

# Attachment A

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***Notes on a Ft. McKay-specific scenario for LARP modelling***

# Notes on a Ft. McKay-specific scenario for LARP modelling

J. Straker, May 27, 2009

These notes are to support development of a potential LARP modelling scenario specific to Ft. McKay's needs/interests, or that incorporates some of these interests and needs. It is our understanding that the LARP RAC has run one scenario (termed "Business as Usual"), and contemplates running up to three more. We have asked for the input assumptions regarding the completed scenario, but have been told that these cannot be provided at this time (although Ft. McKay is familiar with elements of the modelling approach that are common with CEMA SEWG's work). We believe that development of a useful scenario or elements of a scenario would most productively be done as an iterative approach, involving discussions with RAC and with modellers about what elements could most effectively be incorporated into model runs, or how various concerns/interests could best be represented through modelling. Our current approach, developed in isolation without the benefit of this iterative conversation, is likely to have some limitations. Nevertheless, the following are some notes on modelling elements that are of interest to Ft. McKay:

- Ft. McKay has reviewed the current list of LARP indicators, and generally finds them to be comprehensive. There would be interest from the community in having beaver represented as a wildlife indicator, as this is a Cultural Keystone Species for the community. Another indicator of interest would be Sustainable Potential Annual Moose Harvest.
- Ft. McKay would be interested in having results reported for a smaller land area. Examples would include a portion or all of Ft. McKay's Traditional Territory, or a similar proxy (such as the Mineable Oil Sands Area). This would provide results that would be of more relevance to the community and the future facing its inhabitants.
- Ft. McKay would be interested in modelling designed to explore options for achieving protection of 40% of the land area in Ft. McKay's Traditional Territory, while minimizing foregone opportunities for bitumen extraction (e.g., an optimization scenario for both protection of critical ecological/cultural resources and bitumen extraction). Ft. McKay would provide input into selection of candidate protected areas, both through selection criteria and through suggested locations. Ft. McKay is currently finalizing this information in preparation for such a task.
- Ft. McKay would be interested in having input into air-quality targets selected as evaluation parameters for modelling – e.g., Ft. McKay would favour use of World Health Organization air quality standards as opposed to the Alberta Ambient Air Quality guidelines.
- Ft. McKay would be interested in modelling effects of varying bitumen extraction *rates*, not total bitumen volume extracted, to explore whether taking volumes out at a lower rate over longer time periods contributes to a better balance of environmental, social and economic outcomes.

- Ft. McKay wishes to have input into reclamation assumptions used in modelling runs, both in terms of reclamation “lag” – time elapsed between clearing and initiation of reclaimed ecosystems – and in success (e.g., effectiveness of reclamation at replacing critical components of wildlife habitat).
- Ft. McKay would be interested in modelling the effects of restricted human access to portions of the landscape. This modelling would include both the effects on Ft. McKay residents of restricted access to traditionally utilized areas (e.g., lack of ability to access traplines due to large intervening open-pit mining disturbances); and effects on ecological indicators of restricted access by non-Ft. McKay residents (this could take the form of restrictions on motorized access, on hunting, or of preferential access for Ft. McKay residents to some areas).
- Ft. McKay would be interested in exploring modelling scenarios in which ecological indicators provide the boundaries of model runs, rather than being derived from bitumen extraction levels. Ft. McKay would set objectives or thresholds for environmental indicators, and then explore optimization to find solutions that optimize bitumen recovery while respecting these environmental objectives.
- Ft. McKay would be interested in modelling effects of adoption of industrial “Best Practices” on environmental outcomes.

# Attachment B

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## *Letter to Oil Sands Sustainable Development Secretariat*



# FORT MCKAY INDUSTRY RELATIONS CORPORATION

P.O. BOX 5905 Fort McMurray, Alberta T9H 4V9 Business: (780) 828-2480 Facsimile: (780) 828-2481

November 1, 2009

Oil Sands Sustainable Development Secretariat  
2001 Scotia Place 2  
10060 Jasper Avenue  
Edmonton, AB T5J 3R8

**Attn: Heather Kennedy  
Assistant Deputy Minister**

Dear Heather:

**Re: LARP and cumulative effects assessment on treaty and aboriginal rights**

Further to our meeting on October 2<sup>nd</sup>, I am writing to confirm that we had requested, on behalf of the Fort McKay First Nation and Metis, information and analysis the government of Alberta was undertaking in relation to the impact of land use and the LARP on treaty and aboriginal rights and particularly the infringement of those rights. You have undertaken to get back to us on this question, and we look forward to receiving your response.

The Terms of Reference for LARP recognize that it is important that continued opportunities exist for aboriginal traditional uses to in close proximity to First Nation and Métis communities. One of the purposes of protected or conservation areas identified in the Terms of Reference is to set aside lands that will support traditional land uses.

We are still unclear as to what work is being done and what information is being gathered to determine the size of areas that need to be conserved to support traditional land use and how the government is going to determine how much land is required for traditional land use for Fort McKay.

We are of course concerned about the ability of community members to exercise their aboriginal and treaty rights in reasonable proximity to the community that have already been severely compromised as a result of the oil sands mines that surround Fort McKay. It is difficult to envision how enough land can be set aside in its natural state and support sufficient wildlife populations to enable Fort McKay members to exercise their rights in a practicable way. Impacts could be even more significant if the land use plan results in a designation of a large industrial zone or surface minable zone in the locations of existing leases within Fort McKay's traditional lands and priority lands.

We would appreciate being advised as to what information the government of Alberta has gathered on the potential infringements and adverse impacts on Fort McKay's treaty and aboriginal rights from the three development scenarios being considered in the formulation of the LARP and the land use zoning or designation that will be included in the LARP.

Finally, the Land Use Framework envisioned a new method or process for addressing cumulative effects. Alberta's policy on oil sands development "Responsible Actions" states that consultation and reconciliation with First Nations is part of the oil sands strategy and consultation will occur on cumulative effects:

4.1.1 Work with First Nations to understand the potential cumulative environmental impacts on rights and traditional uses in order to inform regional planning and consultation approaches.

Its not clear how the land use planning and cumulative effects consultation relate to each other and specifically what work is proposed to enable Alberta to understand the potential cumulative environmental impacts on Fort McKay's rights and regional planning (we assume LARP is a "regional plan" as referred to the above quote?). We would appreciate clarification on these questions. Thank you.

Your sincerely,

A handwritten signature in blue ink that reads "Lisa Schaldemose". The signature is written in a cursive style and is set against a light blue rectangular background.

Lisa Schaldemose  
Executive Director  
Fort McKay Industry Relations Corporation

cc Chief Jim Boucher, Fort McKay First Nation  
President Ron Quintal, Fort McKay Metis Local #63  
Stan Rutwind, Government of Alberta  
Morris Seiferling, Government of Alberta  
Dave Bartesko, Government of Alberta  
Karin Buss, Ackroyd Law  
Dan Stuckless, Fort McKay IRC  
Kim Dertien, Fort McKay IRC

# Attachment C

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## *Fort McKay thoughts on Protected Areas*

# Fort McKay thoughts on Protected Areas<sup>1</sup>

Goal: to have, at any given time, 40% of Fort McKay's traditional lands (map attached) designated with the status of a 'protected area', including an adequate amount of protected land in and around the hamlet of Fort McKay.

The following are preliminary thoughts on the characteristics, potential uses and potential strategies/designations for protected areas on Fort McKay traditional lands:

Protected areas would have the following characteristics:

1. natural features commensurate with a pre-disturbance landscape
2. a network of protected areas that encompass all different ecotypes
3. air quality and water quality and quantity that is not significantly impacted by the direct or indirect impacts of industrial development
4. wildlife populations within their natural range of variation
5. plant communities with natural abundance and vigor levels
6. adequate buffer zones around the boundaries for those areas in close proximity to the intensive zone of development, including buffer zones around Fort McKay Traditional Land Entitlement lands
7. a network of wildlife corridors for the movement of wildlife into and out of the protected area
8. adequate access for Fort McKay community members
9. an adequate amount of protected areas in close proximity to Fort McKay
10. managed access to recreational and other users, where allowed

Potential uses in protected areas:

1. traditional land use in all protected areas
2. non-disruptive research-based use
3. educational use
4. managed recreational use

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<sup>1</sup> Fort McKay takes no position in this briefing note regarding the measures necessary to avoid or accommodate the adverse effects and infringement of its Treaty and Aboriginal rights



5. low impact industrial use that utilizes an ecosystem-based management approach (e.g. appropriate forestry practices) in some areas

Potential strategies and designations for protected areas:

1. strict protection where possible – Fort McKay Traditional Land Entitlement areas (e.g. Moose Lake, Cree Burn Lake) – designation by Fort McKay First Nation
2. work with the Government of Alberta to identify areas to be designated as Historical Sites (e.g. Quarry of the Ancestors) and potentially to create ‘Culturally Important Sites’ and ‘Ecologically Important Sites’ – these sites have strict protection allowing for traditional land use and low impact recreational/educational/research use
3. wildlife areas – designated and managed for the maintenance of healthy, abundant wildlife resources allowing for traditional use and educational/research type use and non-consumptive recreational use
4. recreational areas – designated by the Government of Alberta to manage and confine recreation to a system of trails and parks

Fort McKay sees the designations of protected areas as both permanent as well as adaptive and moving, for example, a protected area may be developed provided that there is a provision for an offset of the area, either through certification of a reclaimed area or designation of a new site of similar size, diversity and vigor. Fort McKay wants to be part of the discussion around such proportions as well as the criteria used in different protected area designations.

Co-management of protected areas – Fort McKay would like to be involved with the Government of Alberta in the co-management of protected areas pursuant to which permissible activities would be reviewed periodically and potentially expanded or restricted depending on how well the objectives for the areas are being realized.

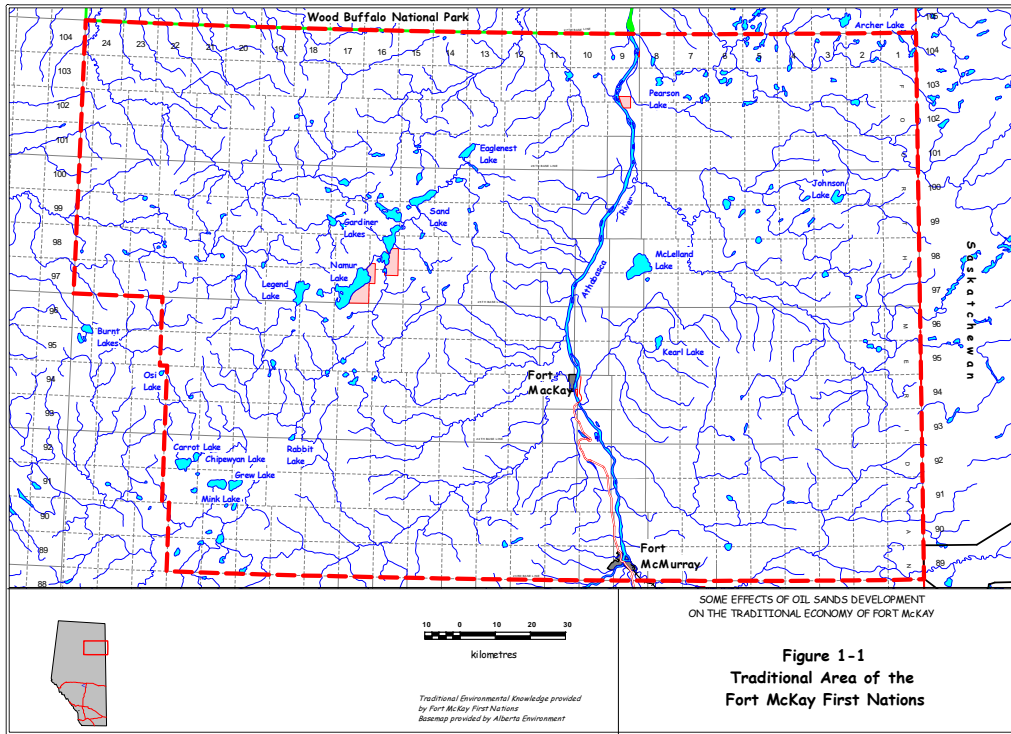
Fort McKay wishes to work with the Government of Alberta to identify key designate areas within their traditional lands. Fort McKay has, and would be willing to share the resources that it has available to them in this regard.

Fort McKay has two initiatives in support of protected areas that it would like to share with the Government of Alberta and other stakeholders:

Fort McKay Protected Areas Initiative

Fort McKay Healing the Earth Strategy

Fort McKay Land Use Plan



# Attachment D

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## ***Notes on the Lower Athabasca Regional Plan Terms of Reference for Ft. McKay***

# Notes on the Lower Athabasca Regional Plan Terms of Reference for Ft. McKay

J. Straker, Jan. 8, 2010

The following discussion points provide a review of a document entitled *Terms of Reference for Developing the Lower Athabasca Regional Plan*, dated July 2009. Overall, while the Lower Athabasca Regional Plan (LARP) Terms of Reference (ToR) include many positive statements regarding such principles as inclusion of Aboriginal peoples in land-use planning, and collaboration of local peoples in development of the regional plan, the process that has been followed to date in development of the LARP has not involved any inclusion of Ft. McKay in land-use planning or in collaboration in plan development. While Ft. McKay appreciates the efforts that have been made to date by the LARP team to provide communication to Ft. McKay on the LARP process, this has not constituted collaboration on development of the regional plan. We assume, given our knowledge of the original and modified LARP schedule, that at this time development of the LARP, and the work of the LARP Regional Advisory Committee, is almost complete, and yet there still has been no collaborative involvement of the community of Ft. McKay, one of the communities most highly impacted by regional industrial development. It appears then that community involvement will be incorporated at the “consultation” phase, on an existing draft plan. In Ft. McKay’s view, this process does not constitute the “inclusion” or “collaboration” referenced in the ToR document, and is contrary to Ft. McKay’s stated wish for early and meaningful involvement in the LARP process. Ft. McKay looks forward to discussion with the LARP team on how to begin more substantive collaboration in the development of this plan.

- p. 2, bullet item # 7, states that one of the “key strategies for improving land-use decision-making in Alberta” is, “Inclusion of Aboriginal peoples in land-use planning”. Ft. McKay is obviously in support of this statement, and is looking forward to the initiation of this strategy in the development of the LARP. The sentence immediately below this strategy indicates that the Lower Athabasca Regional Plan will be a “regional land-use plan”. It is difficult to reconcile the key strategy of inclusion of Aboriginal Peoples in land-use planning with Ft. McKay’s experience to date with LARP. Currently, Ft. McKay’s involvement in LARP, and any land-use planning within it, has been peripheral. We are extremely poorly informed about any details regarding land-use planning in LARP, but very much wish to be meaningfully included in land-use planning, both as one of the primary long-term occupiers and traditional land users in the region, and as the largest private landholder in the RMWB. We do not believe that consultation on a completed draft LARP constitutes “inclusion of Aboriginal peoples in land-use planning”.
- p. 4, 2<sup>nd</sup> para., 1<sup>st</sup> sentence: “Regional planning also involves local input.” The paragraph then proceeds to discuss Regional Advisory Committees (RACs) and representation on these committees. Ft. McKay wishes to note that we do not believe that the LARP RAC provides an adequate mechanism for soliciting and incorporating Ft. McKay’s input to

LARP – this is a process which must be conducted directly with Ft. McKay, as discussed further in the above item.

