Annual Report 2009

Cumulative Environmental Management Association (CEMA)

Lake Athabasca December 2009

Executive Summary

The Cumulative Environmental Management Association (CEMA) is a multi-stakeholder organization focused on addressing cumulative environmental effects of oilsands development within the Regional Municipality of Wood Buffalo. Established in 2000, CEMA's mandate is to provide recommendations to regulators on how to best manage impacts resulting from direct and indirect industrial development within the region.

Operating in its 9th year, CEMA has continued a restructuring and renewal process, to strengthen the Association for the environmental challenges in the years ahead. In June, CEMA formed a Joint Review Committee, which included representatives from Federal and Provincial Northeast Alberta Regulators and the CEMA Management Committee. A number of recommendations for improving the effectiveness of CEMA will be voted upon by CEMA members at the March General Meeting.

In 2009, CEMA produced 42 important reports and guidance documents. World class scientists, within CEMA's working, sub and task groups provided the most current science available related to the air, reclamation, biodiversity & wildlife, land, vegetation, water and fish, wetlands, trace metals, and the ecosystem. CEMA was once again a leader in cumulative environmental effects research in the oilsands region over the past year.

Aboriginal engagement was advanced throughout the year to continue reaching the Métis and First Nations Peoples. The Traditional Environmental Knowledge (TEK) Advisory Committee hosted its TEK Coaching Workshop and Elders Workshop titled "Pass it On". In keeping with the theme, Aboriginal Youth attended.

The Aboriginal Roundtable ongoing grassroots outreach via an Aboriginal Youth and Elders Camp brought together Aboriginal traditions and local environmental issues.

The Membership base of CEMA was expanded with new members including Keyano College, Nistawayou Association Friendship Centre, and Métis Region One. These new Members helped ensure a healthy balance of educational and Aboriginal Groups in the operation of CEMA. An existing member, EnCana Corp. performed a corporate split resulting in the new integrated oil company, Cenovus Energy Inc. becoming the CEMA member.

A world class Air Contaminant's Management Framework was announced and the key recommendation is a formal comprehensive review of regional air quality. The review would be undertaken by a multi-stakeholder Regional Advisory Panel and would identify regional priority air contaminants for management consideration.

An important Workshop on Biodiversity in Reclamation of the Oil Sands Region: Current State & Next Steps was held. CEMA Members and biodiversity experts from Australia, the United States, and Canada focused on pressing issues associated with establishment and assessment of biodiversity in reclamation.

A scientific leading Framework for Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region (Revegetation Manual) was completed. The Revegetation Manual provides guidance on re-establishing the forest vegetation component of ecosystems and on evaluating the

success of this process on reclaimed oil sands leases.

A Closure Coordination Workshop; "Meeting the Expectation of a Continuous Functional Closure Landscape in the Oil Sands Region" reviewed the planning, operation, and reclamation of oilsand minesites which support the development of a functional and interconnected post-closure regional landscape.

CEMA and the Wood Buffalo Environmental Association (WBEA) hosted a workshop on sulphur and nitrogen deposition in Western Canada. World leading academics and scientists from across Canada, the United States, the United Kingdom and Norway with oil sands industry representatives, regulators, non-government organizations and Aboriginal Representatives attended.

CEMA broadened its connection with the Federal Government over the past year. The Executive Director led two trips to Ottawa to meet with senior government officials. A $350,000 in kind contribution was received from Fisheries and Oceans Canada and CEMA appeared before the House of Commons Standing Committee on the Environment.

As with previous years, the majority of CEMA funding was provided by oilsands mining and in situ operators and in 2009, that funding commitment was 7.5 million. Alberta Environment and Sustainable Resources Development provide grant contributions to the sum of 800,000. and 100,000. respectively.
CEMA deepened its local ties, through a series community based activities over the year. Environment Week 2009, saw the continuation of the very popular CEMA Family Fun Day, with over 1200 attendees. In 2009 CEMA partnered with the Royal Alberta Museum and the Oilsands Discovery Centre.

CEMA was active in the Fort McMurray Science Fair and Fort McMurray Spring trade show. CEMA held one of their General meetings in Fort McKay. After the meeting CEMA members met with a number of the Fort McKay Elders and held an information session on the 2009 programs and the proposed review. Finally, CEMA along with the Regional Aquatics Monitoring Program delivered a Joint Community Update to all resident of Municipality of Wood Buffalo.

CEMA Office
Suite 214, 9914 Morrison Street
Fort McMurray, AB
T9H 4A4
Phone: (780) 799-3947
FAX: (780) 714-3081
E-Mail: info@cemaonline.ca
Website: www.cemaonline.ca

Table of Contents

1.0 Background

1.1 Oil sands Development and Cumulative Effects Concerns

In the mid -1990s a record number of applications were made for new licenses and expansion of existing oil sands operations in the Regional Municipality of Wood Buffalo. This was due in part to lower production costs and higher oil prices. At the time, questions were raised about the ability of the environment to handle this level of projected growth and development in oil sands mining, extraction and upgrading. Additionally, stakeholders expressed increasing concern over potential combined or cumulative effects that increased levels of industrial activity could have on the environment. Cumulative environmental impacts could affect environmental quality, biological diversity, and/or human health because of habitat loss, wildlife loss, and reduced air and water quality.

1.2 Regional Sustainable Development Strategy (RSDS) for the Athabasca Oil sands Area Initiated to Address Potential Cumulative Effects

The Alberta Government took steps in the late 1990s to initiate a strategy to address potential cumulative environmental effects in the oil sands region. The intent of the strategy was to provide a framework for managing cumulative environmental effects and ensure sustainable development in the Athabasca oil sands area. Alberta Environment led the creation of the Regional Sustainable Development Strategy (RSDS) for the Athabasca Oil sands Area, working with regional stakeholders and other regulators. The Strategy was based on the anticipation of greater than $12 billion of new capital investments in the oil sands region. The RSDS identified and prioritized 72 environmental issues within the oil sands region that should be studied in light of the projected growth. Issues were divided into a list of 14 themes and three priority categories. The Strategy was published in 1999. The diversity of environmental values and interests in the region prompted the need for a multi-stakeholder forum to establish environmental management objectives for the region.

1.3 Cumulative Environmental Management Association (CEMA) Formed to Address RSDS Issues

A stakeholder group, the Cumulative Environmental Management Association (CEMA), agreed to address 37 of the RSDS issues. Currently CEMA is addressing 27 of the original issues. The remaining RSDS issues not falling under CEMA's mandate were to be addressed by existing government mandate or other regional initiatives. CEMA's focus was to provide recommendations to regulators on managing potential cumulative environmental effects using a variety of environmental management tools such as environmental limits or thresholds.

2.0 Cumulative Environmental Management Association

2.1 Overview

The Cumulative Environmental Management Association (CEMA) is a registered not-for-profit non-governmental organization (NGO) established in Fort McMurray, Alberta in June 2000. A multi-stakeholder organization, CEMA is governed by 46 members representing all levels of government, industry, regulatory bodies, environmental groups, Aboriginal groups, and the local health authority who have an interest in protecting the environment in the Wood Buffalo region.

2.2 Vision

CEMA's vision is that:

The environment of the region including the land, forest, air, water, wildlife and biodiversity will be protected, sustained, and restored over the long term; and that the collective activity of industrial activity in the region will not cause any lasting harm to the environment or adverse effects to the health of humans. Should these impacts be evident, the Association and its Members will recommend, promote and implement mitigating action to reverse their effects.

2.3 Purpose

CEMA's purpose is to:

Provide a forum for its stakeholders to discuss and make consensus-based decisions forming the basis for action by members, and recommendations to Alberta Environment's Regional Sustainable Development Strategy (RSDS) as appropriate, on managing the region's cumulative environmental effects, thereby forming the core of a proactive regional environment management system that addresses cumulative biophysical, health and resource use impacts of regional developments.
Develop and apply environmental management frameworks, thresholds, guidelines and objectives.

2.4 Objectives

CEMA's objectives are to:

- Ensure that effective and efficient stakeholder driven regional environmental management frameworks are established for air, water, land and biodiversity. Ensure regional environmental guidelines, objectives and thresholds are in place or established and recommended to RSDS where appropriate for effective implementation. Develop the basis for the ongoing management of impacts of industrial development and resource use on the regional environment including recommending the priorities and objectives for and content of monitoring and research, and both employing and recommending mitigating options.

- Respond to issues brought forward by stakeholders. Issues not within the mandate of the Association will be referred to an appropriate organization for a response.
- Work cooperatively with other activities and organizations which also have responsibilities with respect to managing the regional environment, including establishing appropriate linkages to other environmental management initiatives or activities in the region e.g. Wood Buffalo Environmental Association (WBEA), Regional Aquatics Monitoring Program (RAMP) and Canadian Oil sands Network for Research and Development (CONRAD) . Effectively communicate the need, activities, and results of the Association to internal and external stakeholders.

2.5 Mandate

CEMA's mandate is to:

- Achieve the vision, purpose and objectives of the Association and ensure the principles of the Association are consistently applied in aspects of its activities.
- Set Terms of References for Working Groups, review and endorse Working Group recommendations and provide comments and guidance to Working Groups.
- Approve work plans and budgets according to the requirements of its Members; and report in a timely fashion all issues that need to be brought to the attention of Members.

2.6 Scope

CEMA focuses on issues involving the impacts of industrial activity on biodiversity, land, water, and air:

- Land - Oil sands development has the potential to make significant changes to landscapes, wildlife populations, and habitats. Accordingly, CEMA is determining and recommending the best management tools available to protect, sustain, and restore the health of the landscape, vegetation, soil, and watersheds while balancing industrial development and environmental considerations. CEMA is also looking at the best measures and methods available to protect the environment in areas where reclamation activities need to occur.
- Water - CEMA's work on water issues centers on the health of aquatic ecosystems (rivers, lakes, and streams) and understanding how the natural environment is likely to respond to increasing industrial development. CEMA is developing a system that minimizes the long-term environmental impacts on surface water quantity and quality so that the water systems will remain healthy.
- Air - The focus of CEMA's air related research is to increase understanding of the sources of potentially harmful emissions. CEMA is assessing the potential impacts of industrial air emissions (i.e. discharges from stacks and vehicles) on the environment and recommend actions to keep the air clean and minimize the effects of emissions.

2.7 Priority Issue Areas

CEMA's current priority level environmental issues were identified through the Regional Sustainable Development Strategy (RSDS) issued by Alberta Environment in July 1999. This initiative identified 72 priority environmental issues in the oil sands area. CEMA is responsible for addressing 27 of those issues. The CEMA priority issues include research and recommendations on the following:

- Acidification
- Air contaminants
- Biodiversity
- Culture and historical resources
- Fish habitat
- Ground-level ozone
- Landscape diversity
- Reclamation
- Surface water quality
- Surface water quantity
- Trace metals
- Wildlife habitat

2.8 CEMA Products

CEMA products include recommendations on management frameworks to address environmental concerns. The recommendations are based on scientifically founded limits and use information from existing research as well as traditional environmental knowledge provided by CEMA's Aboriginal members.

Recommendations from CEMA are referred to the appropriate regulatory agency for approval and implementation. Interim products, such as reports, models and databases, are developed to inform the management frameworks. It's important to note that CEMA does not make decisions on individual project applications. However, frameworks and information provided by CEMA to regulators that can assist the regulators make individual project-level assessments and decisions.

2.9 CEMA Structure

CEMA is a formal society with governance and administrative systems. It is guided by and accountable to its Members and is both collaborative and consensus driven.

CEMA Members - CEMA is made up of its Members Board that represents regional stakeholders and is the decision-making body of CEMA. Members bring different perspectives, knowledge, skills, and expertise to the table. They work in partnership, based on a common belief in the importance of the environment.

Working Groups - CEMA's work is completed through 5 Working Groups that direct technical and scientific work and then use the information to develop the management frameworks that are approved through the Members. Each Working Group's mandate focuses on specific RSDS issues that contribute to the larger CEMA goals.

The Working Groups include:

NOxSO2 Management Working Group (NSMWG)
Mandate - To review the relevant science and develop a management system for current and projected emissions levels of NOX and SO2 given appropriate levels of protection as well as receptor sensitivities to acidification and eutrophication. NSMWG is also designing a management system that addresses ground-level ozone and its effects on vegetation, health, and nitrogen eutrophication (i.e. the effects of nitrogen on vegetation growth).

