# Red River Floodway
# Operating Rules
# Public Review Report



**Manitoba Water Stewardship**
**November 1, 2010**

Manitoba

## Introduction

*Environment Act* Licence No. 2691 issued on July 8, 2005 to authorize the expansion and operation of the Red River Floodway (the floodway) requires the Department to operate the floodway in accordance with the rules of operation set out in an attachment to the licence. Clause 15 of the licence requires the department to conduct a public review of the floodway rules of operation not less than once every five years or, more specifically, by July 8, 2010. Due to 2010 spring flooding in the Red River Valley and resources dedicated to related flood fighting activities, approval was received by the Director of the Environmental Assessment and Licensing Branch, Manitoba Conservation to delay the submission of the report on the public review until November 1, 2010.

The floodway is operated according to four rules. The intent of operating rules 1 to 3 is to provide flood protection to the City of Winnipeg. Rule 4 provides emergency operations to deal only with the risk of sewer backup, basement flooding and resultant health risks, in the period after the spring flood has passed. Operation to reduce the risk of sewer backup has occurred four times since 2002, including in 2010. In addition, with high summer flows experienced in the past decade, the floodway has also been operated under Rule 1 in the summers of 2002, 2005 and 2010.

## Public Consultation Process

The public review process began in May 2010 with public consultation led by Farlinger Consulting Group Inc. and H N Westdal & Associates (see Attachment One) and included several broad components:

- Letters to the Cities of Winnipeg and Selkirk and to adjacent municipalities advising of the review process and an invitation to provide comments;
- Meetings with adjacent municipalities;
- Newspaper advertisements;
- Web based materials;
- Public open houses; and
- An invitation to the public to provide written comments.

Meetings were held with three municipalities and the City of Selkirk. Meetings were either with council or senior municipal staff. A record was kept of each meeting. In two cases, the meeting notes constitute the primary expression of municipal concerns.

Three public open houses were held as part of this review. People resident north of the floodway, inside the floodway and south of the floodway generally have different perspectives on floodway operations, reflecting their personal experience with the floodway and Red River flooding. Therefore, venues were chosen to facilitate attendance by these three groups. The open houses included a comprehensive set of storyboards to explain floodway history, operations and rules (see Attachment One for a copy of the storyboards). Open houses were led by Farlinger Consulting Group Inc. and H N Westdal & Associates with staff from Water Stewardship in attendance to explain technical details of floodway operations, related regulations, supporting legislation, and

floodway related research and studies. The open house hours were held from 2:00 PM to 8:00 PM on the following dates:

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| Monday, July 5th | Selkirk Inn & Conference Centre, Selkirk |
| Tuesday July 6th | Holiday Inn Winnipeg South, 1330 Pembina Highway, Winnipeg |
| Thursday July 8th | Howden Community Centre 1078 Red River Drive, Rural Municipality of Ritchot |

The public was notified about the public consultation through newspaper advertisements that invited the public to "Share Your Views" by attending open houses and submitting comments in writing. On the Manitoba Water Stewardship web site, information on the open houses, background information including copies of relevant reports and the *Environment Act* licence, and an electronic comment form were provided (http://www.gov.mb.ca/waterstewardship/floodway_rules_of_operation/index.html).

Members of the public and municipal governments were invited to make written comments about the floodway operating rules. Written comments were received at open house venues, via mail and through the Water Stewardship website. At the open house venues comment cards were provided to facilitate comments. Comments received at each open house included both those written on comment cards and more detailed written submissions.

The public consultation identified a number of issues concerning the floodway and its operation. As noted in the report on public consultation (Attachment One), perspectives on floodway operations tend to relate to a respondent's place of residence. This applies to the Cities of Winnipeg and Selkirk, municipal governments and individuals. For example, residents north of the floodway have different perspectives than people resident south of the floodway, reflecting different types of effects from the floodway. In general, those residents north of the floodway have concerns about flooding due to ice jams and concerns about the regular loss of the Dunning Road Crossing. People resident south of the floodway have concerns about artificial flooding and the impact to property, lifestyle and peace of mind. Residents within the floodway's protection are most concerned about high water levels that affect bank stability and the use and enjoyment of the Red River during the summer. Although a wide range of concerns were heard about the floodway during the public consultation process, this public review, as required under the *Environment Act* licence, focuses on issues related to the Red River Floodway operating rules.

