

**Webb, Bruce (CWS)**

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**Subject:** R. M. of Mossey River Fork River Low Level Crossing File: 5655.00

The attached information can be placed in the public registries for the above project:

1. Response to request for additional information (email from Stantec, September 26, 2013) 3 pages
2. Request for additional information (email to Stantec, August 29, 2013) 1 page
3. Public comments on Environment Act Proposal – none received.
4. Technical Advisory Committee comments on Environment Act Proposal: 11 pages
  - Manitoba Conservation and Water Stewardship, Environmental Compliance and Enforcement Branch, August 6, 2013
  - Manitoba Conservation and Water Stewardship, Environmental Programs and Strategies Branch, Air Quality Management Section, July 17, 2013
  - Manitoba Conservation and Water Stewardship, Watersheds and Protected Areas Branch and Lands Branch, August 6, 2013
  - Manitoba Conservation and Water Stewardship, Lands Branch, Western Region, July 8, 2013
  - Manitoba Conservation and Water Stewardship, Parks and Natural Areas Branch, July 29, 2013
  - Manitoba Conservation and Water Stewardship, Water Science and Management Branch, Water Quality Management Section, July 17, 2013
  - Manitoba Conservation and Water Stewardship, Water Use Licensing Section, July 4, 2013
  - Manitoba Conservation and Water Stewardship, Office of Drinking Water, July 26, 2013
  - Manitoba Infrastructure and Transportation, Highway Planning and Design Branch, Environmental Services Section, August 6, 2013
  - Manitoba Health, Medical Officer of Health, Prairie Mountain Health, July 31, 2013
  - Office of the Fire Commissioner, July 12, 2013

Bruce.

**TAC Questions and Responses**

- 1. Culvert type:** the executive summary mentions open bottom culverts for the new crossing; the project summary (p. 2.1) mentions arched CMPs. Since a cross section of the installation is not shown in the drawings, can you clarify if the proposed culverts have an open bottom?

**Response:**

The proposed will be arched so that a natural bottom will develop along the bottom of the culvert.

- 2. Culvert invert elevation:** the project summary (p. 2.2) mentions an invert elevation of 295.35 m and a streambed elevation of 295.50 m, for an embedded amount of 0.15 m. In the mitigation measures discussed on page 5.7, embedding 0.3 m or 10% of the vertical height of the pipe, whichever is greater, is mentioned. Can you confirm the invert elevation with respect to the bed elevation?

**Response:**

The culverts have an invert elevation of 294.35 m, a streambed elevation of 294.50 m (I'm assuming the 295.XX was a typo) with a 0.15 m embedment.

- 3. Culvert horizontal spacing:** what is the horizontal distance between adjacent culverts? How does this compare with the stream crossing guidelines?

**Response:**

The culverts will be spaced 500 mm from metal to metal. UNIES' analysis (modified one-dimensional open channel flow hydraulics) does not explicitly consider a pipe spacing, only the conduit cross sectional flow area and number of conduits in order to estimate entrance, exit, and frictional energy losses and the resulting headlosses, water depths and velocities in the conduits and over the top of the road. For minimum obstruction to the discharges under lower flow conditions, it would be desirable to minimize the pipe spacing, subject to construction requirements.

- 4. Concerning the phases of the project (Section 2.1.3, p. 2.2),** it is not clear that each of the two phases will require a separate cofferdam to isolate the work area involved, while leaving the other side open for flow and fish passage. Can you confirm that this is the case?

**Response:**

Correct, a cofferdam will be used during each phase of construction to isolate the construction from the stream.

- 5. Concerning fish passage and the application of the stream crossing guidelines,** the anticipated average flow velocity (Section 2.1.5, p. 2.2) is 1.64 m/s, but DFO reports an average velocity (presumably an average maximum velocity) of 1.0 m/s, which is lower than the anticipated velocity. Can you clarify? Has any analysis been done of the amount of time maximum fish passage velocities could be exceeded? What happens during extraordinary events such as the event that damaged the existing structure? Is fish passage possible through or over the structure?

**Response:**

Stantec has surveyed cross sections A, B, and C upstream, and D, E, F, G and H downstream of the crossing. Varying cross sectional geometry at the various cross sections within the group surveyed means that, for any particular river discharge, in simplest form, the average or mean velocity in the stream theoretically speeds up and slows down as the water advances downstream through the contracting and expanding cross sections. In reality, the flow in the river is not simply one-dimensional; its velocity varies across the channel both in rate and direction, creating both quieter and more rapid areas of flow.