Reclamation Working Group (RWG)
Mandate - To provide recommendations to government to ensure that reclaimed landscapes within the region meet regulatory requirements, satisfy the needs and values of stakeholders and are environmentally sustainable.

Surface Water Working Group (SWWG)
Mandate - To develop a management recommendation related to water quantity in the lower Athabasca River.

Sustainable Ecosystems Working Group (SEWG)
Mandate - SEWG's mandate is to develop and recommend a management system to address cumulative effects on ecosystems and landscapes in the Regional Municipality of Wood Buffalo (RMWB) based on sustainable development principles.

Trace Metals & Air Contaminant Working Group (TMAC)
Mandate - To assess the risks posed by trace metals and trace air contaminants
to human health and ecosystems under existing environmental management systems and, if required, recommend changes to adequately manage those risks.

CEMA Advisory Committees and TaskGroups:

CEMA's work is also completed through the support of an Advisory Committee and Task Group.

Traditional Environmental Knowledge (TEK) Advisory Committee
Mandate – The CEMA Traditional Environmental Knowledge (TEK) Advisory Committee is established to guide the efforts of the Working Groups to integrate and use traditional knowledge in management frameworks and recommendations to government. This is to help ensure the land, forest, air, water, wildlife and biodiversity in the Regional Municipality of Wood Buffalo will be protected, sustained and re-established over the long term. Environmental Knowledge (TEK) Advisory Committee

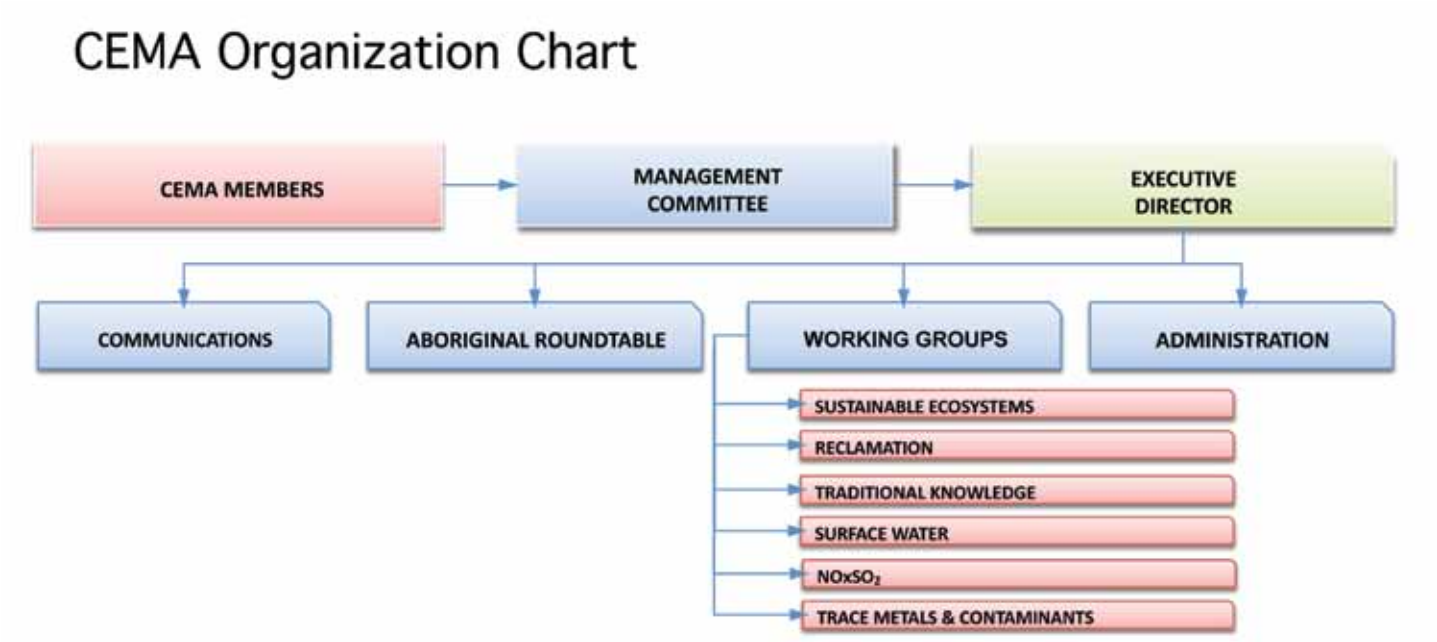
Aboriginal Roundtable (ART)
Mandate – The Aboriginal Round Table (ART) Task group started work in the early part of 2009. Meetings were scheduled, which were intended to develop and organize the group to work within a framework of cooperation in seeking their vision. The ART task group began this process with a well intended approach that included a vision of Total Participation and a mission statement of facilitating a process to fulfill their vision.

2.10 CEMA Secretariat

CEMA's headquators is in Fort McMurray, Alberta. A full time staff of professionals' complete the day to day operations in accordance, with the CEMA policies. The Executive Director is responsible for completion of the Secretartict's work of the organization.

Position	Name
Executive Director	Glen Semenchuk
Office Manager	Christine Kenning
Executive Assistant	Bharati Naidu
Bookkeeper	Lynette Whelan
Program Manger - RWG	Kyle Harrietha
Program Manger - RWG	Heather Bartlett
Program Manger - SWWG, TMAC SEWG, NSMWG	Katherine Duffett
ART Facilator	Alice Martin
Communications Director	Corey Hobbs

2.11 CEMA Organization Chart



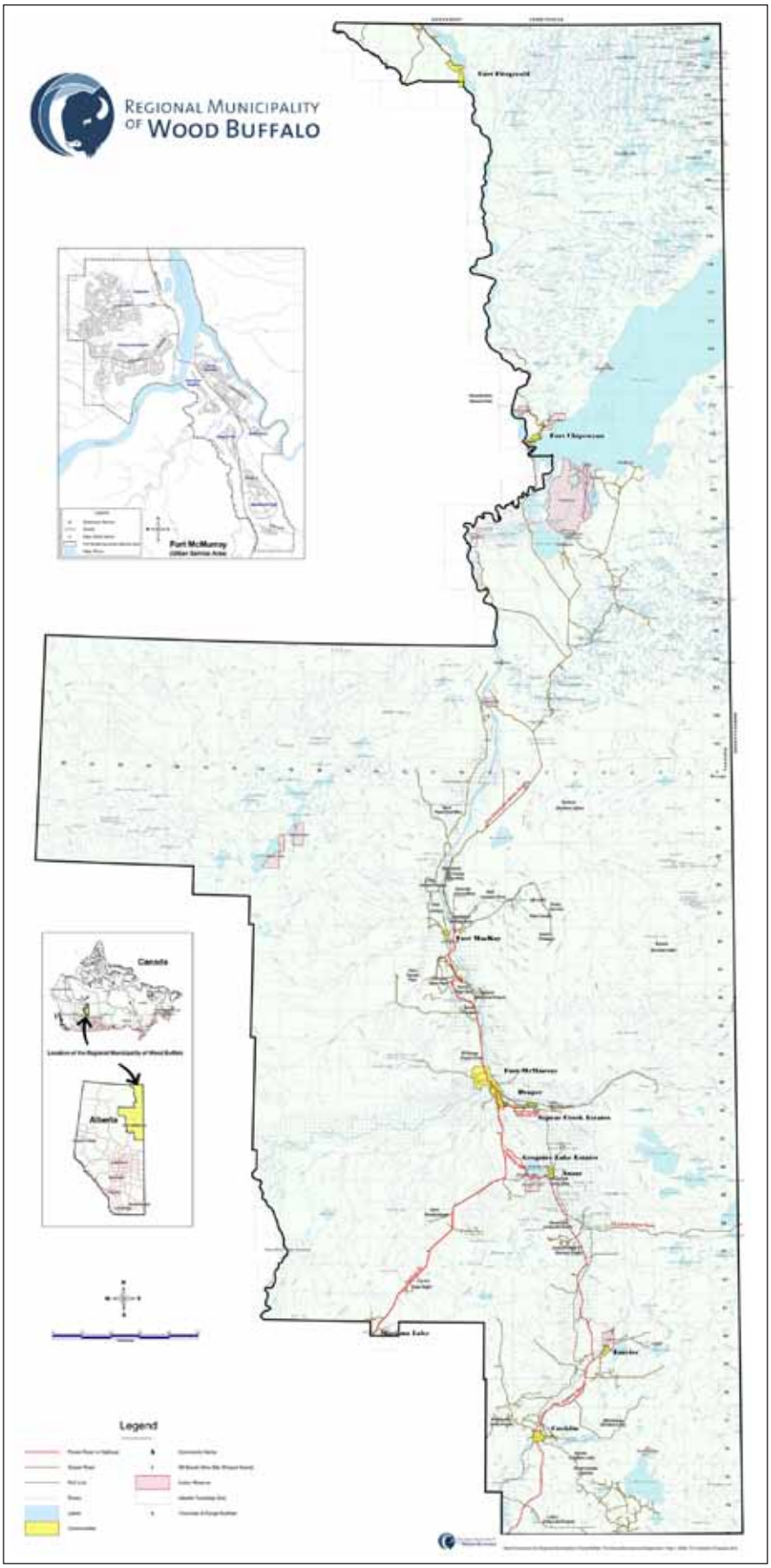
Fort McKay September 2009

2.12 CEMA Membership

Aboriginal Members:	Non Profit Groups:
Chard Métis Local # 214 Conklin Métis Local #193 Fort Chipewyan Métis Local #125 Fort McKay Métis Local #63 Fort McKay First Nation Fort McMurray Métis Local #2020 Nistawayou Association Friendship Centre, Métis Region 1	Alberta Conservation Association Alberta Fish and Game Association Canadian Parks and Wilderness Society Ducks Unlimited Canada Fort McMurray Field Naturalists Keyano College - (Associate)
Governments Members:	**Industry Members:**
Alberta Aboriginal Affairs & Northern Development (Associate) Alberta Department of Energy (Associate) Alberta Environment Alberta Health and Wellness Alberta Sustainable Resource Development Canadian Environmental Assessment Agency Department of Fisheries and Oceans Environment Canada Energy Resources Conservation Board(ERCB) Health Canada Regional Municipality of Wood Buffalo Saskatchewan Environment (Associate) Natural Resources Canada - (Associate) Northern Lights Regional Health Authority Wood Buffalo National Park	Alberta Pacific Forest Industries Inc. Canadian Natural Resources Ltd. Cevnovus Energy Ltd. ConocoPhillips Canada Devon Canada Husky Energy Ltd. Imperial Oil Resources Japan Canada Oilsands Ltd. MEG Energy Nexen Canada Inc. Shell Canada Suncor Energy Inc. Syncrude Canada Inc. Total E&P Canada UTS Energy Corporation

General Meeting September 2009

2.13 Map of the RMWB



3.0 RSDS Issues that CEMA is Addressing

3.1 Terrestrial

The Sustainable Ecosystems Working Group (SEWG) and the Reclamation Working Group (RWG) are both addressing terrestrial related RSDS issues from different angles.

Terrestrial Related Issues

The RSDS terrestrial issues that are of concern to CEMA focus on biodiversity, landscape diversity, wildlife habitat, and cultural and historic resources. The main task of the Working Groups responsible for terrestrial issues is to determine and recommend the best management tools available to protect, sustain and restore, the landscape, biodiversity, vegetation resources, unique landscape features, ecological capabilities, soil, and watershed integrity within the region. In order to more effectively examine these complex terrestrial issues, the CEMA Working Groups responsible have categorized their studies into specific themes:

Biodiversity is related to the variety of species and ecosystems in a region and the ecological processes of which they are a part. The underlying assumption of biodiversity is that all life forms have some value, economical, ecological, real or potential. Related to this concept is landscape diversity. This concept consists of managing areas of land that are distinguished by variations in landforms, vegetation, land-use, and aesthetic appearances.

Reclamation involves returning land to its former capability after it has been disturbed. This is a concern for CEMA due to the large areas of the region that are being disturbed by development. These disturbed areas will eventually be reclaimed to support natural ecosystems.