**Summary of Main Comments Regarding Floodway Operating Rules**

**a) Timing of Initial Floodway Operation:**

The timing of initial floodway operations is a concern to municipalities and there is disagreement on when initial notification of floodway operation should be made. For example, downstream municipalities noted that when the floodway is activated during the day, they have to deal with floodway issues at night because of the time delay between water first entering the floodway and reaching the downstream municipalities. Downstream municipalities would prefer operation just before midnight so that any floodway effects would reach them the next morning. In contrast, the upstream municipalities prefer initial operation in the morning to allow the municipality and its residents to deal with impacts of operation in daylight hours.

The Department recognizes the need for municipalities to address issues of initial floodway operation during daytime hours and will make every effort to time initial operation to minimize night-time impacts. However, operation of the floodway must occur in a timely fashion that best reflects the need to protect public health and safety. Improved communication between the Department and the municipalities (as described below) may assist both upstream and downstream municipalities in dealing with the impacts of floodway operation, regardless of the timing of operation.

Some residents and associations within the City of Winnipeg recommended that the floodway be operated as soon as possible in the spring and that the clause stating "The Floodway gates should not be operated until ice on the river is flowing freely" should be removed from the operating rules. Respondents indicated that recent expansion activities including bridge construction should mitigate the risk of ice jams within the City of Winnipeg. Others downstream of the City of Winnipeg recommended that the floodway not be operated until ice on the Red River is flowing freely to the Breezy Point area.

There are considerable risks associated with operating the floodway before ice on the river is flowing freely. Even with the expanded floodway, the potential exists for ice jams to occur at bridges thereby reducing floodway effectiveness and compromising the City's flood protection. Traditionally, the floodway is operated once ice is moving freely at the floodway inlet so that ice does not move into the floodway channel. The operating rules provide for an exception when flooding in the City of Winnipeg is imminent. For example, in the spring of 2009 the floodway was operated before ice had broken up in the vicinity of the floodway inlet to reduce a serious threat of flooding within the City of Winnipeg from ice jamming.

**b) Dunning Road Crossing:**

Dunning Road is an important link between areas east and west of the floodway in the RM of St. Clements. Dunning Road crosses the floodway at grade with a ford type crossing of the central drain. The crossing provides access from Henderson Highway to Highway 59 in the vicinity of the Pineridge Trailer Park. When the floodway is in

operation, the road is closed to the public, providing a significant inconvenience and impacting emergency response times and costs. Before the crossing can be returned to use after floodway operation, the municipality often has to restore the road to a useable condition at their own cost. It is also important to note that the municipality received authorization to build this crossing and accepted that the crossing would require repair and clean-up following use of the floodway in the spring.

The Department recognizes that the closure of Dunning Road during summer flooding is a significant negative impact to the RM of St. Clements, and one which was not planned for by the municipality as part of its maintenance program for the crossing. The Department will evaluate options to compensate the RM of St. Clements for the impacts on Dunning Road Crossing arising from summer floodway operation under Rule 4.

**c) Interpretation of Rule 2:**

The City of Winnipeg requested additional interpretation on how the province will operate the floodway under Rule 2 as it impacts the City's flood preparedness.

It is difficult to predict exactly how the floodway will be operated under Rule 2 to ensure flood protection for the City of Winnipeg. However, Manitoba Water Stewardship will control the amount of water through the City of Winnipeg so as not to sacrifice freeboard on the primary dikes.

However, under Rule 2 which is used in a major flood event, the City of Winnipeg must also perform due diligence and raise the primary dikes. During all floodway operations Manitoba Water Stewardship maintains open communication with the City of Winnipeg's Water and Waste Department engineering staff. Water Stewardship engineering staff consult with city officials on proposed operation plans to ensure coordination of emergency response activities and operation of the primary dikes and associated structures.

**d) Expanded Summer and Fall Floodway Operation:**

A number of comments were received regarding expanded summer and fall floodway operation. There are a number of benefits such as regulating river levels and supporting river tourism activities that could be attained if operation of the floodway in the summer and fall were not limited to emergency circumstances. However, except in the most extreme seasonal flood conditions, all summer and fall operations of the floodway cause artificial flooding and related costs and damages (including social impacts) upstream of the floodway gates. There are also impacts downstream such as loss of the Dunning Road Crossing. During the public consultation, arguments were presented both for and against expanded operation of the floodway in summer and fall.