- p. 5, 4<sup>th</sup> para.: “The development of a regional plan is a complex task, involving a significant amount of data, policy input and decision-making. It requires collaboration among the Alberta government, the Regional Advisory Council and those working, living and doing business in the region.” As one of the primary communities of people “working, living and doing business in the region”, Ft. McKay has an expectation of working in collaboration with the Alberta government and the RAC to develop the LARP. While Ft. McKay appreciates the efforts that have been made to date by the LARP team to provide communication to Ft. McKay on the LARP process, this has not constituted collaboration on development of the regional plan. Ft. McKay looks forward to the beginning of this collaborative process.
- p. 6, last para.: “development must be balanced with protection of the environment, to ensure current and future generations have clean airsheds, watersheds and landscapes and healthy ecosystems. The RAC will be given advice about how to strike this balance in the region.” Two comments:
  1. Ft. McKay is strongly in support of the objective of ensuring that current and future generations have clean airsheds, watersheds and landscapes and healthy ecosystems in the LARP area, and more specifically in Ft. McKay’s traditional territory, and looks forward to seeing this principle robustly enshrined in the LARP.
  2. The cited phrase implies that there is a possibility that the balance between economy and environment might be approached differently in different regions. For example, it is possible that the balance will be tilted more heavily towards development in the LARP area, because of the wealth of oil sands resources in the region, while the Lower Peace area might provide greater environmental protection values. Ft. McKay wishes to note that while this “zoning” approach or differing balances may appear to work well at a provincial scale, it is less likely to be functional for a community like Ft. McKay, which exists almost entirely within the Mineable Oil Sands zone of the LARP area. Ft. McKay strongly wishes to see that clean airsheds, watersheds and landscapes and healthy ecosystems are ensured through LARP at the scale of their traditional territory, and wishes to see the development-environment balance struck well in this area.
- p. 9, last para.: “It is important that regional planning take into account Aboriginal issues with respect to Aboriginal consultation, environmental protection and human development”. Ft. McKay strongly agrees with this statement, but, as noted above, does not know how this incorporation of “Aboriginal issues” is occurring to date within the LARP development process, and does not feel that the community has collaborated in the development of the regional plan at this time.
- p. 10, Economic growth and development scenarios: this section describes the economic importance of oil sands, natural gas, and timber extraction to the region and

the province. Ft. McKay acknowledges this importance, but wishes to note that the *entire* economy – both monetary and subsistence – of the community of Ft. McKay is based within this region, and depends not only on economic development to provide employment and business opportunities, but also on healthy ecosystems which provide a variety of natural goods and services to the community. Protection of these ecosystems, and their ability to supply these goods and services, is absolutely essential to the livelihood, culture and survival of the community of Ft. McKay.

- p. 12, Economic growth and development scenarios, first para. Special attention is paid in the ToR document to timber quota holders and Alpac as parties that may be negatively affected in the long term by oil sands development: “To address potential timber shortfalls, a range of strategies will need to be explored.” While Ft. McKay acknowledges the potential economic impacts on other parties, we also wish to note that Ft. McKay is likely the party most significantly impacted by oil sands development in the region. While Ft. McKay does experience positive economic impacts from oil sands development in the form of employment and business opportunities, the community is already experiencing what could be described as traditional-use-opportunity and subsistence-economy “shortfalls”, and these shortfalls will increase in the future. Ft. McKay would like to see the communities interests and the jeopardizing of these interests by continued economic development enshrined on a level parallel to that afforded to timber quota holders and Alpac. For instance, the LARP could acknowledge that, “to address negative impacts to Ft. McKay’s traditional and ongoing land use, a range of strategies will need to be explored”.

Further to this point, the third item in the list at the top of p. 13 states, “options should be developed to address potential forest land base shortfalls in the Lower Athabasca region”. Ft. McKay wishes to see the LARP also develop options to address potential traditional-use land-base shortfalls in the Lower Athabasca region, and to explicitly acknowledge the importance of doing so.

- p. 13, last two paragraphs. Statements contained in these two paragraphs again suggest that conservation areas outside the Lower Athabasca region could contribute to achievement of environmental objectives within the region, e.g., “The dominant ecosystem in the Lower Athabasca is the boreal forest, which stretches across northern and central Alberta and spans six of Alberta’s land-use planning regions. It therefore makes sense that conservation objectives for the Lower Athabasca be established within the context of the Boreal forest”, and, “All regional plans will take into account what is already conserved. For example, Wood Buffalo National Park already protects approximately nine per cent of Alberta’s Boreal forest”. Again, Ft. McKay wishes to strongly note that while this approach may appear to work at a multi-region or provincial scale, it provides little value to the community of Ft. McKay, whose traditional territory is contained almost entirely within the Lower Athabasca region, and does not include any portion of Wood Buffalo National Park. Conservation objectives within the Lower Athabasca region need to be capable of ensuring maintenance of healthy, functional ecosystems within this region alone, and within the traditional territory of Ft. McKay. The importance of planning at this scale and for these

objectives is acknowledged in the LARP ToR on p. 17-18, under the discussion of “Human Development Considerations”: “It will be important that continued opportunities exist for Aboriginal traditional uses to be in close proximity to First Nations and Métis communities.”

Further to this point, continued discussion on pages 14 and 15 reinforces these points, and Ft. McKays responses, e.g., “about six per cent of the Lower Athabasca land base currently contributes to conservation objectives. An additional 10 per cent of the land base could meet the above key criteria for conservation areas, without conflicting with mineral tenure; these would be mostly situated in the northern part of the region”, and, “Including areas such as Wood Buffalo National Park in a conserved area could have a significant impact on the calculation of the actual land mass conserved”. Conservation should not be viewed as a regional arithmetic exercise, but as action undertaken to achieve environmental and other objectives. Protection of land north of Lake Athabasca, or inclusion of Wood Buffalo National Park in conserved-area statistics, may increase the total proportion of protected area, but will not have any impact on ensuring the maintenance of healthy ecosystems in Ft. McKay’s traditional territory. In addition, the goal of protection with minimal conflict with existing mineral tenure will not lead to meaningful conservation in Ft. McKay’s traditional territory, as the vast majority of this territory is already under mineral dispositions. It appears that these lands have been tenured with little regard to the continued practice of Ft. McKay’s treaty and aboriginal rights, and Ft. McKay supports the acknowledgement that the Alberta government may “cancel the mineral leases and provide compensation to the leaseholder”. Ft. McKay wishes to raise the possibility that various governments may also have to consider compensation to the community of Ft. McKay for infringement on their treaty and aboriginal rights by regional industrial development.

- p. 14, Land Conservation Objectives. Note that one of the listed key criteria for establishing conservation areas is “areas that support Aboriginal traditional uses”. However, nowhere are specific considerations discussed on how to achieve this criterion, given other constraints such as economic development goals and existing mineral tenure. Nor has there been any substantial attempt to date to include Ft. McKay in a collaborative discussion on how these objectives might be achieved, besides acceptance of Ft. McKay’s “desired protected areas” map, and provision of this map to RAC.
- Air and Water Thresholds: the topics of thresholds is addressed by Fort McKay under separate submissions.

# Attachment E

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## *Access and Tourism*



# Access and Tourism

## Notes on Ft. McKay-LARP Meeting, Sept. 3, 2009 - J. Straker

This meeting was focussed on the issue of recreation and tourism planning for the Lower Athabasca Region. Critical points from Ft. McKay's perspective include the following:

- **Participation in economic opportunities arising from recreation and tourism** – because of their knowledge of, and skills on, the lands and waters in the Lower Athabasca Region, particularly that part of the region within Ft. McKay's Traditional Territory, Ft. McKay residents are ideally suited to participate in recreation- and tourism-based economic opportunities (e.g., as guides, outfitters, lodge operators, etc.). Ft. McKay wishes to be actively involved in any discussions within the LARP process involving planning for these activities, and to be made directly aware of any opportunities arising from the LARP process.
- **Protected areas and recreation/tourism** – some of the tourism and recreation attraction in the Lower Athabasca Region will be centred on low-impact recreation and eco-tourism (e.g. hiking, wildlife viewing). These activities will be best pursued in protected or conservation areas, where restrictions on industrial activities, motorized access, and wildlife harvest may be implemented. Ft. McKay has presented information on candidate protected areas of importance to the community, and wishes to reiterate the need for consideration of these areas in the LARP process, and for further involvement of Ft. McKay in detailed discussion on the establishment of protected areas.
- **Access management** – from Ft. McKay's perspective, issues of access management fall into two primary categories:
  1. **Management of access by non-Ft. McKay residents.** The Lower Athabasca Region is characterized by a high density of linear features (e.g. seismic lines, access roads) that afford easy motorized access across the landscape, particularly in areas of active exploration and surrounding active development. Significant ecological damage can be done to boreal ecosystems through motorized human access, through direct damage from access (e.g., damage of aquatic habitats through stream crossings by motorized vehicles, damage to recovering vegetation communities through frequent traffic), and through increased hunting pressures (mortality) that accompany access. CEMA's Sustainable Ecosystems Working Group determined that one of the most powerful tools for minimizing negative ecological effects in the region is a restriction on motorized access. Given the high pressures placed on the Lower Athabasca Region's ecosystems by intensive motorized access, Ft. McKay recognizes the need for the active management of motorized access to form one of LARP's management tools. (This is especially true in areas that have already been identified by Ft. McKay as areas of access-management concern, such as the Moose Lake

corridor and the Richardson Backcountry. Ft. McKay wishes to see meaningful re-engagement by SRD in finalizing draft access-management plans for these areas.) Due to the importance of this tool to Ft. McKay, and implications of its implementation for Ft. McKay's traditional land use, Ft. McKay wishes to be involved in development of access-management provisions for the Lower Athabasca Region and for Ft. McKay's Traditional Territory, and in the details of access-management implementation.

2. **Management of access by Ft. McKay residents.** Ft. McKay's traditional land use is dependent on the ability of Ft. McKay residents to access their traditional lands. Currently, and since the beginning of industrial activity in the region, access of Ft. McKay residents to these lands has been significantly constrained by industrial activities occurring within Ft. McKay's Traditional Territory (e.g. secured roads obstructing access to traplines, requiring advance notice and escort to transit). Ft. McKay residents require consideration to be given in the LARP process to how their access to their traditional lands can be restored and maintained in the face of increasing industrial development. In addition, in light of the discussion contained in item #1, above, is the need for consideration of preferential access and modes of access for Ft. McKay residents, where access may be restricted for non-Ft. McKay residents. Ft. McKay's ability/need to access their traditional lands is an issue that requires consideration during the LARP process and subsequent development of implementation details.
- **Limits on density of linear features** - as noted above, linear anthropogenic features such as seismic lines and roads are a major factor allowing motorized human access to the boreal forest of the Lower Athabasca Region, and thus are a major factor in increasing human pressure and damage on these ecosystems. As the density of these features on the landscape increases, so does human presence and resulting damage. Linear densities have been increasing in the Lower Athabasca region since the initiation of industrial activities in the area, and are projected to continue increasing substantially in the near future due to continued new development and exploration. Ft. McKay wishes consideration to be given to placing limits on the density of linear features that can be allowed on the Lower Athabasca Region landscape at a given time. Density limits would require successful implementation of Integrated Landscape Management (coordination of access features between users), and would prevent further construction of access features once limits are reached. This in turn would provide direct incentives for successful reclamation of existing, unused access features, in order to "make room" for new access construction. Ft. McKay wishes to be involved in further discussion of this management tool in the LARP process, and in the subsequent development of implementation details.
  - **Designated high-impact recreation areas** – given the interest of a component of the Lower Athabasca Region's population in high-impact recreation (e.g. "quad" usage as a motor-sport, rather than as a means of back-country access), and the damage done to ecologically sensitive areas through this mode of recreation, Ft. McKay believes that it

may be desirable to designate high-impact recreation areas in areas whose ecological function and integrity may already be compromised. Examples of candidate areas might include quarries, gravel pits and mine waste areas.

# Attachment F

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## ***Fort McKay Social Indicators – Input into the Land Use Framework***

# Fort McKay Social indicators

## Input into the Land Use Framework

### Introduction

Social indicators may be identified by a variety of terms including social indicators, community indicators (CI), benchmarks, quality of life index (QLI). Sustainable Index, healthy community index, human development index (HDI), community audit, Genuine Progress Indicators (GPI), Urban Quality Indicators (UQI), social accounting, community assets, etc. Each has a different leaning yet all underline the concern for a universal well being and an interest in systematic and practical use of social statistics<sup>2</sup>

The basic function of social indicators from Fort McKay's perspective is to put economic development in perspective with human development and the state of the environment, which supports our economy and way of life.

This document reflects a compilation of issues, stressors and potential indicators of concern to Fort McKay.<sup>3</sup> Some social indicator data is available.

### Principles to Assess Social Impacts

To assess the impact of regional growth and development upon the well being of the community, Fort McKay has adopted the "Guidelines and Principles for Social Impact Assessment" from the International Association for Impact Assessment. These guidelines and principles provide a framework from which to assess the social impact of resource developments upon the community of Fort McKay. The principles are outlined as follows:

- **Precautionary Principle:** In order to protect the environment, a concept which includes peoples' ways of life and the integrity of their communities, the precautionary approach shall be applied. Where there are threats or potential threats of serious social impact, lack of full certainty about those threats should not be used as a reason for approving the planned intervention or not requiring the implementation of mitigation measures and stringent monitoring.
- **Uncertainty Principle:** It must be recognised that our knowledge of the social world and of social processes is incomplete and that social knowledge can never be fully complete because the social environment and the processes affecting it are changing constantly, and vary from place to place and over time.

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<sup>2</sup> Human Resources Development Canada website, Volume 3, No 1 (Winter-Spring 1997), Social Indicators: What Are They All About?"

