APPENDIX C

DFO SUBMISSIONS

RED RIVER – NORTH DRIVE

AQUATIC HABITAT ASSESSMENT

October 2018

Prepared for

KGS Group

by

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ACKNOWLEDGEMENTS

KGS is thanked for the opportunity to conduct this study. Nicole Vidal at KGS provided technical support and direction during the course of this study.

STUDY TEAM

Data Collection

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1.0 INTRODUCTION

KGS Group is performing engineering services related to an outfall on the Red River adjacent to North Drive in Winnipeg, Manitoba (Figure 1). Work will occur along a 20 m x 15 m section of the inside bend of the Red River bank. The Endangered Mapleleaf mussel (*Quadrula quadrula*) is known to occur in the Red River and the lower portions of its tributaries. Because of the potential occurrence in the Red River, North/South Consultants conducted a substrate mapping and validation program to determine if suitable habitat for the Mapleleaf exists in the target area. This report also provides a brief description of fish habitat and potential fish use of the study area.

2.0 METHODS

2.1 HABITAT MAPPING

A boat-based survey of the aquatic habitat was conducted on a 100 m x 30 m reach of the Red River on October 4, 2018. A Biosonics MX survey grade Single-beam 200 kHz frequency sonar transducer in conjunction with a Trimble R10 connected to the Cansel Can-Net network were used to record acoustic and Real-time kinematic (RTK) positional data. A Lowrance® Elite7 TI consumer grade dual-beam side-scan echo-sounder equipped with Eagle dual 83/200 kHz frequency sonar transducer and 455kHz side imagery transducer with an integrated global positioning system (GPS) receiver were used to record acoustic and positional data to assist in the substrate typing.

Survey transects were navigated in a grid-like fashion from an 18 foot boat with a 50 hp outboard motor. Surveys were conducted at boat speeds of less than 5 km/hr. Mapping data positions were collected with a Trimble R10 GNSS RTK receiver using a virtual reference station (VRS), WPG2, which was located approximately 5 km from the study area. The Can-Net VRS network provides a real-time centimetre-grade positioning solution without the use of a local base station receiver. Existing vertical survey control points provided by KGS were used to confirm accurate elevation readings collected during the survey. The raw survey data positioning was corrected post-survey for positional offsets in Trimble Business Centre and re-projected to CGVD28 (HTv2.0) and was linked back to the Biosonics data.

Collected data was exported to a comma delimited file (i.e., CSV file), which was then imported into Microsoft Excel for additional processing. Canvec vector data was downloaded for use in mapping and bathymetric analysis. Using the Topo to Raster interpolation method in ArcGIS 10.6 software, the corrected sonar data was used to produce a 2 m bathymetry grid. The bathymetry grid was used to create vector contouring at 0.25 m intervals for cartographic presentation. The recorded acoustic data was also used to model the unregulated winter river level contour (221.76 masl).

Substrate was collected along transects throughout the Study Area and was used to validate the results of the hydro-acoustic imaging. Samples were collected using a Petite Ponar dredge and photos of each sample were taken using a GPS-linked Nikon camera. Primary, secondary and tertiary substrate types were identified at each validation site. Substrate in the near-shore area, where water depth was insufficient to collect acoustic data was surveyed from shore. Substrate in this area was determined by probing the river bottom along the shoreline and location recorded with a Garmin GPSMAP78. The single beam sonar data, in combination with the side-scan data and shoreline survey was used to produce a substrate database.

2.2 MUSSEL SURVEY AND IDENTIFICATION

A brief visual mussel survey was conducted on the shorelines of the Red River within the designated Study Area. Empty mussel shells were collected, identified to species and their locations recorded using a Garmin GPSMAP78. Any live mussels found in the river were to be recorded and photographed but not removed from their location.

3.0 RESULTS

3.1 PHYSICAL ENVIRONMENT

The banks of the Red River in the Study Area were well vegetated and gently sloped in most areas (Photos 1-5). Riparian vegetation consisted primarily of deciduous grasses, shrubs and trees. Flow conditions were low with some observable current. Instream substrate consisted mostly of a mix of clay and silt (Photos 6-15) with a small area of clay and silt with organic material (Photo 16), and near-shore areas of sand (Photo 17), cobble/gravel/sand (Photo 18) and rip rap and cobble (Photo 4).

3.2 HABITAT MAPPING

The average water depth within the Study Area was 4.83 m. There was a relatively quick drop off in the study area where the depth dropped over 4 m within 10 m of the shoreline. As the study moved farther from shore the depth plateaued with a maximum depth of 7.28 m. The Red River water level in the City of Winnipeg is controlled through management of the St. Andrew's Lock and Dam with the unregulated winter river level at approximately 221.76 masl (City of Winnipeg 2018). A bathymetric map of the area surveyed is presented in Figure 2.

Substrate classes were divided up into five different classes based on primary, secondary and tertiary substrates. Substrate in the entire Study Area reach was largely comprised of clay and silt (Photo 13); clay and silt accounted for 94% of the substrate composition in the Study Area. Clay and silt with organics accounted for 2% of the substrate and in the near-shore area cobble/gravel/sand, rip rap and cobble, and sand accounted for 2%, 1% and 1% respectively. In the area where there was clay and silt with organics there was harder substrate (cobble/gravel) beneath the fine sediments but was not captured in the acoustic data and was not seen in the side-scan imagery of the data collection. A substrate map is presented in Figure 3. Substrate validation results are presented in Table 1. Locations of grabs, photos, and survey transects are presented in Figure 4.

3.3 FISH COMMUNITY

The Red River near Winnipeg provides year-round habitat for approximately 53 species of fish, including species that are sought after for recreational fishing, such as Walleye (*Sander vitreum*), Sauger (*Sander canadense*), Channel Catfish (*Ictalurus punctatus*), and Northern Pike (*Esox lucius*) (Table 2). The species assemblage includes a wide variety of fish trophic guilds, including omnivorous and piscivorous species, and species that inhabit predominantly benthic or pelagic habitats. However, benthic insectivores (e.g., redhorse suckers) dominated the population captured during the City of Winnipeg Ammonia Criteria Study in 1999 (Remnant et al. 2000).

The fish inhabiting the Red River near the City of Winnipeg are highly mobile (Clarke et al. 1980; Barth and Lawrence 2000), and are able to access large areas within the Red River, Assiniboine River, and Lake Winnipeg drainages upstream and downstream of Winnipeg. Fish distribution in the vicinity of Winnipeg is relatively even because spatially distinct habitat features do not exist in the area (Remnant et al. 2000).

