Alberta Offset Program: Overview of Alberta’s Verification Standards and Guidelines and Lesson’s Learned

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Sacramento, CA
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Senior Partner
Outline

1. Alberta GHG Regulatory Framework
   a) Elements - Form and Function
   b) Discovery – Verification, Government Audits, Auditor General (Conservation Cropping)

2. Verification Evolution
   a) Verification Guidance Document – Key Issues
   b) Verification Best Practice Guides for Agriculture

3. Going Forward
Alberta’s Carbon Pricing Policy – Specified Gas Emitter’s Regulation (SGER)

- In 2007, Alberta regulated large industrial GHG emissions
- Existing facilities required to immediately reduce per unit GHG output by 12%
- Three compliance options:
  - Physically reduce emissions
  - Purchase serialized Alberta offsets
  - $15 dollar/tonne towards technology fund

RESULTS (March 2012):
- 32 million tonnes of emissions avoided (from BAU)
- $312 million into the Climate Change and Emissions Management Fund
- $161 million invested in clean energy projects
Offsets

34 offset protocols
17 Mt of offsets retired to date

Top offsets:
- agriculture (tillage)
- wind
- energy efficiency
- enhanced oil recovery
- nitric acid abatement
- wastewater management
Compliance Option Use*:

<table>
<thead>
<tr>
<th>Compliance Cycle</th>
<th>Offset Credits</th>
<th>Fund Payment</th>
<th>EPC Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 (half year)</td>
<td>1 Mt</td>
<td>$43 Million</td>
<td>0.25 Mt</td>
</tr>
<tr>
<td>2008</td>
<td>2.7 Mt</td>
<td>$82 Million</td>
<td>0.57 Mt</td>
</tr>
<tr>
<td>2009</td>
<td>3.8 Mt</td>
<td>$63 Million</td>
<td>1.2 Mt</td>
</tr>
<tr>
<td>2010</td>
<td>3.9 Mt</td>
<td>$70.0 Million</td>
<td>1.9 Mt</td>
</tr>
<tr>
<td>2011</td>
<td>5.3 Mt</td>
<td>$55.4 Million</td>
<td>1.0 Mt</td>
</tr>
</tbody>
</table>

*Alberta Auditor General, 2009 – audit based on money for value to Albertan’s
Tech Fund Investments

Strategic Investment Areas reflect Alberta’s Climate Change Strategy

CCEMC Funding by Strategic Investment Area

- Energy Efficiency (33.6)
- Greening Fossil Fuels (55.1)
- Renewables (50.2)
- CCS (22.0)
Offsets – Core System Elements in Alberta

- **A demand** for credits
  - Created through the Specified Gas Emitters Regulation (SGER)

- **A supply** of credits
  - Creation allowed through the regulation; government approved protocols and methodologies

- **Rules** to govern the system – Technical Guidance Documents

- **Infrastructure** – Registry, Templates, Protocol Review Process (4 Levels of Review/Approval)

- **Consequences** for non-compliance
  - Government audits on verified projects – continuous improvement/learn by doing

- *(Alberta Auditor General – Value for Money Audit)*
Alberta’s Adaptive Management Framework
Alberta Offset System – Evolution of Efforts focusing on Verification

- Additional, Real
  - Management improvements
  - Permanent

Science
- Quantifiable
  - Measureable
  - Sound science basis

Policy
- Verifiable
  - Records, data management
  - Agrologists, accountants, engineers
Limited vs. Reasonable Assurance:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Reasonable Assurance</th>
<th>Limited Assurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Format of the Conclusion</td>
<td>Fairly stated in all material respects – Positive Proof</td>
<td>Nothing has come to our attention that would lead us to believe that the information is not fairly stated in all material respects.</td>
</tr>
<tr>
<td>Which Means What?</td>
<td>Verifier has done enough work to conclude that the offset reduction is accurate to +/-5%.</td>
<td>Verifier has done less work than they would in an audit (reasonable assurance) and in the course of doing that work they have not identified any issues that would lead the verifier to believe that there are material (&gt;5%) errors in the emission reduction (i.e. it is plausible).</td>
</tr>
<tr>
<td>Amount of Work &amp; the Degree of Rigor to support the conclusion.</td>
<td>Higher -“Quantitative”</td>
<td>Lower – “Qualitative”</td>
</tr>
</tbody>
</table>
Lessons Learned in Alberta 2007-2011

