

**STATUS REPORT ON THE ACTIVITIES OF THE
INTERNATIONAL RED RIVER BOARD**

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1.0 Introduction

This status report provides highlights of active projects and issues for the period October 2003 to April 2004, and continues upon the International Red River Board's fourth annual report submitted to the Commission in October 2003.

2.0 Flood Conditions

The Red River basin experienced a generally dry summer in 2003 with flows in the Red River and its international tributaries reaching the lower decile level by early fall. The dry conditions also resulted in low soil moisture levels and increased depression storage capacity throughout the basin. Although snowfall was somewhat above average over parts of the basin in January 2004, total winter snow cover was generally below average. Further, mild weather during March resulted in considerable depletion of the snowpack. By the end of March spring runoff was underway in the U.S. portion of the basin and the flood outlook indicated an average to below average spring runoff for the basin assuming normal weather conditions.

However, on March 27-28, heavier than normal spring rains occurred [rain on snow] with observed amounts ranging from 50-80 mm (2-3.1 in.) in some parts of the basin. Frozen soil conditions contributed to rapid runoff, and combined with snow-clogged channels and culverts, extensive flooding of agricultural lands occurred. For the most part, streamflows remained in-channel, however, flood alerts were issued to a number of communities along the Red River and its tributaries. Sandbagging of homes and urban areas occurred in several communities, particularly in Grafton, North Dakota. Numerous roads and bridges in the upper basin were closed due to overland flooding and high river levels. Flood levels on a number of rivers and streams in north-eastern North Dakota were particularly high with levels on the Forest River, for example, being greater than in all previous events except for the floods in 1948 and 1950. Tributaries to Devils Lake ranged from 60 to 70% of the 1997 levels, and in one case, exceeding the peak of record.

On April 3rd a major ice jam occurred on the Red River downstream of Selkirk, Manitoba causing water levels to rise some 5.7 feet in 24 hours. The jam moved northward by end of day causing flooding of some cottages near the mouth of the Red River. Some 40 residences were evacuated as a result.

Flood levels crested at Emerson on April 7th and at Winnipeg on April 10th, and have been receding continuously since then. If no significant rainfall occurs over the basin in the next few days, the stream flow levels should continue to decline. However, as a precaution, some 13 homes were sand-bagged in the City of Winnipeg.

Flood damages will not be known until well after the flood has passed.

3.0 International Red River Board - Initiatives and Activities

3.01 Living with the Red

In January 2003, the IJC requested the IRRB to provide a written report on actions taken by governments at all levels in implementing the recommendations contained in *Living with the Red*. With external Canadian federal funding, a basin-wide survey and analyses of flood preparedness and mitigation activities was conducted by R.Halliday & Associates Ltd. in cooperation with the Canadian Water Resources Association. The survey results were presented to the IRRB annual meeting in July 2003 and a draft report was circulated to IRRB members for review and comment. The final report titled *Flood Preparedness and Mitigation in the Red River Basin* was received in October 2003. Subsequently, the IJC gave approval for the Board to release the

report so that it is available for discussion and use throughout the basin.

The survey results indicate that expenditures since 1997 relating to the IJC recommendations are in the order of hundreds of millions of dollars and that similar amounts will be spent in the next five years. Although considerable progress has been made in increasing preparedness for major floods and in mitigating potential harm from future floods, not all recommendations have been implemented. Further, it is unlikely that a few of the recommendations will be implemented. Recommendations involving construction of structural features, and those aimed at single agencies, have achieved greatest success, while those recommendations involving multiple agencies and multiple objectives, have achieved less success. The results also indicate that it may take considerable effort to achieve the level of inter-agency and intergovernmental cooperation needed to assure cohesion on flood management and long-term resiliency in the basin.

The IRRB has undertaken an assessment of the survey findings:

- 1.) to ascertain its satisfaction with regard to progress being made in implementing the IJC recommendations,
- 2.) to identify, with supporting discussion, which activities as reflected in the survey results, current and future, are deemed most important, and
- 3.) to evaluate the specific follow-up activities proposed for the IRRB in the survey report.

This assessment is currently in progress and will be available for discussion at the IRRB annual meeting in July 2004.