Two of the fish species inhabiting the Red River in the vicinity of Winnipeg have been specially designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The

Saskatchewan-Nelson River population of Lake Sturgeon was designated as "Endangered" in 2017, but is not listed under any schedules of the *Species at Risk Act* (SARA). The Bigmouth Buffalo (*Ictiobus cyprinellus*) was designated as "Special Concern" in 2009, and is currently listed as "Special Concern" under Schedule 1 of SARA. The Chestnut Lamprey (*Ichthyomyzon castaneus*) was listed as "Data Deficient" by COSEWIC in 2010, and still remains listed under Schedule 3 of SARA. The Bigmouth Shiner (*Notropis dorsalis*) was listed as "Not at Risk" by COSEWIC in 2003, but remains listed as "Special Concern" under Schedule 3 of SARA. The Silver Chub was listed as "Not at Risk" by COSEWIC in 2004, but remains listed a "Special Concern" under Schedule 1 of SARA. None of these species are designated as species at risk (Endangered or Threatened) on Schedule 1; therefore, none are protected under SARA.

In rivers with uniform habitat or degraded shorelines, the introduction of rip rap may enhance fish habitat by increasing substrate diversity for aquatic invertebrates and fish (Quigley and Harper 2004; White et al. 2009). It is anticipated that this has occurred in the Red River along reaches where rip rap has been placed over erosion prone, mud banks and uniform, clay/silt-dominated near shore substrate. Rip rap placement at the site is not expected to result in negative impacts to fish or fish habitat.

3.4 MUSSELS

During the cursory shoreline survey no live mussels or empty valves were observed at the Study Site.

The Mapleleaf mussel is listed as "Endangered" by both *The Endangered Species and Ecosystems Act (*Manitoba) and the federal *Species at Risk Act.* In an assessment in 2016, COSEWIC downgraded the species designation to "Threatened" but legislative changes have not yet been made.

Mapleleaf are typically found in medium to large rivers, in substrates of firmly packed, coarse gravel and sand, and to a lesser extent firmly packed clay/mud (COSEWIC 2006; 2016; Watson 1998). Areas with shifting substrates (i.e., active erosion or deposition) do not represent suitable habitat for Mapleleaf (pers. comm. E. Watson, Watson 2000). The substrate at the Red River study site consisted mainly of soft clay and silt which is not considered typical habitat for the species. Areas of coarser substrate, including sand and cobble/gravel/sand found along the shoreline are well above the unregulated winter river level and are therefore not suitable for mussels.

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Table 1. Substrate validations from ponars taken at the outfall on the Red River at North Drive.

Transect	Distance from Shore (m)	Substrate			Photo #	Waypoint ID	UTM (14U)		Comments
		1°	2°	3°			Easting	Northing	
T1	5	Clay	Silt	-	Photo 6	RrW003	634726	5523537	-
T1	10	Clay	Silt	-	-	RrW004	634729	5523544	-
T1	15	Clay	Silt	-	-	RrW005	634732	5523550	-
T1	20	Clay	Silt	-	-	RrW006	634738	5523553	-
T1	30	Clay	Silt	-	-	RrW007	634744	5523563	-
T2	5	Clay	Silt	-	-	RrW008	634734	5523531	-
T2	10	Clay	Silt	-	-	RrW009	634738	5523536	-
T2	15	Clay	Silt	-	Photo 7	RrW010	634737	5523539	-
T2	20	Clay	Silt	-	-	RrW011	634744	5523543	-
T2	30	Clay	Silt	-	-	RrW012	634752	5523554	-
T3	5	Clay	Silt	-	-	RrW013	634740	5523524	-
T3	10	Clay	Silt	-	-	RrW014	634741	5523530	-
T3	15	Clay	Silt	-	-	RrW015	634745	5523535	-
T3	20	Clay	Silt	-	-	RrW016	634751	5523539	-
T3	30	Clay	Silt	-	-	RrW017	634760	5523549	-
T4	5	Clay	Silt	-	-	RrW018	634751	5523516	-
T4	10	Clay	Silt	-	-	RrW019	634755	5523521	-
T4	15	Clay	Silt	-	-	RrW020	634757	5523524	-
T4	20	Clay	Silt	-	-	RrW021	634760	5523528	-
T4	30	Clay	Silt	-	-	RrW022	634765	5523539	-
T5	5	Clay	Silt	-	-	RrW023	634754	5523511	-
T5	10	Clay	Silt	-	-	RrW024	634755	5523517	-
T5	15	Clay	Silt	-	Photo 8	RrW025	634759	5523523	-
T5	20	Clay	Silt	-	-	RrW026	634760	5523528	-
T5	30	Clay	Silt	-	-	RrW027	634766	5523536	-
T6	5	Clay	Silt	-	-	RrW028	634760	5523506	-

T6	10	Clay	Silt	-	-	RrW029	634763	5523515	-
T6	15	Clay	Silt	-	-	RrW030	634765	5523520	-
T6	20	Clay	Silt	-	-	RrW031	634762	5523526	-
T6	30	Clay	Silt	-	-	RrW032	634771	5523538	-
T7	5	Clay	Silt	-	-	RrW033	634763	5523506	-
T7	10	Clay	Silt	-	-	RrW034	634767	5523512	-
T7	15	Clay	Silt	-	Photo 9	RrW035	634767	5523517	-
T7	20	Clay	Silt	-	-	RrW036	634770	5523524	-
T7	30	Clay	Silt	-	-	RrW037	634775	5523536	-
T8	5	Clay	Silt	-	-	RrW038	634764	5523505	-
T8	10	Clay	Silt	-	-	RrW039	634769	5523509	-
T8	15	Clay	Silt	-	-	RrW040	634773	5523515	-
T8	20	Clay	Silt	-	-	RrW041	634777	5523519	-
T8	30	Clay	Silt	-	-	RrW042	634783	5523525	-
T9	5	Clay	Silt	OM	-	RrW043	634772	5523500	soft clay on top of rip-rap
T9	10	Clay	Silt	OM	-	RrW044	634773	5523501	-
T9	15	Clay	Silt	OM	Photo 10	RrW045	634776	5523505	-
T9	20	Clay	Silt	-	-	RrW046	634780	5523513	-
T9	30	Clay	Silt	-	-	RrW047	634786	5523520	-
T10	5	Clay	Silt	OM	-	RrW048	634775	5523496	soft clay on top of rip-rap
T10	10	Clay	Silt	OM	-	RrW049	634776	5523499	soft clay on top of rip-rap
T10	15	Clay	Cobble	Gravel	Photo 11	RrW050 and RRW051	634777	5523501	-
T10	20	Clay	Silt	-	-	RrW052	634786	5523509	-
T10	30	Clay	Silt	-	-	RrW053	634792	5523516	-
T11	5	Clay	Silt	-	-	RrW054	634781	5523491	-
T11	10	Clay	Silt	-	-	RrW055	634782	5523495	-
T11	15	Clay	Silt	-	-	RrW056	634786	5523500	-
T11	20	Clay	Silt	-	-	RrW057	634792	5523507	-

