

Confined Feeding Operations Project Team Report



Prepared by the
Confined Feeding Operations (CFO) Project Team
for the
Clean Air Strategic Alliance
Board of Directors

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Table of Contents

PREFACE	III
ACKNOWLEDGEMENTS	III
CFO PROJECT TEAM MEMBERS	V
ACRONYMS	VI
EXECUTIVE SUMMARY	VII
1. INTRODUCTION.....	8
2. BACKGROUND INFORMATION.....	8
3. STATUS OF THE 2008 RECOMMENDATIONS	10
3.1. Recommendation 1: Development of a New Emissions Inventory	10
3.2. Recommendation 2: Source Apportionment	11
3.3. Recommendation 3: Monitoring for Ammonia, H2S, PM and VOCs	12
3.4. Recommendation 4: The 24-hour AQO for Ammonia	13
3.5. Recommendation 5: Management Mechanisms Research Plan	13
3.6. Recommendation 6: Paper Study on Potential Management Mechanisms	14
3.7. Recommendation 7: Odour Management Plan Template	15
3.8. Recommendation 8: Managing Odour in Problem Areas	16
3.9. Recommendation 9: Improving Communications.....	17
3.10. Recommendation 10: Evaluating the Strategic Plan	17
4. SUCCESSES, GAPS, AND CONSIDERATIONS.....	18
5. CONCLUSION AND RECOMMENDATION	19
APPENDIX 1: LIST OF SUCCESSES (WORKSHOP PART 1)	20
APPENDIX 2: LIST OF GAPS & CONSIDERATIONS (WORKSHOP PART 1)	21

Preface

The CFO project team worked diligently and in good faith to reach consensus on this submission to the CASA Board. Throughout the process, representatives from all sectors provided their views and perspectives, raised concerns and participated in deliberations. This report is the culmination of these discussions, negotiated by the team and agreed to as a package. The report must be considered in its entirety and not fragmented in any way.

It should also be noted that Appendices 1 and 2 are a record of the discussions that occurred at the Workshop Part 1 on March 15th and are taken directly from the Proceedings of Workshop Part 1. They have been included for information purposes only and are not part of the consensus document.

Acknowledgements

The Confined Feeding Operations (CFO) project team would like to thank all the project team members and implementers for the time and effort spent reviewing the implementation of the CFO recommendations and preparing the team's advice to the CASA Board.

It is important to note that four years have passed since the CFO project team was placed in abeyance. In that time, many people from the original team have moved on and were no longer available to participate. New representatives were asked to attend in their place and, as such, there are many participants who were both new to the CFO project team and to the CASA consensus process.

CFO Project Team Members

Name	Organization
Ron Axelson	Intensive Livestock Working Group
Ann Baran (co-chair)	Southern Alberta Group for the Environment
Bob Barss	Alberta Association of Municipal Districts and Counties
Laura Blair	Alberta Environment and Water
Darren Bruhjell (corresponding)	Agriculture and Agri-Food Canada
Darcy Fitzgerald	Alberta Pork
Jenny Graydon (alternate)	Alberta Health
Sandi Jones (co-chair)	Alberta Agriculture and Rural Development
Albert Kamps (co-chair)	Alberta Milk
Jim McKinley	Natural Resources Conservation Board
Tanya Mrowietz (alternate)	Alberta Health Services
Lynn Que	Alberta Health Services
Ashley Rietveld	Alberta Poultry Producers
Denis Sauvageau	Friends of an Unpolluted Lifestyle
Rich Smith	Alberta Beef Producers
Leonard Standing on the Road (alternate)	Ponoka Fish and Game
Karina Thomas	Alberta Health
Wayne Ungstad	Ponoka Fish and Game
Martin Van Diemen	Alberta Milk
Opel Vuzi	Health Canada
Kevin Warren	Parkland Airshed Management Zone
Martin Zuidhof	Alberta Cattle Feeders Association/Alberta Beef

