HEALTH SCIENCES CENTER
FLOOD PROTECTION BERM
Environmental Assessment Registration Report

Prepared For
Environmental Assessment Division,
Provincial Department of Environment and Climate Change

On Behalf of
Eastern Health

| APRIL 5, 2017 |

TRACT

CONTACT INFORMATION:
100 LEMARCHANT ROAD | ST. JOHN'S, NL | A1C 2H2 |
P. (709) 738-2500 | F. (709) 738-2499
WWW.TRACTCONSULTING.COM

HEALTH SCIENCES CENTER FLOOD PROTECTION BERM:

ENVIRONMENTAL ASSESSMENT REGISTRATION REPORT

Prepared For
Environmental Assessment Division,
Provincial Department of Environment and Climate Change

On Behalf of
Eastern Health

April 5, 2017

Contact Information:
Neil Dawe, President
100 LeMarchant Road
St. John's, NL A1C 2H2
P. 709.738.2500
F. 709.738.2499
ndawe@tractconsulting.com
www.tractconsulting.com

TABLE OF CONTENTS

APPENDICES

NAME OF THE UNDERTAKING

Health Sciences Centre Flood Protection Berm

PROPONENT

Corporate Body: Eastern Health.

Address: N/A

Chief Executive Officer: N/A

Official Title: N/A

Address: N/A

Telephone No. N/A

Principal Proponent Contact for purposes of Environmental Assessment:

Daniel Parsons,

Regional Manager, Planning & Engineering, Eastern Health

Tel: 709-777-7754

Daniel.parsons@easternhealth.ca

THE UNDERTAKING

PURPOSE / RATIONALE / NEED FOR THE UNDERTAKING

The Health Sciences Center (HSC) is adjacent to a broad area of Leary's Brook Pond that has been prone to flooding in recent years. Although the flooding to date has mostly occurred away from the HSC, a flood plain study conducted by Amec Americas (now Amec Foster Wheeler Inc.) in 2014 determined that wind and wave factors combined with a 1:100 storm flood do put the HSC at risk of inundation. The report recommended a new berm be constructed north of the Pond, along the maintained edge of the Health Sciences Centre Property, to protect against inundation of certain buildings. Other structural methods of preventing such inundation were reviewed but deemed impractical due to space restrictions (in the case of diversion and increased detention options) or damage to the natural environment (in the case of channel modification options).

Use of a berm was recommended not only by the Amec report but also an earlier report, the Rennies River Catchment Stormwater Management Plan (RRCSWMP) by CBCL Consulting Engineers Limited, as well as a follow up investigation of Leary's Brook by CBCL in 2016. It should be noted that the RRCSWMP identified the berm at Leary's Brook Pond as one in a series of structures that will be necessary to control flooding not just in the immediate area, but in the Rennies' River Watershed as a whole.

The submission of this Registration report includes copies of the Amec and CBCL reports as background information, as well as construction drawings by Pinnacle Engineering Limited and Tract Consulting Incorporated. The project was tendered in August 2016 and awarded the following month to Bursey's Excavating and Development Incorporated.

DESCRIPTON OF THE UNDERTAKING

GEOGRAPHICAL LOCATION

The address of the Health Sciences Center is 300 Prince Philip Drive, St. John's. Access to the various buildings is by Clinch Crescent, a collector road which loops around the property from two intersection points with Prince Philip Drive. *See Appendix A: Location Plans, Figure 1.*

Leary's Brook runs through an undeveloped portion of the HSC property adjacent to Prince Phillip Drive. This area is characterized by meadow, bog, some standing water and scattered trees. It varies between 60-100 m in width and over half a kilometer in length. Leary's Brook itself runs through it in varying widths, meandering at around 1 meter in the southwest end before expanding into a small Pond in the northeast end, adjacent to most of the buildings of the Health Sciences Centre. The Pond measures some 4,000 square meters and its fringe can be considered wetland.