3.02 Lower Pembina River Flooding

The Pembina River originates in the Turtle Mountains area of south central Manitoba, flowing easterly than southerly into North Dakota, entering the Red River about three kilometres south of the international boundary. There is very little gradient in the lower reaches of the system and flooding has been a natural and common occurrence. The natural flood pattern is for breakout flows from the main stem of the Pembina River in the vicinity of Niche, North Dakota to move away from the river and overland into the Tongue River watershed to the south, or north toward Canada and eastward to the Red River. To some extent, these flow regimes are influenced by the timing and magnitude of flood levels on the Red River. Going back as early as the 1940s, control works such as dikes and raised roads have been implemented in the lower reaches of the Pembina River in an effort to mitigate flood impacts. These works cumulatively have changed the natural flow patterns in the basin reducing flooding in some areas and increasing flooding in others.

The IJC investigations on measures to develop the water resources of the Pembina River basin in the early 1960s resulted in a number of recommendations regarding flood control for the basin. Over the intervening years various follow-up studies and negotiations between Manitoba and North Dakota have taken place to improve drainage in the United States and to increase the capacities of the receiving channels such as the South Buffalo and Aux Marais systems in Manitoba. Issues related to cost-sharing of projects and differences regarding the efficacy of projects have militated against resolution of the problem. More recently, non-permitted levees along the Pembina River in North Dakota were removed and alternative set-back levees from the City of Niche to near the confluence with the Tongue River have been proposed. There is concern that these actions may exacerbate flooding in some areas if provision for the storage of water along the system, or diversion of water across the international boundary is not provided.

In July 2003, in light of the long-standing unresolved nature of the drainage and flooding issues in the watershed, the Pembina River Basin Advisory Board formally requested the assistance of the IRRB to find an effective and acceptable solution. In response to this request, and with funding support from the IJC and

Environment Canada, the IRRB assembled a three-person Pembina Study Team comprising one member from North Dakota, one member from Manitoba, and an independent team chairperson, to work with the Pembina River Basin Advisory Board (PRBAB) and its appointees. The Study Team was asked to define the drainage and flooding issues in objective terms and to recommend strategies for moving toward a resolution.

On April 13, 2004, the Pembina Study Team submitted its final report to the IRRB Secretariat. The report titled *Lower Pembina River Flooding - A Report to the International Red River Board* provides an historical review of drainage and flooding mechanisms in the basin, an assessment of flood control measures recommended in previous investigations and those that have been implemented, and an overview of the prevailing perceptions. The report presents eight conclusions with respect to a potential long-term solution to the flooding problem, and six recommendations for action by the IRRB and government agencies.

The conclusions and recommendations identify three potential components to any solution to lower Pembina flooding. The first is to flood-proof urban centres and rural buildings to a specified flood protection level, most likely the 100-year flood. To a considerable extent, this has already been accomplished. In effect, this flood-proofing transforms the problem to one of farmland and road protection. The second component would be set-back levees along a critical reach of the Pembina River to provide primarily summer flood protection to farmland. The third component would be adjustments to openings in the boundary road-dike and County Road 55, and to associated drainage systems, to accommodate natural flows.

IRRB members will be given the opportunity to provide their assessment of the Pembina Study Team report so that a clear position can be presented to the IJC, and appropriate steps taken as soon as possible toward resolution of the problem. A copy of the report will also be provided to the Pembina River Basin Advisory Board who will be invited to participate in discussions with the IRRB at its annual meeting in July, 2004.

3.03 Notification Protocol for Intensive Livestock Operations

In 2002, at the direction of the IRRB, a Notification Protocol for Intensive Livestock Operations proposing to locate near the international boundary was developed and approved by the Board. The purpose of the protocol is to share information on issues of mutual concern and to resolve transboundary issues associated with intensive livestock operations prior to operation.

During the present reporting period, concerns regarding a proposed 6,000-hog farm operation located approximately one kilometre north of the international boundary in the Municipality of Stanley, were brought to the attention of Manitoba Water Stewardship and North Dakota Department of Health through the Notification Protocol. The hog farm proposal was withdrawn following public hearings in Manitoba and as a result of the significant opposition to the proposal expressed by local communities and residents from both sides of the international boundary.

