



CLIMATE  
ACTION  
RESERVE

## Anaerobic Digestion (Organic Waste & Manure) Protocol Stakeholder Meeting

Ontario & Quebec Adaptation  
April 26<sup>th</sup>, 2017

# Agenda

1. Background & Introductions
2. Process Overview
3. Candidate Protocol Review
4. Stakeholder Questions/Discussion
5. Next Steps



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Item 1

# BACKGROUND

- Ontario & Quebec have retained the Reserve and Partners to develop 13 offset project protocols to support cap-and-trade
  1. Landfill Gas Destruction
  2. Mine Methane Destruction
  3. ODS Destruction
  4. Fertilizer Management
  5. Livestock (Enteric)
  - 6. Anaerobic Digestion (Organic Waste and Manure)**
  7. Organic Waste Management
  8. Forest
  9. Afforestation/Reforestation
  10. Urban Forest
  11. Grassland
  12. Conservation Cropping
  13. Refrigeration Systems

- **MOECC** = Ontario Ministry of Environment and Climate Change
- **MDDELCC** = Quebec Ministry of Sustainable Development, Environment, and Fight Against Climate Change

# Climate Action Reserve



- Nonprofit founded in 2001
- Developed GHG inventory & verification protocols for commercial and industrial entities
  - Operated a public registry for hundreds of entities in California
- Launched online offset project registry in 2008
  - Developed or adapted 18 project protocols for the US and Mexico
  - Work directly informed the CA and QC compliance protocols
  - Registered hundreds of voluntary and compliance projects, generating >90M tCO<sub>2</sub>e in GHG reductions
- Partners: Viresco Solutions, Brightspot Climate, Cap-Op Energy, Green Analytics, and EcoResources

# Anaerobic Digestion (Organic Waste & Manure) Protocol Adaptation Team (PAT)

Organizations	Names
<b>Climate Action Reserve</b>	<ul style="list-style-type: none"><li>• Sami Osman (<i>Team Lead</i>)</li><li>• Andrew Craig</li></ul>
<b>Brightspot climate</b>	<ul style="list-style-type: none"><li>• Aaron Schroeder (Deputy Project Manager)</li></ul>
<b>Cap-Op Energy</b>	<ul style="list-style-type: none"><li>• Cooper Robinson</li><li>• Peter Macleod</li></ul>
<b>Viresco Solutions</b>	<ul style="list-style-type: none"><li>• Candace Vinke</li><li>• Jonathon Alcock</li><li>• Liz Brennan</li></ul>
<b>EcoRessources</b>	<ul style="list-style-type: none"><li>• Nathan DeBaets</li><li>• Mathieu Dumas</li></ul>

# Anaerobic Digestion (Organic Waste & Manure) Technical Task Team (TTT)



Name	Title	Organization
<b>Dr. John Lauzon</b>	Assistant Professor	University of Guelph
<b>Brandon Gilroyed</b>	Assistant Professor	University of Guelph
<b>Dr. Claudia Wagner-Riddle</b>	Professor	University of Guelph
<b>Dr. Andrew VanderZaag</b>	Research Scientist	Agriculture and Agri-Food Canada
<b>Dr. Craig Drury</b>	Research Scientist	Agriculture and Agri-Food Canada
<b>Dr. Hambalou Balde</b>		Agriculture and Agri-Food Canada
<b>Dr. Roland Kroebe</b>	Research Scientist	Agriculture and Agri-Food Canada
<b>Dr. Sean McGinn</b>		Agriculture and Agri-Food Canada
<b>Ward Smith</b>	Physical Scientist	Agriculture and Agri-Food Canada