The new berm will be located at the interface of the maintained HSC property and the undeveloped area. Specifically, it will run approximately 480 meters along this edge from the southern end of the Agnes Cowan Hospital to the Clinch Crescent East bridge. See *Appendix A: Location Plans, Figure 2.*

As noted above, the vegetation along the banks of the Pond can be considered riparian, consisting mostly of wetland grasses and shrubs on a bog substrate. The berm footprint will affect an approximately 120 m long x 5 meter wide stretch of Pond bank; the existing water line of the Pond will, however, be preserved. Elsewhere, the berm construction will occur 5-10 metres back from the normal water line and disturb little but some isolated patches of native vegetation growing on filled land (birch, alder, spruce).

The following fish species are present in Leary's Brook: Brook trout (Salvelinus fontinalis), Atlantic Salmon (Salmo salar), Brown Trout (Salmo trutta), Rainbow Smelt (Osmerus mordax), Sticklebacks (Gasterosteus Aculeatus). American eel (Anguilla

rostrate) may also be present. It should be noted that despite the presence of Salmon, Leary's Brook is not a scheduled Salmon River.

PHYSICAL FEATURES

The area of the berm is approximately 2.6 acres. During construction, the limit of work will likely make the affected area closer to 3 acres.

The route of the berm is constrained by two key factors: avoidance of the Pond waterline, and the need to preserve the maintained green space along the south side of the Health Sciences Centre. This green space includes an asphalt path and water main infrastructure that is critical for emergency fire access to this side of the Hospital. Accordingly, the northern toe of the berm hews as closely as possible to the outer edge of the green space, hugging the shoulder of the asphalt path that runs through it. Only in two areas does the berm diverge from this path to make room for building and parking lot expansion that are planned by Eastern Health. Similarly, the southern toe of the berm avoids disturbing the water's edge of the Pond. Where the recommended 2.5:1 side slopes would do so, small segments of retaining wall have to be used to avoid grading into the open water.

Geotechnical investigation has revealed the land near the edge of the Pond to be mostly loose fill with scattered organic debris. Below that is a compacted layer of sandy till. Excavation will have to reach this layer to establish a solid sub-base for the berm.

Some of the boggier excavated areas (approximately 600 square meters) will require de-watering. Over these areas the berm will to be constructed of clean rockfill, free of fines. The rest of the berm, built over dry land, will be constructed of common fill (typically a sand and gravel mixture with between 10-15% fines content, and a maximum particle size that does not exceed 200 mm in diameter).

The top of the berm will be set at 58.50 m in elevation for much of its length. This figure was arrived at based on a minimum levee freeboard criteria of flood level plus three fee stipulated by the U.S. Federal Emergency Management Agency and recommended by Stantec Consulting in their 2016 report. With its sides graded at a typical 2.5:1 slope, the berm varies in width from between 4 to 10 meters.

Stabilization techniques for the berm include hydraulic rip rap along any portion of the slope toe closest to water, including at the foot of the retaining walls. Similarly, all back-valve outfalls will be stabilised with rockfill mattress. The main stabilization component, however, will the mix of hydroseed and sod applied to the surface of the entire berm. Pocket plantings of native shrubs and trees provide some further stability, but chiefly act to tie the berm visually into the surrounding landscape.

CONSTRUCTION AND ITS EFFECTS

The construction period from mobilization to demobilization is expected to last four months at most, from late May to September 2017. The earliest that construction could commence is estimated to be the week of May 25th. The latest that construction would be expected to start is June 1st.

Potential pollutants from the construction period are anticipated to be either fuel spills from construction vehicles and dust from the placement of common fill. For this reason all vehicles will be equipped with (and all employees will have access to) spill kits. During hot and dry conditions, sources of dust will be monitored and wet down if necessary.