Cultural and historical resources consist of an object, a site or the location of a traditional societal practice that is of historical, recreational or archeological importance to Alberta, a community or a group of Aboriginal People. Cultural resources include archeological sites and structural features, whereas historical sites consist of landscape features, recreational sites and traditional use sites.

3.2 Surface Water

The Surface Water Working Group (SWWG) is the main Working Group addressing water related RSDS issues, although the Reclamation Working Group (RWG) is also dealing with water related issues through their work on End Pit Lakes.

Water Related Issues

The RSDS issues linked to these main concerns that CEMA is addressing focus on surface water quantity and the sustainability of watersheds in the region.

The main SWWG tasks that support the creation of a Water Management Framework for the Lower Athabasca River are:

- Evaluate how best to assess the Instream Flow Needs (IFN) development of the lower Athabasca River and the Peace-Athabasca Delta reaches within its delta region at Lake Athabasca, initiate development of a monitoring program that tests assumptions of the IFN, and assess the spatial distribution and habitat of key fish species in the river and delta.
- Assess social and traditional land and water uses potentially affected by changes in water quantity in the lower Athabasca River and Peace-Athabasca Delta.

3.3 Air

The Trace Metals and Air Contaminants Working Group and the NOxSOx Management Working Group are both addressing air related RSDS issues. These two groups focus on tasks related to the management of air pollutants, acid deposition, and ozone.

Air Related Issues

CEMA is developing air quality management systems because of the evident connection between human activities (including industrial development) and the production of emissions that can have adverse environmental effects. The basic question underlying the research and science being done by these Working Groups is whether any specific emission has the potential to cause adverse environmental effects either directly or through subsequent reactions with other chemical compounds. Issues addressed by CEMA that are related to air pollution include trace air contaminants, trace metal deposition, acidification, eutrophication, and ground-level ozone.

Trace air contaminants released by oil sands development and other sources (including vehicle emissions) in the CEMA region include several compounds, which at higher concentrations can be harmful to plants, animals and people. These include polycyclic aromatic hydrocarbons (PAHs), particulate matter (PM); reduced sulphur compounds (SCs) and volatile organic compounds (VOCs).

Trace metals are elements that occur in very small amounts in living organisms. Some are essential nutrients and others are potentially toxic. These elements are of concern to CEMA because industrial and vehicle emissions in the region can lead to increased environmental concentrations. Emissions of trace metals have steadily decreased over the past 30 years as a side benefit of sulphur controls. Levels of metals in lichens, fish and traditional foods are monitored and high mercury levels in predatory fish have resulted in advisories for some reaches of the Athabasca River.

Acidification is the process where air pollution (mainly ammonia, sulphur dioxide and nitrogen oxides) is converted into acid substances, i.e. acid rain. It is caused when a receptor (i.e. soil, wetland, water body) increases in acidity through either the deposition of acidic compounds or through the loss of substances, which are able to act as buffers. As acid concentrations increase in the environment the result can be changes to the health and varieties of vegetation and animal life. Currently, there are several hundred tones of acidifying emissions released daily from oil sands operations in the Wood Buffalo Region. Although annual volumes of sulphur emissions have declined (through more stringent management requirements), there has been an increase in the emissions of nitrogen compounds. The cumulative

volume of all acidifying emissions is a concern to CEMA because of their potential to affect local areas, and regional areas due to long distance transportation.

Eutrophication is caused by the enrichment of an ecosystem with chemical nutrients; typically compounds containing nitrogen or phosphorus. It may occur on land or in the water. It is considered a form of pollution, despite the fact that it is a natural process because it promotes excessive plant growth and decay, favors certain weedy species over others, and causes severe water quality problems.

Ground-level ozone is formed in the lower atmosphere through photochemical reactions involving Volatile Organic Compounds (VOCs) and nitrogen oxides (NOx). Ozone is associated with human health effects and vegetation damage, including crop damage and greater vulnerability to disease in some tree species. Since the amount of ozone precursors being emitted from oil sands development in the region will be increasing, CEMA is continuing to investigate management options.

Highway 63

4.0 2008 Revenue and Expenditure

PETERSON WALKER LLP
CHARTERED ACCOUNTANTS
SUITE 804, OXFORD TOWER, 10235 - 101 STREET NW
EDMONTON, ALBERTA T5J 3G1

AUDITORS' REPORT

To the Members of
Cumulative Environmental ManagementAssociation - Wood Buffalo Region

We have audited the statement of financial position of Cumulative Environmental Management Association - Wood Buffalo Region as at December 31, 2009 and the statements of operations, changes in net assets and cash flows for the year then ended. These financial statements are the responsibility of the Association's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Association as at December 31, 2009 and the results of its operations and cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Peterson Walker LLP

Edmonton, Alberta
February 12, 2010

Chartered Accountants

STATEMENT OF FINANCIAL POSITION

CUMULATIVE ENVIRONMENTAL MANAGEMENT ASSOCIATION - WOOD BUFFALO REGION

	December 31 2009	2008
ASSETS		
CURRENT ASSETS		
Cash	$1,908,549	$2,041,645
Accounts receivable	693,713	886,354
Prepaid expenses	22,268	28,156
	2,624,530	2,956,155
LONG-TERM INVESTMENTS--Note 3	17,358	16,562
PROPERTY AND EQUIPMENT--Note 4	23,571	32,538
	$2,665,459	$3,005,255
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Accounts payable and accrued liabilities	$ 801,708	$1,066,257
Deferred contributions--Note 5	967,698	1,039,950
	1,769,406	2,106,207
NET ASSETS		
Internally restricted--Note 6	600,000	600,000
Invested in property and equipment	23,571	32,538
Unrestricted	272,482	266,510
	896,053	899,048
	$2,665,459	$3,005,255

APPROVED BY THE BOARD

STATEMENT OF OPERATIONS

CUMULATIVE ENVIRONMENTAL MANAGEMENT ASSOCIATION - WOOD BUFFALO REGION

	Year Ended December 31 2009	2008
REVENUE		
Contributions	$5,586,427	$6,529,966
Grants	1,113,989	1,871,702
Interest and other	11,274	40,452
	6,711,690	8,442,120
TECHNICAL		
Reclamation Working Group	1,651,355	1,334,476
Surface Water Working Group	1,475,012	2,195,877
NoxSox Management Working Group	674,437	744,001
Salaries	472,948	404,899
Groundwater Working Group	413,989	568,648
Administration	197,518	184,325
Sustainable Ecosystems Working Group	194,269	250,736
Aboriginal Task Group	135,750	69,160
Traditional Environmental Knowledge Working Group	109,454	129,825
Trace Metals Working Group	36,718	160,401
Reclamation Working Group (Innovation)	0	1,106,457
	6,361,450	7,148,805
OPERATING		
Salaries, benefits and fees	585,036	570,257
Communications	275,942	266,715
Meeting costs	132,481	93,540
Office	164,111	173,265
Rent	112,108	62,733
Professional fees	25,494	36,016
Insurance	25,329	19,977
Amortization	23,174	34,689
Photocopier lease	9,560	16,097
Loss on disposal of property and equipment	0	10,076
	1,353,235	1,283,365
TOTAL EXPENSES	6,714,685	8,432,170
REVENUE (UNDER) OVER EXPENSES	$ (2,995)	$ 9,950

5.0 Joint Review Committee

In June of 2009, CEMA announced the formation of a Joint Review Committee (JRC) comprised of Members of the CEMA Management Committee and Northeast Alberta Regulators. CEMA's Management Committee identified a need to engage in a process to review the current governance structure, operations and clarify the future relationship of the organization with regulators. The purpose of the Committee was to determine the future direction of the Association; provide clarity about CEMA's relationship with the government`s regulators; address CEMA's relationship with its members and clearly articulate the limits of the difference between the power to recommend and the power to decide.

In 2007, CEMA initiated a revitalization program to address the challenges identified by the Radke report, the Oilsands Multi-stakeholder Consultation Committee. CEMA has made extremely good progress in completing over 90% of the 100 action items it identified to resolve the challenges.

In this same time frame two independent reviews where conducted to explore the operations and structure of CEMA and to identify recommendations to make improvements. The organization and its members and staff participated fully in each of the third party reviews conducted by Alberta Environment and Athabasca Tribal Council.

In December 2008 the Government of Alberta embarked on a new approach to managing cumulative effects by releasing the Land-use Framework and announced the development of the Lower Athabasca Regional Plan (LARP) which proposes a framework for managing a number of key land, air, and water issues within and beyond CEMA's current geographic area.

Over the past 6 months the JRC, held meetings and conducted research to develop draft recommendations. In November CEMA Members, the Secretariat and former CEMA stakeholders met for a facilitated workshop to tackle the draft recommendations. After considerable more feedback, a final report was competed and delivered to the Management Committee. The CEMA Membership will vote on the recommendations presented in the final report at the March 2010 Annual General Meeting.

Joint Review Team

6.0 Management Committee (MC)

CEMA's Management Committee (MC) provides strategic leadership to CEMA to enhance the effectiveness and success of the organization. It directs CEMA's work to ensure that management frameworks are developed to address the priority environmental issues.

The CEMA Management Committee is comprised of a President, Vice President, Secretary, Treasurer and 5 members at large. Election of the CEMA Management Committee occurs at CEMA's Annual General Meeting each March. Each management committee member serves up to two years. The CEMA Members ensure the Management Committee has a balance representation from CEMA's four sectors: Aboriginal, Government (federal, provincial and municipal), Environmental Groups and Industry. The Management Committee is responsible for the stewardship of CEMA and for directing the Executive Director and staff on CEMA work.

Management Committee Members (Dec. 31/2009)

Position	
President	Rick Brown, Alberta Environment
Vice President	Judy Smith, Shell - Finish term in December 2009
Secretary	Helene Walsh, Canadian Parks & Wildness Society
Treasurer	Ruth Kleinbub, Fort McMurray Field Naturalists
5 Directors	• Lisa Schaldmose, Fort McKay IRC • Neil Barker, Sustainable Resources Development • Jumbo Fraser, Fort Chipewyan Métis Local #125 • Simon Geoghegan, MEG Energy • Stuart Nadeau, Imperial Oil

Management Committee Members: Jumbo Fraser, Neil Barker, Stuart Nadeau, Rick Brown - President, Ruth Kleinbub - Treasurer, Lisa Schaldmose, Judy Smith - former vice president, Simon Geoghegan, Helene Walsh - Secretary.

7.0 CEMA Communications

Communications Director: Corey Hobbs

Communications is an important element of CEMA. The Communications Director operates closely with the Executive Director, Management Committee, Program Managers and working group's Co-Chairs. CEMA Communications provides internal interactions between the CEMA Members and the secretariat, in a professional timely manner. External communications is delivered via the most modern communications tools available to all residents of the Regional Municipality of Wood Buffalo (RMWB). The 'CEMA Message" is explained in regular website updates www.cemaonline.ca, press releases on CEMA products and news, advertising in print and radio, attendance at special community events, a quarterly newsletter The Insider, and the annual and community reports. CEMA Communications has a close working association with the Regional Aquatics Monitoring Program (RAMP) and the Wood Buffalo Environmental Association (WBEA) for some special events and publications.

2009 was one of CEMA's most successful years in providing updates on its achievements to the residents of Fort McMurray and the surrounding areas. A community report was delivered to all homes and businesses in the RMWB, providing a detailed list of CEMA highlights over the year. A Community sponsored Family Fun Day in conjunction with the Royal Alberta Museum and the Oilsands Discovery Centre; ensured CEMA had direct contact over 1200 people. CEMA held an Open House with Elders from Fort McKay. Provided sponsorship to the Wood Buffalo Science Fair. CEMA continued to participate in countless television, radio and print interviews, with local journalists from Fort McMurray, national media from Toronto, and international reporters from Paris.

Environment Week 2009

8.0 Traditional Environmental Knowledge (TEK) Advisory Committee

Co-Chairs – Jumbo (Fred) Fraser (Métis Local 125), Ainslie Campbell (Shell)
Program Manager – Heather Bartlett

Mandate – The CEMA Traditional Environmental Knowledge (TEK) Advisory Committee is established to guide the efforts of the Working Groups to integrate and use traditional knowledge in management frameworks and recommendations to government. This is to help ensure the land, forest, air, water, wildlife and biodiversity in the Regional Municipality of Wood Buffalo will be protected, sustained and re-established over the long term.