<sup>3</sup> Sources include: Fort McKay Community Wellness Study, Human Environment Group May, 2006 (updated Sept 15, 2006); A Proposal for a Community Health and Wellness Strategy, May 2007; and various Socio-Economic Impact Assessment (SEIA) Reviews

- **Intergenerational Equity:** The benefits from the range of planned interventions should address the needs of all, and the social impacts should not fall disproportionately on certain groups of the population, in particular children and women, the disabled and the socially excluded, certain generations or certain regions.
- **Intergenerational Equity:** Development activities or planned interventions should be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs.
- **Recognition and Preservation of Diversity:** Communities and societies are not homogenous. They are demographically structured (age and gender), and they comprise different groups with various value systems and different skills. Special attention is needed to appreciate the existence of the social diversity that exists within communities and to understand what the unique requirements of special groups may be. Care must be taken to ensure that planned interventions do not lead to a loss of social diversity in a community or a diminishing of social cohesion.
- **Internalization of Costs.** The full social and ecological costs of a planned intervention should be internalised through the use of economic and other instruments, that is, these costs should be considered as part of the costs of the intervention, and no intervention should be approved or regarded as cost-effective if it achieves this by the creation of hidden costs to current or future generations or the environment.
- **The Polluter Pays Principle.** The full costs of avoiding or compensating for social impacts should be borne by the proponent of the planned intervention.
- **The Prevention Principle.** It is generally preferable and cheaper in the long run to prevent negative social impacts and ecological damage from happening than having to restore or rectify damage after the event.
- **The Protection and Promotion of Health and Safety.** Health and safety are paramount. All planned interventions should be assessed for their health impacts and their accident risks, especially in terms of assessing and managing the risks from hazardous substances, technologies or processes, so that their harmful effects are minimized, including not bringing them into use or phasing them out as soon as possible. Health impacts cover the physical, mental and social wellbeing and safety of all people, paying particular attention to those groups of the population who are more vulnerable and more likely to be harmed, such as the economically deprived, indigenous groups, children and women, the elderly, the disabled, as well as to the population most exposed to risks arising from the planned intervention.
- **The Principle of Multisectoral Integration.** Social development requirements and the need to consider social issues should be properly integrated into all projects, policies, infrastructure programs and other planning activities.
- **The Principle of Subsidiarity.** Decision making power should be decentralised, with accountable decisions being made as close to an individual citizen as possible. In the context of SIA, this means decisions about the approval of planned interventions, or conditions under which they might operate, should be taken as close to the affected

people as possible, with local people having an input into the approval and management processes.

## Fort McKay Social Indicators

Determinants of health and quality of life indicators are signs or signals of complex events and systems. They are bits of information pointing to characteristics or highlighting what is happening. Generally, as Fort McKay monitors and addresses social wellness issues it focuses on the following:

- Quality of Life Indicators
  - People
  - Economic standard of living
  - Housing
  - Natural environment
  - Safety
  - Civil & political rights
  - Knowledge and skills
  - Economic development
  - Health
  - Built environment
  - Social connectedness
  -
- Determinants of Health
  - Income and social status
  - Education and literacy
  - Social environment
  - Personal health practices & coping skills
  - Biology and genetic endowment
  - Gender
  - Social support networks
  - Employment/working conditions
  - Physical environments
  - Health child development
  - Health services
  - Culture

Fort McKay is subject to a variety of stressors that affect the health and well being of individuals and the community. These stressors may also be seen as social indicators for quality of life.

Potential general social indicators include:

- Overall Population
- Distribution of Population by age groups

- Birth and Death Rates
- Population by Marital Status

## **Employment and Training**

Fort McKay workers are particularly concerned with opportunities for training and advancement within industry

Potential social indicators related to employment and training includes:

- Participation Rate
- Employment Levels
- Training Programs leading to Employment
- Income per capita
- Income gap between community members
- Cost of Living

## **Small Business Opportunities**

There must be well-functioning and sustained mechanisms to ensure that small businesses operating closest to industry can derive business benefits that are suited to their business. Mechanisms to assist in advancing management skills and business acumen of Fort McKay entrepreneurs enabling them to secure and retain contracts are required.

Potential social indicator related to small business includes:

- Success Rate of Community Owned Business

## **Education**

Fort McKay has concern about the limited number of students that graduate from high school and improving the quality and quantity of education and training opportunities for Fort McKay students. Alternatives to delivery of education through Northland School Division would be welcomed by many residents.

Potential social indicators related to education include:

- Percent of community with Grade 12 or GED
- Literacy, percent of community with Grade 9
- Adult Education



## Housing

Although the First Nation currently has adequate housing for its members a number of potential issues related to housing can be identified as social indicators. Because of the high cost of housing in Fort McMurray some Fort McKay members are returning to the community seeking more affordable housing. When there is a shortage of housing in Fort McKay community residents (especially younger people) have to move into Fort McMurray to find accommodation. Additionally, community residents who had previously moved away from the region are returning to the area to take advantage of economic and employment opportunities.

A critical shortage of housing exists for the Métis residents of the community. A number of sub-standard houses require replacement and ongoing maintenance/repairs is an issue. Five Métis homes are currently condemned. For many homes issues related to occupation levels (overcrowding) and quality are concerns. The Métis have a plan to construct 20 new units over the next 5 years.

Potential social indicators related to housing include:

- Access to housing
- Quality of housing
- Allocation of housing

## Safety and Security

A number of issues of concern in Fort McKay relate to safety and security including unknown/unwanted “visitors” in the community; proximity of camps, increased access and availability of drugs and alcohol, increased pressure on families and individuals resulting in destructive behaviour, traffic, lack of policing services, etc.

Although the Fort McKay Volunteer Fire Department has recently been re-established and the 911 call system has been put in place for emergencies the community is concerned about emergency preparedness and evacuation plans for large events at the plants or forest fires. Recent efforts to develop an emergency plan reflect the priority of this issue.

Policing services in Fort McKay is a priority of the community to reverse the trends in substance abuse and the collateral effects of violence, crime, accidents and unwanted traffic in the community. Recent increases in police service have had some positive results.

The Municipality needs to allocate tax dollars to augment regional rural policing services and the RCMP need to be brought into the planning process early so that it can plan for increased policing during construction of projects for such matters as increased volumes on the roads, problems in camps, traffic accidents, alcohol and drug use, etc..

Potential social indicators related to safety and security includes:

- Presence of protective services
- Sense of security
- Crime rates

## Traffic

Fort McKay is concerned about the increased volumes of traffic on Highway 63 and the ability of residents to safely get to and from Fort McMurray for school, appointments and shopping. Concerns relate to the condition of the road with the high volume of heavy traffic, congestion and unsafe driving (speed, drinking, etc). At shift change now when the plants disgorge onto Highway 63 driving conditions become overwhelming.

Fort McKay is particularly concerned about the heavy traffic (size and volumes) including logging trucks that enter the Fort McKay road from the CNRL access and the increased traffic through the community. As well, there is concern about wide loads as emergency vehicles from Fort McKay may be slowed down on the way to hospital. The road has narrow shoulders and the lane markings are almost invisible.

The Highway 63 – Fort McKay intersection has recently been upgraded however Fort McKay residents remain skeptical that it will address safety concerns in the long run. The community would like traffic lights installed at this intersection.

## Camp Based Operations

The proximity of additional workers in camp increases Fort McKay's concerns regarding unwanted intrusions onto traditional lands and in the community; drinking, drug use and antisocial/predatory behaviour and the potential for increased negative interaction between the community and camp residents.

## Health Services

In recognition of the importance of factors traditionally seen as outside the health realm, Health Canada has adopted a population health model that is based on 12 determinants. This model acknowledges an entire range of factors that determine health of a population in a region. These factors include: income and social status, social support networks, education, employment/working conditions, social environments, physical environments, personal health practices and coping skills, healthy child development, biology and genetic endowment, health services, gender and culture. The October 2005 draft, "*Fort McMurray Mineable Oil Sands Integrated Resource Management Plan*" also endorses this model for population health.

Like the rest of the region Fort McKay has difficulty recruiting and retaining experienced and skilled health care and social service providers. In an effort to keep as much skill in the community as possible, efforts have focused on recruiting local residents and through

capacity building to develop their skills to meet the requirements of the job. While this is more successful in retaining staff, it deprives the community of expertise in the near term.

In Fort McKay basic health services are provided through the Community Health Centre, a National Native Alcohol and Drug Abuse Program (NNADAP) worker, and a visiting counselor sees clients in the community. For more specialized services Fort McKay residents are required to travel to Fort McMurray to confront waiting lists, shortages and unavailable services.

Through its community plan, Fort McKay has identified a number of psychological impacts related to the industrial development and cumulative impacts in the region. These relate to a sense of powerlessness, isolation, concerns for safety and security, concerns about health of self and traditional foods, frustration and depression. This climate of “dis-ease” appears to be impacting the physical well being of Fort McKay residents.

Fort McKay finds itself in this spiral of cumulative effects, absent or inadequate services; concern about response times and at least a perception that their health is being negatively impacted.

Potential social indicators related to health services include:

- Access to health care
- Elders care in the community
- Number of programs for Youth, Adults and Elders
- Resources invested into running social programs
- Access to daycare
- Response times for emergency providers such as ambulance and police

## **Social History Effects**

The impacts of the federal government’s Residential School Initiative are far reaching. Not only did it attempt to destroy the cultural and political way of life of First Nations but it also segregated these individuals from mainstream society thereby estranging them from their ancestral ways with nothing to replace what was lost. The loss of culture, traditions, language, and family has had profound multi-generation negative effects on many residential school students and their families.

## **Lifestyle Choices**

Fort McKay residents, like other residents in the region have benefited from the increased economic opportunities in the region. However, there remain a number of Fort McKay residents who do not enjoy the economic prosperity of the region, and the community as a whole is significantly impacted by the social and economic effects of development. Like other populations that find themselves in a boom and bust wage economy lifestyle choices

significantly affect health and well being. These choices can include substance use and abuse, addictive behaviours such as gambling, abusive relationships, sedentary lifestyles and diet.

Potential social indicators include:

- Rates of addictions and abuse

## **Cultural Identity and Language**

Culture is a very important aspect of community wellness. It provides identity, sense of community and solidarity. It is the basis for perception of wellness and in many ways culture constitutes the foundation of the concept of community.

Access to natural, undeveloped areas close to the community is very important for the continuation of traditional activities. Traditional activities are very important for spiritual, recreational, cultural, and economic reasons. Currently, community members are finding it more difficult to know what areas are accessible and what areas are not. Access planning in the past has not been well coordinated between the community and Industry. However, the increasing development in the region is making it hard to keep track of the areas that the community can access for traditional activities. The Fort McKay IRC continues to work on an access management plan that will help community members understand what areas are being developed and help companies understand what areas are commonly used by the community.

Trapping, hunting and medicinal plant gathering are common activities in the community for both Métis and First Nation members.

There are 29 trap lines around Fort McKay, which are used on a regular basis. Trapping is partially an economic activity, but is mostly for cultural, spiritual and recreational benefits. Trapping is one way the community Elders mentor and pass on knowledge to younger members of the community.

Hunting and medicinal plant collection is also common in the community. At some point during the year virtually every member of the community will eat wild meat. For many members who have low levels of income, wild meat is an important supplement to their diet.

Assessing the community's perspective on accessibility to undeveloped areas and the areas of actual development in comparison to areas that the community identifies as high usage may be a useful indicator of community wellness.

Potential social indicators regarding culture and access to traditional lands include:

- Ability to access the bush
- Language used at home

- Eating traditional foods
- Clean air, water, fish, wildlife, etc.

## **Encroaching Non-Aboriginal Population**

As access increases to an area where there previously was none, there is an increase in hunting and angling pressures, as well as noise disturbance to wildlife resulting in reductions in wildlife and fish populations, especially losses in harvestable yield. As ground disturbance increases with more vehicular traffic (both road and off road), sensitive landscapes are affected, successful reclamation of clearings becomes more difficult, and opportunities for introduction and establishment of invasive species occur. These can result in habitat fragmentation, declines in biodiversity, and loss of forest productivity. In addition, improved access often results in land uses that can create issues related to littering, vandalism of property, and fire. As access to an area develops this may accelerate the rate of resource exploration and development, which might otherwise be delayed, as access costs are now reduced.

Fort McKay is concerned about non-aboriginal access to its traditional lands through such activities as hunters, outfitters, recreational users, cottage owners, etc. Trappers express concern that their cabins being broken into and lived in, and there are squatters on trap lines. The damage, unnecessary death of animals, bear baiting and garbage are particularly distressing to community residents.

## **Air Quality/Odours**

Odours associated with industrial activities (e.g. sulphur, nitrogen and hydrocarbons) odours are generally well below levels that have direct toxic effects and are therefore often referred to as 'nuisance odours'. However, because these unwanted odours are present in and around homes and cannot be avoided, they cause distress to many and adversely affect quality of life in the Community.

Existing and future predicted air quality in Fort McKay indicates the potential for ongoing odour issues with hydrogen sulphide (rotten egg smell) levels and this of particular concern to the Community. Additionally from time to time noxious odours are at levels that become a concern from an immediate health effects standpoint. The frequent occurrence and perpetual threat of noxious emissions is therefore a serious community health concern. Despite air monitoring and some air quality studies that have been undertaken many community residents do not trust the findings and continue to believe that industry purposely releases emissions after hours and that these emissions are affecting their health.

When Syncrude had an ammonia release in 2006 it was the first real instance that the community felt an immediate threat to their health. Prior to this occurrence they were simply feeling inconvenienced. Now with a company going to be built in every direction of the community, there is a concern that no matter which direction the wind is blowing there is a high potential for an upset that will cause odor issues and immediate health impacts.

## **Air Quality/Dust**

PM and PM<sub>2.5</sub> from industrial activity is of concern to community members. Dust and blowing sand from tailings ponds and emission fallout that, for example discolors surrounding snow, is a typical concern. Community residents now have to drive daily between two tailings areas which have a high amount of dust blowing due to slow progress of reclamation.

## **Noise**

At the present there are noticeable noise impacts associated with regional development including traffic as well as noise cannons that can occasionally be heard in the community. Industrial developments are now within sight of the community and the amount of traffic, industrial equipment, blasting and air traffic grows the residents of Fort McKay are becoming more concerned about the loss of their peace and quiet and in some cases operational noise will be easily heard 24 hours a day. Residents are also very concerned about the impacts of noise on wildlife movements, birthing and stress levels.

It is unlikely that any noise emitted by industry which is heard in the community, or even adjacent to the industrial sites would ever present a hazard to hearing. Conventional wisdom tells that exposure to continuous noise above 80 dB will damage hearing. The overall noise levels from industry in the community, and even adjacent to industry operations will be well below this.

However, this is not to say that the relatively low levels of noise emitted by industry cannot cause ill-health. The intrusion of industrial noise in a rural environment will cause noise stress in an individual used to natural background. This will be particularly evident at night, when the overall background noise levels are lowest, and even very small noises are no longer 'masked' by the day-time background noise. Most of us have experienced this sensation in a hotel room where the AC system becomes a dominant irritating noise source in an otherwise low background noise levels.

It is industrial noises similar to pure-tone emission that are of particular concern to Fort McKay and could cause stress and irritation in the community if not controlled.

