evaluate the evidence obtained by the third party assurance provider or auditor. The criteria establish the methods that should be used to prepare the statement and the manner in which the statement is to be reported to the department (See Table 2).

Requirements for facility reports, benchmark applications and project reports are outlined in the Act, the Regulation, and the related standards including this standard.

Requirements for offset reports are outlined in the Act, the Regulation, and the Standard for Greenhouse Gas Offset Project Developers, the Carbon Offset Emission Factors Handbook, and offset quantification protocols.

Requirements for cost containment applications including ERPs and financial statements are outlined in the Act, the Regulation, and the Standard for Developing Benchmarks.

TABLE 2: PRINCIPLES USED TO COMPARE STATEMENT TO CRITERIA

Principle	Definition	Comments
Accuracy	The degree of conformity and correctness with respect to the approved and typical quantification methods.	There is no double counting, no bias, no significant transcription errors, methodology is an approved method, and emission factors have been used appropriately.
Completeness	All relevant factors that would affect the conclusions of the department, must be presented and disclosed, and not omitted	The quantification methods include all sources and sinks at the facility or offset project. The financial accounting represents the financial boundaries of the facility.
Consistency	Allows for the dependable evaluation of the evidence by other similarly qualified third party assurance providers.	The quantification techniques are specific to the task and can be duplicated with similar results by qualified personnel. Consistency can trump conservativeness.
Conservativeness	Ensures that values reported such as the emissions and production would represent a conservative scenario for baseline, compliance, or offset projects, and baselines.	Overstating or understating emissions introduces bias and are to be avoided whenever possible. Where appropriate, it may be necessary to take a conservative approach in the baseline setting, compliance reporting, and project reporting. For example, conservativeness in a baseline setting could represent an underestimation of emissions, while conservativeness in compliance or project reporting could represent an overestimation of emissions. Reporting entities and verifiers disclose assumptions that affect the accuracy of reported emissions.
Relevance	The data and methods are appropriate. This contributes to the conclusions and assists with decision making of the department.	The quantification methods are applicable to the source and its operating conditions.
Transparency	Allows for clear, comprehensive, and consistent interpretation of the information by qualified personnel with reasonable confidence.	Presentation of the quantification methods, calculations, references, data management system, financial management systems, raw data, and

Principle	Definition	Comments
		evidence supports consistent interpretation of the statement.

2.3.5. Materiality

The third party assurance provider or auditor must apply the materiality threshold as specified in Part 1 of this standard for a validation, verification, or audit.

3. Validation, Verification, or Audit Planning and Approach

Third party assurance providers and auditors must develop a validation, verification, or audit plan and approach outlining the specific activities to be conducted to achieve the objectives of the validation, verification, or audit. As part of the validation, verification, or audit planning process, third party assurance providers and auditors are required to develop a sampling plan that is based on a risk-based approach. It is important to note that the validation, verification, or audit planning and approach is a dynamic process and can be adjusted as new evidence is collected and reviewed.

The validation, verification, or audit approach includes the following activities, not necessarily in this order:

- Kick Off Meeting
- Verification Plan
- Verification Scope, Criteria, and Objective
- Verification Procedures
- Verification Schedule
- Risk Assessment
- Sampling Plan
- Initial Information and Data Request
- Initial Desktop Review
- Preparing and Developing Working Papers or Files

3.1. Kick Off Meeting

The kick off meeting is the official start of the working relationship between the third party assurance provider or auditor and the responsible party after the validation, verification, audit has been accepted by the third party assurance provider or auditor. It is useful for the people involved to meet and understand their roles, as well as for the third party assurance provider or auditor to review the typical flow and schedule of the validation, verification, or audit process, to discuss document and data provision dates, potential site visit dates and for each party to clarify any potential issues or concerns.

For the audit of the financial statement in the cost containment application, it is recommended that the facility and auditor allow the department to participate in the kick-off, close-out, and other key meetings throughout the audit process to ensure that audit criteria and objectives are clearly outlined and followed during the audit process.

3.2. Initial Information and Data Request

As part of the validation, verification, or audit planning, the third party assurance provider or auditor may ask the responsible party to provide initial documentation including the facility report, benchmark application, or project report and any other submission documents, diagrams, quantification details, calculations, or evidence that support or corroborate the report or benchmark application, or statement. The documents should be provided in an organized and timely manner, as the detailed validation, verification, or audit work cannot begin until receipt of this information. A transmittal record summary with a description of each document, including versioning, may be a useful and efficient measure where there are a significant number of records provided.

The third party assurance provider or auditor gains an understanding of the statement through inquiry, observation, and inspections. During this time, the third party assurance provider or auditor is attempting to obtain sufficient knowledge of the facility or offset project to plan in order to complete the validation, verification, or audit. This understanding provides a framework for the desktop review, the validation, verification or audit plan, sampling plan, and the detailed procedures tailored to the unique characteristics of the facility or offset project.

3.3. Validation, Verification or Audit Plan

The validation, verification, or audit plan documents the nature, extent and timing of validation, verification or audit procedures developed to conduct the sampling plan. It is used by the validation, verification, or audit team, the responsible party, and the peer reviewer or independent reviewer, and is included in the final validation, verification, or audit report. The validation, verification, or audit plan must be provided to the responsible party at least 24 hours prior to the site visit. The validation, verification, or audit plan includes:

- The validation, verification, or audit objective, scope, and level of assurance being provided.
- The statement, and previous statements, if applicable.
- The program criteria highlighting any specific requirements that must be reviewed.
- The assurance standard being used by the validation, verification, or audit team (i.e., ISO 14064-3, this standard, CAS, etc.).
- Applicable materiality thresholds.
- The risk assessment (section 3.6), which can be adjusted throughout the validation, verification, and audit process as the third party assurance provider or auditor is collecting and reviewing data and evidence provided by the facility or proponent. The final risk assessment must be included in the final validation, verification, and audit report.
- The sampling plan (section 3.7) with the detailed sampling plan to be included in the final validation, verification, or audit plan within the validation, verification, or audit report.
- A description of the validation, verification, or audit procedures (nature, timing, and extent) that will be applied to address risks identified at the statement level for each line item in the facility report/offset project. Note that the procedures will evolve as the validation, verification, or audit evidence is collected and reviewed.
- The validation, verification, or audit schedule, including health and safety requirements needed for the site visit, if required.
- Members and roles of the validation, verification, audit team including team experience and qualifications. The lead verifier and/or designated signing authority must ensure that the experience and qualifications of verification team members meet at minimum the requirements set out in Part 1 of this standard. The director may request evidence of training and/or experience of team members if deemed required.
- Other items that may be helpful in the validation, verification, or audit plan could be a description of any changes to operations and organizational or operational boundaries since the prior validation, verification, or audit.
- A description of the responsible party's data and financial management system(s).
- A description of the control environment.
- References to prior validations, verification, or audit reports and findings (if applicable).

Reminder: it is the responsibility of the validator, verifier, or auditor to design and execute the validation, verification, or audit plan according to the respective validation, verification, or audit standards and professional judgment. Consideration may be given to the responsible party's operations and abilities, but the responsible party does not approve the validation, verification, or audit plan or have input on how the plan is structured and implemented.

Note that the third party assurance provider or auditor is assessing the statement as it was compiled based on the records used to create the statement. It is not appropriate for the responsible party to start creating records to address questions raised by the third party assurance provider or auditor. If a facility report, benchmark application, emission offset project, or financial statement lacks sufficient and appropriate evidence, the third party assurance provider or auditor will not be able to complete the validation, verification, or audit.

3.4. Validation, Verification, or Audit Procedures

Third party assurance provider and auditors are required to develop procedures to conduct the validation, verification, or audits including ones to collect and review data, conduct site inspections, conduct recalculations of emissions, production, and other reported parameters, and identify risk areas, and to assess materiality.

The validation, verification, or audit procedures can fluctuate between partial controls reliance testing and full substantive testing. At one end of the spectrum the validation, verification, or audit approach relies almost exclusively on substantive procedures as the basis for the conclusion. Substantive testing procedures are performed on more granular information (e.g., raw data and evidence). Substantive procedures consist of analytical testing of the data and the details of the evidence.

The following are tools used to assess information and to address the risk areas determined through the risk assessment, which is discussed in detail in Part 2 section 3.6 of this standard.

3.4.1. Data Management

The third party assurance provider and auditor is required to assess the data management system including how data is stored, if it is manipulated from measurement or initial input to the final reporting and what data controls were in place. Data management systems are the procedures and systems (e.g., paper, electronic databases, etc.) that the responsible party uses to measure, manage, store, and report data and information, whether for the facility's greenhouse gas inventory, offset project emission reductions, or financial accounting. Third party assurance providers and auditors need to have sufficient understanding of the data management system to develop the validation, verification, or audit plan and approach. The data management system is often a composition of data platforms including the financial and accounting systems, the operation control system, and manual data records.

The following are considerations for the third party assurance provider or auditor's review of the data management system:

- Degree of automation: data management systems that are automated are usually of higher quality than those that are heavily reliant on manual components.
- Use of database features: data management systems that are based on data warehouses or databases are usually of higher data quality and quantity than those that are based on spreadsheets or hard copies.
- Length of operation: data management systems that have been operational for several years are usually of higher quality than those that have just been implemented.
- Linkage to other systems: data management systems that are linked in with operational systems or financial systems are usually of higher quality than those that are stand-alone.
- Standardization within an organization: data management systems that are consistently applied throughout the organization are usually of higher quality than those that have multiple platforms.
- Transparency of calculations: data management systems with easy access to calculations rather than embedded in libraries and scripts are easier to review than "black box" systems. Errors may be harder to detect where there is reliance on manual collection, transcription, or manipulation of data.

For ERPs, data management systems may not be in place yet for the validator to evaluate. As part of the validator's procedures, an evaluation on the reasonableness of the data management proposed will be conducted. Alternatively, in cases where the facility is intending to use existing data management systems, the validator may evaluate the existing system as a proxy.

3.4.2. Data Flow

The third party assurance provider or auditor is required to understand the path of data from the reported values back to the root information or measurements or sales and accounting records. The third party assurance provider or auditor can best determine where data sampling might be appropriate by understanding the data flow. The elements of data flow may include, but not limited to:

- Measurements (i.e. flow, temperature, and pressure measurements, etc.);
- Use of records from external sources (e.g., third party invoices, fuel purchase records, etc.);
- Transfer of measurements or input data from one or part of the data management system to another (e.g., measurement records or invoiced fuel quantities entered into a spreadsheet, manually or automatically.);
- Data management system interface and how readily data can be extracted from system; and

- Data collection frequency and retention period.

3.4.3. Data or Internal Controls

Data or internal controls are activities and processes that an organization implements to reduce the potential for error. Controls can be endemic (e.g., the tone at the top), or specific (e.g., reconciliation of fuel purchase between invoices and meters). Controls can be specific to the data flow (e.g., record counts), or embedded in the personnel (e.g., training). The third party assurance provider or auditor assesses data controls to understand:

- The control and its location in the data flow;
- The control objective;
- The importance of the control;
- Who operates the control;
- The frequency of operation of the control;
- The control type;
- The control method (e.g., automated, manual, etc.); and
- The implementation of the control.

Third party assurance providers or auditors should document their understanding of the data management system including the data flow and controls used in the working papers or files.

3.4.4. Records Review

The following are some considerations for the third party assurance provider or auditor's initial review of records:

- Frequency: records that are generated at higher frequency (e.g., monthly) are can capture shorter term events than records that are recorded at a lower frequency (e.g., annually).
- Connection to other programs: records that feed into performance reward/compensation systems/programs may have positive or negative impacts on data quality depending on the degree of security around these systems.
- Connections to financial transactions: records that feed into financial systems are usually of higher quality than those that do not.
- Connections to other processes: records that are relied upon for operational processes are usually of higher quality than those that are not. (e.g. Production reported under the Regulation matching royalty reporting or S-23 reporting).
- Quality assurance and quality control (QA/QC): the types of QA/QC procedures that are implemented to provide instruction on how to assess accuracy of data and how to backfill data that is considered inaccurate and/or not appropriate for use.

3.4.5. Analytics

Several types of analytics may be used to evaluate records and data to identify risk areas at the planning stage and/or to help the third party assurance provider or auditor to focus the majority of the validation, verification, or audit to higher risk areas. This is commonly referred to as "risk-based approach." For validators and verifiers, types of data or calculations analyzed typically include: emissions, fuel consumption, production, and energy consumption. For auditors, possible areas for analysis including revenue and sales records and records for prices of products sold to external and internal markets. Third party assurance providers or auditors should request additional data during the validation, verification, or auditor and perform analytics, to further enable the third party assurance provider or auditor to form a conclusion on the statement. Results from the analytical testing, including any identifying anomalies and discrepancies should be documented in the working papers or files. Analytics testing is just one of many tools the third party assurance provider or auditor can use to assess the data that was used by the responsible party for their statement.

3.4.6. Comparative Analytics

Comparative analytics typically includes comparing evidence to:

- Similar operating periods;
- Anticipated results;
- Similar industry information;
- Data and/or financial trending; and
- Other, similar operations.

