

Webb, Bruce (SD)

To: Steele, Tania (SD)
Subject: Municipality of Harrison Park - Sandy Lake Water Level Control Project File: 5804.00

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

Additional Information

Additional information: Information from Chad Davies, Municipality of Harrison Park, November 9, 2016 (2 pages) and letter from Glen Newton, G. D. Newton and Associates Inc., December 7, 2016 (3 pages)

Request for additional information: email from Environmental Approvals Branch to G. D. Newton and Associates Inc., August 18, 2016 (8 pages)

Public Comments on Environment Act Proposal

Part 1 : Geri Pringle, December 14, 2015, Hank Monita, December 17, 2015, Lorne and Janet Bradley, December 18, 2015, Sheila Miller, December 18, 2015, Dennis Hodgson, December 22, 2015, Barry Zachedniak, December 30, 2015, Vern Cross, January 3, 2016 (9 pages)

Part 2 : Virginia Shemeliuk, January 3, 2016, Brad Kelso, January 6, 2016, Harold Fung, January 7, 2016 (14 pages)

Part 3 : James Nicholls, January 7, 2016, Doug Wotton, January 7, 2016, Tom Sherb, January 8, 2016, Lorne and Janet Bradley, January 8, 2016, Ken and Eloise Gosnold, January 8, 2016, Dale Scott, January 8, 2016, Liz Wotton, January 8, 2016, Kevin and Rhonda Pratt, January 9, 2016 (11 pages)

Part 4 : James and JoAnna Grant, January 9, 2016, Marno and Connie Cross, undated, Gil Van Daele, January 7, 2016, Owen Hagan, January 11, 2016, Myles and Lorie Emrick, January 11, 2016, Ken Omilanow, January 11, 2016, Gordon and Cheryl Cormack, January 13, 2016, Darryl and Julie Kines, January 13, 2016, Jeanette and Renald Rouire, January 13, 2016 (13 pages)

Part 5 : Mark Sefton, January 13, 2016, Ricki Marie Woods, January 13, 2016, Chris Miller, January 7, 2016, Keeseekowenin Ojibway Nation, March 7, 2016 (10 pages)

.../2

Technical Advisory Committee Comments on Environment Act Proposal (11 pages)

Canadian Environmental Assessment Agency, February 9, 2016

Manitoba Sustainable Development, Climate Change and Air Quality Branch, Air Quality Section, January 14, 2016

Manitoba Sustainable Development, Parks and Protected Spaces Branch, December 29, 2015

Manitoba Sustainable Development, Lands Branch and Integrated Resource Management Team,
Western Region, January 13, 2016

Manitoba Sustainable Development, Office of Drinking Water, January 11, 2016

Manitoba Sustainable Development, Water Use Licensing Section, December 13, 2015

Manitoba Sustainable Development, Water Control Works and Drainage Licensing Section, January 7, 2016

Manitoba Sustainable Development, Wildlife and Fisheries Branch, January 14, 2016

Manitoba Infrastructure, Highway Planning and Design Branch, Environmental Services Section, January 7, 2016

Manitoba Health, Medical Officer of Health, December 19, 2015

Bruce.

Sandy Lake Water Level Control Project File: 5804.00

Response to August 18, 2016 Request for Additional Information

Items 1 and 5: Letter from G. D. Newton and Associates, December 7, 2016 (attached)

Items 2 - 4 and 6 - 7: from Chad Davies, CAO, Municipality of Harrison Park, November 9, 2016

2. The target level was established taking into consideration the properties that are prone to flooding when the level is exceeded, specifically the Serenuk Drive area, as well as the level that was visible on the old pier (now removed). Other considerations taken into account were the historic level near the natural drain that was filled in, shore lines along Lake Street, and what people remember.
3. Water levels on Sandy Lake, Beaufort Lake and at Crossing #9 would be monitored a minimum twice per week during operation. During and immediately after heavy rains, the drain would be closed to ensure that the drainage route is not completely flooded.