Acronyms

AAAQOSAC: Alberta Ambient Air Quality Objective Stakeholder Advisory Committee

AAQO: Ambient Air Quality Objective

APMEICA: Ammonia and Particulate Matter Emissions Inventory for CFOs in Alberta

AQM: Air Quality Management

ARD: Alberta Agriculture and Rural Development

BMP: Beneficial Management Practice

CFO: Confined Feeding Operation

CFO-IRT: Confined Feeding Operation-Implementation Review Team

ESRD: Alberta Environment and Sustainable Resource Development

ILWG: Intensive Livestock Working Group

MAG: Multi-stakeholder Advisory Group

MDS: Minimum Distance Separation

NRCB: Natural Resource Conservation Board

Executive Summary

In March 2008, the CFO project team brought forward its final report to the CASA Board entitled “Managing Air Emissions from Confined Feeding Operations in Alberta”. The report contained ten recommendations, nine of which constituted substantive work, while the tenth asked the team to reconvene in January 2011. Until that time, the CFO project team was put into abeyance.

In 2012, the CASA Secretariat hosted two workshops on March 15th (Part 1) and May 24th (Part 2) for all CFO project team members. The ultimate goal of the workshops was to reach agreement on the team’s findings with respect to Recommendation 10 and to advise the Board as to the future of the CFO project team. Recommendation 10 asked the CFO project team to conduct three tasks:

- a) review the implementation status and outcomes of recommendations made in the 2008 report,
- b) assess the success of these activities, and
- c) make any further recommendations, if needed, to reduce air emissions from CFOs in Alberta related to the strategic plan.

At the Workshop Part 1, team members heard updates on the implementation status and outcomes of the recommendations, and discussed successes, gaps and considerations. Team members then had time to share and discuss this information with their stakeholders prior to the Workshop Part 2.

At the Workshop Part 2, the team shared the feedback they had heard from their stakeholders and discussed what advice to give the CASA Board with respect to the future of the CFO project team. After much discussion, team members agreed that the CFO project team should be disbanded.

1. Introduction

In 2012, the Confined Feeding Operations (CFO) project team reconvened to review the implementation of the recommendations from their 2008 report “Managing Air Emissions from Confined Feeding Operations in Alberta” and to advise the CASA Board as to the future of the CFO project team. This report:

- provides a brief history of the CFO project team,
- reviews the key outcomes and next steps for each of the recommendations from the 2008 report,
- discusses successes, gaps, and considerations and
- presents the team’s final recommendation regarding the future of the CFO project team.

2. Background Information

In response to a statement of opportunity presented by the Intensive Livestock Working Group (ILWG) and Alberta Agriculture and Rural Development (ARD), the CASA Board established the CFO project team in September 2005. The CASA consensus process was viewed as a useful and appropriate way to address stakeholder concerns.

The goal of the CFO project team was to develop a strategic plan to improve the management of air emissions from existing and future CFOs in Alberta and to improve relationships between stakeholders. In developing the plan, the team was to consider the following principles:

- continuous improvement and pollution prevention to protect air quality;
- prevention of short and long-term adverse effects on human, animal and ecosystem health due to air emissions; and
- assurance that air quality recommendations maximize social, economic, environmental and health benefits and minimize social, economic, environmental and health costs.

Among the substances emitted by CFOs, the team identified five priority substances: ammonia, hydrogen sulphide, volatile organic compounds, particulate matter, and bioaerosols/pathogens. It was agreed that odour was a priority issue, recognizing that there are fundamental differences between odour and the priority substances.

The team undertook a great deal of work in subgroups to compile and assess information on emissions, health effects, potential management mechanisms, and approaches taken by other jurisdictions to address these issues. The subgroups produced detailed reports that enhanced the knowledge base of the project team and provided much of the necessary information for the strategic plan. The subgroups also suggested recommendations to the project team. All of the recommendations were considered and many became part of the project team’s strategic plan.

The CFO project team strived to develop a common understanding of stakeholder concerns related to CFOs. The project team agreed that stakeholder relationships around the table were improved over the course of the team’s work. Greater understanding, combined with the

information gathered, enabled the multi-stakeholder team to reach consensus on the final package of recommendations.¹

In March 2008, the CFO project team brought forward its final report to the CASA Board entitled “Managing Air Emissions from Confined Feeding Operations in Alberta”. The report contained ten recommendations, nine of which constituted substantive work, while the tenth asked the team to reconvene in January 2011. Until that time, the CFO project team was put into abeyance.