T11	30	Clay	Silt	-	Photo 12	RrW058	634795	5523512	-
T12	5	Clay	Silt	-	-	RrW059	634784	5523489	-
T12	10	Clay	Silt	-	-	RrW060	634785	5523491	-
T12	15	Clay	Silt	-	-	RrW061	634792	5523496	-
T12	20	Clay	Silt	-	-	RrW062	634795	5523501	-
T12	30	Clay	Silt	-	-	RrW063	634803	5523512	-
T13	5	Clay	Silt	-	Photo 13	RrW064	634788	5523482	-
T13	10	Clay	Silt	-	-	RrW065	634792	5523487	-
T13	15	Clay	Silt	-	-	RrW066	634796	5523490	-
T13	20	Clay	Silt	-	-	RrW067	634800	5523497	-
T13	30	Clay	Silt	-	-	RrW068	634805	5523503	-
T14	5	Clay	Silt	-	-	RrW069	634795	5523476	-
T14	10	Clay	Silt	-	-	RrW070	634796	5523479	-
T14	15	Clay	Silt	-	-	RrW071	634800	5523485	-
T14	20	Clay	Silt	-	-	RrW072	634802	5523487	-
T14	30	Clay	Silt	-	Photo 14	RrW073	634811	5523496	-
T15	5	Clay	Silt	-	-	RrW074	634799	5523471	-
T15	10	Clay	Silt	-	-	RrW075	634800	5523474	-
T15	15	Clay	Silt	-	-	RrW076	634804	5523478	-
T15	20	Clay	Silt	-	Photo 15	RrW077	634805	5523484	-
T15	30	Clay	Silt	-	-	RrW078	634815	5523493	-
T16	5	Clay	Silt	-	Photo 16	RrW079	634804	5523466	-
T16	10	Clay	Silt	-	-	RrW080	634808	5523470	-
T16	15	Clay	Silt	-	-	RrW081	634812	5523474	-
T16	20	Clay	Silt	-	-	RrW082	634814	5523478	-
T16	30	Clay	Silt	-	-	RrW083	634825	5523486	-

Table 2. Fish species inhabiting the Red River near Winnipeg, Manitoba[1].

FAMILY	SYSTEMATIC NAME	COMMON NAME
Petromyzontidae	*Ichthyomyzon castaneus*	Chestnut Lamprey
	I.unicuspis	Silver Lamprey
Acipenseridae	*Acipenser fulvescens*	Lake Sturgeon
Hiodontidae	*Hiodon alosoides*	Goldeye
	H. tergisus	Mooneye
Catostomidae	*Ictiobus cyprinellus*	Bigmouth Buffalo
	Catostomus commersoni	White Sucker
	Carpiodes cyprinus	Quillback
	Moxostoma anisurum	Silver Redhorse
	M. erythrurum	Golden Redhorse
	M. macrolepidotum	Shorthead Redhorse
Cyprinidae	*Carassius auratus*	Goldfish
	Cyprinella spiloptera	Spotfin Shiner
	Cyprinus carpio	Common Carp
	Macrhybopsis storeriana	Silver Chub
	Notemigonus crysoleucas	Golden Shiner
	Notropis atherinoides	Emerald Shiner
	N. blennius	River Shiner
	N. dorsalis	Bigmouth Shiner
	N. hudsonius	Spottail Shiner
	N. ludibundus	Sand Shiner
	Pimephales promelas	Fathead Minnow
	Platygobio gracilis	Flathead Chub
	Rhinichthys atratulus	Blacknose Dace
	R. cataractae	Longnose Dace
	Semotilus atromaculatus	Creek Chub
Ictaluridae	*Ameiurus melas*	Black Bullhead

FAMILY	SYSTEMATIC NAME	COMMON NAME
	A. nebulosus	Brown Bullhead
	Ictalurus punctatus	Channel Catfish
	Noturus flavus	Stonecat
	N. gyrinus	Tadpole Madtom
Umbridae	*Umbra limi*	Central Mudminnow
Salmonidae	*Coregonus artedi*	Lake Cisco
	C. clupeaformis	Lake Whitefish
Esocidae	*Esox lucius*	Northern Pike
Percopsidae	*Percopsis omiscomaycus*	Trout-perch
Gadidae	*Lota lota*	Burbot
Fundulidae	*Fundulus diaphanus*	Bandecd Killifish
Moronidae	*Morone chrysops*	White bass
Centrarchidae	*Ambloplites rupestris*	Rock bass
	Lepomis macrochirus	Bluegill
	Pomoxis annularis	White Crappie
	P. nigromaculatus	Black Crappie
Percidae	*Etheostoma exile*	Iowa Darter
	E. nigrum	Johnny Darter
	Perca flavescens	Yellow Perch
	Percina caprodes	Logperch
	P. maculata	Blackside Darter
	P. shumardi	River Darter
	Sander canadense	Sauger
	S. vitreum	Walleye
Gasterosteidae	*Culaea inconstans*	Brook Stickleback
Sciaenidae	*Aplodinotus grunniens*	Freshwater Drum

[1] List compiled from: Clarke et al. 1980; Renard et al. 1986; Peterka and Koel 1996; Koel and Peterka 1998; Stewart 2000; Remnant et al. 2000.