Erosion, sedimentation and general water movement are also anticipated to be standard concerns during the berm construction. Accordingly, silt fence barriers will be used to separate the work area from Pond-side areas, effectively blocking any movement of particles into the Pond and stream. Where excavation is anticipated to be more boggy, a combination of sand-bags and silt fences will be used as a barrier. Further, where trenches are dug through the berm for pipe, trench plugs will be installed to prevent erosive channel flow from forming.

The construction phase of the project should not disturb any residential areas with traffic or noise in any significant way. Nearby residential zones are, at their closest, over 100 meters away from the site of work, and no work is scheduled to go beyond hours approved by the City of St. John's Noise Bylaw. Neither is the work expected to cause any disturbance to the property itself, as it is largely confined to the uninhabited south side of the HSC, and will have its own access road from Clinch Crescent.

OPERATION AND ITS EFFECT

The berm is designed to address two different scales of flood problem associated with a 1:100 Annual Exceedance Probability (AEP) storm event. Firstly, it will protect the buildings immediately adjacent to it from inundation caused by water levels and wave action anticipated from Leary's Brook Pond during such an event.

Secondly and just as importantly, it will help manage flood levels in the larger Rennies River watershed, primarily through detaining water upstream of Long Pond during storm events. This in turn will help reduce the impact of downstream flooding events significantly. The *Rennies River Catchment Stormwater Management Plan (2014*) identifies the berm as one of the key structures, amongst others within the watershed, that needs to be built to achieve this goal. Others include another berm on the south side of Leary's Brook, two berms upstream of the HSC between Wicklow Street and Thorburn Road, and, critically, a weir at the end of Long Pond near Allandale Road. These structures and others associated with the RRCSWMP are outside of the scope of this project.

In protecting against water from Leary's Brook Pond, the berm will necessarily interrupt some of the existing sheet drainage into the Pond from the adjacent landscape. To mitigate this effect, a rock infiltration swale will be placed at the toe of the slope on the side of the berm facing the Health Sciences Centre. During storm events these infiltration swales will channel water to backwater valves that in turn direct storm water back into the Pond, approximating what would happen in the pre-existing drainage regime. Note that this swale is not needed in that portion of the berm immediately adjacent to the parking lot at Clinch Crescent. Instead, the parking lot catch basin will be used to collect and redirect stormwater.

Sheet flow from the berm banks themselves will be addressed by the landscaping and rock stabilization techniques described previously. These measures will prevent erosion of the berm, subsequent movement of soil into the water and related harm to fish habitat. See *Appendix B* for approval letter for the berm from the Fisheries Protection Program of the Federal Department of Fisheries and Oceans.

OCCUPATIONS

The contract for this job has been awarded to Bursey's Excavating and Development Incorporated, and the number of employees who will be on-site during the entire construction period is slated at nine. All are currently direct hire employees of Bursey's Excavating and Development Incorporated. Breakdown of occupations according to National Occupational Classification is as follows:

Construction Superintendent – 1 (NOC code 0711)

Dump Truck Driver – 1 (NOC code 7411)

Pipefitters – 2 (NOC code 7252)

Excavator Operator – 1 (NOC code 7421)

Flagman – 1 (NOC code 7611)

Construction Labourers – 3 (NOC code 7611)

Bursey's hiring practices are based on ability and equal opportunity. The firm has been awarded numerous construction contracts by the federal government in the past.

PROJECT-RELATED DOCUMENTS

Amec Americas Ltd. (2014, 6 August). Health Sciences Centre: Flood Plain Study Report. Technical Report.

Bursey's Excavating and Development Inc. (2017). Environmental Protection and Sediment Control Plan :HSC Flood Protection Berm.

CBCL Consulting Engineers Ltd. (2016, 1 April). RE: Leary's Brook Investigation: Final Report. Technical Letter Report.

CBCL Consulting Engineers Ltd. (2014, 15 April). Rennies River Catchment Stormwater Management Plan: Final Report. Technical Report.

Pinnacle Engineering Ltd. (2016, 10 July). Health Sciences Centre – Flood Protection Berm. Sheets C1-C5 & D1. Construction Drawings.

