# 13.0 Responses to TAC/Public Review

**REFERENCE:** **TAC Table 2, #1**

**ITEM:**

An erratum should be provided addressing errors and discrepancies in the EIS, including those identified in public and technical comments.

**RESPONSE:**

Please see TAC/MFA-S-1 Attachment 1.

# TAC/MFA-S-1

# ATTACHMENT 1

# FLOODWAY EXPANSION PROJECT

# ENVIRONMENTAL ASSESSMENT

# ERRATUM

# DOCUMENT ERRATA SHEET

| | |
|---|---|
| PROJECT NAME: | Floodway Expansion Project Environmental Assessment |
| PROJECT NUMBER: | 0211-A-09 |
| DATE: | August 2004 |
| CLIENT: | Manitoba Floodway Authority |
| REVISION DATE: | November 16, 2004 |
| AUTHORIZED BY: | David Morgan |

---

Chapter 1 (Figure 1.1-1)

In the Figure title; **DELETE** "Local Study Region" and **ADD** "Components of the Floodway System"

Chapter 1
Page 1-11

In the 5th paragraph, 1st sentence; **DELETE** "four" and **ADD** "five"

Chapter 1
Page 1-12

In the 3rd paragraph, 5th sentence; **DELETE** "the need for authorizations under the *Fisheries Act* and permits under the *Navigable Water Protection Act (NWPA)*" and **ADD** "Infrastructure Canada contribution of federal funds to the Project, as well as the need for authorizations under the *Fisheries Act* and permits under the *Navigable Water Protection Act (NWPA)*"

Chapter 4
Page 4-7

In the 5th paragraph, 4th sentence; **DELETE** "a distance of about 32 km (20 miles) in a southern and westerly direction from the Inlet Control Structure up to the point where the natural ground is above the design flood elevation" and **ADD** "70 km (44 miles) from the Floodway's Inlet Control Structure south of Winnipeg. The Dyke runs in a generally south westerly direction to tie into high ground at the west side of the Red River Valley."

Chapter 4
Page 4-9

In the 2nd paragraph, 3rd sentence; **DELETE** “surpassed” and **ADD** “significantly surpassed”

Chapter 4
Page 4-13

In the 1st bullet point; **DELETE** “60 m (200 ft)” and **REPLACE** with “110 m (350 ft)”

Chapter 4
Page 4-15

In the 1st bullet point, 2nd sentence; **DELETE** the entire sentence and **REPLACE** with “The depth will generally not increase but selected reaches of the channel may be deepened by up to 0.6 metres (2 ft)”

Chapter 4
Page 4-20

In the 1st paragraph, 2nd sentence; **DELETE** “0.3” and **REPLACE** with “0.6”

Chapter 4
Page 4-30

In the 1st paragraph, 5th sentence; **DELETE** “Section 12.0” and **ADD** “Preliminary Engineering Report Appendix B Section 12”

Chapter 4
Page 4-46

In the 1st bullet point, 2nd sentence; **ADD** “is discussed in Section 2 of the document Preliminary Engineering Report: Appendix C-Inlet Control Structure Pre-Design (SNC/Wardrop 2004a). The discharge capacity of these facilities is discussed in section 3.1.8 of the same Appendix in the Engineering Report.”

Chapter 4
Page 4-130

In the 2nd paragraph, 2nd sentence; **DELETE** “60” and **ADD** “70”

Chapter 5
Page 5-11

In the 8th paragraph, 2nd sentence; **DELETE** “without” and **REPLACE** with “with”
In the 8th paragraph, 2nd sentence; **DELETE** “with” and **REPLACE** with “without”

Chapter 5 (Table 5.4-2)

In the 3rd column, 2nd row, sulphate; **DELETE** “≤ 250 mg/L” and **ADD “**≤ 500 mg/L”

In the 3rd column, 3rd row, chloride; **DELETE** "≤ 200 mg/L" and **ADD "**≤ 250 mg/L"

In the 3rd column, 4th row, sodium; **DELETE** "≤ 45 mg/L[4]" and **ADD "**≤ 200 mg/L[3]"

In the 3rd column, 5th row, nitrate; **DELETE** "≤ 0.3mg/L" and **ADD "**≤ 45 mg/L"

In the 3rd column, 5th row, nitrate; after nitrate **ADD** "(as $NO_3$)"

In the 3rd column, 6th row, iron; **DELETE** "≤ 0.05 mg/L" and **ADD "**≤ 0.3 mg/L"

In the 4th column, 5th row, nitrate; after "0,05 mg/L" **ADD** "(as N)"

In Source 4; after "concentration" **ADD** "45 mg/L (as $NO_3$) is equivalent to 10 mg/L (as N)"

Chapter 5

Page 5-10

In the 3rd paragraph, 4th sentence; **DELETE** "7,900" and **ADD** "approximately 8 500" and **DELETE** "Inlet Structure" and **ADD** "Inlet Structure and Floodway Channel"

Chapter 5

Page 5-46

In the 6th bullet point; **DELETE** "would be less than in the river" and **ADD** "would be less than in the Floodway"

Chapter 5

Page 5-52

In the 2nd paragraph, 3rd sentence; **DELETE** "that flows northward from the Canada-U.S. border, through the City of Winnipeg into Lake Winnipeg" and **ADD** "that originates in the United States flowing northward into Canada, through the City of Winnipeg and draining into Lake Winnipeg"

Chapter 6 (Table 6.3-1)

In the 1st column, 2nd row, Total Ammonia; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)

In the 1st column, 3rd row, Dissolved Nitrate-Nitrite **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)

In the 1st column, 4th row, Total Kjeldahl Nitrogen **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)

In note 1, 2nd sentence; **DELETE** "Ranges are based on data from 1978 to 2003" and **ADD** "Ranges for most parameters are based on data from 1978 to 2003. Ranges for

2,4-D are based on data from 1986 to 2003, ranges for glyphosate are based on data from 2000 to 2003 and ranges for mercury are based on data from 1980 to 1984."

In note 2, 1st sentence; **DELETE** "There was no or minimal data collected during these months" and **ADD** "The data set did not include data on Total Ammonia during the months of January, March, September and October. The data set included only one or two data points for the months of February, July and August, thus percentiles could not be determined for these months."

Chapter 6 (Table 6.3-2)

In the 1st column, 2nd row, Total Ammonia; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)"

In the 1st column, 3rd row, Dissolved Nitrate-Nitrite; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)"

In the 1st column, 4th row, Total Kjeldahl Nitrogen; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)"

In note 1, 2nd sentence; **DELETE** "Ranges are based on data from 1970 to 2003" and **ADD** "Ranges for most parameters are based on data from 1970 to 2003. Ranges for Total Kjeldahl Nitrogen are based on data from 1974 to 2003, ranges for 2,4-D are based on data from 1985 to 2003, ranges for glyphosate are based on data from 1999 to 2003 and ranges for mercury are based on data from 1980 to 1984."

Chapter 6

Page 6-8

In the 2nd, 1st sentence; **DELETE** "0.18" and **REPLACE** with "0.56".

In the 2nd, 1st sentence; **DELETE** "0.22" and **REPLACE** with "0.69".

In the 2nd, 7th sentence; **DELETE** "Concentrations of 2,4-D amine peak in March at the Selkirk location and are typically consistent at the St. Norbert location" and **ADD** with "Concentrations of 2,4-D amine peak in March at the Selkirk location and in April at the St. Norbert location".

Chapter 6 (Table 6.3-3)

In the 1st column, 2nd row, Total Ammonia; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)"

In the 1st column, 3rd row, Dissolved Nitrate-Nitrite; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)"

In the 1st column, 4th row, Total Kjeldahl Nitrogen; **DELETE** "(mg/L)" and **ADD** "(as N; mg/L)

In the 2nd column, 7th row, 2,4-D; **DELETE** "$100^3$" and **REPLACE** with "$100^2$"

In the 2nd, 3rd, 4th columns, 1st row, Total Phosphorus; **DELETE** "NV" and **REPLACE** with "narrative guidelines for phosphorus of not in excess of 0.025 mg/L in any reservoir, lake or pond, or in a tributary where it enters such bodies of water, In other streams, total phosphorous should not exceed 0.05 mg/L."

Chapter 6 (Table 6.3-5)

In the 5th column, 2nd row; **DELETE** "average" and **ADD** "50th percentile"

In the 6th column, 2nd row; **DELETE** "average" and **ADD** "50th percentile"

Chapter 6 (Table 6.6-1)

Title; **DELETE "**and clam"

In the 3rd column, title row; **ADD** superscript "a"

Notes; **DELETE** "[c] Included in the *Fisheries Act* definition of "fish"" and "c"

Notes; **DELETE** "[d] Fingernail clam shells were observed along the gravel shoreline of the Floodway Channel near the outlet area in late September, 2003. During May 2004, after the operation of the Floodway, fingernail clams and giant floater mussels (live and shells) were observed within 1 km of the Floodway Outlet in the Low Flow Channel and along the Low Flow Channel shoreline (shells only)"

Chapter 6 (Table 6.6-2)

Title; **DELETE "**and clam"

In the 3rd column, title row; **ADD** superscript "a"

Notes; **DELETE** "[c] Included in the *Fisheries Act* definition of "fish"" and "c"

Notes; **DELETE** "[d] Fingernail clam shells were observed along the gravel shoreline of the Floodway Channel near the outlet area in late September, 2003. During May 2004, after the operation of the Floodway, fingernail clams and giant floater mussels (live and shells) were observed within 1 km of the Floodway Outlet in the Low Flow Channel and along the Low Flow Channel shoreline (shells only)"

Chapter 6 (Table 6.6-3)

Title; **DELETE "**and clam"

Notes; **DELETE** "[c] Included in the *Fisheries Act* definition of "fish"" and "c"

Notes; **DELETE** "[d] Fingernail clam shells were observed along the gravel shoreline of the Floodway Channel near the outlet area in late September, 2003. During May 2004, after the operation of the Floodway, fingernail clams and giant floater mussels (live and shells) were observed within 1 km of the Floodway Outlet in the Low Flow Channel and along the Low Flow Channel shoreline (shells only)"

Chapter 7

Page 7-10

In the 5th paragraph, 2nd sentence; **DELETE** "approximately 60 km"

Chapter 7

Page 7-26

In the 5th paragraph, after the 3rd sentence; **ADD "**Willows and other shrubs will also be cleared periodically so the hydraulic capacity of the floodway is not compromised"

Chapter 7 (Figure 7.2-1)

**DELETE** Figure 7.2-1 and **REPLACE** with the attached new Figure 7.2-1

Appendix E-1 (Section 1.3.2 Fisheries Act)

Page 1E-33

In the 2nd sentence; **DELETE** "Wuskwatim Generating Station" and **REPLACE** with "Floodway Expansion Project"

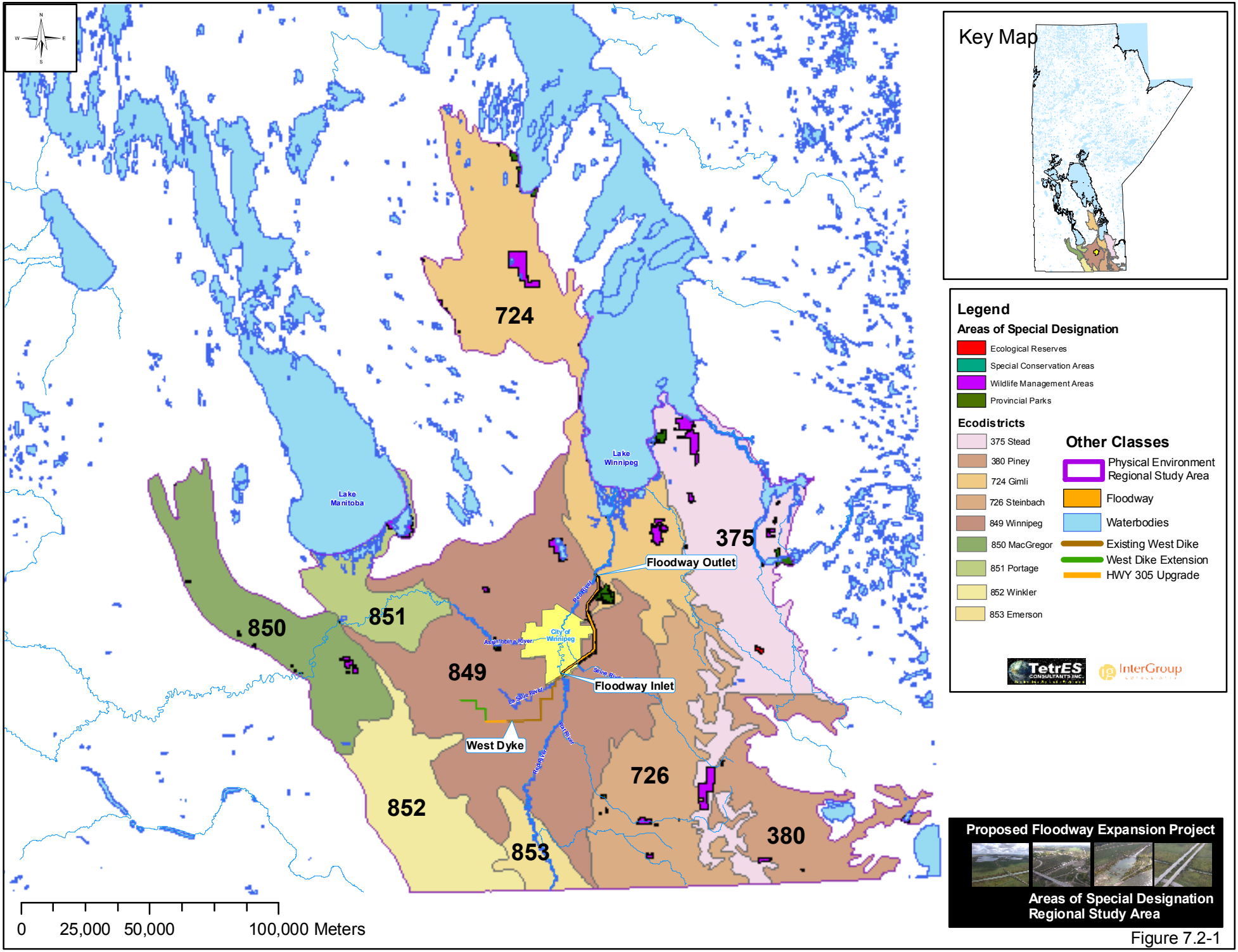
Key Map
Legend
Areas of Special Designation
Ecological Reserves
Special Conservation Areas
Wildlife Management Areas
Provincial Parks
Ecodistricts
375 Stead
380 Piney
724 Gimli
726 Steinbach
849 Winnipeg
850 MacGregor
851 Portage
852 Winkler
853 Emerson
Other Classes
Physical Environment Regional Study Area
Floodway
Waterbodies
Existing West Dike
West Dike Extension
HWY 305 Upgrade
TetrES CONSULTANTS INC.
InterGroup
724
375
850
851
849
726
852
853
380
Lake Manitoba
Lake Winnipeg
Floodway Outlet
Floodway Inlet
West Dyke
City of Winnipeg
Assiniboine River
La Salle River
Red River
Seine River
0
25,000
50,000
100,000 Meters
Proposed Floodway Expansion Project
Areas of Special Designation
Regional Study Area

Figure 7.2-1

**REFERENCE:** **TAC Table 2, #2**

**ITEM:**

All information identified for supplementary filing by MFEA should be provided.

**RESPONSE:**

Information identified for supplementary filing by MFA has been provided in Sections 1 through 12 of the Supplementary Filing.

**REFERENCE: TAC Table 2, #3**

**ITEM:**

All necessary applications for approvals must be submitted to regulatory agencies. Plans for obtaining these approvals should be described.