Depending which structure is ultimately chosen, provisions would be taken to prevent unauthorized operation. With a culvert, a control gate would be installed with a secure lock that only employees authorized to open and close the drain in accordance with the issued license would have. If the concrete box culvert is installed, it would be designed with a weir system, which again would be securely locked.

4. Winter flows would be strictly monitored for freeze up. However, unless we receive a large amount of precipitation prior to freeze up, the drain would not have to be operated, as the Municipality's goal would be to have it at a reasonable level prior to winter.

It should be noted that the drain was in operation during the winter of 2015 with no resulting issues.

6. Sandy Lake & Beaufort Lake have northern pike, walleye, and yellow perch (not many). The Little Saskatchewan River has northern pike, very few walleye in the area, and suckers. Should MB Sustainable Development recommend a fish screen, the Municipality has no objection to installing fish screens as necessary. In my opinion it would be wise to install fish screens to prevent suckers from entering both Beaufort and Sandy Lakes.
7. The Municipality would attempt to regulate the lake level and drain throughout the summer months, when temperatures are high and the soil has capacity to absorb water. The amount of water being released at any time would not negatively impact any roads or culverts because if the drainage system is full because of precipitation, the drain would not be operated. Given that the Municipality would regularly monitor the drainage system, debris remove would occur as necessary - when flows are being significantly restricted by debris or flooding is occurring because of a blockage.

The Municipality has made improvements to the crossing within Keeseekoowenin First Nation (#10) with the installation of a 900 mm culvert, alongside the existing 800 mm pipe, which will alleviate the washouts that the First Nation has been faced with over the past number of years. We also have begun to have regular discussions/contact with representatives of Keeseekoowenin First Nation.

We have excellent working relationships with area contractors and availability of equipment to address debris issues would not be an issue. Crossing #9 is steep, however a track excavator can easily maneuver down to the culvert to clean debris.

G. D. Newton and Associates Inc.

727A 10th Street
Brandon, Manitoba
R7A 4G7
204-725-1688
204-725-3922 (fax)

December 7th, 2016

Bruce Webb, P.Eng.
Water Development and Control Assessment Officer
Environmental Approvals Branch
Manitoba Sustainable Development
160-123 Main Street
Winnipeg, Manitoba
R3C 1A5

Sent via email bruce.webb@gov.mb.ca

Re: **Sandy Lake**
 Water Level Control Project

This letter is written to address the three outstanding comments from the public and Technical Advisory Committee review of the Sandy Lake Water Level Control Project EAP.

WATER QUALITY EFFECTS OF THE PROJECT

The water quality data provided by yourself for Sandy Lake, Beaufort Lake, and the Little Saskatchewan River were reviewed. Unfortunately the water quality data for the three locations were taken on separate years. Therefore is not possible to compare the differences in water quality in the three bodies of water under similar weather conditions. The relevant water quality parameters that had data available for the three water bodies are summarized below.

	Sandy Lake	Beaufort Lake	Little Saskatchewan River
Sampling Parameters			
Year in which samples were taken	2014	2007-2009	1997-1999
Sampling Location	<ul style="list-style-type: none">• North east end• south east end▪ south narrows		2 km upstream of Rolling River
Constituents			
Total Suspended Solids (mg/L)	Range: 8-27 Avg = 17	Range: 5-15 Avg = 13	Range: 5-120 Avg = 33
Total Dissolved Phosphorus (mg/L)	0.02	Range: 0.01-0.03 Avg = 0.02	Range: 0.02-0.45 Avg = 0.09
Total Phosphorus (mg/L)	Range: 0.04-0.07 Avg = 0.06	Range: 0.03-0.04 Avg = 0.04	Range: 0.03-0.52 Avg = 0.14
Nitrogen Total Kjeldahl (mg/L)	Range: 2.1-2.6 Avg = 2.3	Range: 1.4-1.9 Avg = 1.7	Range: 0.5-2.5 Avg = 1.2
Nitrogen Dissolved NO ₃ & NO ₂ (mg/L)	Range: 0.07 – 0.08 Avg = 0.07	No data	Range: 0.01 – 5.38 Avg = 0.6

Based on the available data, total suspended solids (TSS) and phosphorus are similar in both Sandy Lake and Beaufort Lake, and are lower than is present in the Little Saskatchewan River.