At the Fork River low-level crossing in question, the channel hydraulics are further complicated by the very high skew of the roadway in relation to the general direction of flow. Flows traversing the roadway via the culverts do so more or less in parallel with the general direction of flow. In contrast, any portion of the flow which passes over the roadway, or weir, tends to curve toward the left, to exit at an angle closer to right angles with the road. The accumulated widening of the channel now seen at the left bank just downstream of the crossing may be largely attributable to the more direct attack angles for the flows that have been imparted to them during their passage over the top of the roadway. The flows tend additionally to be a little quieter near the right bank as a result, and the right side upstream of the crossing has tended to catch a little more of the stream's bed load and debris over time.

For the 3dQ10 one-dimensional test discharge estimated at 16 cubic metres per second, the theoretical mean velocities at the open channel cross sections ranged typically between 0.78 m/s, at one of the upstream sections located about 40 metres upstream of the roadway centreline, to 1.20 m/s at one of the downstream sections located about 65 metres downstream of the roadway centreline (UNIES report, Table 2). At the other typical cross sections upstream and downstream, the theoretical mean velocities varied within that range. Cross sections at two other locations were considered to be unrepresentative of actual general channel conditions near the crossing and yielded estimated flow conditions outside this range, one appearing to be unrealistically constricting and the other too large. Ignoring the non-linearity of flow conditions, one could estimate that the range of geometries therefore would yield a theoretical average velocity in the open channel near the site of around 1.0 m/s at the adopted 3dQ10 discharge. One would expect faster flows nearer the middle and slower flows nearer the banks.

At the 3dQ10 discharge of 16 cu m/s, it is estimated that 10.2 cu m/s would be passing through the ten proposed culverts and 5.8 cu m/s would be going over the road. It is expected that the effective widening of the flow section at the road (due to the high degree of skew and shallow approach gradient of the road) would result in areas of very low overflow velocity along the sides and limited contribution to the total discharge, together with an active area toward the middle, above the culverts. As this differs from uniform flow conditions, quantiles cannot be estimated precisely. However, with an assumed active overflow flow area about 28 metres in width at the upstream side and 40 metres at the downstream side, with ineffective flow areas assumed further out from the stream centre line, average velocity in the culverts under these conditions is estimated at 1.64 m/s. Average velocity above the active part of the road at the upstream edge with this conceptualization of flow conditions is estimated to be about 0.74 m/s from an average flow depth of 0.28 m and flow width of 28 m, while at the downstream edge it is 1.11 m/s from a flow depth of 0.13 m and the 40 metre flow width. These estimates must be considered range only, due to the expected unresolvable difference between simple theory and actual field conditions.

The existing structure is overtopped often for short periods due to the combination of a flashy stream and low roadway/weir height (~ 1 metre). At the time of the site inspection in late 2011, the structure was still in position and a functional stream crossing for motor traffic. However, the hardened surface was well worn and cracked. The main loss in hydraulic performance of the structure has been the plugging of the culverts by an accumulation of stream bed material delivered at higher discharges. The significant reduction in culvert capacity has increased the number of times that the roadway has overtopped. Whether the inner dimensions of any of the existing conduits had been reduced by collapsing could not be ascertained. The proposed replacement conduits are of significantly greater flow area in order to facilitate their maintenance and allow a greater proportion of the flow to pass beneath the roadway surface, thus reducing the frequency of road closure.

Fish passage is possible both over the roadway and through the culverts, as exemplified in Table 2 of the report for various discharges. It is expected that overflow velocities lower than the cross-sectional average would be experienced adjacent to the shorelines and provide alternative opportunity for fish bypass outside of the main flow areas when conduit and overflow velocities may be high. Because the proposed replacement roadway would remain quite low, frequency of overtopping would remain relatively high, although less than for the existing structure (with the obstructing stream bed materials assumed to be removed). At higher, although less frequently experienced flow conditions, the obstructive effect of the submerged structure diminishes to minor, while overflow velocities within the same range as experienced in the unaltered channel at various points upstream and downstream would prevail. As noted in the report (page 13 and Figure 9), the lengths of time when discharges remain above about 13 cu m/s at the site have been about three or four days for the largest rainfall floods on the record and slightly longer for spring runoff conditions.