**RESPONSE:**

All necessary applications for approvals will be submitted to regulatory agencies prior to Project construction. Plans to obtain these approvals are outlined in Sections 1.5 and Appendix 1E in the EIS. As outlined in Appendix 1E of the EIS, The Manitoba Acts and Regulations that are applicable to the Floodway Expansion Project at minimum include the following:

- Environment Act;
  - Storage and Handling of Gasoline and Associated Products Regulation (MR 97/88R);
  - Waste Disposal Grounds Regulation (MR 150/91);
  - Litter Regulation (MR 92/88R);
- The Wildlife Act;
- Endangered Species Act;
- Crown Lands Act;
- Mines and Minerals Act;
- Water Rights Act;
- Sustainable Development Act;
- Heritage Resources Act; and
- Water Resources Administration Act.

Canadian federal governments Acts and Regulations applicable to the Floodway Expansion Project include the following:

- Canadian Environmental Assessment Act;
- Fisheries Act;
- Navigable Waters Protection Act;
- The Constitution Act;

- Species at Risk Act; and
- Migratory Bird Convention Act.

A description of each of the aforementioned acts is provided in Appendix 1E. Following issuance of the required Manitoba Environment Act license and federal approvals, additional required permitting required under the approvals process will be sought prior to the onset of Project construction. The types of permits required and the process of their acquisition will be outlined in the Environmental Protection Plan (EPP).

**REFERENCE:** **TAC Table 2, #4**

**ITEM:**

A listing of topics to be addressed in the EPP should be provided. Activities, monitoring, follow up and responsibilities for each topic should be discussed. The parties responsible for developing the plan should be identified, and planned consultation should be outlined.

**RESPONSE:**

Section 12 of this supplementary filing provides a framework of the construction phase environmental protection plan and the monitoring and follow-up. The construction phase environmental protection plan will be developed during the final design of the project and submitted for approval prior to start of construction. The monitoring and follow-up plans will be submitted after the licence is issued.

**REFERENCE: TAC Table 2, #5**

**ITEM:**

Elements to be included in EPP: mitigation plans for construction dewatering in case of high flows; development of monitoring and mitigation plans to address surface water intrusion; contingency plans to address groundwater blowouts.

**RESPONSE:**

It is recognized that groundwater monitoring and contingency planning need to be fully developed. The detailed design phase of the Project will present construction methods to prevent groundwater effects. The construction phase environmental protection (CPEP) Plan, that will be prepared after the detailed design will present, the activities to be taken, monitoring plans and contingency plans should blowout prevention methods fail or the monitoring indicate that adverse groundwater effects from groundwater intrusion could be occurring.

A framework for the CPEP Plan is provided as Section 12 of this supplementary filing. The CPEP Plan will be developed following detailed engineering design by the Manitoba Floodway Authority, engineering consultants, and the construction contractors and submitted to Manitoba Conservation for approval prior to start of construction.

The CPEP framework outlines the activities, monitoring, contingencies, follow-up, responsibilities, auditing, reporting, and documentation requirements. The plan will address all aspects of the construction including bridges, road works, earthworks, hydraulic structures, drainage structures, floodway channel and utility crossings.

The preliminary design phase of the Project investigated potential groundwater issues. Preliminary Engineering Report Appendix Q considered potential impacts of the Project on groundwater and of the groundwater on the Project.

**REFERENCE:** **TAC Table 2, #6**

**ITEM:**

Clarification is needed on Floodway Channel deepening (and widening).

**RESPONSE:**

The detailed design intent is to maintain the channel bottom consistent with the original floodway design elevation. Local scour holes, which have developed in the low flow channel, will be backfilled back to the original grade. Riprap lining will be added in areas susceptible to future scouring, such as in clays and sands. In the detailed design, the option is reserved for selective channel lowering over limited areas, such as at some bridge structures with up to 0.6 m (2 ft) lowering if required, to satisfy hydraulic requirements.

The floodway expansion has been optimized such that the amount of widening varies along the Channel. Near the upstream end there is no widening, whereas along the channel the amount of widening can vary from approximately 30 m to 120 m in total. A plot of the optimized channel configuration existing and expanded base widths is shown in EIS Figure 4.3-4 as well as Preliminary Engineering Report- Appendix B, on Figure 7-4 -- Floodway Channel Base Widths.

**REFERENCE: TAC Table 2, #7**

**ITEM:**

Additional information should be provided concerning the gate buoyancy.

**RESPONSE:**

The Inlet Control Structure gates have operated reliably since the first operation of the structure in 1968. As a part of the dam safety review conducted by SNC-Lavalin, the reliability of the gates was assessed. In spite of the fact that SNC-Lavalin concluded that there was an extremely remote chance that the gates could malfunction, a number of relatively low cost measures were identified to further increase the reliability of the gate and hoist system. The inlet control gate buoyancy is one of a number of measures recommended to increase the reliability. Although it cannot be said that failure of the gates is impossible, the standards for design have been met or exceeded and the probability of failure is deemed to be sufficiently remote that safety in the future will not be an issue.

**REFERENCE: TAC Table 2, #8**

**ITEM:**

Additional information is needed to address West Dyke design, construction and maintenance.

**RESPONSE:**

The proposed alignment of the West Dyke follows existing municipal roads and Provincial Road #305 that will be raised to the elevation required for flood protection.

It was suggested the design of the West Dyke should consider "the use of municipal roads as a base for the West Dyke". In fact, of the 63.6 kms of the West Dyke all but the most downstream 7 kms is located on road allowance, either on municipal roads or along PR 305. The suggestion was made to use trees and shrubs on the upper portions of the dyke slopes to assist in erosion protection. Given that most of the dyke also functions as a road, the presence of such vegetation is discouraged due to its propensity to act as a snow fence. The suggestion was that woody vegetation would "provide an opportunity for creating natural areas for wildlife". In general, vegetation along road shoulders and slopes is maintained in such condition so as to prevent wildlife from being obscured when coming into close proximity with vehicular traffic.

On-going maintenance of the West Dyke will likely consist of an extension of current practices. The roads will be maintained by the appropriate local traffic authority and the dyke slopes will be maintained through revenue generating leases for forage production. The Floodway Authority will manage an annual maintenance program to attend to all other infrastructure maintenance needs, i.e., culverts, gates, adjacent drain cleanouts, etc.

The rail lines are not being modified. All rail line alignments follow provincial roads and together they become combined closure points during a flood event.

**REFERENCE:** **TAC, Table 2, #9**

**ITEM:**

Additional information is required respecting pesticide use and mitigation during project revegetation.

**RESPONSE:**

Refer to DFO/MFA-S-25.

**REFERENCE: TAC Table 2, #10**

**ITEM:**

Bridge design – the EIS does not appear to address environmental considerations for the design and maintenance of the new road bridges. Additional information should be provided on environmental considerations for the new road bridges, including how deck drainage will be handled, potential impacts from use of road salts on the bridges, routine bridge maintenance, etc. Best management practices should be implemented with respect to deck drainage, use of road salts, etc. For example, deck drainage should not be discharged directly into surface water. Addition information on the Code of Practice for the Environmental Management of Road Salts is available at the Environment Canada website.

**RESPONSE:**

All of the new road bridges constructed over the floodway channel will be designed without any deck drains directly over the low flow channel. Deck drains are required in the remaining portion of the bridge in order to remove excess surface water during rain events as a safety measure to prevent hydroplaning of vehicles on the bridges. The design will provide for collection pits directly below the deck drains. These collection pits will be basically excavated into the ground, filled with rock and equipped with a standpipe collection system. For the majority of the time, any water that is collected within these pits will seep into the surrounding area. However, the standpipe collection system will allow for these pits to be pumped out in the event that there is an accident on the bridge and a hazardous material (such as diesel fuel, gas, etc.) is collected in the pits.

With respect to the use of road salts, the Manitoba Department of Transportation and Government Services (MTGS), the government agency responsible for the provincial highway system, is currently following the Code of Practice for the Environmental Management of Road Salts (April 2004) by Environment Canada and the Transportation Association of Canada (TAC) Syntheses of Best Practices for Road Salt Management, September 2003. MTGS also sent a Letter of Intent, dated October 2004, to Environment Canada stating that Manitoba has agreed to develop a Road Salt Management Plan, and is actively developing this Plan.

Current best practices used by MTGS to clear highway bridges are to push the snow entirely from one end of the bridge to the other. The snow clearing operations do not blow snow and accumulated road salts over the sides of the bridges.

**REFERENCE: TAC Table 2, #11**

**ITEM:**

Clarification is needed respecting flood return periods and historic floods.

**RESPONSE:**

Flood frequency information is stated in the Preliminary Engineering Main Report – Section 2.1.

Notable floods at Redwood Bridge in Winnipeg are:

***1826*** – has been quantified some 50 years ago as a value of ***6 370 $m^3/s$*** (225,000 cfs), however, this has been disputed by evidence reviewed by KGS Group in their report of 2001 ("Flood Protection for Winnipeg" – Appendix A). Evidence shows that actual flood peak could have been between 5 100 $m^3/s$ (180,000 cfs) and 8 500 $m^3/s$ (300,000 cfs). Actual peak may never be known.

***1852 -*** flood peak was estimated by the Red River Basin Investigation (RRBI) in 1952 to be between 3510 $m^3/s$ (124,000 cfs) and 5097 $m^3/s$ (180,000 cfs), with a best estimate of **4672 *$m^3/s$* (165,000 cfs)**. This was based on the RRBI's calculations using water levels reported from an 1880 report by Sir Sanford Fleming. Review and refinement of this by KGS Group in 2001 led to an estimated range from 4012 $m^3/s$ (142,000 cfs) to 5825 $m^3/s$ (206,000 cfs) with a best estimate of 5340 $m^3/s$ (188,600 cfs). With the uncertainty inherent in this estimate, it is considered to be roughly the same size as the 1997 flood.

***1950*** – ***2 930 $m^3/s$*** (103,440 cfs) (actual recorded peak flow – no flood control works in place).

***1966*** - ***2 500 $m^3/s$*** (88,200 cfs) (actual recorded peak flow – flood control works under construction and not operable).

***1979*** – ***3 010 $m^3/s$*** (106,300 cfs) (estimated natural flood that is approximately 230 $m^3/s$ (8,100 cfs) greater than actual flood peak below the Floodway Outlet, due to reductions provided by the Portage Diversion and Shellmouth Reservoir).

***1996*** – ***2 970 m³/s*** (105,000 cfs) (estimated natural flood that is approximately 360 $m^3$/s (12,800 cfs) greater than actual flood peak below the Floodway Outlet, due to reductions provided by the Portage Diversion and Shellmouth Reservoir).

***1997*** – ***4950 m³/s*** (163,000 cfs) (estimated natural flood that is 310 $m^3$/s (11,000 cfs) greater than actual flood peak below the Floodway Outlet, due to reductions provided by the Portage Diversion and Shellmouth Reservoir).

Also see erratum (attachment for TAC/MFA-S-1, page 2).

**REFERENCE:** **TAC Table 2, #12**

**ITEM:**

Additional information is needed on the results of the dam safety.

**RESPONSE:**

The dam safety issues related to the Floodway between the TransCanada Highway and the Inlet Control Structure are described in the Preliminary Engineering Report Appendix C – Section 3.1.7.5.

**REFERENCE: TAC Table 2, #13**

**ITEM:**

Clarification is required respecting the upgrading at the inlet control structure – where the work is being carried out.

**RESPONSE:**

The scope of upgrading work for the Inlet Control Structure upgrades is described in Preliminary Engineering Report Appendix C. At this time, it is anticipated that this work would be implemented in a 2 to 3 year period. Work requiring access to the gates and possibly the hoists would likely be done in the winter, similar to the 2000 to 2002 Inlet Control Structure rehabilitation project implemented by the Province. For the water related work to be completed during the winter months, it is anticipated that the structure would be dewatered on site, one bay at a time, similar to the 2000 to 2002 rehabilitation program. For these activities, it is anticipated that structural cofferdams similar to those used in 2000 to 2002 would be used. A low level access rockfill berm to the site may be required, again, similar to what was done for the 2000 to 2002 work.

In addition to the work potentially related to instream works, described above, other reliability upgrade projects related to the mechanical/electrical systems will be undertaken. These works can be done concurrently with the water related works (i.e., during the winter) or during the summer months.

All of these activities and the associated schedules will be addressed in detail at the final design stage.

**REFERENCE: TAC Table 2, #14**

**ITEM:**

Clarification is required concerning temporary roads for construction access.

**RESPONSE:**

There is not a requirement for any public temporary detour routes during construction, with the possible exception of the PTH 44 bridge crossing. This crossing may require a temporary detour structure adjacent to the existing structure, and this decision will be finalized during detailed design. Any temporary detour routes will be removed and restored to original condition, including re-vegetation as required, in accordance with the re-vegetation plan that will be developed as part of the Construction Phase Environmental Protection (CPEP) Plan.

Any temporary construction access will be contained within the existing floodway channel right-of-way or Manitoba Transportation and Government Services right-of-way, and again will be restored to the original condition. Temporary construction access will be identified during the development of the CPEP Plan.

The Construction Phase Environmental Protection (CPEP) Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

**REFERENCE: TAC Table 2, #15**

**ITEM:**

Information is needed respecting alterations to and the operation and maintenance of the Seine River Siphon.

**RESPONSE:**

Transport Canada comments – Section 4.8:

> *"approval for the existing infrastructure must be obtained under the NWPA…to make the siphon a lawful structure…proposed alterations will then be assessed…identify mitigation…improve navigation and navigation safety measures in place or proposed".*

As indicated in the Preliminary Engineering report – Appendix "D", the alterations currently planned for the Seine River overflow structure/siphon are confined to 1) abandonment/decommissioning of two of the four overflow culverts into the floodway channel 2) installation of isolation gates on the remaining two overflow culverts 3) minor modifications to the overflow weir to enhance low flow characteristics in the siphon and 4) supply and installation of an improved trash rack on the siphon inlet. A revised operation and maintenance plan will be prepared following construction. The present project design includes no alterations to improve navigation or navigation safety at this structure.

An application for authorization under NWPA will be submitted and consultation with Transport Canada would be initiated to determine signage and other works required to improve navigation safety and facilitate portaging ability at this location. See also Section 9.0 of the Supplementary Filing regarding status of authorization under the Navigable Waters Protection Act.

**REFERENCE:** **TAC Table 2, #16**

**ITEM:**

Additional information is needed respecting water levels and their effects for all operational scenarios. Additional information is specifically required concerning gate operation during spring flood events.

**RESPONSE:**

Information on operation scenarios and resulting water levels, flooded areas and effects are described in Section 8.1 of the Supplementary Filing regarding Spring Floodway Operation.

**REFERENCE: TAC Table 2, #17**

**ITEM:**

Summer (emergency) operation - information is needed on the objectives, rules and environmental effects. Ranges of frequency, duration, and timing of gate operation must be described. The effects related to all project components must be considered.

**RESPONSE:**

Information is provided in Section 8.2 of the Supplementary Filing regarding Summer Water Level Control in the City of Winnipeg and in Section 8.3 regarding Floodway Operation to Minimize Sewer Backup During Summer Storms.

**REFERENCE: TAC Table 2, #18**

**ITEM:**

Information on gate reliability is required, in view of the fact that redundant gates are not included as a project component.

**RESPONSE:**

Gate reliability and recommended improvements are addressed in the Preliminary Engineering Report, Appendix C. Based on an extensive review of precedents and assessment of the reliability of the existing system, it was concluded that it would be prudent to enhance the reliability of the existing gate system with some relatively low cost measures. These have been incorporated into the final design scope, and with the incorporation of these measures, the gate will meet or exceed accepted standards and expectations for this type of system and will be sufficiently reliable. Redundant or back up gates were considered and not recommended as a system reliability improvement.

**REFERENCE: TAC Table 2, #19**

**ITEM:**

Information is required concerning the effects of the project on the operation and maintenance of St. Andrews Lock and Dam. (PWGSC).

**RESPONSE:**

Public Works and Government Services Canada (PWGSSC) expressed concern that "the scope of the assessment does not include assessment of all instances of operation, only operation during spring events." The EIS lists the Project as the Expansion of the Floodway and determines effects of this project on the operation of the floodway.