## **Water**

Without exception the quality of the drinking water in the community is a significant concern. Issues range from the high level of chlorine to perceived health effects. Elders receive bottled drinking water and ongoing concern is expressed about the provision of bottled water and the eligibility criteria for receipt of bottled water. Development of projects north and west of the community heightens concern about water quality in the Ells River, the community's source of water.

One of Fort McKay's key concerns is the amount of water in the Athabasca. Especially since 2006, the community has seen the water level getting lower and lower. There are a number

of reasons for this: there has been very little rain and snow over the past couple of years which is needed to replenish the lakes and rivers; industry is withdrawing water to make oil ; the river is no longer being dredged and silt is building up; and global warming threatens to increase evaporation.

Concerns about the diminishing levels of water through out the traditional lands include decreasing muskeg areas, lower creeks, and increased drying of the land. These occurrences cause considerable concern about the quantity of water in the rivers and lakes and the impact that water level has on fish populations. . As well the community is concerned about diversion of water bodies feeding into larger rivers, subsurface water withdrawals, accidental industrial releases into rivers, etc. Of particular concern are the quantity and quality of water in the Athabasca and Muskeg Rivers. Alberta Environment's recent first low water level alert this January (2009) supports community concerns.

## **Infrastructure**

Community residents have expressed a need for walking trails, sidewalks, cross walks, dust control and street lighting. For many community members these needs are related to safety as traffic increases in and through the community.

Potential social indicators include:

- Water supply, sewage treatment, garbage collection, etc.
- Conditions of roads, sidewalks, buildings, etc.

## **Cumulative Socio-Economic Effects**

Fort McKay is concerned about a number of cumulative effects that also serve as potential proxy social indicators:

- Ever increasing encroachment on traditional lands;
- Adjusting to the forced transition to lifestyle without having the skills to manage;
- Increased population in the region and the effects on the land;
- Impacts of shift work on families, both parents working, commuting time;
- Safe and affordable day care and after school child care;
- Level and provision of health care services;
- Recreational and cultural opportunities in Fort McKay;
- Safety and security issues arising from increased drug and alcohol; traffic, unwanted visitors, etc;
- Increased pressure and stress as a result of the fast paced, congested and/or inaccessible services, and competitive social milieu;

- Traveling to Fort McMurray for virtually all of its services;
- Increasing difficulty recruiting and retaining skilled workers to provide community-based services when salaries are not competitive with industry and housing is unavailable;
- The effect of camps on the safety and security of the community;
- Education: (1) attaining a level of education to access the surrounding job market (2) attaining the skills necessary to take advantage of contract-type employment (3) pursuing post-secondary education within a labour market that offers high wages for a Grade 12 education; and
- Business: (1) the ability of small entrepreneurs to bid on the large contracts tendered in the oil sands industry; (2) working with large subcontractors to attain work (3) attaining the necessary business acumen to be successful in a competitive market.



# Attachment G

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## *Summary of Discussion with Alberta Environment*

# Summary of Discussion with Alberta Environment

## Air Modeling conducted by Alberta Environment (AENV) as part of the Lower Athabasca Regional Plan (LARP) Development Work on December 8, 2009

David Spink, Pravid Environmental Inc.

**Purpose:** The meeting was an information session for Fort McKay to provide:

1. An update on the air modeling work that AENV has been conducting as part of LARP;
2. A draft of the LARP groundwater management approach; and
3. An update on activities related to surface water quality and quantity management.

Attendees:

- Representing the Fort McKay IRC
  - i. Ron Bothe – surface water
  - ii. Lew Fahner – groundwater
  - iii. David Spink – air
- Representing AENV
  - i. Shannon Flint – Director, Oilsands
  - ii. Preston McEachern – Oilsands Group -Surface Water
  - iii. Margaret Klebek – Groundwater Specialist
  - iv. Randall Barrett – Northern Region – Air
  - v. Karina Andrus – Aboriginal Relations – Manager
  - vi. Greg Bereza – Aboriginal Relations

**Air Assessment Approach:** AENV gave a slide presentation summarizing the approach to, and modeling results from, their air impact assessment work (copy attached). In general the assessment approach involved the following;

- ***Modeling of three development scenarios***

- low – 1.5Mb/d (basically no more development),
- medium – 3.3.Mb/d (production from existing and approved projects), and
- high - 5.8 Mb/d (production from existing, approved and announced projects)
- ***Modeling three emission management levels***
  - business as usual emission requirements (BAU),
  - reduction scenario “A” (which is continuous improvement, partial application of Tier 4 limits for heavy haulers and the compliance limits in Policy 2 (this is the Policy that the Fort McKay IRC pushed for and helped develop which covers NOx emissions from boilers, heaters and gas turbines operating North of Fort McMurray - under scenario “A” Policy 2 would apply to all operators on the region)), and
  - reduction scenario “B” (which is continuous improvement, the performance target limits in Policy 2 and full application of Tier 4 limits for heavy haulers).
- ***Modeling was done using the CALMET/CALPUFF model***
- ***Ground-level concentrations (hourly, daily and annual) of Sulphur Dioxide (SO<sub>2</sub>), Nitrogen Dioxide (NO<sub>2</sub>) and Potential Acid Input (PAI) were modeled***
- ***Annual quantities of regional emissions of SO<sub>2</sub> and NO<sub>2</sub> were estimated for the three different emission management levels***
- ***Predicted ground-level concentrations were compared to Alberta Ambient Air Quality Objectives (AAAQOs)***

**Air Issues:** Based on the presentation a number of issues and concerns related to the air modeling/assessment approach were identified and discussed. These issues, and the concern, are as follows:

1. **Reduction Scenarios** – The reduction scenario “A” is largely a BAU since Policy 2 already applies to all operators North of Fort McMurray which is where most of the NOx emissions currently occur and in the next 50 years will likely continue to occur and this scenario should likely have been considered as BAU. Reduction scenario “B” makes the performance target limits in Policy 2 compliance limits but since companies are currently expected to design and operate to the performance targets this is also not really a reduction scenario. Since Tier 4 vehicle emission limits are a given this is also not really a reduction scenario.

**Conclusion:** *AENV has really not modeled an aggressive but doable emission reduction scenario which means that the RAC is not being given the full range of emission reduction options available. Also the presentation of emission reductions gives the impression that industry is being required to significantly reduce emissions when they*

***are not. The Fort McKay IRC may therefore wish to advise the Government of Alberta that it does not believe that the air emission reduction/management options being considered are reflective of best emission management practices and as such is not prepared to accept them as regional pollution control technology-based thresholds/limits.***

2. **Impact Criteria** – The assessment approach uses the AAAQOs that for NO<sub>2</sub> and SO<sub>2</sub> are out of date and in will likely change soon. This is a major weakness of the modeling and also reflects a “pollute up to” approach which the government has specifically indicated that it will not use. There is no recognition/application of the “keeping clean areas clean” principle or “precautionary principle”.

***Conclusion: The assessment approach used is based on criteria that are not current or fully protective of health and/or the environment. Fort McKay provided a draft of its Healing the Earth Strategy (HTES) air quality criteria and targets to AENV last year but these do not appear to have been considered. The Fort McKay IRC may wish to consider formalizing its air quality criteria and provide it to the GoA indicating that these are the air quality targets it expects the Government to use in setting air quality-based emission thresholds in the region.***

3. **Assessment Results** - The modeling shows that Fort McKay is the community in the region most impacted by industrial emissions. While no exceedences of AAAQO objectives are predicted in Fort McKay, exceedences of NO<sub>2</sub> levels are predicted in areas of Fort McKay’s traditional lands. PAI values are also expected to increase as is the area above critical loads. These areas are all on Fort McKay’s traditional lands. Since the assessment criteria used are not fully protective of health and the environment the assessment really understates the risks/impacts of emissions. It is worth noting that the assessment and findings by AENV are directionally similar to those in the Fort McKay Specific Assessment (FMSA) however the magnitude of impacts are estimated to be higher in the FMSA.

***Conclusion: The assessment approach and results underestimate air quality risks/impacts, and since aggressive but doable emission reduction options are not considered, the impacts on Fort McKay are higher than estimated and higher than necessary. The Fort McKay IRC may wish to formally provide a synopsis of its FMSA to RAC and the Alberta Government ASAP so that it can be considered in the LARP process.***

4. **Odours and other Issues** – Odours are not addressed in the assessment but are a major air quality impact associated with industrial emissions. AENV acknowledged this. There are also other issues e.g. direct and deposition effects of nitrogen emissions/gases on vegetation that have not been addressed.

***Conclusion: The assessment does not address all the key regional and community air quality related issues. The Fort McKay IRC may wish to outline what it views as all the outstanding air quality issues and how it expects these to be addressed in the future under LARP.***

**Summary:** The assessment approach and findings reflect what has been done in project EIAs and none of the results are surprising/new. The major weaknesses/problems with the review are:

- emission reduction scenarios do not include a best possible emission management scenario
- air quality assessment criteria are not reflective of current science
- impacts assessments are based on a “pollute up to approach” rather than a health/environment protection approach

From the discussion with AENV it was apparent that industry has had an influence on the scenarios modeled and the assessment approach. Since LARP is intended to be a multi-stakeholder process, this type of “behind close doors” influence is not appropriate particularly since consultation with Fort McKay is occurring after the modeling has been done and there is no real chance to influence the work and assessment scenarios.

**Recommendation:** It is recommended that the Fort McKay IRC consider a formal submission and/or presentation to RAC and/or the Government indicating its expectations in terms of process, assessment and/or thresholds and possibly even requesting a Fort McKay specific assessment using Fort McKay criteria.

# Attachment H

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## *Fort McKay to AENV LARP Frameworks*



## FORT MCKAY INDUSTRY RELATIONS CORPORATION

P.O. BOX 5905 Fort McMurray, Alberta T9H 4V9 Business: (780) 828-2480 Facsimile: (780) 828-2481

August 20, 2010

Alberta Environment  
Oil Sands and Clean Energy Policy Branch  
Twelfth floor - 10025 - 106 Street Baker Centre  
Edmonton, Alberta  
T5J 1G4  
Phone: (780) 427-9563  
E-mail: lisa.sadownik@gov.ab.ca

Attention: Lisa Sadownik, Section Head, Policy and Governance

Dear Ms. Sadownik

**Re: Fort McKay Comments on Government of Alberta Draft Air Quality, Groundwater and Water Quality Frameworks for the Lower Athabasca Regional Plan (LARP)**

The Fort McKay Industry Relations Corporation (IRC) is writing on behalf of the community of Fort McKay, including the Fort McKay First Nation and Métis Local 63 with regard to Alberta Environment's draft frameworks for air quality, groundwater quality and water quality for the Lower Athabasca Regional Plan (LARP). We understand that the intent of the LARP is to establish management frameworks and resource and environmental outcomes. The LARP overlaps with our traditional lands and will influence our ability to access those lands and the health and quality of the resources that we rely on for traditional use and cultural purposes and to exercise our treaty and aboriginal rights. Fort McKay is concerned about cumulative effects of development within our traditional lands and wants input into the development and implementation of cumulative effects management. Hence, these management frameworks are of significant interest and concern to Fort McKay.

Thank you for meeting with us on meeting on July 26<sup>th</sup> in Edmonton. We have reviewed the following frameworks which we understand are draft and for discussion only:

- Lower Athabasca Region: Air Quality Management Framework. Alberta Environment. July 27, 2010.
- Groundwater Management Framework Northern Athabasca Oil Sands Region. Part 1 Technical Framework. July 2010
- Lower Athabasca River Water Management Framework: Surface Water Quality Update. June 2010. Government of Alberta.

We have provided our detailed comments in the three attached technical memos. We respectfully request that AENV consider our comments in the finalization of the draft frameworks. We also request that AENV provide a written response to each of the questions and recommendations in the attached memos, indicating if it is/will be addressed in the final draft framework and if not, the rationale for not including it. Once the response and the next draft of the frameworks are prepared we would like to meet with AENV to discuss.

Management of air quality, groundwater and water quality are of significant interest and concern to Fort McKay and vital to the exercise of our rights. We look forward to on-going consultation regarding these frameworks as well as the rest of the LARP.

Sincerely,

A handwritten signature in blue ink that reads "Lisa Schaldemose". The signature is fluid and cursive, with the first name being more prominent.

Lisa Schaldemose,  
Executive Director  
Fort McKay Industry Relations Corporation

Cc: Jim Boucher, Chief, Fort McKay First Nation  
Phil Peddie, CEO, Fort McKay First Nation  
Ron Quintal, President, Fort McKay Métis Local 63  
Dan Stuckless, Fort McKay IRC  
Karla Buffalo, Fort McKay IRC  
Karina Andrus, Aboriginal Relationships and Policy Implementation, AENV



# Attachment I

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***Comments on AENV AQMF - July 2010***

# July 7, 2010 Draft “Lower Athabasca Region: Air Quality Management Framework”

## The Fort McKay IRC’s Questions, Comments and Suggested Revisions Prepared by David Spink of behalf of Fort McKay IRC (August 2010)

1. **General:** Fort McKay supports the general concepts and approaches outlined in the draft AQMF for the LAR and the selection of NO<sub>2</sub> and SO<sub>2</sub> as the initial pollutants covered by the Framework. Fort McKay also believes that, with some important exceptions, the draft Framework represents an important, practical and potentially effective component of a comprehensive regional air quality management system. These exceptions are:
  - a. **Air Quality Objectives (AQOs)** – the current AQOs for SO<sub>2</sub> and NO<sub>2</sub> are outdated and new provincial AQOs (or regional AQOs) for SO<sub>2</sub> and NO<sub>2</sub> should be set before the AQMF is finalized. Without new/different AQOs the Fort McKay could not support the AQMF as currently drafted.
  - b. **Air Quality (AQ) Monitoring** – for the proposed AQMF to have credibility stakeholders must have confidence that the monitoring system supporting the Framework is appropriate. Fort McKay is a strong supporter of WBEA but is not sure that the current monitoring network is adequate to support the Framework. The framework should therefore include a monitoring program review to determine if any regional air quality monitoring enhancements or changes that are necessary to support the Framework and its air quality management principles. This review needs to have a multi-stakeholder consultation component.
  - c. **Consultation** – If and/or when any Level 2, 3 or 4 triggers are reached that are associated with air quality in Fort McKay, on Fort McKay Reserve Land or on Fort McKay’s Traditional Lands, Fort McKay expects to be consulted on the type of assessment that is conducted and the management plan, if any, to address the identified AQ issue. This consultation expectation could possibly be achieved through a standing multi-stakeholder group depending on the nature and structure of such a standing group.
  - d. **Emission Management** – The two foundations of effective air quality management are minimizing emissions and the application of good protective ambient air quality standards/objectives/guidelines. For stakeholders to have confidence that AQOs, and this Framework, are not allowing AQ deterioration beyond what is necessary, or allowing measurable/significant environmental effects, the Framework must be put into a broader regional AQ management system context. This will allow stakeholders to understand the role of the Framework relative to other policies, principles, regulatory requirements, frameworks etc.