The benefits of expanded floodway operation could include a reduction in physical damage to property, enhanced business and recreational opportunities on or near the rivers, and reduced costs for clean up associated with summer flooding events in the City

of Winnipeg. The risk of basement flooding resulting from high river levels would be further reduced under expanded operation because river levels within Winnipeg would be lowered more frequently, and the water level could be kept lower than allowed under the current operation rules. A positive effect on riverbanks within Winnipeg would be a reduction in bank erosion due to maintaining lower river levels.

Some participants in the public consultation process expressed concern regarding current cost benefit analyses around summer emergency floodway operation. Uncertainty is expected to be reduced after results are available from the engineering study, jointly funded by the City of Winnipeg and Manitoba Water Stewardship, on basement flood damages related to high Red River water levels.

The negative impacts of expanded summer and fall operation of the floodway include artificial flooding for many miles upstream of the floodway inlet causing damage to tangible assets such as agricultural crops, roads, backyards, onsite wastewater systems, and gardens. Expanded operation of the floodway in summer and fall would increase the frequency of such artificial flooding which causes social as well as economic impacts. During the public consultation, residents and municipalities upstream of the floodway spoke of the stress and resulting illness and anxiety that come from the uncertainty of operation of the floodway during summer storms. Enhanced summer and fall operation of the floodway could also have a negative incremental effect on erosion, sliding and failures of riverbanks upstream of the floodway gates, and may negatively impact fish and wildlife habitat. Downstream residents would also be impacted by expanded summer and fall operation of the floodway through more frequent closure of the Dunning Road Crossing and the resulting impacts to convenience, safety and costs in the RM of St. Clements.

The Manitoba Government has committed to review whether the floodway operating rules should be revised to allow greater use of the expanded floodway. Expanded floodway operation to summer and fall would be considered a major alteration that would require a full review and approval in accordance with *The Environment Act.* A referral of such a proposal to the Clean Environment Commission for a public hearing would be expected. A number of federal departments and agencies, including the Canadian Environmental Assessment Agency, the Department of Fisheries and Oceans, Transport Canada, and Infrastructure Canada would participate in an environmental review of expanded summer and fall floodway operation. Engineering, environmental and social–economic studies to examine the costs and benefits associated with expanded floodway operation are expected to take at least two years.

**e) Communication Protocol:**

It was noted during the public consultation that there is no requirement under the floodway rules for notification of municipalities or residences north of the entrance on the activation of the floodway gates. The current protocol whereby the Emergency Measures Organization informs the various RM and City of Selkirk coordinators that the

Floodway is about to be operated was not found to be an effective method of communicating to municipal and City officials.

Manitoba Water Stewardship will develop an e-mail database that includes contact information for those municipal and City officials who require notification. The new notification process will be in place for the spring of 2011.

**f) Selkirk Area Ice Jamming:**

The City of Selkirk, the R.M. of St. Clements, the Coalition for Flood Protection North of the Floodway and a number of individuals expressed the opinion that floodway operation exacerbated ice jams downstream of the floodway outlet which in turn causes flooding upstream of the jam location. It is perceived that ice jams are frequently related to the activation of the floodway gates as flow in the floodway lifts upstream ice, carrying it downstream too fast, and causing ice jamming. Several participants recommended that the floodway not be operated until ice is moving freely to the Breezy Point area.

Historical newspaper articles as well as a report from Sir Sanford Fleming indicate that serious ice jams occurred on the Red River near Selkirk as early as the mid to late 1800s. Considerable work is underway through Manitoba Water Stewardship to understand the mechanisms of ice formation on the Red River. Computer models are being developed to simulate the evolution and behaviour of ice jams along the Red River. Technologies are being studied to extract data from satellite imagery for large-scale ice monitoring and ice thickness measurements to support activities of the Ice Jam Mitigation Program.

To date, studies have determined that ice jamming has become more severe within the last decade. In addition, spring floods are occurring earlier in the year. This leads to earlier ice breakup downstream and less time for thermal processes to degrade the ice cover before ice breakup.