The operation of the Existing Floodway is discussed in section 5.3.2.2 on Page 5-6 & -7 of the EIS. Emergency Spring operation was discussed in section 5.3.2.3 on page 5-7 of the EIS.

Effects of the Project (Expansion of the Floodway) on spring operation and summer operation were discussed on page 5-8 to 5-11. The EIS stated that the construction of the Project could decrease the probability of summer operation, since emergency summer operation would disrupt the construction of the Project and therefore potentially delays the completion date.

The Province is clarifying the rules for operation of the floodway for emergency operation to reduce the risk of sewer backup as discussed section Supplementary Filing Section 8.3.

Once the project is complete the newly expanded floodway is expected to have no effect on the probability of emergency summer operation. Emergency summer operation is possible without this expansion; it is not dependant upon the project.

PWGSC has specific concerns about the effects of the existing floodway and expanded floodway on operation and maintenance of the St. Andrews Lock and Dam (SALD).

During floods the Existing Floodway diverts water around the City of Winnipeg and regions north of the City including the SALD. The operation of the floodway reduces the flow passing through the

SALD. This operation should be expected to reduce erosion at the SALD and amount of debris passing through the area. The reduced flooding within Winnipeg during a major flood would greatly reduce the amount of debris passing through the SALD due to less flooding on the flood plain.

PWGSC is concerned that "once the floodway gate is dropped a great deal of debris is released". There does not appear to be evidence supporting this statement. The gates at the inlet structure are overflow gates as show on Figure 4.4-2 on Page 4-40 of the EIS. The water flows freely over the top carrying the debris. These gates are not like the "curtain" structures at SALD that may be prone to holding back debris. The floodway gates do not hold back debris. Debris arriving at the inlet control gates would flow over the gates and continue downstream. Operation of the floodway would be expected to cause some debris to be diverted around the SALD through the floodway. This would be expected for spring or summer operation.

The Project Expanded Floodway will have no effect on water levels or flow for spring or emergency summer operation (with the exception of reduced emergency summer operation during construction) until very large (greater than 1 in 90 year return periods). The Project is expected to reduce flow through the SALD during these very large floods. Reduced flooding in Winnipeg would reduce debris passing through the SALD.

PWGSC has expressed concern that "operation of the Floodway has resulted in variation in flow that affect the ability of the dam operators to react quickly enough to prevent damage to the structure." This statement is not very specific. The operation of the SALD is to increase water levels upstream of the dam during lower flow conditions. The floodway operation (in spring or summer) would only be initiated at flows higher than when SALD would be operating. It is unclear how the two operations would overlap.

It appears that ongoing discussion between the operators of the Floodway and SALD are required to further clarify any misunderstandings in the future and improve coordination of these operations.

**REFERENCE: TAC Table 2, #20**

**ITEM:**

Commentary should be provided respecting the prevention of ice entering the floodway channel.

**RESPONSE:**

This suggestion merits further attention in final design. It will require attention to the following:

- The existing piers are not designed to withstand significant ice loads, and would have to be analyzed to determine whether there would be a risk of failure of any of the piers during an ice jam event. Failure could lead to a rapid release of ice and impact ice loads on the new bridge that could threaten its integrity.
- Whether the additional head loss due to two structures at St. Mary's Road during moderate floods would adversely impact upstream interests.
- Whether it is desirable to have a facility that instigates ice jams, and thereby contributes to an ice jam that causes substantial loss of Floodway capacity and control of flow in the channel, or whether it would be of less risk to allow the ice to release through the enlarged Floodway Channel and Outlet Structure.

If careful consideration of this option indicates a net benefit to the project, it could be included in the project as a value-added component. It should have no bearing on the environmental impacts of the project as a whole. If included, notice would be provided to Manitoba Conservation.

**REFERENCE: TAC Table 2, #21**

**ITEM:**

Additional information is needed on maintenance of all components of the project.

**RESPONSE:**

Specific information was requested related to floodway channel base vegetation management/maintenance.

In general, vegetation management is usually a combination of mechanical (mowing) and chemical treatment. Control of undesirable species through mowing alone is cost prohibitive. A comprehensive maintenance manual, which will include channel maintenance activities, will be developed following construction.

In terms of future maintenance of the main channel base, the approach to controlling woody vegetation and other broadleaf species would likely involve a resumption of past practice, i.e., a five year cycle of mowing any heavy growth in the fall and an application of an approved targeting broadleaf herbicide on the re-growth the following year. Without the follow-up herbicide treatment, the undesirable species would re-establish with an even greater density than prior to mowing.

Cattail and other rush or woody growth in the outside drains is another area requiring vegetation management. Such growth, if left unattended for even two years, can have a significant detrimental affect on the hydraulic performance of the outside drains. On smaller drains/channels, a heavy establishment of undesirable vegetation within the channel can reduce the capacity of the channel by up to 50 percent. Inevitably, this reduction in capacity coincides with the greatest exposure to significant precipitation events during the season critical to crop production - summer. Although it is anticipated that for a few years following reconstruction the outside drains should require relatively little maintenance work, down the road they will need attention in terms of vegetation management. It is anticipated regulated use of herbicides licensed for aquatic application will be the methodology employed.

**REFERENCE: TAC Table 2, #22**

**ITEM:**

Clarification should be provided respecting laboratory detection limits.

**RESPONSE:**

Manitoba Conservation advises the detection limits for the surface water quality parameters provided in the data sets provided that were used to create Tables 6.3-1, 6.3-2 and 6.3-5 are as follows:

*Total Phosphorus* – from April 2001 to December 2003 the detection limit was <0.001 mg/L, the detection limit prior to April 2001 was not readily available.

*Total Ammonia* – until April 2001 the detection limit was <0.02 mg/L as N, from April 2001 to December 2003 the detection limit was <0.01 mg/L.

*Dissolved nitrate-nitrite* – the detection limit was <0.01 mg/L as N for the entire dataset.

*Total Kjeldahl Nitrogen* – from April 2001 to December 2003 detection limit was <0.2 mg/L as N, the detection limit prior to April 2001 was not readily available.

*Extractable Potassium* – Prior to April 2001 the detection limits were between <2 mg/L and <5 mg/L, the detection limits after April 2001 were not readily available.

*2,4-D* – Prior to 2002 the detection limits were between <0.05 mg/L and <0.1 mg/L, during 2002-2003 the detection limits were <0.05 mg/L.

*Glyphosate* – prior to 2001 the detection limits were between <0.005 µg/L and <5 µg/L, during 2001 the detection limits were between <0.002 µg/L and <0.2 µg/L, during 2002 the detection limits were between <0.002 µg/L and <35 µg/L, and during 2003 the detection limits were <2 µg/L.

*Mercury* – the detectable limit was < 0.02 µg/L.

The surface water quality analysis data for the years April 2001-2003 was done by Cantest Ltd. The surface water quality data analysis for the years 1996-March 2001 was done by Enviro-Test Laboratories. W.M. Ward Technical Services Laboratory (Provincial Lab) did the laboratory analysis prior to 1996.

No statistical techniques were used to account for any changes in detection limits when calculating the "ranges of measured data from the $10^{th}$ percentile to the $90^{th}$ percentile". If the measured concentration of a parameter was below the detectable limit infrequently for any particular month, the value for the detectable limit was included in the calculation of $10^{th}$ and $90^{th}$ percentile. For example, if one measurement in a data set for the month of January had a value of <0.05 mg/L, the percentiles were determined using a value of 0.05 mg/L for this parameter. In this case, if the detection limits changed over time and both detection limits were within the values within a particular dataset, then both detectable limit values were included in the percentile calculations. For example, if a dataset had values of both <0.05 and <0.1 the percentiles were calculated using values of 0.05 and 0.1 for these data.

In cases where the dataset for a particular month consisted primarily of values that were below detectable limits, the percentiles for these data were not calculated. The tables note these parameters as being below detectable limits.

**REFERENCE: TAC Table 2, #23**

**ITEM:**

Additional information is required concerning responsibilities for followup.

**RESPONSE:**

The monitoring and follow up Sub-sections identify parties responsible for such activities when the responsible party is other than the Manitoba Floodway Authority. In other cases the sections indicate that monitoring and follow up is either not necessary or will be detailed in the Environmental Protection Plan. Where the section is silence on who is responsible, the Manitoba Floodway Authority is responsible.

**REFERENCE: TAC Table 2, #24**

**ITEM:**

Information is required concerning the development of pre and post construction monitoring for aquatic invertebrates.

**RESPONSE:**

Baseline invertebrate datasets in the Red River are described in detail in Appendix 6E.

This dataset suggests that the benthic invertebrate community of the Red River is highly diverse and follows no identifiable pattern with respect to habitat characteristics. Replicated samples also displayed very high degrees of variation, suggesting elevated site-specific diversity or failure of the sampling methodology to be able to characterize the community.

The Red and Assiniboine River dataset suggest that benthic invertebrate sampling in these areas does not yield either predictive results respecting community dynamics and fails to provide reliable, reproducible results from a scientific viewpoint. This methodology has therefore been demonstrated to fail to produce useful results. The Guidelines Section 11 "Sources of Information" notes that the assessment is to use *"credible technical information and local knowledge"*.

Given the variability demonstrated by the available local knowledge and dataset on the comparatively stable invertebrate communities of the Red and Assiniboine Rivers, it is highly unlikely that any invertebrate sampling effort conducted in the Low Flow Channel (which typically experiences many annual environmental extremes of low and high flows, variable oxygen levels, changing water chemistry, etc.) will yield scientifically valid results regardless of the sampling or survey effort. For this reason the EIS acknowledges this issue as an information deficiency, but recommends against attempt to resolve it.

**REFERENCE: TAC Table 2, #25**

**ITEM:**

Additional information is needed respecting the acquisition and use of further information on migratory bird habitat.

**RESPONSE:**

With respect to migratory birds and other wildlife, Section 7.4 of the EIS provides a summary of relevant information needed in the assessment of potential effects. A more detailed description of the methods and survey results are outlined in Appendix 7C.

There were late spring and heavy rains, which led to the Floodway Channel slopes being largely under water in the spring of 2004 (Section 7.4.5 and Appendix 7C). This extent of spring high water levels in the Floodway Channel occurs in about two out of three years. Surveys were conducted prior to July 7, which is within the acceptable timeframe for breeding bird surveys as established by the Canadian Wildlife Service. Additional spring surveys of migratory birds and their habitat will occur in 2005 (Section 7.4.5) to further test the predictions of the EIS and to determine whether any unforeseen effects on birds and their habitat would occur.

**REFERENCE: TAC Table 2, #26**

**ITEM:**

Information is required on river and channel bank slumping and landslides.

**RESPONSE:**

***Channel Slope Stability***

The existing floodway is constructed at a channel side slope of 1 vertical to 6 horizontal (1V to 6H) in the clays and tills, with slopes at 1V to 9H at bridge abutments and 1V to 3H in areas of sands and gravels in the vicinity of the Springhill Ski Hill south of Highway 59 North bridge crossing the channel.

In the years of operation from 1968 to 2004, slumping of the main channel side slopes has not been a problem, with no long term creep problems and no evidence of slumping observed up to 2004. Local sloughing of the low flow channel side walls (approximately 1.5 m in height) was observed in 2004, related to local scouring and undercutting of the low flow channel.

For the floodway expansion, main channel slopes be maintained at 1V to 6H in clays and tills and at 1V to 3H in the sands and gravels near Springhill. The design includes minimum setback distance on the bench (prairie level) between the top of the channel slope and the base of the spoil piles, and on the top of the spoil pile, such that the critical slip surfaces have no reduction in the current design safety factor (see Preliminary Engineering Report Appendix B, Section 6.5 and 6.6). The bridge abutment slopes will be constructed at 1V to 6H and include vertical subsurface rockfill columns as required to augment stability. The low flow channel slopes and base will be lined with riprap in areas susceptible to erosion and scouring (primarily clay foundations).

Seismic loading was considered in the slope stability analyses for the embankments adjacent to the Inlet Control Structure in the Preliminary Engineering Report, Appendix C. The Floodway location is in a low seismic zone and the risk of liquifaction of the high plasticity clays in the foundation and embankments is low. The seismic accelerations are sufficiently small that additional seismic loadings will not bring the safety factors under normal loading conditions below values that are acceptable for unusual loading conditions.

***Red River Upstream of Floodway Inlet Control Structure***

The riverbanks are subjected to natural ongoing scouring and erosion, with periodic slumping. An evaluation of bank stability upstream of the intake has been done. Under design conditions the riverbanks will be totally submerged and any bank failures ("landslides") will not result in significant wave impact on the structure.

***Red River Downstream of Floodway Outlet***

Slumping of the Red River banks downstream of the Floodway Outlet Structure occurs naturally, primarily due to toe erosion and slope undercutting. Downstream of the Outlet Structure discharge channel, within the area of potential impact of a sudden discharge of water, the Red River west bank is protected with riprap and this riprap will be upgraded to provide protection against scouring and erosion. Slumping ("landslides") that could cause potential river damming is not a concern.

**REFERENCE: TAC Table 2, #27**

**ITEM:**

Information on climate change is needed in the context of comments from Natural Resources Canada (reviewer #1, Section 5.8.3.3.2) and others (NRC, NRAC-18, MW).

**RESPONSE:**

The EIS (Section 5) concluded that construction of the project would result in emissions of greenhouse gases (GHGs); however, the effects are expected to be local, of small magnitude, of short duration, and not significant. Further, the construction of the project is not expected to affect the Province's ability to satisfy its commitment and the Kyoto protocol. The project further is not expected to cause emissions of GHGs of concern in its operating phases with regard to climate change.

The effects of climate change on the project were discussed and it was concluded that potential changes will not alter the need for the project.

The PAT has asked for further discussion of climate change. As well, comments from the public also requested more discussion. Accordingly, we will provide additional discussion primarily based on the Canadian Environmental Assessment Agency practitioner's guidance, i.e., "Incorporating Climate Change Considerations in an Environmental Assessment: General Guidance for Practitioners, Canadian Environmental Assessment Agency, January 2004."

The guidance document provides useful advice in terms of approaching the issue of climate change considerations in an environmental assessment. The document suggest two practical approaches for incorporating climate change considerations in an environmental assessment, i.e., 1) GHG considerations: where a proposed project may contribute to GHG emissions; 2) impact considerations: where climate change may affect a proposed project. The document then provides guidance in terms of scoping the assessment process. Consistent with this guidance we will discuss these approaches in the context of the Floodway Expansion.

## 1.0 GHG Considerations

The potential GHG emissions during any stage of the project were considered.

### 1.1 Use of Fossil Fuels for Vehicles

The construction of the Floodway will require the consumption of considerable fossil fuel, particularly during the excavation of the Floodway channel.

In this context, firstly, it is useful to note that the total yearly emissions of $CO_2$ in Manitoba are estimated at 20.9 million tonnes (20,900 kilotonnes) (Ref. Manitoba Climate Change, reported to Taskforce 2001).

In this context, the total $CO_2$ emissions resulting from the Floodway excavation were estimated as follows:

- Approximately 800,000 L of fuel are required per million cubic metres of earth moved (Ref. Manitoba Heavy Construction Association).
- The Floodway project will require excavation of approximately 21,000,000 $m^3$ of earth.
- The total amount of fuel required over four years of construction will therefore be approximately 16.8 million L.
- Each litre of fuel releases approximately 2.5 kg of $CO_2$ (Personal Communication –Email -with Leif Hockstad, Climate Change Division, Office of Atmospheric Programs, U.S. Environmental Protection Agency-November 17, 2004).
- Total emissions from the project of $CO_2$ are therefore estimated at 40 kilotonnes.
- The above represents an average of 10 kilotonnes of $CO_2$ per year. The above annual $CO_2$ emissions from the excavation of the Floodway would indicate that the project excavation will contribute approximately 0.05% of the total yearly Manitoba $CO_2$ emissions.