In September 2010, a Statement of Opportunity came to CASA asking that a team be formed to report on the implementation of the 2008 recommendations to prepare for the reconvening of the full project team. Subsequently, the CFO Implementation Review Team (CFO-IRT) was formed and in March 2011 the CFO-IRT submitted its final report to the CASA Board. The CFO-IRT concluded that, although implementation was not complete for all recommendations, progress was sufficient to reconvene the full CFO project team in November 2011.

In November 2011, a small working group advised that it would be beneficial to allow implementers a further extension to complete their work after which enough progress would be made on the recommendations to reconvene the full CFO project team in early 2012.

In 2012, the CASA Secretariat hosted two workshops on March 15th (Part 1) and May 24th (Part 2) for all CFO stakeholders. The ultimate goal of the workshops was to reach agreement on the team’s findings with respect to Recommendation 10 and to advise the Board as to the future of the CFO project team. Recommendation 10 asked the CFO project team to conduct three tasks:

- a) review the implementation status and outcomes of recommendations made in the 2008 report,
- b) assess the success of these activities, and
- c) make any further recommendations, if needed, to reduce air emissions from CFOs in Alberta related to the strategic plan.

Workshop Part 1 focused on tasks (a) and (b) (which were initiated by the CFO-IRT in 2011)² while Workshop Part 2 focused on task (c).

It is important to note that four years had passed since the CFO project team was placed in abeyance. In that time, many people from the original team moved on and were no longer available to participate. New representatives were asked to attend in their place and, as such, there were many participants in this process who were both new to the CFO project team and to the CASA consensus process.

¹ See the CFO project team 2008 report “Managing Air Emissions from Confined Feeding Operations in Alberta” for more information and detail.

² See the CFO-IRT 2011 report “Confined Feeding Operations Report on Implementation of Recommendations” for more information and detail.

3. Status of the 2008 Recommendations

Part (a) of Recommendation 10 asked the team to review the implementation status and outcomes of the nine recommendations included in the 2008 CFO report. This section provides a summary of the key outcomes from each recommendation and describes next steps that are planned by implementers. Please refer to the CFO-IRT 2011 report “Confined Feeding Operations Report on Implementation of Recommendations” for full details. This report can be found on the CASA website or requested from the CASA office.

3.1. Recommendation 1: Development of a New Emissions Inventory

The CFO project team recommends that:

The Government of Alberta, led by Alberta Agriculture and Rural Development, with support from Alberta Environment and advice from a multi-stakeholder group formed for this purpose, compile an inventory for CFO air emissions in Alberta based on the US EPA National Air Emissions Monitoring Study, with the inventory to be completed by March 31, 2011.

Emission inventories are a key component of Alberta’s air quality management system. Developing an accurate inventory that precisely reflects the impact of livestock production on air quality will aid policy makers in making decisions that will not only benefit Albertans in general, but the CFO industry in particular.

The new CFO emissions inventory will facilitate effective livestock air quality management in Alberta. It will also help assess the levels of emissions of interest released into the atmosphere from various CFO sources in Alberta and provide a perspective on what the potential impact of such emissions might be, using tools such as air quality models.

Summary of key outcomes:

- ARD developed an inventory to estimate emissions of ammonia (NH₃) and particulate matter (PM) from CFOs called the Ammonia and Particulate Matter Emissions Inventory for CFOs in Alberta (APMEICA). This work was completed in December 2011.
- Preparatory work included:
 - CFO emission inventory preparation plan
 - QA/QC plan
 - Methodology plan for developing Ammonia and Particulate Matter emission inventory
 - Emissions inventory compilation
 - Data analysis
 - Emission inventory report

Next steps:

- The APMEICA database will be maintained on an annual basis.

- The emission factors and activity factors will be updated as new data becomes available.
- As newer data from Statistics Canada becomes available, it will be incorporated into the study.