Relationship analytics assumes there is a relationship between two independently measured variables (e.g., fuel consumption for a turbine and energy produced by the turbine, or steam-oil-ratios and stationary fuel combustion emissions for in-situ facilities). Relationship analytics typically includes:

- Correlations; and
- Efficiencies.

3.4.7. Contribution Analytics

Contribution analytics is commonly used in validations, verifications, and audits and is used to compare a line item, emissions source category, or individual sources or sink to the total (i.e., total regulated emissions, total project emissions, etc.). It is also used to assess the relative contribution of the line item to the overall statement. This analysis is usually done for both the line item, source or sink and for the greenhouse gas species reported in the statement.

For large emitters and opted-in facilities, the contribution analysis is conducted for the two parts of the compliance obligation calculation: the total regulated emissions (TRE) and allowable emissions (AE). For the TRE, a contribution analysis is conducted for the emissions from each of the emission source categories used in the direct emissions (DE) calculation. The emissions from these source categories are compared with the DE to determine the percent contribution of that source. A contribution analysis is also conducted for the imported CO₂, exported CO₂, and CO₂ consumed in urea production, where the percent contribution of each parameter is compared with the TRE. Similarly for the AE, a contribution analysis is conducted for the facility products, where the allocations of individual products (in tonnes CO₂e) is compared with the total product allocations to determine the percent contribution. Separately, a contribution analysis is conducted for the imported indirects where the tonnes CO₂e of the individual indirect is compared with the AE. Table 3 provides an example of a contribution analysis conducted for a large emitter or opted-in facility report.

For aggregate facilities, the contribution analysis includes emissions and exported CO₂ from emission sources that are regulated for aggregate facilities only.

For emission offset project reports, the relative contribution of an item to the whole is the value of the line item divided by the total project and/or baseline emissions, expressed as a percentage. Table 4 provides an example of a contribution analysis conducted for a project report.

TABLE 3 EXAMPLE OF AN INVENTORY CONTRIBUTION ANALYSIS

Total Regulated Emissions	Source	CO ₂	CH ₄	N ₂ O	SF ₆	Emissions	Contribution
							(%)
(tonne CO ₂ e/yr)							
Stationary Fuel Combustion	Engine	170,000	10,000	900	0	180,900	68%
	Boiler	120,000	8,000	500	0	128,500	
On-site Transportation	On-site vehicles	25,000	1,200	300	0	26,500	5.8%

Total Regulated Emissions	Source	CO₂	CH₄	N₂O	SF₆	Emissions	Contribution (%)
		(tonne CO₂e/yr)					
Flaring		30,000	2,500	300	0	32,800	7.2%
Fugitive		1,000	50,000	250	25,000	76,250	16.8%
Industrial Process		10,000	0	0	0	10,000	2.2%
Direct Emissions		356,000	71,700	2,250	25,000	454,950	-
Greenhouse Gas Contribution		78.3%	15.8%	0.5%	5.5%	-	-
Imported CO ₂		5,000	-	-	-	5,000	1.0%
Exported CO ₂		50,000	-	-	-	50,000	10%
CO ₂ consumed in urea process		2,000	-	-	-	2,000	0.4%
Total Regulated Emissions		403,000	71,700	2,250	25,000	501,950	-
Allowable Emissions						Allowable Emissions (tonnes CO₂e/yr)	Contribution (%)
Pentane						188,439	33%
Butane						199,893	35%
Propane						176,675	31%
Product Allocations						565,007	-
Imported Electricity						20,000	3.7%
Imported Industrial Heat						1,000	0.2%
Imported Hydrogen						-	-
Allowable Emissions						544,007	-

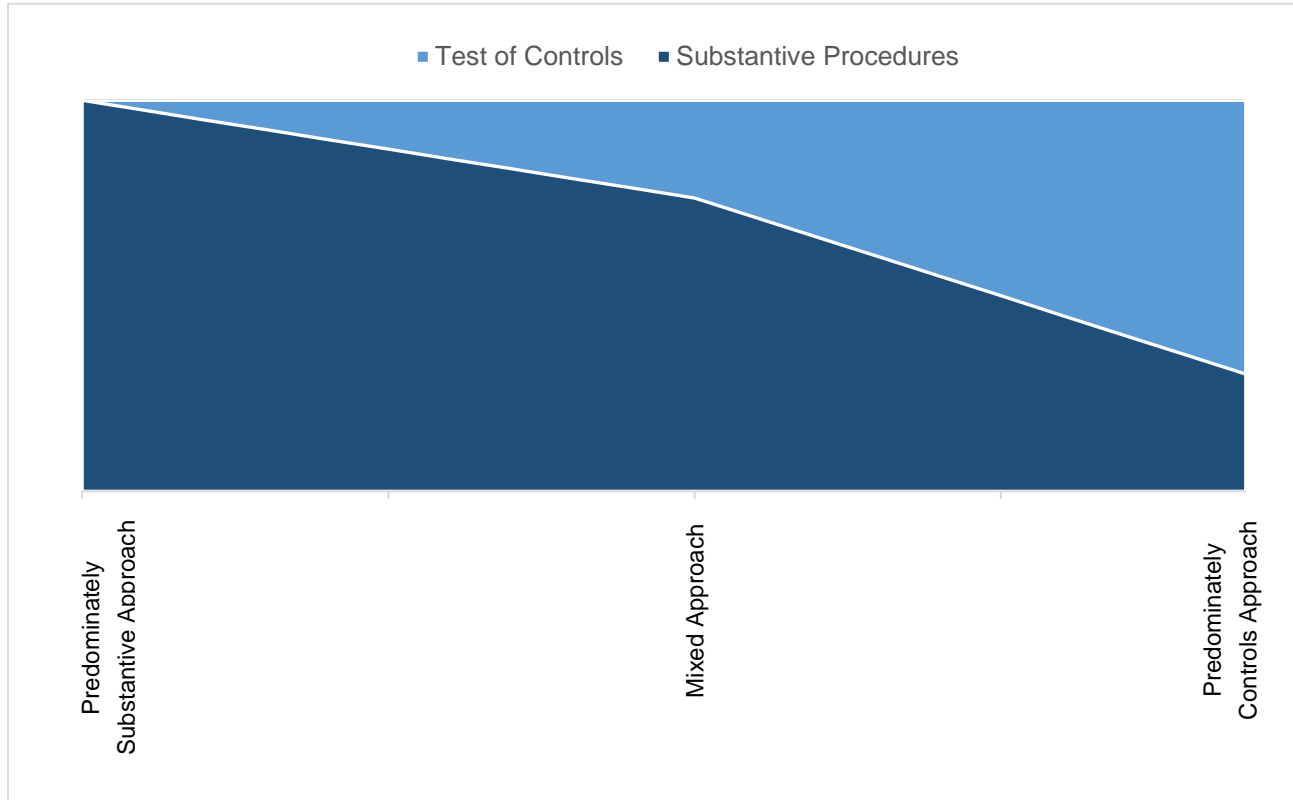
TABLE 4 EXAMPLE OF AN OFFSET PROJECT CONTRIBUTION ANALYSIS

Category	Source/Sink	CO ₂	CH ₄	N ₂ O	SF ₆	Emissions	Contribution (%)
(tonne CO ₂ e/yr)							
Project							
Stationary Fuel Combustion	Engine	50,000	1,250	100	0	51,350	38%
On-site Transportation	On-site Vehicles	10,000	250	50	0	10,300	7.7%
Indirect	Electricity Consumption	67,000	1,500	120	25	68,645	51%
Mobile	Off-site Vehicles	3,000	700	50	0	3,750	2.8%
Project Total		130,000	3,700	320	25	134,045	
Contribution		97%	2.8%	0.2%	nil		
Baseline							
Stationary Fuel Combustion	Engine	100,000	5,000	200	0	105,200	50%
On-site Transportation	On-site Vehicles	10,000	250	50	0	10,300	5%
Indirect	Electricity Consumption	90,000	2,250	200	60	92,510	44%
Mobile	Off-site Vehicles	3,000	700	50	0	3,750	2%
Baseline Total		203,000	8,200	500	60	211,760	
Greenhouse Gas Contribution		96%	4%	0%	0%		
Emission Reduction						77,715	

3.4.8. Controls or Substantive Testing

Controls reliance tests the controls used to manage data used to generate the statement. Controls reliance can only be used in a relatively robust and mature data or financial management system, which is assessed by the third party assurance provider, or auditor. The preliminary risk assessment in a controls reliance approach identifies the controls along the data trail, and develops tests to analyze the effectiveness of the controls. If the third party assurance provider or auditor is going to partially rely on controls, the third party assurance provider or auditor needs to test the operational effectiveness of the controls and the data that the control is processing. Data testing is done to a lesser extent in controls reliance validations, verifications, or audits than it is in substantive testing procedures.

FIGURE 3 VALIDATION, VERIFICATION AND AUDIT PROCEDURES



In most cases, significant controls reliance is not appropriate or feasible for greenhouse gas verifications or financial auditing. As such, the department requires that the verification or audit plan and approach be designed so that much of the evidence required to support the verifier or auditor's conclusion comes from substantive procedures. For validations, more usage of controls reliance testing is anticipated than for verifications and audits as there will be limited actual data available for review. A facility's ERP may utilize existing data management systems; therefore the validator may choose to conduct a higher level of controls reliance testing for validations of ERPs.

The department will not accept validations or verifications based solely on controls reliance; however, for validations, it is acceptable that validator's conduct more testing on controls reliance. In all cases, validators, verifiers, or auditors must assess underlying data to confirm it is being reported correctly and that responsible party's data management systems being used are performing as intended.

The validation, verification, or audit procedures need to be tailored to the specific data streams, controls, and evidence available for the facility, offset project, or financial statement. For example, a controls approach is used for data tied into the operating systems and a substantive approach is used for data that relies on spreadsheets and manual entries. In cases with small or limited number of data points, such as monthly invoices for a calendar year, substantive testing is generally a more efficient and accurate method.

Some controls reliance is appropriate in situations where there are extensive operational controls operating effectively, and where there is a large amount of data in which sampling alone and other substantive procedures are unlikely to yield sufficient and appropriate evidence to support the validator, verifier, or auditor's conclusion. For example, readings from a continuous emissions monitor (CEMs) are conducted at a high frequency that yields too much data to be tested using substantive testing methods (cannot be economically or efficiently sampled). A controls approach would be appropriate to assess this type of evidence. (See Table 5).

In cases where there is a high control risk and the validator, verifier, or auditor has little or no confidence in the design or the operation of controls, the validator, verifier, or auditor must use a substantive approach to assess the evidence.

TABLE 5 EXAMPLES OF TESTS OF THE EFFECTIVENESS OF CONTROLS

Potential Misstatement (Statement)	Control	Test of Operating Effectiveness
A greenhouse gas source may be excluded from the inventory (occurrence, completeness)	Controls implemented to develop greenhouse gas inventory and changes to the inventory	Examine source documents for approvals Assess facility boundaries as part of site visit
A greenhouse gas source may be counted twice in the inventory (validity)	Controls for evaluating and totalizing emissions in greenhouse gas inventory	Examine reconciliation of emissions Observe data verification procedures to avoid double entries
A greenhouse gas source may be calculated in the wrong units (accuracy)	Controls for conducting limit and reasonableness checks	Examine evidence of test data
CEMS unit malfunction (accuracy)	Controls for assessing error codes	Examine evidence of error codes, re-perform conditions of error
natural gas consumption source may be missing for a certain period during the reporting period	Controls used to compile data used for fuel consumption	Examine natural gas invoices and how reconciliation of fuel consumption was evaluated
Production accounting inaccuracies	Controls implemented for production accounting balances	Recalculate the monthly balance and reconcile Examine the methods used to balance and compare to criteria

In summary,

- It is not necessary to use a controls approach; a substantive testing only approach can be effective and efficient;
- Complete reliance on controls is not permitted. A controls approach must be supported by substantive procedures on the data;

- For validations, it may not be possible to conduct extensive substantive testing as actual data from the implementation of the emissions reduction plan would not be available;
- If any reliance is going to be placed on controls, the controls must be tested (operation and design effectiveness); and
- Controls that have been tested by another validation, verification, or audit completed to levels that meet or exceed requirements for validation, verification, or audit do not need to be re-tested in the validation, verification, or audit (e.g., revenue custody meters, regulatory CEMs meter, etc.). Results from these validations, verifications, or audits can be used to support the validation, verification, or audit unless the third party assurance provider or auditor has reason to suspect the data.

3.4.9. Assessing Emission Estimates and Quantification Methodologies

Third party assurance providers must test the emissions estimates and assess potential discrepancies. To do this they must develop appropriate test procedures and recalculate emissions estimates used by the responsible party to develop the statement. Methods used to test estimates may include:

- Examining the completeness, accuracy, and relevancy of the underlying data used in the estimate. If information is generated by the responsible party, the integrity of the information will need to be consistent with the system(s) used to generate the statement;
- Examining the underlying assumptions for the estimate, compare the assumption to prior operating conditions (e.g., does the estimate apply to the operating conditions?), assess the appropriateness of the estimation model (e.g., using a seasonal model vs. a prior period model), assess if all appropriate factors are included (e.g., fuel consumption or fuel consumption and load), etc.;
- Testing the calculations and recalculating the emissions;
- Where possible, comparing prior estimates to actual results;
- Using independent estimates developed by the third party assurance provider to confirm the responsible party's estimates. If independent estimates are used, the third party assurance provider must ensure that the independent estimate is relevant and appropriate to assess the original estimate against program criteria; and
- Assessing the emissions estimates against quantification methodologies prescribed by the department in the Alberta Greenhouse Gas Quantification Methodologies (AQM), Standard for Benchmark Development and Standard for Completing Compliance and Forecasting Reports, and offset quantification protocols. Where mandatory quantification methodologies are not prescribed, confirm whether a deviation has been granted by the department for the parameter(s) reported.