### 1.2 Changes in Land Use

The Province of Manitoba (Climate Change Action Plan 2002) notes that land use changes and forestry contribute about 1% of Manitoba's annual emission of GHGs. The area of the Floodway, when expanded, is approximately 24 $km^2$ (48 km long x 0.5 km wide). The total Manitoba area is about 583,000 $km^2$. The land use changes resulting from the Floodway excavation will therefore contribute approximately 0.004% of total annual GHG emissions from this kind of activity. It should also be noted that this land use change resulting from the Floodway construction will be transitory as revegetation is established.

The expanded Floodway will reduce the flooded area from an extreme flood. This will reduce the emission of GHGs under these conditions by preventing inundation of vegetation in Winnipeg and reducing artificial flooding (under current conditions) and subsequent release of $CO_2$ and methane.

There will be a transitory loss of capacity for sequestered carbon during construction phase due to the excavation of grassland/shrub cover in the channel. Temperate grasslands sequester approximately 1 kg of carbon (C) per/$m^2$ (Smith 1996). This represents approximately 24 kilotonnes of C (about 70 kilotonnes of equivalent $CO_2$) for the entire Floodway. Much of this sequestered carbon will be buried during construction but a portion will decompose to release carbon dioxide to the atmosphere. Newly planted native vegetation in the channel, however, will sequester carbon in the aboveground tissue. Over the long term, this will actually reduce GHG as new grassland can store up to 0.6 kilotonnes/C/ha/yr and properly managed grasslands can store from 0.1 to 0.3 kilotonnes/C/ha/yr (Sherman, Janzen and Herrick 2002). Over the long term, this disturbance will be GHG neutral or better.

### 1.3 Operation

The operation of the Floodway, either in its inactive or active phase, will not result in substantive emissions of GHG. The monitoring and maintenance of the Floodway will require the use of vehicles but this is expected to be a very nominal effect. The number of vehicles involved is expected to be low and represent a very, very small fraction of a total vehicle fuel consumption in the province.

### 1.4 Conclusion re: GHG

The Floodway project GHG emissions will be of low intensity during construction and operational phases of the project, and may over the long term, actually contribute to a reduction of GHGs. Therefore, under the scoping approach, provided in CAA Guidance document, no further analysis of emissions is required.

## 2.0 Impacts of Climate Change on Project

Section 5.8.3.2 of the EIS (with references) clearly states that potential climate change scenarios indicate a need for the Floodway project. The Manitoba Government states that "Extreme weather such as thunderstorms, tornadoes, hailstorms, heat waves and droughts **may** become more frequent on the prairies due to climate change. Warmer winters **may** increase the potential for more intense winter storms and more frequent rain. In the spring, flooding **may** increase with heavy rains. Earlier spring runoff, increases in summer temperatures and decreased summer rainfall **may** result in low summer water flows and increased occurrence of drought conditions. Kyoto and Beyond, Province of Manitoba Climate Change Action Plan, 2002. (from: http://ww.gov.mb.ca/conservation/ climatechange)" On the other hand Warkentin, 2002, concludes that climate change **could** decrease the frequency of major spring floods and increase the frequency of rain-generated summer floods.

Some scenarios indicate increased spring flooding and decreased summer flooding (Province of Manitoba, 2002), while other scenarios predict decreased spring flooding and increased summer flooding (Warkentin, 2002). Neither scenario provides a language-based estimate of certainty (US Global Change Research Program, from: http://ww.uscrp.gov/usgcrp/Library/nationalassessment/ overviewAboutScenarios.htm, though use of the word 'may' in the Government of Manitoba document suggests an estimate of certainty of around 50% (US Global Change Research Program (from: http://ww.uscrp.gov/usgcrp/Library/nationalassessment/overviewAboutScenarios.htm).

For some aspects of climate, however, virtually all models, as well as other lines of evidence, agree on the types of changes to be expected. For example, all climate models suggest that the climate is going to get warmer, the heat index is going to rise, and precipitation is more likely to come in heavy and extreme events. Thus, climate change does not reduce the need for the project.

The project is designed to reduce the risk of climate change to the public. It will accommodate a 1 in 700-year flood. The return period of the design event could change but it is uncertain as to the extent. This uncertainty is only one of many factors involved in estimating extreme floods and was considered in choosing the design return period.

It should be noted that the level of confidence in specifying regional climate change scenarios is low. Current projections are not estimates or predictions but scenarios. They are 'starting points' (US Global Change Research Program
(from: http://ww.uscrp.gov/usgcrp/Library/nationalassessment/overviewAboutScenarios.htm).

**Based on climate change scenarios, the effect of climate change on the Floodway expansion project is a low risk to the public and the environment. Indeed, risk to the public and the environment is greater if the project does not proceed. Therefore, climate change impacts on the Floodway project do not warrant further in depth assessment (in accordance with the scoping guidance outlined in the Canadian Environmental Agency, Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners (from: http://ww.ceaa-acee.gc.ca/012/014/a_e.htm).**

## 3.0 Other Concerns

NR Canada questioned whether additional rain events may create slope stability problems on the dykes and Floodway channel side slopes. The side slope design has incorporated safety factors which consider uncertainties. A Dam Safety Review is being conducted to confirm the adequacy of the safety factors on slope stability used in the design of each component.

Manitoba Wildlands expressed a number of opinions and recommendations; the most important, in our opinion, being that the climate change analysis should be done based on the CEAA *General Guidance for Practitioners* (referenced earlier). We have provided a description of how the EIS assessment conforms to this guidance (in Sections 2.0 and 3.0 of this response), and we believe this responds to the concerns expressed.

## 4.0 Overall Conclusions

The above discussion supports the EIS conclusions as to the potential effects of the project on climate change and the potential effects of climate change on the project.

**REFERENCE:** **TAC Table 2, #28**

**ITEM:**

Information is needed respecting clam habitat in the Red River.

**RESPONSE:**

Refer to DFO/MFA-S-18.

**REFERENCE: TAC Table 2, #29**

**ITEM:**

Information on health effects is needed in connection with floodway operation.

**RESPONSE:**

Information on health effects of the Floodway Expansion Project is provided in the EIS, to the extent practicable and relevant to the environmental assessment of this Project. This information is reviewed below. Information on health effects related to the Construction phase and Operation In-active are also discussed in the response to TAC-MFA-S-63.

From the outset, the baseline analysis in the EIS reviewed health conditions under flood and non-flood conditions without the Floodway Expansion Project. The environmental assessment analysis then examined the extent to which such health conditions might be expected to change with the Floodway Expansion Project. 'Health effects" of the Project were defined as such changes that could be related to the Floodway Expansion Project.

The baseline analysis looked at heath conditions under large floods without the Floodway Expansion Project. During a large flood (such as the one experienced in the Red River Valley in 1997), there can be considerable effects from the flood on the health and well-being of the affected population. These effects on health and well-being are generally categorized as either direct effects that occur during the flood itself and are caused by flood waters (such as mortality from drowning or flood-induced injuries) or indirect effects caused by damage to infrastructure or property (such as increased incidence of infectious diseases or post-traumatic stress disorder).[1]

It is extremely difficult to isolate health and well-being effects related to artificial flooding caused by the operation of the floodway (either the existing floodway or the proposed floodway expansion) as these effects are exactly coincident in time and space with the considerable effects of a major,

[1] See for example the World Health Organization – Europe fact sheet "Flooding: Health effects and preventive measures". World Health Organization – Europe. Rome, Italy. September, 2002. This fact sheet focuses on health related effects of flooding in Europe. The factsheet notes that infectious disease effects related to flooding are not common and are normally confined to illnesses endemic to the flooded region. The risk of introducing new diseases, such as vectorborne diseases, is considered negligible.

natural flood event. In order to understand the nature and extent of effects of the existing floodway operation on health and well-being as they were experienced in the Red River Valley in 1997, studies and research on social and community specific effects of the 1997 flood were reviewed and referenced in the EIS[2] and interviews were conducted with health service providers in each of the Regional Health Authorities (RHAs) in the study area. During these interviews, acute stress immediately following the 1997 flood and chronic long-term stress were cited as the most substantive health effects stemming from the 1997 Red River Valley flood.[3]

Health and well-being effects specifically expected to result from the Expanded Floodway during a flood event are related largely to either changes in flood water levels caused specifically by the Expanded Floodway (which may result in changes to direct health and well-being effects) or changes to the amount of damage to infrastructure and property caused by flood water changes specifically caused by the Floodway Expansion (which may result in changes to indirect health and well-being effects).[4] As the proposed Floodway Expansion affects water levels differently in different areas of the Flood Study Region, these effects were discussed in the EIS differently for different areas of the Flood Study Region.

For areas inside the floodway, including the City of Winnipeg, flood water levels are considerably reduced with the Floodway Expansion compared to the existing floodway for flood events up to the 1 in 700 year flood event. This change reduces both the chance of direct health and well-being effects during a flood event (such as flood induced mortality or injury) and the chance of damages to infrastructure and property that could result in indirect health and well-being effects in this portion of the Flood Study Region. It is therefore likely that there would be a positive residual effect on health and well-being in this portion of the Flood Study Region as a result of the operation of the Floodway Expansion.

For areas upstream of the Floodway Inlet, water levels with the Expanded Floodway are the same or lower for all flood events, compared to the existing floodway. As a result, the chance of direct and indirect health and well-being effects in these areas are expected to be either the same or somewhat

[2] For example, Morris-Oswald, 2004, and IJC, 2000.
[3] Health and well-being effects related to the 1997 Red River Valley flood are discussed in more detail on pages 8-94 through 8-97 of the EIS.
[4] Other effects on well-being that are generally experienced at the community level, such as concerns about equality of flood protection between communities, were discussed in sections 8.6.3.5 – Way of Life, Culture and Spirituality and section 8.6.3.6 – Community Cohesion and Organization on pages 8-110 through 8-113 of the EIS.

lower for certain flood events with the Floodway Expansion compared to the existing floodway. The degree of change in water levels is small compared to the water levels arising from a large flood, and therefore a minimal positive effect is expected on health and well-being effects with the operation of the Floodway Expansion compared to the existing floodway for this portion of the Flood Study Region.

For areas downstream of the Floodway Outlet, water levels during some large flood events[5] can be somewhat higher with the Floodway Expansion compared to the existing floodway. However, these increased water levels in this specific area are[6]:

- of small magnitude (less that 0.3 meters);
- occur only rarely (beginning in floods with a return period of approximately 1 in 120 years, i.e., floods larger than the 1997 flood);
- cause new flooding to a small local area (less than ten residences and an estimated 20 people would be affected only in a very large flood, i.e., a flood larger than the 1 in 225 year flood which is approximately the same as the flood of record, the 1826 flood); and
- cause only a small increase in total estimated damage costs during a 1 in 700 year flood (approximately a ten per cent increase in flood damage costs in the area from the Floodway Outlet to Netley Creek).

Based on a consideration of the nature of these effects from the Floodway Expansion, and the MFA's commitment to ensure compensation, there is not expected to be an appreciable residual adverse effect on health and well-being in this downstream portion of the Flood Study Region.

The ability for emergency workers and health service providers to respond during and after a large flood event can mitigate or moderate the direct and indirect effects of flooding, with or without the Floodway Expansion. Considerable progress in this regard in Manitoba following the 1997 Red River flood was consistently noted during interviews with health service providers. It was commonly stated by health service providers that health and well-being effects for future floods are expected to be less severe for several reasons:

[5] Beginning with approximately the 1 in 120 year flood, which is larger than the 1997 Red River Valley flood.
[6] Refer to pages 8-31 through 8-43 of Volume 1 of the Proposed Floodway Expansion Project Environmental Impact Assessment for more detailed information.

- Improved protection of personal and public property through the 1997 Red River Valley Flood Proofing and Dyke Enhancement program.
- Increased experience of the RHAs in health care service delivery during crises and development of emergency preparedness plans.
- Increased coordination between local municipalities and the RHAs emergency response systems.[7]

Under severe flood conditions (i.e., floods well in excess of the 1997 flood), the Floodway Expansion is expected to materially improve health conditions inside the floodway, including the City of Winnipeg. This improvement is likely to significantly improve the ability for emergency workers and health service providers to respond in all areas (including downstream areas) during and after any such large flood event.

The Manitoba Floodway Authority recognizes that it is important to ensure that health service providers and the RHAs have access to the information needed to understand how the proposed Floodway Expansion may affect public health and well-being in Manitoba (either positively or negatively). Therefore, the Manitoba Floodway Authority will hold an information workshop on the proposed Floodway Expansion with health service providers in the Flood Study Region. The purpose of the workshop will be to provide information about the project and to create an ongoing dialogue with health service providers so that any unexpected potential health and well-being effects of the project can be identified, monitored and mitigated.

[7] See pages 8-96 and 8-97 in the Proposed Floodway Expansion Project Environmental Impact Statement – Volume 1: Main Report.

**REFERENCE: TAC Table 2, #30**

**ITEM:**

Information is needed respecting the effects of the project on navigation, including the effects on navigation at the floodway outlet that may impact the Red River channel.

**RESPONSE:**

Issue; (TC) Outlet- Section 4.5:

> *"Provide detail regarding potential for … outlet reconstruction works to affect navigation…temporary infrastructure, timing, duration of works". "Explain impacts of floodway operation on navigation safety at the outlet…current or proposed mitigation measures to notify downstream waterway users".*

Outlet reconstruction will consist of replacement of the existing outlet control structure with a larger structure at its current location approximately 400 m away from the Red River. As such no impacts to navigation on the Red River are anticipated associated with reconstruction of the Outlet Structure proper. Reconstruction of the outlet channel to its confluence with the Red River will consist of removal/widening of the north bank of the channel and approximately 50 to 100 m of the east riverbank. The newly excavated slopes will be rip-rapped to prevent erosion.

The west riverbank opposite the floodway channel outlet will receive augmentation of the existing erosion protection. During detailed design phase, investigations will be made of cost-effective approaches to riverbank erosion mitigation. Alternatives being considered include rip-rap for approximately 1000 m downstream of the existing armored slope. Planting of additional adaptive vegetation will also be assessed as an alternative to the placement of additional rip-rap on the west riverbank.

Operations involving placement of rock at the base of the riverbank would be scheduled to take place late in the fall when river levels have receded to their lowest levels. These operations are anticipated to have minor impacts on local navigation safety within the Red. The requirement for deployment and maintenance of appropriate waterborne warning devices during construction will be developed in

consultation with Transport Canada prior to final preparation of construction tenders, and then incorporated into the construction contracts.

At present, there are no permanent devices installed or formal procedures developed, aimed at facilitating safe navigation in the vicinity of the Floodway Outlet Control Structure. It is understood the Floodway Channel is not considered a "navigable waterway" and therefore no provisions have been included for facilitating safe navigation in the floodway channel upstream of the Outlet Control Structure. However, it is understood that an application is required under the Navigable Waters Protection Act (NWPA) to assess/authorize potential effects turbulence downstream from the Floodway Outlet may have on navigation on the Red River. It is presumed consultation with Transport Canada pursuant to the NWPA application will determine the riverbank signage, waterborne markers, and policies and procedures that may be desirable downstream of the Outlet Control Structure to the Red River, for the entire range of operation (spring and summer). See also Section 9.0 of the Supplementary filing regarding status of the NWPA authorization.

**REFERENCE: TAC Table 2, #31**

**ITEM:**

Clarification is needed respecting river dredging as a project considered in the cumulative effects analysis and clarification on its potential effects.

**RESPONSE:**

MFA is not proposing dredging as part of the Project. Dredging of the Red River is an example of a future activity not contingent on (or affected by) the Floodway Expansion Project.

Discussion on the potential cumulative effects of sedimentation are reviewed on page 6-26 of the EIS.

> *The construction-related suspended sediment discharges, while anticipated to remain within the range of baseline variability on the Red River, could act in a cumulative fashion with other activities, like dredging or shoreline stabilization, to result in potential exceedances of natural variability. No such activities are known to be planned during the Project construction period. Should these other activities proceed during Floodway construction, more aggressive sediment control may be necessary to ensure suspended sediment levels remain within the range of natural variability.*

**REFERENCE: TAC Table 2, #32**

**ITEM:**

Clarification is needed respecting construction traffic management related to railway works and general traffic interactions.

