Verification Report for Oldman 2 Wind Farm Offset Project (January 1, 2016 to June 30, 2016)

Final Report

Prepared for:
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EXECUTIVE SUMMARY

A summary of the verification of the Oldman 2 Wind Power Project (the Project) for the period of January 1, 2016 to June 30, 2016 is provided in Table E.1.

Table E.1 Verification Summary

Project Name	Oldman 2 Wind Power Project
Project Start Date	July 16, 2014
Credit Start Date	September 1, 2014
Credit Duration Period	September 1, 2014 to August 31, 2022
Verification Period	January 1, 2016 to June 30, 2016
Expected Lifetime of the Project	20 years
Project Contact	Mainstream Renewable Power (Transacting credits for Oldman 2 Project on behalf of Oldman 2 Wind Farm Ltd.) Alan McCarthy, Asset Operations Manager - Canada & Generation Systems Manager Address: Arena Hse, Arena Rd, Sandyford, Dublin 18, Ireland Phone: +1 353 1 290 2058 Fax: +353 1 294 2390 Email: Alan.McCarthy@mainstreamrp.com Web: http://www.mainstreamrp.com
Applicable Quantification Protocol	Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008)
Other Environmental Attributes	The Project is 100% owned by Oldman 2 Wind Farm Ltd. (held fully by IKEA Properties Limited). The facility is operated by EDF Renewable Services. Mainstream Renewable Power is transacting the credits on behalf of Oldman 2 Wind Farm Ltd (the Owner). Currently the Owner has exclusively registered the Project offsets under the Alberta Emissions Offset Registry. However, the Project is eligible to create Renewable Energy Certificates (RECs) and the Project may be registered in the Western Renewable Energy Generation Information System (WREGIS) at some point in the future, or alternatively the Owner may decide to set aside some RECs for retirement.
Project Registration	The Project is registered under the CSA Group Alberta Offset Registry.
GHG Assertion	The fundamental assertion to be verified is the quantification of 48,846 t CO_2e in GHG reductions for the period of January 1, 2016 to June 30, 2016 resulting from the production of electricity through wind turbines instead of fossil fuel combustion at the Oldman 2 Wind Power Project, located in Pincher Creek, Alberta.
Level of Assurance	The *SGER* and AEP require the verifier to conduct sufficient procedures to deliver a ***reasonable level of assurance***. The verification was planned and executed accordingly.
Verification Criteria	• *Climate Change and Emissions Management Act (the Act), SA 2003, c C-16.7;* • *Specified Gas Emitters Regulation, Alta Reg. 139/200, with amendments up to and including Alberta Regulation 104/2015 (Regulation);*

Table E.1 Verification Summary

	• Technical Guidance for Offset Project Developers (version 4.0, February 2013); • Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008); and • The Emission Factors Handbook (March 2015, V1.0).
Verification Objective	The objective of the verification was to assess whether the Project Report under the *SGER* for the Project (the GHG assertion) satisfies the following AEP requirements: • *Climate Change and Emissions Management Act;* • *Specified Gas Emitters Regulation;* • Technical Guidance for Offset Project Developers (version 4.0, February 2013); • Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008); and • The Emission Factors Handbook (March 2015, V1.0).
Verification Standards	The verification was conducted in accordance with ISO 14064:3, ISO 14065, and guidance contained within the Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, January 2013, version 1.0.
Project Activity	The Project Activity is eligible under the SGER to generate offsets as it meets the following conditions. • Result from actions taken on or after January 1, 2002 – the Project began operation after this date. • Be real, demonstrable, quantifiable – the Project has been verified according to the Verification Criteria above. • Not be required by law – the Project is not required by any current or proposed law, nor is wind energy required to be purchased. • Have clearly established ownership. The Project is owned by Oldman 2 Wind Farm Ltd. The facility is operated by EDF Renewable Services. Mainstream has provided sufficient and appropriate evidence that Mainstream has been authorized to serialize the offset credits generated by the Project. • Be counted once for compliance purposes – the Project's offset credits are serialized on the Alberta Emission Offset Registry (AEOR). • Be verified by a qualified third party – Stantec is a qualified third party (see Section 1.0, 3.1, and Statement of Qualifications). • Have occurred in Alberta – the Project is physically located in Alberta and all power generated is sold to the Alberta Power Pool.
Verification Summary	No unresolved material misstatements were identified in the Project Report (including the Project Offset Plan) as submitted. The GHG assertion for the Project is deemed to be fairly presented and substantiated by sufficient and appropriate evidence. A reasonable level assurance verification statement was issued.
Verification Team	
Lead Verifier	Daniel Hegg, M.Sc., CEM
Designated Signing	Vicki Corning, P.Eng

Table E.1 Verification Summary

Authority	
Project Manager	Daniel Hegg, M.Sc., CEM
Independent Peer Reviewer	Joe Harriman, Ph.D., P.Chem.
Quality Reviewer	Vicki Corning, P. Eng.
Verifier	Orasa Webber, M.Eng.
Verification Timeframe	August - November 2016
Site Visit Dates	The site visit was conducted during the reporting period, on June 23, 2016. This site visit was conducted for the July 1, 2015 to December 31, 2015 crediting period as well as the crediting period of January 1 to June 30, 2016.
Report Date	November 16, 2016

1.0 INTRODUCTION

Mainstream Renewable Power (Mainstream) retained Stantec Consulting Ltd. (Stantec) to conduct a verification of the Project Report for the Oldman 2 Wind Farm Offset Project (the Project) located in Pincher Creek, Alberta. The Project Report is dated September 19, 2016.

In this work, Mainstream was responsible for the collection of data used in the calculations, data management, completion of the calculations, and presentation of the information within the Project Report, and for the supporting technical documents.

Stantec was responsible for planning and executing the verification in order to deliver an opinion to a reasonable level of assurance as to whether the Project Report is presented fairly and in accordance with the verification criteria. Stantec is a qualified third party verifier, as defined in Section 18 of the *SGER*. Stantec is accredited with the American National Standards Institute (ANSI), a member of the International Accreditation Forum (IAF), in accordance with ISO 14065 (Accreditation ID #0805 issued to Stantec Consulting Ltd. for greenhouse gas (GHG) verification).

1.1 PROJECT DESCRIPTION

1.1.1 Location

The Project is located in Pincher Creek, Alberta.

1.1.2 Processes and Activities

The Project generates electricity from twenty (20) 2.3 MW wind turbines for a total installed capacity of 46 MW. The Project generates emission reductions by displacing electricity generated by fossil fuel burning power stations in Alberta. In addition to the wind turbines, there is a substation on-site, connected to the turbines via an underground transmission and distribution system. There is no electricity storage system located onsite. The Baseline emissions are the emissions that would have been produced by burning fossil fuels for the generation of an equivalent amount of electricity. The Project emissions include natural gas combustion for space heating at the Operations and Maintenance (O&M) facility on-site and the back-up generator, gasoline combustion in on-site vehicles, electricity consumption for lighting and power, and sulphur hexafluoride (SF_6) leakage from the switchgear. Also included in Project emissions are fuel extraction and processing indirect emissions, as required by the Protocol.

The Project is 100% owned by Oldman 2 Wind Farm Ltd. which is held fully by IKEA Properties Limited. The facility is operated by EDF Renewable Services. Mainstream is transacting the credits on behalf of Oldman 2 Wind Farm Ltd.

Emission reductions are calculated as the difference between the Baseline and Project emissions.

1.1.3 Baseline Emissions

As defined by the Protocol, the Baseline scenario is the production of an equivalent amount of electricity by a conventional fossil fuel power plant based on the emissions intensity of Alberta electricity producers. Baseline emissions are estimated using the Project electricity production and a grid electricity emission factor developed by the Alberta Environment and Parks (AEP).[1]

1.2 GHG ASSERTION

The fundamental assertion to be verified is that the Project Report dated September 19, 2016 meets the criteria of AEP for the period of January 1, 2016 to June 30, 2016 (see Section 2.3).

The essential information contained within the GHG assertion verified by Stantec is presented in Table 1.1.

Table 1.1 GHG Assertion

Year	Baseline Emissions (t CO_2e)	Project Emissions (t CO_2e)	Emission Reductions (t CO_2e)
January 1, 2016 to June 30, 2016	49,026.31	180.07	48,846

Notes:
Emission Reductions are rounded down as per Guidance.

[1] http://esrd.alberta.ca/focus/alberta-and-climate-change/regulating-greenhouse-gas-emissions/alberta-based-offset-credit-system/offset-credit-system-protocols/documents/Memo-IncreasedElecticityUsage-Dec2011.pdf

2.0 VERIFICATION METHODOLOGY

2.1 VERIFICATION OBJECTIVES

The objective of the verification was to assess whether the GHG assertion (as presented in Table 1.1) for the Project Report under the *SGER* satisfied the AEP requirements in the verification criteria in accordance with the verification standards identified in Section 2.3.

2.2 LEVEL OF ASSURANCE

The *SGER* and AEP require the verifier to conduct sufficient procedures to deliver a ***reasonable level of assurance***. The verification was planned and executed accordingly.

2.3 VERIFICATION CRITERIA

Stantec has conducted sufficient and appropriate procedures in order to express a ***reasonable level of assurance*** opinion as to whether the Project (the GHG assertion) satisfies the requirements of the:

- Climate Change and Emissions Management Act (the Act), SA 2003, c C-16.7;
- Specified Gas Emitters Regulation, Alta Reg. 139/200, with amendments up to and including Alberta Regulation 104/2015 (Regulation);
- Technical Guidance for Offset Project Developers (version 4.0, February 2013);
- Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008); and
- The Emission Factors Handbook (March 2015, V1.0).

The verification was conducted in accordance with ISO 14064:3, ISO 14065:2014, and the Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, January 2013, version 1.0 (Verification Guidance).

2.4 VERIFICATION SCOPE

The verification is for the Project period of January 1, 2016 to June 30, 2016.

The verification covers the specified gases under the Act and the *SGER*. These include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). The total GHG emissions are reported as equivalent tonnes of carbon dioxide (t CO_2e) emissions.

Baseline and Project sources of GHG emissions are:

- **Natural Gas Combustion (CO_2, CH_4, and N_2O)**
  - Project source: on-site space heating and back-up generator.

- **Mobile Fuel Combustion (CO_2, CH_4, and N_2O)**
  - Project sources: on-site gasoline vehicles, and diesel-fueled cranes for maintenance.
- **Electricity Production (CO_2e)**
  - Baseline source: emissions from fossil fuel combustion to produce an equivalent amount of electricity as wind power electricity (during the crediting period) which would have happened in the absence of the Project.
- **Electricity Consumption (CO_2e)**
  - Project source: consumption of electricity from the Alberta grid to run the Project.
- **Sulphur Hexafluoride (SF_6) Fugitive Emissions**
  - Project source: leaks from switchgear equipment located in the Project boundary.
- **Fuel Extraction & Processing (CO_2e)**
  - Project source: indirect emissions associated with the extraction and processing of fossil fuel resources for Project operation (gasoline, natural gas, and diesel).

2.5 MATERIALITY

AEP has set the quantitative materiality threshold at 5% of the total reported GHG emission reductions or removals asserted. Qualitative misstatements are at the discretion of the verification body.

2.6 VERIFICATION PLAN

A copy of the final verification plan is provided in Appendix A. The activities described therein were executed during the course of the verification. The sampling plan, a subset of the verification plan, is outlined along with the final results in Section 5.0 of this report.

3.0 VERIFICATION TEAM: QUALIFICATIONS, ROLES AND RESPONSIBILITIES

The verification team is identified in Table 3.1.

Table 3.1 Verification Team

Name	Role	Responsibilities
Daniel Hegg, M.Sc., CEM	Lead Verifier	Carry out project management duties. Lead and delegate verification duties.
Vicki Corning, P.Eng.	Quality Reviewer	Review verification deliverables technical soundness and compliance with Stantec's internal processes and AEP criteria. Designated Signing Authority on verification documents.
Joe Harriman, Ph.D., P.Chem.	Independent Peer Reviewer	Independent review of verification activities and conclusions. The independent reviewer confirms the verification activities have been completed and that the activities provide the required level of assurance.
Orasa Webber, M.Eng.	Verifier	Assist in desktop review and deliverable preparation.

Full details of the qualifications of the project team are included in the final verification plan located in Appendix A.

3.1 STATEMENT OF COMPLIANCE WITH THE *SGER*

Ms. Vicki Corning is the signing authority for the report. She is a professional engineer registered by the Association of Professional Engineers and Geoscientists of New Brunswick (APEGNB) which satisfies Section 18(a)(ii)(A) of the *SGER*.

With respect to the technical knowledge required under Section 18(b)(i-iii), each member of the team has the required technical knowledge of GHG emission quantification methodologies and all have experience in completing third party GHG verifications. Please refer to the team profiles included in the verification plan in Appendix A.

4.0 VERIFICATION STRATEGY

Details of the verification activities undertaken as part of the verification strategy are set out in Table 4: Verification Procedures of the final Verification and Sampling Plan included in Appendix A and summarized in Section 5.0 of this report. The Verification and Sampling Plan for the Project was developed considering our initial assessment of the verification risk for the engagement. We assessed the initial verification risk as **Low**[2] for the verification of this crediting period (January 1, 2016 to June 30, 2016). Using the Verification and Sampling Plan, Stantec assessed the control procedures surrounding the GHG data and information. Important components included: processes for collecting, processing, consolidating and reporting GHG data and information; systems and processes that ensure GHG data accuracy, documenting and monitoring processes; methods to identify errors and methods to identify and report deficiencies in the reporting information and management system. Stantec verified equations used for quantification and monitoring purposes. These procedures included a site visit. Based on the results of the verification procedures undertaken, the final verification risk is deemed to be **Low**. This final risk assessment is shown based on the assessment of inherent, control and detection risk as follows.

4.1 INHERENT RISK

Inherent risk is the risk of error that occurs as a result of the lack of capacity by staff; the size/complexity of the organization or GHG project; the industrial sector; and/or, the technologies or processes being applied in the organization or GHG project. We regard this risk as **Low** due to:

- Electricity production/consumption for wind turbines and transmission lines are metered by a revenue quality meter with documented calibration records. Data are sourced by Alberta Electric System Operator (AESO) statements (low risk);
- Electricity and natural gas consumption for the operation/office building are metered by a third party for invoicing purposes (low risk);
- Gasoline consumption is metered at commercial fuel stations and tracked via receipts (low risk);
- Emission factors are from recognized sources (low risk); and
- The Project received positive verification statements for the previous three reporting periods (low risk).

4.2 CONTROL RISK

Control risk is the risk that the proponent's control system will not detect and rectify a misstatement. We regard this risk as **Low** due to:

- The Project has an expense report system in place to track gasoline consumption via receipts (low risk);

[2] Possible risk ratings are "high", "medium" and "low". These are based on inherent, control, and detection risks as evaluated by the project team prior to engaging in verification activities.

- Natural gas consumption and electricity production and consumption data are from monthly invoices or reports and used for accounting purposes. The consumption was re-aggregated per calendar month (low risk); and

- The calculators used for this reporting period have been previously reviewed by Stantec for the previous three reporting periods. Several detected errors were resolved and no material discrepancies exist in the calculator template (low risk).

4.3 DETECTION RISK

Detection risk is the risk that Stantec will not identify a material misstatement. We regard this risk as **Low** due to:

- Our quality management procedures. We are committed to providing exceptional service to our clients in accordance with our ISO 9001 and ISO 14065 accreditations. We believe that quality is a basic principle and have made quality management an integral part of our work. We take a systematic approach to quality management in compliance with ISO requirements and strive to achieve continual improvement. The cornerstone of our quality management system is an entrenched process of technical and independent peer review where our deliverables are objectively vetted by senior people in our firm.

- Level of assurance. The ***reasonable level of assurance*** applied in this verification (as required by the *SGER*) mandates that Stantec perform increased sampling to meet the assurance requirements, however, the level of assurance still increases the risk to Stantec as the risk-based verification approach means that not all information can be reviewed. Stantec has designed the sampling plan to target all potentially material items in the GHG information to minimize detection risk.

The verification team assessed whether the Project resulted in emission reductions in a manner consistent with the Project Offset Plan. During the verification, the verification team considered the level of audit risk noted above and incorporated necessary tasks to mitigate the audit risk. These tasks included:

- assessing conformance with applicable verification criteria, including the principles and requirements of relevant standards or GHG programs within the scope of verification;

- evaluating the establishment, justification and documentation of the Project Report;

- assessing the GHG project's quality assurance and controls; and

- assessing the information for consistency with our knowledge of Mainstream's operations.

The schedule for the verification activities is presented in Table 4.1.

Table 4.1 Schedule of Verification Activities

Verification Activity	Responsible Party	Date of Completion
Kick-Off communication with Mainstream	Stantec / Mainstream	August 26, 2016
Receive Mainstream Documentation	Mainstream	September 19, 2016
Desktop Review	Stantec	September 23 – 28, 2016
Provide Verification Plan to Mainstream	Stantec	October 3, 2016
Site Visit	Stantec / Mainstream	June 23, 2016
Receive Additional Documentation	Mainstream	October 6, 2016
Draft Verification Report	Stantec	October 14, 2016
Address Follow-Up Items	Stantec / Mainstream	November 7, 2016
Finalize Verification Report and Statement of Verification	Stantec	November 16, 2016

4.4 SITE VISIT

The site visit to the Project location, in Pincher Creek, Alberta was conducted during this reporting period (on June 13, 2016). Findings from this site visit have been applied to the verifications of the July 1, 2015 to December 31, 2015 and January 1, 2016 to June 30, 2016 reporting periods.

Stantec Verifier, Orasa Webber, conducted a site visit to the Project location, in Pincher Creek, Alberta on June 13, 2016. The following Mainstream personnel were interviewed:

- Ryan Bell (Project Manager, EDF Renewable Services); and
- Inês Ribeiro Canella (Asset Operations Manager - Oldman 2, Mainstream Renewable Power).

The tour was led by EDF Renewable Services representatives with in-depth knowledge of the Project. During the tour, Stantec performed procedures to identify Project boundaries, confirm GHG sources, look for additional sources, visually confirm the presence of electrical meters, as well as inquire about Project operations and the GHG data management system.

4.5 VERIFICATION PROCEDURES

The process of developing the sampling plan included a review of Mainstream's records and comparisons of raw data to calculation spreadsheets provided by Mainstream for the verification program. Interviews with the staff member listed above were conducted to assess various aspects of Project operations, data management, data storage, and transfer. Activities associated with

operations, record keeping, meter data management, and emissions sources were reviewed to better understand the calculations, data treatment, and data management for the Project.

The site boundaries were evaluated to confirm that no additional GHG sources, sinks, or reservoirs were present by comparing the GHG sources, sinks, or reservoirs with the previous site visit and inquiring about any change to the site operation, data collection and management, and quality controls. During the site visit, Stantec observed the electricity meters, natural gas space heating equipment, the substation, and the wind turbines.

Stantec's final sampling plan included sampling invoices and statements for electricity production, electricity consumption, and fuel, as well as recalculating Baseline and Project emissions and assessing consistency with the Protocol and AEP guidance. The final verification procedures are provided in the final verification plan (Appendix A) and summarized in Table 5.1.

4.6 CONFIRMATIONS

For this Project, Stantec confirmed that:

- the Project information was consistent across the Offset Project documentation;
- the Project location is as indicated in the Project Offset Report;
- the Project Plan contains the monitoring and quantification procedures applied to this Project for the period verified;
- the Project contact, report date, emission reduction numbers and other related information is accurate for the period verified; and
- the Project GHG Information System is consistent with the data flow diagram shown in the Project Plan.

5.0 SUMMARY OF FINDINGS

A summary of the key findings from this verification is provided in Table 5.1.

Table 5.1 Verification and Sampling Plan

Parameter	Procedures	Sampling Plan	Result
GHG Assertion	Reviewed the Project Report for the following information: • Location of the Project; • Project start date and period; • Registration of Offset Credits; • Project Plan; • Notice of Creation; • Protocol followed; and • Eligibility of GHGs reduction.	All required information.	**Satisfactory** • The Project takes place in Alberta. • The Project took place after January 1, 2002 and the emission reductions are claimed within the allowable 8-year crediting period. • The credits have been registered on the Alberta registry. • The Project Offset Plan is available on the Registry. • Mainstream has appropriately completed the Notice of Creation. • The Project is using an appropriate Protocol and the correct version of the Protocol. • The GHGs reduced are eligible.
	Conducted a site tour to compare emissions inventory to on-site sources.	All on-site GHG sources.	**Satisfactory** Stantec visually confirmed that the site does not have an electricity storage system. Stantec noted that there were no diesel combusting vehicles during the site visit. The third party natural gas meter was observed. No omission of emission sources was detected.
Ownership	Reviewed the Project Report for a statement regarding credit ownership. Reviewed ownership evidence.	Sufficient and appropriate evidence to support that Mainstream is authorized to serialize the offset credits.	**Satisfactory** The Project Report indicates that the Project is 100% owned by Oldman 2 Wind Farm Ltd. Ownership in Oldman 2 Wind farm Ltd. is held fully by IKEA Properties Limited. The facility is

Table 5.1 Verification and Sampling Plan

Parameter	Procedures	Sampling Plan	Result
			managed by EDF Renewable Services and the turbines are serviced by Siemens. Mainstream has presented evidence demonstrating that Mainstream is authorized to transact the credits on behalf of Oldman 2 Wind farm Ltd.
Project Additionality	Reviewed the Project Report and supporting documentation to assess whether the Project Developer is meeting the additionality criteria in the Protocol and the Project continues to be additional to regulations.	Not applicable.	**Satisfactory** The Protocol does not have specific criteria related to Project additionality. Stantec conducted a brief review of existing and proposed legislation and did not find any requirement for wind turbine operation. Therefore, the Project is considered to be sufficiently additional to meet the AEP requirements.
Consistency with Project Offset Plan	Reviewed the Project Report against the Project Plan for the following criteria: • deviation of the Project from the Project Plan; • same Baseline and project boundaries for the Project and the Project Plan; and • similar emission reductions claimed.	Not applicable.	**Satisfactory** This is the forth crediting period for the Project where no changes were made to the Project Plan dated March 5, 2015. The Project Plan and Project Report both disclose the changes from the original Project Plan (submitted to the GHG registry on January 10, 2014). The Baseline and project boundaries are identical. The Project Report claims similar emission reductions to those estimated and presented in the Project Plan.
Consistency with ISO 14064-2	Assessed the Project Report for transparency.	Not applicable.	**Satisfactory** The Project Report is adequately transparent when presenting the GHG emissions, emission reductions, and related information for this crediting period.
	Assessed the Project Report for accuracy.	Not applicable.	**Satisfactory** The GHG assertion within the Project Report was found to

Table 5.1 Verification and Sampling Plan

Parameter	Procedures	Sampling Plan	Result
			agree with the emissions quantified.
	Assessed the Project Report for relevance and completeness.	Not applicable.	**Satisfactory – Immaterial Qualitative Misstatement (1)** The Section 4 of the Project Report (dated September 19, 2016) indicates that this is the second Project Report but this is the forth Project Report. See Table 5.2 for more details.
	Assessed the Project Report for consistency.	Not applicable.	**Satisfactory** The Project Report is consistent with the Project Plan. Consistent meters and formulas were used for emissions quantification.
Quantification and Monitoring	Assessed the Project for missing electricity and fuel purchase records and confirmed records were within the crediting period.	Entire crediting period (January 1, 2016 to June 30, 2016), electricity records (MWh), gasoline records (L, and natural gas records (GJ).	**Satisfactory** Mainstream provided monthly electricity, natural gas, and gasoline records. Fuel consumption used in emission calculation is supported by the invoices. Cut-off (calendar month cut-off) was done appropriately.
	Assessed the Project for inconsistent quantification methodologies.	All methodologies (including Baseline emissions, Project emissions, and emission reductions).	**Satisfactory** The quantification methodologies used were consistent with the Project Plan and the Protocol. The changes have been adequately described in the Project Report.
	Traced electricity production records to the quantification spreadsheet.	All monthly electricity production statements (total of 6 months in period), unit of MWh, January 1, 2016 to June 30, 2016.	**Satisfactory** The records from AESO agreed with the quantification spreadsheet.
	Traced electricity consumption records to the quantification spreadsheet.	All monthly electricity consumption statements (total of 6 months in period), unit of MWh, January 1, 2016 to June 30, 2016.	**Satisfactory** The records from AESO and third party electricity supplier (EPCOR) agreed with the quantification spreadsheet.
	Traced natural gas purchase records to	All monthly natural gas invoices (total of 6	**Satisfactory – Immaterial Quantitative Misstatement (1)**

Table 5.1 Verification and Sampling Plan

Parameter	Procedures	Sampling Plan	Result
	quantification spreadsheet.	months in period), unit of GJ, January 1, 2016 to June 30, 2016	The records from third party natural gas supplier (AltaGas) agreed with the quantification spreadsheet, except for January 2016. See Table 5.2 for more details.
	Traced gasoline purchase records to quantification spreadsheet.	All gasoline purchase receipts and reports for the period of January 1, 2016 to June 30, 2016, unit of L.	**Satisfactory – Immaterial Qualitative Misstatement (1) and Immaterial Quantitative Misstatement (1)** The records for gasoline purchase agreed with the quantification spreadsheet. However, some receipts do not show amount of gasoline (liters) consumption (Immaterial Qualitative Misstatement) and some gasoline consumption was missing from the emission reduction calculation (Immaterial Quantitative Misstatement). See Table 5.2 for more details.
	Trended electricity production and wind speed to look for anomalies.	All electricity consumption and production records in the period of January 1, 2016 to June 30, 2016.	**Satisfactory** Stantec did not detect any anomalies in the electricity production.
	Trended natural gas consumption to look for anomalies.	All gasoline and natural gas records in the period of January 1, 2016 to June 30, 2016.	**Satisfactory** Natural gas use is seasonal, with less natural gas purchased in the summer months. No unexplained anomalies noted.
	Inspected calibration and verification records for the electricity production meter.	Calibration certificates.	**Satisfactory** Stantec reviewed the calibration certificate and determined it is valid for the reporting period.
	Recalculated Baseline emissions.	Not applicable.	**Satisfactory** Stantec successfully recalculated the Baseline emissions.
	Recalculated Project emissions.	Not applicable.	**Satisfactory** Stantec successfully recalculated the Project

Table 5.1 Verification and Sampling Plan

Parameter	Procedures	Sampling Plan	Result
			emissions.
	Assessed whether emission factors were appropriate and agree with the source.	Sampled the following factors: • electricity displacement factor (CO_2e); • electricity use factor (CO_2e); • natural gas combustion (CO_2, CH_4, and N_2O); • natural gas extraction and processing factors (CO_2, CH_4, and N_2O) • gasoline combustion in vehicles (CO_2, CH_4, and N_2O); • gasoline production factors (CO_2, CH_4, and N_2O); and • diesel production factors (CO_2, CH_4, and N_2O).	**Satisfactory - Immaterial Quantitative Misstatement (1)** • The electricity displacement grid factor (0.59 t CO_2e/MWh) and use factor (0.64 t CO_2e/MWh) applied were appropriate per the Handbook. • The conversion value for natural gas (GJ to m^3) was appropriate. • The emission factors used to quantify natural gas combustion emissions were appropriate. • The emission factors used for natural gas extraction and processing are appropriate per the Quantification Protocol, except for the CH_4 emission factor for natural gas processing (Immaterial Quantitative Misstatement). See Table 5.2 for more details. • The emission factors used to quantify gasoline combustion emissions were appropriate for the vehicle type, from an appropriate source (the National Inventory Report), and match the source. • The emissions factors for gasoline or diesel production used are appropriate per the Quantification Protocol. Note that there was no diesel usage in the crediting period. • The appropriate Global Warming Potentials (GWP) was used.
GHG Data	Assessed whether	Entire system for	**Satisfactory**

Table 5.1 Verification and Sampling Plan

Parameter	Procedures	Sampling Plan	Result
Management and Quality Control	Mainstream's GHG data management system, including quality control, is adequate.	completeness, accuracy, validity, and restricted access, through interviews, Project documentation, and site visit.	Stantec reviewed Mainstream's data management system through a review of on-site monitoring systems, personnel interviews, and inspecting the quantification spreadsheet, Project Plan, Project Report, and supporting information. Stantec found that Mainstream's data management system adequately collects and aggregates Project data and performs checks on the quantified emissions. The electricity meters are calibrated and sealed.
GHG Data Retention	Assessed whether there is sufficient document storage and retention.	Not applicable.	**Satisfactory** Mainstream asserts that Project records are retained in a retrievable manner for 7 years past the end of the crediting period. This is sufficient to meet the requirements of the Protocol and the Guidance.

Misstatements identified during the verification are provided in Table 5.2.

Table 5.2 Identified Misstatements and Resolutions

Identified Misstatement	Material/Immaterial and Rationale	Resolution
Consistency with ISO-14064:2 (Completeness and accuracy of Project Report) **Immaterial Qualitative Misstatement**. First paragraph of Section 4 of the Project Report states that "This is the second Project Report for Oldman 2 Wind Farm, covering the period 1st January 2016 to 30th June 2016. However, this is the forth Project Report as there are three previous Project Reports on the AEOR (Alberta Emissions Offset Registry).	Immaterial qualitative misstatement	Not Resolved.
Quantification and Monitoring (Inaccuracy of January 2016 natural gas consumption)	Immaterial quantitative	Not Resolved.

Table 5.2 Identified Misstatements and Resolutions

Identified Misstatement	Material/Immaterial and Rationale	Resolution
Immaterial Quantitative Misstatement. Natural gas consumption for January 2016 in the emission reduction calculation is not consistent the third party invoices (17.9 GJ in the calculation versus 20.27 in the invoice); however, this results in negligible impact to emission reduction (0.04 tCO_2e, over stated).	misstatement (0.04 tCO_2e or <0.001% of the offset credits, over-reported).	
Quantification and Monitoring (Inaccuracy of gasoline receipts for trucks) **Immaterial Qualitative Misstatement.** The invoices for EDM truck for January 17, 2016 and April 20, 2016 show gasoline cost but not liters of gasoline. However, the liters of gasoline used in emission reduction calculation is deemed reasonable (based on back calculation using January 2016 and April 2016 gas prices).	Immaterial qualitative misstatement	Not Resolved.
Quantification and Monitoring (Inaccuracy of gasoline receipts for trucks) **Immaterial Quantitative Misstatement**. For EDF truck, incorrect gasoline liters were entered in "Vehicle Emissions Calculator" for May 8, 2016 (95.057 liters were entered but 98.057 liters in the invoice) and the volume of 82.719 liters for February 16, 2016 was missing from the emission reduction calculation. Therefore, gasoline volume for trucks in the emission reduction calculation is understated by 86 liters. This has negligible impact to emission reduction (0.2 tCO_2e, over stated).	Immaterial quantitative misstatement (0.2 tCO_2e or <0.001% of the offset credits, over-reported).	Not Resolved.
Quantification and Monitoring (Incorrect natural gas processing CH_4 emission factor) **Immaterial Quantitative Misstatement**. The natural gas fuel processing EF-CH_4 (for P3 Project emissions) is not consistent with the Quantification Protocol. The impact to emission reduction is negligible (0.09 tCO_2e, understated).	Immaterial quantitative misstatement (0.09 tCO_2e <0.001% of the offset credits, under-reported).	Not Resolved.

6.0 CONCLUSION

6.1 OPINION

Based on the procedures undertaken and described in this report, the Project Report, dated September 19, 2016, for the Oldman 2 Wind Power Project (January 1, 2016 to June 30, 2016) satisfies the requirements of the:

- Climate Change and Emissions Management Act (the Act), SA 2003, c C-16.7;
- Specified Gas Emitters Regulation, Alta Reg. 139/200, with amendments up to and including Alberta Regulation 104/2015 (Regulation);
- Technical Guidance for Offset Project Developers (version 4.0, February 2013);
- Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008); and
- The Emission Factors Handbook (March 2015, V1.0).

6.2 SUBMISSION DOCUMENTS

The verification documents for submission are in Appendix B and include: Statement of Qualifications, a Statement of Verification, and a Conflict of Interest Checklist.

7.0 CLOSURE

Stantec has undertaken all assignments in its role as an environmental engineering consulting firm using professional effort consistent with the Technical Guidance for Offset Project Developers, February 2013, version 4.0, and the Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, January 2013, version 1.0. Stantec has assessed the Project Report submitted by Mainstream for the Oldman 2 Wind Farm Offset Project using reasonably ascertainable information, as defined by ISO 14064-3, obtained from a review of operational records and available literature and documents. The assessment represents the conditions in the subject area at the time of the assessment. Stantec did not conduct direct GHG emissions monitoring or other environmental sampling and analysis in conjunction with this verification report. Stantec disclaims liability for use by any other party and for any other purpose.

Stantec will retain all project documents for a minimum of seven (7) years.

This report entitled, "Verification Report for Oldman 2 Wind Farm Offset Project (January 1, 2016 to June 30, 2016)" was produced by Orasa Webber (Verifier) and Daniel Hegg (Lead Verifier).

This report was peer reviewed by Joe Harriman and technical quality reviewed by Vicki Corning.

Respectfully Submitted,

STANTEC CONSULTING LTD.

Daniel Hegg, M.Sc., CEM, ENV-SP
Lead Verifier, Environmental Services
Tel: (250) 217-9729

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Designated Signing Authority,
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Appendix A

Final Verification Plan

Stantec Consulting Ltd.
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Template version 1.1 October 2014

VIA EMAIL <Alan.McCarthy@mainstreamrp.com>

November 16, 2016
File: 123220579

Attention: Alan McCarthy
Mainstream Renewable Power
Top Floor, Arena House,
Arena Road, Sandyford
Dublin 18, Ireland

Dear Alan,

RE: FINAL VERIFICATION PLAN - *SPECIFIED GAS EMITTERS REGULATION* VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

INTRODUCTION

Stantec Consulting Ltd. (Stantec) is pleased to provide this verification plan for the Mainstream Renewable Power (Mainstream) Oldman 2 Wind Farm Offset Project (referred to as the Project) under the Alberta Environment and Parks (AEP) *Specified Gas Emitters Regulation* (*SGER*) for period of January 1, 2016 to June 30, 2016. The verification plan outlines the terms of the engagement and the planned verification procedures. The verification plan also provides a list of data and documentation required to complete the planned procedures.

VERIFICATION OBJECTIVES

The objective of the verification is to verify that the Project Report and associated GHG assertion satisfies in material aspects the following AEP requirements:

- *Climate Change and Emissions Management Act (the Act), SA 2003, c C-16.7;*
- *Specified Gas Emitters Regulation, Alta Reg. 139/200, with amendments up to and including Alberta Regulation 104/2015 (Regulation);*
- *Technical Guidance for Offset Project Developers (February 2013, V4.0);*
- *The Specified Gas Emitters* Quantification Protocol for Wind-Powered Electricity Generation (March 2008, V1.0); and
- The Emission Factors Handbook (March 2015, V1.0).

VERIFICATION STANDARD

The verification will be conducted in accordance with:

- *ISO 14064 Part 3 – Greenhouse Gases: Specification with guidance for the validation and verification of greenhouse gas assertions;*

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

- *ISO 14065 – Greenhouse Gases: Requirements for greenhouse gas validation and verification bodies for use in accreditation and other forms of recognition; and*
- *Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance (January 2013, version 1.0.*

VERIFICATION SCOPE

The verification is for the period of January 1, 2016 to June 30, 2016.

Stantec understands the Project is described in the following manner. The reasonableness of this project description is subject to verification by Stantec.

The Oldman 2 Wind Farm Offset Project consists of 20 wind turbines with a total installed capacity of 46 MW. The Project is located in the Municipal District of Pincher Creek, Alberta.

The Project generates GHG emission reductions by displacing electricity generated by fossil fuel combustion at power stations with lower carbon intensity wind energy. In addition to the turbines, there is a substation on-site, connected to the turbines via an underground transmission and distribution system. There is no electricity storage system onsite. The baseline emissions are the emissions that would have been produced by burning fossil fuels for the generation of an equivalent amount of electricity. The Project emissions include natural gas combustion for space heating at the Operations and Maintenance (O&M) facility on-site and the back-up generator, gasoline combustion in on-site vehicles, GHG emissions associated with grid electricity consumption for lighting and power used by the Project, and sulphur hexafluoride (SF_6) leakage from the switchgear. Also included in Project emissions are fuel extraction and processing indirect emissions, as required by the Protocol.

The Project is 100% owned by Oldman 2 Wind Farm Ltd. Ownership in Oldman 2 Wind farm Ltd. is held fully by IKEA Properties Limited. EDF Renewable Services operate the facility. Mainstream is transacting the credits on behalf of Oldman 2 Wind Farm Ltd.

The following GHGs are included within the scope of the verification as required by *SGER* reporting:

- carbon dioxide (CO_2);
- methane (CH_4);
- nitrous oxide (N_2O);
- hydrofluorocarbons (HFCs);
- perfluorocarbons (PFCs); and
- sulphur hexafluoride (SF_6).

The total equivalent GHG emissions are reported as equivalent tonnes of carbon dioxide (tCO_2e).

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Baseline and Project sources of GHG emissions at the Project are:

- **Natural Gas Combustion (CO_2, CH_4, and N_2O):**
  - *Project source:* on-site space heating and back-up generator;
- **Mobile Fuel Combustion (CO_2, CH_4, and N_2O):**
  - *Project sources:* on-site gasoline vehicles, diesel-fueled cranes for maintenance;
- **Electricity Production (CO_2e):**
  - *Baseline source:* emissions from fossil fuel combustion to produce an equivalent amount of electricity as wind power electricity (during the crediting period) which would have happened in the absence of the Project.
- **Electricity Consumption (CO_2e):**
  - *Project source:* consumption of electricity from the Alberta grid to run the Project;
- **Sulphur Hexafluoride (SF_6) Fugitive Emissions:**
  - *Project source:* leaks from switchgear equipment located in the Project boundary; and
- **Fuel Extraction & Processing (CO_2e):**
  - *Project source:* indirect emissions associated with the extraction and processing of fossil fuel resources for gasoline, natural gas, and diesel fuels.

ASSERTION

The fundamental assertion being verified is that the Project Plan and quantification meets the criteria above for the period of January 1, 2016 to June 30, 2016. The GHG assertion includes the reduction of 48,846 tCO_2e emissions associated with the Project for the period noted above.

LEVEL OF ASSURANCE

Sufficient procedures are conducted in order to express a ***reasonable level of assurance*** opinion as required by AEP.

MATERIALITY

AEP has set the quantitative materiality threshold to 5% of the asserted emission reductions and removals for offset projects. The materiality is assessed on the net and absolute values of

discrepancies. The identification of material qualitative discrepancies is at the discretion of the verification body.

VERIFICATION SCHEDULE

Table 1 presents the verification schedule.

Table 1 Verification Schedule

Verification Activity	Responsible Party	Date of Completion
Kick-Off communication with Mainstream	Stantec / Mainstream	August 26, 2016
Receive Mainstream Documentation	Mainstream	September 19, 2016
Desktop Review	Stantec	October 23 – 28, 2016
Provide Verification Plan to Mainstream	Stantec	October 3, 2016
Site Visit	Stantec / Mainstream	Not applicable.
Receive Additional Documentation	Mainstream	October 6, 2016
Draft Verification Report	Stantec	October 14, 2016
Address Follow-Up Items	Stantec / Mainstream	November 7, 2016
Finalize Verification Report and Statement Of Verification	Stantec	November 16, 2016

VERIFICATION TEAM: QUALIFICATIONS, ROLES AND RESPONSIBILITIES

Table 2 presents the verification team.

Table 2 Verification Team

Name	Role	Responsibilities
Daniel Hegg, M.Sc., CEM	Lead Verifier	Carry out project management duties. Lead and delegate verification duties. Daniel will complete the desktop review and reporting activities.
Vicki Corning, P.Eng.	Quality Reviewer	Review verification deliverables technical soundness and compliance with Stantec's internal processes and AEP criteria. Designated Signing Authority on verification documents.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Name	Role	Responsibilities
Joe Harriman, Ph.D., P.Chem.	Independent Peer Reviewer	Independent review of verification activities and conclusions. The independent reviewer confirms the verification activities have been completed and that the activities provide the required level of assurance.
Orasa Webber, M.Eng.	Verifier	Assist in desktop review and deliverable preparation.

TEAM PROFILE

Lead Verifier – Daniel Hegg, M.Sc., CEM, CEM, ENV-SP.

Living on Canada's west coast has deepened Dan's passion for the development and implementation of sustainable practices. His unique perspectives and insights cross many important areas such as sustainable asset management, strategic energy and water management, sustainable ROI business case development, full value accounting, climate change infrastructure risk assessment for the private and public sectors.

In addition to providing strategy and policy advice, Daniel has specialized expertise in climate change adaptation planning. Daniel utilizes a modified risk assessment framework designed to align with ISO 31010 Risk Management Standard and the PIEVC Engineering Protocol to assess various assets and their exposure to climate change risks and hazards, determine priority areas, and develop short/medium/long term strategies to build natural and engineering resilience. Dan has prepared multiple climate-resilience strategies across a variety of sectors including buildings/real-estate, forestry, oil & gas, renewable energy, and mining. Much of his work has directly helped guide various private and public sector organizations in sustainability and climate action decision-making. Daniel has also developed and verified over 130 organizational and facility GHG inventories and offset projects across a wide range of industry sectors.

Quality Review – Vicki Corning, P.Eng.

Ms. Corning has a degree in chemical engineering and 11 years of technical and management expertise in many environmental services in the field of atmospheric emissions. Ms. Corning is a GHG & Climate Services Discipline Leader with the responsibility for growth and continuous improvement of the service line. She has been involved in over 100 verifications for organizational inventories and GHG offset projects in western Canada, Ontario and the United States. Ms. Corning has worked with clients in a variety of different industries in Canada and the US including: gas processing plants, oil refineries, SAGD facilities, pipeline operations, electrical generating stations (coal, gas, co-generation), manufacturing plants, chemical processing facilities, construction projects and pulp mills. Ms. Corning has managed the preparation of several policy reports on renewable energy for the New Brunswick Department of Energy, and authored technical content on carbon capture systems for coal facilities as part of an environmental report for Carbon Capture Nova Scotia.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Independent Peer Reviewer – Joe Harriman, Ph.D., P.Chem.

Joe is responsible for managing air quality, acoustics and climate components environmental baseline assessments, environmental assessments and environmental planning and permitting. In addition, Dr. Harriman is a Project Manager with substantial experience and background knowledge in the energy sector with respect to air quality and GHG emissions. He has been the project manager and technical lead on the development of numerous greenhouse gas (GHG) emission inventories for industrial, corporate, municipal and government clients.

Dr. Harriman is experienced in working under the Alberta, British Columbia, Ontario, Quebec and Massachusetts mandatory reporting regulations, as well as voluntary programs such as The Climate Registry, having participated in over 200 verifications since the inception of these regulations and/or programs. Dr. Harriman, on behalf of Stantec, is an instructor for the CSA to deliver the ISO 14064 GHG series of courses including Inventories (ISO 14064-1), Projects (ISO 14064-2) and Validations/Verifications (14064-3). Dr. Harriman is a registered Professional Chemist in the Province of Alberta and has the responsibility at Stantec for ensuring the quality of the verification and acting as peer reviewer in accordance with ISO14065. This designation is reserved for select individuals with the appropriate experience in GHG inventories and projects.

Verifier – Orasa Webber, M.Eng.

Ms. Webber successfully completed the ISO-14064-3 (GHG Verification) training in 2012. She has over four years of experience on GHG verification projects under Alberta's Specified Gas Emitters Regulation (SGER), Alberta's Offset Credit, British Columbia Reporting Regulation, Ontario Regulation, The Massachusetts Department of Environmental Protection Regulation, and The Climate Registry. The GHG validation/verification projects have included the following sectors: oil and gas extraction, production, and refining; power generation; chemical and petrochemical production; natural gas distribution systems; metal, mining and mineral production; and carbon capture and storage. Ms. Webber has also completed an introductory training for CALPUFF (air dispersion modelling) in 2014 and is continuing development in air dispersion modelling as an area of interest.

Ms. Webber has a Master's degree in chemical engineering from McGill University and has experience in a variety of environmental fields including National Pollutant Release Inventory (NPRI) reporting, ambient air quality and noise monitoring, environmental impact assessment, greenhouse gas (GHG) inventory, GHG verification and validation, and petroleum contaminated water/soil testing under Atlantic Risk-Based Corrective Action (RBCA) guidelines. She also has industrial experience in quality control of oil refinery products, polymer characterization, and processing and design of plastic products.

RISK ASSESSMENT

Stantec performed a preliminary assessment of the potential risk associated with this verification assignment and presents the results below. The risk assessment is an internal procedure used to assess inherent, control, and detection risk. Based on the risk assessment in each of these categories, the Stantec team assigns an overall risk to the verification and defines the verification procedures

accordingly. We assessed the verification risk as **Low**[1] for the verification of this reporting period (January 1, 2016 to June 30, 2016). A summary of the risk assessment is provided in Table 3.

Table 3 Risk Summary

Risk Area	Preliminary Assessment	Final Assessment
Inherent Risk	Low	Low
Control Risk	Low	Low
Detection Risk	Low	Low
Overall Risk	**Low**	**Low**

We consider the inherent risk to be **low** based on the following:

- Electricity production/consumption for wind turbines and transmission lines are metered by a revenue quality meter with documented calibration records. Data are sourced by Alberta Electric System Operator (AESO) statements (low risk);
- Electricity and natural gas consumption for the operation/office building are metered by a third party for invoicing purposes (low risk);
- Gasoline consumption is metered at commercial fuel stations and tracked via receipts (low risk);
- Emission factors are from recognized sources (low risk); and
- The Project received positive verification statements for the previous three reporting periods (low risk).

We consider the control risk to be **low** based on the following:

- The Project has an expense report system in place to track gasoline consumption via receipts (low risk);
- Natural gas consumption and electricity production and consumption data are from monthly invoices or reports and used for accounting purposes. The consumption was re-aggregated per calendar month (low risk); and
- The calculators used for this reporting period have been previously reviewed by Stantec for the previous three reporting periods. Several detected errors were resolved and no material discrepancies exist in the calculator template (low risk).

[1] Possible risk ratings are "high", "medium" and "low". These are based on inherent, control, and detection risks as evaluated by the project team prior to engaging in verification activities.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Detection risk is the risk that Stantec will not identify a material discrepancy. We regard this risk as **low** due to:

- **Our Quality Management Procedures.** We are committed to providing exceptional service to our clients in accordance with our ISO 9001 and ISO 14065 accreditations. We believe that quality is a basic principle and that quality management is an integral part of all our work. We take a systematic approach to quality management to comply with requirements and to strive for continual improvement. The cornerstone of our quality management system is an entrenched process of technical quality and independent review where our deliverables are vetted by quality reviewers and expert people in our firm (low risk).

- **Level of Assurance.** The ***reasonable level of assurance*** applied in this verification (as required by the SGER) mandates that Stantec perform increased sampling to meet the assurance requirements, however, the level of assurance still increases the risk to Stantec as the risk-based verification approach means that not all information can be reviewed. Stantec has designed the sampling plan to target potentially material items in the GHG information to maintain low detection risk.

VERIFICATION PLAN

The objective of the verification plan is to facilitate the assessment of the completeness, conservativeness, consistency, accuracy, and transparency of the Project's GHG information and GHG Assertion.

With regards to the magnitude of potential errors, omissions and misrepresentations, as electricity production represents 100% of baseline emissions and project emissions are small in comparison, the greatest risk of material error relates to errors in the data that supports baseline emissions (e.g., metered electricity production).

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Table 4 shows the verification procedures.

Table 4 Verification Procedures

Line Item	Verification Objective	Risk Identified	Type of Procedure	Description of Procedure
Greenhouse Gas Assertion	Completeness	Incompleteness of inventory.	Test of detail – inspection.	Conduct a site tour to determine sources and compare with inventory. Inquire of operators whether any diesel storage tanks are present and whether there were any maintenance events that would require a diesel-fueled crane or other fossil fuel fired mobile or stationary equipment.
Greenhouse Gas Assertion	Accuracy Classification	Information not appropriately disclosed.	Test of detail – inspection.	Inspect Project Report for correct reporting of emissions and related information.
Greenhouse Gas Assertion	Completeness	Incompleteness of Project Report.	Test of detail – inspection.	Inspect Project Report for missing information.
Greenhouse Gas Assertion	Accuracy	Mainstream does not have authorization to serialize emission reduction credits.	Test of detail – inspection.	Inspect supporting evidence that Mainstream is authorized to serialize credits.
Greenhouse Gas Assertion	Accuracy	Potential for double counting of offsets if Mainstream is claiming Renewable Energy Certificates (RECs)	Test of detail – inquiry.	Inquire whether Mainstream will be claiming RECs. If so, conduct additional procedures to assess potential for double counting offsets.
Greenhouse Gas Assertion	Occurrence	Document storage and retention	Test of detail – inquiry.	Inquire of operators the location and retention period of data used for GHG Assertion.

Table 4 Verification Procedures

Line Item	Verification Objective	Risk Identified	Type of Procedure	Description of Procedure
		practices may not be sufficient.		
Electricity Production	Completeness	Missing electricity records.	Test of detail – inspection, reconciliation, tracing	Conduct a site tour to determine meter location and identification numbers. Reconcile meter numbers with meters in records. Trace meter records to emission reduction calculations.
Electricity Production	Consistency	Inconsistent quantification methodologies.	Test of detail – inspection.	Assess whether quantification methodologies (including emission factors) are consistent with previous periods.
Electricity Production	Accuracy	Anomaly in emissions trend.	Test of detail – inquiry. Analytical test – profile.	Inquire of operators as to any production anomalies. Run profile tests for monthly data.
Electricity Production	Accuracy	Inaccurate measurement of electricity.	Test of control – inspection, inquiry.	Inspect calibration records. Inquire on data aggregation and quality assurance and control procedures.
Electricity Production	Accuracy	Inaccurate calculation of emissions.	Test of detail – recalculation.	Recalculate annual baseline emissions.
Electricity Production	Cut-off	Improper dates of recording electricity production.	Test of detail – inspection.	Inspect the dates of electricity records.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Table 4 Verification Procedures

Line Item	Verification Objective	Risk Identified	Type of Procedure	Description of Procedure
Electricity Consumption	Completeness	Missing consumption records.	Test of detail – inspection, reconciliation, tracing.	Conduct a site tour to determine meter location and identification numbers. Reconcile meter numbers with electricity accounts. Trace metered electricity use to emissions reductions calculations.
Electricity Consumption	Consistency	Inconsistent quantification methodologies.	Test of detail – inspection.	Assess whether quantification and aggregation methodologies are consistent with previous periods.
Electricity Consumption	Accuracy	Anomaly in production trend.	Test of detail – inquiry. Analytical test – profile.	Inquire of operators as to any production anomalies. Run profile tests for monthly data.
Electricity Consumption	Accuracy	Inaccurate measurement of consumption tonnages.	Test of control.	Inspect calibration records.
Electricity Consumption	Accuracy	Inaccurate calculation of emissions.	Test of detail – inspection.	Review annual project emission calculation.
Electricity Consumption	Cut-off	Improper dates of recording production.	Test of detail – inspection.	Inspect the dates on electricity records.
Gasoline Combustion	Completeness	Missing fuel receipt records.	Test of detail – tracing.	Trace fuel purchase records to emission reduction calculations.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Table 4 Verification Procedures

Line Item	Verification Objective	Risk Identified	Type of Procedure	Description of Procedure
Gasoline Combustion	Consistency	Inconsistent quantification methodologies.	Test of detail – inspection.	Assess whether quantification methodologies (including emission factors) are consistent with previous periods.
Natural Gas Combustion	Completeness	Missing consumption records.	Test of detail – inspection, reconciliation, tracing.	Trace fuel energy on invoices to quantification spreadsheet. Conduct a site tour to determine meter location and identification numbers. Reconcile meter numbers with natural gas accounts.
Natural Gas Combustion	Consistency	Inconsistent quantification methodologies.	Test of detail – inspection.	Assess whether quantification and aggregation methodologies are consistent with previous periods.
Natural Gas Combustion	Accuracy	Anomaly in production trend.	Test of detail – inquiry. Analytical test – profile.	Inquire of operators as to any production anomalies. Run profile tests for monthly data.
Natural Gas Combustion	Accuracy	Inaccurate calculation of emissions.	Test of detail – inspection.	Review annual project emission calculation.
Natural Gas Combustion	Cut-off	Improper dates of recording production.	Test of detail – inspection.	Inspect the dates on natural gas consumption records.
Gasoline Combustion	Accuracy	Anomaly in emissions trend.	Analytical test – profile.	Run profile tests for monthly data.
Gasoline Combustion	Accuracy	Inaccurate measurement or aggregation of fuel.	Test of control – inquiry.	Inquire on data aggregation and quality assurance and control procedures.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Table 4 Verification Procedures

Line Item	Verification Objective	Risk Identified	Type of Procedure	Description of Procedure
Gasoline Combustion	Accuracy	Inaccurate calculation of emissions.	Test of detail – inspection.	Review annual project emission calculation.
Gasoline Combustion	Cut-off	Improper dates of recording fuel purchases.	Test of detail – inspection.	Inspect the fuel purchase record dates.
Diesel Combustion	Accuracy	Inaccurate calculation of emissions.	Test of detail – inspection.	Review annual project emission calculation.
Diesel Combustion	Completeness	Missing diesel fuel use.	Test of detail – inspection.	Inspect maintenance records to assess if the numbers of maintenance events involving diesel usage for cranes.
Fuel Extraction and Processing	Accuracy	Inaccurate calculation of energy conversions.	Test of detail – inspection.	Review calculation of conversions of energy to volumes.

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

SITE VISIT

The site visit was conducted to the Project location, in Pincher Creek, Alberta during this reporting period (on June 13, 2016) by Stantec Verifier, Orasa Webber. This site visit conducted for the July 1, 2015 to December 31, 2015 verification.

Stantec performed procedures to identify Project boundaries, confirm GHG sources, look for additional sources, visually confirm the presence of electrical meters, as well as inquire about Project operations and the GHG data management system. The agenda for the site visit was communicated to Mainstream in the verification plan dated, June 8, 2016.

INFORMATION REQUEST

Table 5 contains a list of documentation and data required by Stantec to complete the proposed procedures and the outcome of the requests.

Table 5 Information Requested

Information Requested	Request Date	Obtained On
1. The Project Report for the period of January 1, 2016 to June 30, 2016.	September 19, 2016	September 19, 2016
2. The calculator for quantification of emission reductions in the period of January 1, 2016 to June 30, 2016.	September 19, 2016	September 19, 2016
3. The AESO statements containing electricity production by the Project and electricity consumption by the wind turbines and transmission system for the period of January 1, 2016 to June 30, 2016.	September 19, 2016	September 19, 2016
4. Natural gas invoices for the O&M building for the period of January 1, 2016 to June 30, 2016.	September 19, 2016	September 19, 2016
5. Electricity invoices for the O&M building for the period of January 1, 2016 to June 30, 2016.	September 19, 2016	September 19, 2016
6. Receipts for gasoline usage for onsite vehicles for the period of January 1, 2016 to June 30, 2016.	September 19, 2016	September 19, 2016
7. Calibration records for the revenue electricity meter.	On file	On file
8. Records for revenue meter check during the period of January 1, 2016 to June 30, 2016 (if applicable).	October 3, 2016	NA

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

Table 5 Information Requested

	Information Requested	Request Date	Obtained On
9.	In April to June 2016, the monthly average wind speed in the wind farm area is slightly lower than the first three months of 2016; however, electricity production was significant lower. Please explain why.	October 3, 2016	October 6, 2016
10.	Metered electricity generation data from SCADA showing daily total electricity generation in .csv or Excel format for February 2016 and May 2016.	October 3, 2016	October 6, 2016
11.	Explain why natural gas usage for the O&M building for January to June 2016 was lower than January to June 2015.	October 3, 2016	October 6, 2016
12.	Confirm whether there was diesel usage for crane for the period of January 1, 2016 to June 30, 2016. Please provide maintenance records as evidence.	October 3, 2016	October 6, 2016
13.	Confirm whether there was SF_6 usage and SF_6 loss for the period of January 1, 2016 to June 30, 2016.	October 3, 2016	October 6, 2016
14.	Confirm whether there was any change to the site operation, data collection and management, and quality controls of the data used in quantification of emission reduction during the period of January 1, 2016 to June 30, 2016.	October 3, 2016	October 6, 2016

RE: FINAL VERIFICATION PLAN - SPECIFIED GAS EMITTERS REGULATION VERIFICATION OF THE JANUARY 1, 2016 TO JUNE 30, 2016 OLDMAN 2 WIND FARM OFFSET PROJECT

CLOSURE

Should you have any questions or require additional information, please contact me directly.
Sincerely,

STANTEC CONSULTING LTD.

Daniel Hegg, MSc
Lead Verifier, Environmental Services
Tel: (250) 217-9729

Joe Harriman, Ph.D., P.Chem.,
Peer Reviewer, Environmental Services
Tel: (506) 634-2185

Vicki Corning, P.Eng
Designated Signing Authority,
Environmental Services
Tel: (506) 457-3200

Appendix B

Submission Documents

STATEMENT OF QUALIFICATIONS

Vicki Corning is a professional engineer registered by the Association of Professional Engineers and Geoscientists of New Brunswick. Vicki Corning is the Designated Signing Authority for the report and this satisfies Section 18(1)(ii)(A) of the SGER. With respect to the technical knowledge required under Section 18(b)(i-iii), each member of the team has the required technical knowledge of GHG emission quantification methodologies and all have experience in completing third party GHG verifications. Please refer to the team cameos below for details.

TEAM QUALIFICATIONS AND EXPERIENCE

Lead Verifier – Daniel Hegg, M.Sc., CEM, CEM, ENV-SP.

Living on Canada's west coast has deepened Dan's passion for the development and implementation of sustainable practices. His unique perspectives and insights cross many important areas such as sustainable asset management, strategic energy and water management, sustainable ROI business case development, full value accounting, climate change infrastructure risk assessment for the private and public sectors.

In addition to providing strategy and policy advice, Daniel has specialized expertise in climate change adaptation planning. Daniel utilizes a modified risk assessment framework designed to align with ISO 31010 Risk Management Standard and the PIEVC Engineering Protocol to assess various assets and their exposure to climate change risks and hazards, determine priority areas, and develop short/medium/long term strategies to build natural and engineering resilience. Dan has prepared multiple climate-resilience strategies across a variety of sectors including buildings/real-estate, forestry, oil & gas, renewable energy, and mining. Much of his work has directly helped guide various private and public sector organizations in sustainability and climate action decision-making. Daniel has also developed and verified over 130 organizational and facility GHG inventories and offset projects across a wide range of industry sectors.

Quality Review – Vicki Corning, P.Eng.

Ms. Corning has a degree in chemical engineering and 11 years of technical and management expertise in many environmental services in the field of atmospheric emissions. Ms. Corning is a GHG & Climate Services Discipline Leader with the responsibility for growth and continuous improvement of the service line. She has been involved in over 100 verifications for organizational inventories and GHG offset projects in western Canada, Ontario and the United States. Ms. Corning has worked with clients in a variety of different industries in Canada and the US including: gas processing plants, oil refineries, SAGD facilities, pipeline operations, electrical generating stations (coal, gas, co-generation), manufacturing plants, chemical processing facilities, construction projects and pulp mills. Ms. Corning has managed the preparation of several policy reports on renewable energy for the New Brunswick Department of Energy, and authored technical content on carbon capture systems for coal facilities as part of an environmental report for Carbon Capture Nova Scotia.

Independent Peer Reviewer – Joe Harriman, Ph.D., P.Chem.

Joe is responsible for managing air quality, acoustics and climate components environmental baseline assessments, environmental assessments and environmental planning and permitting. In addition, Dr. Harriman is a Project Manager with substantial experience and background knowledge in the energy sector with respect to air quality and GHG emissions. He has been the project manager and technical lead on the development of numerous greenhouse gas (GHG) emission inventories for industrial, corporate, municipal and government clients.

Dr. Harriman is experienced in working under the Alberta, British Columbia, Ontario, Quebec and Massachusetts mandatory reporting regulations, as well as voluntary programs such as The Climate Registry, having participated in over 200 verifications since the inception of these regulations and/or programs. Dr. Harriman, on behalf of Stantec, is an instructor for the CSA to deliver the ISO 14064 GHG series of courses including Inventories (ISO 14064-1), Projects (ISO 14064-2) and Validations/Verifications (14064-3). Dr. Harriman is a registered Professional Chemist in the Province of Alberta and has the responsibility at Stantec for ensuring the quality of the verification and acting as peer reviewer in accordance with ISO14065. This designation is reserved for select individuals with the appropriate experience in GHG inventories and projects.

Verifier – Orasa Webber, M.Eng.

Ms. Orasa Webber has conducted over 80 greenhouse gas (GHG) verifications in Canada and the United States under many jurisdictions and programs including British Columbia Reporting Regulation, Alberta's Specified Gas Emitters Regulation (SGER), Ontario Regulation, The Climate Registry, The Massachusetts Department of Environmental Protection Regulation. The GHG verification projects have included the following sectors: oil and gas extraction, production and refining; power generation; chemical and petrochemical production; natural gas distribution systems; metal production; mining and mineral production.

Orasa has also conducted over 15 offset credit verifications under Alberta's Offset Credit System. Orasa completed her Master's Degree in chemical engineering from McGill University and brings over ten years of experience. For the past five years, she has focused on climate change and environmental work including National Pollutant Release Inventory (NPRI) reporting, ambient air quality and noise monitoring, environmental impact assessment, GHG inventory, GHG verification and validation, and petroleum contaminated water/soil testing under Atlantic Risk-Based Corrective Action (RBCA) guidelines. She also has industrial experience in quality control of oil refinery products and processing and design of plastic products.

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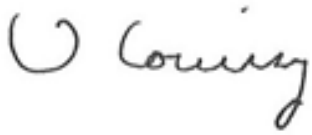

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November 16, 2016

Issued in Victoria, British Columbia

1.0 STATEMENT OF VERIFICATION

Mainstream Renewable Power (Mainstream) retained Stantec Consulting Ltd. (Stantec) to conduct a verification of the Project Report for the Oldman 2 Wind Farm Offset Project (the Project) located in Pincher Creek, Alberta. The Project Report is dated September 19, 2016.

In this work, Mainstream was responsible for the collection of data used in the calculations, data management, completion of the calculations, and presentation of the information within the Project Report, and for the supporting technical documents.

Stantec was responsible for planning and executing the verification in order to deliver an opinion to a reasonable level of assurance as to whether the Project Report is presented fairly and in accordance with the verification criteria. Stantec is a qualified third party verifier, as defined in Section 18 of the *SGER*. Stantec is accredited with the American National Standards Institute (ANSI), a member of the International Accreditation Forum (IAF), in accordance with ISO 14065 (Accreditation ID #0805 issued to Stantec Consulting Ltd. for greenhouse gas (GHG) verification).

1.1 INTENDED USER

This report has been prepared for Alberta Environment and Parks (AEP) for the express purpose of facilitating the creation of Emission Reduction Credits (ERCs) under the *Climate Change and Emissions Management* Act and the *Specified Gas Emitters Regulation* (*SGER*).

1.2 VERIFICATION OBJECTIVE

The objective of the verification was to assess whether the GHG assertion (as presented in Table 1.1) for the Project Report under the *SGER* satisfied the AEP requirements in the verification criteria in accordance with the verification standards identified in Section 1.5.

1.3 PROJECT DETAILS

1.3.1 Location

The Project is located in Pincher Creek, Alberta.

1.3.2 Description

The Project generates electricity from twenty (20) 2.3 MW wind turbines for a total installed capacity of 46 MW. The Project generates emission reductions by displacing electricity generated by fossil fuel burning power stations in Alberta. In addition to the wind turbines, there is a substation on-site, connected to the turbines via an underground transmission and distribution system. There is no electricity storage system located onsite. The Baseline emissions are the emissions that would have been produced by burning fossil fuels for the generation of an equivalent amount of electricity. The Project emissions include natural gas combustion for space

heating at the Operations and Maintenance (O&M) facility on-site and the back-up generator, gasoline combustion in on-site vehicles, electricity consumption for lighting and power, and sulphur hexafluoride (SF_6) leakage from the switchgear. Also included in Project emissions are fuel extraction and processing indirect emissions, as required by the Protocol.

The Project is 100% owned by Oldman 2 Wind Farm Ltd. which is held fully by IKEA Properties Limited. The facility is operated by EDF Renewable Services. Mainstream is transacting the credits on behalf of Oldman 2 Wind Farm Ltd.

Emission reductions are calculated as the difference between the Baseline and Project emissions.

1.3.3 Baseline and Project Conditions

The Baseline scenario is the production of an equivalent amount of electricity by a conventional fossil fuel power plant.

The Project scenario is the operation of a wind turbine facility for the production of electricity.

1.3.4 Emission Reduction Credit Period

Emission reductions have been calculated and verified for the period of January 1, 2016 to June 30, 2016.

1.4 GHG ASSERTION

The fundamental assertion to be verified is that the Project Report dated June 8, 2016 meets the criteria of AEP for the period of January 1, 2016 to June 30, 2016 (see Section 2.3).

The essential information contained within the GHG assertion verified by Stantec is presented in Table 1.1.

Table 1.1 GHG Assertion

Year	Baseline Emissions (t CO_2e)	Project Emissions (t CO_2e)	Emission Reductions (t CO_2e)
January 1, 2016 to June 30, 2016	49,026.31	180.07	48,846

Notes:
Emission Reductions are rounded down as per Guidance.

1.5 VERIFICATION CRITERIA

Stantec has conducted sufficient and appropriate procedures in order to express a ***reasonable level of assurance*** opinion as to whether the Project (the GHG assertion) satisfies the requirements of the:

- Climate Change and Emissions Management Act (the Act), SA 2003, c C-16.7;
- Specified Gas Emitters Regulation, Alta Reg. 139/200, with amendments up to and including Alberta Regulation 104/2015 (Regulation);
- Technical Guidance for Offset Project Developers (version 4.0, February 2013);
- Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008); and
- The Emission Factors Handbook (March 2015, V1.0).

1.6 VERIFICATION STANDARDS

The verification was conducted in accordance with ISO14064:3, ISO 14065, and the verification guidance contained within the Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, January 2013, version 1.0 (the Verification Guidance).

1.7 UNRESOLVED MISTATEMENTS

The AEP has set the materiality threshold for offset projects to 5% of the total reported GHG emission reductions or removals asserted. Qualitative misstatements are at the discretion of the verification body. Misstatements were detected and resolved. For more information, see the verification report.

1.8 OPINION

Based on the procedures undertaken and described in this report, the Project Report, dated September 19, 2016, for the Oldman 2 Wind Power Project (January 1, 2016 to June 30, 2016) satisfies the requirements of the:

- Climate Change and Emissions Management Act (the Act), SA 2003, c C-16.7;
- Specified Gas Emitters Regulation, Alta Reg. 139/200, with amendments up to and including Alberta Regulation 104/2015 (Regulation);
- Technical Guidance for Offset Project Developers (version 4.0, February 2013);
- Quantification Protocol for Wind-Powered Electricity Generation (version 1.0, March 2008); and
- The Emission Factors Handbook (March 2015, V1.0).

1.9 VERIFICATION CLOSURE

The findings presented herein were used to make a reasonable level of assurance opinion as required by AEP.

Stantec did not conduct direct GHG emissions monitoring or other environmental sampling and analysis in conjunction with this verification.

Because of the inherent limitations in any internal control structure it is possible that fraud, error or non-compliance with other laws and regulations may occur and not be detected. Further, the verification was not designed to detect all weaknesses or errors in internal controls as the verification has not been performed continuously throughout the period and the procedures performed on the relevant internal controls were on a test basis. Any projection of the evaluation of control procedures to future periods is subject to the risk that the procedures may become inadequate because of changes in conditions, or that the degree of compliance with them may deteriorate.

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CONFLICT OF INTEREST CHECKLIST

Question	Yes	No
1. Can the verifying organization or the verification team members directly benefit from a financial interest in the Project Developer or the Project Developer's Project? For example: • owning shares of the Project Developer; • having a close business relationship with the Project Developer; • contingent fees relating to the results of the engagement; • potential employment with the Project Developer; or • undue concern about the possibility of losing the verification or other fees from the Project Developer.	☐	☒
2. Can the verifying organization or verification team members be in a position of assessing their own work? For example: • provided greenhouse gas consultation services to the project; • provided validation for the project; • if providing non-greenhouse gas work for the company, consideration needs to be given as to how potential and perceived conflict of interests can be managed; or • a member of the verification team was previously employed with the company.	☐	☒
3. Does the verifying organization or a member of the verification team, or a person in the chain of command for the verification, promote or be perceived to promote, a project developer'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, greenhouse gas credits on behalf of a project developer; or • acting as an advocate on behalf of the project developer in litigation or in resolving disputes with third parties.	☐	☒
4. Is one or more of the verification team too sympathetic to the project developer's interests by virtue of a close relationship with a project developer, its directors, officer or employees? For example: • a person on the verification team has a close personal relationship with a person who is in a senior greenhouse gas compilation role at the project developer; or • the verification team or a person of influence on the verification team has accepted significant gifts or hospitality from the project developer.	☐	☒
5. Is a member of the verification team or a person in the chain of command is deterred from acting objectively and exercising professional skepticism by threats, actual or perceived, from the directors, officers or employees of the Project Developer. For example: • the threat of being replaced as a third party verifier due to a disagreement with the application of an greenhouse gas quantification protocol; • fees from the project developer represent a large percentage of the overall revenues of the verifying organization; • the application of pressure to inappropriately reduce the extent of work performed in order to reduce or limit fees; or • threats of litigation from the project developer.	☐	☒

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