# Anaerobic Digestion (Organic Waste & Manure) Technical Task Team (TTT)

Name	Title	Organization
<b>Amadou Thiam</b>	Engineer Air Quality	Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
<b>Chris Duke</b>	EMB	OMAFRA
<b>Phil Dick</b>	Business Resource Specialist	OMAFRA
<b>Sara Peckford</b>	Senior Policy Advisor	OMAFRA
<b>Lucie Guichelaar</b>	Policy Advisor	Ontario Ministry of the Environment & Climate Change (MOECC)
<b>Shelley Hyatt</b>	Senior Policy Advisor	MOECC
<b>John Hutchison</b>	Senior Policy Advisor	MOECC
<b>David Coates</b>	Project Manager	MOECC
<b>Dushan Jojkic</b>	Senior Program Advisor	MOECC

# Anaerobic Digestion (Organic Waste & Manure) Technical Task Team (TTT)

Name	Title	Organization
<b>Marc-André Ouellet</b>	Direction de l'agroenvironnement et du développement durable, Direction générale du développement et de l'aménagement du territoire agricole	Ministère de l'Agriculture de l'Alimentation et des Pêcheries (MAPAQ)
<b>Suzanne Burelle</b>	Direction des matières résiduelles	Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC)
<b>Vincent Chouinard-Thibaudeau</b>	Direction du marché du carbone, Direction générale de la réglementation carbone et des données d'émission	MDDELCC
<b>Sophie Houplain</b>	Direction du marché du carbone, Direction générale de la réglementation carbone et des données d'émission	MDDELCC
<b>Chris Budiwski</b>	Director for the Agri-Resource Branch	Manitoba Agriculture, Food and Rural Initiatives

# Anaerobic Digestion (Organic Waste & Manure) Protocol Stakeholder Team

- Targeted group to provide feedback during the adaptation process
- >50 stakeholders from diverse sectors
  - Government
  - Industry
  - Consulting
  - Academia
  - NGOs