**RESPONSE:**

Incremental construction traffic and related safety will be addressed as appropriate during construction. Any temporary detour railway roadbeds and structures will be removed and restored to original condition, including revegation as required. All railway crossings will remain at their existing elevation along the West Dyke. The railway crossings that are breeches along the West Dyke are: CNR Letellier, CPR La Riviere and CEMR Carman.

Section 8.5.3.1 in the EIS reviews construction related traffic, noting existing highway bridges will stay open during construction to mitigate traffic disruptions and detours planned for some railway bridges but consultations have been undertaken with all of the operators.

For a description of Navigable Waters Protection Act Authorization status, please refer to Section 9 of the Supplementary Filing.

**REFERENCE: IC, Page 1**

**ITEM:**

Information is needed respecting fish mortality associated with each project component, including the inlet control structure, outlet structure, low flow channel, Seine River syphon, drop structures and drains.

**RESPONSE:**

This question is similar to DFO/MFA-S-19 and DFO/MFA-S-34.

Appendix 6D, Section 2.2.2.2 provides details of fish winterkill mortality in the existing Low Flow Channel of the existing floodway. The Project is anticipated to reduce the frequency and magnitude of these events.

No existing information regarding fish mortality with respect to the Inlet Control Structure, Outlet Structure, Seine River syphon, drop structures and drains was available, and the public information program did not note any observations of fish mortalities potentially associated with the above components. The Inlet Control Structure, Seine River syphon and the area's drains are not anticipated to be substantively altered by the Project; therefore no Project-related changes in fish mortality are anticipated. A number of the drop structures associated with the drains will be reconstructed, but this is not anticipated to affect fish mortality.

The Outlet will be substantially reconstructed by the Project, but the potential effects of this aspect of the Project cannot be evaluated until the final design is available. It is anticipated that both the federal and provincial fisheries regulators will be involved in the ongoing development of a final design of the Outlet Structure.

**REFERENCE: TAC Table 2, #34**

**ITEM**:

Information is needed respecting the effects of drainage upgrading east of the floodway channel and upstream of the west dyke. Drainage upgrading would be considered to be cumulative effects projects.

**RESPONSE**:

No upgrades to the capacity of the existing through-dyke culverts in the West Dyke are planned as part of this project. The local Rural Municipality has requested the project include installation of an additional through-dyke gated culvert NE 15 -8-2E. It will be designed to existing drainage standards and will afford the opportunity to the local RM to re-route existing local agricultural drainage for a 3 square mile area immediately south of the West Dyke.

As indicated in the Preliminary Engineering reports, there are several local drainage outlet drop structures requiring relocation/replacement due to widening of the main Floodway Channel. The local drainage systems involved are identified in the Preliminary Engineering Report- Appendix "D". It is proposed to replace the existing structures with new drop structures whose capacity will be greater than pre-existed as the capacities will be determined utilizing current hydrologic parameters. Coincidently, local authorities will therefore be afforded the opportunity to upgrade the capacity of their land drainage system without being constrained by the structures at the system's outfall, namely the Floodway. Although the opportunity will exist for system upgrades, there can be no increase in local drainage run-off until upgrades to the capacity of the appurtenant delivery system are completed.

Immediate replacement of the existing Floodway Drop Structures with higher capacity structures has been deemed prudent expenditure of public funds as even greater future expenditures would be required if upgrading/re-working of these structures were delayed to coincide with the tributary system upgrades.

Beyond the Floodway right-of-way, there are no plans to include local tributary drainage system upgrades within the Floodway Expansion project. Local drainage system upgrades are considered

hypothetical. It is understood that "the environmental effects of uncertain or hypothetical projects or activities need not be considered". (CEAA Reference Guide, April 2002: Section3- Cumulative Environmental Effects) It is anticipated the authorities responsible for local drainage systems (local RM's, Cooks Creek Conservation District, etc.) would be required to obtain separate Environmental approvals for whatever system upgrades are planned and implemented in the future.

**REFERENCE: TAC Table 2 #35**

**ITEM:**

Information is required respecting the effect of construction dewatering on fish habitat.

**RESPONSE:**

Detailed site-specific construction practices will not be available until the completion of final design and development of a refined construction schedule. The Environmental Protection Plan will outline these activities and provide site-specific practices to mitigate potential effects. Potential HADDs will be discussed with DFO. Dewatering for construction of bridge piers will remove water in the vicinity of the bridge and add water to the low flow channel downstream. The potential effects of site-specific dewatering on the adjacent fish communities, primarily in the Low Flow Channel, are anticipated to be manageable and fully mitigable.

**REFERENCE: TAC Table 2, #36**

**ITEM:**

Information is needed respecting potential upgrading of City of Winnipeg infrastructure and its implications for the project. This should be addressed as a cumulative effect. Interactions between City infrastructure and water quality/health effects during floods and significant rainfall events should be included in this discussion.

**RESPONSE:**

Refer to Sections 8.2, 8.3 and 11.0 of the Supplemental Filing documentation.

**REFERENCE: TAC Table 2, #37**

**ITEM:**

Information is needed respecting traditional use of the west bank of the Red River downstream of the floodway outlet (in particular, with respect to medicinal plants in the area potentially affected by riprapping.)

**RESPONSE:**

During interviews conducted with Peguis First Nation elders, no specific use of the area on the west bank of the Red River opposite the Floodway Outlet for medicinal plant collecting was reported. Prior to any additional riprapping, the Manitoba Floodway Authority will conduct a site investigation of the area with a First Nation elder to determine if any medicinal plants are present and if any remedial action is necessary.

**REFERENCE: TAC Table 2, #38**

**ITEM:**

Information is needed on project effects on traditional resource use.

**RESPONSE:**

An update on the status of the investigation into potential effects on Aboriginal land and resource use has been provided in this supplementary filing. Based on interviews and investigations conducted to date, no residual adverse effects have been identified. However, there remains some question about potential effects of the project on traditional fishing in the Flood Study Area and effects on medicinal plants on the west bank of the Red River. The Manitoba Floodway Authority has committed to ongoing consultations with the Peguis First Nation and the Manitoba Métis Federation to identify and mitigate any potential effects on traditional resource use.

**REFERENCE: TAC Table 2, #39**

**ITEM:**

Information is needed concerning the water quality impacts of nutrients and pesticides during channel revegetation.

**RESPONSE:**

Water Quality Management division has noted some errata on footnotes within tables and references guidelines. These were reviewed, along with the data analysis, and dealt with on errata sheets. The water quality parameters that were reviewed are parameters that could be affected by the project. The herbicides and nutrients reviewed are those proposed by the proponent during revegetation and for which there are water quality guidelines. For further discussion on glyphosate see response to DFO/MFA-S-25.

Elaboration was requested on the reason the volume of river flow from May 1 to September 30 was use in the assessment. The period of application for revegetation is expected to be May 1 to September 30 in each year, therefore the period of Red River flow used to assess potential impacts on the river was also selected as May 1 to September 30.

The amount of fertilizer and herbicides used was a very preliminary estimate and the amount estimated to be released in the "worst-case" analysis was much higher than could potentially released. The analysis was not done to justify the release of this amount to the waterways, it was done to determine the potential for statistically significant changes in water quality from the Project.

The analysis shows that even if all the 71 tonnes of phosphorous were released to the Red River it amounts to 1.4 % of the load at Selkirk and 1.2% of the Lake Winnipeg load. The estimate of P load at Selkirk (Bourne et al. 2002) shows loads at Selkirk varying from 2261 tonnes/year to 7344 tonnes/year from 1994 to 2001. The mean load was 4905 with a standard deviation of 1988 tonnes/year. A potential hypothetical load of 71 tonnes per year against this background variance cannot be described as statistically large and significant in any scientifically defensible manner. This analysis demonstrated that direct monitoring of phosphorus in the Red River will not be able to detect any change in phosphorus due to this Project.

Again this analysis was not done to justify a 71 tonne release of phosphorus. Reduction of phosphorus to Lake Winnipeg is an important goal and all measures should be taken to release no phosphorus to a waterway. The goal of nutrient application in the revegetation plan is to stimulate revegetation in order to minimize erosion, thus reducing sediment and nutrient loads to the waterways. The goal is not to maximize yield of crops, therefore the plan will be to use fertilizer at a fairly low rate, while achieving a rate of growth to establish vegetation. Information on soil condition will need to be collected to refine the application rates of nutrients in order to meet the goal of minimum impact to the waterways.

The vegetation survey conducted during the summer of 2004 (See Supplementary Filing Section 4.0) will also be reviewed to more accurately estimate herbicide requirements. Herbicides will be applied to maximize the extent of natural (non-introduced vegetation) after revegetation.

The re-vegetation plan will be included in the CPEP Plan (See Supplementary Filing Section 12).

**REFERENCE: TAC Table 2, #40**

**ITEM:**

Information is needed on water quality impacts during the active operation mode of floodway operation.

**RESPONSE:**

The benefits to water quality during a major flood are substantial. The diversion the water from the City of Winnipeg flood plain to the Floodway avoids of flooding heavily developed areas. Flooding in these commercial, residential or industrial properties could release harmful substances, while the Floodway is a floodplain without development. Future planned recreation activities will be reviewed to ensure that they will not affect water quality. The MFA maintenance plan will include monitoring the Floodway to ensure refuse is not deposited in the Floodway and any debris will be promptly removed. The net water quality benefits of diverting water from a developed floodplain to a controlled floodway are very large and beneficial. The Project's EIS did not focus on quantification of net benefits; rather it focused on discussing potential adverse effects and mitigating those effects.

In order to maintain the desired hydraulic capacity of the floodway, a plan to control the growth of willows will need to be developed. Mechanical mean of control or very targeted herbicide use will be used. If maintenance plans using herbicide are required a permit pursuant to MR 94/88R pesticide regulation will be required.

**REFERENCE: TAC Table 2, #41**

**ITEM:**

A rationale for conclusions on the water quality impacts of recreational use of the floodway channel is required. (WQM)

**RESPONSE:**

Recreation vehicle use is very low compared to urban, highway and rural vehicle use in the vicinity draining to the floodway or the Red river in the regional. Human activity is very low compared to activity in parks along the river within the City of Winnipeg. Therefore the existing water quality impacts of existing recreation are judged to be relativity low in the EIS.

There is a statement in the EIS after a brief discussion on existing recreational effects. "No Project related effects are anticipated." This can be elaborated upon. Various proposals for recreational use have been submitted to MFA. These are not included in the Project and are therefore not assessed in the EIS. No assessment of significance of recreation impact has been included in the EIS.

**REFERENCE:** **TAC Table 2, #42**

**ITEM:**

Information on the rationale for conclusions on ice jamming is required. The study referenced in the Executive Summary (page 10) should be provided.

**RESPONSE:**

This reference is in the section referring to commitments made by MFA in a public meeting in Selkirk in the month of June 2004. Examination of the causes of ice jams in the Red River was to be considered independent of the Project's environmental assessment. Therefore it was thought that a report on ice jamming independent of the EIS (i.e., a supplemental to the EIS) would be issued by the end of the summer 2004, following the submission of the EIS in early August 2004. The work, done by the Lead Engineering Consultant, was completed prior to completion of the EIS and was therefore a summary of the results were incorporated in the EIS.

The key finding on the assessment of ice jams are presented in Section 5.7.2 and Section 5.7.3 of the EIS and within the Preliminary Engineering Design Report.

The EIS Executive summary should read:

- "*…second example is examination of effects on ice jams in the Red River downstream of the Floodway, these results were completed prior to completion of the EIS and are incorporated in the EIS."*

**REFERENCE: TAC, Table 2 #43**

**ITEM:**

Clarification is required concerning effects boundaries.

**RESPONSE:**

The **Flood Study Region** as defined in Chapter 2 and detailed in Section 8.2.2.2 includes:

- The Floodway Channel and associated right-of-way – including any potential land requirements for spoil disposal.
- The Floodway Inlet and Outlet Structures and associated right-of-way.
- The West Dyke, associated right-of-way and any potential land acquisition areas.
- Other areas involving direct physical works required by the project (for example erosion control works such as rip-rapping on the West side of the Red River across from the Outlet Structure).
- Other areas that might be disturbed during the Construction phase of the Project.
- The potential zone of influence of groundwater effects.
- The geographic extent to which the operation of the Project may influence water levels and flows during a flood event.

The Flood Study Region also includes all or portions of the Rural Municipalities of Morris, De Salaberry, Hanover, Macdonald, Ritchot, Taché, Springfield, East St. Paul, West St. Paul, St. Clements, St. Andrews and the City of Winnipeg, City of Selkirk, Town of Morris, Town of Niverville, Village of St. Pierre-Jolys, Brokenhead Ojibway Nation and Peguis First Nation.

The northern extent of the Flood Study Region was defined by the northern boundary of the RM of St. Andrews and RM of St. Clements (both end at Lake Winnipeg). The eastern boundary of the Flood Study Region area was defined largely by the potential extent of groundwater related effects. The southern boundary of the Flood Study Region was generally defined by the extent to which there is a discernible change in the backwater effect associated with the operation of the Floodway Expansion relative to the Existing Floodway during extreme flood events. The southern boundary of the Flood Study Region was extended to the Town of Morris. The western boundary of the Flood Study Region was defined to the southwest to include the latest optimization of the West Dyke expansion in the RM

of Macdonald. The City of Winnipeg, RM of West St. Paul and RM of St. Andrews were used to define the Northwestern boundary.

For purposes of conducting the SEIA in accordance with EIS Guidelines, potential effects of the Project on Aboriginal communities (including lands and resources used for traditional purposes by such communities) are considered. Accordingly, the Peguis First Nation has been included in the Flood Study Region even though the Peguis First Nation community, where the on-reserve population resides, is located in the Interlake and is not geographically located in the Flood Study Region. No direct physical effects of the Project are anticipated on the Peguis First Nation community in the Interlake. However, Peguis has several uninhabited Reserve parcels located adjacent to or near the Red River between the City of Selkirk and Lake Winnipeg. As these Reserve parcels are located in the Flood Study Region, key socio-economic data tables used throughout the document, such as those indicating population and demographic characteristics, include Peguis First Nation. Other communities in the Flood Study Region, such as Selkirk, are home to a substantial number of off-reserve Peguis First Nation members.

The Project may also have an economic effect on both Manitoba and Canada. Economic effects from the Project will include contributions to Gross Domestic Product (GDP) as a result of project expenditures for products, services and labour, project employment, and government revenues earned through income and sales taxes.

The geographic scope for specific environmental effects (physical, aquatic, and terrestrial, socio-economic and heritage resources) are identified separately for each environmental component, as appropriate, as part of the scoping for each assessment chapter (Chapters 5 through 9) based on predicted links between the Project and each environmental component. Below are the references to the specific sections within the EIS:

- Physical Environment (Section 5.2.3)
- Aquatic Environment (Section 6.2.3)
- Terrestrial Environment (Section 7.2.3)
- Socio-Economic Environment (Section 8.2.2)
- Heritage Resources (Section 9.1)

**REFERENCE:** **TAC Table 2, #44**

**ITEM:**

Information is needed concerning the rationale for considering public issues as outside of scope for the environmental assessment. (Issues relating to operation of the project are within the scope of the assessment.)

**RESPONSE:**

Issues raised by the public that relate to the operation of the proposed project were considered in the assessment. An example of this includes concerns raised by the public about the potential adverse effect further deepening of the channel might have on groundwater. Additional discussion on how issues raised during the public involvement program influenced the environmental impact assessment process for the Project can be found in Section 3.4 on page 3-17 of the EIS.

Issues raised by the public that relate to effects from the operation of the existing structure were noted during the various consultation rounds but were not included in the assessment of effects associated with the proposed floodway expansion. Insofar as they related to the Project, these comments were included in both the existing environment and cumulative effects portions of the EIA.

Please see response to IC/MFA-S-10 for explanation of rationale for considering issues within and outside the scope of the environmental assessment.

**REFERENCE: TAC Table 2, #45**

**ITEM:**

Information is needed linking public comments and MFEA actions and responses.