Based on the assessment conducted, the third party assurance provider is required to determine what the risk is associated with any potential discrepancies identified (e.g., whether there is a high, medium, or low risk of a material misstatement). If the third party assurance provider determines there is a high risk for a material error, the third party assurance provider must adjust the sampling plan to mitigate the risk (e.g. increase data sampling). If the third party assurance provider cannot mitigate these risks, the third party assurance provider should consider qualifying their opinion in the validation or verification statement. Third party assurance providers are required to use their professional judgement in assessing both quantitative and qualitative findings.

3.4.10. Uncertainty

Quantification of reported parameters such as greenhouse gas emissions, production, and facility sales has inherent uncertainty due to the precision of measurements and calculations. For facilities, the department has prescribed acceptable measurement and calculation approaches that limit uncertainty while recognizing limits on available data and measurement techniques. A tiered approach is used to determine the methodology suitable for the type of emission source. The Standard for Completing Greenhouse Gas Compliance and Forecasting Reports specifies the methodologies to be used by source category and gas type.

A facility submitting an ERP as part of a cost containment application is required to apply quantification methodologies that are prescribed for their facility using the tiered approach described for applicable sources.

Offset project quantification methodologies, including uncertainty, are assessed during protocol development and published in the relevant quantification protocols. Offset projects are required to ensure the data collection and offset project specific calculations are appropriate and meet Alberta emission offset system program requirements. More information on project requirements is available in the Standard for Greenhouse Gas Emission Offset Project Developers or in the specific offset protocol.

Third party assurance providers are required to assess the appropriateness of the methodology used against program requirements.

If third party assurance providers encounter enough uncertainty that it causes presentation and disclosure concerns for the statement, the third party assurance provider should consider additional disclosure, or issuing a qualified opinion, or adverse opinion.

3.5. Validation, Verification or Audit Schedule

A detailed schedule must be presented in the validation, verification, or audit plan prior to the site visit. Although a higher level schedule would typically be provided in the contracting phase, a detailed and agreed upon schedule is needed to help the third party assurance provider or auditor keep the validation, verification, or audit process and costs on track and identify and manage changes in the scope or schedule. It is very important that the third party assurance provider or auditor informs the responsible party of when information is expected, what deadlines are targeted and when the draft and final validation, verification, and audit reports will be submitted.

The schedule should be detailed in conjunction with the responsible party, especially when establishing a site visit date. The third party assurance provider or auditor should try to provide sufficient notice in requesting to meet with individuals in particular roles so it can be planned and accommodated.

Allowing some flexibility for operational upsets or key personnel availability is helpful.

Third party assurance providers and auditors are required to contact the facility or offset project to arrange the timing of the site visit. For reverifications conducted for the department, verifiers are also required to provide the department with the verification plan and the schedule for the site visit.

3.6. Risk Assessment

The third party assurance provider must assess the validation, verification or audit risk in accordance with the principals of ISO 14064-3; while auditors must use CAS for an audit of a financial statement. The overall risk is the risk that the statement is materially misstated. The third party assurance provider or auditor first assesses the inherent and control risks, based on information collected to date, and then mitigates these risks by adjusting the detection risks to bring the overall risk to an acceptable level. The third party assurance provider or auditor will use the results of the risk assessment to design the appropriate sampling plan and procedures to manage the risk.

The risk assessment must be documented in the validation, verification or audit plan, and may be modified if new risks are identified during the validation, verification, or audit process.

The detection risk has an inverse relationship to the inherent and control risks. If the inherent and control risks are high, the third party assurance provider or audit designs and performs procedures that result in a low detection risk so that the overall risk is low. In some situations, the inherent and control risk may be so high that it would be impractical or cost prohibitive to design and perform procedures to achieve the desired low level of verification risk. An example may be an offset project that relies exclusively on manual data management processes and hard copy records.

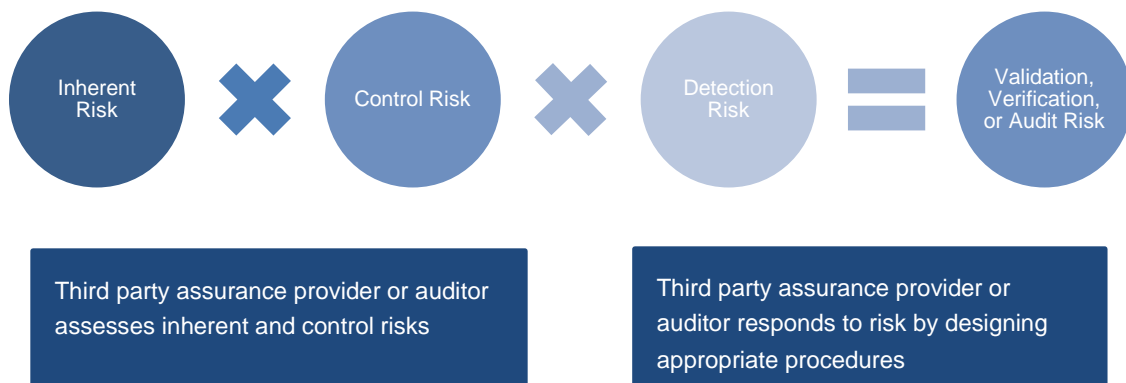


FIGURE 4 RISK MODEL

In assessing risks related to the statement the third party assurance provider or auditor must consider the aspects of the statement including: quantification methodologies used, presentation, and disclosure of the greenhouse gas emissions or financial accounting practices, emission reductions, and production. Risks can be determined by considering the validation, verification, and audit principles as well as:

- Occurrence: emissions, production, accounting, and reductions that have been recorded have occurred and pertain to the facility or offset project;
- Completeness: all emissions, production, accounting, and reductions that should have been recorded have been recorded;
- Accuracy: emissions, production, accounting, reductions, quantification, and related information have been recorded and appropriately disclosed;
- Classification: emissions, production, accounting, and reductions have been recorded in the appropriate category;
- Transparency: information is appropriately presented and described, and disclosures are clearly documented;
- Consistency: quantification methodologies are consistent with the general or the prescribed quantification methodologies or with the quantification protocol. If changes have been made, sufficient justification needs to be provided. Substantive changes require approval from the department. Any restatements in prior periods are to be clearly documented along with any impacts to past statements.

3.6.1. Inherent Risk

Inherent risk is the risk that a statement may be misstated because of intrinsic challenges in the subject matter. Inherent risk is assessed as high, medium, or low, which may change with the industry sector or offset project type, process complexity, number and type of sources and sinks, number of data streams, complexity of calculations, uncertainty in measurements, emissions inventory or offset project statement, and the greenhouse gas source categories. Inherent risk is increased if there have been changes from the prior submission (e.g., ownership, merger or acquisition, facility equipment, methodology, turnover of key staff, etc.).

Some offset projects have high inherent risk because the differential calculation between the baseline condition and the project condition creates a degree of imprecision in the statement that is higher than what is typically seen in an inventory (facility) statement. Likewise, aggregated offset projects have higher complexity and higher inherent risk than non-aggregated offset projects. Inherent risk does not consider internal controls which are addressed in control risk assessment.

3.6.2. Control Risk

Control risk is the risk that a misstatement in the statement has occurred and has not been detected and corrected by the internal controls of the facility or offset project. It is assessed as high, medium, or low risk. Control risk is determined based on

the design of the responsible party's data management system and the application of the data management system to develop the facility, project report statement, or financial statement.

Typically, the design of the controls reflects the inherent risks (e.g., the higher the inherent risk the more extensive the controls).

Understanding of the controls and control risks is critical to designing a validation, verification, or audit plan. High control risk would mean controls were either not appropriately designed, not operating effectively, or both. Therefore, high control risk must be mitigated by adjusting the detection risk.

3.6.3. Detection Risk

Detection risk is the risk that the procedures that the third party assurance provider or auditor applies will not detect a misstatement in the statement (e.g., the misstatement occurred and was not identified and corrected). The third party assurance provider or auditor's assessment of the risk of misstatement (i.e., the third party assurance provider or auditor's combined assessments of inherent risk and control risk) will affect the nature, timing, and extent of the procedures performed for a particular statement. Table 6 below is an example risk matrix used to rank risk types. The department requires an explanation and ranking for each type of risk. Note, the detection risk is the inverse of the detection confidence. As validations, verifications, and audits are required to be performed to a reasonable level of assurance, the third party assurance provider or auditor should design the approach to lower the detection risk (low or medium) and improve the detection confidence.

TABLE 6 DESIGN OF DETECTION RISK

		Control Risk			Detection Risk
		High	Medium	Low	
Inherent Risk	High	Low	Low	Medium	}
	Medium	Low	Medium	High	
	Low	Medium	High	High	

3.7. Sampling Plan

The sampling plan is the backbone of the validation, verification, or audit plan and is designed to mitigate the risks that are identified by the third party assurance provider or auditor in the risk assessment. Sampling is used to gather records in order to test controls, evidence, and internal procedures to determine whether the information is reliable and correct and that there are no material misstatements in the facility or project statement. Sampling is based on the principle that a statistically relevant percentage of the population can be used to infer results on the entire population. Sampling manages risks while balancing time and cost to complete the validation, verification, or audit.

Prior to the site visit, the third party assurance provider is required to provide the responsible party with a validation, verification, or audit plan which includes the sampling plan. The validation, verification, or audit plan will help the responsible party prepare for the validation, verification, or audit and inform the responsible party about the data requested for review.

The sampling procedures, including the type and size of data set, should be based on the risk assessment conducted by the third party assurance provider or auditor. The sampling plan should be adjusted as the third party assurance provider or auditor gains more knowledge about the facility or project statement in order to mitigate the risks that are identified throughout the validation, verification, or audit process.

Third party assurance providers or auditors may use different types of sampling methods that can be used alone or combined:

- **Statistical:** This type of sampling can be used when there is a large sample population (over 100 samples). Probability theory is used to evaluate the results. Often used when low risk conditions apply or there is a large amount of data or controls to test.
- **Strategic:** The sample is specifically selected because higher risks had been identified for a specific area (e.g., high risk of control failure, etc.). Typically used when preliminary analytics reveal a high or medium risk at a particular period and further details are required.
- **Systematic:** The sample has a specified sampling interval (e.g., temporal or size). This is commonly used when a high or medium risk occurs on a regular basis (e.g., data that rolls over into a new accounting year, annual maintenance turn-overs, seasonal variations, shift changes, etc.).
- **Convenience:** The sample is readily available to the third party assurance provider or auditor. Used when low risk and a small sample is sufficient to demonstrate that data is accurate or controls are functioning properly.
- **Stratified:** The population has been divided into sub-populations where the sample design is based on the sub-populations. This can be used when the population is not normal in distribution (e.g., bimodal) and can be stratified into multiple sub-populations that are more normally distributed. If different sections of the population have different levels of risks, the sampling will be different for different sections (e.g., near a measurement threshold, larger sources versus smaller sources, etc.).
- **Random:** The sample has no structured technique. The department will not accept random sampling only, as random sampling has limited underlying rigor. Some random sampling can help mitigate potential bias in other techniques though.

Hint: In some cases, samples may be identified as a “local occurrence” meaning that the sample is not representative of the population and the sample results are confined to that sample. Justification for local occurrences are to be clearly documented in the verifier’s working papers.

For aggregate facilities, the verifier must design a sampling plan based on a risk assessment to ensure proper coverage of the various types of facilities within the aggregate. Within the aggregate facility, there may also be multiple data collection and management systems that are used to prepare the statement. For these facilities, it may be appropriate to apply a stratified sampling method in the sampling plan.

Small Sample Statistics

Small sample populations (less than 100 samples) are common in greenhouse gas verifications. These populations are too small to use statistical sampling techniques that assume a normal distribution in the population, or to allow a sufficiently large sample size to be taken to reduce the requirement for a normal distribution. As populations and associated samples get smaller, the need to sample larger portions of the population increases. Therefore, populations of 12 or less are best sampled in their entirety. Rationale for the sample size used should be documented in the third party assurance provider or auditor’s working papers.

Third party assurance providers and auditors may need to subcontract expertise in statistical sampling for more complex samples (e.g., extremely large or extensive samples).

Sampling Process

The procedures discussed above, are used to collect and analyse the samples. When assessing the sampling results, the third party assurance provider or auditor decides whether any deviation or errors identified are localized occurrences or affect the entire population. If the error is systemic in the population, the third party assurance provider or auditor projects the deviation or errors to the rest of the population to estimate the magnitude of the error. The third party assurance provider or auditor also

determines whether the nature of the error has further ramifications to the statement, and if there is a relationship between this error and other validation, verification, or audit evidence.