Item 2

# PROCESS OVERVIEW

# Process Overview

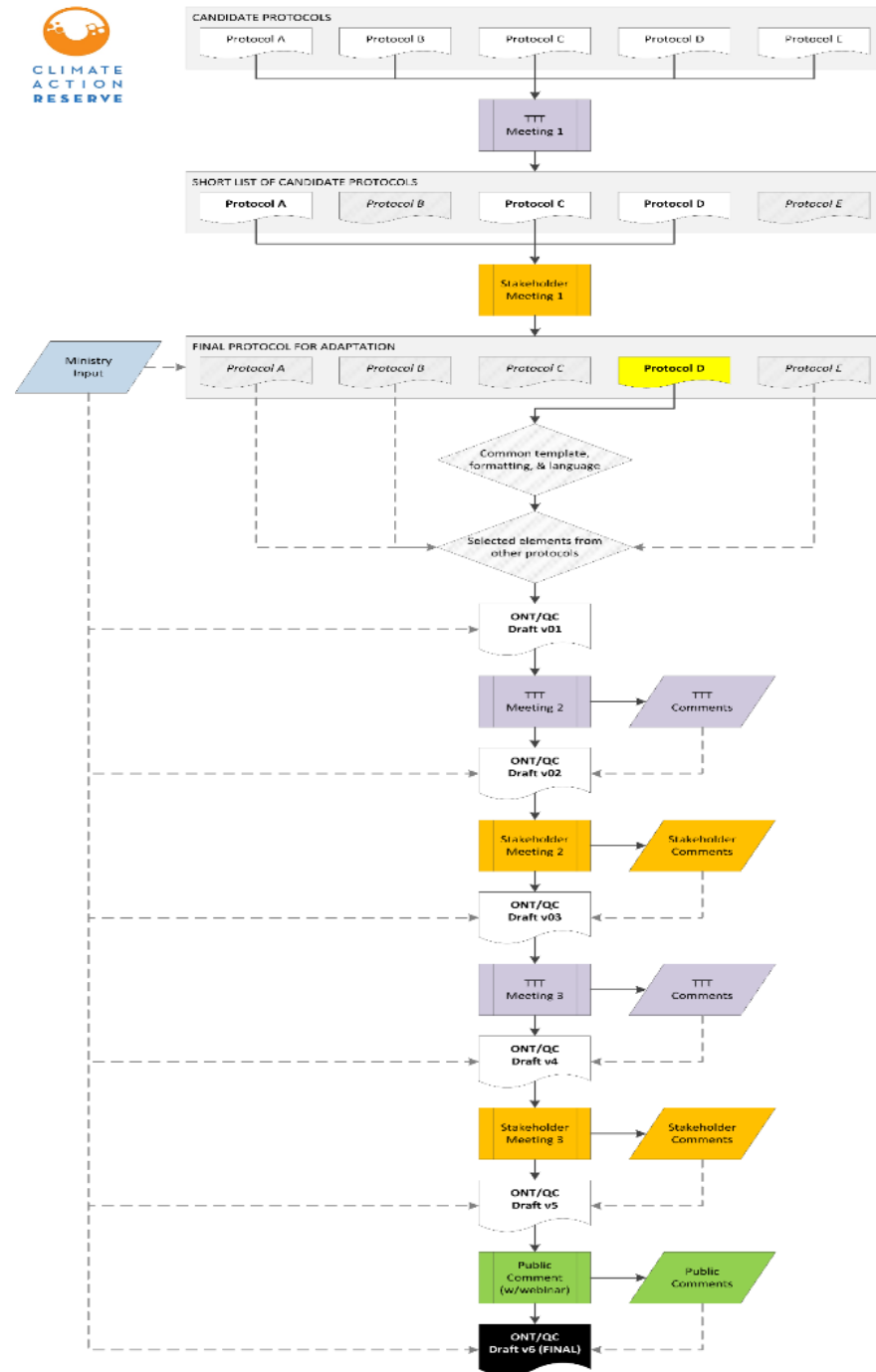
- High level review of all anaerobic digestion protocols
- Narrow down list to 1-3 candidate protocols as starting point for adaptation
- Stakeholders asked to review and comment on candidate list & short list
- All protocols will use a common template
- Key issues to be identified prior to drafting
- Stakeholder drafts will incorporate feedback from Technical Task Team (TTT)
- After Stakeholder review, additional comments/feedback will be reviewed and incorporated

# Tentative Work Plan

Timeline (expected)	Task
February	Protocol Adaptation Team (PAT) worked with Ministries to develop task teams and coordinate outreach
March – early April	Initial meetings (webinars) held with TTTs. PAT outlined process, presented protocol candidate lists, outlined key issues and next steps.
	Short lists of candidate protocols & initial screening sent to TTT
	TTT reviewed screened protocols and provided feedback
April 26 <sup>th</sup>	Initial meeting (webinar) with the broader group of interested stakeholders. TTT members encouraged to attend.
May 3 <sup>rd</sup>	Stakeholder feedback on candidate list due
May 5 <sup>th</sup> – 12 <sup>th</sup>	Protocol candidate finalized and posted
May 12 <sup>th</sup>	PAT to begin drafting protocol



## Work Plan for Ontario/Quebec Non-Priority Protocol Adaptation



# Process Flow Diagram



Item 3

# CANDIDATE PROTOCOLS



# Task Ahead of Us

- Task – if possible, protocol applies to all of Canada
- Follow Western Climate Initiative Offset Criteria (2010)
- Need to assess regulatory requirements in each province (additionality)
- May need additional definitions – terms consistent
- Update language based on ON / QC Offsets regulation
- Refresh equations, tables and diagrams – Canadian science and alignment with National Emissions Inventory
- Standardize emission factors
- Align with industry standards (4R framework)

# Terminology

Protocol Term	Ontario	Quebec
“Project”	Offset Initiative	Project
“Ministry”	MOECC	MDDELCC
“Regulation”	Regulation concerning The Cap and Trade Program, made under the Climate Change Mitigation and Low-Carbon Economy Act	Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, made under the Environment Quality Act
“Project Developer”	Offset Initiative Operator and/or Offset Initiative Sponsor, as appropriate	Project Promoter