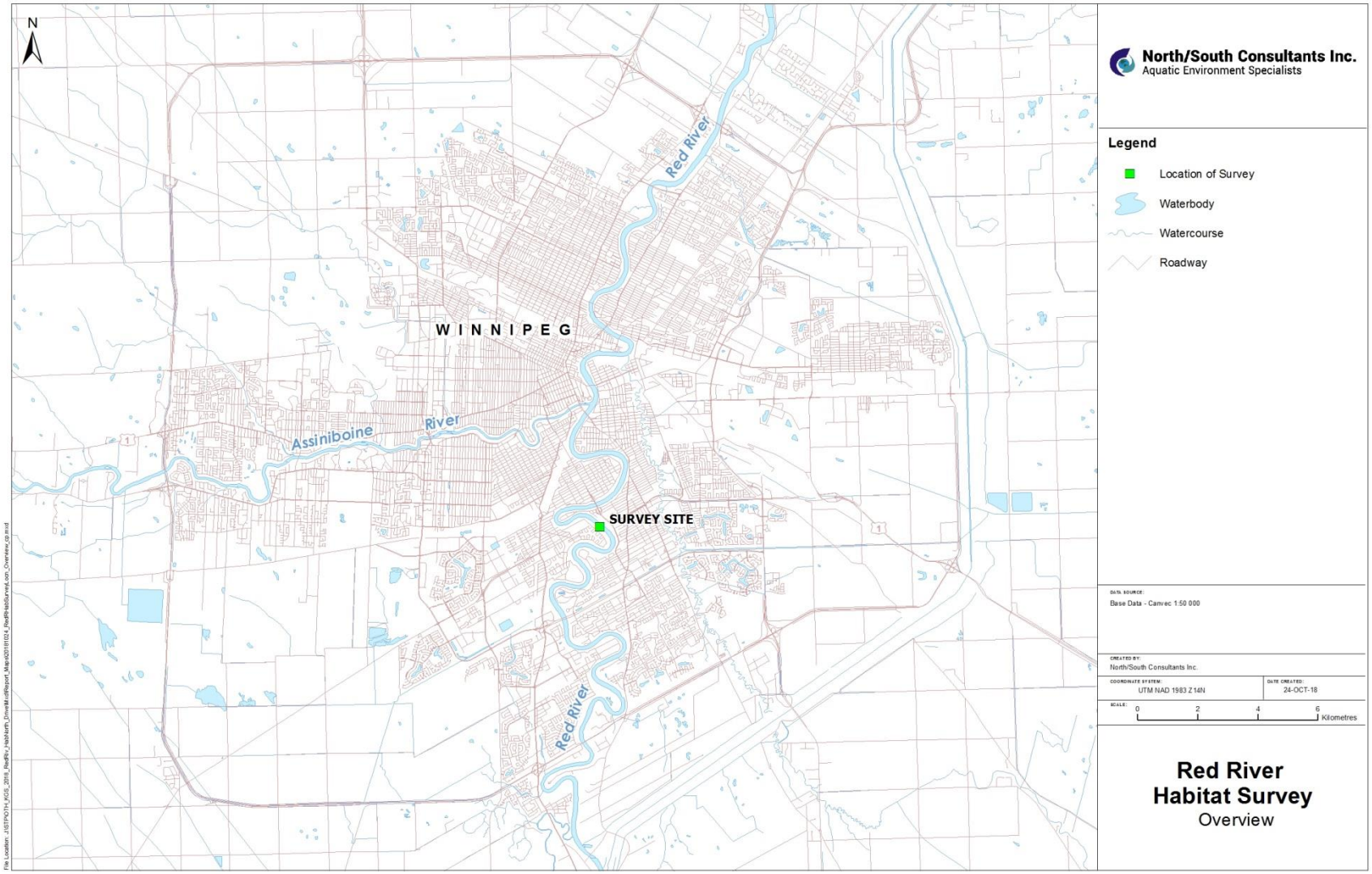

Figure 1. Red River North Drive outfall study site.

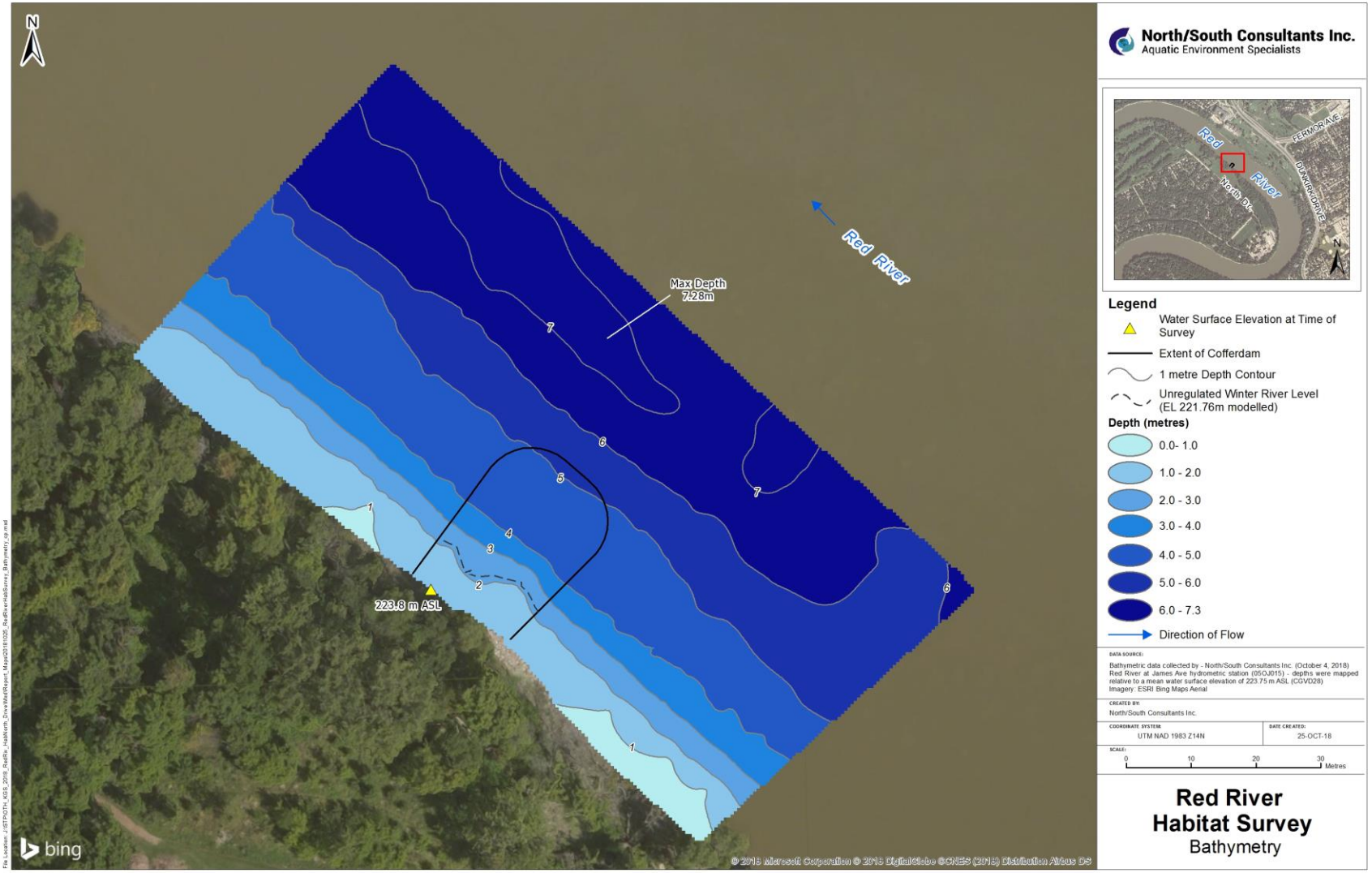

Figure 2. Bathymetric map of the Red River North Drive outfall study site.