Aggregation Process

The responsible party will aggregate the data and information for submission to the department in a facility report, benchmark application, offset report, or financial statement and the supporting information for the validation, verification, and/or audit and then submission to the department or registry.

If the responsible party determines a need for changes to the statement or supporting materials after compilation and prior to submission to the department, the changes must be disclosed to the third party assurance provider or auditor as they could impact the validity of the validation, verification, or audit. Information in the statement cannot be changed once the third party assurance provider or auditor has issued a statement of validation, verification, or audit. If changes are made, the third party assurance provider or auditor will need to review the changes, and may need to issue an amendment to the validation, verification, or audit statement.

3.7.1. Appropriate Evidence

The evidence for the validation or verification of a facility report or application includes, but is not limited to fuel usage records, production accounting records, financial accounting records, metering data, meter calibration and maintenance records, third party invoices, manufacturer specifications, and theoretical calculations for emissions reductions. This evidence is used to evaluate the facility statement such as the facility's total regulated emissions and production reported against the validation or verification criteria. For an offset project verification, appropriate evidence is required for both the project and baseline conditions, which covers the net greenhouse gas emission reduction, avoidance, or capture and sequestration achieved by the offset project that can be evaluated against the Alberta emission offset system criteria.

Note: Very poor quality evidence may not be appropriate regardless of the amount of evidence available. An example of poor quality evidence would be attestations without any form of supporting evidence.

The evidence for the audit of a financial statement may include financial records on product sales and product pricing.

The third party assurance provider or auditor must determine if the evidence available is appropriate to evaluate the statement against the applicable criteria. If the evidence available is not appropriate to assess the statement against the criteria, the third party assurance provider or auditor must take this into consideration in developing the validation, verification, or audit findings and conclusions. Examples of inappropriate evidence include: reliance on attestations without supporting records, use of outdated methodologies, and the use of generic quantification methodologies when site specific information is available.

3.7.2. Sufficient Evidence

The third party assurance provider or auditor must determine if sufficient evidence is available to support the statement and the validation, verification, or audit. The third party assurance provider or auditor can obtain information on the data management systems and the records available to support the statement during the preliminary documentation review, verification execution, interviews, questionnaires, and further data requests. Third party assurance providers and auditors may standardize this process through forms, filled out by the responsible party, which provide the third party assurance provider or auditor with a general sense of the information available, including potential weaknesses in the available evidence.

The initial assessment of the data management systems and records also helps to check that the scope and cost for the validation, verification, or audit are still suitable. Data management systems with larger data sources, higher complexity, or higher reliance on manual data processes may take more time to assess and may have higher costs than simpler or more automated systems.

Appropriate evidence can further be broken down into the two characteristics: relevant and reliable. Relevant is evidence that pertains to the relevant objectives. It is the third party assurance provider or auditor's responsibility to correctly identify the relevant information. Information provided that is not relevant to the validation, verification, or audit cannot be considered for the purposes of issuing assurance on the statement.

The reliability of the evidence depends on the nature and source of the evidence. Table 7 below shows a general hierarchy of evidence.

TABLE 7 GENERAL HIERARCHY OF EVIDENCE

Hierarchy	Evidence Type	Example
High	Evidence that is collected directly by the third party assurance provider	Inspection of greenhouse gas inventory through a site visit Re-calculation of the total greenhouse gas emissions
	Documentary evidence that originates outside of the responsible party’s data management system but is processed by it	Electricity or natural gas invoices
	Documents produced by the responsible party	Operational and financial records
Low	Oral evidence	Interviews with maintenance or accounting personnel

Two forms of evidence that tend to vary the most in reliability are documentary evidence obtained from external sources and analytical testing results.

- Documentary evidence obtained from external sources, such as production from pipeline companies, or acreage from insurance companies, will depend highly on the purpose and design of the third party data management system and the purpose for which the third party is collecting the data.
- Analytical testing varies based on the strength of the underlying relationships. Analytical tests that are based on mass or energy flows are typically very strong forms of analytical tests while test that are based on extrapolations, averages, or samples are less reliable.

The third party assurance provider or auditor must use professional judgment to assess the reliability of the documentary and analytical evidence to determine whether it is appropriate for the purposes of validation, verification, or auditing.

For example, if there is a risk that the inventory is incomplete, the third party assurance provider or auditor may undertake a physical inspection of the site, examine satellite imagery of the site, examine data or financial management systems onsite, review as-built drawings, interview maintenance staff, site, and/or accounting personnel, inspection permits, or other measures to develop an understanding of the emissions inventory and/or financial accounting systems based on the risks associated with inventory completeness. At a high level of risk, a physical inspection is more appropriate because this form of evidence has higher reliability than other tests. At a low level of risk, interviews with operations or accounting personnel and an inspection of as-built drawings may be sufficient to address risks at reasonable costs.

3.8. Initial Desktop Review

The initial desktop review is when the third party assurance provider or auditor reviews and evaluates aspects of the operations and specific processes, quantification methodologies, data and information provided, the data and financial management systems and management practices used to develop the statement.

During the desktop review, the third party assurance provider or auditor increases their understanding of the technical operations and processes and/or financial accounting practices. This helps the third party assurance provider or auditor develop an effective, efficient and focused validation, verification, or audit. The third party assurance provider may use the following strategies to conduct an initial desktop review:

1. For validations or verifications, the validator or verifier may review submission information and supporting evidence from the facility's report or benchmark application, emission offset project report or project plan, the methodology description, a simplified process flow diagram of the operation or specific process, and fuel diagrams, where helpful, to:
 - Identify sources and sinks that should appear in the inventory;
 - Identify variables that may be related to one another;
 - Understand what measurements related to the greenhouse gas emissions may be available;
 - Understand the scope of the validation or verification;
 - Identify quantification methodologies used; and
 - Understand the population of facilities within the aggregate facility and the interaction between these facilities (if applicable).

For audits, the auditor may review the following documents as part of the desktop review:

- List of the facility's accounts including facility assets, expenditures, employee count, and sales records;
 - Historical financial records;
 - Facility organizational chart; and
 - Accounting procedures and internal controls used to manage facility financial accounting records.
2. Develop historical graphs of key variables over prior periods to understand the pattern or trends related to the facility's operation, project, or accounting practices. Key variables may include, for example, financial data, greenhouse gas emissions, energy/fuel consumption, and production.
 3. Initial discussions and interviews with key operations personnel to obtain a further understanding of:
 - Process operations (normal and upset conditions);
 - Technologies and process proposed for emissions reductions;
 - Relationships between process and financial variables;
 - Availability of measurements and records;
 - Common performance metrics from an operational perspective;
 - Significant operational events (e.g., shutdowns, changes in operations, emergencies, retrofits, etc.) that occurred during the statement period;
 - The processes used to assess the risk of misreporting.
 - Technical or data management processes;
 - Controls used to capture and process relevant data;
 - Production and accounting records for facilities, and
 - Influences, such as reward systems, on the behaviour of management and other key personnel that might affect the risk of misstatement in reported greenhouse gas emissions or financial statements.
 4. Perform an information search to determine if there have been any:
 - Changes to regulations, standards, or protocols that affect operations or the statement;
 - Significant events that affect the statement;
 - Changes in the references used for the statement; and

- Changes and/or consistencies in the reported standard conditions.
5. Review the results of prior verifications or follow up requirements from government reverifications, to determine:
- Areas of control weakness that should be examined in a verification;
 - Uncorrected misstatements that may impact a verification; and
 - Presentation and disclosure of issues that are pertinent to a verification.

3.9. Working Papers

The third party assurance provider or auditor's internal working papers are integral to the validation, verification, or audit as they document all aspects of the validation, verification, or audit, are used for developing the plan and procedures, record the evidence and results, support the work, and provide assurance that the validation, verification, or audit was performed appropriately.

The initial development of the working papers takes place early in the validation, verification, or audit process and is continued throughout the entire validation, verification, or audit, ultimately documenting findings and undergoing peer review.

Third party assurance providers and auditors use the working papers to:

- Document their understanding of the various process and data management systems, including the data and accounting flow and controls,
- Describe the results from the analytical testing, including any anomalies identified,
- Determine where further information is needed, and
- Document findings and conclusions and when a particular item can be closed out.

Minimum components of the working papers include the following:

- An issues log that includes the third party assurance provider's or auditor's issues, findings, conclusions, and information requests.
- Re-calculations and analyses of emissions, production, financial data, and other reported parameters based on data and information provided by the responsible party (e.g. facility or proponent);
- List of immaterial and non-material discrepancies;
- Total error calculation based on discrepancies identified for various emission sources and parameters (section 5.1.1);
- Comparison of the calculated total error to the applicable materiality threshold;
- Qualitative assessments and findings;
- Data and information provided by the responsible party that was analyzed by the third party assurance provide or auditor (e.g. tabulated data from third party fuel invoices, outputs from facility data control systems or accounting systems);
- Conflict of interest and impartiality assessment; and
- Experience and qualifications of validation, verification, or audit team members.

Although working papers are the legal property of the third party assurance provider and auditor, access must be granted to the department upon request.

TABLE 8 EXAMPLES OF PROCEDURES IN A VERIFICATION PLAN

Category/ Line Item	Verification Objective	Risk/Concern Identified	Period	Type of Procedure (analytical test, test of detail, test of controls)	Description of Procedures (nature, timing, and extent)
Statement	Existence/ Completeness	Incompleteness of inventory		Test of detail – inspection	Observe emission sources during site visit and compare with reported inventory
Stationary Fuel Combustion	Completeness	Improper measurement of natural gas on site due to multiple meters		Test of detail – inspection, reconciliation, tracing	Observe meter location and identification numbers on site visit Reconcile meter identification numbers with meters identified in database equations Confirm meter identification numbers with meters identified on natural gas invoices (one-month sample) Trace meter records to emissions calculations
Flaring	Accuracy	CEMS inaccuracy		Test of detail – inspection Test of control	Inspect RATA and CGA tests for sensor accuracy Inspect onsite maintenance records for CEMS records Observe zero span testing or meter calibration records
Stationary Fuel Combustion	Accuracy	Analytics Concern – energy efficiency ratio is 10% higher than for comparable	Average of year	Test of detail - Inspection of documents, Inquiry	Inspect manufacturer’s specs as to the normal operating efficiency

Category/ Line Item	Verification Objective	Risk/Concern Identified	Period	Type of Procedure (analytical test, test of detail, test of controls)	Description of Procedures (nature, timing, and extent)
		equipment in the industry			Inquire of maintenance personnel as to overhauls and improvements made to specific piece of equipment Identify whether mandatory quantification methodologies have been applied for the emission source. If not, confirm whether the facility has been granted a deviation from the department for use of alternative quantification methodologies
Stationary Fuel Combustion	Accuracy	Planning Analytics Concern- production and emissions trend in opposite directions	June, Sept of year	Test of detail – Inquiry, Inspection of Records Analytical test – correlation, profile	Inquire of operators as to any production anomalies in June and September Sample daily data for the months of June and September Run correlation and profile analytical tests for daily data for June and September Inspect maintenance records for June and September (or for 2 months)
Industrial Process	Classification	Misclassification of process emissions		Test of detail - inspection	Inspect inventory and compare classification with program criteria
Production	Classification	Improper classification of shrinkage		Test of detail - inspection	Inspect production accounting records and determine methods of allocating shrinkage

Category/ Line Item	Verification Objective	Risk/Concern Identified	Period	Type of Procedure (analytical test, test of detail, test of controls)	Description of Procedures (nature, timing, and extent)
	Accuracy	Inaccurate measurement of production		Test of control	<p>Inspect all calibration records</p> <p>Observe meter locations and identification and determine whether they measure the appropriate production</p> <p>Identify whether mandatory quantification methodologies have been applied for the production. If not, confirm whether the facility has been granted a deviation from the department for use of alternative quantification methodologies</p>
	Validity	Production used as fuel used on site		<p>Analytical test – efficiency</p> <p>Test of detail – inspection</p> <p>Test of control - observation</p>	<p>Run efficiency ratios for equipment to determine if the fuel consumed is appropriate</p> <p>Inspect production records and invoices to locate the source of the fuel for the equipment</p> <p>Inspect site to determine if there is appropriate piping and meters for measuring production that is used as fuel onsite</p>

4. Verification, Validation, or Audit Execution

This section describes the execution of the validation, verification, or audit procedures after the initiation phase. Validation, verification, and audit activities that are conducted are often iterative and are revisited throughout the process.

4.1. Site Visit

The site visit is a required and crucial component that helps confirm emissions, production, emission reductions, financial data, and information reported in the statement. During the site visit, the third party assurance providers and auditors have the opportunity to physically inspect the various source operations, review records, data, and account management systems. Where a facility is spread out over a large geographic area (e.g., pipelines) or is an aggregated facility or an emission offset project is aggregated, it may not be practical to visit every part of the facility each year or for every project report. In these circumstances, site visits should be undertaken on a sample basis, established on a risk-based approach. Justification for the sample size and selection process should be provided in the validation, verification, or audit plan and report. The third party assurance provider or auditor may also choose to visit a location that is not the facility, such as the company main headquarters, as data and financial records are held at a separate location.