The level of nitrogen is shown to be lower in the Little Saskatchewan River . This level may be quite closely associated with volume of runoff. The Sandy Lake sample was taken in 2014. In 2014 the volume of runoff will have been quite large. The Little Saskatchewan River samples were taken in 1997 through 1999. These were years of lower runoff. However, these levels will likely vary with levels of precipitation that immediately preceded the time of sampling.

In summary, it is the opinion of the undersigned that available water quality data does not clearly indicate likelihood for negative impacts on either Beaufort Lake or the Little Saskatchewan River as a result of the proposed outflow of water from Sandy Lake.

GEODETTIC LEVEL FOR THE TARGET ELEVATION AND REFERENCE POINT FOR MONITORING WATER LEVELS

The geodetic elevation of the top of the main pier was at 611.03. The goal is to lower the lake level to 0.1m below the top of the main pier to an elevation of 610.93.

The target water level of 0.1m below the top of pier was just used as an easy reference for the public. During survey and construction, numerous benchmarks will be available to be used as a reference point for monitoring water levels.

ENGINEERED DRAINAGE PLAN

Rick Pemkowski, the local water resource officer, was contacted regarding the need for an engineered drainage plan. He stated that all he would need, aside from the stamped plans included in the EAP, are geodetic elevations for the proposed culvert and the target water level. See the attached Drawing for the relevant geodetic elevations. A copy of the attached drawing has been forwarded to Rick Pemkowski.

I trust you will find everything in order however, should you have any questions please contact the undersigned.

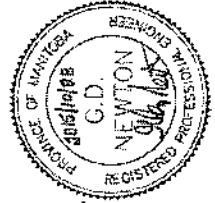
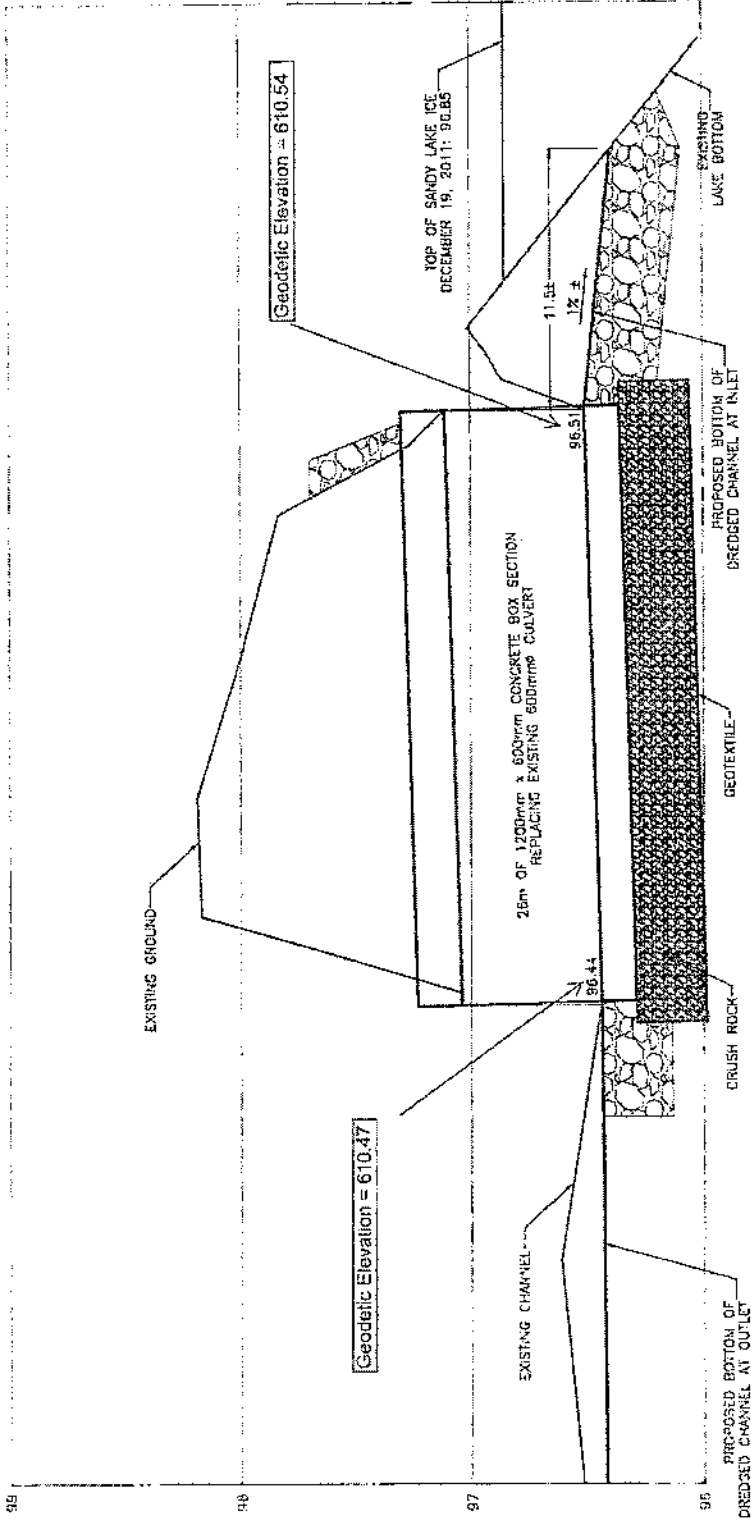
Respectfully submitted,