Figure 3. Substrate map of the Red River North Drive outfall study site.

Figure 4. Substrate validation results showing ponar locations and GPS tracks at the Red River North Drive outfall study site.

Photo 1. Site photo at the Red River – North Drive outfall site.

Photo 2. North Drive outfall site showing the downstream extent of the study site.

Photo 3. North Drive outfall site showing the upstream extent of the study site.

Photo 4. North Drive outfall site showing shoreline around the outfall (photo taken looking upstream).

Photo 5. North Drive outfall site showing shoreline around the outfall (photo taken looking downstream).

Photo 6. Substrate validation from site T1-5m showing a mix of soft clay/silt.

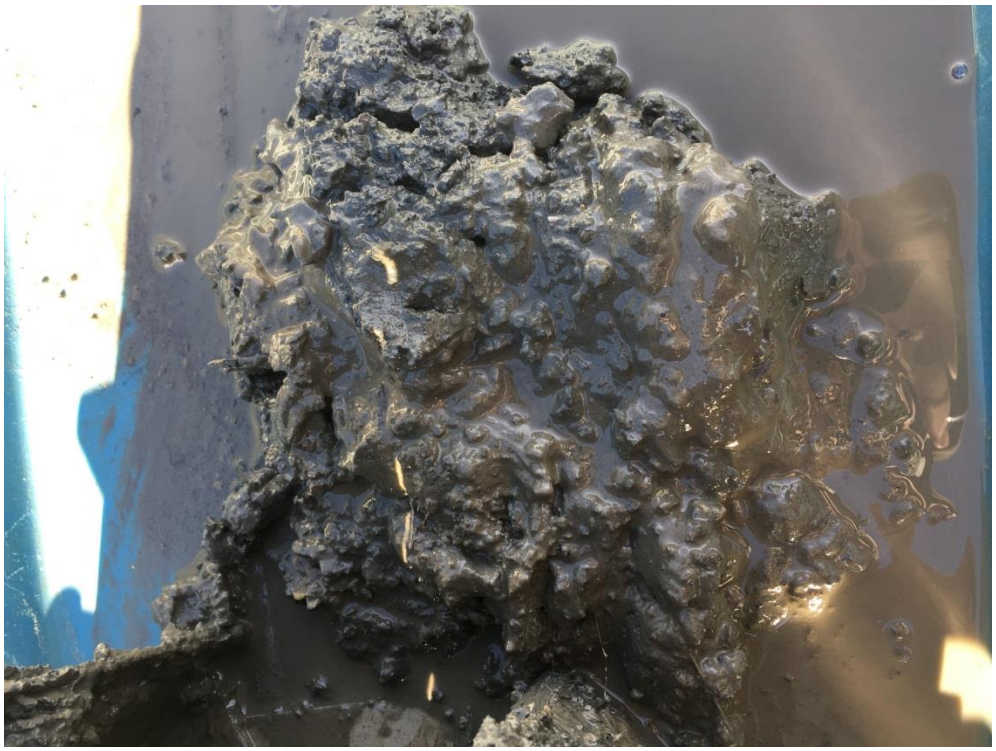

Photo 7. Substrate validation from site T2-10m showing a mix of soft clay/silt.

Photo 8. Substrate validation from site T5-15m showing a mix of soft clay/silt.

Photo 9. Substrate validation from site T7-15m showing a mix of soft clay/silt.

Photo 10. Substrate validation from site T9-15m showing a mix of soft clay/silt and organic material.

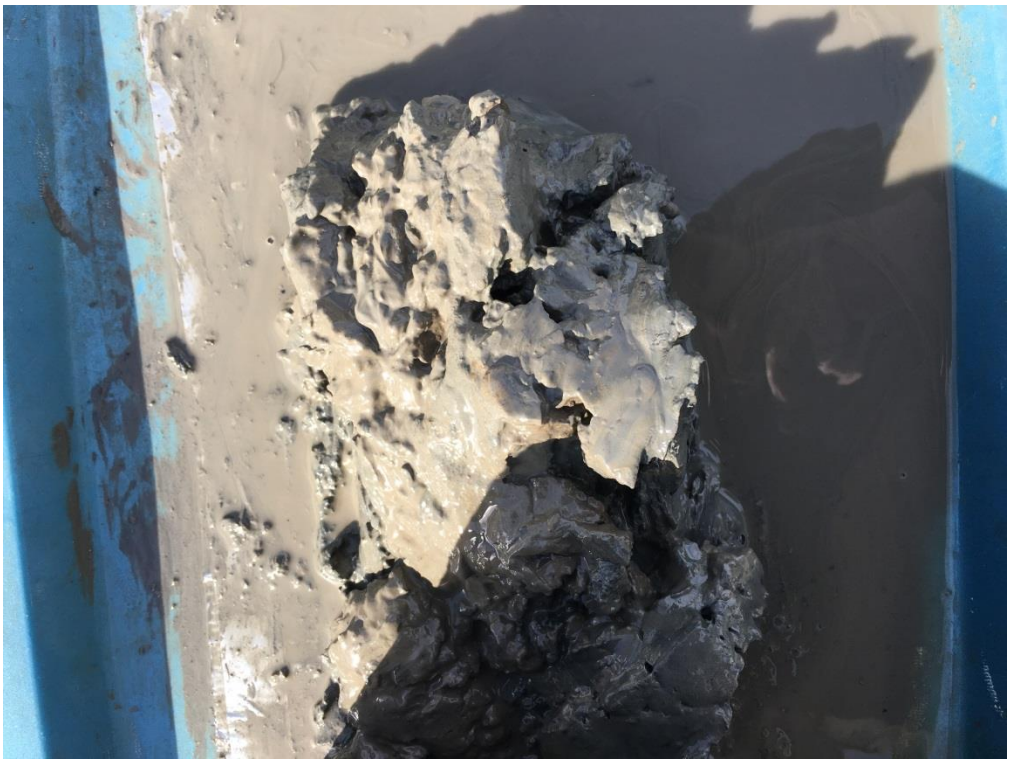

Photo 11. Substrate validation from site T11-30m showing a mix of soft clay/silt.

Photo 12. Substrate validation from site T13-5 showing a mix of soft clay/silt

Photo 13. Substrate validation from site T14-30 showing a mix of soft clay/silt.

Photo 14. Substrate validation at site T15-20m showing a mix of soft clay/silt.

Photo 15. Substrate validation at site T16-5m showing a mix of soft clay/silt.

Photo 16. Substrate validation from site T10-15m showing a mix of clay, cobble, gravel.

Photo 17. Substrate in the near-shore area consisting of sand.

Photo 18. Substrate in the near-shore area consisting of cobble/gravel/sand.