A third party assurance provider or auditor may contact the department to request approval to omit the site visit if there are specific reasons conducting a site visit is considered redundant or not required. For example, if a third party assurance provider was retained to conduct a re-verification of a facility report or benchmark application and a site visit was previously conducted by the same third party assurance provider.

The third party assurance provider or auditor is required to contact the facility or emission offset project to arrange the timing of the site visit. Facilities and projects are expected to work with the third party assurance provider or auditor to establish a schedule that allows for all required validation, verification, or audit activities.

4.1.1. Site Access and Information Requested During Validation, Verification, or Audit Process

Facilities and projects must provide adequate access for the third party assurance provider or auditor to conduct a site visit and provide the information requested by the third party assurance provider or auditor. Not meeting this requirement may result in an adverse or qualified validation, verification, or audit statement and/or compliance investigation or administrative penalty from the department.

Each site visit has different aspects but follows a typical flow with an opening meeting, a facility/project site tour, interviews with key personnel, review of records, calculations, and other supporting documentation, and a closing meeting to discuss initial findings and next steps in the validation, verification, or audit.

4.1.2. Opening Meeting and Closing Meeting

The opening meeting is an opportunity to introduce the validation, verification, or audit team members, discuss the objectives of the site visit, review, and revise the itinerary, and answer any initial questions about the process. The closing meeting provides an opportunity to review initial findings, itemize information requests, and discuss next steps.

4.1.3. Review, Operations, Records, Data Management

The site visit allows the third party assurance provider or auditor to collect evidence by both observation and by obtaining hard copies or electronic records at the facility/project. This step is iterative in that the evidence collected will inform additional procedures that may be required, and in some cases, will change the approach, and validation, verification, or audit and sampling plans.

4.1.4. Interviews with Facility or Project Personnel

The site visit offers the opportunity for third party assurance providers or auditors to interview specific key personnel (i.e., in operations, accounting, procurement, information systems, instrumentation, maintenance, operations, etc.) to obtain a more detailed understanding of:

- Process operations (normal and upset conditions);
- Technologies and process proposed in the emissions reduction plan;
- Relationships between process and financial variables;
- Availability of measurements and records;
- Common performance metrics from an operational perspective;
- Significant operational events (e.g., shutdowns, changes in operations, emergencies, retrofits, etc.) that occurred during the statement period;
- Processes used to assess the risk of misreporting;
- Technical or data management processes;
- Controls used to capture and process relevant data;
- Production and accounting records for facilities, and
- Influences, such as reward systems, on the behaviour of management and other key personnel that might affect the risk of misstatement in a reported parameter such as the facility's greenhouse gas emissions or production.

Follow-up discussions with key facility personnel may be warranted and should be conducted at the discretion of the third party assurance provider or auditor. Third party assurance providers or auditors may also request a telephone conversation if unable to meet with an individual on site.

4.1.5. Virtual Site Visits

Site visits described in this standard generally require a verifier to be physically present at the facility or project location to conduct an inspection. Virtual site visits are a method of conducting site visits using information and communication technologies (ICT), which allow the verifier to conduct inspections remotely. Reasons for conducting a virtual instead of a physical site visit may include the presence of health and safety issues at a site or restricted access to certain areas of a site.

In accordance with section 3(1)(h) of part 1 of this standard, the director may provide written authorization for a third party assurance provider to conduct a virtual site visit instead of a physical site visit for any verification, if deemed appropriate. The third party assurance provider may submit a request to the director if seeking a waiver for a physical site visit.

The department recognizes that there are higher risks of not detecting material or significant errors in a facility or project statement if conducting a virtual site visit instead of a physical site visit. The verifier is responsible for mitigating these risks by conducting adequate verification procedures and sampling to ensure that the verification is conducted to a reasonable level of assurance.

If a verifier conducts a virtual site visit, the verifier must conduct the following:

- Document the decision and reasons for not conducting a physical site visit in the verification plan. The verification plan does not need to be submitted to the department prior to initiating the virtual site visit.
- Conduct the virtual site visit in accordance with the International Accreditation Forum (IAF) Mandatory Document for the Use of Information and Communication Technology (ICT) for Auditing/Assessment Purposes (IAF MD 4:2018) or as amended:
 - <https://www.iaf.nu/upFiles/IAF%20MD4%20Issue%202%2003072018.pdf>

- The verifier may utilize guidance materials that are provided by their accreditation body regarding the performance of virtual site visits. If other materials are used, the verifier should reference the documents in the verification plan.
- Identify the risks associated with not conducting a physical site visit and how the verifier intends to mitigate these risks in the verification procedures and sampling plan. Refer to section 3.3 for guidance on preparing a verification plan and section 3.6 for guidance on preparing a risk assessment.
- Outline specific findings in the verification report from the performance of the virtual site visit(s). This may include, but is not limited to:
 - Results from the completion of activities such as inspections of meters and source areas, data and information obtained, discussions with facility or project personnel, etc.
 - Issues encountered during the performance of the virtual site visit (i.e. technology challenges, inadequate remote access to areas of the site or project, unable to obtain information requested in real time, etc.).
 - Implementation of contingency plans or alternative verification procedures as a result of issues that occurred during the virtual site visit.

The following are some specific considerations and verification procedures to be evaluated by the verifier prior to initiating a virtual site visit:

- Agree on the type of ICT to be used by both parties (the verifier and facility/project team members) and ensure that both parties have screen sharing capabilities using the agreed upon communication platform.
- Ensure that a secure data transfer system is available for the facility or project team members to provide data or information requested during the virtual site visit.
- Determine which parts of the virtual site visit will require real time inspection and which can be conducted asynchronously. For example, the facility or project walk-through may require real time inspection using a video camera, while it may be appropriate to request time and location stamped photos of certain requested meters and serial numbers, fuel handling systems, and other source areas.
- Develop alternative or contingency plans if there are technology failures or other unforeseen circumstances. This may include rescheduling or extending the site visit, applying back-up technologies, or conducting additional data sampling.
- Evaluate and implement strategies to ensure that the facility or project boundaries are adequately assessed during the virtual site visit. This may include obtaining and reviewing detailed facility and process diagrams and recent satellite imagery prior to conducting the virtual site visit.

5. Data Review and Evaluation

Throughout the process, the third party assurance provider or auditor will collect, review, and evaluate data that is deemed to be pertinent to the validation, verification, or audit. During the data review and evaluation process, the third party assurance provider or auditor will:

- Review validation, verification, or audit procedures and findings;
- Reassess materiality and risks;
- Perform new analytics as required based on any new evidence provided throughout the validation, verification, or audit (section 3.4.5);
- Update working papers as required (section 3.9);
- Assess the evidence and confirm appropriate and sufficient evidence (sections 3.7.1 and 3.7.2) has been acquired to come to a conclusion on the statement;
- Conduct recalculations based on data collected during the validation, verification, or audit to assess quantitative materiality;
- Evaluate the statement against the applicable criteria and requirements of the Regulation and this standard (section 2.3.4);
- Conduct confirmations that reported details are correct (i.e. entries into the report files and forms such as location, description, reporter name);
- Review and assess all facts and evidence related to the facility's statement;
- Develop validation, verification, or audit conclusions:
- Conclude whether the statement conforms to the program criteria and disclosure requirements;
- Conclude whether the statement is corroborated by the evidence collected;
- Conclude whether the statement is materially correct; and
- Confirm working papers are updated and issues and questions are addressed and closed-out.

5.1. Material Threshold

The third party assurance provider or auditor is required to assess whether there are any material misstatements in the statement made by the responsible party. Materiality is described below:

Information is material if its omission or misstatement could influence the decisions of intended users taken on the basis of the statement.

Materiality can be expressed as quantitative or qualitative materiality as described in the sections below.

5.1.1. Quantitative Materiality

Quantitative materiality is an assessment of the aggregate of errors in reported values resulting from actual misstatements, incomplete inventories or misclassified emissions, quantifiable errors, and variability in estimates. Part 1 of this standard prescribes the materiality thresholds required for validations, verifications, and audits.

As a general requirement, third party assurance providers and auditors are required to assess the absolute aggregate of errors identified in a validation, verification, or audit when comparing with the materiality threshold.

The method of using absolute values for errors provides an assessment of internal control challenges within the organization. The higher the absolute error, the higher the controls risk. For example, two errors that are equal and large, but of opposite

sign would cancel each other in a net method of error aggregation, but will be clearly identified in the absolute value method of error aggregation (e.g., first: $+10-10=0$; second: $|+10|+|-10|=20$).

Total discrepancies below the materiality threshold are deemed immaterial and are assessed on a case-by-case basis to determine appropriate corrective action. The third party assurance provider or auditor may issue a positive assurance statement for an statement that contains unresolved immaterial discrepancies, but unresolved immaterial and material errors must be identified, detailed and quantified in the validation, verification, or audit report.

The following section provides further instructions to aggregate errors in validation, verification, and audit processes.

Emissions Reduction Plans

For validations of ERPs, the materiality threshold applies to the facility's forecasted emissions intensity (FEI). The FEI is determined by assessing the anticipated emissions intensity reduction from the implementation of reduction activities at the facility compared with an established baseline. Product "j" may represent one or multiple products. Individual discrepancies (Δ_i) are identified for the forecasted emissions and production. The net effect of all the discrepancies identified for the forecasted emissions (numerator) and forecasted production (denominator) are calculated separately using the following equations:

$$\Delta_{emissions,j} = \sum_i \Delta_{i,emissions,j} \quad \text{Equation 5-1}$$

$$\Delta_{product,j} = \sum_i \Delta_{i,product,j} \quad \text{Equation 5-2}$$

The corrected forecasted emissions and production values are calculated by subtracting the net discrepancy for the reduced emissions and production separately using the following equations:

$$Emissions_{j,corrected} = Emissions_{j,reported} - \Delta_{emissions,j} \quad \text{Equation 5-3}$$

$$Product_{j,corrected} = Product_{j,reported} - \Delta_{product,j} \quad \text{Equation 5-4}$$

The corrected FEI is determined by the following equation:

$$FEI_{corrected} = \frac{Emissions_{corrected}}{Product_{j,corrected}}$$

If the corrected FEI is greater than the reported FEI, the total error must be calculated per Equation 5-7 and compared with the materiality threshold as defined in part 1 to determine if there is a material error in the proponent's statement. If the corrected FEI is less than the reported FEI, the total error should be calculated; however it does not need to be compared with the materiality threshold as it would not be considered to be a material error.

The individual discrepancies are converted into percentages based on the corrected emissions reduction and production using the following equations:

$$D_i = \frac{\Delta_{i,emissions}}{Emissions_{corrected}} \times 100\% \quad \text{Equation 5-5}$$

$$D_i = \frac{\Delta_{i,product,j}}{Product_{j,corrected}} \times 100\% \quad \text{Equation 5-6}$$

The total error is the sum of the absolute individual (percentage based) discrepancies for both the forecasted emissions and production combined per Equation 5-7, which is then compared with the materiality threshold:

$$Total\ Error = \sum_i |D_i| \quad \text{Equation 5-7}$$

Where:

Δ_i	=	Individual discrepancy of a parameter (emissions reductions or production), expressed in the unit of the parameter.
Δ	=	Sum (net effect) of discrepancies of a parameter (forecasted emissions or production), expressed in the unit of the parameter.
$Parameter_{corrected}$	=	Corrected parameter (forecasted emissions or production), expressed in the unit of the parameter.
$Parameter_{reported}$	=	Reported parameter (forecasted emissions or production), expressed in the unit of the parameter.
D_i	=	Individual discrepancy of a parameter (forecasted emissions or production) on a percentage basis.
$FEI_{corrected}$	=	Corrected Forecasted Emissions Intensity (tonnes CO ₂ e per unit of production)

Facility Reports and Benchmark Applications

Under TIER, several parameters are used to calculate the total regulated emissions (TRE) and allowable emissions (AE). These parameters include emissions from various source categories, imported, and exported indirects such as electricity, industrial heat, and hydrogen, imported and exported CO₂, CO₂ used in urea production, and products with high performance benchmarks and facility-specific benchmarks. The contribution of these parameters in the calculation of TRE and AE varies and therefore the errors identified for each parameter should be weighted to reflect its contribution to the TRE or AE. As such for verifications of facility reports and benchmark applications, the total error is calculated by Equation 5-8 and compared with the materiality threshold, which is prescribed in Part 1 of this standard.

Total Error =

$$\left[|\Delta_{DE}| + |\Delta_{imported\ CO_2}| + |\Delta_{exported\ CO_2}| + |\Delta_{urea\ CO_2}| + \sum_j |\Delta_{product,j} \times (AR_{product,j} + BCCA_{product,j})| + \sum_k |\Delta_{indirect,k} \times BHP_{indirect,k}| \right] \div (TRE_{corrected\ or\ AE_{corrected}})^*$$

Equation 5-8

*For the denominator of Equation 5-8, apply whichever term is greater in the equation.

Quantitative discrepancies may be identified for various parameters that are reported in facility reports and benchmark applications including:

- Production quantities;
- Indirects, imported, and exported (e.g. electricity, hydrogen, and industrial heat). Note that exported indirects are considered a product;
- Direct emissions (DE);
- Individual emission source categories (e.g. stationary fuel combustion, flaring, fugitives, etc.);

- CO₂, imported and exported; and
- CO₂ consumed in an urea production process.