- Offsets can be mobilized quickly (over 16 Mt in 4 years – if the protocol is right)
- No-Till offset credits make up 40% of the mix – but have their challenges with public perception (business as usual); Auditor General reports
  - In first year, approximately eligible 10% of the acres were contracted, back to 2002
  - Now at about 40% of the eligible acres
- Alberta’s Audits on the Audits on the Audits revealed:
  - Need tighter guidance in protocols around data and documentation requirements necessary for objective evidence
  - Crop Insurance records are weak evidence
  - Data gathering and substantiation will become more intense
Lessons Learned in Alberta 2007-2011

- Alberta Moving to Reasonable Level of Assurance in 2012
  - Means ‘go-forward’ crediting only; no retroactivity
- Moving to a tighter, more prescriptive system
  - Will limit supply somewhat
  - Tougher on ‘what’s eligible’
- All protocols going through Upgrading to meet Reasonable level of Assurance
- Can’t do retroactive crediting at a reasonable level of assurance

*In Alberta – only Chartered Accountants and Professional Engineers can ‘Verify’ GHG Offsets*
# Evidence Strength – to Support Reasonable Level of Assurance*

<table>
<thead>
<tr>
<th>Evidence Strength</th>
<th>Sources</th>
<th>Characteristics</th>
<th>Examples</th>
<th>Assurance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strong</strong></td>
<td>Third party documentation given by third party to the verifier.</td>
<td>External evidence is more reliable than internal evidence.</td>
<td>Google Earth accessed directly by verifier, <strong>or</strong> Sign off by a P.Ag.</td>
<td>Supports Reasonable Assurance</td>
</tr>
<tr>
<td></td>
<td>Third party documentation given by project developer to the verifier.</td>
<td>Written responses received directly by the verifier from 3rd parties normally provide evidence that is more reliable</td>
<td>Packing plant harvest data for beef cattle, <strong>or</strong> Land title certificates from Land Registry</td>
<td>Supports Reasonable Assurance</td>
</tr>
<tr>
<td></td>
<td>Internally generated documentation by the project developer with corroborating information.</td>
<td>Corroborating information obtained from a source independent of the entity may increase the assurance the verifier obtains from internal evidence</td>
<td>Farm records which show farming practices <strong>backed up</strong> by farm inspections.</td>
<td>Supports Reasonable Assurance</td>
</tr>
<tr>
<td></td>
<td>Internally generated documentation by the project developer without corroborating information.</td>
<td>Same as above</td>
<td>Farm records which show farming practices.</td>
<td>Does not support Reasonable Assurance unless other corroborating information is collected.</td>
</tr>
<tr>
<td><strong>Weak</strong></td>
<td><strong>Affirmation</strong></td>
<td>Documentary evidence is more reliable than oral evidence.</td>
<td>Farmer affirmation on farming practices.</td>
<td>Does not support Reasonable Assurance unless other corroborating information is collected.</td>
</tr>
</tbody>
</table>

*Farmers Advocate Office, Alberta Agriculture and Rural Development*
• Four aspects:

1. **Quantification Methodology** – modeled (estimated), measured, calculated - best available science, IPCC, NIR **methods**, etc.

2. **Quantification accounting basis** – principles and procedures for calculating the GHG reduction
   - ISO-14064:2; Baseline to Project – relative quantification
   - 6 Principles
   - Procedures for addressing offset criteria – permanence, ownership, Measuring, Monitoring, Reporting and Verification

3. **Farm Activity Data** - the data collected from the Project/Farm to calculate the GHG reductions

4. **Farm or Third Party Source Documentation** – evidence to support the data that went into the GHG calculations –” Positive Proof” that activities occurred
Conservation Cropping Protocol v1. 2012 – Key Key Data Points

- The “Acre” making the claim.
- Annual Crop
- Implement Spacing Correct
- Acres under an annual Crop
- Implement passes correct
- Right to Sell the Offset
- Correct Ecozone
Tillage System Mgmt Protocol V 1.3 2009 - 2011

Protocol Applicability Conditions

To demonstrate that a project meets the requirements under this protocol, the project proponent **must supply sufficient evidence** to demonstrate that:

- Farms must be producing annual crops on the applicable land as confirmed by an affirmation from the project developer and farm records;
- Farms in the project must operate on the applicable land in a no-till or reduced till system as defined in this protocol as confirmed by an affirmation from the project developer and farm records;
- The quantification of reductions achieved by the project is based on actual measurement and monitoring (except where indicated in this protocol) as indicated by the proper application of this 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.
<table>
<thead>
<tr>
<th>Data Requirement</th>
<th>Records Needed</th>
<th>Why it is Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership of the farm field</td>
<td>▪ Land title certificate for each field being claimed in the project for the first year the field is included, AND ▪ Confirmation of annual check against land titles to determine if ownership of the property has changed. If ownership has changed, a new land title certificate must be obtained and associated land owner – tenant agreements must be updated.</td>
<td>To confirm land ownership</td>
</tr>
<tr>
<td>Right to transact on offset credits</td>
<td>▪ Contract between project developer and the farm operator for the assignment of the carbon rights. This must include an agreement to provide access to data needed to quantify the greenhouse gas assertion for the farm enterprise. AND, in the case of rented or crop-shared land: ▪ Signed written lease agreement between land owner(s) and the tenant that clearly states the assignment of the rights to the carbon. The contract must be in place before the farm field can be registered in an offset project.</td>
<td>To confirm the right to transact on offset credits</td>
</tr>
<tr>
<td>Field size and location being claimed</td>
<td>▪ GPS track file from farm seeding equipment for each year. OR ▪ GPS shape file derived from field inspection, showing deductions for non-cropped areas (e.g. roads, gullies, wooded areas, grassed waterways, farm buildings). OR ▪ Measurement of field size using Google Earth, airphotos or satellite data showing deductions for non-cropped areas (e.g. roads, gullies, wooded areas, grassed waterways, farm buildings, etc).</td>
<td>Only area under conservation cropping is eligible for offset credits.</td>
</tr>
</tbody>
</table>
1. Revised - CCP V1. 2012

<table>
<thead>
<tr>
<th>Ecozone protocol area classification</th>
<th>Location of field compared to classification boundary layer file available at: <a href="http://xxx">http://xxx</a></th>
<th>To confirm the ecozone and the emission coefficients</th>
</tr>
</thead>
</table>
| Existence of an annual crop, or first year of seeding a perennial crop | At least one of the following list of detailed farm records (completed by the farm operator), specifying the crop during the project year:  
  ▪ Detailed farm record sheets (see example in Appendix E),  
  ▪ Crop plan, such as one provided to seed/fertilizer dealers to ensure product is available for spring farming operations,  
  AND one of the following:  
  ▪ Crop insurance records, or  
  ▪ Photo of annual crop with time and date stamp and link to location of field making the claim (e.g. reference point in photo, GPS file), or  
  ▪ Supporting records to verify the accuracy of the items above. This may include sign off by a Professional Agrologist who has reviewed and collected supporting farm records that confirm the types of crops/field activities for that year. These records must be identified in the report and maintained in a format that is readily available for verifiers to inspect. | To confirm offset credits were generated from an annual or first year perennial crop |
# 1. Revised - CCP V1. 2012

**Occurrences of soil disturbance on each farm field being claimed**

- Detailed farm record sheets (see example in Appendix E) that specify all land disturbance activities including but not limited to seeding, manure spreading/ incorporation and discretionary tillage;
- Disclosure of any discretionary tillage events on a field and calculation of area affected by the disturbance confirmed by a farm record sheet (see example in Appendix E) or GPS readings from farm equipment.
- If no discretionary tillage is done on a farm field, this must be documented in the farm record sheet.

**AND one of the following:**

- The specific equipment used, or
- Supporting records to verify the accuracy of the items above. This may include sign off by a Professional Agrologist who has reviewed and collected supporting farm records that confirm the types of equipment used to meet protocol requirements (e.g. number of passes, shank spacing and opener width) and disturbances per field. These records must be identified in the report and maintained in a format that is readily available for verifiers to inspect.

Failure to disclose discretionary tillage will result in the field being disqualified for the claim year.

<table>
<thead>
<tr>
<th>Seeding/fertilizer specifications used each year</th>
<th>Equipment specifications affect the amount of soil disturbance incurred during farming operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AND one of the following:</strong></td>
<td></td>
</tr>
<tr>
<td>• Calculation of the percentage of soil disturbance based on the width of the opener and shank spacing.</td>
<td></td>
</tr>
<tr>
<td>• Photo evidence with time stamp of equipment used including:</td>
<td></td>
</tr>
<tr>
<td>• Opener width,</td>
<td></td>
</tr>
<tr>
<td>• Distance between shanks</td>
<td></td>
</tr>
<tr>
<td>• Supporting documentation for equipment used by the farm operator including equipment receipt or rental agreement, model number of the tillage equipment. Changes in equipment need to be documented and recorded in the project developer’s files. Equipment purchase and sale records or rental records shall be maintained for verification purposes, or</td>
<td></td>
</tr>
<tr>
<td>• Signed-off report completed by a Professional Agrologist who has reviewed and collected supporting farm records that confirm the type of equipment used by farm or custom operator meets the protocol requirements.</td>
<td></td>
</tr>
</tbody>
</table>
1. Revised - CCP V1. 2012