Request for Review

A) Contact information

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Select additional contact:
Contractor/Agency/Consultant *(if applicable)*:

KGS Group

Mailing address:

3rd floor - 865 Waverley Street

City/Town:

Winnipeg

Province/Territory:

Manitoba

Postal Code:

R3T 5P4

Tel. No. :

204-896-1209

Fax No.:

204-896-0754

Email:

roffman@kgsgroup.com

Is the Proponent the main/primary contact? ○ Yes ◉ No

If no, please enter information for the primary contact or any additional contact.

Proponent Representative Contact - Ray Offman, P.Eng.
Title: Infrastructure Engineer / Project Manager
Telephone Number: (204) 896-1209
Facsimile Number: (204) 896-0754

B) Description of Project

If your project has a title, please provide it.

2019 Outfall Renewal and Rehabilitation - North Drive Outfall

Is the project in response to an emergency circumstance*? ○ Yes ◉ No

Does your project involve work in water? ◉ Yes ○ No

If yes, is the work below the High Water Mark*? ◉ Yes ○ No

What are you planning to do? Briefly describe all project components you are proposing in or near water.

As part of the 2019 Outfall Renewal and Rehabilitation Project KGS Group has identified that the North Drive Outfall located on the Red River requires in-water works due to the outfall outlet being submerged below the Unregulated Winter River Level (UWRL). The North Drive Outfall (City of Winnipeg Asset # S-MA60013422) is a 1200mm Diameter CSP that discharges to the Red River.

The purpose of the proposed works is to protect the public and upstream neighborhoods from surface and basement flooding. The outfall is an important and necessary asset of the City of Winnipeg Sewer Management System. The following in or near water works will be required to complete the outfall repairs:
- Construction of a temporary clay cofferdam to facilitate construction works in a safe and dry environment;
- Removal and replacement of 15.4 m of 1200 mm diameter CMP outfall with 15.4 m of 1200 mm diameter CMP with polymer coating;
-Cleaning and CCTV Inspection of the upstream concrete section of the outfall;
-Installation of mid-bank manhole;
-Localized regrading to match existing bank contours;
-Installation of 0.6m thick riprap set flush to existing bank contours at the pipe outlet;
-Removal of temporary clay coffer dam;
-Site Restoration and Revegetation (Tree planting, seeding).

The proposed in-water works showing the extents of our proposed temporary cofferdam is included on the attached KGS Group Figure Drawing.

How are you planning to do it? Briefly describe the construction materials, methods and equipment that you plan to use.

Construction Schedule
The North Drive Outfall in-water works are scheduled between January 1 and March 15, 2019 during the low flow and water levels. Every reasonable effort will be made to minimize the duration of in-water activity and disturbance to the bed and shore at the project location. Site restoration and revegetation will be completed the following spring before June 15, 2019.

Site Access
Site access and works near the river edge will be conducted during low flow (winter) and during frozen ground and ice conditions. Access by fording is to be restricted to one crossing location, and traffic is to be limited. Minor regrading of the riverbank area may be required for equipment access; it will be performed by excavation only. Under no circumstances will any fill be allowed on the riverbank for equipment access. In general, all excavation shall proceed from the top of bank area down to the bottom so as not to jeopardize riverbank stability. All material excavated shall be disposed of off-site immediately upon excavation. The stockpiling of excavated material at the site will not be allowed. Upon completion of the works, the bank shall be restored to the pre-construction condition and geometry.

Sediment and Erosion Control
Silt fences and erosion control blankets will be used to prevent the release of sediment laden runoff into the river during excavation or other construction activities. These protection measures will be maintained until re-vegetation has been re-established. Any sediment, sand, or debris introduced to the ice surface shall be removed upon project completion and prior to spring thaw. Effective long term erosion and sediment control measures (e.g. erosion control blankets, sediment barriers, straw mulch, silt fences) will be used to prevent any construction activities from contributing sediment to the water bodies. This includes stabilizing and seeding disturbed areas after construction and ensuring they are reclaimed to vegetation within one growing season. In addition to the above, all work will be performed in accordance with an Environmental Protection Plan approved by the Contract Administrator.

Construction of Temporary Clay Coffer Dam
A temporary clay coffer dam will be required to facilitate the repair of the outfall. A small footprint area (will not exceed 8 meters from

the pipe outlet) will be required for installation of the coffer dam. The total proposed project foot print area below the high water mark is approximately 575 square meters. Temporary clay coffer dam materials shall be clean clay fill free of deleterious materials such as roots, organic materials, ice, snow, or other unsuitable materials. The contractor shall check the temporary clay coffer dam periodically to ensure no leakage. The temporary clay coffer dam materials shall be removed following construction.

Decanting Existing Water from the Temporary Clay Coffer Dam / Pipe
All existing river water from inside the coffer dam / pipe shall be pumped back into the river. The Contractor shall ensure that the pumped water does not have elevated levels of sediment and is directed to an appropriately sized energy dissipating outlet device to prevent bed or bank erosion at the point of discharge into the natural water body. The decanting activities shall be monitored continuously to address the turbidity of the water. Contractor will continuously monitor the pump pressure. Contractor shall cease pumping operation prior to taking in sediment. All sediment material shall then be pumped into a storage tank and is to be disposed of off site. The water withdrawal rates shall not exceed 10% of the instantaneous stream flow at the time. Vacuum unit and pumping systems size, screens, and capacity will be sized according to the Department of Fisheries and Oceans' Freshwater Intake End-of-Pipe Fish Screening Guidelines to prevent debris blockage and fish mortality.

Cleaning and Removal of Sediment in the Pipe and Inspection
The upstream concrete segment of the outfall shall be cleaned by a reverse setup method. This involves the cleaning equipment to be positioned at the upstream chamber manhole and cleaning the sewer run from that location. The Contractor shall use appropriately sized high velocity sewer jet and vacuum unit due to the site specific conditions as well as ensure an appropriately sized storage tank that will allow the liquid portion to be displaced off-site. The cleaning will result in reduced sediments in the river during spring melt and rainfall events.

Outfall Pipe Replacement
The end of the CMP outlet section of the outfall shall be replaced as part of the proposed works. The pipe material will include 15.4 m of 1200mm diameter corrugated metal pipe. The pipe will be replaced within a shored excavation and the temporary clay cofferdam. The pipe invert at the shoreline is to be approximately Elev. 222.35 m +/- for the 1200mm diameter outfall. The pipe will be bedded in clean granular material extending 600mm above the top of the pipe (in areas above the high water mark). The remaining backfill will consist of selected clean clay fill material. Lastly, a 600mm thick riprap blanket will be placed around the pipe outlet to protect against erosion. The riprap is to consist of 300mm diameter rock, and is to be set flush to the existing bank contours above the UWRL and placed resting on the existing bank slope below the UWRL.