Individual discrepancies (Δ_i) are calculated based on the corrected value minus the reported value. These discrepancies will have various units depending on the parameter that is being evaluated. Production can be based on a mass or volumetric unit depending on the type of product produced. Indirects, whether imported or exported, are in units of megawatt-hour (MWh) for electricity, tonnes for hydrogen, and gigajoules (GJ) for industrial heat. The net effects of discrepancies identified for each parameter are calculated using the following equations:

$$\Delta_{product,j} = \sum_i \Delta_{i,product,j} \quad \text{Equation 5-9a}$$

$$\Delta_{indirect,k} = \sum_i \Delta_{i,indirect,k} \quad \text{Equation 5-9b}$$

$$\Delta_{import CO2} = \sum_i \Delta_{i,imported CO2} \quad \text{Equation 5-9c}$$

$$\Delta_{exported CO2} = \sum_i \Delta_{i,exported CO2} \quad \text{Equation 5-9d}$$

$$\Delta_{urea CO2} = \sum_i \Delta_{i,urea CO2} \quad \text{Equation 5-9e}$$

$$\Delta_{source,n} = \sum_i \Delta_{i,source,n} \quad \text{Equation 5-9f}$$

Where:

Δ_i = Individual discrepancy of a parameter, expressed in the unit of the parameter.

Δ = Sum (net effect) of discrepancies of a parameter, expressed in the unit of the parameter.

For large emitters and opted-in facilities, two error terms are calculated for DE since DE is a function of emissions from several source categories. $|\Delta_{DE}|$ represents the sum of the absolute discrepancies from individual emission source categories such as stationary fuel combustion or flaring (Equation 5-9g), which is applied in Equation 5-8, while $\Delta_{DE,net}$ is the net sum of errors from each source (Equation 5-9h), which is used to calculate the corrected TRE in Equations 5-10a and 5-11a.

For aggregate facilities, the TRE is based on emissions and exported CO₂ from regulated emission sources for aggregate facilities only. Therefore, the corrected TRE is calculated based on Equations 5-10b and 5-11a. For all other parameters in the total error calculation that do not apply to the aggregate facility, the value would be zero in the calculation.

$$|\Delta_{DE}| = \sum_n |\Delta_{source,n}| \quad \text{Equation 5-9g}$$

$$\Delta_{DE,net} = \sum_n \Delta_{source,n} \quad \text{Equation 5-9h}$$

$$\Delta_{SFC,net} = \sum_n \Delta_{source,n} \quad \text{Equation 5-9i}$$

Where:

$|\Delta_{DE}|$ = Sum of the absolute discrepancies from individual emission sources, expressed in tonnes CO₂e.

$\Delta_{DE,net}$ = Sum (net effect) of discrepancies from individual emission sources, expressed in tonnes CO₂e.

Equation 5-10a is used to calculate the net effect on the TRE for large emitters and opted-in facilities based on $\Delta_{DE,net}$, imported and exported CO₂, and CO₂ consumed in the urea process if present at the facility.

$$\Delta_{TRE} = \Delta_{DE,net} - \Delta_{imported\ CO_2} + \Delta_{exported\ CO_2} + \Delta_{urea\ CO_2} \quad \text{Equation 5-10a}$$

Equation 5-10b is used to calculate the net effect on the TRE for aggregate facilities based on the $\Delta_{i,Agg,abs}$ and $\Delta_{exported\ CO_2}$. Note that the exported CO₂ would include CO₂ from regulated emissions sources for aggregate facilities only.

$$\Delta_{TRE} = \Delta_{Agg,abs} + \Delta_{exported\ CO_2} \quad \text{Equation 5-10b}$$

The corrected values for various parameters are then calculated as follows:

$$TRE_{corrected} = TRE_{reported} + \Delta_{TRE} \quad \text{Equation 5-11a}$$

$$Product_{j,corrected} = Product_{j,reported} + \Delta_{product,j} \quad \text{Equation 5-11b}$$

$$Indirect_{k,corrected} = Indirect_{k,reported} + \Delta_{indirect,k} \quad \text{Equation 5-11c}$$

$$AE_{corrected} = \sum_j \left(Product_{j,corrected} \times (AR_{product,j} + BCCA_{product,j}) \right) - \sum_k (Indirect_{k,corrected} \times BHP_{indirect,k})$$

$$\text{Equation 5-11d}$$

Where:

Parameter_{corrected} = Corrected parameter, expressed in the unit of the parameter.

Parameter_{reported} = Reported parameter, expressed in the unit of the parameter.

AR_{product,j} = Allocation rate for each product, which is the greater of the high performance benchmark and facility-specific benchmark of the product in tonnes CO₂e per production unit for that year.

BCCA _{product,j}	=	Cost containment allocation for product j, expressed in tonnes CO ₂ e per production unit.
BPB _{indirect,k}	=	High performance benchmark for indirect, k, expressed in tonnes CO ₂ e per MWh of electricity, tonnes of hydrogen, or GJ of industrial heat.

Emission Offset Project Reports

For project reports, the materiality threshold applies to the amount of quantified emission offsets that were generated for the Reporting Period under the offset project report. The total error must represent the sum of absolute errors identified by source/sink in the emission offsets reported.

Financial Statements

For financial statements, the materiality applies to the facility sales ratio (FSR), the facility profit ratio (FPR), and the product(s) sold as outlined in the Standard for Developing Benchmarks.

For audits of financial statements, the auditor must evaluate the errors to the FSR and FPR from the discrepancies of individual parameters and sources of errors in the equations and then take the absolute aggregate of the discrepancies from all of the parameters and sources of errors to compare with the materiality threshold. In other words, discrepancies in the numerator and the denominator of these equations cannot cancel out when evaluating the total error to the FSR and FPR.

The auditor must assess errors in the FSR and FPR using the following equations as applicable:

$$\sum_i^I ABS(FSR_{Error,i} - FSR_{Correct}) < 0.0006$$

$$\sum_j^I ABS(FPR_{Error,j} - FPR_{Correct}) < 0.002$$

Where,

ABS	=	Represents the absolute value;
FSR	=	Facility Sales Ratio as described in the Standard for Developing Benchmarks;
FPR	=	Facility Profit Ratio as described in the Standard for Developing Benchmarks;
FSR _{Error,i}	=	FSR calculated with the individual error from a single parameter or source of error;
FSR _{Correct}	=	FSR calculated based on correct values of all parameters;
FPR _{Error,j}	=	FPR calculated with the individual error from a single parameter or source of error;
FPR _{Correct}	=	FPR calculated based on correct values of all parameters;
i	=	Individual errors on a parameter or source;
I	=	Total number of individual errors;
0.0006	=	FSR Materiality Threshold;
0.002	=	FPR Materiality Threshold.

5.1.2. Qualitative Materiality

Qualitative errors refer to issues that cannot be quantified numerically but impact the statement. The materiality of qualitative errors is assessed based on the professional judgement of the third party assurance provider or auditor and can lead to an adverse opinion if material. Examples of qualitative issues that require a qualified or adverse opinion or additional disclosure include:

- Statement does not meet certain requirements under the Regulation, this standard, Standard for Developing Benchmarks, CPA Regulation, CAS, Standard for Greenhouse Gas Emission Offset Project Developers, and the applicable quantification protocol;
- Control issues that erode the third party assurance provider or auditor's confidence in the reported data;
- Poorly managed files;
- Difficulty in obtaining requested information or other transparency concerns;
- Reluctance or failure to disclose information that limits the third party assurance provider or auditor's ability to render an opinion on the statement including, but not limited to fraud or intentional misreporting; and/or
- Changes in operations that make the criteria less applicable.

Material misstatements identified during the validation, verification, or audit must be resolved to the extent possible during the validation, verification, or audit and should appear in the findings section of the report. If material errors in facility submissions cannot be resolved by the compliance deadline, the responsible party will need to contact the department to determine an appropriate course of action. Unresolved discrepancies need to be below the materiality threshold.

Third party assurance providers and auditors must provide an adverse statement (i.e. a statement that indicates that there are material misstatements in the statement) when there are unresolved material misstatements. Facilities must submit verification reports with a positive opinion for compliance purposes. Emission offset projects cannot be registered on the Alberta Emissions Offset Registry until material errors have been resolved. The department's reverification reports are valid with any of the three opinions. Cost containment applications must be submitted with a positive validation opinion for the validation of the ERP and positive audit opinion for the audit of the financial statement.

5.1.3. Confirmations

Confirmations are required for verification of compliance reports or offset project reports only. These are activities the department requires verifiers to perform during the verification. Confirmations are conducted to ensure that required data and information in facility reports and benchmark application are completed and accurate. The following is a list of confirmations required by the department:

- Correct entry of administrative fields such as facility codes and legal locations;
- Quantification methodology document is provided and consists of the required components;
- Simplified process flow diagrams and energy diagrams;
- Fuel usage;
- Additional request items/forms are complete and reasonable justification provided where needed;
- N/A is checked on pages in the reporting form that do not apply;
- For forecasting facilities, the fund to credit ratio was met;
- For oil sands facilities, the area fugitive calculations, including the areas of sources and all sources are accounted for, as required;
- For emission offset projects, confirm alignment with project report plan and project report form requirements; and
- For an aggregate facility, confirm that the compliance report includes all of the approved or benchmark application includes all of the intended individual COG facilities.

5.1.4. Subsequent Events

Subsequent events are events that occur after the statement period, and may occur before or after the statement of validation, verification, or audit has been issued. These events may affect the validity of the statement.

Subsequent events deal with situations that either existed during or after the validation, verification, or audit but changed after the statement period, or new situations that arose after the statement period. Examples of subsequent events are shown in Table 9 below.

TABLE 9: EXAMPLES OF SUBSEQUENT EVENTS

Existing Conditions that have Changed	New Situations
Estimation procedures used to determine fugitive emissions will be updated to reflect better scientific knowledge	An emergency system shut-down caused significant emissions
Announcement that federal regulations will be imposed on greenhouse gas emissions for this offset project next year	New equipment has been commissioned at the site.
The facility realized there was an error in a quantification method they had used.	Offset project was destroyed by a forest fire

New situations that arise after the statement period do not generally require adjustments to previous statement values, but may require disclosure to maintain a true and fair representation of facility and project operations or financial statements. Subsequent events that occurred during the statement period may require further action by the third party assurance provider or auditor.

If subsequent events are identified before the third party assurance provider or auditor has issued a statement of validation, verification, or audit, the third party assurance provider or auditor needs to assess the event and implications to the statement. Additional evidence may need to be collected, and additional procedures may need to be performed before the third party assurance provider or auditor can come to a conclusion and issue a statement.

If the event is noticed after the statement of validation, verification, or audit has been issued, the third party assurance provider or auditor may need to perform additional procedures, conduct further testing including collection of additional evidence, or other activities. If changes are made to the statement, a new statement of validation, verification or audit is required, and will need to be submitted to the department. The degree of change needed to the statement will depend on how material and pervasive the subsequent event is to the statement. Table 10 provides more information on the types of subsequent events and normal corrective actions.

TABLE 10: TYPES OF SUBSEQUENT EVENTS

	Between end of collecting evidence and issuance of the statement (Proactive)	After the statement has been issued (Reactive)
Third party assurance provider and auditor responsibility	Discover and evaluate events that are likely to have a material effect on the statement	Evaluate only those events that come to their attention
Third party assurance provider and auditor possible actions	Collect additional evidence Request statement disclosures Alter original statement	Suggest an amendment to the statement, to be supported by evidence Issue a updated statement
Procedures	Reviewing the most recent facility or offset project data and information Inquiring about recent activities that could affect the statement (e.g., new regulations or guidance, acquisitions/divestitures, operational interruptions)	None required

5.2. Update Working Paper Files

The purpose of working papers is to document the validation, verification, or audit to demonstrate that the validation, verification, or audit was conducted in accordance with the Regulation, this standard, the criteria set for the validation, verification, or audit, and other applicable regulations.

Working paper files are retained by the third party assurance provider or auditor and may be requested by the department if situations arise that require further clarification on the scope and extent of the validation, verification, or audit. These might include instances where a government reverification identifies material issues in a facility or offset project’s statement. Third party assurance providers are required to retain their working papers as prescribed in Part 1 of this standard.

5.3. Develop a Conclusion

Third party assurance providers and auditors are required to develop a conclusion or opinion based on the third party assurance provider or auditor’s assessment of the information and data collected during the validation, verification, or audit.

For a validation, verification, and audit, a reasonable level assurance conclusion is required and a positive factual statement that indicates whether the statement is materially correct and has been presented fairly. A third party assurance provider or auditor must have done sufficient testing of the evidence to determine that the statement is materially correct and fairly presented.

Developing a conclusion requires assessing whether:

- The quantification methods used are consistent with the criteria;
- The evidence is sufficient and appropriate to support the statement;

- The quantitative discrepancy is below the materiality threshold set by the department.
- The qualitative discrepancy is not considered to be material based on the professional opinion of the third party assurance provider or auditor;
- Estimates of emissions or other reporting parameters used are reasonable and consistent;
- The statement provides adequate disclosure for significant judgments and uncertainties such that the intended user can understand them; and
- The conclusion and the wording of the conclusion (e.g., determining how to phrase the conclusion and whether the conclusion should be a positive opinion, a qualified opinion or an adverse opinion).