Glen Newton, P.Eng.



Geodetic Elevation
 Top of main pier = 611.03
 Target water level (0.1m below top of main pier) = 610.93



AREON
 Certificate of Authorization
 G.D. Newton & Associates Inc.
 No. 4633 Date: APRIL 30, 2016

R.M. OF HARRISON: SANDY LAKE
 WATER LEVEL CONTROL PROJECT
 OUTLET SECTION

G.D. NEWTON AND ASSOCIATES INC.
 7774 10TH STREET
 WARGOON, MANITOBA
 R7A 0T7

NO.	REVISIONS

DATE: OCTOBER 2015
 SCALE: (0) 1:200 (1) 1:50
 SHEETS: 1

BENCHMARK: 3M CORNER @ TOP OF MAIN PIER 97.00
 ALL DIMENSIONS ARE IN METRES
 ALL ELEVATIONS ARE BASED ON A LOCAL DATUM



Webb, Bruce (SD)

From: Webb, Bruce (SD)
Sent: August-18-16 9:23 AM
To: 'Sarah Santiago'; 'Glen Newton'
Cc: 'Chad'
Subject: Sandy Lake Water Level Control Project File: 5804.00
Attachments: Application for Licence to Construct Water Control Works.pdf; Fact Sheet-Engineered Drainage Plans for Subdivisions.pdf

The public and Technical Advisory Committee review of the Environment Act Proposal for the above project was completed earlier; I apologize for the lengthy delay in the process for this project. I have now compiled a list of additional information items that are needed to address concerns identified during the review. Your comments on the following items are requested:

1. The proposal references a target water level for the lake to the main community dock (0.1 m below the top of the dock). I understand the dock has since been removed. A geodetic level for the target elevation is needed. Are there plans to establish another convenient reference point for monitoring water levels?
2. Please outline how the target level for lake regulation was determined. From the proposal, it appears to have been based on observations over the past several years of levels which affect low lying properties. Can you confirm?
3. How often would water levels on Sandy Lake, Beaufort Lake and at Crossing #9 be monitored by operators, and how frequently would flows be adjusted? Are provisions planned to prevent unauthorized operation of the control structure at the outlet of Sandy Lake?
4. The proposal noted that winter flows would be a possibility. Please describe any operating rules that would apply to winter operation, and any additional monitoring that would be needed to accommodate this operation.
5. Water quality effects of the project are discussed briefly; page 13 of the proposal suggests that water quality data is either not available or was not examined. Please comment on any known differences in water quality between Sandy Lake, Beaufort Lake and the Little Saskatchewan River, and potential project effects. Some water quality data should be available for Sandy Lake and Beaufort Lake through monitoring for the community of Sandy Lake's water supply and wastewater treatment systems.
6. A fish screen is not proposed to prevent the escape of fish from Sandy Lake with the outlet in place. What data is available on fish species present in Sandy Lake, Beaufort Lake and the Little Saskatchewan River, and are any project effects on fish anticipated?
7. The proposal notes that the outlet would not increase peak flows, but that downstream flow durations would be extended. Additional commentary would be useful on downstream effects, including effects on downstream roads and culverts and their maintenance. The proposal suggests that the municipality would address debris removal at downstream culverts; more information on how frequently this would be done would be helpful. In particular, it is noted that the outlet route slope in the lower reaches is steep, and the road over Crossing #9 is high – how could debris be removed at this location in a timely manner?

The following comments from the Water Control Works and Drainage Licensing Section of Manitoba Sustainable Development are provided for your information:

An engineered drainage plan and design of proposed infrastructure are required, as per the attached specifications.

Please advise the proponent that all water control works (drains, culverts, dykes, dams, etc.) require licensing under the *Water Rights Act* – an application is attached for their convenience. Any inquiries in this regard may be directed to the local *Water Resource Officer*. Their contact information may be found at:

Licensing of yard and field approaches (access points) are the responsibility of either the municipality, or *Manitoba Infrastructure and Transportation*, whichever is applicable.

The drainage and/or alteration of permanent and semi-permanent wetlands is not permissible under the *Water Rights Act*.

Bruce.

Bruce Webb, P.Eng.
Water Development and Control Assessment Officer
Environmental Approvals Branch
Manitoba Sustainable Development
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e-mail: bruce.webb@gov.mb.ca

**Application for Licence
To Construct Water Control Works**



Water control works are defined as any dyke, dam, surface or subsurface drain, drainage, improved natural waterway, canal, tunnel, bridge, culvert, borehole or contrivance for carrying or conducting water.

Applicant Name(s): _____

E-mail: _____ Contact #: _____

Landowner Name: _____

Landowner Mailing Address/Phone #: _____

The Water Rights Act

- 3(1) Except as otherwise provided in this Act or the regulations, no person shall
- (a) in any manner whatsoever use or divert water, unless he or she holds a valid and subsisting licence to do so; or
 - (b) construct, establish, operate or maintain any works, unless he or she holds a valid and subsisting licence to do so; or
 - (c) control water or construct, establish, operate or maintain any water control works, unless he or she holds a valid and subsisting licence to do so.

Location of Works

Municipality: _____ Conservation District: _____

Parish: _____ River / Wood Lot: _____

Quarter	Section	Township	Range	E / W

Other description(s): _____

Identify water body, natural waterway or drain into which the water will outlet: _____

Proposed works are located on: Private Property Municipal Property Crown Lands

The applicant is the: Registered Landowner Lessee Other

Description of Works

- Choose all applicable
- Construct protection dyke Construct dam Engineered project
 - Reconstruct drain Construct new drain Install culvert Remove culvert
 - Install tile drainage Reset existing culvert Relocate culvert Install gated culvert

Other description(s): _____

Will drainage / lowering of a slough, pond or lake be undertaken? Yes No

Has a survey been completed for these works? (If yes please attach) Yes No

Location Plan

Please include a photo, sketch, plans or drawings that depict an accurate representation of the intended works. Please be sure to include the flow direction, north arrow, description and location of the works and / or and industry accepted engineering plan and construction standards. Aerial photo can be requested through your Water Resource Officer.