Riverbank Regrading
Native riverbank grass seed installation, silt fencing, and erosion control blanket shall be used at the mid and lower bank as erosion mitigation. Backfilled excavations and areas disturbed by construction activities shall be regraded to match the existing river bank contours. The materials will consist of clean clay fill, compacted in 150mm lifts. All deleterious materials shall be removed off-site during the regrading operations. Placement of sod and seed at the top of bank within the limits of bank access, and any damaged areas, shall be completed by June 15, 2019.

Construction Equipment Required:
A Loader, Excavator, and Skid Steer will be required for site access, temporary clay cofferdam installation, pipe replacement, regrading, and restorations. Other smaller equipment that may be required includes appropriately sized pumps, small hand tools, and generators.

Plans, Maps, and Affected Area:
See attached documents.

Include a site plan (figure/drawing) showing all project components in and near water.

Are details attached? (•) Yes ( ) No

Identify which work categories apply to your project.

- [ ] Aquaculture Operations
- [ ] Aquatic Vegetation Removal
- [ ] Beaches
- [ ] Berms
- [ ] Blasting / Explosives
- [ ] Boat Houses
- [ ] Boat Launches / Ramps
- [ ] Log Handling / Dumps
- [ ] Log Removal
- [ ] Moorings
- [ ] Open Water Disposal
- [ ] Piers
- [ ] Riparian Vegetation Removal
- [ ] Seismic Work

- ☐ Breakwaters
- ☐ Bridges
- ☐ Cable Crossings
- ☐ Causeways
- ☐ Culverts
- ☐ Dams
- ☒ Dewatering / Pumping
- ☐ Docks
- ☐ Dredging / Excavation
- ☐ Dykes
- ☐ Fishways / Ladders
- ☐ Flow Modification (hydro)
- ☐ Groundwater Extraction
- ☐ Groynes
- ☐ Habitat Restoration
- ☐ Ice Bridges
- ☒ Shoreline Protection
- ☐ Stormwater Management Facilities
- ☐ Surface Water Taking
- ☐ Tailings Impoundment Areas
- ☐ Temporary Structures
- ☐ Turbines
- ☐ Water Control Structures
- ☐ Water Intakes / Fish Screens
- ☒ Water Outfalls
- ☐ Watercourse Realignment
- ☐ Weirs
- ☐ Wharves
- ☐ Wind Power Structures

☐ Other Please Specify

Was your project submitted for review to another federal or provincial department or agency? ○ Yes ◉ No

If yes, indicate to whom and associated file number(s).

C) Location of the Project

Coordinates of the proposed project Latitude [ ] N Longitude [ ] W

OR UTM zone [14] ; [634767.598] Easting

[5523496.175] Northing

Include a map clearly indicating the location of the project as well as surrounding features.

Name of Nearest Community (City, Town, Village): Winnipeg

Municipality, District, Township, County, Province: Manitoba

Name of watershed (if applicable):

Name of watercourse(s) or waterbody(ies) near the proposed project: Red River

Provide detailed directions to access the project site:

The project site is located in the Wildwood area in Winnipeg. The site can be accessed via North Drive. The upstream chamber of the outfall is located on the north side of North Drive, approximately 40m Northwest of Wildwood Park B. The outfall extends from the chamber through a small park area and exits at the Red River.

D) Description of the Aquatic Environment

Identify the predominant type of aquatic habitat where the project will take place.

- ○ Estuary (Estuarine)
- ○ Lake (Lacustrine)
- ◉ On the bank/shore at the interface between land and water (Riparian)
- ○ River or stream (Riverine)
- ○ Salt water (Marine)
- ○ Wetlands (Palustrine)

Provide a detailed description of biological and physical characteristics of the proposed project site.

Please see the attached Aquatic Habitat Assessment which includes the biological and physical characteristics of the proposed project site. Additional photos are also included within the report.

Include representative photos of affected area (including upstream and downstream area) and clearly identify the location of the project.

E) Potential Effects of the Proposed Project

Have you reviewed the Pathways of Effects (PoE) diagrams (http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html) that describe the type of cause-effect relationships that apply to your project?

◉ Yes ○ No

If yes, select the PoEs that apply to your project.

- ☐ Addition or removal of aquatic vegetation
- ☐ Change in timing, duration and frequency of flow
- ☐ Cleaning or maintenance of bridges or other structures
- ☐ Dredging
- ☒ Excavation
- ☐ Fish passage issues
- ☒ Grading
- ☐ Marine seismic surveys
- ☐ Organic debris management
- ☐ Placement of marine finfish aquaculture site
- ☒ Placement of material or structures in water
- ☒ Riparian Planting
- ☐ Streamside livestock grazing
- ☐ Structure removal
- ☐ Use of explosives
- ☒ Use of industrial equipment
- ☒ Vegetation Clearing
- ☒ Wastewater management
- ☐ Water extraction

Will there be changes (i.e., alteration) in the fish habitat*? ◉ Yes ○ No ○ Unknown

If yes, provide description.

The placing of riprap at the pipe outlet will change existing substrate composition.

Will the fish habitat alteration be permanent*? ◉ Yes ○ No ○ Unknown

Is there likely to be destruction or loss of habitat used by fish? ○ Yes ◉ No ○ Unknown

What is the footprint (area in square meters) of your project that will take place below the high water mark*?

575

Is your project likely to change water flows or water levels? ○ Yes ◉ No ○ Unknown

If your project includes withdrawing water, provide source, volume, rate and duration.

N/A. No withdrawing water activities associated with this project.

If your project includes water control structure, provide the % of flow reduction.

No permanent fill or structure is required therefore no permanent reduction in flow.

If your project includes discharge of water, provide source, volume and rate.

Source: Appropriately sized water pump; 2" to 4" pump is estimated to be required with appropriately sized energy dissipating outlet device to dewater the cofferdam area. Water discharge rates shall not exceed 10% of the instantaneous stream flow at the time of construction works. Vacuum unit and pumping system size, screens, and capacity will be sized according to the Department of Fisheries and Oceans' Freshwater Intake End-of-Pipe Fishing Screening guidelines to prevent debris blockage and fish mortality.

Will your project cause death of fish? ○ Yes ◉ No ○ Unknown

If yes, how many fish will be killed (for multi-year project, provide average)? What species and lifestages?

Are there aquatic species at risk (http://www.sararegistry.gc.ca/species/aquatic_e.cfm) present? If yes, which ones?