CEMA defines Traditional Environmental Knowledge (TEK) as a body of local environmental knowledge and beliefs transmitted through oral tradition and first hand observation based upon living in close contact with nature.

Annual Elder's Workshop

Mandate –Promote the use of TEK within the region to facilitate TEK integration and maintain effective relationships with the community and to update Elders regarding CEMA activities.

Annual Elder's Workshop Description of work - The Annual Elder's workshop pays tribute to the contribution that local Aboriginal Elder's make to CEMA and requests feedback on work done to date. This is a one day workshop for community members within the region.

Community Orientation Project

Community Orientation Project Description - Develop a regional Aboriginal orientation program for new residents / employees to RMWB.

Description of work- Interested CEMA members representing an Aboriginal community are given the opportunity to create a presentation on the history of Aboriginal people of Canada, specifically in the Regional Municipality of Wood Buffalo.

Importance/rationale of work – This project will help orient people about the history of the area and increase awareness of the CEMA personnel of traditional knowledge within the region while promoting the use of TEK.

How work is being done – The projects will facilitate the development of local ownership for collecting and documenting community historical and cultural information, storytelling and day to day life as an introduction for new residents and workers in the Regional Municipality of Wood Buffalo. This project will be modeled after the Fort McKay "A Day in McKay" presentation.

Facilitated Workshop

Mandate- Facilitate TEK Collection and Integration

Description of work - In order to continue utilizing TEK in CEMA's work, the committee provides CEMA members with training and cultural awareness through a facilitated workshop so that members on the working groups are better versed in the area of TEK when making decisions about the local environment. This workshop focuses in part on providing updates on the strategy to integrate TEK and considers the relationship between TEK and Western science.

Importance/rationale of work – Educates and increases awareness of CEMA members on TEK.
How work is being done - Conduct a facilitated workshop on TEK research and integration into the working groups of CEMA. This workshop is for new CEMA staff, MC, WBEA, RAMP, Working Group Chairs, and the general membership.

TEK 2009 Deliverables

Elder's Workshop - (March, 2009)
Coaching Workshop - (October, 2009)
Ongoing support to CEMA working groups
Ongoing support for the Community Orientation Project

TEK Future Deliverables

Ongoing support to CEMA working groups
Elder's Workshop in partnership with the Aboriginal Round Table (2010)
Plain Language Document (2010)
Review of TEK Research Guidelines (2010)
Community Orientation Project (2010- 2011)
Update TEK Bibliography (2010)
Initiate Mentorship Program (2010)

TEKAC Co- Chairs - Ainslie Campbell & Jumbo Fraser

9.0 Aboriginal Round Table

The Aboriginal Round Table (ART) Task group started work in the early part of 2009. Meetings were scheduled, which were intended to develop and organize the group to work within a framework of cooperation in seeking their vision. The ART task group began this process with a well intended approach that included a vision of Total Participation and a mission statement of facilitating a process to fulfill their vision. Their belief in their work to rebuild trust between CEMA and the aboriginal people of this region, specifically the Grassroots/people of the land. Gaining greater awareness of CEMA and its mandate through their meetings.

Aboriginal Round Table 2009 Deliverables

Met with AB Environment field workers in their work for greater capacity in understanding the complicated process that deal with regulations and laws.
Completing a vision and mission statement.
Completed a survey in their respective communities.
Completed a Terms of Reference.
A Youth and Elders Cultural Environmental Camp was held to bring the aboriginal people together as a regional camp. The intent was to create greater awareness of the work between the ART and CEMA to gain support and momentum for future gatherings. The approach was to take the aboriginal people within a safe and neutral setting. The intent was to take this approach to generate support for this work on a regional basis that was to meet a need expressed by CEMA to make aboriginal participation better.

Glen Semenchuk with Members of the Aboriginal Roundtable

Aboriginal Round Table Future Deliverables

The tentative plan for 2010 is to focus entirely on the communication strategy.
The work in developing this Strategy will entail a comprehensive plan that will attempt to align all the work that CEMA is currently doing and working with completed reports as well.

ART will focus their work on the Communication Strategy for 2010. This will be good training for all involved in determining how a group like CEMA works with the aboriginal people in developing a comprehensive strategy that will provide information to the aboriginal communities of CEMA's work.

The task group will have the opportunity to utilize their expertise with their traditional knowledge while working with CEMA groups. This process is intended to provide an extensive training to the aboriginal task group on the technical aspects of organizing the communication strategy. The CEMA group will in return get the benefit of understanding the substance and content of Aboriginal traditional knowledge, what works and does not work in the Indian country.

10.0 CEMA Working Groups And Task Groups

10.1 Reclamation Working Group (RWG)

Co-Chairs – Tanya Richens (Alberta Environment) & Fred Kuzmic (Shell)
Program Managers: Kyle Harrietha & Heather Bartlett
Technical Program Managers: Théo Charette & Gillian Donald

Mandate – To produce and maintain guidance documents that provide recommendations and best practices which ensure that reclaimed landscapes within the Athabasca oil sands region meet regulatory requirements, satisfy the needs and values of stakeholders, and are environmentally sustainable.

Importance/rationale of the work being undertaken - RWG produces and/or updates a series of guidance documents relating to reclamation in the Oil sands Region including:

- Land Capability Classification System for Forest Ecosystems in the Oil sands (LCCS)
- Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil sands Region (Revegetation Manual)
- Guideline for Wetland Establishment on Reclaimed Oil Sands Leases (Wetlands Guideline)
- End Pit Lake Technical Guidance Document

Scope – RWG's work applies to surface mineable oil sands and other surface disturbances including In Situ. Goals and objectives for the RWG are coordinated with other CEMA working groups and other related groups (such as the Canadian Oil Sands Network for Research and Development (CONRAD)) to avoid duplication and overlap.

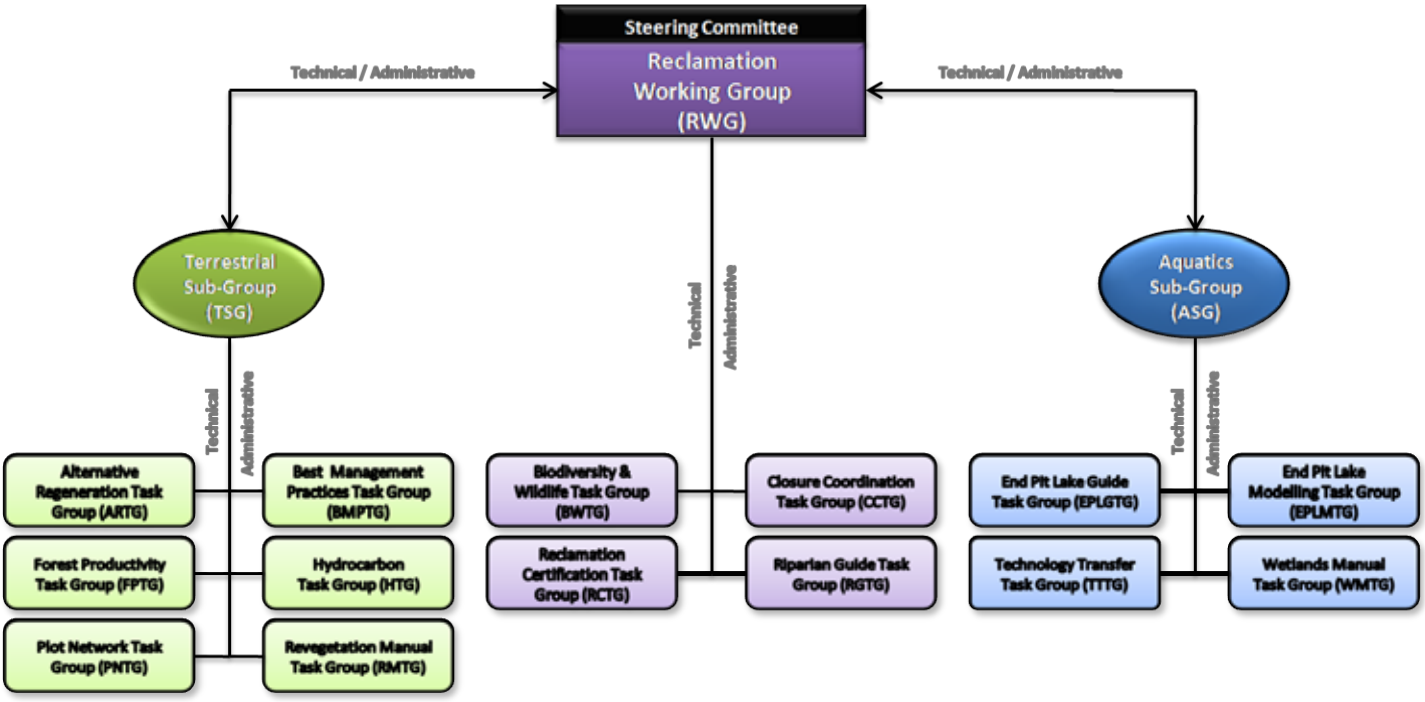
CEMA has split the RSDS Theme 1 (sustainable ecosystems and land-use) into two objectives, with SEWG being responsible for the first objective and RWG taking responsibility for the second objective. These objectives are:

- Objective 1 (SEWG) to define the relationship between the environmental effects of development

and ecosystem sustainability.

- Objective 2 (RWG) to define the process and standards needed to return developed land to sustainable ecosystems with desired end land use values.

In 2009, RWG implemented a re-structuring of its groups. The major changes consisted of: 1) lumping together the Wetlands & Aquatics Subgroup and the End Pit Lake Subgroup to form the Aquatics Subgroup, which allows increased coordination of aquatic projects, 2) moving the Biodiversity & Wildlife Subgroup and the Reclamation Certification Subgroup as task groups under RWG, and 3) renaming the Soils & Vegetation Subgroup to the Terrestrial Subgroup. The following figure outlines the new structure.



Reclamation Working Group 2009 Deliverables

Biodiversity & Wildlife

- Final report: Soil Biodiversity Backgrounder
- Workshop: "Biodiversity Reclamation in the Oil Sands Region: Current State & Next Steps"
- Draft Interim Report: "Renewing the Health of Our Forests Biodiversity Traditional Knowledge of the Oil Sands Region"
- Conducted verification workshops with participating communities on the draft interim report noted above
- Updated Guidelines for Monitoring Habitat Suitability & Wildlife Use of Reclaimed Land which were incorporated into Appendix D - Wildlife Populations and Habitat Capability in the Oil Sands Region of the 2nd edition of the Revegetation Manual

Closure Coordination

- Workshop: "Meeting the Expectation of a Continuous Functional Closure Landscape in the Oil Sands Region"
- Reclamation Certification

- A Framework for Reclamation Certification Criteria and Indicators for Mineable Oil Sands

RWG Future Deliverables

Reclamation (general)

- Summary and assessment of operational techniques for reclamation (2010)
- Landscape design guide to accompany the Landscape Design Checklist (2010)
- Summary of In Situ reclamation research and operational reclamation techniques (2010)

Biodiversity & Wildlife

- Final Report: "Renewing the Health of Our Forests: Biodiversity Traditional Knowledge of the Oil Sands Region" (2010)
- Technical review and development of a biodiversity appendix for Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands (2010)
- Develop a field program to monitor biodiversity indicators on reclaimed landscapes (2010)
- Evaluate methods available to define reference conditions for biodiversity in the oil sands region (2010)
- Early Successional Wildlife Monitoring Program Design (2010)

Closure Coordination

- Workplan to address Closure Coordination following review of workshop recommendations (2010)

Reclamation Certification

- Develop an approach on the selection or creation of reclamation certification criteria where no current regulatory standard exists (2010+)

Riparian Ecosystems

- Peer review of Riparian Classification and Reclamation Guide (2010)

10.1.1 Terrestrial Subgroup (TSG)

Co-Chairs - Clayton Dubyk (Shell) and Robert Vassov (Syncrude)

Mandate – To develop optimal operational-scale reclamation methods (e.g., soil handling, soil prescriptions and revegetation techniques) that will ensure equivalent land capability and desired end land uses are achieved on reclaimed landscapes.