## Webb, Bruce (CWS)

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**From:** Webb, Bruce (CWS)  
**Sent:** August-29-13 5:34 PM  
**To:** Anseeuw, Carmen  
**Subject:** RM of Mossey River - Fork River Crossing Replacement File: 5655.00

Hello! We received no public comments on this project, and limited TAC comments. I have a licence mostly drafted that will be available for your review once I have some clarification on few points in the project description:

1. **Culvert type:** the executive summary mentions open bottom culverts for the new crossing; the project summary (p. 2.1) mentions arched CMPs. Since a cross section of the installation is not shown in the drawings, can you clarify if the proposed culverts have an open bottom?
2. **Culvert invert elevation:** the project summary (p. 2.2) mentions an invert elevation of 295.35 m and a streambed elevation of 295.50 m, for an embedded amount of 0.15 m. In the mitigation measures discussed on page 5.7, embedding 0.3 m or 10% of the vertical height of the pipe, whichever is greater, is mentioned. Can you confirm the invert elevation with respect to the bed elevation?
3. **Culvert horizontal spacing:** what is the horizontal distance between adjacent culverts? How does this compare with the stream crossing guidelines?
4. **Concerning the phases of the project (Section 2.1.3, p. 2.2),** it is not clear that each of the two phases will require a separate cofferdam to isolate the work area involved, while leaving the other side open for flow and fish passage. Can you confirm that this is the case?
5. **Concerning fish passage and the application of the stream crossing guidelines,** the anticipated average flow velocity (Section 2.1.5, p. 2.2) is 1.64 m/s, but DFO reports an average velocity (presumably an average maximum velocity) of 1.0 m/s, which is lower than the anticipated velocity. Can you clarify? Has any analysis been done of the amount of time maximum fish passage velocities could be exceeded? What happens during extraordinary events such as the event that damaged the existing structure? Is fish passage possible through or over the structure?

Thanks!

Bruce.

**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Hagenson, Kayla (CWS)  
**Sent:** August-06-13 11:33 AM  
**To:** Webb, Bruce (CWS)  
**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

Hi Bruce,

The following is my comment for the attached proposal:

All construction and demolition waste, including all cured and uncured concrete must be disposed of at an approved waste disposal ground.

Kayla Hagenson, *B.Env.Sc.*  
Environment Officer  
Conservation and Water Stewardship  
Environmental Compliance and Enforcement, Western Region  
27-2nd Ave SW  
Dauphin, MB R7N 3E5  
(204) 622-2316

**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Molod, Rommel (CWS)

**Sent:** July-17-13 9:19 AM

**To:** Webb, Bruce (CWS)

**Cc:** Streich, Laurie (CWS)

**Subject:** RE: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

Bruce, Air Quality has reviewed the above proposal and have no comment. The proposal has no significant impact on air quality.

Thank you for the opportunity to review.  
Rommel

**Webb, Bruce (CWS)**

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**From:** Kaita, Adara (CWS) on behalf of +WPG1212 - Conservation\_Circulars (CWS)  
**Sent:** August-06-13 9:11 AM  
**To:** Webb, Bruce (CWS)  
**Subject:** EA Proposal - RM of Mossey River - Fork River Crossing Replacement - File: 5655.00

Hi Bruce,

The Watersheds and Protected Areas Branch and the Lands Branch have no concerns with the EA proposal and note that the surface ownership is privately held.

Thank you,

**Adara Kaita**  
Crown Land Programs and Policy Manager  
Conservation and Water Stewardship  
Box 25, 200 Saulteaux Crescent  
Winnipeg, MB R3J 3W3  
Cell: (204) 945-6301  
F: (204) 948-2197



**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Misanchuk, Lorne (CWS)

**Sent:** July-08-13 9:54 AM

**To:** Webb, Bruce (CWS)

**Subject:** RE: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

No concerns with proposal as presented.

## **Webb, Bruce (CWS)**

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**From:** Kelly, Jason (CWS)  
**Sent:** July-29-13 8:45 AM  
**To:** Webb, Bruce (CWS)  
**Subject:** Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

Parks and Natural Areas Branch has reviewed the proposal filed pursuant to the Environment Act for Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00. The Branch has no comments to offer as this does not impact any parks or ecological reserves.

Jason Kelly, M.N.R.M.  
Ecological Reserves and Protected Areas Specialist  
Parks and Natural Areas Branch  
Conservation and Water Stewardship  
Box 53, 200 Saulteaux Cres  
Winnipeg, MB R3J 3W3

Phone: 204-945-4148

Cell:

Fax: 204-945-0012

Email: [Jason.Kelly@gov.mb.ca](mailto:Jason.Kelly@gov.mb.ca)

**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Jacobs, Kevin (CWS)  
**Sent:** July-17-13 2:11 PM  
**To:** Webb, Bruce (CWS)  
**Subject:** RE: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

Hello Bruce,

I reviewed the proposal to replace a damaged low level crossing of the Fork River in the Rural Municipality of Mossey River on behalf of the Water Quality Management Section of Manitoba Conservation and Water Stewardship.

The proposal seems reasonable such that provided the proponent implements appropriate best practices and mitigation measures there should not be outstanding water quality concerns.