3.04 Status of Water Quality Objectives for Nitrogen & Phosphorous

By letter dated March 5, 2003, Manitoba Conservation requested the IRRB to consider setting new water quality objectives for nitrogen and phosphorous at the international boundary. These would be in addition to the five water quality objectives currently in effect, namely; *dissolved oxygen*, *total dissolved solids (TDS)*, *chloride*, *sulfate*, and *fecal coliform*. It is noted that the current water quality objectives were adopted for the Red River by the IJC in 1969, and any changes or additions to these would involve a formal procedure requiring significant data analysis and review prior to any recommendations by the IRRB, and subsequent decisions by the IJC.

During a meeting of IRRB's Aquatic Ecosystem Health Committee (AEHC) on April 24, 2003, Manitoba Conservation provided a detailed presentation on their findings regarding the nitrogen and phosphorus issue in the Red River basin. On July 01, 2003, the Co-Chairs of the IRRB sent a letter to the AEHC with instructions regarding the development of a response to the Manitoba request and for initial recommendations on how to move forward. During the subsequent IRRB annual meeting in July 2003, and associated AEHC meeting, the request for nutrient objectives was further discussed. It was concluded that more time was needed to develop a process for responding to the request, that the options be reviewed from a basin-wide perspective, and that all available data in addition to that provided by Manitoba Conservation be considered. Manitoba Conservation indicated that an interim response from the IRRB was not required given that a suitable process for addressing the request was being proposed and that the AEHC was engaged in undertaking the assignment.

Since then, the AEHC has held several informal discussions. The general consensus is that traditional water quality concentration data would not adequately describe nutrient contributions from various stream reaches or other sources.

At the request of the AEHC, the North Dakota Health Department agreed to organize a workshop to discuss nutrient loading into the Red River. The workshop is scheduled for April 20 and 21 in Fargo, ND. Participation includes representatives from agencies in Canada and the U.S. with expertise in nutrient loading. The workshop will address nutrient loading results, data analyses, constructing a monitoring plan for better estimation of loading rates, and development of nutrient objectives at the international boundary. The outcomes of this workshop will assist the AEHC in responding to its specific IRRB assignment regarding the development of nutrient objectives at the international boundary. The AEHC will provide a full report on the outcomes of this workshop at the July 2004 meeting.

3.05 Biological Monitoring and Assessment

The AEHC held the Red River Basin Reference Condition Workshop on March 10-12, 2004 in Fargo, ND. The workshop was sponsored by the IRRB and funded via grants from the IJC and the Bureau of Reclamation to the Red River Basin Institute who handled all workshop arrangements.

The Institute invited U.S and Canadian experts in reference condition monitoring to facilitate the workshop. Drs. M. Barbour (Tetra Tech, Inc.), P. Larsen (U.S.EPA), D. Arscott (Stroud Water Research Center), and R. Bailey (University of Western Ontario) were instrumental in making the workshop a success. The facilitators helped the participants address several important workshop goals:

1. Reach consensus on the definition of a reference reach and a reference condition.
2. Identify predominant anthropogenic stressors.
3. Reach consensus on the appropriate biological assemblages that will be monitored.
4. Reach consensus on methods.
5. Develop a monitoring plan.

The AEHC will be preparing a formal report on the outcomes of the workshop with recommendations for the IRRB on how biological monitoring should proceed. The AEHC will also make recommendations to the IRRB on how it plans to move forward with tasks identified in the IRRB work plan. The full report will be presented to the IRRB at the July 2004 annual meeting.

3.06 Water Quality Data at the International Boundary (Emerson, MB)

The automatic water quality monitor located at Emerson began collecting data for *chloride*, *pH*, *conductivity*, *temperature* and *dissolved oxygen* in May 2002 and, except for occasional equipment failure, has been operating continuously since that time. Apparent anomalies in the data, as reported at the IRRB annual meeting in July 2003, have also been investigated. The investigations would indicate that the *pH*, *temperature* and *dissolved oxygen* data are consistent with manual field readings. However, it has been determined that the conductivity probe is periodically subject to air entrapment resulting in below normal values. Through comparison with grab sample data, it was also confirmed that there are anomalies in the *chloride* data. New combination probes and separate reference and chloride probes are presently being tested.. A replacement conductivity meter and probe will be installed as soon as field conditions permit.

With assistance from the USGS, real-time access to the Emerson water quality data has been provided on the USGS website. The data have been closely scrutinized to ensure that only reliable data are presented for public use.