Description of Work – The TSG works to update both the Land Capability and Classification System (LCCS) Manual and the Revegetation Manual through the development and implementation of projects, studies and monitoring programs designed to address uncertainties and provide evidence to support the guidelines and recommendation manuals

Importance/rationale of work – The work of the TSG is designed to provide recommendations and guidelines to improve reclamation techniques and practices related to soil handling, reclamation prescriptions and revegetation techniques. These recommendations and guidelines are provided in the LCCS and Revegetation Manuals which are reviewed every five years and updated as necessary.

RWG 2009 Deliverables:

Soils and Vegetation

- 2nd edition of the "Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region" – Recommendation to GOA
- A Technical Review: Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region – 2nd Edition - Report
- 2009 Reclamation and Monitoring Plot Reports for Soils, Vegetation and Forestry
- Updated Plot Network Database (Including 2009 Plot Monitoring Data)
- LCCS Calculator Debugging Tool
- Petroleum Hydrocarbons in Lean Oil Sands and Petroleum Hydrocarbon in Tar Balls – Reports
- Definition of Timber Productivity Rating (TRP) - Letter to Operators
- Understory Shrub Propagation - Report
- Evaluating Existing Prescriptions for Creating Target Ecosites (FORECAST Modelling) – Report
- Forest Productivity in Naturally Saline Landscapes of Alberta's Boreal Forest - Report
- RWG Future Deliverables

Soils and Vegetation

- Revegetation Manual (2014) - Calibration Research and Manual Revision
- LCCS Manual 3rd Edition (2013) – Calibration Research and Manual Revision
- Juvenile Plot Assessment (2011)
- Continued Plot Network Maintenance
- Continued Database Maintenance and Updates
- Web-enabled Database (2010)
- Field-Based Protocol Manual for Monitoring Reclaimed Plots (2010)
- Growth and Yield Strategic Plan Development (2010)
- Evapotranspiration Measurements on Reclaimed Landscapes (2010)
- Hydrocarbon Survey – Phase III (2011)
- Development of Alternative Regeneration Standards (2010)
- Development of Terrain Units (2010)
- Development of Best Management Practices Recommendations for Soil Salvage and Placement (2010)
- Contribution of nitrogen availability to the growth of jack pine, white spruce and aspen (2010)
- Development and evaluation of an integrated modelling approach for a risk analysis of reclamation strategies using FORECAST and FORECAST-CLIMATE (2010)
- Maximizing Available Soil Moisture in Reclamation Caps on Coarse Grained Soil (2010)

10.1.2 Aquatics Subgroup (ASG)

Chairs – Christine Daly (Suncor) and Roderick Hazewinkel (Alberta Environment)

Mandate – The ASG will provide guidance and produce tools to ensure that reclaimed aquatic ecosystems within the Athabasca oil sands region meet regulatory requirements, satisfy the needs and values of stakeholders, and are environmentally sustainable.

Description of Work – The ASG develops and maintains the following guidance documents and decision support tools that encompass establishment, assessment, monitoring, criteria & indicators for certification and adaptive management of reclaimed aquatics on oil sands leases in the Regional Municipality of

Wood Buffalo:

- A guidance document for wetland & aquatics establishment;
- A guidance document for end pit lake establishment;
- Other aquatic reclamation guidance documents and tools as agreed upon by the RWG (e.g., riparian areas and streams); and
- Predictive models for the assessment of end pit lake and wetland development scenarios.

These guidance documents will support the creation of a range of sustainable aquatic ecosystems in reclaimed landscapes. The ASG will provide these guidance documents as recommendations to the RWG.

Importance/rationale of work – Provide recommendations relating to aquatic reclamation techniques.

RWG 2009 Deliverables

Wetlands

Wetlands Performance Assessment

- Bacterial communities as indicators - thesis
- Waterfowl as indicators - thesis
- Amphibians as indicators - thesis
- Effects of salinity on vegetation - report

Water Quality & Treatment of Process Water

- Effectiveness of wetlands for treatment - report
- Role of nutrient enrichment on wetland development - thesis

End Pit Lakes

- Peer review of the 2007 End Pit Lakes Technical Guidance Document by a panel of multi-disciplined experts - report

RWG Future Deliverables

Wetlands

- Peer review of Wetlands Guideline 2nd Edition (2010)
- Wetlands Guideline 3rd Edition (2012)
- Technology transfer of wetlands research to date (2011)
- Habitat design criteria Phase I (2010)
- Indigenous Ecological Classification of Wetlands Pilot Study (2010)
- Wetland monitoring program plan (2010)

Aquatic Performance Assessment
- Application of a non-lethal bioassay based on indigenous fish cell lines for assessing toxicity in aquatic reclamation options (2010)
- Biotic indices assessment (2010)
- Selection of aquatic criteria & indicators to assess constructed wetland performance (2012)

End Pit Lakes
- End Pit Lake Technical Guidance Document (2012)
- Determination of sediment oxygen demand rates for modelling wet landscapes (2012)
- Development of regional geotechnical design criteria for oil sands end pit lakes (2010)
- End pit lake phase III modelling – coupled physical / biogeochemical model (2010)

10.2 Surface Water Working Group

Co-Chairs: Chris Fordham (Suncor) & Pat Marriott (AENV)
Program Manager: Katherine Duffett

The Surface Water Working Group (SWWG) is the main Working Group addressing water related RSDS issues, although the Reclamation Working Group (RWG) is also dealing with water related issues through work on end pit lakes and wetlands.

Water Related Issues

The RSDS issues linked surface water quantity issues include ensuring the health of the aquatic ecosystem and the maintenance of socio-economic uses of the lower Athabasca River. The main SWWG tasks that support the creation of the Phase 2 Water Management Framework for the lower Athabasca River are:

Assess the In-stream Flow Needs (IFN) of the lower Athabasca River including the Peace-Athabasca Delta. This is being accomplished through a number of studies, including projects on fish movement and habitat, dissolved oxygen levels, and recreational and traditional uses of the river.

Key Definitions:
- Fish habitat consists of areas in and about a stream, such as spawning grounds and nurseries, rearing, food supply and migration areas, that fish depend on in order to carry out processes necessary to life.
- Water quantity refers to the amount of water in a surface water body.

Mandate: To recommend a Phase 2 Water Management Framework that will manage industrial water withdrawals from the lower Athabasca River while providing protection to the aquatic ecosystem, and maintaining social, economic, and traditional use of the river over the long term.

Importance/Rationale of the work being undertaken: To address the following RSDS issues:
- Activities in the region will result in changes in flow (volume), which in turn will alter fish habitat.
- Changes in flows, sediment concentrations and channel regime in receiving streams in local basins and their impacts on fish habitat.
- Changes in open water areas, including lakes and streams. This is an overall issue of watershed management and cumulative changes in flow regimes due to development.
- In-stream flow needs in the Athabasca River and developed tributaries.

- Changes in the Athabasca River water quality and the quality of tributaries.
- Restructuring of drainage regimes may contribute to increased erosion and result in impacts to wetlands and change flow rates in tributaries, increase sediment concentration, and have an impact on fish habitat.
- Mitigation of cumulative environmental effects through regional development planning and integrated mine plans for industry developments.

Scope: SWWG is addressing RSDS issues that focus on surface water quantity for the lower Athabasca River.

Lake Athabasca Winter 2009

10.2.1 Phase 2 Framework Committee (P2FC)

Co-Chairs: Chris Fordham (Suncor) and Pat Marriott (AENV)

Mandate: The P2FC shares the same mandate as the SWWG; however, the P2FC is structured to allow membership of non-CEMA members including the World Wildlife Fund Canada (WWF), the Alberta Wilderness Association (AWA) and the South Peace Environmental Association (SPEA). Output from the P2FC will be forwarded to regulators and CEMA concurrently.

Description of work: To develop a range of water management scenarios through a structured decision making approach in order to work with stakeholders for development of a Phase 2 Water Management Framework recommendation.

- The structured decision making process is being facilitated through a contract with Compass Resource Management.

Importance/Rationale of work: Current work is imperative to achieve the mandate of the SWWG, the recommendation of a Phase 2 Water Management Framework for the lower Athabasca River. The following RSDS issues are being addressed:

RSDS Issue #47
Topic: Surface Water – Water Quantity
Description: In-stream flow needs in the Athabasca River and developed tributaries.

RSDS Issue #69
Topic: Terrestrial – End Land Use
Description: Mitigation of cumulative environmental effects through regional development planning and integrated mine plans for oil sands developments.

10.2.2 Instream Flow Needs Technical Task Group (IFNTTG)

Chair: Andrew Paul (ASRD)

Mandate:

- Evaluate IFN within the lower Athabasca River including the delta region
- Initiate development of and recommendations for a monitoring program that tests assumptions of the IFN, and assess the spatial and temporal distribution of fish species in the LAR.
- Provide technical IFN support and evaluation tools to SWWG for the Phase 2 Structured Decision Making Process.

Description of work: The work developed by the IFNTTG included:

- Development of objectives, impact hypotheses, and evaluation criteria for the Phase 2 Structured Decision Making Process.
- Fish and Fish Habitat Studies – projects to further knowledge on the spatial location and migration patterns of fish species within the lower Athabasca River (Burbot, Lake Whitefish, Longnose Sucker, Flathead Chub). The target fish species had been identified for understanding the effects of lower winter flow in the lower Athabasca River.
- Determination of dissolved oxygen levels at lower river flows to identify whether or not dissolved

oxygen conditions inside channels and snyes have the potential to limit or eliminate fish use of those habitats.
- Develop and update habitat suitability criteria for select fish species in the lower Athabasca River through an expert workshop.
- Collect information on the sill elevation at Big Egg Lake in the Peace-Athabasca Delta to identify any connectivity problems due to changes in water level.
- Evaluate the effects of changes in water level on semi-aquatic mammal habitat.

Importance/Rationale of work: Overall, the work contributes to the development of the Phase 2 Water Management Framework and completing the following RSDS issue:

RSDS Issue #36
Topic: Surface Water – Surface Water
Description: Changes in flows, sediment concentrations, and channel regime in receiving streams and local basins and their impacts on fish habitat.

RSDS Issue #37
Topic: Surface Water – Drainage Regime
Description: Restructuring of drainage regimes may contribute to increased erosion and result in impacts to wetlands and change flow rates in tributaries, increase sediment concentration, and have an impact on fish habitat.

RSDS Issue #39
Topic: Surface Water – Surface Water
Description: Changes in open water areas, including lakes and streams. This is an overall issue of watershed management and cumulative changes in flow regimes due to development.

RSDS Issue #47
Topic: Surface Water – Water Quantity
Description: In-stream flow needs in the Athabasca River and developed tributaries.

10.2.3 Water Requirements and Engineering Mitigation Task Group (WREM)
Chair: Stuart Lunn (Imperial)

Mandate: A companion group to the Oil Sands Developers Group (OSDG) leading work to gather water requirements for the oil sands industry and the mitigation options for periods of low water availability.

Description of work: The WREM group communicates work being led by industry through the OSDG. WREM has two main tasks:
- Develop a long term forecast of the amount of Athabasca River water required by the oil sands mining industry. This work was completed in 2007 and has been presented to CAPP, SWWG, and the P2FC.
- Develop the advantages and disadvantages of different engineering mitigation options for periods of potential water shortage from the Athabasca River.

Importance/Rationale of work: Contributes to the development of the Phase 2 Water Management Framework, and the following RSDS issue:

RSDS Issue #47
Topic: Surface Water – Water Quantity
Description: In-stream flow needs in the Athabasca River and developed tributaries.

10.2.4 Socio-Economic Task Group (ETG)

Chair: John Sedley (Fort McKay IRC)

Mandate: To support the SWWG and the Phase 2 Structured Decision Making Process by providing socio-economic analysis and advice.

Description of work:

- A literature review on existing socio-economic information related to the lower Athabasca River has been completed.
- A study to gather information on recreational uses potentially affected by changes in water level on the lower Athabasca River has been initiated.
- A study to gather information on traditional uses potentially affected by changes in water level on the lower Athabasca River has been initiated.