In addition to research underway through the Department, Manitoba Water Stewardship will be recommending an independent study of downstream ice jamming in the Selkirk area related to floodway operations.

**g) Rule 4 Compensation:**

Since 2002, emergency summer use of the floodway has occurred four times, including in 2010. Each use of the floodway under Rule 4 results in artificial flooding causing property damage. Compensation for artificial flooding is a major concern for residents south of the floodway. Participants in the public consultation noted that compensation provided for emergency summer use was generally considered inadequate. It was noted that the loss of natural vegetation is not covered by compensation and that cleanup costs are based on minimum wage rates. Compensation for artificial flooding due to summer operations is provided under a program announced after each event.

Manitoba Water Stewardship plans to develop a regulation defining a Rule 4 compensation program under *The Shellmouth and Other Water Control Works Management And Compensation Act (Water Resources Act Amended).* This will formalize the compensation under Rule 4 similar to the compensation under the Floodway Act for compensation for artificial flooding caused by spring operations.

**h) Courchaine Road Closure**:

When the floodway is operated, the current policy is to close Courchaine Road to protect public health and ensure secure operation. Upstream residents complained of lost access through Courchaine Road while the floodway is being operated. During the summer 2010 operation, it took three weeks to cease floodway structure operation once the level was below the floodway lip. In 2010, access issues were compounded by the closure of the St. Adolphe Bridge which is currently under repair.

For summer flood events, flows are much lower than typically experienced during spring floods. When flows are higher, as in the spring, and the structure controls upstream levels to just below natural, the gates have little effect once inlet elevations are below the floodway lip. The drop from upstream to downstream of the structure is in the order of one foot. The gates can be lowered into their bedded position without significantly reducing the upstream elevation. However, when the levels are artificially elevated (several feet above natural) as in Rule 4 operation, gate changes are constrained by the rule which states that water levels should not be lowered "more than one foot per day". This criterion exists to protect the river banks from slumping. The drop from upstream to downstream of the structure in this situation is in the order of several feet (nine feet in June 2010). In addition, in June 2010, lowering of the gates was further delayed by the risk of heavy rains.

Operational staff with Manitoba Infrastructure and Transportation have expressed significant workplace and public safety concerns with having Courchaine Road open across the inlet control structure during floodway operation. Therefore, Manitoba will continue with the practice of closing Courchaine Road during inlet control structure operation as a standard operating protocol. Exceptions to this standard protocol may be considered on a case by case basis where workplace and public safety risks might be reduced such as during extended summer operations.

**i) Rule 1 Natural Water Level Computations:**

The City of Winnipeg proposed that during floodway operations, water levels should be kept as close as possible to natural water levels upstream of the Inlet Control Structure. The City proposed that decisions should be based on the best flow information available at the time and should not include a 0.5 ft or more safety factor. Operating as close as possible to natural, lowers water levels within the City and reduces the amount flood activities that the City needs to undertake, as well as maximizing the gravity capacity of the sewer system.

Operating to just below natural water levels at the inlet is done for the following reasons. Real-time data which is used for floodway operation contains many uncertainties. The source of these uncertainties are varied and include, among other things, water level gauge drift, rating curve anomalies, and human error. The floodway operations report which the department is required to produce by June 30 in a flood year uses provisional data provided by Water Survey of Canada. Experience has shown that significant differences can exist between the data used in real-time and the provisional data used in the report. Since the report is the official document used to determine artificial flooding, it is important that natural levels are not exceeded under Rule 1 flow conditions. Moreover, a difference in water level of 0.3 feet at the inlet equates to 0.25 feet or less at James Avenue for many flow conditions encountered in recent years.

j) **Sharing the Protection Offered by Flood Control Works**

The Ritchot North Action Committee requested that the benefits of flood control structures in southern Manitoba be shared by all residents. Specifically, they recommended that water elevations upstream of the floodway should also be reduced below natural whenever possible.

Flood protection measures are currently shared across the Red River Valley. The province has spent $110 million on flood protection upstream of the floodway to ensure that communities and individual residences are protected to the level of the 1997 flood at each particular location plus 2 feet (0.6 m). Lowering water levels upstream of the floodway would compromise the City of Winnipeg's flood protection.