3.2. Recommendation 2: Source Apportionment

The CFO project team recommends that:

Alberta Environment, with support from Alberta Agriculture and Rural Development and the intensive livestock industry, conduct specific studies in areas with CFOs, using suitable source apportionment methods to estimate the contribution of CFO emissions of the five priority substances relative to other sources of these emissions. These studies are to be completed by December 31, 2010.

Source apportionment is a method of identifying types of emission sources and their relative contributions to measured air pollution. CFOs are only one source of the priority substances emitted into the ambient air.

Summary of key outcomes:

- Due to resourcing issues, this recommendation could not be implemented as stated above. Instead, Alberta Environment and Sustainable Resource Development (ESRD) and ARD selected a contractor to identify the best available methods for conducting CFO source apportionment studies and to develop a workplan for the study, including a feasibility assessment for completing Recommendation 2. This work was completed in May 2012.
- The literature review and workplan were discussed at Workshop Part 2 on May 24th. After reviewing the information, it was agreed that it would not be advantageous to proceed with the source apportionment project at this time as the research field has not sufficiently evolved to provide the required information, costs to implement are high, and there is a lack of province-wide applicability.³

Next steps:

- As ESRD was the lead agency, they will keep the literature review and workplan on file.

³ Please refer to the CFO project team proceedings from Workshop Part 2 on May 24th for the full discussion on the subject of Recommendation 2. These are available from the CASA website.

3.3. Recommendation 3: Monitoring for Ammonia, H₂S, PM and VOCs

The CFO project team recommends that:

Alberta Agriculture and Rural Development:

- a) develop, with input from all stakeholders, an ambient monitoring plan for ammonia, H₂S, PM and VOCs to determine current ambient levels around CFOs. The plan will include timelines, budget, methodology (with reference to the Air Monitoring Directive) and responsibilities;
- b) undertake ambient air monitoring of ammonia, H₂S, PM and VOCs around CFOs, based on the above plan, beginning in 2008; and
- c) submit a status report by March 31, 2009 with a final report on results to be submitted by March 31, 2010 to CFO project team stakeholders and the Alberta Ambient Air Quality Objectives Stakeholder Advisory Committee.

The intent of this recommendation was to measure concentrations of the four substances in the air to provide a representative indication of air quality around CFOs and the relative impact of CFOs on air quality. Both upwind (background) and downwind concentrations were measured to assess the relative contribution of CFOs to air quality.

Summary of key outcomes:

- In 2008, an ambient air quality measurement (AQM) plan was developed by ARD in collaboration with a multi-stakeholder advisory group (MAG).
- Ambient air concentrations of five air quality parameters-of-interest were measured over a 14-month period, at the category one minimum distance separation (MDS), along the path of the prevailing bi-directional wind, both upwind and downwind of a beef cattle, a dairy cattle, a poultry and a swine CFO in Alberta. The five parameters-of-interest were: ammonia (NH₃), hydrogen sulphide (H₂S), respirable particulate matter (PM_{2.5}), total suspended particulates (TSP) and volatile organic compounds (VOCs).
- The final project report was completed in December 2011. The report included information on how the measurements were conducted in the field, what data were gathered, how the data were analyzed, a summary and discussion of the results (including a comparison of the measured concentrations to existing and proposed Alberta Ambient Air Quality Objectives - AAQOs), and recommendations.

Next steps:

- ARD will share the results and outcomes of the study with the CFO industry and other stakeholders.
- ARD will continue to use the two monitoring stations developed to implement this recommendation, in research studies that are designed to assess the ability of Beneficial Management Practices (BMPs) to effectively mitigate the impact of CFO air emissions on ambient air quality.

3.4. Recommendation 4: The 24-hour AQO for Ammonia

The CFO project team recommends that:

The Alberta Ambient Air Quality Objective Stakeholder Advisory Committee (AAAQOSAC) defer its decision on a 24-hour ambient objective for ammonia until April 2009, at which time the AAAQOSAC will determine if they have sufficient information from the ambient air monitoring study on which to base a decision.