Approvals

Will the proposed works cause water to leave your land? Yes No

If yes do you have the necessary approvals? (Please attach) Yes No

Municipality Conservation District Highways Affected Landowner (s)

Landowner approval

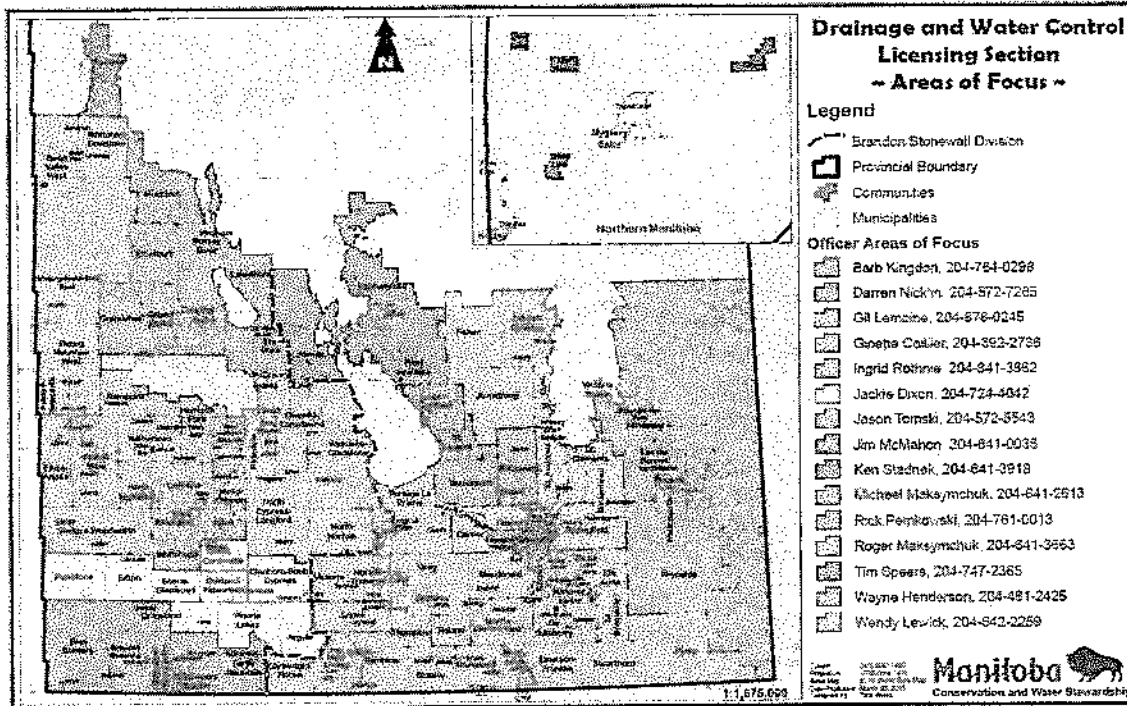
The legal title holder for the land parcel noted below understands and agrees to the proposed drainage works as explained by the applicant.

Landowner Name and Signature _____

Land parcel affected (Section, Township and Range) _____

Fee

A fee of \$25.00 must accompany all applications. Make check payable to: **MINISTER OF FINANCE**. ALL APPLICATIONS MAILED TO: Box 13, 1129 Queens Avenue, Brandon, MB R7A 1L9 Or Box 8, 200 Saulteaux Cresc. Winnipeg, MB R3J 3W3



Applicant Signature

Print Name

For	Date Received:	_____
Office	Amount Received: \$	_____
Use	Received By:	_____
Only	MRO #:	_____

Water Control Works and Drainage Licensing Section

This Factsheet is intended for proponents of urban residential, rural residential, urban commercial, rural commercial and recreational sub-division developments.

The Water Rights Act as it relates to Sub-division Development

The Water Rights Act, Section 3(1) (c):

Except as otherwise provided in this Act or the regulations, no person shall control water or construct, establish, operate or maintain any water control works, unless he or she holds a valid and subsisting license to do so.

Water Control Works (Definition):

According to the *Water Rights Act*, Water Control Works means – any dyke, dam, surface or subsurface drain, drainage, improved natural waterway, canal, tunnel, bridge, culvert borehole or contrivance for carrying or conducting water that:

- a) Temporarily or permanently alters or may alter the flow or level of water, including but not limited to water in a water body, by any means, including drainage, or
- b) Changes or may change the location or direction of flow of water, including but not limited to water in a water body, by any means, including drainage.