Stantec Consulting Ltd. (2016, 7 July). Geotechnical Investigation – Flood Protection Berm (Rev. 1), Health Sciences Centre, St. John's, NL. Technical Letter Report.

Tract Consulting Inc. (2016, 10 July). Health Sciences Centre Berm. Sheets L1-L3. Construction Drawings.

APPROVAL OF THE UNDERTAKING

PERMITS, LICENCES, APPROVALS

Below are listed the authorities who need to give approval the project and the status of their approval.

Federal Department of Fisheries and Oceans (DFO)

- *Type of Permission needed*: Review and letter approval.
- *Description*: The Fisheries Protection Programme branch of the DFO was made aware of the project in the summer of 2016 and responded with a letter dated September 16, 2016 that concluded the project posed no harm to fish habitat in Leary's Brook or its associated watershed. This letter is found in *Appendix B.*

  Status: Approved.

Provincial Department of Environment and Climate Change.

- *Type of Permission needed*: Permit to Alter a Body of Water.
- *Description:* The Water Resources Division of the Department needs to review the project including its construction drawings and geotechnical reports. The proponent must fill in Schedule I and Schedule J of the Application for Permit to Alter a Body of Water, and then receive the Permit, before proceeding with work.

Status: Pending. The necessary schedules were filled out and submitted to the Water Resources Division in fall 2016. Follow-up with the Water Resources Division is being conducted at time of writing.

Note that the above permissions are in addition to any that may emerge from the Environmental Assessment Registration process.

SCHEDULE

As stated previously, the construction period from mobilization to demobilization is expected to last four months at most, from late May to September 2017. The earliest that construction could commence is estimated to be the week of May 25th. The latest that construction would be expected to start is June 1st.

These dates have been selected based on existing contract conditions and rapid turnaround of known approvals.

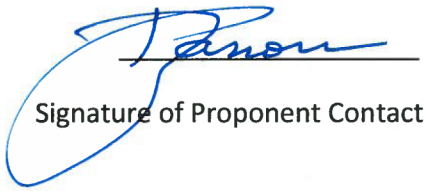
FUNDING

This Project does not depend on grants or loans from a government agency.