Additional comments on these issues, and on other elements of the draft AQMF, are outlined below.

2. Introduction (page 5):

- a. The statement is made that: “Existing and planned activities within the Lower Athabasca Region (LAR) will produce air emissions that may affect regional air quality.” Regional air quality has already clearly been affected by municipal and industrial developments i.e. SO<sub>2</sub>, NO<sub>x</sub>, VOC, TRS/H<sub>2</sub>S and PM<sub>2.5</sub> levels in parts of the region are much higher than they would be without industrial activity. This reality should be acknowledged and we recommend a statement along the following lines: “Existing activities within the Lower Athabasca Region (LAR) are having an impact on local and regional air quality and these impacts can be expected to increase with planned and possible future regional activities.”
- b. The statement that: “Ambient air concentrations are not uniform throughout the LAR for most pollutants; rather they are specific to locations as a result of local activities.” should be qualified. For example the density of surface mining activity north of Fort McMurray means that so called local activities cover an area in the order of approximately 10,000km<sup>2</sup>. We suggest that the statement be reworded to: “Ambient air concentrations are not uniform throughout the LAR for most pollutants; rather they are significantly influenced by the location, density and nature of the developments in the area. The extensive nature of certain developments such as surface oilsands mining operations means that the area of influence from cumulative emissions can be large.”
- c. Fort McKay supports the shift reflected in the statement that: “To achieve the flexibility required in a preferred management approach and to manage cumulative effects on air quality in the region, the focus of this Framework shifted from emission thresholds to ambient air quality.” We are not sure if these means that regional or sub-regional thresholds will not be established at this time. From its meeting with Alberta Environment on July 26<sup>th</sup> regarding the AQMF it is Fort McKay’s understanding that regional caps/thresholds will not be set. Clarification on this should be provided and it could/should be noted that a possible emission management plan triggered by the Framework could lead to emission thresholds/caps.
- d. Last paragraph – “*Managing the cumulative impacts of air emissions through ambient air outcomes ...*” is an important element of an Air Quality Management Framework. However the federal Comprehensive Air Management System (CAMS), the Clean Air Strategic Alliance (CASA) Clean Air Strategy, Canadian Council of Ministers of the Environment (CCME) PM and Ozone Canada Wide Standards (CWS), and Alberta Environment Industrial Release Policy collectively clearly identify the importance of:
  - i. pollution prevention,

- ii. best emission management/control practices,
- iii. continuous improvement from existing sources, and
- iv. applying the Keeping Clean Areas Clean principle i.e. trying to minimize air quality impacts regardless of air quality limits.

Fort McKay therefore suggests that the this last paragraph begin with a statement along the lines that: *“Developing a comprehensive air quality management framework for the LAR requires that well recognized and provincially adopted environmental protection and management principles such as pollution prevention, emission minimization through best management/control practices, continuous improvement and keeping clean areas clean be considered and applied. It is also requires managing the cumulative impacts of air emissions through establishing ambient air outcomes and quality expectations. This aligns with recommendations....”*

Where and how the AQMF fits with these other policies, principles, etc. should be outlined in a separate section near the beginning so that stakeholders clearly understand the context for, and role of, this Framework in relation to other AQ management activities e.g. application of BATEA, other regional frameworks related to SO<sub>2</sub> and/or NO<sub>x</sub> management e.g. the CEMA Acid Deposition Management and Ozone Management framework and Nitrogen Management Recommendations and Work Plan.

3. The Lower Athabasca Region (Page 5 and 6):

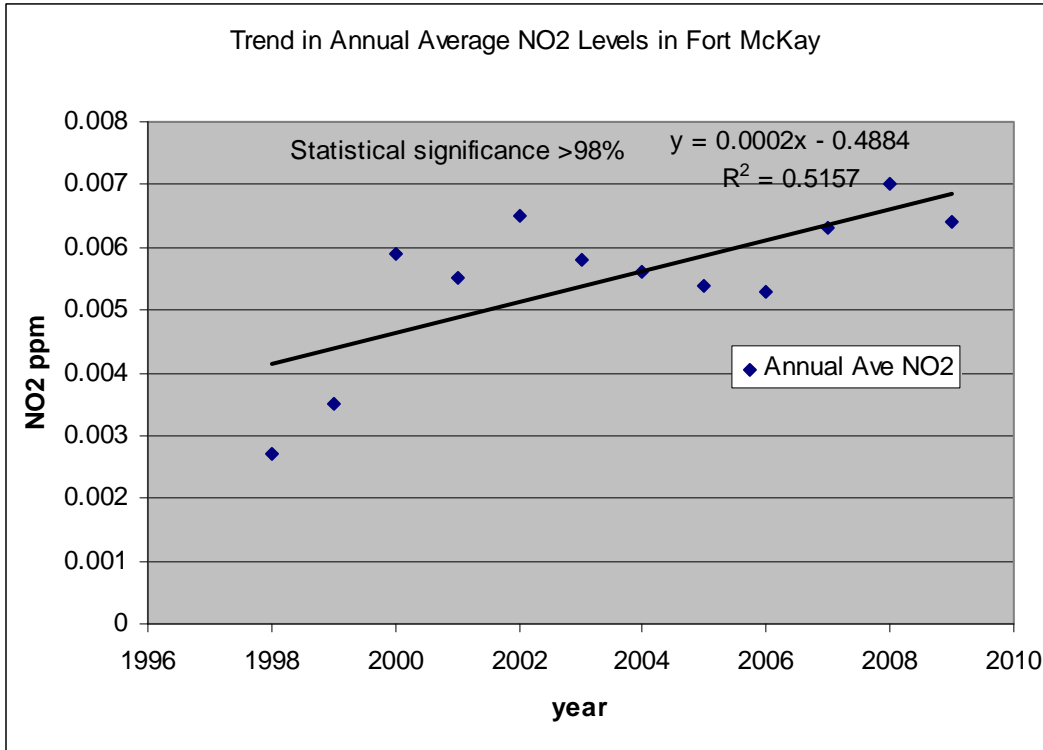
- a. In this section it should be noted that the region is home to a number of First Nation and Métis communities, settlements and reserves and aboriginal peoples have expressed concerns regarding the impact of industrial air emissions on health, the environment and overall quality of life in the region e.g. odours and visibility.
- b. “topography and land cover” also affect the spatial variability in emission related contaminant concentrations and should be added to the list of factors affecting spatial concentrations.
- c. Since NO is also an important air pollutant it is suggested that the list of pollutants read: *“...various air pollutants, including nitrogen oxides NO<sub>x</sub> (NO and NO<sub>2</sub>), sulphur...”*.
- d. Consideration should be given to adding NH<sub>3</sub> to the list of emission sources with Syncrude’s FGD unit being the single largest point source.
- e. The initial focus of the Framework on NO<sub>2</sub> and SO<sub>2</sub> is supported but there should be a statement here on the management strategy envisioned for other parameters even though this is covered in Section 4.2.7.

4. Section 2.1 The Importance of NO<sub>2</sub> and SO<sub>2</sub> (page 6):

- a. Additional reasons for a focus on NO<sub>2</sub> and SO<sub>2</sub> are:

- i. These are two of the major pollutant emission types in the region
  - ii. Emissions of NO<sub>x</sub> are predicted to increase with expanded development
  - iii. Increasing and/or elevated levels of these pollutants have or are being detected (note: there is a clear increasing trend in NO<sub>2</sub> levels in Fort McKay and SO<sub>2</sub> levels are sometimes elevated with the last 1 hour exceedence of the AAAQO in Fort McKay occurring in 2007)
- b. Suggest the statement: “The contributions of NO<sub>2</sub> and SO<sub>2</sub> to acid deposition and eutrophication may occur over several years.” be changed to “Acid and nitrogen deposition and their long term acidification and eutrophication (fertilizing) impacts are another potential environmental issue associated with NO<sub>2</sub> and SO<sub>2</sub> emissions.”
5. Section 2.2 Air Monitoring Network (page 6):
- a. The statement that: “Airshed zones seek to understand and manage air quality by addressing regional issues and by implementing air monitoring systems to meet their specific monitoring requirements.” may be an overstatement in terms of WBEA which doesn’t per se “manage air quality” but rather assists in air quality management by providing reliable air quality and air-related environmental effects data. In the RMWB the development of air-related environmental management plans and frameworks has been, and is currently being, done by CEMA and/or the GOA.
  - b. The statement: “The two airshed zones, like others in the province, involve local groups of stakeholders – including citizens, industry and government – who play key roles in identifying and managing air quality concerns.” again somewhat overstates the role of at least WBEA in regional air quality management and should probably indicate that the airshed zones: “.....play key roles in identifying and assisting in the management of air quality concerns.” Also this statement should specifically note “aboriginal groups” in the list of stakeholders.
  - c. It is not clear whether or not this section is focused only on NO<sub>2</sub> and SO<sub>2</sub>. If the focus is on NO<sub>2</sub> and SO<sub>2</sub> then this should be stated and comment d. below is not applicable.
  - d. The statement: “Data collected includes continuous (hourly) and passive (monthly) measurements.” could be expanded to include “integrated/intermittent measurements ( a 24 hour integrated samples collected on a regular cycle e.g. every 6 to 30 days depending on the parameter(s)”. Integrated monitoring is an important part of the WBEA monitoring program as relates to VOCs, PAHs, wet ppt. and PM composition. Also meteorological data collection, which is critical to understanding the effects of air emissions on air quality as noted on page 6 of the draft Framework, should be mentioned/described.

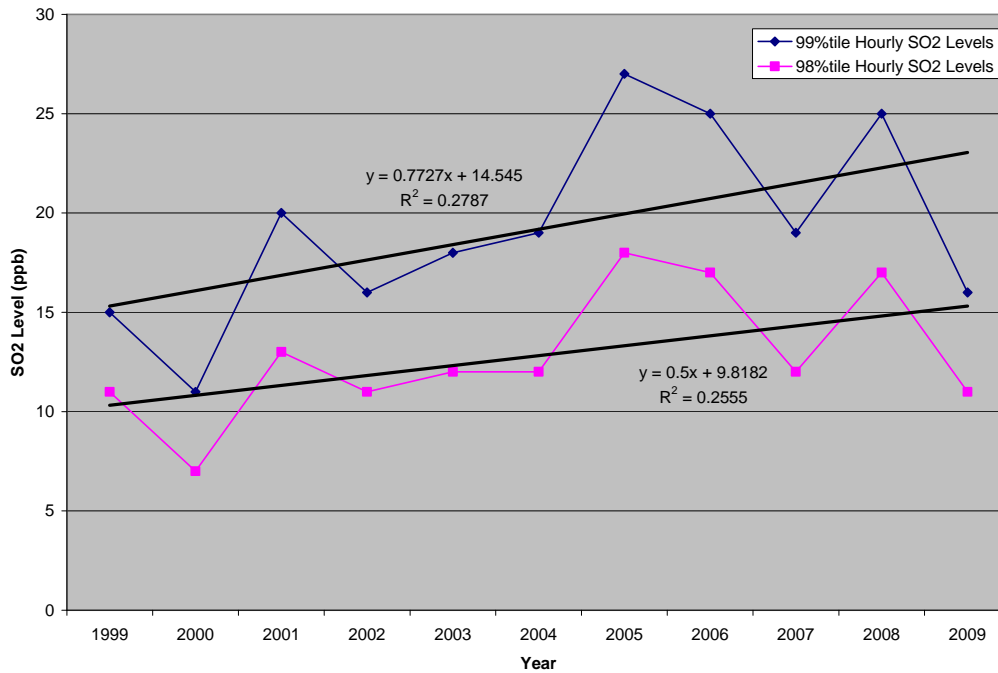
- e. While the WBEA association has a good air monitoring network, as noted in the draft AQMF, there may be some limitations in terms of meeting the needs of the AQMF and it is Fort McKay's position that once the AQMF is finalized a multi-stakeholder process should be initiated to review what if any additional or alternate monitoring is required to meet the needs/expectations of stakeholders. Monitoring in the right locations will be essential if stakeholders are to have confidence that AQ information being used in the AQMF is appropriate.
6. Section 2.3 Types of Monitoring (page 7-9):
- a. In WBEA there are two monitoring stations that are classified as "attribution". These are located between industrial sources and Fort McKay and are used to help determine which industrial sources may be influencing air quality in Fort McKay particularly during poor air quality events in the community. These types of stations should be noted and briefly described under the "industrial stations" section. In addition to "background" stations, there are "transboundary" stations that are intended to provide an indication of the air quality entering and exiting (depending on wind direction) an airshed or on a larger scale entering and/or exiting the province. WBEA does not have any of these types of stations per se but some stations could serve this purpose and the need for, value of, such stations has been discussed. Such stations at the Saskatchewan border and at the southern end of the region would address important issues/concerns related the import and export of particularly acidifying and nitrifying air contaminants and ozone precursors. The Framework should briefly note this type of monitoring and its potential value/uses. Meteorological monitoring is important and WBEA has a number of meteorological monitoring stations/sites that are intended to collect representative sub-regional meteorological data.
  - b. As noted in comment 5)d. above there are other sampling/averaging times if this section is to be generic and if the focus is on NO<sub>2</sub> and SO<sub>2</sub> this needs to be clearly indicated.
7. Section 2.5 Current State of Ambient NO<sub>2</sub> and SO<sub>2</sub> (Page 9/10):
- a. The statement: "Annual average NO<sub>2</sub> levels have increased at specific industrial stations in the oil sands region, based on historical data dating back to 1999; however, annual average NO<sub>2</sub> levels have remained fairly consistent at community and most industrial stations." is not correct for Fort McKay. Linear regression of annual average NO<sub>2</sub> levels in Fort McKay for the period 1998 to 2009, inclusive, yields a statistically significant (significance level of ~0.02) positive upward trend in annual NO<sub>2</sub> levels in Fort McKay during this period. See the figure below:



- b. The statement that: “The upper range of the ambient concentrations of NO<sub>2</sub> and SO<sub>2</sub> has also remained fairly consistent, despite increasing trends in peak NO<sub>2</sub> at a couple of industry stations near mining operations. Hourly NO<sub>2</sub> and SO<sub>2</sub> concentrations remain below AQO levels at community stations.” needs some additional qualification. Based on the recent the WBEA Ambient Air Quality Data Summary and Trend Analysis the upper range of concentrations (80<sup>th</sup>, 90<sup>th</sup>, 95<sup>th</sup> and 98<sup>th</sup> percentile concentrations) of NO<sub>2</sub> in Fort McKay have been increasing. Also, in 2007 there was an exceedence of the 1 hour AAAQOs for SO<sub>2</sub> in for McKay.

As the following figure shows there has been an upward trend in the upper range of SO<sub>2</sub> levels in Fort McKay. These increases are significant at a 90% confidence interval (two-tailed).