In 2000, a multi-stakeholder workshop recommended that Alberta Environment's Ambient Air Quality Objective Stakeholder Advisory Committee (AAAQOSAC) should review the ambient air quality objective (AAQO) for ammonia. Following the review by the Committee's ammonia subgroup, the one-hour AAQO did not change, but a new 24-hour objective for ammonia of 200 µg/m³ was proposed, based on a health effects threshold. The primary intent was to address emissions from industries other than CFOs (e.g., fertilizer manufacturing).

There is still some uncertainty around whether or not CFOs would be able to meet the proposed 24-hour ambient objective for ammonia. Therefore, the AAAQOSAC deferred the decision on implementing a 24-hour ambient air quality objective for ammonia until the ambient monitoring study results became available (Recommendation 3).

Summary of key outcomes:

- The AAAQOSAC deferred its decision until the results from Recommendation 3 became available which found that there were no exceedances of either the 1-hour average or proposed 24-hour average NH₃ AAQOs during the study.
- Additionally, stakeholders at the 2009 Priority Setting Workshop (which was organized by CASA for Alberta Environment) indicated that an annual objective for ammonia was a priority.

Next steps:

- The workplan for an annual ecological effects objective is currently being developed and work will likely begin in late 2012 or early 2013. The process to finalize an objective usually takes 1-3 years.

3.5. Recommendation 5: Management Mechanisms Research Plan

The CFO project team recommends that:

Alberta Agriculture and Rural Development and the CFO industry develop a plan to submit to the Government of Alberta and research agencies for funding to do a study to quantify the reductions in priority emissions and odour, and any other benefits, from frequent manure removal, manure application, and moisture management.

The CFO project team identified the three management mechanisms listed above as practices that were being increasingly adopted by CFOs. However information was lacking on the

potential for these BMPs to reduce emissions of ammonia, hydrogen sulphide, odour, particulate matter, pathogens or volatile organic compounds, or to minimize the impact of these substances downwind of CFOs. A research plan was developed to investigate the mitigation potential and co-benefits or limitation of these mechanisms.

Summary of key outcomes:

- ARD developed a research plan and furthered this work by conducting scientific and technical reviews on three BMPs to assess the effects of these BMPs on the emissions of six substances-of-concern, ambient air quality, nutrient recovery and other potential benefits.
- ARD also conducted a social and economic impact assessment of the BMPs.
- This work was completed in March 2012.

Next steps:

- In addition to the work already completed, ARD and the CFO industry will develop a research plan that expands on the 3 BMPs from Recommendation 5 and the 5 BMPs from Recommendation 6 (below) and considers the outcomes from all ten of the CASA CFO recommendations. The focus of the research plan will include:
 - Developing a list of research options following consultation with CFO operators and experts.
 - Sharing and discussing the research options with the CFO industry.

3.6. Recommendation 6: Paper Study on Potential Management Mechanisms

The CFO project team recommends that:

Alberta Agriculture and Rural Development lead a paper study on the following five management mechanisms, to assess their potential to favorably affect emissions, ambient air quality, nutrient recovery and other potential benefits, and report back to CFO project team stakeholders by March 31, 2009, at which time consideration will be given as to where the research might be applied.

- Biocovers
- Bottom loading
- Shelterbelts
- Composting
- Dust palliatives

These five management mechanisms were prioritized by the industry, non-government organization and government as the mechanisms that had the most promise for reducing emissions from CFOs in Alberta. There was limited information on the potential for these mechanisms to reduce emissions of ammonia, hydrogen sulphide, odour, particulate matter, pathogens or volatile organic compounds, or to minimize the impact of these substances. A study was conducted to investigate the mitigation potential and other co-benefits or limitations of these mechanisms.

Summary of key outcomes:

- ARD completed a final report detailing a scientific, technical, social and economic review of the five beneficial management practices (BMPs). This work was completed in December 2011.
- The study reviewed published literature and expert subject matter opinions pertaining to the impacts of the five BMPs on emissions of ammonia, hydrogen sulphide, odour, particulate matter, pathogens, and volatile organic compounds.
- The final report also included recommendations to address key knowledge gaps in relation to the five BMPs.