| Reseeding Events, if applicable | • One additional low-disturbance pass is allowed for reseeding events if total disturbance remains within allowable limits, see Appendix C. Equipment specifications must be recorded in the farm record sheet (see sample field sheet in Appendix E) indicating dates of initial and reseeding events; OR
   • Sign-off by a Professional Agrologist who reviewed and collected supporting farm records that confirm the reseeding events and the types of field operations that meet the protocol requirement. | Reseeding events must not exceed the soil disturbance requirements in Table 1. |

| Use of Irrigation in Dry Prairie Ecozone, if applicable | • Supporting documentation for water usage on the field by farm operator including two of the following:
   ▪ Water use records
   ▪ Photo evidence with GPS time stamp showing equipment used including model information
   ▪ Crop insurance records noting use of irrigation
   ▪ Air photo or satellite imagery showing pivots
   ▪ Saskatchewan Irrigation Program documents
   ▪ Detailed farm maps showing coverage of irrigation networks over farmed lands | Irrigation increases the carbon sequestration potential of Dry Prairie soils to that of Parkland soils. This information is needed to confirm the practices occurred.
   • Sign-off by a Professional Agrologist who reviewed and collected supporting farm records that confirm the reseeding events and the types of field operations that meet the protocol requirement |
# Roles and Responsibilities for Data Collection

<table>
<thead>
<tr>
<th>Entity</th>
<th>Data Collection and Retention Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Operator</td>
<td>Provides copies of farm records and documentation to the project developer. The farm operator must retain original records for their files.</td>
</tr>
<tr>
<td>Project Developer</td>
<td>The project developer has primary responsibility for record keeping and record coordination to support project implementation and due diligence, and will be the primary information source for third party verification. The project developer is required to collect and manage copies of farm records and supporting documentation outlined in Table 8 above.</td>
</tr>
<tr>
<td>Professional Agrologist</td>
<td>The Professional Agrologist can provide a third party opinion on the project based on project records. Records must be collected and maintained consistent with this protocol, and to support his/her professional opinion of the farm management practices.</td>
</tr>
</tbody>
</table>
Alberta’s Verification Pathway:

1. Launch of GHG Reg Framework:
   - 2007
   - July
   - AENV Audits - OAG
   - Registry/Offset Portal

2. Technical Guides/Protocols:
   - 2008
   - Sept
   - AENV Committee: CA’s and P.Eng.’s – Reasonable Level of Assurance

3. 1st Compliance - 7 Offset Projects:
   - 2009
   - Mar
   - Technical Guide v2
   - OAG Reports

4. Limited Level of Assurance:
   - Jan
   - 2010
   - Explicit Evidence and Updated Protocols
   - OAG Report

5. Limited Level of Assurance:
   - 2011
   - OAG Report

6. Reasonable Level of Assurance:
   - 2012
   - OAG Report

7. Protocol Validation Studies – Verification Guides:
   - 2013
   - Verification Guidance Document

Limited Level of Assurance:

Limited Level of Assurance:

Limited Level of Assurance:

Limited Level of Assurance:

Limited Level of Assurance:

Limited Level of Assurance:

Limited Level of Assurance:
Alberta Verification Guidance Document V1. 2013
Joint Task Force on Reasonable Assurance

- AESRD, The Alberta Institute of Chartered Accountants, and APEGGA
- Informed the development of the draft verification guidance document
  - Combined accounting and engineering approaches to develop a best practices document
- Outline minimum requirements for reasonable assurance verification
  - Needed to improve consistency and common understanding across verifications and professions
Key Changes

- All verifications must be done to ISO 14064-3
  - Additional standards required by professions can be added to the verification

- Mandatory Roles
  - Designated Signing Authority
  - Lead Verifier
  - Peer Reviewer, independent of team

- Use of subject matter experts is encouraged

Must be a CA or PEng
Can be the same person
Cannot be the DSA
Key Changes

• **New – mandatory verification acceptance phase**
  – Conducted prior to contracting
  – Includes independence review, client evaluation, and team evaluation
  – Verification evaluation

• **The verifier may decline work**
  – Concerns about the client
  – Insufficient time allowed to complete work
  – Insufficient records available to support verification
  – Facility/project has a high likelihood of failing the verification
Verification Strategy: Controls vs Substantive Procedures
Site Visits

• Are required as part of the verification process
• Used to assess:
  – Boundaries,
  – Inventories,
  – Data management systems,
  – Staff knowledge,
  – Data sampling etc.
• Aggregated projects and pipelines may need to use a sampling approach to site visits.
Verifier Procedures – Data Collection and Testing Process

- Inspection
- Observation
- Inquiry
- Confirmation
- Re-calculations
- Re-performance
- Analytical Procedures
### Sampling – Based on Preliminary Risk Assessments

