Planner's Update
Cold Lake Beaver River Basin Water Management Plan
(March 2006)

Background

The Cold Lake–Beaver River Water Management Plan was adopted in 1985 to provide direction on managing water resources in the combined Cold Lake and Beaver River basins. The intent of this plan was to provide for an adequate quantity and quality of water to meet the long-term user requirements of the basin. A planning process to update this existing water management plan is currently underway and is nearing completion. The updated plan will strive to balance community, economic and environmental issues and values with government legislation and policy for protecting and managing water resources in this area.

Planning Area

The Cold Lake–Beaver River planning area is part of the Cold Lake basin located in Alberta that drains to the outlet of Cold Lake. It also includes the lower Beaver River Basin that drains to the Alberta/Saskatchewan boundary.

The management plan study area focuses on the following major lakes and downstream rivers: Jackfish Creek, Manatokan Creek, Marie Creek, Moose Lake River, Muriel Creek, Reita Creek, Sand River, Wolf River, Cold Lake, Moose Lake, Muriel Lake and Marie Lake.

Updating the Plan

Over the past 20 years, the region has experienced increased industrial development, considerable population growth, and years of below-normal precipitation. This has resulted in a need to assess the current situation, including demands on the water resources in the basin, and update the 1985 plan to meet current and future water needs.

Updating the plan will also address new information related to groundwater within the basin. Groundwater has become an important component of the regional water resources, and protecting groundwater quantity and quality is one of the main emergent issues in the Cold Lake–Beaver River Basin.

Alberta's *Water for Life* strategy and the Framework for Water Management Planning requires that strategies for the protection of aquatic resources be included in water management plans. The updated plan will be consistent with the goals and objectives of Alberta's *Water for Life* Strategy.

The initial steps to update the existing 1985 plan took place during the summer of 2003 and resulted in the establishment of a Basin Advisory Committee (BAC) and the development of a Terms of Reference that outlined the topics to be addressed and the technical studies that would be completed.

Four technical teams were established to look at specific components of the basin in order to summarize and update existing scientific knowledge. This up-to-date information is now available within the four integrated state of the basin reports that have been recently completed. These reports are now available under the following titles:

- Surface Water Quality
- Surface Water Quantity and Aquatic Resources
- Groundwater Quantity and Brackish Water
- Groundwater Quality

In addition to these reports, a draft overview report that summarizes all four reports and includes a set of proposed management options has also been completed and is available for public review.

Updating the Plan - Groundwater

Groundwater will be an important component to the updated plan. With the help of Alberta Geological Survey (AGS), our knowledge of the underlying geological structure and underlying aquifers has been extensively mapped and this basin is fortunate to have some of the best available groundwater information in the province. By knowing the sub-structure of our basin, we will be better able to determine groundwater availability and the potential interactions between groundwater withdrawals and surface water. Because groundwater withdrawals have been mentioned as one of the main concerns within the basin there has been a significant amount of effort to understand the true nature of groundwater availability, withdrawals and interactions. Several of the main areas of focus during this study included:

- Supply and location of groundwater resources
- Assessment of groundwater quality
- Potential effects of groundwater withdrawals (i.e. interaction with surface and other aquifers)

Working in Partnership

As part of Alberta Environment's Water for Life Strategy, there is now more emphasis on working with local partners to manage the water resources within the basin. Alberta Environment has been working closely with LICA (Lakeland Industry and Community Association) during the information gathering stage of the planning exercise and will continue that partnership during the development of the management recommendations. AENV and LICA are co-chairs of the Basin Advisory Committee - the group responsible for reviewing technical information and providing advice on management plan recommendations. The Basin Advisory Committee is a multi stakeholder group comprised of local governments, industry, Metis Settlements and First Nations, federal and provincial government departments, and members of the public. Besides reviewing technical information, this committee provides advice and recommendations on the range of views and community values to be considered when preparing the Water Management Plan Update.

Summary of Key Findings:

Some of the key findings from the four State of the Basin Reports are listed below. A more comprehensive list is available in the actual reports. This information will assist in determining the best management options available for each of the main themes to be addressed in the management plan update.

Water Quantity (Water Supply and Demand)

- The Cold Lake-Beaver River Basin currently has sufficient water resources to meet current and projected demands
- A total of 44 million m^3 of groundwater and surface water licences have been allocated in the basin for multiple uses (e.g. municipal, industrial, agricultural). Together, the licenses for groundwater and surface water allocation represent about 4.5% of the average annual flow of water out of the basin.
- Fresh water use requirements are not projected to increase substantially from 1985 water use volumes.
- The water levels have decreased in most of the lakes and streams since the 1985 water management plan. This is because of less precipitation, low run-off, and increased temperature and evaporation in recent years.
- Despite some low run-off years, Alberta has always exceeded the requirements under the apportionment agreement with Saskatchewan (i.e. 68 per cent of natural flow goes to Saskatchewan).
- Some lakes in the basin are more sensitive than others to regional climate fluctuations (e.g. Muriel Lake, Chickenhill Lake).
- Industrial groundwater pumping does not cause an adverse effect to the water tables and surface water bodies.

- Model runs using maximum allocations of groundwater show no long-term impacts to adjacent aquifers and surface water bodies

- Climactic conditions over the past 20 years have been dryer than average resulting in lower lake and stream levels. Some areas within the basin have been more impacted by these climactic conditions than other areas.

- Since 1985, there has been no significant increase in surface water allocations and an (approximately) 50% increase in industrial groundwater allocations

- Actual water use is about 30-35 % of allocations. This is true for all water use sectors (i.e. municipal, industrial), residential)

- Freshwater requirements per barrel of oil produced has decreased substantially compared to 1985 due to increases in recycling, and uses of alternate water sources (e.g. brackish, produced/recycled water).

Protection of Aquatic Resources

- The health of the basin's fish populations remain below optimum due to past over harvesting and habitat change. However, there are some signs of localized improvement (Lake Trout in Cold Lake)

- Increasingly poor water quality in some lakes (e.g. Moose, Muriel and Kehewin), may be reaching critical levels for fish productivity

- Land use has had less of an impact on wildlife than climactic conditions, but these activities remain a concern south of the Beaver River

Groundwater quality

- Regional groundwater quality is generally within Canadian Drinking Water Guidelines and has not changed detectably over time

- There are a number of potential point and non-point sources of contamination located within areas that are sensitive to contamination (i.e. exposed aquifers)

- Most of the data available on groundwater quality is in the area where industrial activity is occurring and there is a need for more data in other areas.

Surface water quality

- Although there are localized exceptions, fertility of Lakes within the basin has generally not changed over the past 20 years
- Low precipitation has increased salinity, pH and ion concentrations. Lakes with larger watersheds were least affected
- There is a strong relationship between land use and lake fertility (i.e. nutrients in the lake)
- Nutrients (phosphorous/Nitrates/nitrites) have decreased in the Beaver River
- No threats were presently evident to sources of drinking water.

Next Steps

With the completion of the State of the Basin reports and the draft Overview Report, the Basin Advisory Committee is now prepared to move on to the next phase of the planning exercise. This includes additional consultation with stakeholders, hosting workshops, drafting the updated plan and hosting public meetings to review the draft updated plan and receive comments.

Key milestones required to complete the updated plan:

- Stakeholder workshop input (completed Feb. 2006)
- Complete the first draft of the updated management plan
- Receive public feedback from open house events (draft plan review)
- Revise draft accordingly based on public feedback
- Forward plan to AENV for approval and implementation
- Formation of a Watershed Planning and Advisory Council (WPAC)

Additional Information and Contacts:

For additional information related to the planning process or any of the available reports contact:

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