

Oldman River Basin Water Quality Initiative ... Partnering For Our Future May 1998/99 Annual Report

A \$2.5 million, five-year initiative to assess the quality of water in the Oldman River Basin and an Action Plan for a Sustainable Resource.

Action Plan

Focuses on four key areas:

1. Public education and awareness regarding water quality in the basin;
2. Assessment of the current land use in the Oldman River Basin;
3. Testing and implementation of beneficial management practices (BMP) to limit negative impacts on water quality;
4. Monitoring of surface water quality in the basin to identify areas of concern and impacts of various activities.

Partnering For Our Future

The Oldman River Basin is home to many towns, villages and the city of Lethbridge, various industries and also represents the most intensive agricultural area in Alberta. Water quality in the basin is the concern of everyone, and maintaining and improving water quality requires full community involvement.

The Oldman River Basin Water Quality Initiative brings together groups and individuals with diverse interests, from intensive livestock operators, irrigators and provincial and federal agriculture groups to health and city officials, environmental activists and provincial environment specialists.

This broad-based group first came together to work toward maintaining and improving water quality in the basin at a public water quality workshop held in Lethbridge in December 1997. From this workshop, where the group agreed on a common agenda - to ensure a supply of fresh, clean water to the communities along the Oldman River Basin, the Initiative got its start.

A working group was established to develop a five-year action plan for the initiative. Teams were put together to carry out the four areas of activities, including: land use assessment, water quality testing, beneficial management practices implementation and education and awareness.

Overall steering and coordination of the initiative is conducted by a five member Business Team. This team assists with the management of cash flow and aligns with

partnering agencies. Their main responsibility is to ensure that the five-year action plan is implemented and that the four work teams have the resources necessary to get their work done. The four components of the action plan are delivered by the Land Use, Water Quality, Beneficial Management Practices and Education and Awareness teams.

Financial Report

The initiative is mainly funded (in cash and in-kind services) through Alberta Environmental Protection, Alberta Agriculture, Food and Rural Development, Alberta Health, Chinook Health Region, and Agriculture and Agri-Food Canada Research Branch, Prairie Farm Rehabilitation Administration (PFRA). Donations from municipalities and organizations in the basin have also contributed to funding the five-year plan. Year one activities amount to nearly \$625,000 in cash expenditures and in-kind services.

Direct Funders (Year 1)

- Town of Coaldale: \$5,000
- Town of Coalhurst: \$366.35
- County of Lethbridge No. 26: \$1,000
- Lethbridge N. Irrig. District: \$8,000
- Town of Picture Butte: \$1,669
- City of Lethbridge: \$20,000
- PFRA \$50,000

Indirect Funders (Year 1)

- Alberta Agriculture: \$144,000
- Alberta Environment: \$328,000
- Alberta Health: \$43,220
- Agriculture Canada: \$8,000
- Chinook Health Region: \$29,270
- Many others: \$70,000

Component Statement Year 1			
	Cash	In-kind	Total
Education and Awareness	4,812	22,256	27,068
Beneficial Management Practices		131,871	131,871
Land Use Assessment		144,000	144,000
Monitoring	26,813	268,355	295,168
Business and Working		19,725	19,725
Subtotal	31,625	586,207	
Total			\$617,832

First Year Activities and Findings

Activities from year one of the Oldman River Basin Water Quality Initiative were presented at the second annual water quality workshop in Lethbridge on January 12, 1999. Information focused on the four components of the action plan: land use assessment and mapping, water quality testing, beneficial management practices (BMP's) research, and education and awareness activities.

"These activities have given us a good baseline for our future work on the five year plan. We have set a foundation for finding out what is going on in the river basin," says Ian Dyson, a member of the initiative's Business Team.