PROPONENT SIGNATURE

Apr 5th 2017

Date



Signature of Proponent Contact

APPENDICES

APPENDIX A: LOCATION MAPS

Figure 1

1:10,000

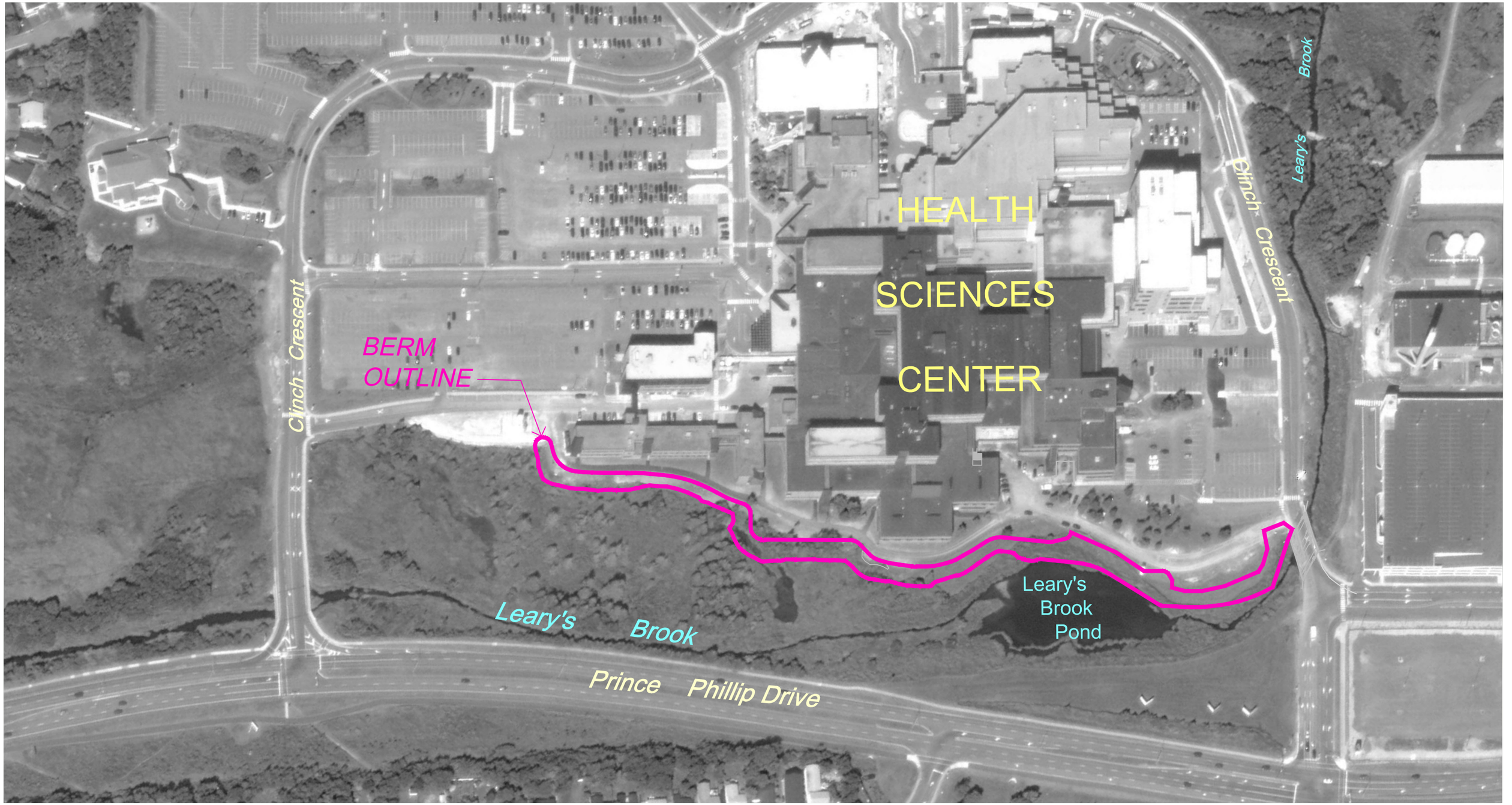


Figure 2

1:2000

APPENDIX B: APPROVAL LETTER FROM FEDERAL DEPARTMENT OF FISHERIES AND OCEANS

Fisheries and Oceans Canada | Pêches et Océans Canada

P.O. Box 5667
St. John's, NL A1C 5X1

Your file *Votre référence*

SEP 1 6 2016

Our file *Notre référence*
16-HNFL-00368

Daniel Parsons
Eastern Regional Health Authority
300 Prince Phillip Drive
St. John's, NL A1B 3V6

Dear Mr. Parsons:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish – Berm construction

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on August 17, 2016.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act*.

The proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 and 58 of the *Species at Risk Act*.

Our review consisted of:

- Application for Review
- Additional information received September 1, 2016

We understand that you propose to:

- Construct a flood protection earthen berm along the property of the Health Sciences Centre.

To avoid the potential of serious harm to fish and their habitat, we are recommending that the attached mitigation measures be included into your plans.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. The Program is also of the view that your proposal will not contravene sections 32, 33 or 58 of the *Species at Risk Act*. No formal approval is required from the Program under the *Fisheries Act* or the *Species at Risk Act* in order to proceed with your proposal.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. No formal approval is required from the Program under the *Fisheries Act* in order to proceed with your proposal.

If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

A copy of this letter should be kept on site while the work is in progress.