Next steps:

- ARD will develop extension and communication plans to promote the adoption of select BMPs by the CFO industry.
- As noted above, in addition to the work already completed, ARD and the CFO industry will develop a research plan that expands on the 3 BMPs from Recommendation 5 (above) and the 5 BMPs from Recommendation 6 and considers the outcomes from all ten of the CASA CFO recommendations. The focus of the research plan will include:
 - Developing a list of research options following consultation with CFO operators and subject-matter experts.
 - Sharing and discussing the research options with the CFO industry.

3.7. Recommendation 7: Odour Management Plan Template

The CFO project team recommends that:

The CFO industry develop an odour management plan template for use by operators in the intensive livestock industry. The plan will be based on economic feasibility, scientific evidence of odour reductions, and new technology, specifically best available technology economically achievable (BATEA), and will be ready for use by January 2009.

The intent of this recommendation was to provide operators of CFOs with information on factors that can influence odour generation, considerations for odour management planning, and sources of information and assistance on odour management. An assessment tool was developed to:

- 1) Allow operators to assess their operation from an odour management perspective and identify those areas that may be improved.
- 2) Help identify options to improve odour management plans.

Summary of key outcomes:

- The ILWG, ARD and the Natural Resources Conservation Board (NRCB) collaborated to create the Odour Management Plan Template. This work was completed in September 2011.
- It will be used by livestock organizations and ARD as an extension/education tool to improve the awareness of various techniques and tools that CFOs can use to better manage odour and foster good neighbour relations.

Next steps:

- ARD is working with their CFO Extension Services branch to promote the use of the template.

3.8. Recommendation 8: Managing Odour in Problem Areas

The CFO project team recommends that:

The CFO industry work with operators in problem areas to develop a site specific odour management plan. The Government of Alberta will provide resources (expertise, skills, knowledge) to assist with plan development and implementation. Problem areas will be identified using information from the NRCB and the industry. In working with operators, the industry and government may want to consider measuring odour around CFOs.

The intent of this recommendation was to use the NRCB's complaint database to identify areas in the province receiving the most odour complaints and subsequently focus resources on problem areas.

Summary of key outcomes:

- The ILWG, ARD and NRCB completed a report in September 2011 which:
 - Determined the number of total odour complaints in the province using the NRCB database,
 - Identified, where possible, the reasons for the odour complaints,
 - Identified areas in the province where odour is a significant issue, and
 - Identified management options that may address odour in problem areas.
- Operations with more than 10 complaints over the nine year period beginning in 2002 were classified as "problem areas". Further analysis concluded that 36 operations fit into this category and that these 36 operations were not located in one specific region of the province. It was concluded that odour issues and odour problem areas are not regional in nature, but rather defined by site specific conditions related to the specific operation.

Next steps:

- Moving forward with site specific odour management, the industry will utilize the Odour Management Plan Template (Recommendation 7) as its primary tool. This tool will be made available to ILWG organizations and to ARD to support extension services and, in particular, will assist in providing one on one consultation with those operations identified in the study that may require odour management improvements.

3.9. Recommendation 9: Improving Communications

The CFO project team recommends that:

The NRCB and Alberta Agriculture and Rural Development work with all involved parties to develop a plan by March 31, 2009 to improve communications and relationships among stakeholders regarding information related to CFOs. The following are areas where attention should be focused to improve communications and stakeholder relationships:

- Alternative dispute resolution processes
- Communications between agencies and Government of Alberta departments, and
- Communications between the NRCB and complainants.

This recommendation focussed on improving communication about the processes that involve or affect CFOs and their neighbours and improving communication among all parties during the complaint resolution process. The main objective of the communication plan was to increase stakeholder awareness of the tools and resources available to them; the roles and responsibilities of various Government of Alberta agencies and departments; and the NRCB compliance and enforcement policy and process.

Summary of key outcomes:

- The Communication Plan was a joint partnership between ARD and NRCB and was drafted and approved in 2009. Since then, all the implementation strategies have been completed. For a complete list, please refer to the CFO-IRT 2011 report.