**RESPONSE:**

The Manitoba Floodway Authority (MFA) has undertaken an extensive public consultation process designed to provide early, ongoing, and meaningful opportunities for public input into the Floodway Expansion project. As part of this effort, MFA made a conscious decision to discuss the project through three rounds of consultation before filing its Environmental Impact Statement.

MFA's public consultation process has been on-going since January, 2004. As part of this process, MFA made presentation to local municipalities and grassroots organizations, participated in numerous stakeholder roundtables, and hosted 13 public open house meetings in Oakbank, Dugald, Selkirk, East Selkirk, St. Norbert, Morris and Winnipeg. The consultation comprised of the following:

- 4 rounds of public consultation – 3 rounds prior to the filing of the EIS
- 250 hours of stakeholder meetings over 8 months
- Approximately 2500 people attended public meetings
- approximately 37,000 visits to the MFEA website
- 13 public open house meetings
- 3 Public Information booths
- MFA's Spring and Fall Newsletters mailed out to 30,000 Manitobans

In response to the public feedback received through the consultation process significant improvements have been made to the project including:

- **Protection of Groundwater Supplies:** To address public concerns regarding the protection of groundwater supplies, the extent of floodway deepening was reduced from a maximum of two metres (six feet) to a maximum of 0.6 metres (two feet) in selected reaches of the channel, subject to final design.

- **Improved Transportation Links:** Six highway bridge crossings that cross the floodway will be completely replaced with upgraded structures at the following locations:
  - St. Mary's Road, PR 200
  - PTH 59 South
  - Trans Canada Highway East
  - PTH 15
  - PTH 59 North
  - PTH 44

- **Highway 15 Bridge Improvements:** In response to safety concerns raised by residents of the Rural Municipality of Springfield, MFA is planning for the four-lane twinning of PTH 15 bridge in anticipation of future traffic flows.

- **Improved Drainage Capacity:** Improvements were made to the design of agricultural drainage drop structures that are being replaced so they could accommodate increased flows and future growth of the local drainage system.

- **Land Acquisition:** In response to concerns raised by local municipalities, MFA has scaled back plans to acquire land for channel widening from 1,000 additional acres (405 hectares) to a maximum of 500 acres (202 hectares).

- **Environmental Mitigation Fund:** In response to concerns raised by the public, MFA has established an environmental mitigation fund to address unanticipated environmental effects associated with the Floodway Expansion project.

- **Erosion Control:** In response to public concerns regarding erosion in the vicinity of the Outlet structure, approximately 1 km (0.6 miles) of riprap or other erosion control measure will be applied on the west bank of the Red River immediately north of the Outlet to mitigate any additional erosion during floodway operation.

- **Springhill Ski Facility:** Construction schedules will be adjusted so that the Springhill Ski Facility will not be required to relocate or close its operation during Floodway Expansion construction or operation.

- **Seine River Syphon:** MFA is continuing discussion with the Save Our Seine group regarding alterations to the inlet of the Seine River Syphon to enhance the river habitat downstream of the Syphon.

- **Re-Use of excavated earth:** In response to public suggestions to facilitate public access to excavated earth, MFA is examining options for a process to facilitate access to the excavated earth from the floodway channel.

- **Involvement in Design:** In response to concerns, MFA is working with local municipalities and residents in developing detailed plans to raise the West Dyke and in determining the best approach to Floodway drainage structures in the RM of Taché and the Cook's Creek Conservation District.

- **Lockport Children's Festival:** MFA will ensure that the project does not disrupt the operation of the Lockport Children's festival site.

**REFERENCE: TAC Table 2, #46**

**ITEM:**

Information is needed regarding public policy and the regulatory framework affecting the project.

**RESPONSE:**

The regulatory framework affecting the Floodway Project is outlined in Section 1.5 and Appendix 1E of the EIS (see also TAC/MFA-S-3). In addition, public policy applicable to the Floodway Project includes but is not limited to:

1. Principles of Sustainable Development as outlined in "*Towards a Sustainable Development Strategy for Manitobans*".
2. The Land and Water Strategy as contained in "*Applying Manitoba's Water Policies*".
3. Rio Conference and International Agreements on Biodiversity.
4. Government-adopted policies regarding wildlife, such as those described in "*A Wildlife Policy for Canada"* (Wildlife Ministers Council of Canada. 1990. A Wildlife Policy for Canada. Canadian Wildlife Service, Environment Canada). (These describe strategies for conservation of wildlife and their habitat.)
5. Fisheries policies such as the "No Net Loss" policy.
6. Policies listed under *The Planning Act*, such as those related to: general development, agriculture, water and shoreland, recreational resources, flooding and erosion, provincial highways.

**REFERENCE: TAC Table 2, #47**

**ITEM:**

Information on the 3-D model referenced in the Executive Summary should be provided.

**RESPONSE:**

In association with the Canadian Hydraulics Center (CHC, a division of the NRC/Infrastructure Canada) and the Manitoba Industrial Technology Centre (ITC), the Manitoba Floodway Authority is undertaking a complementary aspect of the Floodway Expansion project called the "Virtual Reality Flood Simulator".

The intent of this exercise is to develop a visualization tool which will help to demonstrate the benefits of floodway expansion to the residents of Winnipeg and the Red River Valley. We expect that the tool developed through this venture will be the foundation for additional tools that can be further developed by others in the future, for uses such as: emergency preparedness planning; evacuation simulation and planning, etc.

The initial phase of the work will build on the existing one-dimensional (1D) numerical model of the Red River inside Winnipeg. The 1D model, based on MIKE-11 (developed by DHI, Denmark), has been used in the past to simulate flow dynamics as the water rises over the floodplains including the 1997 flood conditions.

The second phase of work will build on the existing two-dimensional (2D) numerical model of the Canadian portion of the Red River basin from the US border to the floodway structure south of Winnipeg. The 2D model, based on the TELEMAC system (developed by LNHE, EDF, France), has also been used in the past to simulate flow dynamics as the water rises over the floodplains including the 1997 flood conditions.

For both phases of the exercise, graphical computer applications will be used to generate 3D temporal animations (static and fly-by views, in the form of AVI movies). 2D and 3D inundation maps will be animated as the water level rises and recesses within the city limits and over the floodplains south of Winnipeg for various flood events, with and without Floodway expansion.

Phase 1 is expected to be complete by the end of January, 2005. The schedule for Phase 2 has not been determined at this time.

**REFERENCE: TAC Table 1, #47**

**ITEM:**

The project's purpose, need and objectives should be clearly stated. Additional information is needed regarding alternatives that were considered and opportunities for enhancing environmental benefits. (also see p. 7, section 5.2 and p. 16, and 17, sections 7 and 9) Information is needed on Kyoto Accord implication of the project.

**RESPONSE:**

**Purpose:**

The purpose of the project is stated on page 1-6 of the EIS.

**Need:**

The project need was identified by the IJC and is stated in the EIS on pages 4-8 to 4-10.

**Objectives:**

The objectives are provided as design criteria on page 4-10 of the EIS.

**Alternatives:**

The alternatives are described in Section 1.4.4 of the EIS. This section describes the alternatives considered from the IJC studies and throughout the Flood Protection for Winnipeg KGS, 1999) study, as well as the rationale for the currently project selection.

**Opportunities to enhance environmental benefits:**

The major environmental benefit is the increased protection against flooding Winnipeg and the adverse effects that would cause through the release of hazardous materials from the flooded area. The most significant health benefit is the reduced risk of having to evacuate the St. Boniface, Victoria, Concordia Hospitals and possibly the Health Sciences Centre.

Other benefits of the project are provided in response TAC/MFA-S-45.

**Kyoto Accord**

Please refer to response TAC/MFA-S-27.

**REFERENCE: TAC Table 1, Guidelines 2.3.2**

**ITEM:**

Additional information is required regarding recycling and reuse of materials.

**RESPONSE:**

The Manitoba Floodway Authority is committed to maximizing recycling and reuse of materials. The one of the largest contribution to waste products is expected to be the demolition of the existing bridges. The steel will be recycled. Ways to reuse or recycle the waste concrete and asphalt are being investigated. Other potential sources such as the domestic waste (e.g., cans, bottles, newspaper) and waste oil will be collected in recycling containers. All waste recycling and reuse practices will be included in Construction Phase Environmental Protection (CPEP) Plan. The Construction Phase Environmental Protection Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and contractors. The plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the Construction Phase Environmental Protection Plan is provided in Section 12 of this Supplementary Filing.

Another waste material that the Manitoba Floodway Authority is investigating reusing is the excavated soil. The Manitoba Floodway Authority is committed to making the waste soil available to others for reuse where ever economically feasible.

**REFERENCE:** **TAC Table 1, Guidelines 3.0**

**ITEM:**

Additional information is needed on other approvals needed for the project.

**RESPONSE:**

Please refer to the response to TAC/MFA-S-3.

**REFERENCE: TAC Table 1, Guidelines 5.1**

**ITEM:**

Other components of Manitoba's existing flood control infrastructure should be included, such as City of Winnipeg dykes, valley ring dykes. The discussion should include how the infrastructure is managed as a flood protection system.

**RESPONSE:**

Flood protection in the Red River Valley involves the coordinated operation of both Flood Control facilities and Flood Protection facilities.

i. Flood Control infrastructure is comprised of facilities that manipulate flow and hence water levels, i.e. Red River Floodway, Assiniboine River Diversion (Portage Diversion), Shellmouth Dam and Reservoir, and Manitoba Water Stewardship operates these facilities.

ii. Flood Protection infrastructure is comprised of facilities that do not influence flow or water levels beyond their immediate surroundings, ie. The Red River Valley Town Ring-dykes including Emerson, Letellier, Roseau reserve, Dominion City, Rosenort, Riverside*, Morris, Aubigny*, Ste. Agathe*, Brunkild, St. Adolphe, Grande Pointe*, Niverville*. There are other towns protected by flanking parallel dykes, ie. Gretna*, Lowe Farm*, Rosenfeld* and St. Pierre. Although Manitoba Water Stewardship maintains overall responsibility for operation and maintenance for these systems, the local governments have assumed responsibility for certain aspects of both operation and maintenance of specific components within each town. By in large, most Town ring-dyke systems are capable of safely sustaining a flood of 1997 proportions.
(*denotes facilities constructed since 1997).

In general, a typical spring flood fighting operation on the Red River begins with the early assessment of flood potential along the river. This assessment, undertaken by Water Stewardship, includes analysis of snowpack and antecedent soil moisture conditions over the entire Red and Assiniboine basins. The long range forecast is usually issued in early March and is followed up if necessary with successive forecasts as the run-off develops. If a significant flood is forecast,

information is provided as required to all departments and local governments involved in planning floodfighting activities.

During the flood, Water Stewardship continuously monitors streamflow, provides daily water-levels and forecast peak flows and dates, to all affected Town flood protection facilities and all protected private home sites, etc. along the Red River and its tributaries.

Detailed information on operations in each ring-dyked community should be requested from Water Stewardship, Infrastructure and Operations Division. Detailed information on coordination of overall flood-fighting activities should be requested from Manitoba Emergency Management Organization.

The City of Winnipeg is responsible for operation and maintenance of the Primary Dykes and associated flood infrastructure within the City (110 kilometres of raised streets, boulevards or earthen dykes paralleling the Red and Assiniboine rivers). Since 1997 the City has developed a detailed Flood Operations Manual which provides an enhanced level of coordination for comprehensive flood fighting planning and operations activities.

For a more detailed description of the City of Winnipeg's flood protection and sewer systems, see Section 11.0 of the Supplementary Filing documentation regarding the City of Winnipeg Flood Protection Infrastructure.

For a more detailed description of how the major flood control infrastructure is managed and operated, see Section 8.0 of the Supplementary Filing documentation regarding Floodway Operation.

**REFERENCE: TAC Table 1, Guidelines 5.3**

**ITEM:**

Additional detail needed on maintenance, as well as discussion of accidents, malfunctions and other risks.

**RESPONSE:**

For Accidents, malfunctions and other risks, refer to Section 3.0 of the Preliminary Engineering Report, Appendix "C" – Inlet Structure Pre-design, which contains a "dam safety" analysis that included a "failure modes" assessment.

For maintenance, refer to responses for DFO/MFA-S-5, TAC/MFA-S-7, TAC/MFA-S-15, and TAC/MFA-S-21.

**REFERENCE: TAC Table 1, Guidelines 5.3.1**

**ITEM:**

More information needed on construction practices and staging areas.

**RESPONSE:**

Section 5.3.1 *Site Preparation,* of the Guidelines, will be addressed through the Construction Phase Environmental Protection (CPEP) Plan. The CPEP Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

**REFERENCE: TAC Table 1, Guidelines 5.3.2**

**ITEM:**

More detailed construction information is required. Information is needed to address bullets 1-7, 9.

**RESPONSE:**

*Bullet 1 – Plans and descriptions of any existing works, temporary works including work areas, cofferdams, dewatering and control facilities, diversions, detours and the proposed temporary and permanent facilities including the control structure, dykes, channel, outlet structure, roadway and railway bridges, buildings and infrastructure.*

The plans and descriptions for the existing works are shown in Appendices of Preliminary Engineering Reports as identified in Table 4.2-1, Page 4-11, EIS, Volume 1: Main Report. The requirements for any temporary works, including work areas, cofferdams and diversions will be identified on a site plan that will form part of the tender documents. These issues will also be addressed in the Construction Phase Environmental Protection (CPEP) Plan. The CPEP Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

The Contractor will be responsible for designing all temporary works to meet the requirements identified in the tender documents. Dewatering and sediment control facilities have been identified in Project Description, Section 4 of the EIS, Volume 1, Main Report and the Preliminary Engineering Reports and will be further defined in the CPEP Plan.

There is not a requirement for any public road detour routes during construction, with the possible exception of the PTH 44 bridge crossing. This crossing may require a detour structure adjacent to the existing structure, and this decision will be finalized during detailed design. Any road detour routes

will be removed and restored to original condition, including revegation as required, in accordance with the re-vegetation plan that will be developed as part of the CPEP Plan.

The temporary detour routes for the rail lines are shown on the drawings in Project Description Section 4 of the EIS, Volume 1, Main Report and Preliminary Engineering Report Appendix A.

Any temporary construction access will be contained within the existing floodway channel right-of-way, Manitoba Transportation and Government Services right-of-way or local municipal right-of-ways, and again will be restored to the original condition. Temporary construction access will be identified during the development of the CPEP Plan.

*Bullet 2 – a description of the installation, operation and removal of any temporary infrastructure.*

The installation, operation and removal of any temporary infrastructure, including road detours, cofferdams and other temporary structures will be in accordance with the Construction Phase Environmental Protection (CPEP) Plan. The Construction Phase Environmental Protection (CPEP) Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

*Bullet 3 – a description of the proposed construction methods that could have an effect on the environment such as those required for placement and removal of cofferdams, underwater or near-water blasting (if required), large scale clearing, dredging, bank protection, destruction of watercourses, grading or earth removal and disposal, including a discussion of possible alternative construction methods.*

The only items from this list that apply to this project include placement and removal of cofferdams, bank protection, grading and earthmoving. Numerous construction methods will be utilized during construction based upon the variety and type of material, quantities and seasonal limitations. Construction methodology will be finalized during detailed design and construction and addressed in

the Construction Phase Environmental Protection (CPEP) Plan. The CPEP Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

*Bullet 4 – an estimate of the size and composition of the workforce required during different times of construction.*

It has been estimated that at the peak of construction activity 400 people will be working on the Floodway Expansion Project. This workforce will be comprised of Professional Engineers, Technologists, heavy equipment operators, carpenters, concrete finishers, steel erectors, skilled laborers, mechanics, surveyors, superintendents, foreman, cooks, clerks, janitors, crane operators, and truck drivers.