<table>
<thead>
<tr>
<th>Sampling Type</th>
<th>Typical Conditions of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statistical</strong></td>
<td>When low risk conditions apply and there is a large amount of data or controls to test. When the characteristics of the sample are to be extrapolated to the population.</td>
</tr>
<tr>
<td><strong>Strategic</strong></td>
<td>When preliminary analytics reveal a high or medium material risk at a particular period and further details are required.</td>
</tr>
<tr>
<td><strong>Systematic</strong></td>
<td>When a high or medium material risk occurs on a regular basis (e.g., rolling over into a new accounting year, annual maintenance turn-overs, seasonal variations, shift changes).</td>
</tr>
<tr>
<td><strong>Convenience</strong></td>
<td>When low risk and a small sample is sufficient to demonstrate that data is accurate or controls are functioning.</td>
</tr>
<tr>
<td><strong>Stratified</strong></td>
<td>When the population is not normal in distribution (e.g., bimodal) and can be stratified into multiple sub-populations that are more normally distributed. When different sections of the population have different risks (e.g., the materiality or the level of risk is different), the sampling will be different for the different sections (e.g., near a threshold of measurement, larger sources versus smaller sources).</td>
</tr>
</tbody>
</table>
Assessment of Errors

Method 1
- Provides effect on assertion
- True values are used
  - +10%
  - -10%
  - 0
- Results could affect statement of verification from a quantitative perspective
- Results reported in verification report

Method 2
- Provides indication of control
- Absolute values are used
  - |+10%|
  - |-10%|
  - 20%
- Results could affect statement of verification from a qualitative perspective
- Results reported in verification report

Both are required to be stated in the verification report.
Mandatory Procedures

• Gain an understanding of the GHG data management system through physical inspection
• Compare the GHG assertion to the approved baseline intensity application/offset project plan and approved protocol
• Compare observed GHG inventories to the GHG assertion
• Compare the GHG assertion to supporting data
• Design substantive procedures to test significant data items:
  – As close to the measurement point as possible
  – At the application of emission factors and data aggregation
  – Close to the assertion
• For facilities, inquire about EPC generation
Protocol Best Practice Guides: Conservation Cropping
Guide Structure:

1. GHG Quantification Considerations of Agricultural Offset Projects/Conservation Cropping Projects
2. General Risks and Data-Related Risks in Conservation Cropping Projects
3. Data Integrity and Controls to Manage Risks in Conservation Cropping Projects
Expectations – Project Developers:

1. **The control environment** - defined as the overall attitude, awareness and actions of project developers regarding the internal control system and its importance to GHG reporting;

2. **Due diligence on farm/field eligibility** – defined as consistent and transparent procedures that control the acceptance of farms/fields into the offset project; and,

3. **Data and record collection and management systems** – defined as the adequacy and quality of data and records collected and the validity of the underlying data; as well as adequacy of data management systems to accurately aggregate and report the data.
Roles and Responsibilities Outlined

<table>
<thead>
<tr>
<th>Responsible Party</th>
<th>AENV</th>
<th>Farmer/Landowner</th>
<th>Project Developer/Field Agent</th>
<th>Verifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Approve protocol</td>
<td>Qualifying agricultural activities</td>
<td>Prepare records to substantiate activities</td>
<td>Confirm eligibility of farming practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract with Project Developer</td>
<td>Contract with Farmer and Landowner</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Conduct farm visit</td>
<td>Gather supporting documentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Develop project plan and compile report</td>
<td>Verification of offset credits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Registration of verified offsets</td>
<td></td>
</tr>
</tbody>
</table>
Quality Evidence

- **Sufficient**
  - Reach the same conclusion with the same data.

- **Appropriateness**
  - Relevance and Reliability
  - Achieves the objective
  - Source and nature
More Reliable Rules of Thumb

• Obtained from knowledgeable outside sources
• Internal data is corroborated against independent data
• Internal data that has effective controls
• Direct observations
• Document controls generated at the same time the document is created
Example

| 1) Existence of an annual crop, or first year of seeding of a perennial crop | At least one of the following list of detailed farm records (completed by the farm operator), specifying the crop during the project year:  
  - Detailed farm record sheets (see example in Appendix E),  
  - Crop plan, such as one provided to seed/fertilizer dealers to ensure product is available for spring farming operations,  
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Protocol Validation Studies

• Working with Project Developers on the Ground to identify barriers, gaps and produce more guidance:
  – Example Project Plans
  – Example Project Reports
  – Calculation Modules
  – Data/Record Collection Templates
  – Cost-Benefit Analysis