5.4. Peer Review or Independent Review

For the purpose of this standard, a peer reviewer is a person who is qualified to conduct peer reviews for validations or verifications per the requirements under Part 1 and an independent reviewer is a person who is qualified to conduct independent reviews for audits per the requirements under Part 1. It is noted that the process of reviewing validations and verifications versus audits is similar; however, the qualifications of the individuals who can perform these tasks are different and are specified under Part 1 of this standard.

The peer reviewer or independent reviewer provides an independent review of the validation, verification, or audit plan plan, the working papers and the report before they are released to the responsible party and the intended user. The peer reviewer or independent reviewer must be familiar with program criteria, validation, verification, or audit processes, the subject matter, and internal risk procedures.

The peer reviewer or independent reviewer focuses on:

- Appropriateness of team competencies, qualifications, and impartiality;
- Review of the risk assessment, procedures performed and significant decisions made during the validation, verification, or audit;
- Whether sufficient and appropriate evidence was collected to support the conclusion;
- Whether the evidence collected supports the conclusions developed by the validation, verification, or audit team;
- Review of the statement and the statement; and
- Review of the validation, verification, or audit process compared with the standard applied.

During the peer review or independent review process, questions, or issues may be identified that were not fully addressed that need to re-evaluated by the validation, verification, or audit team members. This may include requesting additional information and/or clarification from the facility or offset project developer. The peer review or independent review process is complete once the remaining issues and questions have been addressed. The peer reviewer or independent reviewer needs to be identified in the report.

Supporting documents for the peer review or independent review including the credentials of the peer reviewer or independent reviewer, what was reviewed, the conclusions reached, and the date of the review are to be kept in the third party assurance provider or auditor's working papers.

6. Validation, Verification or Audit Report

Once the third party assurance provider or auditor has developed final conclusions, updated the working paper and completed a peer review or independent review, the validation, verification, or audit report and statement for the facility report, benchmark application, or offset report can be issued. A draft report is often provided to the responsible party for review prior to final issuance. This will allow the responsible party to address any outstanding issues and provide any additional clarifications.

Third party assurance providers or auditors are required to prepare a validation, verification, or audit report to document the activities conducted and the findings/conclusions of the validation, verification, or audit.

Verifiers are required to use the Verification Report Form as prescribed by the department and available on the department website and the Alberta Emissions Offset Registry (AEOR). If there are difficulties in using the template, contact the department. The template is intended to increase uniformity and ease of reporting as well as reduce effort and the costs of verification reporting. The template also allows opportunity for future online reporting.

Currently, a report template is not prescribed by the department for validations and audits; therefore validators and auditors may use their own report template. However, the department requires that all of the report elements listed below be included.

The validation, verification, or audit report includes at least the following:

- The statement being validated, verified, or audited;
- Validation, verification, or audit objective, scope, level of assurance, criteria, and materiality threshold;
- Validation, verification, and audit procedures;
- Team members and roles including team member experience and qualifications;
- Assessments used for the statement;
- Material and immaterial discrepancies identified and quantified;
- Assessment of materiality;
- Validation, verification, or audit conclusion; and
- Final validation, verification, or audit plan and schedule (including the risk assessment and final sampling plan).

Once a draft report has been reviewed internally by the peer reviewer or independent reviewer and finalized, the following completed documents must be included:

- Final validation, verification, or audit report;
- Signed Conflict of Interest Checklist (for validations and verifications only);
- Signed Statement of Qualification (for validations and verifications only);
- Signed Statement of Validation, Verification, or Audit (section 6.1);

Although a signed conflict of interest checklist and statement of qualification forms are not required for auditors, the department requires the auditors to conduct an independence evaluation to assess if there are any conflicts to perform the audit and conduct an evaluation of team member qualifications to meet requirements specified under this standard, the CPA Regulation, and the CAS.

The responsible party is required to submit the report and the associated signed forms with the submission of their facility report, benchmark application, or emission offset report.

6.1. Statement of Validation, Verification, or Audit

A positive statement of validation, verification, or audit is required to be included for validations, verifications, or audits, which includes the following:

- Name of Lead Validator, Verifier, Auditor;
- Name of Validation, Verification, or Audit Company;
- The Statement;
- Responsibilities of Responsible Party and Third Party Assurance Provider or Auditor;
- Validation, Verification, or Audit Opinion;
- Signature Date;
- Designated Signing Authority's Signature (for validations or verifications);
- Lead Validator's or Lead Verifier's Signature (for validations or verifications); and
- Lead Auditor's Signature (for audits).

The verifier should ensure that the conclusions provided in the verification report are consistent with the opinion provided in the verification statement. An example of a positive verification statement is:

Based on the verification conducted by _____, the statement prepared by _____ was determined to be free of material misstatements, fairly presented, substantiated by sufficient and appropriate evidence, and was prepared in accordance with the Technology Innovation and Emissions Reduction Regulation and relevant criteria.

6.2. Modifications to the Statement of Validation, Verification, or Audit

Situations may arise that affect the third party assurance provider or auditor's ability to issue a positive assurance finding. Issues that affect the third party assurance provider or auditor's opinion can result in a qualified opinion or an adverse opinion.

If situations arise at a facility that result in a third party assurance provider or auditor not being able to issue a statement of validation, verification, or audit, or if significant time is required to correct misstatements and the facility is at risk of not meeting its compliance deadline, the responsible party will need to contact the department to determine an appropriate course of action. If this occurs at an offset project, the responsible party must address the issues before the greenhouse gas emissions reductions can be verified and registered on the registry.

6.2.1. Qualified Opinion

A qualified opinion offers a favorable opinion on the statement except for a specific scope limitation or disagreement with the statement. Scope limitations occur when there is a specific, known situation that impedes the third party assurance provider or auditor's ability to perform procedures. (i.e., meter malfunctioned and some data not available, records being destroyed in a fire and therefore, not available to review, etc.).

The third party assurance provider or auditor needs to decide whether the qualification is material and/or pervasive to the statement. If it is material or pervasive, an adverse opinion must be provided.

A statement with a qualified opinion must contain the following:

- Description of the limitation or disagreement; and
- The potential effect on the statement.

6.2.2. Adverse Opinion

An adverse opinion is issued when the statement contains: one or more unresolved material misstatements; improper application of the criteria or subsequent disclosures that are material and pervasive; or uncertainties that are material and pervasive.

The different types of opinions available to the third party assurance provider or auditor are based on the unique circumstances of the validation, verification, or audit. It takes into consideration whether the misstatements are material and pervasive to the statement, if there was adequate disclosure, and if there are significant uncertainties that affect the conclusion.

6.3. Issuance of the Submission Documents

The final submission documents for validations or verifications, including the statement of validation or verification must be signed by the designated signing authority and included in the appendix of the validation or verification report.

The final submission documents for audits, including the statement of audit must be signed by the Lead Auditor and included in the appendix of the audit report.

Electronic signatures are allowed. The electronic signature must be of sufficient quality to identify the person signing statement and report, and be consistent with the purpose of the document or record being signed. the department reserves the right to request signed originals where the electronic signature is ambiguous or cannot be verified.

7. Verification of Benchmark Applications

For facilities seeking a facility-specific benchmark (FSB) for products, the facility may submit a benchmark application to the department per section 7 of the Regulation. Benchmark applications are prepared in accordance with the Standard for Developing Benchmarks and are required to be third party verified. As there are differences in the information and data reported in benchmark applications compared with compliance reports, verifications of benchmark applications should include the following:

- For opted-in facilities, the verifier should confirm that the facility has been approved by the director to opt into TIER.
- The verifier is required to confirm whether the product(s) that the facility is seeking facility-specific benchmark(s) for are eligible to receive facility-specific benchmarks in accordance with TIER and the Standard for Developing Benchmarks.
- The verifier is required to confirm whether the emissions, production, and imports and exports associated with indirect emissions are accurately represented by the facility's boundary file.
- The total error as prescribed in section 5.1 should be calculated for each year of information provided in the benchmark application. For example, if data from 2013 to 2015 were provided in the benchmark application, the verifier is required to calculate the total error for each year and assess materiality individually for each year.
- For facilities that produce multiple products and are applying for one or more facility specific benchmarks for product(s), the verifier is required to review the splits in emissions and imported indirects between the products and indicate whether the facility's methodology is reasonable.
- Benchmark applications typically contain data and/or calculated values that were not subject to mandatory quantification methodologies and/or not previously reported under the Specified Gas Emitters Regulation (SGER) or Carbon Competitiveness Incentive Regulation (CCIR). The following are verification requirements for various data scenarios:
 - Previously reported and verified under the SGER or CCIR - the verifier is required to confirm that the data and calculated values in the benchmark application matches those reported in the SGER or CCIR compliance report(s);
 - Not previously reported under SGER or CCIR - the verifier is required to determine whether the data and calculated values are consistent with quantification methodologies prescribed in the AQM. If not, the verifier is required to confirm the facility has been granted a deviation from the quantification methodologies or the quantification methodologies applied represent a conservative approach for benchmarking. For example, facility emissions would be estimated to be conservatively low; while production would be estimated to be conservatively high.

Additional clarifications for the verification of aggregate facilities are provided in section 8.0.

8. Verification of Aggregate Facilities

Aggregate facilities are composed of two or more conventional oil and gas facilities (COGs) as defined under TIER. COGs within an aggregate facility may be geographically spread out across Alberta. As well, there may be one or multiple locations where data is collected and managed depending on the organizational structure of the aggregate facility.

In general, verifications of benchmark applications and compliance reports for aggregate facilities are similar to other regulated facilities under TIER and verifiers are required to follow the requirements outlined in this standard. The verifier is required to use a risk-based approach to develop a verification plan and sampling plan to ensure that the verification is conducted to a reasonable level of assurance. As well, the qualifications and make-up of the verification team must meet the requirements specified in Part 1 of this standard.

8.1. Verification requirements for aggregate facilities

Aggregate facilities are subject to different regulatory requirements under TIER, therefore the following are clarifications and additional or modified requirements for the verification of aggregate facilities:

- The verifier is required to prepare and submit a single verification plan and verification report for an aggregate facility benchmark application or compliance report. The verification report must include one set of completed and signed forms including the Conflict of Interest Checklist, Statement of Qualifications, and Statement of Verification.
- The verifier is required to confirm whether all of the individual COGs within the aggregate meet the definition of a conventional oil and gas facility as defined under TIER and are consistent with the facility lists of the Confirmation of Regulation (COR).
- The verifier is required to assess whether the facility's procedures to compile x, y coordinates for COGs is reasonable.
- The verifier is required to conduct a desktop review of the the boundary files provided for COGs with equal to or greater than 10,000 tonnes of CO₂e emissions. The verifier is required to assess whether the boundary file is representative of the facility boundary and whether reported facility emissions are within the boundary. The department does not expect the verifier to conduct a site visit at every COG to confirm physical facility boundary.
- The verifier is required to assess whether data for all of the COGs within an aggregate facility has been included in a benchmark application or compliance report. To assess this, the verifier should review the *.csv file that is provided with the approval for an aggregate facility to opt into TIER.
- If Petrinex data is used in a benchmark application or compliance report, the verifier is required to evaluate the accuracy and completeness of the fuel consumption, flare volumes and production based on data reported in Petrinex. The verifier is not required to trace the reported values in Petrinex back to meter or source data.
- For fuel consumed at COGs that are not reported in Petrinex, the verifier is required to review third party invoices or accounting records and/or meter data to determine the accuracy and completeness of the fuel consumed for the aggregate facility.
- The verifier is required to evaluate whether the quantification methodologies selected for the COGs are consistent with the requirements outlined in the Alberta Greenhouse Gas Quantification Methodologies, Standard for Developing Benchmarks, Standard for Completing Greenhouse Gas Compliance and Forecasting Reports, and the benchmark application(s) that was submitted by the aggregate facility.
- The verifier is required to evaluate whether the emissions quantified and reported in the benchmark application and/or compliance report is consistent with the definition of stationary fuel combustion and flaring emissions in the Regulation and Alberta Greenhouse Gas Quantification Methodologies.

8.2. Site visit requirements for aggregate facilities

Site visits are generally required for the verification of benchmark applications and compliance reports for aggregate facilities. Mandatory requirements for site visits are outlined in Part 1 of this standard. The following are some additional guidance for site visits conducted at aggregate facilities:

- The verifier may use a risk-based approach to determine the appropriate number of site visits at a selection of COGs. The verifier is not expected to conduct a site visit at every COG within an aggregate facility.
- Where appropriate and aligned with the risk assessment, the verifier may consider conducting at least one site visit for each type of COG in the aggregate facility. For example, an aggregate facility may consist of gas processing plants, well pad sites, and compressor stations. In this example, the verifier may wish to conduct at least one site visit at a gas processing plant, well pad and compressor station.
- If a verifier is conducting multiple verifications for the same aggregate facility (i.e. benchmark application and compliance reports), the verifier should consider selecting different COGs for site visits, where appropriate.
- The verifier is required to conduct a site visit at the location where the data used for benchmarking and/or compliance reporting is managed. If there are multiple locations where data is managed, the verifier may conduct site visits at a sample of these locations based on a risk-based approach.