4.0 **Red River Basin - Activities and Issues**

4.01 Devils Lake Sub-Basin

Since freeze up in November 2003, the USGS monitoring station at Creel Bay (north lake shore at the City of Devils Lake) recorded winter water levels on Devils Lake at about 1446.5ft (msl). On March 27-28, 2004, the annual Spring rise in Devils Lake water levels started somewhat early and abruptly with a two inch rainfall on the still frozen soil. The lake level responded immediately and the lake rose about one-half foot within two days. (The lake level appears to have peaked on April 15 at about 1447.68ft and has started a slow decline with virtually zero overflow into Stump Lake.)

US National Weather Service (NWS) forecasts indicate that the lake will likely exceed elevation 1448 prior to peak in late June 2004 (dependent on future weather conditions). Interpretation of the forecast information suggests an approximately 25% chance the lake may exceed el.1449, and higher levels with lower probabilities. The previous highest recorded historical peak occurred at el. 1448.1 on August 9, 2001. Natural overflows from Devils Lake to the Sheyenne River will occur at el.1459.

NWS information also indicates that at el. 1447 the lake area is about 195 square miles. Other lake areas are as follows: el. 1448 - 202 square miles; el 1449 - 213 square miles; el 1459 - 450 square miles. Flow data into Stump Lake under open water conditions have been rated as follows: el. 1447 - 25 cfs; el 1448 - 125 cfs; el 1449 - 300 cfs. At el 1448 some roads will incur wave action during high winds. At el 1449, drainage problems will occur at the western shore in the town of Minnewakan and US Highway 2. Other infrastructure issues would occur as water levels rise. Many factors influence lake levels, including: Spring melt, summer weather; State Highways 20 and 57 restricting lake flow from west to east; flow into Stump Lake, size of the lake, and annual evaporation rate of 36" to 42".

On October 14, 2003, the US Army Chief of Engineers signed a Record of Decision (ROD) recommending a 300 cfs emergency outlet from Devils Lake at a projected cost of approximately \$200M. Construction of the outlet was contingent upon US State Department assurance, and North Dakota approval. The US Secretary of State, on January 20, 2004 provided his assurance that the project would not violate the Boundary Waters Treaty - subject to several conditions. North Dakota officials subsequently stated they did not agree with water quality and biota transfer provisions in the federal-lead outlet proposal, and the resulting \$70M (65/35) state match.

The North Dakota State Water Commission is proceeding on construction of its own \$28M state-lead emergency outlet. The outlet is based upon a drain permit authorized by the State Water Commission, and a NPDES discharge permit authorized by the State Health Department. The NPDES permit constrains outlet flow to 100 cfs, 300 mg/l downstream sulfate concentration, and discharge only during open water periods between May through November. Both of these authorizations resulted in State court litigation action, and the NPDES litigation is ongoing. The State Water Commission is proceeding with \$19M in contracts for construction this summer, and intends to operate the outlet in 2005.

Because of its ongoing concerns about the State outlet project, Manitoba is currently challenging in North Dakota State court the validity of the operating permit issued for the project. Further, on March 19, 2004, Manitoba indicated that it is suspending cooperation with North Dakota on water issues, and will no longer consult State officials on water projects within the province.

Canada would like to have the Devils Lake outlet projects referred to the IJC.

4.02 Red River Valley Water Supply Study

The Dakota Water Resources Act of 2000 (DWRA), authorized the Red River Valley Water Supply Project. The purpose of the project is to identify the water needs of the Red River Valley in North Dakota and options for meeting those needs.

As directed by the Dakota Water Resources Act of 2000, Reclamation has undertaken studies to identify the water needs of the Red River Valley and options for meeting those needs. The results of those studies will be documented in the *Report on Red River Valley Water Needs and Options* which will be completed in November 2005. Reclamation has finished draft plans for water demand rates, water system assessments, and water system data collection. Final reports have been completed for water conservation, recreation needs, population projections, aquatic needs, and a regulatory overview of the Safe Drinking Water Act. A draft of an industrial projections report needed to identify future water needs for potential industry in the Red River Valley was completed by North Dakota State University and Reclamation and is under review. Meridian Environmental Technology, Inc. prepared a draft report on drought frequency of the Red River of the North Basin which is also being reviewed.