Yes - Mapleleaf Mussel is known to occur in the Red River. We have conducted a Substrate Assessment early on in our project to determine the likelihood of our project causing harm to this species or it's habitat. The Habitat Assessment Report attached determined that the substrate at the study site consisted mainly of soft clay and silt which is not considered typical habitat for the species. Areas of coarser substrate, including sand and cobble/gravel/sand found along the shoreline are well above the UWRL and therefore not suitable for Maple Leaf Mussels or Maple Leaf Mussel Habitat.

What is the time frame of your project?

The construction will start on 01/02/2019 and end by 03/15/2019

If applicable, the operation will start on MM/DD/YYYY and end by MM/DD/YYYY

If applicable, provide schedule for the maintenance

The outfall is expected to have a lifespan of approximately 50 years following repair work.

If applicable, provide schedule for decommissioning

N/A

Are there additional effects to fish and fish habitat that will happen outside of the time periods identified above? ○ Yes ◉ No

(If yes, provide details)

Have you considered and incorporated all options for redesigning and relocating your project to avoid negative effects to fish and fish habitat?

◉ Yes ○ No

If yes, describe.

As part of our design and construction, we will make efforts to cut back (ie. shorter than existing) the outfall or raise the invert of the pipe so as to reduce the amount and/or need of future in water works. However, existing upstream grades preclude full removal from the water.

The project cannot be relocated as the existing outfall structure is damaged and requires repair. It is a required and necessary asset of the City of Winnipeg Sewer Management system.

Have you consulted DFO's Measures to Avoid Harm to Fish and Fish Habitat (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html) to determine which measures apply to your project?

(•) Yes ( ) No

Will you be incorporating applicable measures into your project? (•) Yes ( ) No

If yes, identify which ones. If No, identify which ones and provide reasons.

The following measures will be incorporated into our project to avoid causing harm to fish and fish habitat:

Project Planning/Timing Windows:
Works are to take place between December 1st and March 15th, during low water conditions and every reasonable effort will be made to minimize the duration of in-water activity and disturbance to the shore of the Red River.

Erosion/Sediment Control:
Temporary Clay Cofferdam Installation
- The temporary clay cofferdam shall extend the smallest distance needed from the shoreline to complete the work to ensure flows and fish passage are not obstructed.
- The Contractor shall check the temporary clay cofferdam periodically to ensure no leakage.
- Water within the temporary clay cofferdam with sediment shall not enter the river body. Any water trapped within the cofferdam with sediment shall be collected and pumped into a tank truck and disposed of off site.
- Temporary clay cofferdam materials shall be clean clay fill free of deleterious materials such as roots, organic material, ice, snow, or other unsuitable materials.
- Temporary clay cofferdam materials shall be removed following construction.
- Under no circumstances will stockpiling of material be permitted.
- Any sediment, sand, or debris introduced to the ice surface shall be removed upon project completion and prior to spring thaw.
- Upon coffer dam removal, the Contractor shall gradually remove the downstream end first, to equalize water levels inside and outside of the isolated area and to allow suspended sediments to settle.

Bank Re-Vegetation and Stabilization:
The ice surface and riverbank channel shall be cleared of construction materials prior to ice break-up. The Contractor shall clean up all materials, including but not limited to: soil, snow fence, construction debris, etc. from the construction activity. All items that will have an adverse impact on the channel shall be removed.

Effective long term erosion and sediment control measures (e.g. erosion control blankets, silt fences) will be used to prevent any construction activities from contributing sediment to the river bodies. This includes stabilizing and seeding disturbed areas after construction and ensuring they are reclaimed to vegetation within one growing season.

The construction site will be monitored to evaluate the effectiveness of sediment and erosion control measures. If monitoring identifies any problems, then appropriate actions would be taken immediately to rectify the situation.

Clearing of riparian vegetation shall be kept to a minimum by using existing cut-lines where possible.

Upon completing the outfall repair works, the riverbank shall be restored the original contours and gradient.

Placement of riprap armor stone installed at the pipe outlet shall be installed at the existing slope so as to maintain a uniform shoreline alignment. Riprap placed below the UWRL shall rest on the existing slope (ie. no subcutting below the UWRL). The riprap armor stone shall consist of clean rock free of deleterious materials.

Fish Protection:
Contractor shall make reasonable effort before installing the temporary clay cofferdam to capture and relocate fish to a safe area in the river body immediately downstream of the influence of the work site using best management practices (ie. Seine Net Method).

Contractor shall record number and species of captured fish, gear used, date, and location of fish capture. Captured fish shall be transferred to large fish tubs and released downstream of the work site. Fish shall be monitored at all times to ensure survival and shall be observed following release to determine survival.

To ensure and determine that the work area is free of fish and no further salvage is necessary, the work area shall be subjected to at least two passes with capture gear through its entire wetted area and capture no large bodied fish.

Operation of Equipment/Machinery:
- All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator.
- The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.
- Contractor shall keep machinery and equipment clean and maintained free of fluid leaks.
- Contractor to wash, refuel, and service machinery and equipment and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water body or spreading onto the ice surface.
- Contractor shall keep an emergency spill kit on site in case of fluid leaks or spills from machinery and equipment.
- Contractor shall periodically monitor and check equipment.
- Contractor shall ensure that due care and caution is taken to prevent spills.

Have you considered and incorporated additional best practices and mitigation measures recommended in relevant guidelines to avoid negative effects to fish and fish habitat?

(•) No ( ) Yes

If Yes, include a list of the guidelines being used to avoid negative effects to fish and fish habitat.

Are there any relevant best practices or mitigation measures that you are unable to incorporate? ( ) Yes (•) No

(If yes, identify which ones.)

Can you follow appropriate Timing Windows (http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/index-eng.html) for all your project activities below the High Water Mark*?

(•) Yes ( ) No

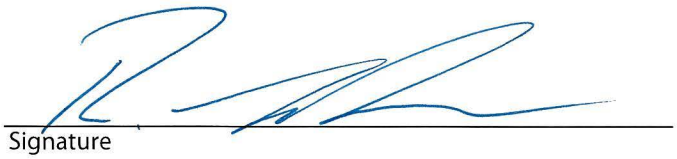
(If no, provide explanations.)

What residual effects to fish and fish habitat do you foresee after taking into account the avoidance and mitigation measures described above?

Beyond the small footprint of altered habitat (riprap) there are no residual effects anticipated following removal of the temporary coffer dam.

F) Signature

I, Ray Offman (print name) certify that the information given on this form is to the best of my knowledge, correct and completed.



Signature

10/25/2018
Date

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the *Fisheries Act* for the purpose of administering the fisheries protection provisions of the *Fisheries Act*. Personal information will be protected under the provisions of the *Privacy Act* and will be stored in the Personal Information Bank DFO-PPU-680. Under the *Privacy Act*, Individuals have a right to, and on request shall be given access to any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at www.infosource.gc.ca or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provision of the *Access to Information Act*.

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*