98 and 99%tile Hourly SO2 Levels in Fort McKay (1999-2009 period inclusive)



8. Section 3 Concept of the Air Quality Management Framework (Pages 10-12):
  - a. As noted previously, the general write-up on the concept should clearly indicate that the Framework represents only one component of a comprehensive air quality management system (section 3.3. notes this but this general context needs to be provided immediately). The write-up should indicate that, consistent with other federal and provincial policies, regional emissions are expected to be minimized through the application of best management practices and continuous improvement and that this AQMF is intended to address the potential issue of cumulative regional and/or local emissions resulting in adverse air quality impacts despite the application of best emission management practices. It is suggested this context be provided/added after the 1<sup>st</sup> sentence in Section 3.
  
9. Section 3.1 Why an AQMF is Needed in the LAR (Page 10);
  - a. The statement: “An AQMF will support long-term certainty in Alberta’s policy and regulatory process; provide clarity for industry, early in their design cycle, about operating requirements for emissions management; and help identify available capacity in the region for new development.” raises some concerns in that it seems to imply a “pollute up to approach”. We suggested that the statement be modified as follows: “.....provide clarity for industry, early in their design cycle, about operating requirements for emissions management beyond best practices that may be necessary due to cumulative



impacts; and help identify available capacity in the region for new development.”

10. Section 3.3 How the AQMF Works (Page 11):

- a. The section: “The appropriate management response or action may include steps to collect more data to understand the ambient air quality trigger or actions to reduce emissions and prevent ambient concentrations from reaching unacceptable levels defined by Alberta’s AQOs. Other regional or provincial frameworks consider the longer term effects on the environment (see Section 3.3). While AQOs for both short-term and long-term ambient concentrations of NO<sub>2</sub> and SO<sub>2</sub> have been established, no framework is in place to take action proactively to prevent reaching the AQOs. Maintaining a proactive approach to good air quality will keep costs down for health, environment and development within the area, as it will reduce the need to retrofit or restore. In addition, proactive planning will help inform regulatory needs to ensure that development can continue to occur without reaching the AQOs.” contains a number of issues of concern to Fort McKay. These are:
  - i. AQOs are being linked to good air quality and air just meeting the AQOs on a regular basis would by any reasonable benchmark be viewed as very poor/unacceptable air quality (see Table 1 below). It is recognized that the Table 5 limits partly address this issue.
  - ii. It is not clear whether or not staying just below AQOs is acceptable or if the intent is to “prevent reaching the AQOs” which could be interpreted as wanting to stay somewhat or well below AQOs.
  - iii. the Industrial Release Policy addresses managing emissions to stay within environmental quality limits just not within the context of a regional framework

These and other issues related to the AQMF approach and use of AQO’s are elaborated upon in subsequent comments.

**Table 1 - Annual mean SO<sub>2</sub> and NO<sub>2</sub> comparison between AAAQOs and air quality in other world cities**

Parameter	AAAQO	Air Quality in Other World Cities*		
		Mexico City	Sao Paulo	Los Angeles
Annual SO <sub>2</sub> , (µg/m <sup>3</sup> )	30	34	10	3
Annual NO <sub>2</sub> (µg/m <sup>3</sup> )	60	59	63	75

\*Mean annual levels for 1997 adapted from Air Quality in Ontario (1998) published by the Ontario Ministry of the Environment

11. Section 3.3 Regulatory Context (Pages 11/12):

- a. The statement: “The desired outcome of the AQMF is consistent with the referenced policies and strategies: Good air quality that supports human health and ecosystems, while promoting economic development.” is challengeable on at least two grounds. Firstly, as noted in comment 10 above, air quality just meeting the AQOs would not be considered good air quality. Secondly, the annual average AQMF allows air quality to deteriorate to AQOs levels which is a “pollute up” to approach. This approach is inconsistent with a “keeping clean areas clean” principle which is referenced in the CASA Recommendations for a Clean Air Strategy (2009) and CCME CWS for PM and Ozone. To be consistent with these policies/principles the Framework AQO’s would have to be set at levels that truly represent good air quality and not at levels that “... are intended to protect the environment and population health to an extent technically and economically feasible, as well as being socially and politically acceptable.” (Section 4.2.1). The Fort McKay is also not aware of any comprehensive analysis on the “technical and economic feasibility” of meeting AQOs on a local, regional or provincial scale and has not seen any criteria for determining whether or not an AQOs is “socially and politically acceptable”. This issues and concerns support the development of regional AQOs that reflect the specific social, economic and technical issues applicable to the region. This could be a recommendation for future AQMF parameters and future updates to the SO<sub>2</sub> and NO<sub>2</sub> elements of the AQMF. Getting endorsement from regional stakeholder groups of provincial AQOs would be a possible alternative to region specific AQOs.

Also with respect to general air quality management, in Annex A to the CWS for Particulate Matter and Ozone it is stated that: *“There are numerous locations across Canada that have ambient levels of PM and/or ozone below the CWS levels but still above the levels associated with observable health effects. There is a need to ensure that the public recognizes that the CWS levels are only a first step to subsequent reductions towards the lowest observable effects levels. It would be wrong to convey the impression that no action is required in these areas or that it would be acceptable to allow pollutant levels to rise to the CWS levels. Jurisdictions should take remedial and preventative actions to reduce emissions from anthropogenic sources in these areas to the extent practicable.”* Fort McKay would submit that the same approach should be followed for NO<sub>2</sub> and SO<sub>2</sub> management in the LAR.

12. Section 4 The LAR AQMF (pages 12-25):

- a. **Introduction:** In general, the numerical elements/approach (i.e. annual average and maximum hourly value based management criteria) of the AQMF are sound/reasonable except for the use of AQOs as the maximum acceptable air quality levels for annual average values. The Provincial Land-use Framework which states that: *“The Government of Alberta will develop a*

*process to identify appropriate thresholds, measurable management objectives, indicators and targets for the environment (air, land, water and biodiversity), at the regional levels and, where appropriate, at local levels.”* As noted in comment 11 it would be desirable to either develop region specific AQOs or ensure that provincial AQOs have regional stakeholder endorsement.

- b. **Section 4.1 Fundamentals:** As noted above, with the exception of the use of AQOs as the basis for some of the air quality triggers, the general fundamentals are considered comprehensive and appropriate. Monitoring is briefly mentioned in the introduction to Section 4 but is also a fundamental that should be listed. As noted previously, to be effective, and to have public credibility, monitoring at regionally representative and key human and environmental exposure locations needs to be part of the framework regardless of the current monitoring networks. In this regard the Fort McKay takes the position that the AQMF should be one of the key considerations in monitoring, and in some cases guide/direct monitoring.
- c. **Section 4.2.1 Alberta’s Ambient Air Quality Objectives:** The following are a number of comments on what is seen as the major impediment to the acceptance of the proposed AQMF by Fort McKay:
- i. The multi-stakeholder processes used to set priorities for the development and/or review of AQOs and the subsequent multi-stakeholder processes used to help develop the specific AQOs are generally good. To date these processes have had limited to no representation from aboriginal communities and as such the existing AQOs cannot be considered to have any endorsement from aboriginal groups in the LAR.
  - ii. Even though the AQOs evolve through multi-stakeholder processes, unless all affected stakeholders are engaged, and unless consensus is reached, the resultant AQOs cannot and should not be assumed to be acceptable to aboriginal communities. It is the Fort McKay IRC’s understanding that consensus could not be reached on new AQOs for both NO<sub>2</sub> and SO<sub>2</sub> based on industry/government blocks. In such circumstances strong provincial leadership is needed to ensure that air quality objectives protective of the health and the environment are set. If this does not occur then aboriginal stakeholders can have no confidence that AQOs are protecting their health and environment but rather are just set/maintained to ensure that industry has minimal air quality compliance issues.
  - iii. It is Fort McKay’s understanding from the June 2009 Alberta Ambient Air Quality Objectives and Guidelines document that AQOs for NO<sub>2</sub> and SO<sub>2</sub> are to be used to:
    - determine adequacy of facility design,
    - establish required stack heights and other release conditions, and

- assess compliance and evaluate facility performance.

These are all facility/emission related AQOs uses which are not related to general air quality management and therefore the use of the AQOs as general air quality management tools seems inconsistent with the stated purpose of the AQOs.

- iv. The current AQOs are clearly out of date in terms of public health protection, based on recent WHO and USEPA health effects reviews, and related guidelines/standards updates for NO<sub>2</sub> and SO<sub>2</sub>. To develop an AQMF based on the current AQOs for NO<sub>2</sub> and SO<sub>2</sub> is therefore not scientifically supportable and cannot be supported by Fort McKay. Fort McKay suggests that Alberta Environment make a decision on the new provincial NO<sub>2</sub> and SO<sub>2</sub> objectives prior to finalizing the AQMF and give stakeholders a chance to comment on these new objectives as they relate to this framework.
- v. The 2000 WHO guidelines vegetation effect level guidelines for NO<sub>2</sub> and SO<sub>2</sub> are much lower than the AQOs. The WHO values are more current than the AQOs, and therefore it is the Fort McKay's position that these WHO levels should be used to address (protect against) the potential direct environmental effects of these pollutants in the LAR.
- vi. The Fort McKay IRC participated in the CASA 2009 Priority Setting Workshop for AQOs at which Alberta Environment indicated that: *"AAAQOs are often a compromise between science and achievability. They are not entirely protective of human health and/or the ecosystem and, importantly, they are not a safe level that can be polluted up to."* The proposed AQMF is definitely inconsistent with this statement.
- vii. Fort McKay recognizes that industrial development and associated economic benefits does not occur without some environmental costs. In order to balance economic benefits and environmental impacts a clear understanding of safe i.e. no effect, levels of air contaminants is needed. The AQOs do not provide this because as noted in the draft AQMF they are not solely based on health and/or environmental protection but rather: *"...are intended to protect the environment and population health to an extent technically and economically feasible, as well as being socially and politically acceptable."* As noted in comment 12 a), the Land-use Framework anticipates the setting of regional air thresholds and objectives and it is the position of Fort McKay that these should be set with a clear understanding of what no-effect levels. This allows for an assessment of the real implications, both economic and with respect to health and environment of being above or below these levels.

- d. **Section 4.2.2 Characterization of Air Quality and Source Attribution:** The following are comments on Section 4.2.2 which is considered, along with the

proposed use of AQOs, as one of the key issues/areas of concerns that Fort McKay has with the draft AQMF.

- i. Where, how and when you monitor can determine the stringency of an objective. For example in the new United States Environmental Protection Agency (USEPA) 1 hour NO<sub>2</sub> standard compliance is to be determined in urban areas by measurement at areas of expected maximum concentration, e.g. near major roadways, which makes it a more stringent standard than if monitoring was to be away from specific sources. So where monitoring is done will in large part determine whether or not an objective is being met. For this reason, as noted in Comment 12.b above, monitoring locations, or at least where/how monitoring stations related to the framework should be sited, needs to be specified as part of the AQMF. Ideally the Framework should have an implementation element that includes a formal multi-stakeholder review of the monitoring needs associated with the Framework.
- ii. In terms of industrial stations, if these are located at sites of maximum expected ground-level concentration associated with local/regional industrial emissions, then the use of AQOs at these worst case sites may be appropriate. This view is based on the fact that the management trigger is based on a sensitive (highest exposure) monitoring location which means conservatism. In the event of trigger levels being reached at these sites the ensuing management actions can assess significance.
- iii. With respect to the statement: "Management responses associated with industry stations reaching ambient air quality triggers (annual or hourly) will involve the identified facilities and might involve forecasting trends and understanding future operational and development plans." it should be noted that where such stations are on Fort McKay's traditional lands then Fort McKay would be expected to be involved.
- iv. For population centers there are 3 cases/scenarios i.e. 1) air quality is largely impacted by internal activities (Fort Chipewain might fall into this category), 2) air quality is largely a function of external industrial emissions (Fort McKay would fall in this category), and 3) air quality is affected by internal sources and external industrial sources (Fort McMurray might fall into this category). Note: the influence of background is assumed to be the same for all three of these scenarios. For Fort McKay's situation, if the approach in 2 above for industrial sources is used, and cumulative impacts at industrial sites are considered, then AQOs would seldom, if ever, be exceeded in the community. This is because the industrial emission impacts influencing community air quality would be managed/captured through the industrial/compliance monitoring and management elements of the AQMF provided these also consider cumulative

impacts. It is Fort McKay's understanding that this was the intent of AQOs and related compliance monitoring.

- v. Health related impacts associated with industrial emissions can affect onsite workers and residents (which are part of some projects) and offsite communities like Fort McKay. To apply the same general model to industrial compliance and community air quality results in a compromise in the protection of public health. For the industrial monitoring case, actual human exposure is likely minimal (except in the case of onsite residents) and it in general represents a worst case local AQ scenario/situation. In the population case, a large number of people are likely exposed but the air quality in a community would be expected to be much better than that measured through worst case fence line monitoring especially if internal community emission sources are minimal as in Fort McKay.
- vi. Background stations are really air quality integration stations that, depending on wind direction, reflect air quality from the region the wind is blowing from. Based on the extensive nature of development in the LAR it would be expected that under certain wind direction conditions background stations would clearly detect the cumulative impact of regional industrial emissions.

**e. Section 4.2.3 Ambient Air Quality Triggers and Limits:** The use of a four level approach and the related descriptors are considered to represent a good AQMF approach with the only issue/concern being the use of the AQOs as the level 4 trigger.

i. Section 4.2.3.1 Annual Average Ambient Air Quality Triggers and Limits:

- **SO<sub>2</sub>:** The limits proposed for SO<sub>2</sub> may be appropriate for industrial monitoring stations which are subject to direct and higher SO<sub>2</sub> emissions. However the WHO annual limit for SO<sub>2</sub> for protection of vegetation is 10 ug/m<sup>3</sup> for lichens and 15 ug/m<sup>3</sup> for forests. In this regard 50% and 33% fractions may be more appropriate as triggers.

For community stations, which have limited internal SO<sub>2</sub> emission sources, the proposed limits would represent a very significant increase in levels above current levels e.g. for Fort McKay the level 2, 3 and 4 triggers would represent 2.5, 5 and 7.5 fold SO<sub>2</sub> increases from the 2008 average annual SO<sub>2</sub> levels in the community. It is suggested that for community stations the level 2 and 3 triggers be set at 25% and 50% of the current AQO on the basis that, in such environments, the desire is to; 1) minimize human exposure to SO<sub>2</sub>, 2) protect air quality where people reside and spent most of their time, and 3) allow the

need for action to be assessed earlier rather than later when/if SO<sub>2</sub> levels are increasing. These more conservative trigger levels would still allow considerable increases in the annual ambient SO<sub>2</sub> levels in communities based on current monitoring data. The approach does not therefore have any immediate AQMF implementation issues and is not likely to result in any issues in the future since it would still allow a 2 to 5 fold increase in ambient SO<sub>2</sub> levels in Fort McKay, Anzac and Fort McMurray.