*Each Ministry may make their own final edits when the adapted protocols are prepared for formal regulatory adoption*

# Candidate Protocols (Organic Waste Digestion) - TTT

Protocol/ Methodology	Voluntary or Compliance	Program	Jurisdiction	Link
<b>Quantification protocol for Anaerobic Decomposition of Agricultural Materials</b>	Compliance	Specified Gas Emitters Regulation	Alberta / Canada	<a href="http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/documents/ProtocolAnaerobicDecomposition-Sep2007.pdf">http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/documents/ProtocolAnaerobicDecomposition-Sep2007.pdf</a>
<b>Anaerobic Treatment of Wastewater Projects</b>	Compliance	Specified Gas Emitters Regulation	Alberta / Canada	<a href="http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/documents/ProtocolAnaerobicWastewater-Mar2009.pdf">http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/documents/ProtocolAnaerobicWastewater-Mar2009.pdf</a>
<b>Organic Waste Digestion Project Protocol v2.1</b>	Voluntary	Climate Action Reserve	United States (North Central Region only)	<a href="http://www.climateactionreserve.org/how/protocols/organic-waste-digestion/">http://www.climateactionreserve.org/how/protocols/organic-waste-digestion/</a>
<b>ACM0022: Alternative waste treatment processes --- Version 2.0</b>	Compliance	CDM	Kyoto Protocol	<a href="https://cdm.unfccc.int/methodologies/DB/YINQ0W7SUYOO2S6GU8E5DYVP2ZC2N3">https://cdm.unfccc.int/methodologies/DB/YINQ0W7SUYOO2S6GU8E5DYVP2ZC2N3</a>
<b>AMS-III.AO. Methane recovery through controlled anaerobic digestion</b>	Compliance	CDM	Kyoto Protocol	<a href="https://cdm.unfccc.int/methodologies/DB/F5U41CTG7ENWK9RSS15BV1LUPDG76W">https://cdm.unfccc.int/methodologies/DB/F5U41CTG7ENWK9RSS15BV1LUPDG76W</a>
<b>ACM0014 Treatment of wastewater</b>	Compliance	CDM	Kyoto Protocol	<a href="https://cdm.unfccc.int/methodologies/DB/3WR2RD30NKR6IDVCD4V65VN1XVPWAQ">https://cdm.unfccc.int/methodologies/DB/3WR2RD30NKR6IDVCD4V65VN1XVPWAQ</a>

# Candidate Protocols (Livestock Manure) - TTT

Protocol/ Methodology	Voluntary or Compliance	Program	Jurisdiction	Link
<b>Quantification protocol for Anaerobic Decomposition of Agricultural Materials</b>	Compliance	Specified Gas Emitters Regulation	Alberta / Canada	<a href="http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/documents/ProtocolAnaerobicDecomposition-Sep2007.pdf">http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/documents/ProtocolAnaerobicDecomposition-Sep2007.pdf</a>
<b>Covered Manure Storage Facilities - CH<sub>4</sub> Destruction:</b>	Compliance	Quebec Cap & Trade System	Quebec	<a href="http://www.mddelcc.gouv.qc.ca/changements/carbone/credits-compensatoires/index-en.htm#current-offset">http://www.mddelcc.gouv.qc.ca/changements/carbone/credits-compensatoires/index-en.htm#current-offset</a>
<b>US Livestock Project Protocol v4.0</b>	Voluntary	Climate Action Reserve	United States (North Central Region only)	<a href="http://www.climateactionreserve.org/how/protocols/us-livestock/">http://www.climateactionreserve.org/how/protocols/us-livestock/</a>
<b>Compliance Offset Protocol - Livestock Projects (2014)</b>	Compliance	California Cap & Trade System	Kyoto Protocol	<a href="https://www.arb.ca.gov/cc/capandtrade/protocols/livestock/livestock.htm">https://www.arb.ca.gov/cc/capandtrade/protocols/livestock/livestock.htm</a>
<b>AMS-III.D Methane recovery in animal manure management systems</b>	Compliance	CDM	Kyoto Protocol	<a href="https://cdm.unfccc.int/methodologies/DB/8OT53W4E1E2S8HYD0O5UNCM0G4I68D">https://cdm.unfccc.int/methodologies/DB/8OT53W4E1E2S8HYD0O5UNCM0G4I68D</a>