If you have any questions, please contact Triage & Planning Unit at 709-772-4140, by fax at 709-772-5562, or by email at FPP-NL@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Michelle M. Roberge
Team Leader, Triage & Planning

Attch (2)

Shoreline Infill (Marine or Freshwater)

Fisheries and Oceans Canada

Measures to Avoid Causing Harm to Fish and Fish Habitat

On November 25, 2013 the Fisheries Protection Provisions of the ***Fisheries Act*** came into force. The ***Fisheries Act*** requires that projects avoid causing *serious harm to fish* unless authorized by the Minister of Fisheries and Oceans. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational or Aboriginal fishery.

If you are conducting a project near water, it is your responsibility to ensure you avoid causing serious harm to fish in compliance with the ***Fisheries Act***. The following advice will help you avoid causing harm and comply with the ***Act***.

a. *Suitable fill material may include clean blasted rock or boulders; fill should be free of fines or sediment, concrete or any other substance deleterious to fish or fish habitat.*
b. *Use site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required.*
c. *Stabilize disturbed shorelines areas to prevent erosion using rip-rap or armour stone. Material used for shoreline stabilization must not be removed from below the high water mark. Material is to be of sufficient size to resist displacement by wave or tidal activity.*
d. *All in-water works should be carried out in the dry.*
e. *Fish passage and flows should be maintained at all times.*
f. *Conduct in-water work during periods of low flow to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.*
g. *Equipment should be mechanically sound to avoid leaks of oil, gas, and/or hydraulic fluids.*
h. *When works are completed, banks and approaches should be restored to original condition.*

Additional measures that may be required to protect fish and fish habitat can be found on the DFO national website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) and in the *Guidelines for the Protection of Freshwater Fish Habitat in Newfoundland & Labrador* (http://www.dfo-mpo.gc.ca/Library/240270.pdf)

Should your plans change please contact the Fisheries Protection Program-Regulatory Review:

Fisheries Protection Program
Fisheries and Ocean Canada
80 East White Hills Road
St. John's NL A1C 5X1
Telephone: (709) 772-4140
Fax: (709) 772-5562
Email: FPP-NL@dfo-mpo.gc.ca

Note: This advice is only applicable to the project specified on the accompanying DFO letter.

Dredging

Fisheries and Oceans Canada

Measures to Avoid Causing Harm to Fish and Fish Habitat

On November 25, 2013 the Fisheries Protection Provisions of the ***Fisheries Act*** came into force. The ***Fisheries Act*** requires that projects avoid causing *serious harm to fish* unless authorized by the Minister of Fisheries and Oceans. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational or Aboriginal fishery.

If you are conducting a project near water, it is your responsibility to ensure you avoid causing serious harm to fish in compliance with the ***Fisheries Act***. The following advice will help you avoid causing harm and comply with the ***Act***.

a. *Time work in water to protect fish, including their eggs, juveniles, spawning adults, migration and/or the organisms upon which they feed.*
b. *Sensitive or important fish habitat should be avoided.*
c. *Conduct in-water work during periods of low flow to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.*
d. *Minimize duration of in-water work.*
e. *Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.*
f. *Minimize the amount of dredged material removed by only dredging the area and depth required.*
g. *Equipment should be mechanically sound to avoid leaks of oil, gas, and/or hydraulic fluids.*
h. *Operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbances to the bank and bed of the water body.*
i. *Use site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required.*

Additional measures that may be required to protect fish and fish habitat can be found on the DFO national website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) and in the *Guidelines for the Protection of Freshwater Fish Habitat in Newfoundland & Labrador* (http://www.dfo-mpo.gc.ca/Library/240270.pdf)

Should your plans change please contact the Fisheries Protection Program-Regulatory Review:

Fisheries Protection Program
Fisheries and Ocean Canada
80 East White Hills Road
St. John's NL A1C 5X1
Telephone: (709) 772-4140
Fax: (709) 772-5562
Email: FPP-NL@dfo-mpo.gc.ca

Note: This advice is only applicable to the project specified on the accompanying DFO letter.