- **NO<sub>2</sub>:** In general the same the comments and approach as outlined above for SO<sub>2</sub> are applicable to NO<sub>2</sub>. It is recognized that NO<sub>2</sub> is slightly more complicated than SO<sub>2</sub> as urban transportation can contribute significantly to NO<sub>2</sub> levels in communities. NO<sub>2</sub> levels in Fort McMurray already reflect these significant internal NO<sub>x</sub> emission sources. Based on current NO<sub>2</sub> levels in the region the suggested 50 and 25% fractions could result in a level 2 trigger in Fort McMurray and a level 3 trigger at Millennium mine. The WHO annual limit for NO<sub>x</sub> for protection of vegetation is 30 ug/m<sup>3</sup> (as NO<sub>x</sub>) which would support having the recommended lower trigger levels that would allow early initiation of the assessments to determine risk to regional vegetation.

ii. **Section 4.2.3.2 Hourly Air Quality Objectives:** The general approach to addressing hourly air quality issues is strongly supported.

iii. **Section 4.2.3.3 Ambient Air Quality Triggers: Upper Range of Hourly Data for NO<sub>2</sub> and SO<sub>2</sub>:** The following are comments regarding this section of the AQMF:

- In general this is considered the most important element of the AQMF because 1 hour limits are intended to address immediate health impact issues and 1 hour values can vary significantly.
- The 98%tile approach for NO<sub>2</sub> and related trigger levels are supported.
- For SO<sub>2</sub>, a 99%tile approach and a Level 4 trigger of 75 ppb, consistent with the new USEPA SO<sub>2</sub> standard, should be used. Fort McKay would be prepared to consider a 98%tile criteria for SO<sub>2</sub> if the Level 2, 3 and 4 triggers were 25, 50 and 75 ppb respectively or would be prepared to consider the proposed SO<sub>2</sub> Level triggers if they were based on the 99th percentile of the maximum daily one-hour averages, averaged over three years. Hourly SO<sub>2</sub> values are an issue in Fort McKay with an exceedence of the 1 hour AQO occurring in 2007. Using the

new USEPA SO<sub>2</sub> standard as a metric, in the 1999 to 2009 period there would have been two 3 year periods (2004-2006 and 2005-2007) when the that standard would have been exceeded. It is Fort McKay view that based on historical 1 hour SO<sub>2</sub> data the community should be at a Level 3 management level based on maximum hourly SO<sub>2</sub> levels and the identified potential health effect levels associated with these levels.

- f. **Section 4.2.4 Management Response to Ambient Air Quality Triggers and Limits (pages 18 – 22):** Overall the general management approaches outlined are supported however the following additions would be required to meet the Fort McKay's expectations with respect to consultation:
- i. An annual air quality assessment of the region would be conducted and a report prepared on the status of the region relative to the AQMF and this report would be provided to Fort McKay with an identification of any follow-up assessments that are planned as a result of the assessment.
  - ii. Alberta Environment would consult with Fort McKay on the appropriate follow-up management strategy if the annual air quality assessment identifies that any Level 2, 3 or 4 triggers have been reached at monitoring sites within Fort McKay's Traditional Lands.
  - iii. Under the Stakeholders column in Table 6, at the Level 3 trigger, a role for Airshed Zones is identified as: *"Engagement, if required, in emissions management planning and facilitation."* In the RMWB this role has been filled by the NO<sub>x</sub>SO<sub>x</sub> Management Working Group of CEMA (which may be amalgamated with the TMAC Group to form a CEMA Air Working Group). It is Fort McKay's expectation that if a multi-stakeholder process is established that this be done through CEMA and Table 6 should reflect this.
  - iv. Related to comment 3 above, Fort McKay suggests that a standing multi-stakeholder committee be established to provide guidance on annual air quality assessments and possible follow-up actions. In the RMWB this standing committee could be the planned CEMA Air Working Group which would help ensure that air quality management activities in the region are co-ordinated and stakeholders are actively engaged in the application of the AQMF. Such a committee could negate the need for the specifics identified in 1 and 2 above but Fort McKay would have to make this determination after the AQMF is finalized and specific implementation plans are developed.
- g. **Section 4.2.5 Communication of Response:** Fort McKay agrees that providing information on past, current and likely future air quality and how air quality is being protected/managed is important. Since the AQMF represents only one element of a comprehensive air quality management system (see comments 1d, 2.d and 8a). In annual air quality assessment



reports, in addition to ambient air quality levels relative to AQMF triggers, information on the following should be provided:

- the status of any relevant AQO development/revisions,
- a summary of existing emission control requirements, why these are considered to represent “best practices” and any activities underway to revise/update these requirements,
- past, current and projected regional emissions of key air contaminants and the major sources of these contaminants, and
- a summary of any major continuous improvement measures that have been taken over the last year or which are in the planning stages.

Collectively it is this type of information and communication that will, as noted in this section: “... *demonstrates that actions are being taken to effectively manage air quality.*”

**h. Section 4.2.6 Role of Modeling vs. Monitoring in the Framework Levels:**

As noted previously, Fort McKay supports the concept of a monitoring based AQMF provided that as part of initial implementation of the Framework there is a review of the monitoring network and Fort McKay views it as adequate. It is not clear from the draft AQMF when Alberta Environment would undertake modeling and Fort McKay believes that periodic regional air quality modeling (e.g. every 3-5 years) independent of any project application should be undertaken. This type of modeling should involve stakeholders in its planning and execution and would identify areas at potential risk and guide related monitoring activities.

- i. Section 4.2.7 Identification of Pollutants to Manage:** As noted above (comment 12.f.3), in the RMWB it is CEMA and not WBEA that has been involved in identifying air contaminants for management. It is therefore suggested part of this section be reworded as follows: *“The objectives of existing airshed zones (WBEA and LICA) and in the RMWB CEMA include identifying substances of concern for their areas. Alberta Environment, working with the airshed zones and CEMA in the RMWB, will assess whether the AQMF could be applied to those identified pollutants. This type of management framework would work well for substances that have established AQOs and are monitored in the area.”* For substances for which no AQOs have been established, or for which regional thresholds are considered desirable or appropriate (see comment 12.a), Fort McKay strongly supports the use of the Air Contaminants Management Framework (ACMF). Fort McKay also suggests that the planned new CEMA Air Working Group be the Multistakeholder Regional Advisory Panel recommended in the ACMF.

# Attachment J

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## *Surface Water Thresholds*

## **Surface Water Thresholds, December 8<sup>th</sup>, 2009 meeting**

**Fort McKay representative: Ron Bothe**

There was not much detail to report on the December 8<sup>th</sup> meeting from the surface water side. Two topics were presented by AENV. We brought up a third, as outlined below.

### **Lower Athabasca River Water Management Framework**

The plan is to incorporate this directly into the LUF. This is a positive step.

### **Athabasca River Water Quality**

The 3-dimensional model of the lower Athabasca River is essentially complete. In-house training on its use is on-going. The model will be used to refine the current list of water quality parameters being monitored and will help guide future effluent licensing. As this model is not coupled to land forms and land use as the HSPF surface water model is, it will be used to replicate observations of the river water quality and assess changes from point loads measured/predicted in tributaries and end of pipe inputs.

### **Muskeg River Water Management Plan**

Finalizing the MRWMP does not seem to be a priority for AENV. AENV feels that their interim measures will provide adequate protection. With Shell's Jackpine Expansion hearing in the offing it is critical to get a management plan in place that helps direct and harmonize development. Fort McKay feels that finalization of the plan is needed and should be completed as early as possible. If AENV cannot provide firm timelines, then consideration should be given to returning the work to CEMA. An Ohlson process similar to the Athabasca River could see this completed within two years.

# Attachment K

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## *Interim GW Management Framework*

# Government of Alberta - Interim Groundwater Management Framework

**Athabasca Oil Sands Region - Reviewed by Agua Consulting, December, 2009**

## Framework Components

This Interim Groundwater Management Framework (GWMF) applies to the mineable oil sands area. Similar GWMFs are planned for the SAGD oil sands area, south of Fort McMurray, and for the Cold Lake – Beaver River Basin. The GWMF was developed by the Alberta Environment (AE) Water Element Team under the direction of a Technical Advisory Committee from AE and related government departments. A two-day workshop was held including members from the Team and the Committee as well as stakeholders from industry and the Saskatchewan Water Authority.

The goal of the framework is to manage groundwater resources in a sustainable manner and to protect groundwater from contamination or overuse. The intent of the framework is threefold, to:

- Provide direction to regulators regarding potential cumulative effects from activities,
- Assist industry with regard to assessing specific issues and
- Assist groundwater users to manage the resource sustainably.

The main components of the framework are to:

- Establish science-based targets and limits for groundwater quality and quantity issues,
- Monitor and measure ecosystem health and
- Manage activities to meet targets and limits.

The guiding principles for the framework include:

- No regional contamination of potable or usable groundwater aquifers and
- Maintenance of existing groundwater flow conditions and related interactions\*.

\*Alberta Environment (AE) acknowledges that no indicators exist for aquifer reclamation and that AE will work on policy and guidelines for reclamation of significant and high priority aquifers to get hydraulic integrity of the landscape and subsurface.

AE acknowledges that this “interim” framework requires more stakeholder input.

The final product is to be a regional groundwater management structure using adaptive management and performance monitoring.

## Next Steps in the Development and Implementation of the GWMF

- The interim GWMF will be reviewed by stakeholders and then become adopted as the guiding document for groundwater management in the region.
- This interim GWMF will need to be consulted for all activities related to groundwater and relevant approvals will need to be updated with guiding principles contained in this framework.
- Through adoption of the management framework, Alberta Environment anticipates an engaged community that understands and accepts the future sustainable groundwater development and other competing resources in the AOS region.

## General Comments

The GWMF was developed by a team, with input from technical advisors, representing extensive hydrogeological experience. The goals, components and guiding principles of the GWMF are excellent and capable of addressing the concern regarding the cumulative effects on regional groundwater quantity and quality from existing and future oil sands mining developments, assuming that they are achieved in a timely manner .

The GWMF provides for the establishment of targets and limits for groundwater quantity (groundwater levels) and groundwater quality (groundwater chemistry) and is dependent upon the ongoing collection and interpretation of appropriate groundwater resource monitoring data. The method for establishing targets and limits has been outlined. Targets and limits should be adequate, once a minimum number of data points (groundwater level or groundwater constituent), from which to obtain the targets and limits, have been obtained. The GWMF uses a type of data presentation chart which is easy to interpret and provides for identifying groundwater levels or groundwater chemical constituents which are trending towards, or have exceeded, the targets or limits. Since a graph is used for each water level and chemical constituent from each monitoring well or piezometer, a large volume of data will be generated, but should generally be user friendly.

The AOS groundwater monitoring program (Worley Parsons 2008), which is an important part of the framework, was designed to assess potentially cumulative impacts from individual operations on the regional water resources. The groundwater model developed for the GWMF is indicated as being able to confirm the predictions contained in the individual EIAs and to assess regional impacts. However, the model covers a very large area and has fairly large grid cells which may be limiting factors.

The GWMF provided the results of an aquifer risk assessment and identifies areas where underlying aquifers are venerable. A major portion over Kearn Channel, an area east of the Athabasca River near the Lewis and Clark Channels and an area west of the Athabasca River near the Birch and Willow Channels are considered to be highly vulnerable. Muskeg Mountain, the Clearwater River Valley, the Athabasca River Valley and low lying areas with shallow, less protective cover are considered to be at moderately vulnerable. The risk assessment confirms the need for carefully planned groundwater quality monitoring sites.

## Concerns - Issues

It is unclear if the groundwater quantity and quality protective measures in the GWMF will protect FMFN's specific groundwater resource requirements needed to pursue traditional activities on their traditional lands. For example, would the use of water from a fen considered to be domestic groundwater use to be protected by the GWMF?

There is some uncertainty with regard to the intent of certain words or phrases in the GWMF. For example, the GWMF indicates the need to reclaim aquifers removed during mining if they are "significant" or "high priority". It is unclear if aquifers important to FMFN, now or in the future, would be considered as "significant" or "high priority" and therefore requiring reclamation if disturbed.

A number of regional groundwater quantity and quality monitoring sites have been identified and some need to have the monitoring facilities installed. These need to be installed and operational as soon as possible so the background and ongoing monitoring data needed to confirm that mining activities are proceeding in a sustainable manner is available. There are a number of aquifers which do not have water quality data rated as "good", and as a result have groundwater quality targets and limits which may be too broad and need to be refined. Such gaps need to be filled. With the current economic climate will the resources needed to develop and implement the monitoring system be forthcoming in a timely manner?

The groundwater model developed for the GWMF is intended to confirm the predictions contained in the individual EIAs and to assess regional impacts from the individual mining projects. To be effective, extensive project-specific groundwater monitoring and reporting data from individual mining projects is needed. The data obtained from specific mining projects need to be integrated with the data from the regional groundwater monitoring network. Will the resources needed to do this be available on an ongoing basis?

The GWMF indicates that a guideline needs to be established to determine how large a sand body or channel need to be to warrant protection from disturbance. An aquifer impact index to determine what percent of an aquifer can be disturbed without having an adverse effect on the aquifer or the surrounding environment is to be developed. The GWMF does not indicate a timely establishment of the guideline.

## Recommendations

It is recommended that AE be advised of FMFN's concerns and ask how they will be addressed.

It is recommended that FMFN suggest to AE that future EPEA Approvals and/or the WA Licences require the Approval holders or Licensees to fund the installation and equipping of some minimum number of monitoring stations to fit into the regional groundwater monitoring grid as per the sites identified in the Groundwater Monitoring Network

(CEMA). Existing oil sands mining Approvals and/or Licences should be revised to provide for the same provision.



# Attachment L

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***Memo to AENV re: LARP GW Framework***

**Date:** November 4, 2010      **File:** 2010-8940-010

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**To:** Lisa Schaldemose, Fort McKay IRC

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**From:** Doug Geller, P.Geo., Summit

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**Project:** Lower Athabasca Regional Plan (LARP) consultation

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**Subject:** LARP – Comments on Draft Groundwater Framework Documents

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## MEMO

Summit Environmental Consultants Inc. (Summit) attended a meeting on July 26, 2010 in Edmonton to discuss the draft framework documents supporting the Lower Athabasca Regional Plan (LARP). Alberta Environment (AENV) is developing air quality, surface water quality and groundwater management frameworks for LARP. This memo provides comments on the framework document titled “Groundwater Management Framework Northern Athabasca Oil Sands Region. Part 1: Technical Framework”, prepared by the Government of Alberta (2010).