If the proposed development entails any of the above activities, then it's necessary to apply for a *License to Construct Water Control Works*.

Application for a License to Construct Water Control Works

To apply for a *License to Construct Water Control Works*, a completed license application form along with the license fee must be submitted to the *Water Control Works and Drainage Licensing Section*. Application forms may be found on-line at:

http://www.gov.mb.ca/conservation/waterstewardship/licensing/wcwdl_license_app.pdf

For more information regarding the application process, please contact your local *Water Resource Officer*. Their contact information may be found at:

http://www.gov.mb.ca/conservation/waterstewardship/licensing/odf/officer_areas_of_focus_30mar2015.pdf

Landowner and Agency Consent Requirements

Consent requirements vary with project scope and location, and are intended to protect the interests of other parties. As such, before a project can proceed the proper authorizations need to be obtained from those potentially impacted by the proposal. The following list serves as a guide:

- For all new or altered water control works that outlet within one mile into a municipal drain, and flows stay within the municipal drainage system, written consent from the affected municipality is required.
- If the municipal drainage system outlets into, or becomes a natural waterway within 3 kilometers (2 miles) of a proposed drain outlet, additional landowner consent may be required.
- For systems that outlet into natural waterways, written landowner consent is required for any impacted landowner(s) within 3 Kilometers (2 miles) downstream of the proposed water control work(s) outlet.
- For any systems that outlet into the Provincial Drain or Highway network, written consent from the affected government agency is required.
- All tile drainage works must have a minimum 50 meter (164 feet) setback from any semi-permanent or permanent wetland.

The above list of requirements is specific to the surface water drainage aspect of a development only. Due to the nature of surface water drainage, there are other agencies that may have input regarding drainage standards and requirements that result from the nature of their infrastructure and/or individual mandates. Agencies that may require further hydraulic and hydrologic information related to surface water runoff include:

- *Manitoba Infrastructure and Transportation (MIT)* – this Provincial Department owns and operates the provincial drain and public road system throughout Manitoba. Their road and drainage infrastructure is significantly impacted by surface water runoff, and if a development's drainage outlets through or into provincial infrastructure, then MIT's approval will be required.
- *Federal Department of Fisheries and Oceans (DFO)* – any surface water drainage works that impact fish habitat will require the separate approval of DFO. DFO determines whether the proposed development will have a potential impact on fish habitat, and will require compensation for any potential destruction of fish habitat caused by alteration of existing drainage works. It is entirely the responsibility of the proponent to contact DFO. Additional information may be found on-line by following the link below:

<http://www.dfo-mpo.gc.ca/pnw-pne/index-eng.html>

- Your municipality.
- Other regulatory agencies as required.

Engineering Design and Analysis

The following information is required in an *Engineered Drainage Plan*, which is submitted to the *Water Control Works and Drainage Licensing Section* for review:

- With exceptions that may be granted by the *Water Control Works and Drainage Licensing Section*, engineered drainage plans that manage sub-division storm water shall be designed by a professional engineer registered to practice in the Province of Manitoba. The construction of the water control works shall be in accordance with the methods and materials as specified by the engineer.
- The Applicant shall submit 2 copies of the design drawings of the proposed works approved by the engineer to the *Water Control Works and Drainage Licensing Section* for review.
- Developments of less than 10 lots total in size, with lot sizes larger than 0.8 hectares (2 acres), may in some instances be subject to less stringent engineered design requirements. Nevertheless, the design and construction of the project shall still be completed in accordance with acceptable engineering standards. The Applicant may be required to provide technical drawings showing design and construction details.
- Lakeside developments proposing marinas and/or canals require an *Environment Act License*, *Department of Fisheries and Oceans Canada* approval, and an *Engineered Drainage Plan* that will ensure this infrastructure does not in part or whole adversely impact the sub-division development.
- Where the *Water Control Works and Drainage Licensing Section* determines it to be appropriate, we may direct the applicant to carry out an engineering analysis of hydrologic regime changes, potential physical impacts, and proposed mitigation measures¹.