Standard license conditions are applicable to this project such as:

- Adherence to Manitoba's Stream Crossing Guidelines
- A clause stating no uncured concrete products shall be allowed in the Fork River. Washing of uncured concrete products should only be a designated area well removed from the river.
- Any rock used as riprap should be clean non reactive rock- the proposal notes that clean field stone would be used which seems like an appropriate material
- Fueling or servicing of vehicles or equipment should be at least 100 metres from the water
- The proponent should stabilize and re-vegetate any exposed areas with a seed mix native to the area
- Biodegradable erosion control materials be used
- The proponent should implement measures preventing the spread of foreign invasive aquatic species
- In water work should take place during low flow conditions if possible and outside fish spawning periods
- Any grading or other work near the riparian area should be avoided during periods of rain and should take place preferably under dry conditions.

Please do not hesitate to ask if you should have questions.

Kevin.

**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Matthews, Rob (CWS)

**Sent:** July-04-13 10:09 PM

**To:** Webb, Bruce (CWS)

**Subject:** RE: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

No concerns.

**Webb, Bruce (CWS)**

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**From:** Stibbard, James (CWS)  
**Sent:** July-26-13 9:12 AM  
**To:** Webb, Bruce (CWS)  
**Subject:** RE: 5655.00 Mossy River Bridge Replacement EAP

Mr. Webb,  
Office of Drinking Water has no concerns with the above noted EAP  
Regards,

**James Stibbard P. Eng.**  
Approvals Engineer  
Office of Drinking Water  
1007 Century Street  
Winnipeg MB R3H 0W4  
phone: (204) 945-5949  
fax: (204) 945-1365  
email: [James.Stibbard@gov.mb.ca](mailto:James.Stibbard@gov.mb.ca)  
website: [www.manitoba.ca/drinkingwater](http://www.manitoba.ca/drinkingwater)

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**Infrastructure and Transportation**  
Highway Planning and Design Branch  
Environmental Services Section  
1420 - 215 Garry St., Winnipeg, MB R3C 3P3  
T (204) 619-4359 F (204) 945-0593

August 6, 2013

Tracey Braun, M. Sc.  
Director, Environmental Approvals Branch  
Manitoba Conservation and Water Stewardship  
123 Main St., Suite 160  
Winnipeg, MB R3C 1A5

RE: RM of Mossey River - Fork River Low-Level Crossing Replacement  
Client File No 5655.00

Dear Ms. Braun:

MIT has reviewed the proposal noted above and we do not have concerns with the development as proposed.

Thank you very much for providing us the opportunity to review the proposal.

Sincerely,

Ryan Coulter, M. Sc., P. Eng.  
Manager of Environmental Services

**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Allison, Sandra (HEALTH)  
**Sent:** July-31-13 4:09 PM  
**To:** Webb, Bruce (CWS)  
**Cc:** Chang, Heejune (HEALTH); Roberecki, Susan (HEALTH); Roberts, Tracy (HEALTH); Frykoda, Amy (HEALTH)  
**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

Bruce,

In response to the Environmental Assessment Review prepared by Stantec for the Fork River Crossing replacement. In my opinion, the review has considered all relevant health impacts. I have nothing further to add.

The document was also reviewed by Stefane Gravelle, the regional director of Public Health inspectors and he also had no further comments.

Thank you for the opportunity to review the proposal.

Sandy

Sandra Allison MD MPH CCFP FRCPC DABPM  
Medical Officer of Health  
Prairie Mountain Health  
20 - 7th Street  
Brandon Manitoba  
R7A 6M8  
Office 204-578-2509  
Cell 204-391-3781  
Fax 204-578-4950  
[sandra.allison@gov.mb.ca](mailto:sandra.allison@gov.mb.ca)

**Webb, Bruce (CWS)**

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**Subject:** FW: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

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**From:** Kubish, Cheryl (OFC)  
**Sent:** July-12-13 7:58 AM  
**To:** Webb, Bruce (CWS)  
**Cc:** Schafer, Dave (OFC)  
**Subject:** RE: Request for comments due Aug. 7, 2013 - Mossey River/Fork River Crossing Replacement - File: 5655.00

Good Morning,

The Office of the Fire Commissioner has reviewed this file and has no concerns or comments at this time.

Cheryl Kubish  
Administrative Assistant  
Office of the Fire Commissioner  
508-401 York Avenue  
Winnipeg MB R3C 0P8  
Phone: 945-3328  
Fax: 948-2089

E-Mail address: [Cheryl.Kubish@gov.mb.ca](mailto:Cheryl.Kubish@gov.mb.ca)