**k) Opportunity for Comment on the Cost and Benefits Report Required Under Rule 4**

Rule 4 requires the Department of Water Stewardship to prepare a report on the associated costs and benefits of operating the Floodway to prevent widespread basement flooding and resulting risk to health and damage to property within the City of Winnipeg when forecast river levels are expected to rise to 14 feet JAPSD or higher. The report describes the basis of the Department's river level forecasts and its risk assessment, the risk of basement flooding in Winnipeg, and the benefits and costs of Floodway operation. Since operation of the floodway must occur in a timely fashion to minimize risks to health and damage to property, there is normally insufficient time available for the department to prepare and disseminate the cost and benefits report in a timely fashion and to obtain meaningful feedback from the Red River Floodway Operation Advisory Board (RRFOAB). Preparation of the report cannot begin until there is a quantitative assessment of the expected precipitation, resultant flows and associated risk of an imminent event. Quantitative precipitation forecasts beyond two days are very unreliable and therefore the Department has little advance warning of such events.

In 2010, the cost and benefit report was distributed to the Red River Floodway Operation Advisory Board for comment on June 2, 2010, just hours before the operation of the Inlet

Structure under Rule 4. Committee members were only given three hours notice to respond.

Manitoba Water Stewardship is investigating the option of preparing a single comprehensive cost and benefits analysis that would provide clear guidelines and triggers for floodway operation under Rule 4. This work will be completed after the jointly funded engineering study by the City of Winnipeg and Manitoba Water Stewardship on basement flood damages related to high Red River water levels is available sometime in the 2011 calendar year.

## Additional Matters

A number of additional matters regarding the floodway were raised by residents, municipalities and Cities during the public consultation process. For example, the RM of St. Clements noted that the floodway effectively cuts the municipality in half creating development issues and a loss of tax base. Policing of the floodway, illegal use of the floodway by ATVs and dumping, and the lack of dredging of the Red River were also raised. Some also mentioned the need for the City of Winnipeg to do more regarding flood protection including upgrading sewer infrastructure to modern standards to reduce the frequency with which the system is overwhelmed by rain. Discussion of these additional ideas and comments will certainly provide further guidance to the Department as well as aid in other programs underway.

## Next Steps

Public and stakeholder interest in the Red River Floodway and its operating rules remains high. Manitoba Water Stewardship thanks those who took the time to prepare detailed submissions and who made the effort to attend the public open houses. Operation of the Red River Floodway impacts municipalities, cities, businesses, personal property, and general wellbeing and peace of mind. Sharp contrasts in recommendations and opinions were expressed throughout the public consultation providing a considerable challenge in terms of balancing costs and benefits along the Red River.

As described above, a number of next steps are planned with respect to ice jams, communications, transportation impacts, and compensation. The department proposes the following:

- Make every effort to time initial floodway operation to minimize night-time impacts, in recognition of the need for municipalities to address issues of initial floodway operation during daytime hours,
- Investigate options to compensate the RM of St. Clements for the impacts of floodway operation on Dunning Road Crossing.
- Maintain the freeboard on the primary dikes under Rule 2 in conjunction with a commitment from the City of Winnipeg to perform due diligence and raise the primary dikes.

- Maintain open communication with the City of Winnipeg's Water and Waste Department engineering staff to ensure coordination of emergency response activities and operation of the primary dikes and associated structures.
- Conduct engineering, environmental and social–economic studies to assess the costs and benefits of expanded summer and fall floodway operation.
- Recommend an independent study of downstream ice jamming in the Selkirk area related to floodway operations, in addition to continuing research underway through the Department.
- Develop an e-mail database that includes contact information for those municipal and City officials who require notification of initial gate operations by the spring of 2011.
- Develop a regulation defining a Rule 4 compensation program under *The Shellmouth and Other Water Control Works Management And Compensation Act (Water Resources Act Amended).*
- Investigate the option of preparing a single comprehensive costs and benefits analysis that would provide clear guidelines and triggers for floodway operation under Rule 4.

Clearly more information is required before approval of significant changes to the operating rules is sought. Manitoba Water Stewardship would return to the Environmental Assessment and Licensing Branch of Manitoba Conservation with a proposal for a major alteration of the Red River Floodway's *Environment Act* license to allow more frequent summer and fall operation of the floodway if the engineering, environmental and socio-economic studies support an alteration.