Land Use Assessment

The objective of the Land Use Assessment Team is to produce 1:50000 scale maps of the Oldman River Basin depicting: land base features, land use classes, intensive livestock operations (ILOs), water wells, waste facilities and water monitoring sites. In Phase I, information on land use classification, ILO inventory, landfill and waste site inventory and water well site inventory was collected through satellite imagery. Other databases, including the Native Prairie database, and the Alberta Vegetation Inventory (AVI) were also incorporated.

"For the land assessment component, we are happy to report that 90 percent of the data has been gathered for Phase 1. This means that we have most of the information we need for mapping and inventory of the land use in the basin," says Livio Fent, Coordinator for the Land Use Assessment Team. Ten of the 39 maps are completed, and the remaining maps are expected to be completed by May. These maps portray all of the information about what is happening on the land and how it is being used in a geographic way. The land use assessment provides the context for interpreting water quality testing results and explaining what impact land use has on water in the basin.

In Phase II, information on ground water, soils, monitoring data and Digital Elevation Mapping (DEM) will be compiled and analyzed. This information will be combined with both Phase I and water quality results to develop impact or risk zone maps for the basin. "These maps will identify which zones are more likely to impact water quality, and what kinds of activities may cause an impact or increase the risk," explains Fent. "All of this information will be integrated into an environmental impact model, which can be used as a planning tool for developing the landscapes and determining the impact on water quality in the basin," he adds.

Water Quality Monitoring

The objectives of the Water Quality Team are to provide an overview of water quality of the Oldman River and its tributaries. This includes documentation of current conditions, and identification or confirmation of areas of concern.

In 1998 the Water Quality Team tested the water at 14 river, 16 tributary and 9 effluent sites and at 10 sites in the Lethbridge Northern Irrigation District (LNID). The data collected in the first year of the Initiative will provide a baseline for comparison on future years. The water quality guidelines used in the testing include the Alberta Ambient Surface Water Quality Interim Guidelines and the Canadian Water Quality Guidelines.

"Water samples were tested regularly for a suite of variables, including nutrients (phosphorus and nitrogen), cations (calcium, magnesium and sodium), total dissolved solids, total organic carbon, and bacteria (fecal coliform bacteria and E. coli)," explains Karen Saffran, Coordinator of the Water Monitoring Team. "Occasional samples were also taken at 15 of the sites for protozoan parasites (Giardia and Cryptosporidium) and pesticides," she adds.

Alberta Ambient Surface Water Quality Interim Guidelines

The Alberta Ambient Surface Water Quality Interim Guidelines are "general" guidelines based on the most sensitive water use that a particular substance can affect. For example, the guideline for total phosphorus is 0.05 mg/L. Exceeding this guideline can mean that excessive aquatic plant and algae growth may occur, which is undesirable from an aesthetic viewpoint (recreation) and may lead to low oxygen conditions due to decay of organic matter. The Alberta guideline for total nitrogen is 1.0 mg/L. Nitrogen is also a nutrient that can contribute to plant growth, and certain nitrogen compounds (eg. nitrate, ammonia) can be toxic to humans, animals and aquatic life. Further information on these guidelines can be obtained at: www.gov.ab.ca/env/dept/facts/watqualt.html

The Canadian Water Quality Guidelines are use-specific, pertaining to recreation, irrigation, livestock watering, freshwater aquatic life, etc. There are no Canadian Guidelines for total phosphorus or total nitrogen, but there are for bacteria. For irrigation use, a value of 100 fecal coliform bacteria/100 mL is used. The guideline for recreation is 400/100 mL. Both of these guidelines take into consideration the risk of ingesting microbes and becoming ill (eating unwashed produce, getting a mouthful while swimming, etc.). It is not necessarily the fecal coliforms themselves that are the infective organisms; they merely indicate that other pathogens might be present due to fecal contamination. Further information on Canadian guidelines are available from Health Canada at: www.hc-sc.gc.ca

Initial Observations

***on-going testing in the river and tributaries (analysis April to Oct. '98)**

1. Testing of 15 river and tributary sites between Fort Macleod and Purple Springs showed 80 percent of fecal coliform bacteria samples complied with Canadian water quality guidelines for recreation use, and 50 percent were within the irrigation guideline.
2. Fifty percent of the samples complied with the Alberta guideline for phosphorus, while 90 percent complied with the nitrogen guidelines.