Reclamation is working with the U.S. Geological Survey (USGS) on several aspects of hydrology modeling. The agencies have formulated a naturalized flow database and have completed calibration of the water accounting model, StateMod. In addition to this work, USGS is preparing reports on Sheyenne River gains and losses, naturalized flow database, water quality modeling, water quality regression analysis, water quality needs assessment, water quality trends analysis, and methods and revisions to unregulated flow. A reservoir evaporation report has been published. USGS is also coordinating water quality modeling of the Sheyenne and Red Rivers with the Corps of Engineers.

The DWRA also requires completion of an Environmental Impact Statement that evaluates environmental impacts of any proposed project designed to meet water needs of the Red River Valley. As directed by the DWRA, Reclamation and the State of North Dakota are jointly preparing the EIS. The Governor of North Dakota has designated the Garrison Diversion Conservancy District as the state entity responsible for serving as co-lead with Reclamation in the preparation of the EIS. Reclamation and Garrison Diversion Conservancy District are jointly preparing an environmental impact statement for the Red River Valley Water Supply Project. The draft document is scheduled to be finished in December 2005. Geographical Information System layers for most of the biological and engineering resources have been created and baseline data collected. This information will be used in impact analysis.

Three groups of alternatives are being studied at the feasibility level for inclusion in the EIS. A No Action Alternative, required by the National Environmental Policy Act; In Basin Alternatives designed to examine potential water sources within the Red River Basin; and Import of Missouri River water alternatives designed to examine moving water from the Missouri River to the Red River Valley. A preferred alternative has not been selected and final selection of the preferred alternative will be made by the Secretary of the Interior in consultation with the State of North Dakota in coordination with local affected communities, as required by the DWRA.

Progress reports on Reclamation's Needs and Options Report and the jointly prepared EIS are available via the Needs and Options Newsletter and the EIS website (www.rrvwsp.com).

4.03 Water-Related Developments in Manitoba

In April 2003, the Manitoba Water Strategy was released that articulates Manitoba's water policies, and identifies the water-related issues in the province and actions to be undertaken. A key element of the Strategy is the integrated planning and management of water on a watershed basis. Further, in November 2003, the Department of Water Stewardship was created that brings together under one ministry all the offices of the provincial government dedicated to water protection and water management.

In February 2004, the Drinking Water Safety Act was proclaimed reinforcing actions already taken to protect drinking water in Manitoba. A new Water Protection Act was introduced into the Manitoba Legislature in March 2004 that complements the Drinking Water Safety Act and provides for additional protection and conservation of water sources. Key elements of the Water Protection Act include:

1. The authority to develop regulations that:
 - establish water quality standards, objectives and guidelines,
 - designate areas as water quality management zones and prescribe activities that are prohibited in those zones,
 - prohibit activities that adversely affect water quality, water quantity, aquatic ecosystem or a drinking water source,
 - control the importation and intentional movement and transfer of invasive exotic species in the province,
 - control the use of water during serious water shortages,
 - govern the preparation, content, approval, authority and implementation of watershed management plans and to designate watershed planning authorities to undertake planning.
2. Establishment of a Manitoba Water Council to advise and make recommendations to the Minister on matters related to water.
3. Establishment of a Water Stewardship Partnership Fund which will be used to provide grants in support of research, projects and activities that further the purposes of the Act.

5.0 International Red River Board Work Plan

5.01 Review of Priorities

The IRRB has undertaken a review and update of its October 2002 work plan to reflect the current status of

activities. A number of these activities i.e. natural flow data base development, *Living with the Red* implementation survey and assessment, lower Pembina River flooding analysis, biological monitoring review, and development of nutrient objectives, are in progress or have been completed as noted in this and previous reports. Over the next two years, the primary focus of the IRRB will be on building momentum through the AEHC with respect to providing leadership on ecosystem health goals and monitoring objectives for the Red River basin and on completing the specific tasks assigned to the AEHC. The capacity of participating agencies is a fundamental consideration in establishing longer-term commitments to the work of the IRRB and will be reflected in the details of the updated work plan.

The updated work plan will be presented for discussion and IRRB approval at its annual meeting in July. Once approved, the work plan will be provided to the IJC.

6.0 Annual Meeting Schedule

The 2004 IRRB annual meeting is scheduled for July 13-15, in Devils Lake, North Dakota. The first one-half day of July 13th will be reserved for the IRRB Executive Session, while the afternoon of July 13th and July 14th will be open to a public audience. The public forum segment will be held in the morning of July 15.

The meeting agenda is presently under development including options for invited presentations and discussions. Further details will be provided in the following days and weeks.