Sub-division Development Drainage Plan Requirements

Hydraulic Design Calculations:

- Hydraulic design calculations are to be provided for review using a design scenario that details how post development storm water runoff rates of the subject property are to be equal to, or less than pre development runoff rates subject to the following criteria²:
 - The site design must be able to handle a minimum of a 1-in-25 year storm event. Water retention volumes should equal the difference between a 1-in-5 year allowable outflow, and a 1-in-25 year post development flow hydrograph. The allowable outflow is the 1-in-5 year peak flow based on pre-development conditions. Water storage is typically accomplished through retention ponds, or internal storage via ditches and drainage patterns.
 - The storm duration for the design should be 3 hours.
 - Report must clearly detail:
 - Pre-development catchment area runoff volumes and rate for design event.
 - Post development catchment area runoff volumes and rate for design event.
 - Volume of water to be stored and proposed outflow rate.
- In cases where increased post development runoff cannot be accommodated within the development, the *Engineered Drainage Plan* must detail how the developer will mitigate negative downstream impacts that may result from an increase in surface water flows³.

¹ Please note: The approval of a drainage plan does not mean that developments that are adjacent to or encroaching on natural waterways are not at risk from overbank or overland flooding during extreme runoff events. There may be instances where overbank or overland flooding occurs during periods of extreme precipitation or spring runoff.

² If the development intends to outlet through Manitoba Infrastructure and Transportation (MIT) Infrastructure (Highway or Provincial Road culvert), then different drainage standards may apply – please contact MIT for details.

Specifications:

- Detailed engineered plans outlining any construction, alteration, improvement, blocking or modification of new or existing water control works servicing the property.
- Drain flow direction(s).
- Proposed/existing culvert sizes and locations and/or schematics of any buried land drainage system.
- Detailed design drawings of proposed storm water retention works.
- Typical cross sections of proposed drains.
- Existing and proposed geodetic lot grade elevations.
- Public right-of-ways or easements.
- Outlet(s) of proposed drainage works (where the water exits the development) - to be licensed in accordance with *The Water Rights Act*, and incorporating the above mentioned criteria.

Checklist³

PROJECT CONSIDERATIONS	REQUIREMENTS						CONSENT				
	SITE PLAN	SURVEY	WATER CONTROL WORKS LICENCE	TECHNICAL DRAINAGE PLAN	ENGINEERED DRAINAGE PLAN	ENVIRONMENT ACT LICENCE	LANDOWNER	MUNICIPAL OR LGD	MIT (HIGHWAYS)	MIT (WATER CONTROL)	DFO
The project is a <i>Commercial Development</i> .	✓	✓	✓		✓			✓			
The project is a <i>Rural Residential Development</i> consisting of 2 to 9 lots with a minimum lot size of 2 acres.	✓	✓	✓	✓							
The project is a <i>Rural Residential Development</i> consisting of 2 to 9 lots with a lot size less than 2 acres.	✓	✓	✓		✓						
The project is an <i>Urban/Rural Residential Development</i> of 10 lots or more in size.	✓	✓	✓		✓						
The project is a <i>Recreational Development</i> over 1 lot in size.	✓	✓	✓		✓						
The project is located within a <i>Designated Flood Zone</i> .	✓	✓	✓		✓						
The project involves construction on, or the outlet of water onto lands not controlled by the proponent, including the municipality or adjacent landowner.	✓	✓	✓		✓		✓	✓			
The project involves construction on, or the outlet of water into a Provincial Road or Provincial Highway right-of-way.	✓	✓	✓		✓				✓		
The project involves construction on, or the outlet of water directly onto the right-of-way of a Provincial Waterway.	✓	✓	✓		✓					✓	
The project is within, or could potentially alter or harm known fish bearing waters or habitat – this also includes marina and canal development	✓	✓	✓		✓	✓					✓

³ Mitigation may include the upgrading of existing drainage infrastructure, such as culverts and drainage channels downstream to accommodate additional runoff.