3. The parasite Giardia was detected more frequently than Cryptosporidium. Preliminary results suggest that both may be occurring more frequently upstream (e.g. Ft. Macleod area) than in downstream areas.
4. Pesticides were detected at least once in 97 percent of all samples. Concentrations increased in a downstream direction. Most guidelines were met, but the herbicides MCPA and dicamba often did not comply with irrigation guidelines. Frequency of pesticide detections are higher in the basin than in other areas of the province.
5. The City of Lethbridge wastewater treatment facility was the largest point source of bacteria and nutrients to the Oldman River. The anticipated positive effect of the new wastewater facility will be monitored in 1999.
6. Six Mile Coulee had the highest concentrations of nitrogen, phosphorus and pesticides. Nitrogen and phosphorus occasionally exceeded the Alberta guidelines. The herbicides dicamba and MCPA also were occasionally above irrigation guidelines. The insecticide lindane was above the Canadian guideline for the protection of aquatic life on one occasion. The insecticide diazanon exceeded the Canadian drinking water guideline once.

Highlights From LNID Study

*** conducted between May and September 1998**

1. The LNID portion of the study showed lower concentrations of nutrients, bacteria and parasites than in the river and tributary sites.
2. The fecal coliform guidelines for recreational use was met in 98 percent of the samples and 94 percent of the samples met the irrigation guideline.
3. The Alberta guideline for phosphorus was met in 90 percent of the samples and for total nitrogen, it was met in 99 percent of the samples.

Beneficial Management Practices (BMP)

The objectives of the BMP Team include evaluating the effectiveness of beneficial management practices within priority watersheds, and protecting the quality of surface ground water resources in the Oldman River Basin.

The watershed testing team tested the water in and around the Lower Little Bow River and the Battersea Drain. Six water quality and flow monitoring stations were established along the Little Bow and seven were established along the Battersea Drain. Water sampling was conducted during the irrigation season from mid-June to early October. Samples were analyzed for total phosphorus, total nitrogen and fecal coliform bacteria. Flow monitoring commenced at all sites by the third week of July. They also provided assistance to the Water Quality Team with overall basin water sampling.

"We found that total nitrogen content was well below Alberta guidelines for most uses in both watersheds in 1998. However, total phosphorus frequently exceeded Alberta water quality guidelines for most uses in both watersheds. Fecal coliform bacteria frequently exceeded Canadian guidelines for recreation use," says Rod Bennett, Coordinator of the

BMP Team. "The content of contaminants tended to increase with distance downstream," he adds.

The Beneficial Management Practices Team will initiate applied research projects in 1999, with the focus along the Lower Little Bow River on riparian area management, including the use of off-site watering and buffer strips. In the Battersea Drain watershed, the applied research projects will focus more specifically on the land application of manure and some of the issues related to manure utilization.

Education and Awareness

The objectives of the Education and Awareness Team include: improving awareness of the Oldman River Basin Water Quality Initiative, building the urban-rural linkages by promoting an understanding of the various issues and concerns and fostering stewardship of water resources within the Oldman River Basin. Other team objectives are to ensure that all internal and external target audiences are kept well informed, and to facilitate the dissemination and distribution of information from related research and activities in a timely manner.

In 1998, the team completed various activities to help inform the public and stakeholders about the initiative, including:

- produced a brochure
- distributed several news releases
- hosted a media tour
- developed and distributed a stakeholder newsletter (2 issues)
- developed and distributed a producer newsletter (1 issue)
- organized and promoted the annual workshop (January 12, 1999).