9. Focused Verifications

As part of the compliance review process, the director may request that a focused verification be conducted on a portion of a compliance report, benchmark application, or data submission. For these requests, the director will provide specific requirements for the focused verification. The following are general requirements for conducting focused verifications:

- The verifier is required to calculate the total error in accordance with section 5.1 based on discrete errors identified in the portion(s) of the submission being verified. This assumes that there are no errors in other parts of the submission that are not part of the scope of the focused verification. This modified total error would form the basis of the verifier's opinion for the focused verification. Although a verifier may present a positive opinion in a focused verification, the department will assess the total error fully based on discrete errors identified in the focused verification and previously conducted verifications in order to determine if there are any material errors in the submission.
- For focused verifications, the verifier is required to follow the requirements in this standard; however, the verification procedures may be tailored specifically to address the areas or portions of the submission that are being verified. For example, if the purpose of the focused verification is to assess the electricity generated, imported, and export from the facility, the verifier is required to develop a verification plan that will assess the reported data and as well as other parameters that are impacted such as the electricity allocations and the total regulated emissions.
- For some focused reverifications, the department may request to review the verification plan and sampling plan prior to implementation. As well, the department may request to review a draft verification report prior to finalization.
- Site visit requirements will be requested on a case-by-case basis at the discretion of the director.
- Verifiers are recommended to contact the department if clarification or guidance is needed for any focused verifications that they are contracted to conduct.

10. Government Re-Verifications

After a facility report or benchmark application has been submitted or after emission offsets, resulting from the emission offset project report, have been serialized, the director may choose a facility report, benchmark application or project report to be reverified by a third party assurance provider who is selected and hired by the director.

If the director selects a report, benchmark application or project to be reverified, they may direct the facility to provide information deemed necessary for reverification.

The facility or the project developer shall comply with any direction made by the director.

10.1. Errors during Re-verification of a Facility Report or Benchmark Application

Where a third party assurance provider or the facility, during the course of a re-verification, identifies a material error, omission or misstatement in the facility report or benchmark application, the facility cannot revise the facility report or benchmark application for the re-verification and the verifier must issue an adverse opinion. As follow up to the reverification, the department will provide direction on corrective actions.

10.2. Errors during Re-verification of an Offset Project

Refer to section 2.8.3 in Part 2 of the Standard for Greenhouse Gas Emission Offset Project Developers for requirements.

11. Government Re-Validations, Re-Audits or Reviews

After the submission of a cost containment application and an emissions reduction plan report, the department under the Regulation may request a re-validation of an ERP or request a re-audit of a financial statement as part of the ERP and the emissions reduction plan report. The department may also request a review engagement for financial statements that have been submitted. Review engagements will follow the Canadian Standard for Review Engagements (CSRE) 2400, Engagements to Review Historical Financial Statements (CSRE 2400).

Appendix A: Glossary

Term	Definition
Adverse Conclusion	The statement of verification that the third party assurance provider issues when the statement contains material misstatements that cannot be resolved.
Aggregator	An entity acting as the offset project developer of aggregated offset projects.
Alberta Emission Offset Registry (AEOR)	A web-based platform that stores, serializes and tracks emission offsets in the Alberta emission offset system.
Analytics/Analytical Procedures	Evaluations of information made by a study of plausible relationships among both greenhouse gas and non-GHG data.
Statement	Representations by the responsible party.
Attribute Level	Potential misstatements or effects that affect a characteristic of the statement. Attribute level is more detailed and narrow in scope than greenhouse gas statement level.
Audit	An engagement to form an opinion on the financial statements in terms of being fairly represented in all material aspects. An audit is conducted to a reasonable level of assurance.
Baseline	A reference case greenhouse gas emissions scenario used in calculating offsets.
Certifying Official	Is the person designated by the facility with signing authority for that facility.
Confirmation	A specific type of inquiry that checks the entered administrative detail and compares it with other sources to corroborate it as true.
Conflict of Interest Form	A signed document identifying any real or perceived conflict of interest that may compromise the impartiality of the third party assurance provider.
Contribution Analysis	An analysis of the line-item contribution compared with the statement or components of the statement used to identify appropriate procedures for the validation or verification plan.
Control Environment	Is a component of internal control that reflects the governance and management functions, and the attitudes, awareness and actions of those charged with governance and management on the internal controls for greenhouse gas evidence.

Term	Definition
Control Risk	Is the risk that the responsible party's internal controls do not detect, prevent or correct a material misstatement in the statement.
Controls / Control Activity	Is a component of internal control that deal with policies and procedures that help ensure that the responsible party's directives are carried out.
Detection Risk	Is the risks that the verification procedures will not detect a misstatement that exists in an statement that could be material to the statement.
Discrepancy	Is the divergence or disagreement, usually between facts and statements.
Eligibility Criteria	Are minimum requirements an offset project needs to meet to be eligible for use in the Alberta emission offset system.
Emission Reduction	Occurs when emissions released into the atmosphere by a source are decreased or eliminated.
Emissions Reduction Plan	A plan submitted as part of a facility's cost containment application and further described in the Standard for Developing Benchmarks.
Emissions Reduction Plan Report	A required annual report for facilities with cost containment status. The report is further described in the Standard for Developing Benchmarks.
Sequestration	Occurs when CO ₂ or CO ₂ e is removed from the atmosphere and geologically stored, through sequestration processes.
Error	An unintended misstatement in amount or disclosure in the statement.
Evidence	Refers to all of the information used by the third party assurance provider to arrive at the conclusion, which is expressed in the statement of verification or statement of validation.
Fraud	An intentional act by one or more individuals in the responsible party or third parties involving the use of deception to obtain an unjust or illegal advantage.
Global Warming Potential (GWP)	Measures a greenhouse gas's relative warming effect on the earth's atmosphere compared with carbon dioxide and is expressed as a 100-year average. Alberta accepts the Intergovernmental Panel on Climate Change's warming potentials for the gases regulated under the TIER.
Greenhouse Gas Species	A category of greenhouse gas based on its chemical structure (e.g., chlorofluorocarbons).
Independence	Is a surrogate measure for objectivity. It requires the third party assurance provider or auditor to be free from conflicts of interest that

Term	Definition
	could alter, impact, or influence the third party assurance provider or auditor's opinion on the statement.
Independent Reviewer	Is an independent qualified professional who reviews the audit. This person cannot be the lead auditor.
Inherent Risk	Is the susceptibility of an statement to misstatements assuming that there are no internal related controls.
Inquiry	Is the action of seeking information from knowledgeable persons internal and external to the responsible party.
Inspection	Refers to the examination of records, documents and tangible assets.
Intended User	The person or persons for whom the third party assurance provider or auditor prepares the statement of validation, verification, or audit.
Internal Control	The process designed and effected by the responsible party to provide assurance of the entity's achievement of objectives. These objectives include reliability of greenhouse gas reporting, effectiveness and efficiency of operations and compliance with laws and regulations.
Limited Assurance	Is a moderate (review) level of assurance, or negative assurance.
Line Item	Is a grouping of greenhouse gas sources and sinks that share the same inherent and control risks.
Management Systems	Management system framework of processes and procedures used to ensure that an organization can fulfill all tasks required to achieve its objectives.
Misstatement	Is the accidental or intentional untrue statement information due to fraud, omission or error.
Observation	A process of looking at a processes and procedures performed by other qualified individuals.
Omission	Is missing information.
Peer Reviewer	Is an independent qualified professional who reviews the third party validation or verification. This person cannot be the lead validator, verifier or the designated signing authority.
Positive Opinion	Unaltered, clean statement of verification without qualifications.
Procedures	Are techniques used to gather evidence to substantiate the reliability of a statement.

Term	Definition
Program Criteria	The benchmarks used to evaluate or measure the greenhouse gas information or other reporting requirements.
Qualified Opinion	Occurs when the statement contains omissions or misstatements that affect the statement, but are not material enough to require an adverse opinion.
Qualitative Materiality	Misstatements of properties that are non-numerical (i.e., cannot be quantified using numbers), but that may influence the decisions of the department taken on the basis of the greenhouse gas statement.
Quantification Protocol	Is a government-approved methodology that outlines appropriate baseline conditions, eligible sources and sinks, and emission reduction calculations for a specific emission reduction activity.
Quantitative Materiality	Refers to numerical misstatements that could influence the decisions of the department taken on the basis of the greenhouse gas statement.
Reasonable Level of Assurance	Is the highest level of assurance, other than absolute assurance. It is written as a positive assurance, and requires a more detailed review of evidence than for a limited level of assurance.
Recalculations	Involves checking the mathematical accuracy of documents or records by recreating the calculations done by the responsible party.
Re-performance	Means the third party assurance provider's independent execution of the responsible party's procedures or controls.
Reporter	Is the person designated by the facility responsible for completing the facility's benchmark application or compliance report.
Responsible Party	Is the person legally responsible for the greenhouse gas statement. This person is the person responsible in the case of a facility or the offset project developer in the case of an offset project.
Review Engagement	An engagement to form a conclusion on a financial statement such that the reviewer or practitioner did not identify any evidence to indicate that the financial statement is not materially correct. A review engagement is conducted to a limited level of assurance.
Risk Assessment	Are procedures performed to obtain an understanding of the entity and its environment, including internal control, to assess the risks of material misstatement with the statement. It evaluates inherent and control risks and determines the necessary detection risk to make the validation, verification, or audit risk appropriate given the objectives of the validation, verification, or audit.

Term	Definition
Sampling Plan	A sub-component of a validation, verification, or audit plan that details any sampling of records, documents, and controls.
Site Visit	A process whereby the third party assurance provider or auditor visits the site to gain familiarity with the facility by observing emissions sources, facility operations, on-site records handling, and/or accounting practices.
Source	Any process or activity that releases greenhouse gases into the atmosphere.
Statement of Qualifications	Is a signed statement attesting to the qualifications of the lead validator or verifier to undertake the validation or verification.
Statement Level	Potential misstatements or effects that affect the entire statement. Examples are tone at the top, incorrect GWPs, incomplete inventories, poor control environment, etc. Statement level is less detailed and broader in scope than attribute level.
Significant line items	Items that contribute 10 per cent or more to the total emissions inventory for the facility or constitute 10 per cent of the emission reductions in a project.
Subject Matter Expert	A person or firm possessing special skill, knowledge and experience in a particular field to enhance the validation, verification or audit process.
Subsequent Events	The treatment of events that occur after the date of the statement.
Substantive Analytical Procedures	Analytical procedures performed at the attribute level.
Substantive Procedures	Validation, verification, or audit procedures performed to detect material misstatement at the attribute level. These include tests of detail and substantive analytical procedures.
Tests of Control	Tests performed to obtain evidence about the operating effectiveness of controls in preventing, or detecting and correcting, material misstatements at the attribute level.
Tests of Detail	Tests for error or fraud at the source or sink/ transaction level or for items contained in the greenhouse gas inventory.
Tracing	The verifier will follow the greenhouse gas data along the reverification trail in the direction from meter readings to final reporting and tests for understatements.

Term	Definition
Uncertainty	A state of having limited knowledge where it is impossible to exactly describe the existing state, a future outcome, or more than one possible outcome.
Validation	Is a process that is used to assess an offset project or facility condition including quantification methodologies before the offset project or emissions reduction plan is implemented. Validation is required for the emissions reduction plan that is submitted as part of a cost containment application, but is not currently a requirement in the Alberta emission offset system.
Verification	Describes the process by which an objective third party examines or reviews an statement such as the greenhouse gas statement for an offset project and provides an opinion or conclusion on the statement.
Validation, Verification, Audit Acceptance	Is an initial screening phases done by the third party assurance provider or auditor to assess the responsible party to determine whether the third party assurance provider or auditor will undertake the validation, verification, or audit.
Validation, Verification or Audit Plan	Is the documentation that details the nature, timing and extent of the procedures for the validation, verification or audit. The plan is updated throughout the execution phase of the validation, verification, or audit as evidence is obtained and assessed.
Validation, Verification or Audit Risk	Is the risk that the third party assurance provider or auditor expresses an inappropriate conclusion when the statement is misstated.
Validation, Verification or Audit Strategy	Sets the general approach, the scope, timing and direction of the validation, verification, or audit and guides the development of a more detailed validation, verification, or audit plan.
Vouching	The verifier will follow the greenhouse gas data along the reverification trail in the direction from final reporting to meter readings and tests for overstatements.
Working Paper Files	The record of validation, verification, or audit procedures performed, relevant validation, verification, or audit evidence obtained, and conclusions that the third party assurance provider or auditor reached.

Any comments or questions regarding the content of this document may be directed to:

Alberta Environment and Protected Areas

12th Floor, 10025 106 Street

Edmonton, Alberta, T5J 1G4

E-mail: AEP.GHG@gov.ab.ca

John Storey-Bishoff

**Original signed by: John Storey-Bishoff, Executive
Director**

Climate Regulation and Carbon Markets

Alberta Environment and Protected Areas

January 30, 2023

Date: