AltaGas Turin Acid Gas Injection Project

Project ID 6878-6600

Verification Report

March 1, 2016

ICF Consulting Canada, Inc.
Suite 605, 734 – Seventh Avenue SW
Calgary, AB T2P 3P8

This page intentionally blank

Statement of Verification

March 1, 2016

Executive Director
Air and Climate Change Policy Branch
Alberta Environment and Parks
12th Floor, Baker Centre
10025 – 106 Street NW
Edmonton, Alberta T5J 1G4

Introduction

AltaGas Processing Partnership ("**AltaGas**") engaged ICF Consulting Canada, Inc. ("**ICF**") to review their GHG Assertion – *Alberta Offset System Greenhouse Gas Assertion of Emissions Reduction Credits* and supporting evidence, covering the period January 1, 2015 to December 31, 2015 ("**GHG Assertion**"). The GHG Assertion, dated February 23, 2016, specifies a claim for 83,957 tonnes CO_2e over the aforementioned period, which resulted from the AltaGas Turin Acid Gas Injection Project based on *Quantification Protocol for Acid Gas Injection, version 1.0 May 2008*. The claim consists exclusively of 2015 vintage credits.

The Responsible Party, AltaGas, is responsible for the preparation and presentation of the information within the GHG Assertion. Our responsibility is to express our opinion as to whether the GHG Assertion is materially correct, in accordance with Alberta Environment and Sustainable Resource Development's approved quantification methodology *Quantification Protocol for Acid Gas Injection, version 1.0 May 2008* ("**Protocol**") for this project; the *Specified Gas Emitters Regulation* (Alberta Reg.139/2007) ("**Regulation**"), and the associated guidance documents.

Scope

We completed our review in accordance with the ISO 14064 Part 3: *Greenhouse Gases: Specification with guidance for the validation and verification of greenhouse gas assertions* (ISO, 2006). As such, we planned and performed our work in order to provide positive, but not absolute assurance with respect to the GHG Assertion. Our review criteria were based on the Protocol, the Regulation, and the associated guidance documents. We reviewed the Offset Project Plan (version 3.0, February 4, 2014); GHG Assertion; and associated documentation. We developed the verification procedures based on the results of a risk assessment that we conducted during the planning stage. The verification procedures are identified in the Verification Plan and the details of any data sampling that was conducted are provided in the Sampling Plan (both plans are appended to the Verification Report). We believe our work provides a reasonable basis for our conclusion.

Conclusion

No unresolved material misstatements remain in the GHG Assertion as detailed in the Verification Report.

Based on our review, it is our opinion to a reasonable level of assurance that the GHG emissions reductions contained in the GHG Assertion are materially correct and presented fairly in accordance with the relevant criteria.

Issued this first day of March, 2016 in Calgary, Alberta.

Jennifer Packer, P.Eng.
Professional Engineer, Alberta (164930)
Lead Verifier and Designated Signing Authority
ICF Consulting Canada, Inc.
Calgary, Alberta

Duncan Rotherham
Vice President and Managing Director
ICF Consulting Canada, Inc.
Toronto, Ontario

1 Verification Summary

Lead Verifier:	Jennifer Packer, P. Eng.
Associate Verifier(s):	Jessica Abella, P.Eng.
Internal Peer Reviewer:	Julie Tartt

Verification Timeframe:	December 2015 to February 2016
Site Visit Date:	January 19, 2016
Objective of the verification:	Reasonable assurance on GHG Assertion for Emissions Reductions Credits
Assurance being provided to:	Alberta Environment and Parks
Standard being verified to:	ISO 14064-3:2006 Specification with guidance for the validation and verification of greenhouse gas assertions
Verification criteria employed:	Climate Change and Emissions Management Act Specified Gas Emitters Regulation (Alberta Regulation 139/2007) Technical Guidance for Offset Project Developers, Version 4.0, February 2013 Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, Version 1.0, January 2013 Quantification Protocol for Acid Gas Injection, version 1.0 May 2008
Verification scope – Gases:	Carbon Dioxide, Methane, Nitrous Oxide

Project Title:	AltaGas Turin Acid Gas Injection Project
Location:	AltaGas Processing Partnership Turin Sour Gas Processing Plant located near Turin, Alberta. LSD:12-19-12-18 W4M (Turin Sour Gas Processing Plant); 03-25-012-19 W4 (Injection Well)
Project Start Date:	November 30, 2004
Credit Start Date:	January 1, 2005
Credit Duration Period:	January 1, 2005 to December 31 2012; Project extension January 1, 2013 to December 31, 2017.
Expected Lifetime of the Project:	Permanent operation

Actual Emissions Reductions/ Removals Achieved:	83,957 tonnes CO_2e
Other Environmental Attributes:	N/A
Project Registration:	N/A

Project Activity:

Offset Eligibility Criteria	Assessment
Occur in Alberta	The gas production wells, processing plant, and injection well are all located within the Province of Alberta near Turin.
Result from actions not required by Law	Acid gas injection is not required by law.
Result from Actions taken on or after January 1, 2002 and occur on or after January 1, 2002	Acid gas injection began in 2004.
Real and Demonstrable	Reductions are a result of geologically sequestered CO_2 and reduced fuel consumption.
Quantifiable and measureable	Data used for the quantification of emissions reductions is measured and verified in accordance with the Protocol.
Have clearly established ownership	The Project is owned and operated by AltaGas Processing Partnership.
Counted Once for Compliance Purposes	Environmental attributes associated with the project are only credited under the Alberta Emissions Offset Registry.
Implemented according to a government approved protocol (for offset projects)	The Project activities and quantification are in agreement with the Quantification Protocol for Acid Gas Injection, version 1, 2008
Verified by a qualified person meeting the requirements under Section 18 of SGER.	The lead verifier for this verification is a professional engineer under the Engineering and Geoscience Professions Act and has the relevant technical knowledge to complete the verification.
Registered on the Alberta Emission Offset Registry	The project is registered on the Alberta Emission Offset Registry as Project # 6878-6600

Project Report Temporal Period: January 1, 2015 – December 31, 2015

Verification Summary: No material misstatements were detected in the final GHG Assertion.

Reasonable level assurance Verification Statement issued.

Main Contact (Verifier)	Jennifer Packer Senior Associate, ICF Consulting Canada 734 – 7 Avenue SW, Suite 605 Calgary, Alberta T2P 3P8 587-390-8301 Jennifer.Packer@icfi.com
Main Contact (Reporting Company)	Stefan Dimic AltaGas Processing Partnership Suite 1700, 355 4th Ave SW Calgary, Alberta T2P 0J1 403-691-7575 Stefan.Dimic@altagas.ca Tooraj Moulai Blue Source Canada 717 - 7th Ave SW, Suite 700 Calgary, Alberta T2P 0Z3 403-262-3026 x259 Tooraj@bluesourcecan.com

2 Project Information

AltaGas Processing Partnership ("**AltaGas**") has developed the necessary documentation detailing project activities to support their claim for emissions reductions to be registered on the Alberta Offset Registry under Alberta's Specified Gas Emitters Regulation. AltaGas has engaged ICF Consulting Canada, Inc. ("**ICF**") to provide a third-party verification of the emissions reductions asserted by AltaGas related to the project activities discussed herein.

The quantification of the emissions reductions associated with the project is defined by Alberta Environment Quantification Protocol for Acid Gas Injection, version 1.0 May 2008 ("**the Protocol**"). The Project Report describes the emissions reductions claim ("**GHG Assertion**") made by AltaGas related to this project.

The AltaGas Turin Acid Gas Injection Project ("the Project") covered by this verification engagement involves the creation of 2015 vintage emissions reductions achieved through injection and geological sequestration of acid gas from the AltaGas Turin natural gas processing plant. The baseline condition for this Project is sulphur recovering unit (SRU) using a three stage Selectox® process unit and acid gas flaring. The Project is located in southern Alberta [1] .AltaGas owns and operates the entire Project.

This is the first time ICF has been engaged by AltaGas for verification services pertaining to this Project. ICF has been engaged by Alberta Environment and Parks to provide a third-party audit of the 2014-vintage emission reductions for this Project.

This document describes the terms and scope of this verification. It serves to communicate the findings of the verification.

[1] Section 2.3 of the Verification Plan provides further information regarding the Project's geographical location, infrastructure and activities, greenhouse gas sources and sinks, and relevant greenhouse gases.

3 Verification Procedures

The scope of the verification was defined during the verification planning stage and is detailed in the Verification Plan, which is appended to this document. The Verification Plan also describes ICF's verification process that was executed through the course of the verification. The specific verification procedures that were planned and executed through the verification process are detailed in Section 4 of this report.

The verification was completed according to Plan. The final verification schedule was as follows:

Table 3-1: Verification Schedule

Procedure	Date
Verification Kick-Off Meeting	December 7, 2014
Verification Procedures Conducted	December 7, 2015 – March 1, 2016
Site Visit	January 19, 2016
Internal Peer Review	February 26, 2016
Final Verification Report Issued	March 1, 2016

3.1 Site Visit

The site visit was conducted by Jennifer Packer on January 19, 2016.

The site visit was a key step in planning and executing the verification. During the course of the site tour, ICF interviewed key Turin Sour Gas Processing Plant operations personnel regarding the operations and data management for the Project.

AltaGas staff interviewed included:

- Judy West, Production Accounting and Administration
- Derek Jensen, Operations Manager
- Brad Antoniuk, Senior Plant Operator

The site visit included a review of all GHG emissions sources at the facility to identify and categorize each one as well as a review of data metering and controls, followed by physical observation of the facility including observation of calibration tags.

3.2 Summary of Project Changes

Major GHG emissions sources and sinks have been identified by the Responsible Party and are detailed in the Offset Project Plan. The quantification methodologies outlined in the Protocol have been used to calculate GHG emissions sources and sinks. There have been no changes to the offset project and baseline with regard to the Facility since the offset project start date, however changes have been made to the quantification methodology and approach as detailed in the Offset Project Report.

The uncertainty associated with the quantification methodologies applied was evaluated during Protocol development. The Project meets the data collection and project specific calculation requirements of the Protocol and therefore, the uncertainty associated with the quantification and resulting assertion meets Alberta Environment requirements.

In the current GHG Assertion, the reference resource document and emission factor associated with electricity consumption has been revised. In previous reporting periods and the Offset Project Plan the Alberta Environment Memorandum dated December 2011 regarding emission factors for increased electricity usage was used. The current GHG Assertion references the Carbon Offset Emission Factors Handbook, March 2015. This was the only emission factor reference change in the current GHG Assertion.

3.3 Program Applicability Criteria

The Project was assessed against the following program applicability criteria outlined in the Protocol, which includes the eligibility criteria specified in Alberta Environment guidance documents. This is described as a verification procedure in Section 4, Verification Findings, in this report.

Protocol applicability criteria include:

- The sequestration project results in removal of emissions that would otherwise been released to the atmosphere as indicated by an affirmation of project developer and project schematics.
- Where the entities/operations are separated and distinct, the emissions reduced are captured under the protocol and will be reported as being emitted at the source facility such that the emission reductions are not doubled counted.
- The acid gas injection scheme has obtained approval form the Energy Resources Conservation Board (ERCB) and meets the requirements outlined under Directive 051: Injection and Disposal Wells – Well Classifications. Completions, Logging and Testing Requirements;
- Metering of injected gas volumes takes place as close to the injection point as is reasonable to address the potential for fugitive emissions as demonstrated by project schematics.
- The sequestration project involves the installation of an acid gas injection project at one of the following:
    - An existing sour natural gas processing facility which commenced operations prior to July 1, 2007, which may either have an operational SRU (i.e., Multi-Stage Claus or Liquid Redox) or may directly incinerate the acid gas stream;
    - Any new natural gas processing facility constructed after July 1, 2007 with total facility GHG's output in the first year of operation, inclusive of any CO_2 that has been captured and sequestered, less than the identified coverage threshold on direct emissions as defined by the *Specified Gas Emitter Regulation*. Therefore, acid gas injection projects applying this protocol at natural gas processing facilities commissioned after July 1, 2007 must also have total baseline emissions calculated as per table 2.4 of the protocol, less than the identified coverage threshold for direct emissions as defined by the *Specified Gas Emitter Regulation*.
- The consolidation or comingling of acid gas streams from multiple emitting facilities during the project's crediting period must be fully accounted for to ensure that each individual emitting facility is eligible to apply this protocol based on the above criteria. The metering and measurement systems implemented for the acid gas injection project activity should allow for disaggregation of the total baseline and project emissions back to the original emitting facilities.
- The quantification of reductions achieved by the project is based on actual measurement and monitoring (except where indicated in the protocol) as indicated by the proper application of the protocol; and
- The project must meet the requirements for offset eligibility as specified in the applicable regulation and guidance documents for the Alberta Offset System.

Offset program eligibility criteria include:

- Occur in Alberta;
- Result from actions not otherwise required by law and be beyond business as usual and sector common practices;
- Result from actions taken on or after January 1, 2002;
- Occur on or after January 1, 2002;
- Be real, demonstrable, quantifiable, and verifiable;
- Have clearly established ownership; and
- Be counted once for compliance purposes.

In addition to the requirements stated above, Alberta Environment also requires that offset projects:

- Being implemented according with a government-approved quantification protocol;
- Be verified by a qualified person(s) meeting the requirements for an auditor under Section 18 of the *Regulation*; and
- Be registered on the registry.

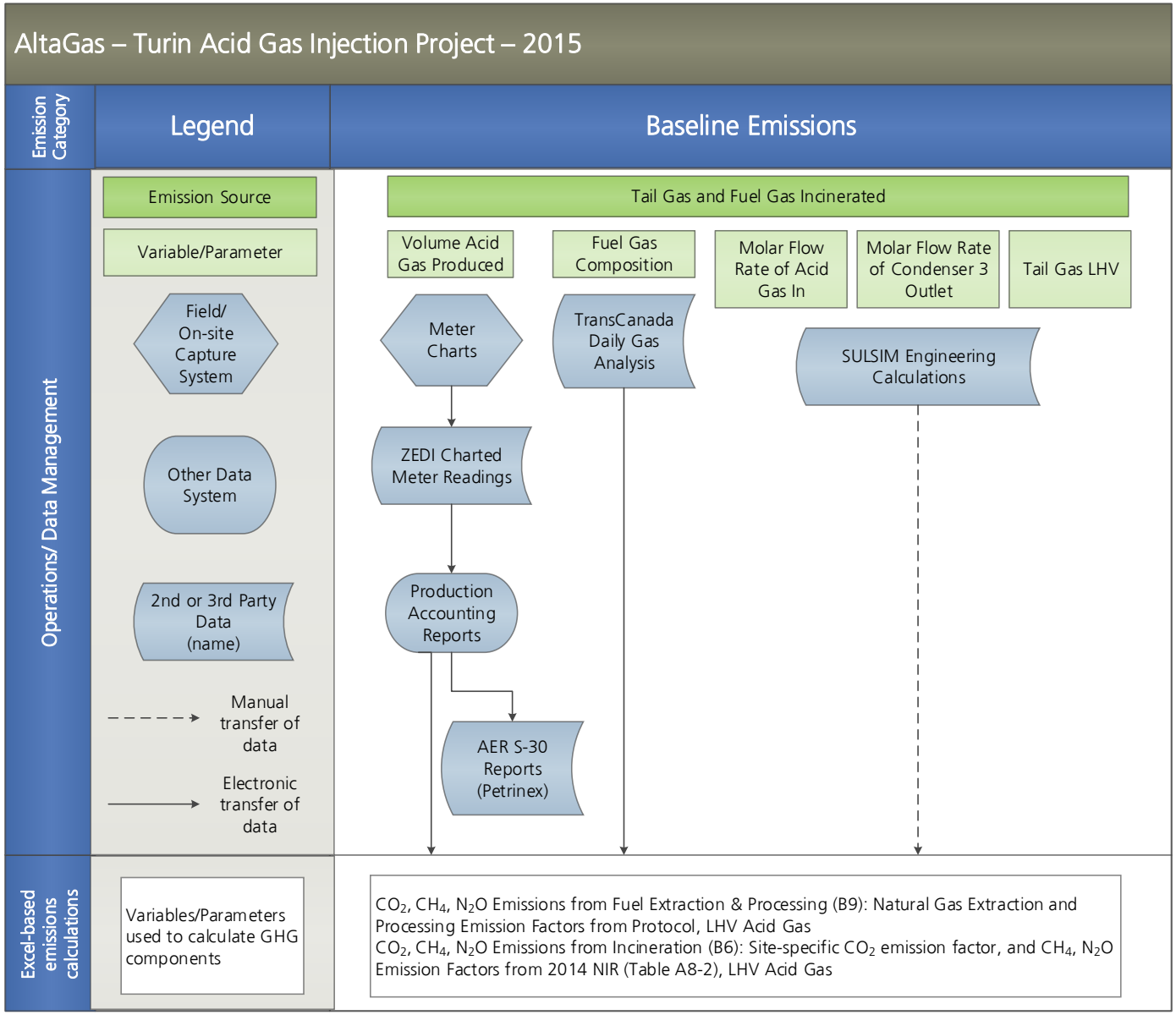
3.4 Verification Strategy

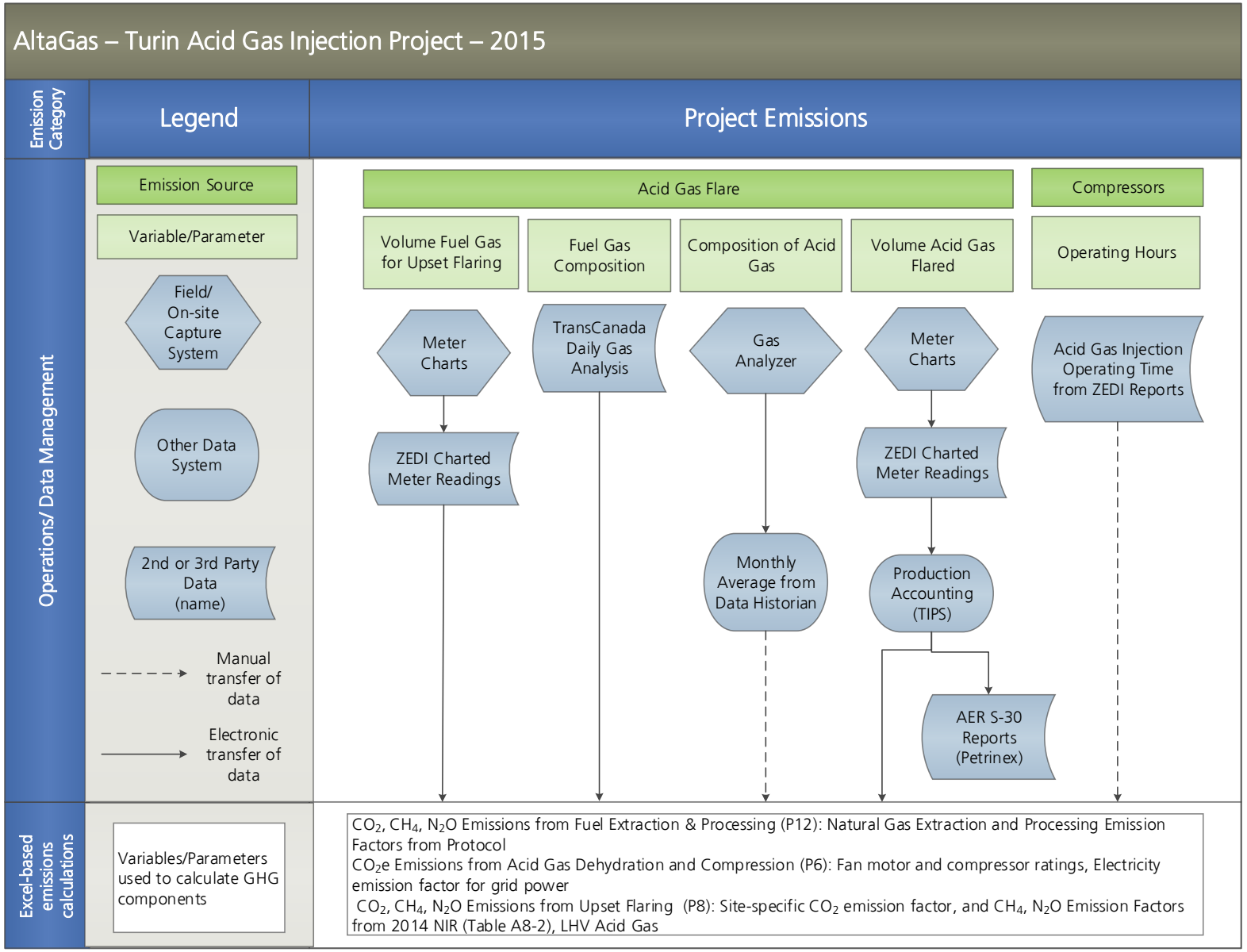
The Verification Strategy applied to this verification was a predominantly substantive approach. The Verification Team designed and executed verification procedures that focused on review of original metered and measured data.

The Responsible Party relies on certain controls for the quantification of emissions. ICF relied on the following controls and as such, tested the operational effectiveness of these controls as well as the data processed by these controls; meters used for collection of data sources are calibrated and maintained on a routine basis to ensure data accuracy. Details of the verification procedures employed to conduct these tests are provided in Section 4 of this report.

3.5 Data Management and Control System Review

The Verification Team developed a thorough knowledge of the data management and control systems utilized in the Project through the review of the Offset Project Plan, observations during the site visit, and interviews with key Project personnel. The data flow diagram shown below outlines the flow of Project data and the custody of control.


AltaGas – Turin Acid Gas Injection Project – 2015
Emission Category
Legend
Baseline Emissions
Operations/ Data Management
Emission Source
Variable/Parameter
Field/ On-site Capture System
Other Data System
2nd or 3rd Party Data (name)
Manual transfer of data
Electronic transfer of data
Tail Gas and Fuel Gas Incinerated
Volume Acid Gas Produced
Fuel Gas Composition
Molar Flow Rate of Acid Gas In
Molar Flow Rate of Condenser 3 Outlet
Tail Gas LHV
Meter Charts
TransCanada Daily Gas Analysis
SULSIM Engineering Calculations
ZEDI Charted Meter Readings
Production Accounting Reports
AER S-30 Reports (Petrinex)
Excel-based emissions calculations
Variables/Parameters used to calculate GHG components
CO2, CH4, N2O Emissions from Fuel Extraction & Processing (B9): Natural Gas Extraction and Processing Emission Factors from Protocol, LHV Acid Gas
CO2, CH4, N2O Emissions from Incineration (B6): Site-specific CO2 emission factor, and CH4, N2O Emission Factors from 2014 NIR (Table A8-2), LHV Acid Gas


AltaGas – Turin Acid Gas Injection Project – 2015
Emission Category
Legend
Project Emissions
Operations/ Data Management
Emission Source
Variable/Parameter
Field/ On-site Capture System
Other Data System
2nd or 3rd Party Data (name)
Manual transfer of data
Electronic transfer of data
Acid Gas Flare
Compressors
Volume Fuel Gas for Upset Flaring
Fuel Gas Composition
Composition of Acid Gas
Volume Acid Gas Flared
Operating Hours
Meter Charts
TransCanada Daily Gas Analysis
Gas Analyzer
Meter Charts
Acid Gas Injection Operating Time from ZEDI Reports
ZEDI Charted Meter Readings
ZEDI Charted Meter Readings
Monthly Average from Data Historian
Production Accounting (TIPS)
AER S-30 Reports (Petrinex)
Excel-based emissions calculations
Variables/Parameters used to calculate GHG components
CO2, CH4, N2O Emissions from Fuel Extraction & Processing (P12): Natural Gas Extraction and Processing Emission Factors from Protocol
CO2e Emissions from Acid Gas Dehydration and Compression (P6): Fan motor and compressor ratings, Electricity emission factor for grid power
CO2, CH4, N2O Emissions from Upset Flaring (P8): Site-specific CO2 emission factor, and CH4, N2O Emission Factors from 2014 NIR (Table A8-2), LHV Acid Gas

3.6 Responsible Party Documentation Reviewed

GHG Assertion:

- AltaGas Turin GHG Calculator 2015 v4.1_2016_02_17.xls
- AltaGas Turin Acid Gas Injection Project Offset Project Plan for the Period 1, January 2013 – 31 December, 2017. Final Report dated February 4, 2014
- Letter correspondence from Alberta Environment dated April 23, 2013 granting approval for the extension request for the AltaGas Turin Acid Gas Injection Project.
- AltaGas Turin Acid Gas Injection Project, Offset Project Report for the Period January 1, 2015 – December 31, 2015. Dated February 23, 2016.

Gas Analysis:

- Turin Sales Gas Analysis 2015
- Turin_Acid_Gas_Analysis_Jan-Dec_2015 (screen shots from plant)

Gas Volumes:

- Turin 2015 Calibration Reports
- Turin_Petrinex_Reports_Jan-Dec_2015
- S30 Turin Excel files January to December 2015
- Turin Zedi Meter 3A Jan-Dec 2015 (3 files)
- Turin Fuel to Flare (151) Jan-Dec 2015 (3 files)

Other:

- Cata-Dyne Fuel and Electrical Rating Data
- Turin 2015 Packer Test
- Altagas Turin SRU Sulsim Simulation Report 2015 - Final
- AER Directive 060

4 Verification Findings

4.1 Verification Findings

The Verification Team planned and completed the verification procedures described in the following two tables. The procedures and findings related to each *specific Project or Baseline emissions source and sink variable* used to quantify the GHG Assertion are provided in Table 4.1-1. The procedures and findings related to the *overall Project GHG Assertion* are provided in Table 4.1-2.

Detailed descriptions of any misstatements identified by the Verification Team are provided in Table 4.2-1.

Table 4.1-1: Project and Baseline GHG Emissions Sources and Sinks Findings

Data Description	Verification Procedure(s)	Findings
B9 and P12- FUEL EXTRACTION AND PROCESSING P8 – UPSET FLARING EMISSIONS		
Acid gas flared volumes (upset flaring)	Compare data in emissions calculations against substantiating sources for transcription error.	A comparison of the acid gas flared volumes reported in the emissions calculations workbook against supporting documentation found no misstatements.
Fuel gas flared	Compare data in emissions calculations against substantiating sources for transcription error.	A comparison of the fuel gas volumes associated with the Project reported in the emissions calculations workbook against supporting documentation found no misstatements.
	Observe meter verification (calibration) tags and reports during site tour.	Meter calibration reports were reviewed for fuel to flare meter 151. No misstatements identified.
Fuel gas composition	Compare data in emissions calculations against substantiating sources for transcription error.	A comparison of the fuel gas composition data reported in the emissions calculations workbook against supporting documentation found no misstatements.
Acid gas disposal volumes	Observe meter verification (calibration) tags and reports during site tour.	Meter calibration reports were reviewed for acid gas to injection well meter 3A. No misstatements identified.
	Compare data in emissions calculations against substantiating sources for transcription error.	A comparison of the acid gas disposal volumes reported in the emissions calculations workbook against supporting documentation found no misstatements.
Acid gas composition	Review data source and appropriateness of use in emissions calculations.	A comparison of the acid gas composition data reported in the emissions calculations workbook against supporting documentation found no misstatements.
Lower heating value of tail gas and make-up fuel gas	Review supporting documents from external sources.	ICF reviewed the AER Directive 060 requirement 7.1.1 and confirmed the assumptions used in the emissions calculations to be valid for this Project. No misstatements identified.

Data Description	Verification Procedure(s)	Findings
Molar flow of acid gas stream into SRU and SRU tail gas as simulated by Sulphur Experts	Review supporting documents from external sources.	The 2016 Sulsim Report was reviewed and compared against the emissions calculation workbook. Molar flow and gas compositions were found to be consistent with the emissions quantification. No misstatements identified.
B6 - INCINERATION		
Site specific CO_2 emission factor for natural gas combustion	Review emissions calculations and OPR regarding data sources, transcription and data security.	The site-specific CO_2 emission factor is calculated based on the composition of natural gas. The emissions quantification workbook uses an average composition for the year, based on monthly sampling. A recalculation of the emission factor using monthly natural gas volumes for a weighted average found the difference to be immaterial, accounting for less than 0.2% of the total Assertion. No misstatements identified.
Composition of tail gas	Compare raw data records, invoices against data in emissions calculations for consistency.	The 2016 Sulsim Report was reviewed and compared against the emissions calculation workbook. Molar flow and gas compositions were found to be consistent with the emissions quantification. No misstatements identified.
P6 - ACID GAS DEHYDRATION AND COMPRESSION		
Operating hours of the acid gas compressor	Compare raw data records, invoices against data in emissions calculations for consistency.	A comparison of compressor operational hours reported in the emissions calculations workbook against supporting documentation found no misstatements.
Acid gas compressor and fan motor rating	Interview Project personnel regarding manually entered data sources, such as operations logs and equipment specifications.	Through interviews of operations personnel during the site visit, ICF confirmed the compressor rating and fan motor capacity. No misstatements detected.

Table 4.1-2: Project GHG Assertion Findings

GHG Assertion Risk Category	Verification Procedure(s)	Findings
Changes at the Project Level	Interview Project operations personnel regarding changes to equipment inventory or changes in operation that have occurred in the time period covered by the GHG Assertion.	ICF confirmed that there were no changes to equipment during the operation period at Turin. No misstatements detected.
Incomplete emission sources	Through the site visit and understanding of the Project, evaluate any emissions sources or sinks that are not considered by the Protocol.	Through the site visit, ICF identified that there were several space heaters and a vapour pump related to the acid gas injection project. These are included in the Project emissions for 2015 and documented in the OPR. No misstatements detected.
Continuity of reporting practices	Compare emission sources and category total for the current assertion year against those in previous years.	Baseline and project emissions were compared to prior reporting periods. Changes in the total asserted emissions reductions year over year are attributable to changes described in the Offset Project Report. In the 2015 reporting year, the electricity emission factor for electricity consumed in the operation of the Project was changed from previous reporting periods and the Offset Project Plan. This change is described further below in regards to ICF's review of emission factors. Space heaters and a vapour pump associated with the Project were added as an emission source in 2015 accounting for 40 tCO_2e. No other changes were identified that may impact the GHG Assertion. No misstatements detected.
Complexity of data systems	Develop a data life cycle diagram, or data map for each major GHG emissions source/sink and confirm with Project operations and GHG reporting personnel.	A data life cycle diagram for each GHG emission source was developed through the course of the verification. The diagram has been included in the Verification Report. No misstatements detected.

GHG Assertion Risk Category	Verification Procedure(s)	Findings
	Interview Project personnel responsible for quantifying emissions reductions regarding data metering and validation, data storage, data security, and any manual data entry or transcription.	Interviews regarding data acquisition and transfer were used to develop the data life cycle diagram included in the Verification Report. A review of data sources and the emissions quantification workbook were also used to understand data systems used in the emissions quantification. The majority of data is directly metered and used in the emissions quantification as well as for reporting to the Alberta Energy Regulator, providing a high level of confidence in the data. No misstatements detected.
Use of appropriate quantification methodologies	Review quantification formulas and estimation calculations prescribed by the Protocol against those described in the OPR and utilized in the emissions calculations for each GHG emissions source/sink.	Methodologies described in the Offset Project Report for quantification of GHG emissions were found to be consistent with Protocol requirements. No misstatements detected.
	Calculate emissions reduction claim from original, second-party or third-party data.	Through a recalculation of emissions from 'original' data sources, ICF confirmed the methodologies used in the GHG Assertion are consistent with those prescribed by the Protocol. No misstatements detected.
Quantification accuracy	Calculate emissions reduction claim from original, second-party or third-party data.	Through a recalculation of emissions from 'original' data sources, ICF confirmed the accuracy of the data and formulas in the emissions quantification workbook. No misstatements detected.
Completeness of GHG Assertion	Review GHG Assertion against guidance documents for completeness.	The final GHG Assertion was reviewed for consistency and accuracy with the calculated emissions reductions. No misstatements detected.
Transcription of Final GHG Assertion	Compare calculated values to those in the GHG Assertion and OPR for transcription accuracy.	The emissions reduction claim was correctly transcribed from the Offset Calculator into the final GHG Assertion.

GHG Assertion Risk Category	Verification Procedure(s)	Findings
Number of parties involved	Through the site visit and understanding of the Project, evaluate accuracy and representativeness of emissions calculations.	Through the site visit, and understanding of the Project, ICF confirmed the emissions quantification is representative of Project conditions.
Manual data entry processes	Observe or interview Project operations personnel regarding the operation of data transfer systems during site tour, including manual data entry procedures and associated controls.	Interviews regarding data acquisition and transfer were used to develop the data life cycle diagram included in this Verification Report. A review of data sources and the emissions quantification workbook were also used to understand data systems used in the emissions quantification. The majority of data is directly metered and used in the emissions quantification as well as for reporting to the Alberta Energy Regulator, providing a high level of confidence in the data. No misstatements detected.
	Compare raw data records, invoices against data in emissions calculations for consistency.	Data in emissions calculations were compared against supporting data sources for transcription error, as detailed in the Sampling Plan. No misstatements detected.
Ownership	Review of documents proving the ownership of the assets creating the emissions reductions.	ICF confirmed that AltaGas has full ownership of the Project and the associated environmental attributes. No misstatements detected.

GHG Assertion Risk Category	Verification Procedure(s)	Findings
Applicability	Review OPR for evidence of applicability for each requirement described by the Protocol;	The applicability criteria listed in the Protocol and Section 3.3 of this Verification Report were reviewed against ICFs understanding of the Project and the OPR. 1. Project schematics and affirmation from the project developer confirmed that the sequestration project results in removal of emissions that have otherwise have been released to the atmosphere. 2. Not applicable. The operations are not separate and distinct. 3. The Turin Acid Gas injection scheme has obtained approval from the AER (formerly ERCB), Approval No. 9959A for the disposal of acid gas into the Mannville Y Pool in the Retlaw Field. 4. Metering of injected gas volumes takes place at the injection well head. 5. The sequestration project involves the installation of an acid gas injection project at an existing sour natural gas processing facility which was evaluating installing a SRU. 6. There is no comingling of acid gas streams and only one emitting facility. 7. The quantification of reductions is based on actual measurement and monitoring, except where molar flow volumes are modeled for baseline conditions. 8. The project meets the requirements for offset eligibility as specified in the applicable regulation and guidance documents for the Alberta Offset System.
	Review OPR for evidence of applicability for each requirement described by the extension approval letter;	The extension approval letter from Alberta Environment dated April 23, 2013 identified four additional requirements beyond those of the Protocol. ICF reviewed these requirements against information gathered during the site visit and verification process and found the additional requirements were being met: - Indirect emissions from the use of heat and electricity are being included in the Project; - Project and documentation adheres to the updated Technical Guidance for Offset Project Developers (v4, 2013); - Injection well is monitored for CO_2 losses from well blow-outs, blow-downs, or leaks. No such instances occurred in 2015; - The formation is monitored to detect any losses of CO_2. None were identified in 2015.

GHG Assertion Risk Category	Verification Procedure(s)	Findings
Assessment of Emission Factors and Default Parameters	Compare emission factors used in calculations against reference documents.	ICF compared the emissions factors and default parameters (or constants such as higher heating values and molecular weights) used in the emissions calculations against reference documents. The values used in the emissions calculations and referenced in the project documentation were found to be relevant and correctly transcribed. No misstatements detected. The emission factor used for quantification of emissions associated with electricity consumption in the project condition was changed in the 2015 GHG Assertion. The emission factor has been changed from 0.88 to 0.64 tCO_2e/MWh to reflect the Carbon Offset Emission Factors Handbook dated March 04, 2015. The Memorandum accompanying the release of the Handbook notes that "All new projects will be required to use values and methodologies provided in the handbook, and current projects will be required to transfer to updated factors when they receive a crediting period extension". While neither of these conditions apply to the Project, the memorandum further states that "the project developer is responsible for ensuring the most current factors and methodologies are being used". As such, the Responsible Party has changed the emission factor for electricity in the current reporting period. The change accounts for an increase of approximately 1,613 tCO_2e, or 2% of the total Assertion in comparison to emission quantified with the electricity emission factor used in previous reporting periods. Due to the ambiguity of the direction provided in the Memorandum, this has been qualified as a **qualitative misstatement.** Emission factor reference sources for all other parameters are consistent with the Offset Project Plan. No other emission factor reference sources were updated to reflect the Carbon Offset Emission Factors Handbook.

4.2 Misstatements

The misstatement section below summarizes the misstatement identified in the verification findings in Section 4.1 including an approximated value of the asserted quantity affected by the misstatement, described as a percentage of the total Assertion. These values should be relied upon only for determining if misstatements breach the materiality threshold and not for any other purpose.

Table 4.2-1: Misstatements

Misstatement Title	Misstatement Description
Qualitative Misstatement Inconsistent change in reference emission factors.	The emission factor used for quantification of emissions associated with electricity consumption in the project condition was changed in the 2015 GHG Assertion. The emission factor has been changed from 0.88 to 0.64 tCO2e/MWh to reflect the Carbon Offset Emission Factors Handbook dated March 04, 2015. The Memorandum accompanying the release of the Handbook notes that "All new projects will be required to use values and methodologies provided in the handbook, and current projects will be required to transfer to updated factors when they receive a crediting period extension". While neither of these conditions apply to the Project, the memorandum further states that "the project developer is responsible for ensuring the most current factors and methodologies are being used". As such, the Responsible Party has changed the emission factor for electricity in the current reporting period. The change accounts for an increase of approximately 1,613 tCO2e, or 2% of the total Assertion in comparison to emission quantified with the electricity emission factor used in previous reporting periods. Due to the ambiguity of the direction provided in the Memorandum, this has been qualified as a qualitative misstatement. Emission factor reference sources for all other parameters are consistent with the Offset Project Plan. No other emission factor reference sources were updated to reflect the Carbon Offset Emission Factors Handbook.

4.3 Materiality

No quantitative misstatements were identified through the course of the verification. There was found to be no breach of materiality (greater than 5% of the total GHG Assertion).

4.4 Other Findings

Through the course of the verification the data management systems and controls employed in the quantification of emissions reductions associated with the Project were reviewed, as detailed in Section 4.1 above. These systems were found to be effective in the calculation of the GHG Assertion.

The approaches to measurement and calculation used to quantify the emissions and production values in the Assertion are those deemed acceptable by Alberta Environment. The uncertainty associated with these accepted approaches have been deemed acceptable by Alberta Environment.

The site-specific CO_2 emission factor for natural gas combustion is calculated based on the composition of natural gas at the site. The emissions quantification workbook uses an average composition for the year, based on monthly sample results. A recalculation of the emission factor using monthly natural gas volumes to obtain a weighted annual average found the difference to be immaterial, accounting for less than 0.2% of the total Assertion. While the finding is immaterial, using a monthly-weighted average would provide a greater level of accuracy and a more representative emission factor.

4.5 Confirmations

The "Confirmations" defined in Section 5.4 of the Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, Version 1.0, January 2013 were completed. The results of this review were as follows.

- Offset project information across offset project documentation was reviewed and found to be consistent with guidance documents;
- Offset project location and any applicable approvals information was included with the GHG Assertion;
- Quantification methodologies have been documented in the offset project documentation;
- Offset project contact, report dates, emission reduction numbers, etc. were included in project documentation;
- Process and data flow diagrams in the project documentation were reviewed during the site visit and found to be an accurate representation of Project operations.

5 Verification Team

Since 1969, ICF International has been serving major corporations, all levels of government, and multilateral institutions. Globally, approximately 500 of our 5,000 employees are dedicated climate change specialists, with experience advising public and private-sector clients. ICF International has earned a reputation in the field of climate change consulting for its analytical rigour, in-depth expertise, and technical integrity through scores of GHG emissions-related assignments over the past two decades.

Over the past ten years, ICF Consulting Canada, Inc., a fully owned subsidiary of ICF International, has carried out numerous facility-level GHG verifications and verifications of emissions reduction projects. ICF's Verification Body has developed the necessary internal controls to ensure qualified and competent staffing uphold the principles of the relevant standard while quality control processes are utilized to assure data integrity is maintained and safeguarded. ICF's clients choose ICF for its strong brand, technical expertise, and rigorous methodological approach.

ICF has assembled a Verification Team consisting of experienced GHG verifiers <and relevant technical experts>.

Lead Verifier – Jennifer Packer, P.Eng.

Jennifer Packer is a Senior Associate in ICF's Energy and Carbon Markets division in the Calgary office and a Lead Verifier in ICF's Verification Body. She has worked on over 25 verification projects including natural gas production and processing, SAGD, bitumen upgrading and refining, landfill gas utilization, biomass to energy, aerobic digestion, wind, energy efficiency, and acid gas injection under the Alberta Specified Gas Emitters Regulation, and oil and gas extraction and processing linear facility operations under the BC GHG Reporting Regulation. Jennifer has also provided verification for Corporate Sustainability Reports and the Alberta Climate Change Emissions Management Corporation. Jennifer holds an M.Sc.in Sustainable Energy Development from the University of Calgary and a B.Eng. in Environmental Engineering from the University of Guelph. She has completed supplementary verification training, receiving an ICF certificate of training for ISO 14064-1,-2, and -3, has current H2S Alive training. Jennifer is a Professional Engineer in the Province of Alberta.

Associate Verifier – Jessica Abella, P.Eng.

Jessica Abella holds a Master of Science degree in Chemical Engineering with a specialization in Energy and Environmental Systems from the University of Calgary and a bachelor's in Chemical Engineering from the Universidad Nacional de Colombia. She is a professional engineer with the Province of Alberta and has completed supplementary verification training, receiving an ICF certificate of training for ISO 14064. Jessica is a skilled and analytical researcher with twelve years of experience in technology assessment in the energy sector. Ms. Abella has developed expertise in assessing environmental tradeoffs of energy decisions on a life cycle basis including greenhouse gas implications of producing Western Canadian crude oils, refining petroleum, development of natural gas industry, and technology assessment of mitigation paths. Additionally, Jessica has developed expertise in interpretation of ISO guidelines and developing internal process reviews, process mapping, and process design to improve and align Environment Risk Management and Compliance Management systems in the energy industry. Ms. Abella has acted as ICF Associate Verifier for third-party assurance engagements in the 2014 compliance period under Alberta's Specified Gas Emitters Regulation and continues to provide these services for the 2015 compliance period. She has also provided quantification of emission profiles for organizations reporting to the Carbon Disclosure Project and Low Carbon Fuel Standards. Ms. Abella has conducted studies internationally in Colombia related to the: engineering, economic, financial, and environmental impact of development of renewable energy resources. Ms. Abella has used her professional strengths to inform studies for Natural Resources Canada, National Climate Change Secretariat of Singapore, National Planning of Mining and Energy Sectors in Colombia, and oil and gas industry in Canada.

Internal Peer Reviewer

Julie Tartt has a Bachelor of Science degree in Environmental Sciences from the University of Guelph and has completed supplementary verification training, receiving a certificate of training for ISO 14064. Julie is the Manager of ICF's Verification Management System (VMS) and is also a Lead Verifier – she led and managed the development of ICF's ANSI-accredited ISO 14065 VMS. She has considerable experience and expertise quantifying greenhouse gases through her work developing numerous GHG inventories, and verifying GHG emissions. Julie has been working with ICF's Verification Body since 2010 and has worked on verifications under several regulatory reporting programs including British Columbia, Ontario, and Quebec's Greenhouse Gas Reporting Regulations, and Alberta's Specified Gas Emitters Regulation. Facility compliance reports verified have included natural gas pipeline and natural gas processing linear facility operations, coal mining, electricity generation, and cogeneration facilities. Emissions reduction project verifications have included wind electricity generation, landfill gas capture and utilization, aerobic composting, and tillage management projects. Additionally, she has provided verification services for organizations reporting to the Carbon Disclosure Project and The Climate Registry, as well as voluntary emissions reductions projects. Julie also has extensive experience managing and administering large, multi-client, carbon market modeling and analysis studies nationally and at the provincial level. Julie has current H_2S Alive and First Aid Training.

Statement of Qualifications

As the Lead Verifier / Designated Signing Authority and a Professional Engineer registered in the province of Alberta, I, Jennifer Packer meet or exceed the required qualifications described in Section 18 of the *Specified Gas Emitters Regulation*, including the training requirements under ISO 14064.

The information contained within this document and this statement of qualifications, is complete and correctly represents the qualifications of ICF and the members of the Verification Team described herein. Dated this first day of March, 2016.

Jennifer Packer, P.Eng.
Professional Engineer, Alberta (164930)
Lead Verifier and Designated Signing Authority
ICF Consulting Canada, Inc.
Calgary, Alberta

Duncan Rotherham
Vice President and Managing Director
ICF Consulting Canada, Inc.
Toronto, Ontario

Appendices

Verification Plan
Sampling Plan
Conflict of Interest Checklist

Verification Plan

AltaGas, Turin and Bantry Acid Gas Injection Project

1 Introduction

This document provides details on the verification scope and process that is planned to conduct a reasonable level verification of the January 1, 2015 to December 31, 2015 Alberta Offset System Greenhouse Gas Assertion of Emission Reduction Credits (the "**GHG Assertion**") for the AltaGas Turin and AltaGas Bantry Acid Gas Injection Projects, (the "**Projects**"). An overview of operations at each Project will be provided in the Verification Reports.

A Risk Assessment is conducted during the verification planning stage; the results will be provided in Section 6. These results were used to inform the development of the verification procedures outlined in the Verification Report. Additionally, the results of the Risk Assessment informed the development of the Sampling Plan, which will be included in the Verification Reports.

The Verification and Sampling Plans will be updated through the course of the verification as additional information becomes available.

The verification conclusion will be documented in the Verification Statement and the verification findings will be further described in the Verification Reports. A separate Verification Report will be developed for each of the Projects. The Verification and Sampling Plans will be appended to the Verification Reports to provide information related to the verification scope and process.

2 Verification Scope

2.1 Objective

The primary objective of this verification engagement is to provide assurance to Alberta Environment and Parks ("**AEP**") that the GHG Assertion is reliable, and of sufficient quality through a review of the Project's GHG Assertion by the Verification Team.

2.2 Parties and Users

The person or organization that has overall control and responsibility for the GHG Project, as defined in Section 2.13 of ISO 14064-2:2006, is the "**Project Proponent**". For this verification, AltaGas Processing Partnership ("**AltaGas**") is the Project Proponent.

The person or persons responsible for the provision of the GHG Assertion and the supporting information, as defined in Section 2.24 of ISO 14064-3:2006, is the "**Responsible Party**". For this verification, AltaGas is also the Responsible Party.

ICF Consulting Canada, Inc., the "**Verifier**" or "**ICF**", has been engaged to provide a third-party verification of the GHG Assertion. The Lead Verifier and Associate Verifier compose the ICF "**Verification Team**".

The "**Intended User**" is defined in Section 2.22 of ISO 14064-2:2006 as the individual or organization identified by those reporting GHG-related information that relies on that information to make decisions. AEP is the Intended User of the information contained within the Verification Statement.

2.3 Scope

The verification will be conducted in accordance with *ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions.*

The Verification and Sampling Plans were developed based on the relevant criteria described in the following:

- *Climate Change and Emissions Management Act*
- *Specified Gas Emitters Regulation, Alberta. Reg.139/2007*
- *Quantification Protocol for Acid Gas Injection, version 1.0 May 2008*
- *Technical Guidance for Offset Project Developers,* version *4.0, February 2013*
- *Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance, Version 1.0, January 2013*

The following table defines the scope elements specified for the Project.

Scope Element	ISO 14064-3 Definition	Project Specific
Boundary	The Project boundary, including legal, financial, operational and geographic boundaries	AltaGas Turin Acid Gas Injection Project Located at the AltaGas Turin Sour Gas Processing Plant near Turin, Alberta. LSD: 12-19-12-18 W4M (Gas Processing Plant) 03-25-12-19 W4 (Injection Well) AltaGas Bantry Processing Plant located near Tilley, Alberta. LSD: 1/4 -33-17-12 W4M (Gas Processing Plant) 02-13-33-17 12 W4 (Injection Well)
Infrastructure and Activities	The physical infrastructure, activities, technologies and processes associated with the Project	Capture and permanent sequestration of the acid gas stream to reduce the quantity of CO_2 released to the atmosphere. Project condition includes compression, transportation, and injection of acid gas. Baseline processes include flaring.
GHG Sources and Sinks	GHG sources to be included	Baseline: • Extraction and processing of natural gas for flaring and to operate sulphur recovery unit • Fuel gas to operate sulphur recovery unit • Flaring of acid gas • Natural gas for flaring Project: • Extraction and processing of natural gas • Upset flaring • Natural gas for flaring • Acid gas injected • Acid gas dehydration and compression
GHG Types	Types of GHGs to be included	• Carbon Dioxide (CO_2) • Methane (CH_4) • Nitrous Oxide (N_2O)
Reporting Period	Vintage of credits to be included	January 1, 2015 – December 31, 2015

2.4 Materiality

During the course of the verification, individual errors, omissions or misrepresentations (collectively referred to as misstatements) or the aggregate of these misstatements will be evaluated qualitatively and quantitatively.

Materiality defines the level at which misstatements in the GHG Assertion or any underlying supporting information precludes the issuance of a reasonable level of assurance.

The Lead Verifier is responsible for applying professional judgment to determine if *qualitative* misstatements could adversely affect the GHG Assertion and subsequently influence the decisions of the Intended User, in which case, the misstatements are deemed to be material.

Quantitative misstatements will be calculated individually to determine the impact of the misstatement as a percentage of the GHG Assertion.

All misstatements that are outstanding at the conclusion of the verification are documented in the Verification Report and classified on an individual basis as either material or immaterial.

Materiality Threshold

The materiality threshold is defined as 5% of the total reported emissions reductions in the GHG Assertion. Individual misstatements and the aggregate of individual misstatements will be analyzed to determine if the materiality threshold has been breached.

Tolerable Error Threshold

Tolerable error dictates the level of rigor applied to the verification at the emissions source level. Tolerable error for this verification will be set at half of materiality (2.5%) of the total GHG Assertion.

2.5 Principles

ISO 14064 defines six principles that should be upheld in the development of the GHG Assertion. These principles are intended to ensure a fair representation and a credible and balanced account of GHG-related information. The verification procedures developed and executed during the course of this verification will present evidence such that each of these principles is satisfied.

Relevance

Appropriate data sources are used to quantify, monitor, or estimate emissions sources. Appropriate minimum thresholds are used to justify the exclusion or the aggregation of minor GHG sources or the number of data points monitored.

Completeness

All emissions sources relevant to the Project are included within an identified source category.

Consistency

Uniform calculations are employed between reporting periods. Emissions calculations for each emissions source are calculated uniformly. If more accurate procedures and methodologies become available, documentation should be provided to justify the changes and show that all other principles are upheld.

Accuracy

Measurements and estimates are presented, without bias as far as is practical. Where sufficient accuracy is not possible or practical, measurements and estimates are used while maintaining the principles of conservativeness and transparency.

Transparency

Information is presented in an open, clear, factual, neutral and coherent manner that facilitates independent review. All assumptions are stated clearly and explicitly and all calculation methodologies and background material are clearly referenced.

Conservativeness

Appropriate parameters affecting the Project's emissions sources are utilized in the calculation of the GHG Assertion. When parameters or data sources are highly uncertain, the choice of parameter or data source utilized results in an underestimation of the GHG Assertion. Note that any error, underestimation or overestimation, would be evaluated as a potential material error.

2.6 Limitation of Liability

Due to the complex nature of the operations within the Project and the inherent limitations of the verification procedures employed, it is possible that fraud, error, or non-compliance with laws, regulations, and relevant criteria may occur and not be detected.

3 Verification Team

The qualifications of the Verification Team and Internal Peer Reviewer are provided in the Statement of Qualifications.

Lead Verifier, Jennifer Packer, P.Eng.

The Lead Verifier is responsible for all activities conducted within the verification, including overseeing the development of the Verification and Sampling Plans and the execution of the verification procedures. The Lead Verifier is the lead author of the Verification Report and executes the Verification Statement at the conclusion of the engagement.

Associate Verifier, Jessica Abella, P.Eng.

The Associate Verifier works under the direction of the Lead Verifier to conduct the verification procedures.

Internal Peer Reviewer[1], Julie Tartt

The Internal Peer Reviewer is not a member of the Verification Team and does not participate in the verification until the draft Verification Report and draft Verification Statement have been prepared. The Internal Peer Reviewer conducts an internal assessment of the verification to ensure the verification procedures have been completed, the results of the verification have been thoroughly documented, any issues or misstatements have been investigated and the verification evidence is sufficient to reach the verification conclusion described in the Verification Statement.

[1] Note: the Internal Peer Reviewer is not a member of the Verification Team, but is listed here to keep the list of personnel involved in the engagement in one place.

4 Verification Process

The ICF approach for verification of a GHG Assertion follows the tasks outlined in the following diagram. Although these tasks are generally completed sequentially, the order may be modified according to circumstances such as scheduling and data availability.

Pre-Engagement	Approach	Execution of Verification	Completion
1. Selection of Lead Verifier 2. Initiate Conflict of Interest Procedure 3. Pre-Engagement Planning and Proposal Development 4. Contract Execution 5. Assess GHG Program & Revise VMS as Required 6. Initiate Verification Tracking	7. Selection of Verification Team 8. Communication with Project Proponent 9. Kick-off Meeting 10. Verification Risk Assessment 11. Draft Verification and Sampling Plan	12. Site Visit 13. Conduct Verification Procedures 14. Issue Clarification & Data Request 15. Revise & Finalize Verification and Sampling Plan 16. Address and Evaluate Outstanding Issues	17. Evaluate Evidence 18. Hold Verification Findings Meeting (if necessary) 19. Draft Verification Reports & Statements 20. Internal Peer Review 21. Completion of COI Form 22. Independent Review of Impartiality 23. Issue Verification Reports & Statements 24. Close Verification File 25. Develop and Issue Management Memo(s)

4.1 Pre-Engagement

Prior to submitting a proposal to conduct this verification, the following pre-planning steps were taken:

- The results of any previous business engagements or verifications with the Project Proponent were reviewed to determine if any previous unresolved conflicts may preclude ICF from engaging in the verification; and
- A Conflict of Interest procedure was initiated that documents whether any perceived or real conflicts were found when considering threats due to:
  - Advocacy
  - Financial Interest
  - Familiarity/Sympathy
  - Intimidation
  - Self-Review
  - Incentives

4.2 Approach

An extensive knowledge of the Project Proponent's business, the relevant industry, and the details of the Project itself are required to conduct a thorough verification that can lead to a conclusion. The initial information collected about the Project Proponent and the Project formed the basis of the preliminary draft Verification Plan. The development of the final Verification Plan is an iterative process; that is, the process will be completed

several times through the course of the verification and the resulting plan will be updated as new information became available.

There are three types of risk associated with the GHG Assertion defined in ISO 14064-3:

- Inherent Risk
- Control Risk
- Detection Risk

The process of designing the Verification Plan began with the development of the Risk Assessment for both the Project as well as the Project Proponent. The steps in this process included:

- Reviewing the GHG Assertion, and the methodologies employed by the Project;
- Reviewing information on the industry and the specific Project under review;
- Assessing the likelihood that a material misstatement might exist in the GHG Assertion, if no controls were used to prevent misstatements in the GHG Assertion (i.e. inherent risk);
- Assessing the control environment and the corporate governance process (i.e. control risk); and
- Reviewing each emissions source identified in the Project, and evaluating the contribution of each source to the GHG Assertion and the associated potential material misstatement for each.

The results of the Verification Risk Assessment inform the development of the verification procedures. A summary of the Verification Risk Assessment is provided in Section 6. The Sampling Plan and the Verification Risk Assessment ensure the verification procedures address each of the risks identified. The draft Verification Plan was provided to the Project Proponent before proceeding with the verification.

4.3 Execution of Verification

With Verification and Sampling Plans in place, the verification procedures will be executed. This process involves collecting evidence, testing internal controls, conducting substantive testing, and developing a review file. Over the course of the verification, the draft Verification and Sampling Plans may change; the final Verification and Sampling Plans provided in the Verification Reports reflect the verification parameters and procedures that were actually executed.

Site Visits

The site visits will be conducted by Jennifer Packer on January 19, 2016.

The site visits will be a key step in the planning and execution of the verification. During the course of the site tours, ICF will interview key site operations personnel regarding the operations and data management for the Project.

AltaGas staff to be interviewed on-site include site operations staff, field technicians, and production accountants, as available. During the site visit all GHG emissions sources for the Projects will be reviewed to ensure appropriate identification and categorization. A review of process flow and metering diagrams will be followed by physical observation of both Projects.

Health and Safety Requirements

Personal Protective Equipment including steel-toe boots, hard had, safety glasses, and safety vest will be required for the site visit. In addition, staff attending the site visit will be required to have current H_2S Alive! certification.

Collecting Evidence and Review of Documentation

Sufficiency and appropriateness are two interrelated concepts that are fundamental to the collection of verification evidence. The decision as to whether an adequate quantity (sufficiency) of evidence has been obtained is influenced by its quality (appropriateness).

Through the execution of the verification procedures described in the Verification Reports, the Verification Team will review three key forms of evidence including physical, documentary and testimonial:

- Management documentation: policies, programs, and procedures related to the collection, safeguarding, and management of the data supporting the GHG Assertion;
- Records: records comprise time-sensitive data, correspondence, and files including: emissions calculations workbooks and supporting evidence;
- Interviews: the interviews will provide information regarding operations and data management and will provide evidence to support the sufficiency of data controls; and
- Computer systems: data systems and data management software used to capture and manage the GHG-related data and to calculate the GHG Assertion.

Testing and Assessment of Internal Controls

The Verification Team will develop a sufficient understanding of the GHG information system and internal controls to determine whether the overall data management system is sound and if it supports the GHG Assertion. This assessment will seek to identify any weakness or gaps in the controls that pose a significant risk of not preventing or correcting problems with the quality of the data and examining it for sources of potential errors, omissions, and misrepresentations. It will incorporate an examination of three aspects of the Project Proponent's internal controls: (1) the control environment, (2) the data systems, and (3) the control and maintenance procedures.

Assessment of Data

Substantive testing procedures will be used to assess the reasonability and validity of the GHG Assertions. Both quantitative and qualitative analysis will be performed to achieve the desired level of assurance. The verification procedures conducted and ICF's associated findings are described in the Verification Reports. The verification procedures include verification activities designed to:

- Review the Project boundaries, including a review of the completeness of emissions sources identified;
- Review the Project data sources to ensure the GHG Assertions are calculated based on metered or estimated data that meets the requirements of the Quantification Protocol for Acid Gas Injection, version 1.0 May 2008
- Re-calculate the GHG Assertions, which demonstrates transparency and accuracy; and
- Review the GHG Assertions to ensure the emissions reductions calculated by the Project Proponent have been accurately reported.

Clarification and Data Request

To facilitate information flow between the Verification Team and the Project Proponent, a consolidated request for additional information will be developed through the course of the verification and issued to the Project

Proponent. This "Clarification and Data Request" will be used to document information requests and summarize the responses. It will also be used to document the Verification Team's assessment of each response.

Developing a Review File

A review file (the "**File**") comprised of documents, records, working papers and other evidence collected and created during the course of the review that support the review conclusions will be developed for this verification. This evidence stored in electronic format will serve to provide support for the verification conclusion, provide evidence that the verification was conducted in accordance with the criteria set forth in this document, and aid the Verifier in conducting current and future reviews.

The File will include:

- The GHG Assertions and supporting documentation, as submitted to AEP;
- Decisions on the level of materiality and the results of the Verification Risk Assessment;
- Documentation on the Project Proponent's internal controls;
- Descriptions of the controls assessment work and results;
- Documentation of the substantive testing procedures that were carried out and the results;
- Documentation of the confirmations outlined in Table 26 of Alberta Environment's *Technical Guidance for GHG Verification at Reasonable Level Assurance*, v1.0, January 2013;
- Copies of any correspondence with the Project Proponent or other parties relevant to the review;
- The Verification Team's working papers;
- The Clarification and Data Request with documented responses from the Project Proponent; and
- Client data (copies of relevant records, spreadsheets, and other data files).

The File is the property of ICF and access to it is normally restricted to the Verifier and the Project Proponent. ICF will retain and safeguard the file for a minimum of seven years.

4.4 Completion

This engagement will be formally closed after the verification has been executed and the Verification Reports have been finalized.

Preparing the Verification Reports

The purpose of the Verification Reports is to document the verification findings. All misstatements are described and compared to the materiality threshold individually and in aggregate. The Verification Statements, which presents ICF's verification conclusion, will be included in the Verification Reports.

Internal Peer Review Process

Prior to releasing the Verification Reports and Verification Statements, an internal review process is conducted by the Internal Peer Reviewer. This process ensures that:

- All steps identified as being required to complete the verification were completed;
- Any identified material or immaterial misstatements identified have been either:
    - corrected by the Project Proponent and reflected in the GHG Assertion; or
    - documented in the Verification Report, if misstatements persist at the conclusion of the verification.
- All required documentation detailing the verification process has been prepared, delivered, and retained.

Closing the Engagement

The verification engagement will be closed out upon delivery of the final Verification Reports for each of the Projects.

5 Verification Schedule

The following schedule is planned for the verification (subject to change).

Description	Scheduled Date
Verification Kick-Off Meeting	December 7, 2015
Draft Verification Plan to Project Proponent	December 9, 2015
Site Visit	January 19, 2016
Initial Clarification & Data Request	February 3, 2016
Draft Verification Statements and Reports	February 26, 2016
Final Verification Statements and Reports	March 1, 2016

6 Verification Risk Assessment

The process for completing a Verification Risk Assessment was described in Section 4.2. The following table describes the *inherent* and *control* risks analyzed by the Verification Team and the corresponding verification procedure(s) outlined in the Verification Reports that have been designed to address these risks.

Description of Inherent Risks	Inherent Risk Evaluation	Description of Control Risks	Control Risk Evaluation	Verification Procedure(s)
Metered data may be inaccurate	Medium	Meter calibration and maintenance program may not implemented or followed	Medium	Observe meter verification (calibration) tags and reports during site tours.
Flared acid gas and fuel gas volumes from S-30 reports may be inconsistent with emissions calculations	Medium	ICF not relying on Responsible Party's controls	N/A	Compare data in emissions calculations against substantiating sources for transcription error.
Acid gas composition applied for the month may not be representative of operations	Medium	ICF not relying on Responsible Party's controls	N/A	Review data source and appropriateness of use in emissions calculations.
Input data to Simulation Report may not be representative of reporting period	Medium	ICF not relying on Responsible Party's controls	N/A	Review supporting documents from external sources.
Methodology / justification of heating values and other non-metered parameters used in emissions calculations may not be transparent in terms of data source or applicable to the Projects	Medium	ICF not relying on Responsible Party's controls	N/A	Review supporting documents from external sources.
Manual data entries into emissions calculations may be incorrectly transcribed	Medium	ICF not relying on Responsible Party's controls	N/A	Review supporting documents from external sources.
Equipment ratings applied in emissions calculations may not be representative of on-site equipment	Medium	ICF not relying on Responsible Party's controls	N/A	Through the site visit and understanding of each Project, evaluate accuracy and representativeness of emissions calculations.
Normal operational changes at the Projects may lead to significant changes in emissions during the reporting period	Medium	ICF not relying on Responsible Party's controls	N/A	Interview Project operations personnel regarding changes to equipment inventory or changes in operation that have occurred in the time period covered by the GHG Assertion.

Description of Inherent Risks	Inherent Risk Evaluation	Description of Control Risks	Control Risk Evaluation	Verification Procedure(s)
Completeness or Consistency of GHG inventory documentation	Medium	ICF not relying on Responsible Party's controls	N/A	Through the site visits and understanding of the Projects, evaluate any emissions sources or sinks that are not considered by the Protocol. Interview Project personnel responsible for quantifying emissions reductions regarding data metering and validation, data storage, data security, and any manual data entry or transcription.
Quantification of emissions within the GHG program requires the use of specific accepted methodologies	Medium	ICF not relying on Responsible Party's controls	N/A	Calculate emissions reduction claims from original, second-party or third-party data.
Accepted quantification methodologies may not be correctly implemented.	Medium	ICF not relying on Responsible Party's controls	N/A	Calculate emissions reduction claims from original, second-party or third-party data.
Quantification of emissions may contain arithmetic errors	Low	ICF not relying on Responsible Party's controls	N/A	Review GHG Assertions against guidance documents for completeness.
Information may be missing from the GHG Assertions	Low	ICF not relying on Responsible Party's controls	N/A	Compare calculated values to those in the GHG Assertion and OPR for transcription accuracy.
Information may be incorrectly transcribed into the final GHG Assertions	Low	ICF not relying on Responsible Party's controls	N/A	Through the site visit and understanding of the Projects, evaluate accuracy and representativeness of emissions calculations.

Description of Inherent Risks	Inherent Risk Evaluation	Description of Control Risks	Control Risk Evaluation	Verification Procedure(s)
The GHG Assertions have been prepared by a second-party consultant. Emissions calculations may not represent site conditions	Low	ICF not relying on Responsible Party's controls	N/A	Observe or interview Project operations personnel regarding the operation of data transfer systems during site tour, including manual data entry procedures and associated controls.
Data is entered into a centralized data management system manually, which poses a risk of transcription error	High	ICF not relying on Responsible Party's controls	N/A	Compare raw data records, invoices against data in emissions calculations for consistency. Calculate emissions reduction claims from original, second-party or third-party data.
Projects may not have full ownership of environmental attributes	High	ICF not relying on Responsible Party's controls	N/A	Interview operations personnel regarding the ownership of the assets creating the emissions reductions.
Projects do not meet Protocol applicability criteria	Low	ICF not relying on Responsible Party's controls	N/A	Review OPR for evidence of applicability for each requirement described by the Protocol.
Incorrect application of emission factors and default parameters used to quantify emission reductions	Medium	ICF not relying on Responsible Party's controls	N/A	Compare emission factors used in calculations against reference documents.

The *detection risk* is a measure of the risk that the verification procedures will fail to detect material misstatements, should such misstatements exist. The verification procedures will be developed to address inherent and control risks, while ensuring the level of detection risk is sufficiently low to reach a verification conclusion at a reasonable level of assurance.

The results of the Verification Risk Assessment will be utilized by the Verification Team to develop the verification procedures, which are outlined in the Verification Reports.

Sampling Plan

AltaGas Turin Acid Gas Injection Facility, 2015

The following sampling plan defines the methodology used to select data to be tested under verification procedures related to confirmation of data through analysis and/or sampling of supporting evidence. All other procedures that do not include sampling, are described in the Verification Report.

Data Description	Verification Procedure(s)	Sample Size	Methodology
Fuel gas composition (Excel file)	Compare raw data records, invoices against data in emissions calculations workbook for consistency	All monthly Production Accounting reports for the reporting period	Confirmed all monthly gas composition analysis reports for the reporting period were consistent with the emissions calculations workbook.
Fuel gas volume for upset flaring (PDF file)	Compare raw data records, invoices against data in emissions calculations workbook for consistency	All daily ZEDI volume statements for 'Fuel Gas for Upset Flaring'	Confirmed volumes were consistent with the emissions calculations workbook.
Acid gas composition (PDF file)	Compare raw data records, invoices against data in emissions calculations workbook for consistency	All 'screen shots' for monthly acid gas average composition	Confirmed volumes were consistent with the emissions calculations workbook.
Volume of acid gas injected (excel file)	Compare raw data records, invoices against data in Electronic Calculator for consistency	All monthly Gas Processing Plant Sulphur Balance Reports from production accounting for the reporting period	Confirmed volumes were consistent with the emissions calculations workbook.
Volume of acid gas injected (PDF file)	Compare raw data records, invoices against data in Electronic Calculator for consistency	Petrinex monthly reports for the reporting period	Confirmed volumes were consistent with the emissions calculations workbook.
Volume of acid gas flared (excel file)	Compare raw data records, invoices against data in Electronic Calculator for consistency	All monthly Gas Processing Plant Sulphur Balance Reports from production accounting for the reporting period	Confirmed volumes were consistent with the emissions calculations workbook.

Data Description	Verification Procedure(s)	Sample Size	Methodology
Volume of acid gas flared (PDF file)	Compare raw data records, invoices against data in Electronic Calculator for consistency	Petrinex monthly reports for the reporting period	Confirmed volumes were consistent with the emissions calculations workbook.
Acid Gas Compresor Hours on Flow (PDF file)	Compare raw data records, invoices against data in Electronic Calculator for consistency	All daily ZEDI volume statements: "Prorate downtime for on/off time discrepancies" data	Confirmed operating hours were consistent with the emissions calculations workbook.
Heating Values, Emission Factors, Densities, Equipment Ratings	Compare values used in calculations against reference documents	All constants used for emissions calculations	Reviewed values used in emissions calculations against reference documentation for consistency and applicability.

Conflict of Interest Checklist – AltaGas Turin and Bantry Acid Gas Injection Offset Projects

AltaGas Processing Partnership

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?		**X**
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?		**X**
For example: • *Provided GHG consultation services to the project;* • *Provided validation for the project;* • *If providing non-GHG work for the company, consideration needs to be given as to how potential and perceived conflicts of interest can be managed;* • *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?		**X**
For example: • *Dealing in, or being a promoter of, GHG 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?		**X**
For example: • *A person on the Verification Team has a close personal relationship with a person who is in a senior GHG 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 deterred from acting objectively and exercising professional skepticism by threats, actual or perceived, from the directors, officers or employees of the Project Developer?		**X**
For example: • *The threat of being replaced as a third party verifier due to a disagreement with the application of a GHG 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.*		

The declaration made in this statement is correct and truly represents ICF Consulting Canada, Inc. and the members of the Verification Team. Dated this first day of March, 2016.

Jennifer Packer, P.Eng.
Professional Engineer, Alberta (164930)
ICF Consulting Canada, Inc.
Toronto, Ontario, Canada

Duncan Rotherham
Vice President and Managing Director
ICF Consulting Canada, Inc.
Toronto, Ontario, Canada