# Protocol Evaluation Framework

- **Quantitative assessment against WCI criteria**
- **Qualitative assessment, including of any modifications necessary to fully meet WCI criterion**
- **Results of full assessment retained, noting elements useful for adaptation (notwithstanding protocol not short listed)**
- **Final recommendation made for 1-3 protocols to form basis of adaptation**

## Protocols were scored based on individual criteria and then weighted by overall category

**1 = this protocol is useful for this item**

**0 = this protocol is somewhat useful for this item, but needs further work**

**-1 = this protocol either doesn't address this item, or addresses it very poorly**

# Summary: OWD – (Alberta) Anaerobic Treatment of Wastewater Projects

- **NOT SHORTLISTED**
- **PROS:**
  - useful reference for Canadian emission factors - good reference to Canadian standards for addressing fugitive emissions – flexible MRV approach
- **CONS:**
  - Wastewater only - main focus on ERs from renewable energy which is non-additional elsewhere

# Summary: OWD – (Alberta) Anaerobic Decomposition of Agricultural Materials

- **SHORTLISTED**
- **PROS:**
  - Diversity of feedstocks good – useful emission factors (including for incineration and dead animals) - good reference to Canadian standards for addressing fugitive emissions
- **CONS:**
  - additionality issues re non-eligible feedstocks not being accounted for – main focus on ERs from renewable energy



# Summary: OWD – (Reserve) Organic Waste Digestion Protocol

- **SHORTLISTED**
- **PROS:**
  - Covers WCI requirements well – standardized assumptions and quant methods – applies waste stream specific assessments ensuring compliance with jurisdiction from which waste is sourced
- **CONS:**
  - Need Canadian emission factors – need adapt baseline and common practice assumptions for local conditions – consider additional SSRs from other protocols

# Summary: OWD – (CDM) ACM0022: Large-scale Consolidated Methodology



- **NOT SHORTLISTED**
- **PROS:**
  - Diverse range of project activities – quantification methods well developed
- **CONS:**
  - Several aspects of protocol handled in external documents – allows for crediting where activity mandated but poorly enforced (additionality concern) - All OW aspects of this protocol covered in Reserve OWD protocol – all manure aspects covered in Reserve Livestock protocol

# Summary: OWD – (CDM) ACM-OO14: Large-Scale Consolidated Protocol - Treatment of Wastewater



- **NOT SHORTLISTED**
- **PROS:**
  - quantification methods well developed
- **CONS:**
  - WW only - several aspects of protocol handled in external - all aspects of this protocol covered in Reserve OWD protocol

# Summary: OWD – (CDM) III.AO. Methane recovery through controlled anaerobic digestion

- **NOT SHORTLISTED**
- **PROS:**
  - quantification methods well developed
- **CONS:**
  - Several aspects of protocol handled in external - all aspects of this protocol covered in Reserve OWD protocol - accounting for venting uses very simple deduction, which would not conservatively accounting for large scale releases of biogas.

# Organic Waste – Short Listed Protocols:

## - **PROTOCOL SHORT LIST:**

- 1) (Reserve) OWD Project Protocol
- 2) (Alberta) Anaerobic Decomposition of Agricultural Materials

## - **RATIONALE:**

- The Reserve OWD protocol comprehensively covers WCI criteria & deals comprehensively with OW elements.
- Alberta Anaerobic Decomp of Ag Materials protocol will provide Canadian Emission factors, insights into SSR changes, and insights into handling specific waste streams in Canada. This protocol scored lower than other Alberta protocol, however should provide more useful information, and all other aspects adequately covered by Reserve OWD protocol.
- Can refer to key issues in remaining protocols as needed.