"The education and awareness team helped to keep the issues and the initiative in the public eye. It also helped to create a greater understanding about the initiative and its findings," says Ron Axelson, Coordinator of the Education and Awareness Team.

Summary of Results

Results from the first year of activities of the initiative helped to highlight that the river basin has many positive attributes including:

- surface water quality met most guidelines in most sample sites;
- Giardia cyst and cryptosporidium oocyst levels at water treatment intakes were consistently low;
- a strong understanding of the river basin and its uses has developed;
- the initiative has shown that many agencies can work together for a common objective.

Through the Initiative, the teams and their results are all dependent on one another. "We all rely on each other for information, because for any one of us in isolation, the results don't mean very much," says Fent. "Therefore, we all have to depend on each other and share information in order to put the whole thing in context," he adds.

"The unique part of this Initiative is that it is not just about understanding the causes or implementing changes in the basin, it is about seeing change and improvements happen in the basin," explains Brent Paterson, Spokesperson for the initiative. One of our focuses is on implementing change in the agriculture sector in the small basins. "We have projects to test these changes, and to demonstrate to farmers, ranchers and irrigation water users how effective and successful these changes can be and what kind of costs it will mean to them," he adds. "We hope that this combination will encourage others in the basin, and in other areas, to take up the challenge," he adds. Results from the first year are certainly supporting this direction.

Emphasis: Year 1 to Year 2		
	Year 1	Year 2
What is there? (data)	100%	30%
What does it mean?	0%	50%
What to do about it?	0%	20%

Oldman Group the Way of the Future

The Oldman River Group is turning the diversity of its expertise into an advantage, and may be a model for finding solutions to issues where many different groups hold conflicting views. According to Ron Axelson, the Alberta Cattle Feeders' Association representative on the initiative, the cooperation among all the stakeholders is a promising sign. "The level and effectiveness of cooperation among the membership may be setting precedents," he says. "This could be the way of the future," he adds.

By working together, the group has come to recognize and appreciate each other's concerns and strengths, rather than taking reactionary and opposing stands. "We've forged informal partnerships that are helping us gain a real understanding of the root causes of water quality problems," he says. These informal relationships are also a firm foundation for full community participation in effective long-term solutions.

What's Next

In 1999 - 2000, the Oldman River Basin Water Quality Initiative plans to:

- complete the land use assessment and include information on soil and water characteristics
- begin analyzing beneficial management practices in the watersheds
- continue water quality monitoring

- continue to seek financial support for ongoing activities
- continue to educate and inform stakeholders about findings of the initiative
- continue to be accountable to the stakeholders of the initiative.

"We will be focusing our investigation around two reaches east of Picture Butte in the Battersea Drain and three southern reaches in the Lower Little Bow watershed to implement research projects to evaluate beneficial management practices in these areas," says Rod Bennett, Coordinator of the BMP Team. "We're really trying to work our way back up into these watersheds to identify potential sources of contaminants, and to try to implement some projects to try and mitigate or reverse what is happening," he adds.

Partners

The list of partners coming on board with this unique initiative continues to grow. In the first year, the following groups or agencies supported the project:

- Agriculture and Agri-Food Canada, Research Branch and PFRA
- Alberta Agriculture, Food and Rural Development
- Alberta Cattle Commission
- Alberta Cattle Feeders' Association
- Alberta Environmental Protection
- Alberta Health
- Alberta Irrigation Projects Association
- Alberta Livestock Council
- Alberta Pork Producers
- Canbra Foods
- Chinook Health Region
- City of Lethbridge
- County of Lethbridge
- Health Canada
- Lethbridge Chamber of Commerce
- Lethbridge Northern Irrigation District
- Oldman River Intermunicipal Service Agency
- Southern Alberta Environmental Group
- Town of Picture Butte
- University of Lethbridge

Contact Us

If you have any questions regarding the Oldman Water Quality Initiative or would like to participate in the group, please contact:

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