Next steps:

- There will be ongoing tool and resource development as needed. For example:
 - Updates to the “Where Neighbours Fit In” factsheet series; and
 - Updates to phone numbers (for complaints, etc.) in the Government Blue Pages as reprints occur.

3.10. Recommendation 10: Evaluating the Strategic Plan

The CFO project team recommends that:

The CASA Secretariat reconvene the CFO team in January 2011 to:

- a) Review the implementation status and outcomes of recommendations made in this report,
- b) Assess the success of these activities; and
- c) Make any further recommendations, if needed, to reduce air emissions from CFOs in Alberta related to this strategic plan.

Summary of key outcomes:

- In March 2011, the CFO-IRT presented its final report which assessed the accomplishments, challenges and lessons learned related to implementing the CFO recommendations. The work of the CFO-IRT focused on part (a) and (b) of Recommendation 10.

- In 2012, the CFO project team participated in two workshops where members heard updates on the implementation of the recommendations, building on the work of the CFO-IRT, and discussed the future of the CFO project team, part (c) of Recommendation 10. Section 5 of this report provides a recommendation to the CASA Board as to the future of the CFO project team.

4. Successes, Gaps, and Considerations

Part (b) of Recommendation 10 asked the team to assess the success of the work done to implement the recommendations. This section reviews the team's discussion on this topic and speaks to the successes, gaps, and future considerations that the team identified, as well as the concerns that were discussed during the two workshops.

Over the course of the two workshops in 2012 (on March 15th and May 24th), the CFO project team concluded that the team has achieved a great deal – documentation of specific successes brainstormed by the team at Workshop Part 1 can be found in Appendix 1.

It was recognized that this work has been a starting point rather than an ending point. It is important that the work completed by the CFO project team be used to inform future emission reduction efforts. The management of CFOs will be an ongoing issue in Alberta and a great deal of work has been done to identify gaps and areas for future work. The CFO project team had a discussion around gaps and considerations related to recommendation implementation that can be found in Appendix 2. It should be noted that some of the issues identified in Appendix 2 have since been addressed or may be resolved by the next steps identified by implementers.

It should also be noted that, as part of the CASA performance measurement process (Performance Measure 3), the CASA Performance Measures Committee continues to follow-up on recommendations to assess their implementation status. Depending on the circumstances, the CASA Board may make a determination that further action is required.

Recurring or new issues that are considered appropriate to work on in a consensus process could be brought to the CASA Board through the Statement of Opportunity process. The human health effects of air emissions from CFOs, dust and particulate matter, and Cumulative Effects Management (CEMS) were identified as possible areas for future work.

In determining the extent to which the recommendations from the 2008 report were implemented, all team members were encouraged to meet with their constituents to discuss project successes, ongoing air quality challenges and any related considerations. While most participants reported that their constituents were pleased with the progress that has been made and felt that the CFO project team has met their objectives, some participants have noted that work remains to be completed. Recognizing that all stakeholders represented by the project team remain committed to making progress on CFO-related air quality issues through ongoing measures and processes (many of which are described in this document), there was general agreement that the CFO project team should disband.

5. Conclusion and Recommendation

Part (c) of Recommendation 10 asked the CFO project team to provide advice to the CASA Board as to the future of the CFO project team.

Recognizing that there is still progress to be made in the area of air emissions from CFOs in Alberta, team members feel that the current CFO project team has completed its terms of reference and recommends that the team be disbanded.

Recommendation 1: Disband the CFO Team.

The CFO project team recommends that the team be disbanded.

Appendix 1: List of Successes (Workshop Part 1)

At the Workshop Part 1 on March 15th, the CFO project team brainstormed a list of successes relating to the implementation of the nine recommendations. This is a record of the team's discussion taken from the Workshop Part 1 Proceedings and is not part of the consensus document. It has been included for information purposes only.