# Summary: Livestock Manure – (Quebec) Covered Manure Storage Facilities - CH<sub>4</sub> Destruction

- **SHORTLISTED**
- **PROS:**
  - Very useful for insights into Canadian Emission Factors/baseline conditions – some additional safeguards used here should be considered for adoption - similar to California/Reserve protocols
- **CONS:**
  - additionality issues re non-eligible feedstocks not being accounted for

# Summary: Livestock Manure – (ALBERTA)

## Quantification protocol for Anaerobic Decomposition of Agricultural Materials



- **NOT SHORTLISTED**
- **PROS:**
  - Diversity of feedstocks good – useful emission factors – good insights into Canadian emission factors and baseline conditions – additional SSRs should be considered further
- **CONS:**
  - additionality issues re non-eligible feedstocks not being accounted for – main focus on ERs from renewable energy

# Summary: Livestock Manure – (Reserve) US Livestock Project Protocol v4.0

- **SHORTLISTED**
- **PROS:**
  - Useful source of mechanisms for most WCI aspects - good source of project specific guidance for verification - Greenfield projects employ mechanism to ensure project-specific baseline assumption is appropriate for relevant location of project - Employs standardized deductions for uncertainty.
- **CONS:**
  - Need to update emission factors and baseline assumptions for Canadian conditions. Methods employed should nonetheless be instructive. Should consider additional methods re conservativeness and N2O calculations (see Quebec protocol)



# Summary: Livestock Manure – (California ARB) Compliance Offset Protocol - Livestock Projects - 2014



- **NOT SHORTLISTED**
- **PROS:**
  - Covers all aspects of WCI criteria very well – methods used should be instructive - employs standardized deductions for uncertainty.
- **CONS:**
  - Need to update emission factors and baseline assumptions for Canadian conditions. Methods employed should nonetheless be instructive. Should consider additional methods re conservativeness and N2O calculations (see Quebec protocol) – various aspects removed to Regulations - very similar to other short listed protocols

# Summary: Livestock Manure – (CDM) AMS-III.D Methane recovery in animal manure management systems



- **NOT SHORTLISTED**
- **PROS:**
  - Covers several aspects of WCI criteria well – useful standardized quantification methods
- **CONS:**
  - Much guidance contained in external documents - need to update emission factors and baseline assumptions for Canadian conditions – accounting for venting events oversimplified - very similar to other short listed protocols

# Livestock Manure – Short Listed Protocols:

## - **PROTOCOL SHORT LIST:**

- 1) (Reserve) US Livestock Project Protocol v4.0
- 2) (Quebec) Covered Manure Storage Facilities - CH<sub>4</sub> Destruction

## - **RATIONALE:**

- The Reserve US Livestock Project Protocol protocol comprehensively covers WCI criteria & deals comprehensively with Livestock Manure elements.
- The Quebec Covered Manure Storage Facilities - CH<sub>4</sub> Destruction protocol provides insights into Canadian conditions (emission factors, baseline conditions) and additional safeguards
- Can refer to key issues in remaining protocols as needed.



Item 4

# STAKEHOLDER QUESTIONS & DISCUSSION



Item 5

# NEXT STEPS

# Submit Comments

- Stakeholder Team to review candidate protocols and submit comments to the Reserve no later than:
  - **Wednesday, May 3<sup>rd</sup>** (end of day)
  - [sosman@climateactionreserve.org](mailto:sosman@climateactionreserve.org)

# Next Meeting

- Next Stakeholder Team Meeting (to review draft protocol):
  - **Late-July**
  - Watch for email announcement with registration link
- Sharing documents and drafts with stakeholders on Reserve website

# Contact Information

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