*Bullet 5 – a description of measures that will be taken to protect the health and safety of workers and the general public in and around the construction areas.*

Manitoba Floodway Authority is establishing a Safety Advisory Council, consisting of members from Manitoba Heavy Construction Association, Winnipeg Construction Association, Manitoba Labour, Manitoba Transportation and Government Services, Manitoba Water Stewardship, Manitoba Floodway Authority and contractors, for the duration of the project. Basically, this council will be mandated with the responsibility to develop a Safety Business Plan for the entire project, ensure consistent enforcement of safety related issues, report and monitor on safety, and act as an advisory body if a conflict arises. The Safety Business Plan in part will reference the Manitoba Workplace Safety and Health Act and Regulations and include procedures to ensure due diligence is taken by all parties to monitor and enforce all construction operations to ensure the appropriate measures are taken.

The general public will not be permitted access to active construction areas and the Construction Phase Environmental Protection (CPEP) Plan will identify measures to restrict access. The CPEP Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and

Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

*Bullet 6 – a description of the work staging areas and facilities provided for construction workers, including potable water supply and waste disposal.*

Site specific plans will be developed by the Contractor in accordance with the Construction Phase Environmental Protection (CPEP) Plan. The CPEP Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

*Bullet 7 – a description of the character and volumes of waste streams generated during the construction phase of the Project and how each waste stream would be managed, consistent with best industry practices, with specific references to waste oil and other potentially hazardous or recyclable material.*

Site specific plans to address bridge demolition waste, waste water, waste oil, containers, etc. will be developed by the Contractor in accordance with the Construction Phase Environmental Protection (CPEP) Plan. The CPEP Plan for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

*Bullet 9 – a description of the proposed construction schedule including sequencing of the various undertakings.*

A proposed construction schedule is shown in Figure 11-1 of the Preliminary Engineering Report, Main Report. The construction schedule will be updated and finalized during detailed design and will take into account the measures identified in the Construction Phase Environmental Protection (CPEP) Plan. The CPEP for the Red River Floodway components will be developed by MFA, the engineering consultants, and Contractors. The Plan will be submitted to Manitoba Conservation for approval prior to start of construction. A framework for the CPEP Plan is discussed in Section 12 of the supplemental filing. The post-construction phase monitoring and follow-up plan for the Red River Floodway Project will be developed after the Environmental Act Licence is issued. The Plans will be submitted to Manitoba Conservation for approval. A framework for the Monitoring and Follow-up Plans is discussed in Section 12 of the supplementary filing.

**REFERENCE:** **TAC Table 1, Guidelines 5.3.3**

**ITEM:**

Information needed on all operating conditions, including summer operation and operation for floods in excess of the design flood. Further information needed to address bullets 3 to 6.

**RESPONSE:**

Information on all operating conditions is described in Tab 8.0 Floodway Operations of the Supplementary Filing.

**REFERENCE: TAC Table 1, Guidelines 5.3.4**

**ITEM:**

Additional discussion needed on the future rehabilitation of project components.

**RESPONSE:**

The item refers to the Guideline statement that "the environmental impact statement shall provide a general description of plans for rehabilitating the operational components of the floodway and related infrastructure at the end of their operational life." At this point there is no foreseeable time when the infrastructure would reach an "end of their operational life." If at some future date a decision is made to decommission a component of the floodway, a decommissioning plan will be developed and filed as an alteration under the provision of *The Environment Act*. That time is anticipated to be at least 50 years in the future.

**REFERENCE: TAC Table 1, Guidelines 6.0**

**ITEM:**

A description is needed of deficiencies in available data and plans to collect additional data.

**RESPONSE:**

Where additional monitoring data was required and the general Plan to collect additional data or other information this is described within the EIS Monitoring and Follow-up subsection under each issue discussed in Sections 5, 6, 7, and 8. Often a more detailed plan will be developed within an EPP.

Physical Environment Monitoring and Follow-up Subsections were:

- Water Regime 5.3.5
- Ground Water 5.4.5
- Erosion and Sedimentation 5.5.5
- Drainage 5.6.5
- Ice Processes 5.7.5
- Climate Air and Noise 5.8.5
- Physiography, Geology and Soils 5.9.6

Aquatic Environment Monitoring and Follow-up Subsections were:

- Surface Water Quality 6.3.5
- Aquatic Habitat 6.4.5
- Lower Trophic Levels and Aquatic Invertebrates 6.5.5
- Fish and Clam Populations 6.6.5

Terrestrial Environment Subsections were:

- Terrestrial Vegetation 7.3.5
- Wildlife, Wildlife Habitat and Communities 7.4.5
- Species at Risk 7.5.5

Socio-Economic Environment Monitoring and Follow-up Subsections were:

- Resource Use 8.3.5

- Economy 8.4.5
- Infrastructure 8.5.5
- Personal, Family and Community Life 8.6.5

Heritage Resources Monitoring and Follow-up Subsection is 9.5.

Many of the data deficiencies discussed in the EIS are filed in Sections #1 through #12 of Supplemental Filing documents.

**REFERENCE: IC, Page 1**

**ITEM:**

Guidelines Section 6.2 "Aquatic Environment" - More detailed information is required for each topic in this section.

**RESPONSE:**

Available baseline data is summarized and evaluated in Appendix 6 of the EIS. The Guidelines Section 6.2 requirements that "*sufficient detail … to predict the potential effects of the Project*" is generally provided and data deficiencies specifically identified and the potential implications to the assessment results discussed with respect to assessment uncertainty. Guidelines Section 12 requirement that "deficiencies in scientific evidence shall be identified, including areas where there is no evidence specific to Manitoba" is addressed throughout the EIS Section 6.0.

Further specific information is discussed in DFO/MFA-S-1 through DFO/MFA-S-38.

**REFERENCE:** **TAC Table 1, Guidelines 6.3.1**

**ITEM:**

Additional information is expected in supplemental material respecting vegetation.

**RESPONSE:**

Please refer to Section 4 of the Supplemental Filing Report.

**REFERENCE:** **TAC Table 1, Guidelines 6.3.2**

**ITEM:**

Important ecological communities should be identified.

**RESPONSE:**

EIS Appendix 7C provides lists of designated areas within the ecodistricts traversed by the Study Area and identifies known and observed distributions of a range of ecological communities in the area.

**REFERENCE: TAC Table 1, Guidelines 6.4.3**

**ITEM:**

A discussion is needed of domestic, commercial and recreational fisheries and the clam fishery. Commercial and recreational waterway use should also be discussed.

**RESPONSE:**

**Domestic Fishery**

No data are available from Manitoba Conservation regarding domestic fisheries use on the Red River. Domestic fisheries use was not raised as a concern during Public Involvement Programs as indicated in the EIS, Section 3.3.4 and 3.3.5.

**Commercial Fishery**

The only commercial fishery on the Red River is the Bait Fishery. There are currently (as of 2004) nine licenses for the commercial bait fisheries on the Red River. These licences are issued for allocation areas along the Red River extending along the Red River north of the City of Winnipeg to its junction with Lake Winnipeg. The commercial bait fishing season occurs from May to October. The majority of bait fishers' catch is caught during June (Tetr*ES* 1999).

**Recreational Fishery**

As indicated in Section 6.6.2, recreational fishing in the Red River is ongoing, encompassing both the winter and summer fishing seasons. Species caught vary by season, location, and type of gear being used. TetrES (1999) indicates that during angler surveys conducted along the Red River, Lockport has the highest rate of recreational fishing than other urban reaches.

Refer to DFO-MFA-S-22 for additional information on angular catch records for 2000.

**Clam Fishery**

As indicated in DFO/MFA-S-9, there is no commercial clam fishery in Manitoba.

**Commercial Waterway Use**

The Red River in Manitoba has historically been utilized as a major transportation corridor to move settlement supplies such as furs, food, equipment, and livestock. In the early 1900s, the advent of

road and rail transportation corridors impacted the use of river steamboats as a mode of transportation. Currently commercial uses of the Red River are more limited. There is a commercial riverboat operation that conducts tours on the Red River, primarily within the City of Winnipeg and the Red River area near Lower Fort Garry and Lockport between the months of May and October (Paddlewheel River Rouge Tours, 2004).

**Recreational Waterway Use**

The Red River is currently used during summer months for primary forms of recreation such as swimming, water-skiing and jet-skiing, as well as secondary forms of recreation like boating and fishing. In winter months, the river is used for snowmobiling, hiking, skiing and ATV driving (Manitoba Conservation 1992).

**References:**

Tetr*ES* Consultants Inc. 1999. Technical Memorandum #RH2.0 Phase 2 Other Stressors Workstream: Resource Harvesting Program Report 1999. Report to the City of Winnipeg Water and Waste Department. May 2000.

Manitoba Conservation. 1992. State of the Environment Report 1992. http://www.gov.mb.ca/conservation/annual-report/soe-reports/soe93/water.html

**Personal Communications:**

Scaife, Barb. 2004. E-mail correspondence between Angèle Watrin Prodaehl, Environmental Scientist, Tetr*ES* Consultants Inc., and Bio-Economist, Manitoba Conservation. November 9, 2004.

**REFERENCE: TAC Table 1, Guidelines 6.5**

**ITEM:**

Archaeological sites and culturally important sites in the study area should be described. A ranking of sites should be provided.

**RESPONSE:**

As discussed in Chapter 9 of the Proposed Floodway Expansion Project Environmental Impact Statement, the heritage resource assessment focused on identifying archaeological sites and culturally important sites that could potentially be affected by physical or biophysical effects of the Project. For each component of the heritage resource assessment, only those geographic areas that are likely to experience effects were scoped into the initial assessment. The study area for this purpose included the West Dyke, Floodway Channel and Outlet Structure areas. The heritage resource assessment did not include all archaeological or culturally important sites in the Red River Valley that may be affected by a large flood event for two reasons:

- The number of entries would be voluminous (likely hundreds or thousands of entries).
- Temporary inundation by floodwaters is not an adverse effect on heritage resources.

During the course of the heritage resource investigation, three archaeological or culturally important sites were identified. These sites are summarized in Table 1 and ranked in order of importance.

**Table 1**
**Inventory of Archaeological Sites Identified in the**
**Heritage Resource Assessment for the Proposed Floodway Expansion Project**

| Site Name | Borden Designation | Comment |
|---|---|---|
| Fidler Mounds Site | EaLf-3 | Portions of site previously disturbed by existing floodway construction. |
| Floodway Village Site | EaLf-9 | Portions of site previously disturbed by existing floodway construction. |
| Collapsing Log Structure | EaLf-59 | Newly recorded archaeological site. |

**REFERENCE: TAC Table 1, Guidelines 7.0**

**ITEM:**

Additional information is needed regarding public health and safety.

**RESPONSE:**

Public health and safety effects related to the proposed Floodway Expansion Project are discussed and assessed in the EIS. These effects are different during the different phases identified for the Project, and vary materially throughout different areas within the Flood Study Region.

Summary detail from the EIS with respect to public health and safety effects of the Floodway Expansion Project during flood events and the floodway operation phase is provided in the response to TAC/MFA-S-29. Public health and safety effects of the Floodway Expansion Project related to the construction and operation-inactive phases, as addressed in the EIS, are summarized described in further detail below.

Construction Phase

Potential construction phase effects on public health and safety as identified in the EIS are primarily of three types:

- **Temporary construction dewatering in the vicinity of some bridge crossings and other local areas in the floodway channel.** Any effects during construction on personal wells would last for less than three months for one summer season. Potentially affected property owners would be notified prior to construction. Where temporary de-watering is expected to adversely affect quality or quantity of well water, mitigation will be taken to ensure there is no disruption to water supply during construction. As a result, it is not anticipated that, following mitigation, there will be any residual adverse effect on public health and safety related to construction dewatering.
- **Worker and public safety during construction and at construction sites.** No significant adverse effects on worker and public safety are expected during construction or at construction sites. The project is subject to *The Workplace Safety and Health Act* of Manitoba. The objects and purposes of this Act relevant in this regard are:

> (a) to secure workers and self-employed persons from risks to their safety, health and welfare arising out of, or in connection with, activities in their workplaces; and
> (b) to protect other persons from risks to their safety and health arising out of, or in connection with, activities in workplaces.[1]

The Manitoba Floodway Authority is committed to undertaking the construction activities in a manner that protects the health and safety of workers and the public. See response to TAC/MFA-S-54 for description of measures that will be taken to protect health and safety of workers and general public.

- **Traffic disruptions during construction.** Traffic disruptions during construction could complicate the provision of emergency services and lead to increased stress and anxiety for residents who use the floodway crossings regularly. In particular, there was concern noted during interviews with health service providers and local municipalities that temporary closure of the Dunning Crossing would impair the provision of emergency service to the Pine Ridge Trailer Park in the RM of St. Clements. The closure of the Dunning Crossing during construction is expected to last no longer than 30 days, and it may be possible to coordinate emergency service during that period with the RM of East St. Paul to ensure that emergency service is provided throughout the construction period. With respect to stress and anxiety caused by construction related traffic delays, mitigation will include providing advance notice to municipalities regarding construction sequence and any re-routing of daily traffic.

Operation Inactive Phase

Potential public health and safety effects during this phase of the project relate primarily to potential changes in groundwater as a result of channel expansion. There are expected to be no permanent, widespread, noticeable reductions in groundwater levels due to the Floodway Expansion. However, the Manitoba Floodway Authority will undertake groundwater monitoring programs to ensure there are no effects on groundwater availability or quality and will undertake remedial actions if this monitoring indicates such action to be necessary, to ensure that there is no residual adverse effect from the Floodway Expansion Project on availability or quality of water supply.

[1] Section 2(1) *The Workplace Safety and Health Act*.

**REFERENCE: TAC Table 1, Guidelines 7.0**

**ITEM:**

Effects should be described quantitatively and qualitatively. All listed criteria should be considered in describing and assessing effects.

**RESPONSE:**

Effects were described quantitatively as well as qualitatively where this was practicable. All listed criteria set out in the EIS Guidelines were considered in describing the assessment of significance regarding Project effects – however, for ease or presentation, some such considerations were not repeated when addressing the significance of each specific effect. More information is provided below on these points.

On the matter of quantification, many socio-economic effects cannot easily be described in a detailed quantitative way. Therefore a less detailed qualitative description of likely effects must be relied on in many instances – supplemented to the extent practicable by quantitative information. Where qualitative assessments were used, they were informed by interviews and conversations with those familiar with the types of effects under consideration and the environment in which the effects would take place.

On the matter of listed criteria regarding quantitative and qualitative of effects, the EIS Guidelines (Section 7) set out the following criteria to be used in the EIS to evaluate the significance of adverse residual environmental effects:

- Nature of the effect (positive, neutral or negative)
- Magnitude of the effect (size of the effect, e.g. small, moderate or large)
- Duration of the effect (how long the impact would last)
- Frequency of the effect (how often would the impact occur)
- Reversibility of the effect
- Temporal boundaries (when the effect would occur)
- Spatial boundaries or geographical extent of the effect
- Ecological context; and
- Non-compliance with legislation, regulations and policies.

A brief description of how each of these criteria were applied in the socio-economic assessment is set out below.

**Nature of the effect.** The nature of the effect (positive, negative or neutral) was described during the discussion of each of the effects and indicated in each of the summary of residual effects and significance tables[1] as positive (+), negative (-) or neutral. This criterion involves an assessment of the nature of the effect rather than any quantification of the effect.