Importance/Rationale of work: Current work contributes to the development of the Phase 2 Water Management Framework.

SWWG 2009 Deliverables

- Impact Hypothesis Analysis: Effects of Water Withdrawal on Traditional Use of the Lower Athabasca River (Westland Resource Group, 2009)
- Traditional Use Mapping of the Lower Athabasca River: Information Summary (Westland Resource Group, 2009)
- Lower Athabasca River: Recreation Sector Information (Westland Resource Group, 2009)
- Traditional Use Mapping of the Lower Athabasca River: Community Interview Summaries (Westland Resource Group, 2009)
- Traditional Use Mapping of the Lower Athabasca River: Phase 1 Study (Westland Resource Group, 2009)
- Effects of Water Withdrawals from the Lower Athabasca River: IFNTTG Final Report (Laughing Water Arts and Science, 2009)
- A Review of Existing Models and Potential Effects of Water Withdrawals on Semi-aquatic Mammals in the Lower Athabasca River (University of Alberta, 2009)
- Dissolved Oxygen Levels in Side Channels and Tributaries in the Lower Athabasca River – Winter 2009 (Golder Associates, 2009)
- Summary of the Lower Athabasca River Fish Habitat Suitability Criteria Workshop (April 22nd to 23rd, 2009) (Golder Associates, 2009)
- Review of Water Management Alternatives on Water Depth in the Lower Athabasca River (AECOM, 2009)
- Report on Movement and Habitat Use of Fishes in the Lower Athabasca River from 2008-2009 (Applied Aquatic Research, 2009)

SWWG Future Deliverables

- Phase 2 Water Management Framework for the lower Athabasca River (report)
- Evaluation Criteria (tools for use in the Phase 2 Structured Decision Making Process)
- Monitoring Program Recommendation to accompany the Phase 2 Water Management Framework (report)

10.3 Trace Metals & Air Contaminants Working Group (TMAC)

Co-Chair - John Dennis (Fort McKay IRC)

Mandate – Develop recommendations for management frameworks that establish objectives and action plans to manage and control regional trace metals and air contaminants and protect human and ecosystem health in the Region.

Importance/rationale of the work undertaken -

- Recommendations on Trace Metals Management (TMMF) – The Framework has now been incorporated into the Air Contaminants Management Framework.
- Recommendations for the Management of Air Contaminant Emissions in the Regional Municipality of Wood Buffalo (ACMF) – To address the cumulative effects of air contaminants, on the environment and human health in the RMWB, to be undertaken by a Multistakeholder Regional Advisory Panel, led and appointed by the Government of Alberta.
- Now that the TMAC Working Group has fulfilled its terms of reference, a communication plan is underway to explain the Air Contaminants Management Framework (ACMF) to the First Nation and Metis communities in the Regional Municipality of Wood Buffalo.

Air Contaminants Management Framework (ACMF)

The ACMF addresses industrial emissions in the RMWB atmosphere, presently not regulated thorough provincial air quality objectives and/or not managed according to other regional or provincial frameworks.

The effects of air emissions on health, wildlife and vegetation are identified as one of the five priority themes to be immediately addressed.

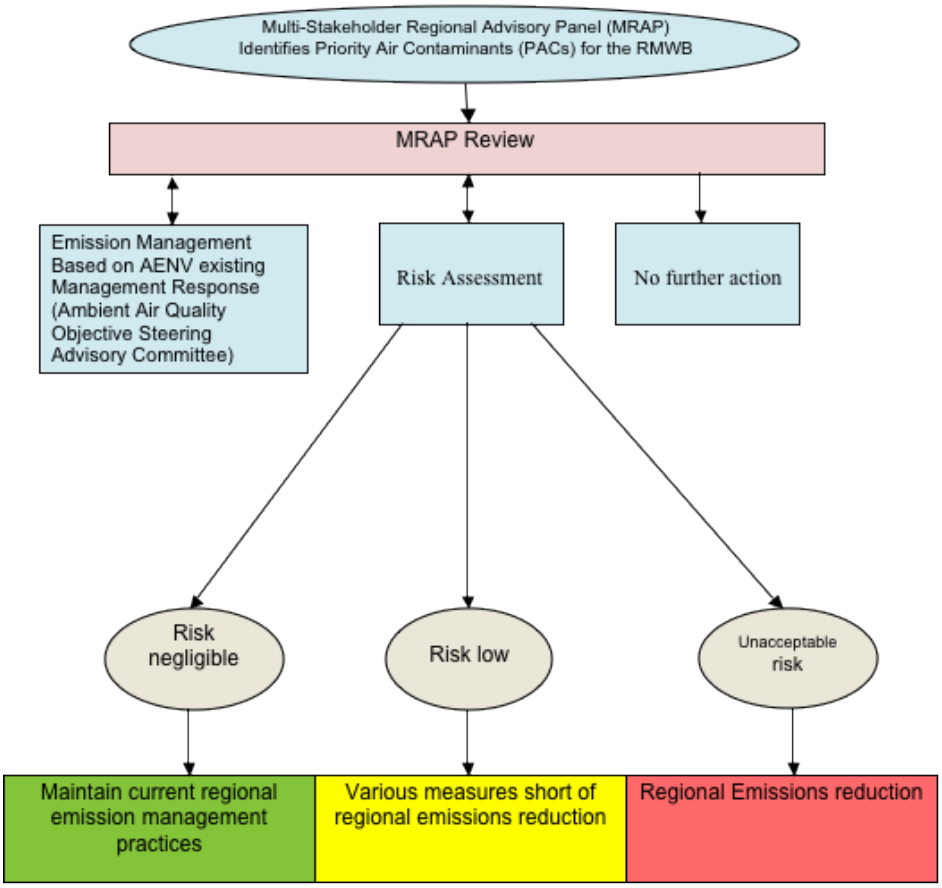
The ACMF recommends a formal review of regional air quality conducted immediately and forthwith every five years. The review is to be completed by a Multistakeholder Regional Advisory Panel, led and appointed by the Government of Alberta. Regional priority air contaminants will be identified for management consideration. The selection criteria will encompass air contaminants with potential to impact human health, ecological health, and includes odours and cumulative effects and multiple air contaminants. The Multistakeholder Regional Advisory Panel will be comprised of representatives from government, industry, non governmental agencies and First Nation and Metis groups.

The ACMF was achieved through the consensus in the TMAC Working Group. The ACMF is expected to provide solid advice to the Government of Alberta, to help identify pollutants of concern and regulate emissions .

The ACMF was approved by CEMA in September 2009. The ACMF was received and supported in principle by the Government of Alberta in January 2010.

The enclosed Figure describes the ACMF flow path for the prioritization and management of air contaminants in the Regional Municipality of Wood Buffalo.

FIGURE 1. FLOW DIAGRAM FOR PRIORITIZATION AND MANAGEMENT OF AIR CONTAMINANTS.



Final Report - Traditional Food Consumption and Risk Communication project in the Regional Municipality of Wood Buffalo (Phase 1) (Treefrog Research, Dialogos Educational Consultants Inc.)

Related to ACMF, the study identified traditional food consumption by First Nations and Métis in the Athabasca Oil Sands Region and the community concerns related to available traditional foods. Communication of this study to First Nation and Metis communities will be undertaken through CEMA.

Priority Chemical Screening Tool Upgrade (PCST) (ENVIRON)

The PCST provides exposure based ranking of priority pollutants from specific industrial sites in the RMWB. The PCST has been beta tested for integrity and accuracy. The PCST is an appropriate tool for reviewers who have a "working knowledge" of the prioritization formulas. The tool will be made available on the CEMA Members' Only website.

Final Report - Review and assessment of deposition and potential bioaccumulation of trace metals in the Athabasca Oil Sands Region (ENVIRON)

Related to the reevaluation of the TMMF, this study provided information on data evaluation of trace metals in human populations and ecological receptors in the oil sands region.

2010 Future Deliverables

ACMF Communication Pilot Project: Complete a video communications package on the ACMF, in collaboration with the Aboriginal Round Table, for distribution in the First Nations and Metis communities.

10.4 Sustainable Ecosystems Working Group (SEWG)

Co-Chairs – Robert Anderson (ASRD), Peter Koning (ConocoPhillips) until May 26, 2009
Shanti Berryman (Fort McKay IRC) from May 26, 2009 on as Interim Co-Chair
Program Manager – Heather Bartlett until August 24, 2009
Margaret Luker from August 24, 2009 onward.

Mandate - SEWG's mandate is to develop a Management Framework based on the TRIAD approach to address cumulative effects on terrestrial ecosystems and landscapes in the Regional Municipality of Wood Buffalo (RMWB) including recommendations for regional and sub-regional land management strategies to achieve environmental, economic and social management goals and measurable environmental objectives.

Importance/rationale of the work being undertaken – Building on the management framework that was designed to achieve12 environmental, economic and social/cultural goals identified by the multi-stakeholder group, SEWG is facilitating research to address the details of key elements of the Terrestrial Ecosystem Management Framework to enable its full implementation. The areas of research include protected areas, access management, validation of modeling uncertainties and assumptions, including Natural Range of Variability (NRV), monitoring and management response trigger systems. The work being undertaken:

1. is likely to be of benefit to the NE planning process
2. tangibly supports the achievement of desired regional outcomes that are likely to be represented in the NE regional plan, and
3. takes advantage of CEMAs multi-stakeholder composition

Scope - To address 17 RSDS issues on sustainable ecosystems, wildlife and biodiversity. SEWG looks at landscapes, vegetation and wetlands, wildlife and fish, plants, biodiversity, cultural and historic resources, and the interaction between land and water.

10.4.1 Workshop Facilitation & Planning

Mandate - To provide administrative and consultant support.
Description of work - Assist in the development of recommendations made by the Government of Alberta to further develop details of the TEMF.

This work will

1. Enable further dialogue and expression of views which could be captured and provided to the NE plan process,
2. Advance development of management system concepts and approaches,
3. Enable specific work scopes to be defined for executing as discrete projects, and
4. Undertake a comprehensive discussion reviewing the assumptions used in the algorithms determining impacts.

The workshops will provide a range of perspectives that will focus on 1) the utility and application of linear footprint thresholds under the broad topic of "Access Management", and 2) Management Response Trigger Systems and revisiting of NRV as it connects to modeling and monitoring.
Importance/rationale of work - This task progresses the work presented in the TEMF which is key to completing SEWG's overall mandate.

How work is being done - A series of facilitated workshops were held between the consultant, Silvatech, and SEWG to further develop recommendations that will lead to the full implementation of the framework. The dates and topics are as follows:

1. Current State: February 23-24, 2009 in Edmonton (Silvatech)
   Protected Areas (SEWG)
2. Values & Outcomes: March 31 – April 1-2, 2009 in Fort McMurray (Silvatech)
   Validate In-situ – update (SEWG)
   Protected Areas – update (SEWG)
3. Strategies: April 28, 29, 30, 2009 in Calgary (Silvatech)
   Culverts – update (SEWG)
4. Actions: May 26-27, 2009 in Fort McMurray (Silvatech)
   Tailings and LDD (SEWG)
   Finalize in-situ (SEWG)

10.4.2 In-situ Footprint Assumptions Task Group

Initiated January 13, 2009
Lead – David Anderson (EnCana Corporation – now Cenovus Energy Inc.)

Mandate -To support ongoing modeling as it relates to the TEMF (Section 5.10)

Description of work – Validate footprint size, duration, and reclamation assumptions by collecting information from in-situ operators on actual footprint data including correlations to actual production, for analysis.

Importance/rationale of work – This work provides further development of recommendations from the TEMF. The task addresses RSDS issues: 28, 29, 32, 37, 68

How work is being done – Preliminary work has begun to address some of the goals listed above. Preparation of a document that outlines the footprint of various companies. Provide suggested improvements, if any, on forecasting in-situ footprint based on production. Review and validate input assumptions associated with the determination of the direct to indirect impacts; e.g. the 1:5 factor.

10.4.3 Protected Areas Task Group

Initiated January 13, 2009
Lead – Helene Walsh (CPAWS)

Mandate -To develop recommendations that address key issues of the TEMF.

Description of work – Develop a clarification document that answers key and/or common questions in various members' letters responding the TEMF, particularly those related to protected areas. Propose recommended methodology, criteria, information and data layers that can be harnessed to inform a decision on protected area.

Importance/rationale of work – This work provides further development of recommendations from the TEMF. The task addresses RSDS issues: 26, 27, 49, 55, 56, 59, 60, 63, 64, 66, 67, 71
-considers Aboriginal engagement

How work is being done - There is ongoing work to address some of the goals listed above through preparation of draft documents for presentation & approval including:

1. Frequent Ask Question document
2. Criteria and considerations document
3. Recommendation on how to engage Aboriginal stakeholders.

Note: SEWG was unable to achieve consensus on these documents. With respect to item #1, there did not seem to be a set of FAQs therefore the document was deemed unnecessary. The criteria for protected areas i.e. size of area, representativeness of area, ecologically sensitive areas, endangered species, connectedness, impactness (distance from industrial activity), recreation, traditional land use, etc. are addressed by the Regional Advisory Council (RAC) therefore it was determined that there was no further use in SEWG proceeding with this item. The letter (#3) was withdrawn on April 2, 2009.

10.4.4 Culvert Inspection Task Group

Initiated January 13, 2009
Interim Lead – Tyler Colberg (Imperial)

Mandate -To develop recommendations for a path forward and potential implementation in NE Alberta in support of the Framework.

Description of work – Since CEMA has no monitoring mandate and a collaborative culvert inspection and mitigation program is already operating in the eastern slopes of Alberta, CEMA could learn how this might be adapted for implementation in NE Alberta and suggest paths forward. Potential opportunities with RAMP could be explored and the task group would describe the current situation in terms of how is monitoring (if any) occurring currently. The task group would also derive information from the eastern slopes program, discuss options for implementation and develop a recommendation for consideration by CEMA.

Importance/rationale of work – The TEMF identified (Recommendation # 21) the need to identify and rectify existing watercourse discontinuities (e.g. hanging culverts). This work provides further development of recommendations from the TEMF. The task addresses RSDS issues: 28, 29, 32, 37, 68

How work is being done – CEMA will learn from the collaborative culvert inspection and mitigation program that is operating in the eastern slopes of Alberta how to potentially adapt the work for implementation in NE Alberta.

10.4.5 Terms of Reference Task Group

Initiated May 26, 2009
Interim Lead – Robert Anderson (Alberta Sustainable Resource Development)

Mandate -To develop a new SEWG Terms of Reference (ToR) and Work Plan to address any outstanding issues not addressed in the last version of the SEWG ToR (March, 2008) as well as any items still outstanding to further the TEMF.

Description of work – A small subset of SEWG was initiated to review work still needing to be done that were not yet addressed from the previous SEWG ToR or TEMF also considering any requests from the government of Alberta (GoA).

Importance/rationale of work – This work would provide further development of recommendations from the TEMF. The task addresses all 17 of the SEWG RSDS issues.

How work is being done – SEWG will review and discuss relevant tasks to address for a new Terms of Reference or agree to dissolve the Working Group having felt they have addressed the issues they could.

10.4.6 Sustainable Ecosystems Working Group 2009 Deliverables

Documents/Reports completed in order to furthering the work of the Terrestrial Ecosystem Management Framework included:

1. Indicator Status Assessment and Modelling Scenario Combination Modelling (Supplement to the TEMF) Silvatech Consulting, July 2009 – Approved at SEWG on February 23, 2009
2. Dialogue on Ecosystem Response Management System and Coordinated Access Management Strategies: Perspectives on a Further Refinement of the TEMF (prepared for the Lower Athabasca Regional Plan) Silvatech Consulting Ltd. July 2009.
3. A Review of the SEWG In Situ Footprint Model Metrics and Assumptions – Draft Report. Silvatech Consulting Ltd. December 2009.

10.4.7 Sustainable Ecosystems Working Group Future Deliverables

SEWG Terms of Reference and Work Plan for 2010.

10.5 Nitrogen Oxide and Sulfur Dioxide Management Working Group (NSMWG)

Co-Chairs -David Spink (Fort McKay IRC), Kim Eastlick (ERCB), Charles Bower (Nexen)

Mandate - Develop management frameworks that establish environmental capacity guidelines, environmental management objectives and action plans to guide the management and control of regional NOx and SO2 emissions associated with oil sands development. The three potential impacts of NOx and SO2 emissions and deposition that are the focus of NSMWG activities are:

- Acidification of ecosystems associated with the deposition of nitrogen and sulphur compounds,
- Formation of ground-level ozone and its impact on ecosystem health, and
- Potential biodiversity and ecosystem health effects associated with nitrogen deposition and related eutrophication (fertilization of ecosystems).

Importance/rationale of the work being undertaken – The NSMWG has developed three management frameworks/plans that are currently in various stages of development and/or application in the Region. Each of these is briefly described below along with the current status of the framework/plan, in terms of development or implementation.

- Recommendations for the Acid Deposition Management Framework for the Oil Sands Region of North-Eastern Alberta (ADMF): This Framework was approved by CEMA in 2004 and subsequently adopted by Alberta Environment as the acid deposition management framework for the Regional Municipality of Wood Buffalo (RMWB). The Framework establishes criteria for protecting and maintaining certain acid sensitive chemical characteristics of soils and lakes and to avoid possible acid deposition-related adverse effects on ecosystems, plants or animals. The Framework has both monitoring and model predicted criteria and associated management objectives and responses.

  The modeling component of the Framework is based on a time-to-effect criteria that requires an effects model that is reflective of regional soils and vegetation. Considerable work has been directed at gathering the necessary data on regional soils and ecosystems and a related understanding of nitrogen and sulphur cycling within these systems. The studies and data collected to date have enabled the NSMWG to initiate an interim, regional application of the Model of Acidification of Groundwater in Catchments (MAGIC) model. An interim model run focused on acid deposition predictions has also just been completed which focused on model inputs and methods to ensure that deposition predictions are as representative as possible. Deposition estimates are a key input into the MAGIC

model. The result of all this work will be a Stage 3 (complete ADMF) model run in 2011 after which the ADMF is scheduled for a multi-stakeholder.

- Ozone Management Framework for the Regional Municipality of Wood Buffalo Area (OMF): This Framework was approved by CEMA in 2006, and subsequently adopted by Alberta Environment, as the Ozone Management Framework for the RMWB. Since NOx is a precursor for ozone formation, it fell within the NSMWG's mandate and a Framework was developed that build upon the Alberta Clean Air Strategic Alliance "Guidance Document for the Management of Fine Particulate Matter and Ozone in Alberta." The NSMWG also undertook a review of vegetation protection criteria related to ozone exposure and proposed a vegetation protection metric, as an addendum to the OMF. In general, the OMF is intended to ensure that NOx emission management in the RMWB addresses issues and priorities related to ozone and its effect on human health and vegetation from human-caused ground-level-ozone. Ongoing regional ozone and ozone, precursor, ambient air monitoring programs and state-of-the art regional scale ozone formation modeling activities are being conducted. This is to determine whether or not regional ozone levels are, or in the future could be, at levels that may of concern from a health or environmental perspective.

- Proposed Interim Nitrogen (Eutrophication) Management Recommendations and Work Plan for the Regional Municipality of Wood Buffalo Area (referred to as the Eutrophication Management Plan (EMP): This Plan was adopted by CEMA in 2008, and is intended to address the potential issue of nitrogen deposition in the Region associated with NOx emissions adversely impacting regional ecosystems that may be sensitive to nitrogen inputs. The EMP identifies research and monitoring activities that are necessary to better quantify and understand nitrogen deposition in the region and its possible environmental impacts. This additional information will be used to develop region-specific critical loads for nitrogen for sensitive ecosystems and if necessary a full Nitrogen Eutrophication Management Framework. The Wood Buffalo Environmental Association (WBEA) and the NSMWG are both involved in fulfilling the work plan component of the EMP. A focus of the NSMWG is on developing and implementing nitrogen addition experiments to determine region-specific nitrogen critical loads, which is a major and long-term i.e. five - seven year undertaking.

Nitrogen Oxide and Sulfur Dioxide Management Working Group (NSMWG) 2009 Devliverables

ADMF Research

This four-year research study used isotopes, as a reliable and practical tool for estimating lake water balance and landscape runoff contributions in complex wetland terrain. The research has improved the understanding of hydrologic interactions between uplands, peatlands, lakes and groundwater, which is essential to determine critical acid loads for watersheds. The approach used overcame some of the modeling limitations in determining the annual sustainable buffering capacity of lakes and watersheds, associated with low-relief wetland-rich terrain. The data collected will be used in the Stage 3 (complete ADMF) model run.

This four-year research study evaluated the application of the MAGIC model, as a tool to estimate chemical responses of acid sensitive soils and lakes in the Region, to sulphur dioxide and nitrogen oxides emissions and related deposition. The findings indicate that in general the lakes in the Region have limited potential for acidification, owing to significant groundwater base cation inputs. The data for acid

sensitive soils in the region indicate a potential for a significant response to acid inputs. At some sites, critical soils' thresholds for base cation and aluminum may be reached. The work included a limited run of the MAGIC model at 50 watersheds. This research program has contributed much of the data and methodologies that will be used in the Stage 3 (complete ADMF) model run.

Assessing the Availability of Data Required to Complete a Regional Application of the MAGIC Model for a Stage III Regional Assessment Under the ADMF (Trent University). This project is directed at evaluating and assembling the data necessary to do the Stage 3 (complete ADMF) model run. It involves assessing the quality and spatial distribution of all available soils, lake and deposition data in the RMWB.

Western Canada Sulphur and Nitrogen Deposition Workshop April 28-30, 2009 (Canadian Council of Ministers of the Environment, CEMA, WBEA) The Workshop brought together scientists and experts from Europe, the United States and Canada, to:

1. assess the state of atmospheric deposition of sulphur and nitrogen and possible associated ecosystem impacts in Western Canada.
2. develop an understanding of the implications of the latest science to current policies and programs aimed at addressing acid and nitrogen deposition; and
3. identify areas for future research and study to support Canada's acid rain science and policy efforts in Western Canada.

Nitrogen Oxide and Sulfur Dioxide Management Working Group (NSMWG) Future Deliverables

NSMWG Technical Science Review (Owl Moon Environmental Inc.) The NSMWG has undertaken considerable research in the last ten years and developed three Frameworks/Plans. The Working Group decided that a comprehensive scientific/technical review, synthesis and evaluation of the NSMWG's past, current and proposed work, with reference to the key elements of the three Management Frameworks/Plans was necessary. The Review, which began in 2009, will provide an independent review and summary of NSMWG work with an emphasis on the work completed to date related to the three Management Frameworks/Plans. The Review will provide assessments of, and recommendations related to, past, existing and possible future NSMWG work and approaches.

ADMF Research

Modeling and Assessment of Regional Acid Deposition related to Stage 2 Implement of the ADMF (Golder). This work is the final element in a Stage 2 ADMF model run to determine the status of the region in terms of acid deposition and possible soil and watershed impacts. It is an intermediate model run that will help inform and guide the full time-to-effect model run that represents the Stage 3 (complete ADMF) model run.

Assessing the Availability of Data Required to Complete a Regional Application of the MAGIC Model for a Stage III Regional Assessment Under the ADMF (Trent University). Additional research is to be undertaken to compile the following:

- all existing soil, lake and landscape data for the RMWB, identify lake catchments, soil polygons and

areas where existing data are absent or insufficient,
- initiate soil classification and lake physiochemical data according to location, and
- determine what level of a regional assessment can be conducted using existing data.

Analysis of mineral soils samples will be conducted to fill the present data gaps and key certainties. The results are to provide an approach for a regional MAGIC application, in 2011, using a soil-polygon approach and summarize simulated forest soil response to atmospheric deposition across the Region.

OMF Research

PM and Ozone Chemistry Modelling in the Alberta Oil Sands Area Using the Community Multiscale Air Quality (CMAQ) Model (ENVIRON (EC) Canada Inc. In 2006, in accordance with the OMF, Environment Canada undertook a regional Community Multiscale Air Quality (CMAQ) model run looking at the impact that current and future regional emissions might have on regional ozone levels and vegetation. This type of regional modeling is to be conducted every three years and another ozone modeling run was initiated in 2009. The CMAQ model is being used to estimate ozone, PM2.5 and sulphur and nitrogen deposition levels for the Region based on 2006 emissions and local, intermediate and long distance source contributions to air quality and deposition in the Region. The Final Report is presently under review.