The Part 2 document provides the supporting technical background information, much of which was compiled during the last three years during the development of the Regional Groundwater Monitoring Network, and contained in Phase 1 and Phase 2 reports prepared by WorleyParsons (2009 and 2010). Because Fort McKay participated in the groundwater committee that oversaw the development of the regional network, to avoid redundancy, Summit reviewed the Part 2 document but is not providing further comment on it. A separate Summit memo provides comments on the surface water quality framework, prepared Dr. Brenda Miskimmin of Summit. Our comments on the groundwater frameworks are organized in General and Technical categories as provided below. Technical comments will reference the Part 1 section, and page/table/figure number(s) and will include a brief preamble followed by the comment or question.

### General Comments or Questions

The framework states that a Groundwater Working Group (GWG) will be formed to guide the implementation of the framework and the continuation of the regional groundwater monitoring network. Fort McKay participated in the regional monitoring project and requests the opportunity to participate in the GWG.

AENV indicates that the framework is intended to be a living document, with the intent being to periodically revise it as updated information dictates. Does AENV have a plan for how often the framework will be updated? We suggest that the updating of the framework be discussed further in the final document and further we recommend a revision be planned at least once every five years, or if and when there is a significant event or a regulatory or policy change that requires a revision.

As discussed at the July 26 meeting, Fort McKay agrees that a key driver in implementing the framework is the concern regarding cumulative effects of a large number of projects on groundwater quantity and quality, and to date the EIA process has relied extensively on models and limited field data. It was also discussed that the information developed by the implementation of the groundwater management framework will serve to inform the EIA process for specific projects, but applicants will still be required to use the regional information in the cumulative effects assessment for the EIA (assuming such an assessment is required by the terms of reference).

The framework will also provide the needed linkage between project – specific groundwater monitoring for approved projects, and regional monitoring. However, it was noted during the meeting that there could be better linkage between the surface water and groundwater frameworks. For example, in the surface water document there is discussion of water

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quality “triggers” and “limits” whereas the groundwater document uses different terms such as “targets” and “thresholds.” We suggest providing some cross-reference to key surface water terms (including in the Glossary) in the groundwater document and vice versa, especially where these linkages have potential environmental significance.

### **Specific Technical Comments (all pertain to the Part 1 Technical Framework)**

Section 4.1, Figure G, Page 14: This schematic does not include the process of reporting and communicating results.

How does reporting fit in to this performance assessment approach?

Section 6, page 29: Discusses regional goals and defined outcomes.

How will these outcomes be measured?

Section 7, page 31 contains a discussion regarding Aquifer Reclamation.

Fort McKay recommends that the management framework should state as a goal the avoidance of impacting regionally-significant aquifers, or aquifers having significant ecological or traditional value; this will then avoid the need for technically complex and unproven reclamation.

Section 10, page 46. This section discusses potential contaminant pathways in groundwater.

Fort McKay recommends adding a discussion on vertical pathways, such as unsealed or partially sealed boreholes/wells, and fractured aquitards, including the potential significance of such pathways at the scale of a project, or regionally.

Section 10.3, page 48. This section describes water quality targets and thresholds and mentions the highly variable nature of some aquifers in terms of mineralization.

Fort McKay recommends that spatial variability in aquifer water quality be addressed through the use of the aquifer management units (AMUs). For example, where the Basal McMurray is known to contain fresh water or mostly fresh water (i.e. < 4,000 mg/L TDS) a statistically-derived water quality target and/or a risk-based threshold could be defined for this sub-unit.

Section 10.5, page 53. This section discusses assessment of regional monitoring data and response when there is an exceedance of a target or a threshold. Two colour-coded conditions are described: Green and Yellow.

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Fort McKay recommends discussion in the final framework document as to why there is not a condition “Red” for groundwater, even if it presented only as an end-member scenario that is rarely if ever encountered. Fort McKay also recommends consideration be given to presenting future assessments of green or yellow conditions spatially and by aquifer sub-unit. The manner in which site-specific monitoring data are used to represent regional or sub-unit conditions also could use further development.

### References

- WorleyParsons (2009) Regional Groundwater Quality Study and Monitoring Network Design in the Athabasca Oil Sands: Phase 1 Technical Summary, prepared for Alberta Environment.
- WorleyParsons (2010) Cumulative Environmental Management Association, Regional Groundwater Monitoring Network Implementawtion in the Athabasca Oil Sands: Phase 2 Program Summary, prepared for CEMA.

# Attachment M

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## *Memo to AENV – LARP WQ Framework*

**Date:** August 11, 2010      **File:** 2010-8940.000

**To:** Lisa Schaldemose

**From:** Brenda Miskimmin, Ph.D., R.P.Bio.

**Project:** Lower Athabasca Regional Plan (LARP) consultation with Alberta Environment

**Subject:** Comments on Draft Surface Water Quality Framework

**MEMO**

On behalf of Fort McKay, Summit Environmental Consultants Inc. (Summit) attended a consultation meeting with Alberta Environment (AENV) on July 26, 2010 in Edmonton. Dan Stuckless, Fort McKay IRC, was also in attendance at the meeting. The purpose of the meeting was to discuss the draft framework documentation in support of the Lower Athabasca Regional Plan (LARP). Here we provide a report of the surface water aspects discussed at the meeting as well as review comments on the proposed water quality framework. Doug Geller separately provided commentary on the groundwater framework documents.

The Water Management Framework for the Lower Athabasca River Phase I was completed in 2007, with revisions for Phase II in 2010. The focus of the framework was on water quantity and establishment of an instream flow needs (IFN) component. The present documentation and related consultation incorporates *water quality* changes in the management framework for the lower Athabasca River. A document entitled "Lower Athabasca River Water Management Framework: Surface Water Quality Update" dated June 2010 and related discussions at the July 26<sup>th</sup> meeting are briefly reviewed in this memo.

The overall intent of the water quality update is to "ensure that water quality changes resulting from human development do not compromise the protection of aquatic life and other water uses." In order to track cumulative changes in water quality in the Athabasca River, AENV plans to establish:

- Historic water quality baseline records (data from the Old Fort monitoring station from 1988 to 2008);
- Water quality "triggers" (point at which a significant change in water quality can be detected); and
- Water quality "limits" (comparisons to AENV, CCME and other water quality guidelines).

As shown in the diagram to the right, three colour-coded water quality conditions were established, similar to those used in the FMSA. The plan is to closely monitor and manage water quality within the "yellow" early warning condition to avoid approaching the "red" degraded water quality condition (see diagram, extracted from the update document). All monitoring is planned to occur at the Old Fort monitoring station.

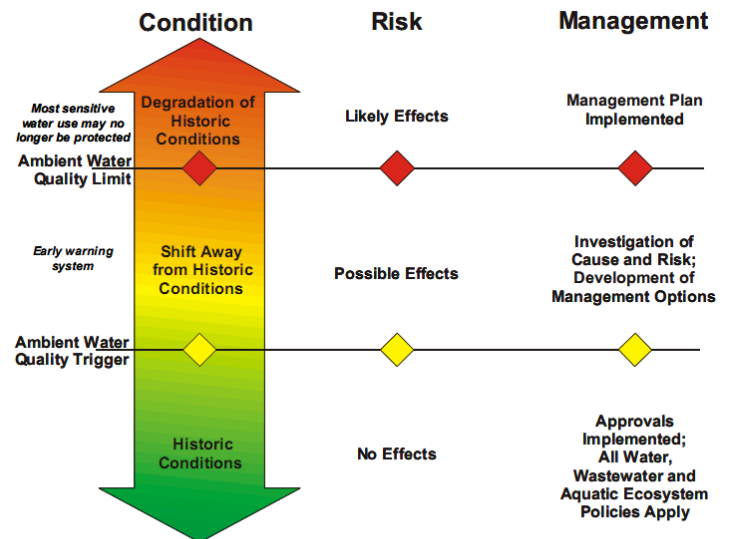


Figure 2.1 Schematic of the Water Quality Components of the LAR WMF

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### Review Comments

1. While it is appropriate to refer to records up until 2008 as “historical records”, it is not accurate to assume that these post-development historical levels are natural background concentrations. Unfortunately, true natural background concentrations are not available for many substances due to analytical detection and/or methodology issues, or simply due lack of samples collected. The framework should clearly qualify that data representing pre-development conditions are unavailable, and that any comparisons of future monitoring results are compared against available historical data.
2. It is commendable that monthly sampling is planned for future monitoring, which will enhance the results of the annual fall monitoring undertaken by RAMP. However, the proposed sampling site is limited to AENV’s Old Fort monitoring site located some 100+ km downstream of current oil sands development (Section 3.2). Even though a sampling site exists at the Firebag River confluence with the Athabasca River, where changes are more likely to be detected, this site is not currently proposed to be used for monitoring comparisons. AENV should add a sampling site in the Athabasca River closer to oil sands development.

Fort McKay may want monthly *community-based water quality sampling* in the river near the community to bolster the dataset for the framework. The timing and analysis of the sampling could be co-ordinated with that of the AENV framework sampling.

3. As discussed at the meeting, surface water and groundwater sampling and reporting should be integrated and not considered as separate monitoring efforts. Near-surface groundwater, including potential tailings pond seepage, is closely linked with surface waters. Any monitoring reports should attempt to harmonize the results of near-surface groundwater and surface water quality wherever possible. Related to the point above about the location of water sampling sites, the location of a surface water sampling site would be best placed near-downstream of groundwater sampling sites. This is particularly important when such sites include wells screened in aquifers (i.e. open to the aquifer) believed to be linked to nearby surface water.
4. The choice of water quality variables may need to be changed to include dissolved concentrations in addition to total concentrations. For example, phosphorus is a nutrient that is readily available for algal growth when dissolved in water, but is also a component of particulates (silt, clay) that are not available for uptake. Total phosphorus (TP) does not distinguish between dissolved and particulate forms. We recommend that dissolved nutrient concentrations always be reported. Likewise, some metals and organics may bind with particulates or organic carbon, a characteristic that reduces their availability to aquatic biota. By reporting dissolved concentrations where possible, more relevant information about water quality will be available.
5. Polycyclic aromatic hydrocarbons (PAHs) and compounds (PACs) have been difficult to detect in water samples resulting in a limited number of PACs proposed for monitoring. Because of their chemical properties, these compounds are known to be likely to bind with sediments more so than dissolved in water. No sediment sampling is proposed in the monitoring program; we recommend annual sediment sampling for PACs.

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6. The data collected for the Framework can be supported by the sampling efforts of others. While RAMP data are indicated to be used for cross check purposes, the timing of RAMP's collections may only be appropriate at certain times of the year (i.e. fall). Data collected by oil sands projects may be more relevant for comparisons to the monthly samples proposed for collection here. Since AENV has access to the monitoring reports of these projects, they should incorporate and compare any available data to their Framework results.
7. Section 3.3.2 of the water quality framework indicates that water quality changes due to human causes will trigger the yellow condition. It isn't clear how a direct link to human causes can be effectively made using a site located 100 km or more from oil sands projects. Nevertheless, in a case where it is determined that the yellow condition is triggered by human causes, the framework makes no mention of how it will expeditiously deal with reversing the trend. The Phase 1 and 2 investigations describe steps that are likely to span a year or more. Such a lengthy delay may result in harm to the environment and/or a lost opportunity to isolate the source of the problem. AENV should provide further details about identifying sources and promptly rectifying the situation.

Overall the meeting with AENV was constructive and they were interested in our feedback. We had a productive discussion and we recommend that AENV incorporate our input in the Framework.

Regards, Brenda



# Attachment N

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## *Health Risk Assessment*

# Synopsis of Health Risk Assessment

prepared for Lisa Schaldemose & LARP by John Dennis, PhD

## Introduction to Health Risk Assessment

- Health Risk Assessment should be our best attempt to guess the likely effect of industrial development on the health of vegetation, wildlife and humans in the region.
- Impacts of industrial development include reduced and altered water flow, disturbance to the land, contamination of air and water from release of pollution to air and water.
- HRAs are practically undertaken by assembling all hard (monitored) and soft (modelled) information available and use best guess to identify which will impact health.
- Different receptors have different levels tolerance to different pollutants
- Health effects include acute (immediate) and chronic (long-term).
- Every emission will have an acute health impact at some concentration, but many have little impact below that level.
- Some emissions 'accumulate' in the environment so even small levels will eventually build up and result in a threshold health effect
- Some threshold effects are irreversible (e.g. acid soil or lakes)
- Many chemicals are well studied and have been allocated a 'safe' limit below which there is no effect.
  - Limits are similar (but not exact) throughout the world and are shared by Provincial and Federal authorities in Canada, USA, etc and internationally through WHO, UNEP and other organizations.
  - There is debate over the actual numbers which differ throughout the different authorities
  - General rule of thumb is that the larger the limit setting authority's territory and influence, the higher the 'safe limit' – because the broader range of species and environments at particular risk.
- It is impossible to predict health risk with absolute confidence because we do not know everything about the exact exposure concentration/dose and health impacts.
- Health risk assessment is a complex imprecise science.
- The precautionary principle is an important part of health risk assessment to help counter uncertainties in health risk assessment.

- The precautionary principal is a paradigm in health risk assessment which says the less sure we are of our science, the higher margins of error we should use in health risk assessment.
- The more weight given to the precautionary principal the higher the predicted health risk impact.

### **Bias in Health Risk Assessment**

- Health risk assessment is a complex undertaking, and involves many assumptions. Ultimately, health risk assessment is a ‘best guess.’
- All scientists involved in EIA health risk assessment have bias. The two extremes in bias will promote:
  - Reduced industrial development - cautious ‘pro-environmental’ scientists who lean heavily towards precautionary principals.
  - Accelerated industrial development – eager ‘pro-industrial development’ scientists who readily dismiss the precautionary principals
- Scientists working the middle ground in health risk assessment have the least bias, but they are inherently difficult to hear due to the noise and publicity from louder and more publicised polarized opposites.

### **Western Vs Aboriginal health risk assessment**

- Western science tends to compartmentalize and is poorly equipped to cope with interaction.
- Traditional aboriginal science is holistic and is poorly equipped to compartmentalize.

### **Main issues of debate Health Risk Assessment**

- How much emphasis is given to precautionary principal
- Bias
- Compartmentalized Vs Holistic risk assessment
- Many areas of Health Risk Assessment have general agreement when there is no argument that a particular emission will have an impact.
- Some areas of Health Risk Assessment are being hotly debated because the polarized health risk arguments yield opposite results:
  - Overall validity of underlying computer models adopted in health risk impacts on wildlife, vegetation, and humans
  - Reclamation
  - Eutrophication

- Odours and quality of life and holistic health impacts

### **Regional Monitoring & Research**

- Research is important to continually progress our understanding of health risks unique industrial emissions into the unique environment of our region
- Monitoring is important to provide data to refine usefulness of both emission and health impact models, and identify/quantify impacts

### ***Fort McKay Recommendations for a HRA to be used in LARP***

- That the value precautionary principle receive greater recognition in order to realistically protect wildlife, vegetation, and human health
- That the overall management process incorporate the means for cumulative impacts to be effectively addressed
- That HRAs focus on holistic as well as compartmentalized risk assessment