- Recommendation 1: Development of an emissions inventory
 - This inventory can continue to be updated. It provides a benchmark and tool for assessing emissions. It also goes beyond fluctuations in animal numbers.
- Recommendation 3: Monitoring for ammonia, H₂S, PM and VOCs
 - This air quality monitoring project has increased our knowledge base and our understanding of the complexity of the issue.
- Recommendation 7: Odour management plan template
 - This has increased understanding of odour sources and how to practically manage the odour from these sources.
- Recommendation 8: Managing odour in problem areas
 - This has led to increased understanding on the nature of problem operations in Alberta and what action has been taken to manage problem operations. It has also demonstrated that problem operations are not clustered geographically.
- Recommendation 9: Improving communication
 - The development of communications tools has been valuable to help improve neighbour relations.
- The CFO Project Team has provided the opportunity for collaboration among diverse groups and helped to improve relations, understanding and awareness among stakeholders. It has acted as a valuable forum for discussion and helped to encourage discussion about the relevant issues.
- The CFO Project Team has achieved a great deal - a number of projects have been completed and a large amount of information has been generated. A great deal of work has been done to identify gaps. It has helped to create ownership of the issues and forward momentum.
- In general, in Alberta, great strides have been made around CFOs since the 1990s and there is ongoing commitment to work on this issue.

Appendix 2: List of Gaps & Considerations (Workshop Part 1)

At the Workshop Part 1 on March 15th, the CFO project team brainstormed a list of gaps and considerations relating to the implementation of the nine recommendations. This is a record of the team's discussion taken from the Workshop Part 1 Proceedings and is not part of the consensus document. It has been included for information purposes only.

- Recommendation 2: Source Apportionment
 - The literature review and work plan need to be completed and next steps need to be considered and prioritized. This could be an opportunity to seek input from the CFO Project Team.
 - *Update: The completed literature review and workplan were presented to the team at the Workshop Part 2.*
 - Recommendation 3: Monitoring for ammonia, H₂S, PM and VOCs
 - The existing information on Recommendation 3 needs to be refined in order to work towards addressing Recommendation 4 (Recommendation 3 is a prerequisite to Recommendation 4).
 - It would be helpful to have more specific data from Statistics Canada.
 - There is no correlation between results and the size of the operation due to confidentiality.
 - A next step could be to relate this Recommendation to the emissions inventory (Recommendation 1).
 - Recommendation 4: The 24-hour AQO for ammonia
 - This recommendation needs to be completed.
 - *Update: The results of Recommendation 3 were made available to ESRD. This recommendation is now complete and details are outlined in Section 3 of this report.*
 - Recommendation 5: Management mechanisms research plan
 - This work needs to be finalized and the next steps determined with regard to plans to move things forward in a deliberate, strategic way using all the information from Recommendations 1, 3, and 6.
 - Recommendation 7: Odour management plan template
 - Time will be needed to determine if the Odour Management Template is effective.
 - There may also be more information required to link odour and management practices.
 - Follow-up work could include further efforts to increase awareness and adoption of the template.
 - Recommendation 8: Managing odour in problem areas
 - Continued effort is required to find ways to manage problem operations.
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- Work is required to ensure the use/adoption of the tools developed by the recommendations. For example:
 - Best management practices (Recommendation 5, 6)
 - Odour management template (Recommendation 7)
 - Problem operations (Recommendation 8)
- There are still gaps in information. Some of the gaps have been pointed out by the final reports resulting from the implementation of the recommendations. Other gaps may include:
 - Human and animal health effects
 - Dust and particulate matter
 - Cumulative Effects Management.
- There are legislative issues that remain unaddressed. For example, relating to the management of problem operations.
- There may be a need to include other stakeholders in CFO related discussions, particularly airsheds.
- Moving forward it is important to consider economic/resource feasibility in order to achieve the most value for expense. It is also important to prioritize issues so that the most pressing rise to the top.
 - *NB: One of CASA's seven operating principles (as described in CASA's Strategic Plan) is 'Integration': CASA supports integrated air quality decision-making that seeks a synergy between: (a) environmental protection to prevent short- and long-term adverse health effects, (b) economic performance and efficiency, and (c) continuous improvement and pollution prevention.*