EMF Research

Role of N and S Cycling in Soil Acidification in Forest Ecosystems in the Oil Sands Region in Alberta (University of Alberta). This five-year research study involves the application of nitrogen and sulphur to experimental sites and associated analysis of soil and soil leachate chemistry, vegetation growth and chemistry. The study is examining the cycling and effects of nitrogen and sulphur deposition on upland soils and vegetation in the Region. The study will be completed in 2010, with the results provided to the NSMWG in 2011. Information from the study will be considered, and possibly incorporated into, the MAGIC model as part of the Stage 3 ADMF model run.

Effects of Atmospheric Nitrogen Deposition on the Nitrogen Cycle of Boreal Bogs: a 15N Tracer Study (Villanova University) .This is a six-year study to determine the effects of N deposition on peatland ecosystem function. The study will provide information on the response of above ground vegetation, litter decomposition and total nitrogen and 15N abundance in peat cores to different nitrogen inputs. The final results will provide information and data that will inform the critical loads' program. A final report from the study will be provided to the NSMWG in 2011.

Conditional Time Averaged Gradient (COTAG) instrumentation (TEEM). This project is directed at getting better estimates of dry nitrogen deposition. The project is lead by WBEA's TEEM group, with some financial support from the NSMWG. The project is part of the Eutrophication Management Plan (EMP). The data collected will allow for an assessment of actual nitrogen deposition rates to verify/calibrate the deposition models (CALPUFF and CASTNet_MLM). Year Two results will be provided in 2011.

Establish a Critical Load for Eutrophying Nitrogen for Sensitive Ecosystems in the RMWB (Southern Illinois University, Villanova University, University of Victoria). This study is a key element of the Eutrophication Management Plan (EMP). The objective of the work is to provide recommendations for the establishment of region-specific critical loads for eutrophying nitrogen in jackpine uplands, fens

and bogs, based on the results from nitrogen addition experiments. The 2010 research objectives are to identify a site near or in the RMWB containing the three target ecosystems and preferably linked to a small lake. The 2010 study program is also to include a detailed five-year research workplan and budget to the NSMWG.

Field Verification of MODIS-based Leaf Area Index (LAI) (Universities of New Brunswick and Calgary). LAI (leaf area index) is a key parameter in estimating dry deposition of nitrogen and sulphur. The NSMWG has therefore been trying to improve the regional estimates of LAI for different vegetation covers found in the region. This work represents the completion of a two-year study to improve understanding on, and use of, LAI, in regional deposition modeling and to improve LAI estimates for all significant forest covertypes in the Region. Field measurements of LAI were made in 2009 using a number of different methods and Fact Sheets summarizing the results of the 72 field sites measured in July 2009 were provided. These field-based measurements were being compared to satellite-based LAI estimates from NASA (MODIS and enhanced vegetation index (EVI)). The Final Report is presently under review.

11.0 CEMA Products

11.1 CEMA Recommendations to Regulators

CEMA products include recommendations on management frameworks to address environmental concerns. Recommendations from CEMA are referred to the appropriate regulatory agency for approval and implementation. These include Alberta Environment (AENV) or Sustainable Resource Development (SRD) and various agencies and departments of the federal government. To date, CEMA has forwarded the following recommendations to regulators:

CEMA Recommendations to Regulators

CEMA Recommendation	Responsible Working Group	Date Produced	Regulator	Regulator Response
Air Contaminants Management Framework (ACMF)	TMAC	Sept 2009	AENV	Under review
Reclamation Certification Criteria and Indicators for Mineable Oil Sands	RWG	Sept 2009	AENV	Awaiting Responce
Terrestrial Ecosystem Management Framework	SEWG	June 2008	SRD	Under review
Interim Nitrogen (Eutrophication) Management Framework	NSMWG	Sept 2008	AENV	Under review
Acid Deposition Management Framework	NSMWG	Feb 2004	AENV	Implemented by AENV August 2004
Ozone Management Framework	NSMWG	May 2006	AENV	Implemented by AENV June 2006
Landscape Design Checklist	RWG	Aug 2004	ASRD	Implemented by ASRD May 2005 Regulators suggested changes and the final government version approved.
Land Capability Classification for Forest Ecosystems in the Oil sands, 3rd Edition. (LCCS)	RWG	April 2006	AENV	Implemented by AENV July 2006
Ecosystem Management Tools	SEWG	Feb 2004	ASRD	Implemented by ASRD Jan 2005 where feasible in the RMWB
Trace Metals Management Framework	TMAC	Nov 2001	AENV	Implemented by AENV May 2002. Review of the TMMF by TMAC scheduled for 2008.

11.2 Implementation of CEMA Recommendations

CEMA recommendations have been implemented by the Government of Alberta in a number of ways:

- Referenced in Environmental Protection and Enhancement Act (EPEA) approvals for operators to use as guidance documents when developing plans
- Used by operators in the development of environmental impact assessments
- Changes to environmental monitoring and research
- Referred to by Government as guidance documents and published on the Government of Alberta website.

The following table highlights the main areas in which CEMA recommendations have been implemented.

Recommendation	Referenced in EPEA Approvals	Used in Environmental Impact Assessments	Changes to Environmental Monitoring & Research	Used as a Guidance Document
Acid Deposition Management Framework		✓		✓
Ozone Management Framework			✓	✓
Landscape Design Checklist				✓
Land Capability Classification for Forest Ecosystems in the Oil Sands, 3rd Edition (LCCS)	✓			✓
Ecosystem Management Tools		✓		✓
Trace Metals Management Framework		✓	✓	✓
Guidelines for Reclamation To Forest Vegetation in the Athabasca Oil Sands Region - Revegetation Manual	✓			✓
The Guideline for Wetland Establishment on Reclaimed Oil Sand Leases Revised 2007 Edition- Wetlands Reclamation Manual	✓			✓

The following provides a few ideas of how specific CEMA recommendations are being or have been implemented:

1. Acid Deposition Management Framework (ACCEPTED)

Is referenced in environmental impact assessments (i.e. key species)
Provides the three phased basis for managing environmental impacts from acid deposition including the implementation of a research program that is informing on-going regional acid deposition and eutrophication management. This work is relied on in all recent EPEA approvals to fulfill research and monitoring plan requirements.
Influenced the Terrestrial Environmental Effects Monitoring (TEEM) program
Led to Air Modelling for acid deposition.
Alberta Environment co-funded Phase II Monitoring and funded Air Modelling Assessment.

2. Ozone Management Framework (ACCEPTED)

The Government of Alberta encouraged Wood Buffalo Environmental Association (WBEA) to update their monitoring sites.
Led to the development of Alberta Environment, Oil Sands Environmental Management Division's Policy 2: "Emission Guidelines for Oxides of Nitrogen (NOx) for New Boilers, Heaters and Turbines Using Gaseous Fuels Based on a Review of Best Available Technology Economically Achievable (BATEA)" http://environment.alberta.ca/2445.html

3. Landscape Design Checklist (ACCEPTED)

Alberta Environment recommends that operators follow the checklist when developing mine, reclamation, and closure plans. The Checklist is available on CEMA's website and will be available on the Government of Alberta's website as a Government of Alberta document by the end of the year.

CEMA has developed a DRAFT document that accompanies the checklist (entitled Guide to the Landscape Design Checklist in the Athabasca Oil Sands Region) but at this time CEMA's Reclamation Working Group (RWG) has decided to keep it as a CEMA document and not recommend it to the Government of Alberta. Further discussion on this decision may be warranted at the Reclamation Working Group level.

4. Land Capability Classification for Forest Ecosystems in the Oil Sands, 3rd Edition (LCCS) (ACCEPTED)

Referenced in EPEA approvals for all oil sands mines.
Used as a tool to assess a variety of parameters and attributes that effect land capability pre-disturbance and post reclamation.
Published as an Alberta Environment document in 2006 and is updated by CEMA's Reclamation Working Group every five years.
Limitations acknowledged in the LCCS report have led to new requirements for soil salvage and placement. The Government of Alberta is also working with CEMA to develop better tools.

5. Ecosystem Management Tools (ACCEPTED)

Minimal Impact Exploration (MIE) is implemented in disposition conditions under the public lands act.
Integrated Landscape Management (ILM) is used provincially as a tool by SRD and stakeholders to minimize footprint. The Regional Municipality of Wood Buffalo is the best example of voluntary implementation of ILM.

Constraints mapping is implemented is a voluntary tool that companies have utilized. SRD is continuing work in this area.

6. Trace Metals Management Framework (ACCEPTED)

Indicators are referenced in EIAs and are the basis for considerations in EPEA approvals.

7. Terrestrial Ecosystem Management Framework (UNDER REVIEW)

The Government of Alberta is currently reviewing this recommendation.
Conducting First Nations consultation.
The recommendations in the Framework have been used during the development of the Lower Athabasca Regional Plan.

8. Interim Nitrogen (Eutrophication) Management Recommendations & Work Plan (UNDER REVIEW)

The Government of Alberta is currently reviewing this recommendation.
Technical Review completed Sept 11th, 2008.

9. Guidelines for Reclamation To Forest Vegetation in the Athabasca Oil Sands Region (ACCEPTED)

Referenced in EPEA approvals for all oil sands mines and some in-situ operators – used as a Guideline for development of revegetation plans in reclamation.
Government of Alberta published the previous version (1998) on behalf of the Oil Sands Vegetation Reclamation Committee. CEMA completed an updated version in September 2009. The plans are for Alberta Environment to publish it as an update to the previous version, as a Government of Alberta document.

10. The Guideline for Wetland Establishment on Reclaimed Oil Sand Leases Revised 2007 Edition (Wetlands Manual) (ACCEPTED)

Referenced in EPEA approvals for both oil sands mine operators – used as a guideline for development of wetlands reclamation and research plans.
Government of Alberta published the previous version (2000) and publication of the 2007 version recommended by CEMA to Government of Alberta is in process (by Alberta Environment) and will be done shortly.

Other Important Technical Input/Documents:

1. End Pit Lake Guidance Document

The document addressed uncertainty in the concepts and implications for end-pit lakes. Both EIAs and determinations of completeness have relied on the guidance document and the technical models derived in the CEMA End Pit Lake (EPL) subgroup. EPEA approvals since 2002 all reference continued participation in developing End Pit Lake knowledge and indicate this can be achieved through participation in CEMAs EPL subgroup.

2. Surface Water Working Group

Few direct recommendations have been received from CEMA as a result of the extensive work done by the water working group; however, the technical reports developed from this group have been essential for the subsequent development of management frameworks by Alberta Environment. These include:

1. The Phase 1 Water Management Framework for the lower Athabasca River which was based on

over 5 years of technical work delivered by CEMA, more than 20 reports on the status of hydrology, fluvial processes and fish habitat needs and the contributions of the Framework group despite their inability to achieve consensus.

2. Development of Reach specific water quality objectives for the lower Athabasca River. These have been developed by Alberta Environment and are based heavily on technical information collected by the Water Working Group.
3. The Phase II Water Managenment Framework Commiittee Recommendations will be released in Q1 2009.

11.3 Status of Future CEMA Recommendations to Regulators

CEMA continues work toward other recommendations in addition to recommendations that have been completed:

Working Group	Key Deliverable	Target Date
SWWG	Phase II Water Management Framework for the Lower Athabasca River	2010 Q1
TSG	Development of Best Management Practices Recommendations for Soil Salvage and Placement	2010
NSMWG	Acid Deposition Management Framework	2010 Q2
ASG	Guideline for the Establishment of Wetlands on Reclaimed Oil Sands Leases	2012
ASG	End Pit Lake Technical Guidance Document (for mining)	2012

CEMA CONTACT INFORMATION
CEMA Office
Suite 214, 9914 Morrison Street
Fort McMurray, AB
T9H 4A4
Phone: (780) 799-3947
FAX: (780) 714-3081
E-Mail: info@cemaonline.ca
Website: www.cemaonline.ca

2009 Annual Report was produced by CEMA Communications