**Magnitude of the effect.** The magnitude of each effect was described in detail quantitatively where practicable[2] and qualitatively otherwise[3]. Effect magnitudes were then categorized generally as small, moderate or large according to the definitions set out in Chapter 2: assessment approach.[4]

**Duration of the effect.** Effect durations were described quantitatively where practicable and qualitatively otherwise. Generally, Construction phase related effects are of short-term duration (i.e. generally during only the construction phase of the project or portions of the construction phase), Operation Inactive phase related effects are of long-term duration (i.e. generally throughout the foreseeable life of the Project) and Operation Active phase related effects are of short-term duration. The definitions of short-term and long-term used in the socio-economic assessment were set out in Chapter 2 of the EIS.[5]

**Frequency of the effect.** Generally Construction phase related effects were considered to occur only once, during the construction phase of the project, Operation Inactive phase related effects were considered to occur only once, though those effects would persist throughout the life of the project and Operation Active related effects could occur with varying degrees of frequency. For the reasons explained in the EIS (Chapter 2), the frequency criterion was not considered to be a useful indicator of significance for Construction or Operation Inactive phase related effects and therefore was not generally discussed with respect to those effects. For Operation Active phase related effects, the frequency of the effect was indicated by stating where practicable the approximate return period of the flood event with which the effect was associated (for example, the effect occurred only in

[1] Tables 8.3-6, 8.4-5, 8.5-3 and 8.6-2.
[2] For example, the estimated change in property damages or the land to be acquired for the project.
[3] For example, in discussing effects on traffic related to bridge construction the likely effects were discussed qualitatively based on an understanding of the current traffic situation at the bridge sites and the proposed implementation of the bridge construction, which includes maintaining access at existing bridges during construction.
[4] Refer to page 2-15 of Chapter 2 of the EIS.
[5] Refer to page 2-15 of Chapter 2 of the EIS.

floods of 1 in 120 year return period or larger). These quantified return periods were considered in assessing the significance of the Operation Active phase effects and were stated in the discussion of each of the relevant effects.

**Reversibility.**[6] Reversibility was generally considered in the discussion of the duration of the effect. Reversibility was also considered in the discussion of whether the effect could be mitigated either now or at some time in the future. The determination of significance therefore incorporated a consideration of whether the effect was permanent or irreversible or whether it could be mitigated or reduced.

**Temporal boundaries.** Temporal boundaries were quantified in the assessment of all effects where this was practicable. For both Construction phase related effects and Operation Inactive related effects, the effects are anticipated to occur beginning with the construction of the Project; where practicable, more specific time periods within the Construction or Operation Inactive phases were indicated for such effects. For Operation-Active related effects, however, it is not possible by definition to predict when the effects would occur, as they would occur only during the operation of the floodway. It was therefore not possible to provide a detailed quantitative assessment of specific temporal boundaries (i.e., specific years within the operations phase) of the Operation-Active related effects, but their relative likelihood of occurring was considered with the frequency criteria.

**Spatial boundaries.** Spatial boundaries were quantified (in the sense of defining specific areas affected) in the assessment of all effects where this was practicable. For Construction phase related effects the biophysical effects are expected to be confined to an area near the construction work on the West Dyke, Floodway Channel and related structures. Effects for Operation Active and Operation In-Active phase effects had different geographic extents depending on the nature of the effect. This geographic extent was described quantitatively in detail where practicable (for example extent of land required to be acquired during construction) and with less detail for other effects (for example downstream of the Floodway Outlet to Netley Creek). Socio-economic geographic extent of the

[6] It should be noted that section 4.2 of the Reference Guide: Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects (FEARO, 1994) notes that when considering reversibility "In practice, it can be difficult to know whether the adverse environmental effects of a project will be irreversible or not. It will be important to consider any planned decommissioning activities that may influence the degree to which the adverse environmental effects are reversible or irreversible." The EIS notes at page 2-2 that "There is no timetable or plan for final disposition or decommissioning the Project facilities."

effects were classified according to the methodology set out in Chapter 2 of the EIS and described where practicable in the summary of residual effects and significance tables.[7]

**Ecological context.** Ecological context was addressed quantitatively and qualitatively as required and practicable in biophysical sections of the EIS. Ecological context was specifically considered in socio-economic assessments only where this was relevant to the assessment, e.g., it was considered appropriate to discuss the socio-economic effects related to natural flooding that are often coincident with effects of the operation of the floodway. This context was considered when assessing the effects of the operation of the proposed floodway expansion.

**Non-compliance with legislation, regulations and policies.** No legislation, regulation or policy non-compliance issues related to socio-economic effects were identified during the socio-economic assessment and therefore this criterion was not specifically addressed in the socio-economic assessment. This criterion was addressed where relevant in dealing with physical or biophysical effects.

[7] Refer to page 2-15 of Chapter 2 of the EIS.

**REFERENCE: TAC Table 2, Guidelines 7.0**

**ITEM:**

Additional information is required on the compensation programs proposed to mitigate residual effects.

**RESPONSE:**

**Red River Floodway Act:** Additional information on compensation programs to mitigate residual effects associated with artificial flooding in the Red River Valley can be found in Section 7 of the Supplementary Filing regarding the Red River Floodway Act Update.

**Groundwater Mitigation Policy:** MFA's groundwater mitigation policy is explained in the EIS in Section 5.4.3.1. As a last resort, compensation as a form of mitigation will be provided. Additional information on how the proposed Groundwater Mitigation Fund will be set up and operated is provided in the response to IC/MFA-S-11.

**Department of Fisheries and Oceans:** Compensation program is required for residual effects of the Project on fish habitat. The details of this program will be developed in the Fish Habitat Compensation Plan that will be completed and reviewed when details of the final design are completed.

**REFERENCE:** **TAC Table 1, Guidelines 7.0**

**ITEM:**

Deficiencies and how they will be addressed should be discussed.

**RESPONSE:**

Please see response to TAC/MFA-S-57.

**REFERENCE: TAC Table 1, Guidelines 8.0**

**ITEM:**

A discussion is needed regarding the identification and addressing of unpredicted effects. (Adaptive management)

**RESPONSE:**

The Manitoba Floodway Authority (MFA) has undertaken extensive technical and public involvement programs to identify potential environmental issues, their effects and to respond to those known or predicted environmental effects. Please refer to TAC/MFA-S-45 for a summary of some of the measures that were incorporated into the project as a result of these proactive programs.

MFA is also aware that regardless of the level of effort expended to identify and respond to the potential environment effects that might result, unforeseen and unpredictable events might still occur. MFA has adopted a monitoring and adaptive management approach to identifying and responding to those unpredictable effects.

The adaptive management approach has been implemented in various ways throughout the environmental assessment and included in the resultant environmental impact statement. The following are a few examples by which adaptive management as been incorporated to address unforeseen effects:

- The inclusion of a Monitoring and Follow-up sub-section after every assessment presented in Chapters 5, 6, 7, 8, and 9. The following is an example:

  **6.4.5 Monitoring and Follow-up**

  The projected potential revegetation of some of the riprapped areas in three to five years should be confirmed and the pattern of revegetation characterized to help direct future riprap-related shoreline stabilization project.
- MFA's commitment to develop and submit, for approval, environmental protection plans that includes the requirement to monitor the success of the plans and adjust according to the results.
- The proposed approach to mitigating unknown effects from changes to the operation the floodway during summer months as described in Section 8.2 of this Supplementary Filing.

**REFERENCE: TAC Table 1, Guidelines 10.0**

**ITEM:**

Additional information is required with respect to indicators and methodologies in the sustainable development assessment.

**RESPONSE:**

The following response provides elaboration on the approach, including methods and indicators, in describing how the proposed Floodway Expansion is consistent with the general principles of sustainable development.

The EIS discussion in Section 10 (Project Sustainability) provides an assessment of the proposed project with respect to project sustainability primarily from the provincial perspective. We believe that provincial perspective is consistent also with a national perspective, as elaborated below.

There is consistency between the fundamental vision of sustainable development between Manitoba and Canada. Manitoba's Sustainable Development Strategy (MSDS) states that "sustainable development means environmentally sound and sustainable economic development, described by a vision for Manitoba comprising certain beliefs, principles, and guidelines." In this regard, Manitoba has developed a series of "principles and guidelines for sustainable development." From a national perspective, Canada's National Taskforce on Environment and Economy (NTEE) stated that "our economic system should be managed to maintain or improve our resource and environmental base so that the generations that follow will be able to live equally well or better." Since there is consistency between the fundamental definition of sustainable development between Canada and Manitoba, the approach used in Section 10 of the EIS was to use the framework of Manitoba's "Principles and Guidelines of Sustainable Development," to assess the attributes of the proposed project with respect to sustainability. Accordingly, the seven principles of sustainable development promulgated by Manitoba were reviewed and the specific application of these principles to the proposed Floodway Expansion project were described in the EIS, Section 10. In addition, the six guidelines of sustainable development promulgated by Manitoba were discussed in a similar manner.

The guidance provided by the Canadian Environmental Assessment Agency (CEAA) was also reviewed. The agency states that their commitment to sustainable development (SD) is described in

the preamble to the Canadian Environmental Assessment Act which states "the government of Canada seeks to achieve sustainable development by conserving and enhancing environmental quality and by encouraging and promoting economic development that conserves or enhances environmental quality. Environmental assessment provides an effective means of integrating environmental factors into planning and decision-making processes in a manner that promotes sustainable development." We understand this to say that a good environmental assessment will contribute towards sound decision making with respect to sustainable development. Other guidance from CEAA was obtained through review of workshops conducted by CEAA with respect to best practices. We believe the Floodway project environmental assessment represents best practices and thus will assist decision making in a sustainable development framework.

We also sought guidance from Manitoba's Water Policies. Manitoba has advanced seven strategies with regard to land and water. In a "discussion paper: Building a Sustainable Future, Water: A Proposed Strategic Plan for Manitoba" October 2001, it is stated that the Land and Water Strategy is part of Manitoba's overall sustainable development strategy. One of the strategies relates to "flooding." The objective of Manitoba's flooding policy is to alleviate human suffering and minimize the economic costs of damages caused by flooding. In this discussion, the paper states that "the 1997 flood has shown the vulnerability of Winnipeg and the Red River Valley to a larger flood. Practical means to decrease flood vulnerability needs to be developed and implemented." The strategy is stated as increasing the level of flood protection in the Red River Valley, and to determine and implement the most effective and viable means of increasing flood protection for the City of Winnipeg. Thus, in general terms, the proposed Floodway Expansion is part of the provincial sustainable development vision and specifically, the strategies for land and water. In Section 10.3, the specific water policies, grouped under different themes, were discussed with respect to the application to the proposed Floodway expansion.

The explicit description of the application of "indicators" in the sustainable development assessment was not provided in Section 10 of the EIS. Indicators are an integral part of the assessment itself. Indicators, where available and applicable, were considered in the assessment described in Sections 3-9 of the EIS. Section 10 stated that Manitoba is still in the process of establishing provincial sustainability indicators. Manitoba has issued a "Provincial Sustainability Indicators: What You Told Us" report and this document was used as guidance in the assessment. The guidance provided in this working document will be elaborated upon below.

Manitoba has provided sustainability indicators for public discussion as described in the above-referenced report. With respect to the environmental dimension, the proposed indicators are as follows:

1. Biodiversity in habitat conservation:
    - Natural lands and protected areas: This indicator refers to the amount of Crown land in Manitoba designated as park reserves, ecological reserves, wildlife management areas, provincial forest, and their level of protection.

      *Natural lands, protected lands, and enduring features were considered in the assessment (EIS Sections 5-8).*

      *The EIS concluded that there would be no effect on protected lands because the effects would be restricted to the project site (i.e., footprint). Supporting information is provided in Table 7C-IV and Figure 7.2-1 (Appendix 7C) of the EIS.*

    - Habitat loss: this indicator refers to the threat to wildlife species and biodiversity due to habitat loss.

      *Habitat changes due to the proposed project were considered with respect to the various types of wildlife arising from the proposed expansion (EIS Sections 5, 6, 7).*

    - Pressure from development: This indicator referenced fragmentation of natural landscapes, possible disruption to species migration, hunting pressures, reduction of forest and grassland, etc., due to human development.

      *Fragmentation and development pressures possibly brought about by the proposed project were considered with respect to their relationship to ecosystem integrity (EIS Section 7).*

2. Wildlife
    - Species diversity: This indicator refers to threatened or endangered animal and plant species and their abundance.

*This characteristic was considered in the assessment, particularly with respect to the expansion of the Floodway channel and its effect on wildlife (EIS Section 7).*

- Distribution of indicator in exotic nuisance species: This indicator was intended to examine threatened and endangered species, migratory birds, and exotic nuisance species.

*These considerations were factors in the environmental assessment in Sections 3-9.*

3. Air
   - Air quality: This indicator refers to greenhouse gases and other harmful releases to the atmosphere.

*Climate change was discussed extensively in the EIS (Section 5) and also in response TAC/MFA-S-27.*

- Urban air quality index: This indicator is intended to consider air quality problems, particularly as they might exist from vehicle emissions.

*The effect of vehicular emissions, particularly during the construction phase, related to the Floodway Expansion were discussed in some detail in TAC response TAC/MFA-S-27.*

- Greenhouse gas emissions: This indicator refers to the amount of type of greenhouse gases emitted.

*This was discussed in the EIS, Section 5.3.3.3.2 and also in TAC/MFA-S-27.*

4. Water
   - Manitoba Water Quality Index: Manitoba has established surface water quality objectives on 25 variables which provide a measure of the water quality in Manitoba and guidelines that would indicate a healthy water quality.

*The Manitoba Surface Water Quality Guidelines were used in assessing effects such as erosion on water quality and were extensively discussed in Sections 3-7.*

- Water quantity and use: This indicator refers essentially to conservation and efficiency with respect to water consumption.

  *The proposed Floodway expansion will not affect water quantity and use.*

- Water consumption: This indicator also refers to the amount of water that flows through municipal water systems.

  *The proposed expansion will not affect water consumption.*

5. Fish
   - Fish species diversity and population: This indicator is intended to track the known species of fish in Manitoba waterways and their relative numbers including identification of aquatic nuisance species.

     *Fish species, diversity, and population were assessed, particularly in Section 6 of the EIS.*

   - Fish harvest: The main indicator of fish harvest was considered to be commercial harvest.

     *The EIS discussed harvesting of fish for commercial and recreation purposes. In response to questions, discussions were also provided on clam harvesting (see TAC/MFA-S-61).*

6. Forest
   - Forest type and age class
   - Forest harvest
   - Allowable annual cut

     *This indicator was not considered to be relevant to the proposed Floodway Expansion.*

7. Minerals
   - Mineral inventory and potential for extraction
   - Identified reserves versus minerals extracted
   - Mining leachate impacts
   - Leachate from mining site

*These indicators, to the extent that they were applicable to the Floodway Expansion project, were considered in the assessment Sections 3-9.*

8. Soils
    - Soil quality, quantity, and productivity: The indicator in this regard was the risk of wind and water erosion on cultivated lands.

*While the proposed expansion will not affect erosion on cultivated lands, the issue of erosion was given substantial discussion in the EIS, particularly in Section 5. In this regard, Manitoba water quality indicators were used to assess potential effects of erosion and their significance. Further, substantial discussion of potential mitigation measures were included in the supporting documents (refer to Engineering Documents). Mitigation measures to minimize erosion to acceptable levels as construction proceeds will be further described, including adaptive management measures, in the Environmental Protection Plan. After construction, revegetation of the channel is a commitment outlined in the Project Description (Section 2) in order to protect against erosion during operation.*

A review of the assessment provided in Sections 3-9 of the EIS will show that indicators such as those proposed by Manitoba were an integral part of the assessment of the proposed Expansion. Applying these indicators (where they are applicable to the assessment) with respect to the potential impact, mitigation measures, and residual effects including judgment of their significance, is responding to the principles of sustainable development.

We believe that amplification of the approach methods and indicators provided above supports the conclusion provided in the EIS, i.e., Section 10.4, that the Floodway Expansion project is an excellent example of sustainable development; a project that balances social and environmental benefits while protecting the welfare of future generations of Manitobans.

**REFERENCE: TAC Table 1, Guidelines 12.0**

**ITEM:**

Maps needed showing zones of effects on land and water use and habitat areas.

**RESPONSE:**

The EIS text describes the effects of the Project on the various components of the biophysical environment (EIS Sections 5, 6, 7). The assessment of the extent of the effects are provided within the context of being site-specific, local or regional, as defined generally in Section 2. Since the zone of effect is dependent on the factor in question, maps were not produced for the zone of each effect due to the fact that this would require numerous maps with overlapping zones and would confuse the message provided in the EIS. Detailed aquatic mapping is provided in EIS Appendix 6D. Additional clarification for the mapping provided in the EIS Section 7 (Figure 7.2.1) and EIS Appendix 7A.