JACK RIVER SCHOOL

ENVIRONMENT ACT PROPOSAL

DOMESTIC WASTEWATER TREATMENT PLANT REPLACEMENT

May, 2014

Alliance
ENGINEERING SERVICES INC

Frontier School Division
Jack River School
EAP Wastewater Treatment Plant Replacement

Alliance
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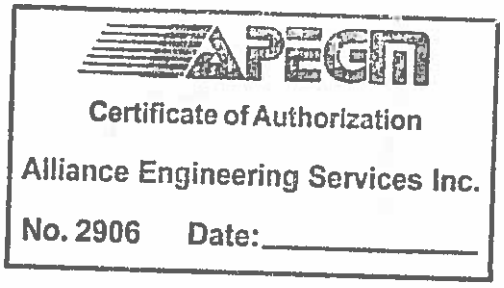

Environment Act Proposal Form

Manitoba
Conservation and Water Stewardship

Name of the development: Jack River School, Domestic Wastewater Treatment Plant Replacement		
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class 2		
Legal name of the applicant: Frontier School Division		
Mailing address of the applicant: 30 Speers Road, Winnipeg, MB R2J 1L9		
Contact Person: Doug Nicholson, (Wpg.), Edgar Throop (Norway House)		
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Phone Number: 204-258-2741	Fax: 204-258-2069	email: doug.nicholson@fro
Location of the development: Jack River School Norway House		
Contact Person: Doug Nicholson, (Wpg.), Edgar Throop (Norway House)		
Street Address: Fort Island, Norway House MB, R0B 1B0		
Legal Description: Lot DES, Section 63, Block 129, Role 0188400.000		
City/Town: Norway House	Province: Manitoba	Postal Code: R2J 1L9
Phone Number: 204-359-6365	Fax: 204-359-6975	email: edgar.throop@fronti
Name of proponent contact person for purposes of the environmental assessment: Art Gossen P. Eng., Alliance Engineering Services Inc		
Phone: 204 774 7859 Fax:	Mailing address: 1035 Logan Avenue Winnipeg, MB R3E 1P6	
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Date: 06-May-14	Signature of proponent, or corporate principal of corporate proponent: A Gossen P.Eng. Printed name: A GOSSEN	

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Executive Summary

Frontier School Division has requested that Alliance Engineering Services prepare an Environment Act Proposal for a Class 2 Development Licence under the Manitoba Environment Act for a replacement of Wastewater Treatment Plant (WWTP) at Jack River School in Norway House, Manitoba. This document contains all of the relevant information required in Manitoba Conservation's Environment Act Proposal Report Guidelines.

The existing Jack River School WWTP was established in the early 1970's, and has been operated by Frontier School Division since that time. The wastewater supply infrastructure at the school site including the WWTP is a dedicated system that only serves the school site. Due to the age of the existing WWTP equipment and a growing student population, Frontier School Division has recognized an immediate need to replace, the existing WWTP. The receiving water stream for the WWTP effluent discharge is the Jack River.

The process treatment train of the replacement WWTP includes a new equalization tank, a Bio-Wheel^{TM} Tank using an integrated fixed film and activated sludge process, a new clarifier tank and a final UV-disinfection/inactivation system. An existing sludge storage tank will be retained for holding waste sludge produced by the WWTP process. The sludge-holding tank will require periodic pump-out by a waste hauling truck for off-site disposal.

An existing 100-mm diameter effluent outfall line discharging into the Jack River will also be retained. The WWTP replacement project will proceed in conjunction with the replacement of the existing site sewage conveyance system.

The new WWTP components will be housed in a new WWTP building located immediately west of the existing WWTP building. The nominal hydraulic capacity of the new WWTP is 125-m^3/day. Frontier School Division will continue to operate the new WWTP.

Commencement of construction for this development is expected in the summer/fall of 2014 pending the receipt of all necessary regulatory approvals with project completion expected in late 2014.

1.0 Background Information

Jack River School in Norway House, Manitoba is a Kindergarten to Grade 6 school operated by Frontier School Division in the division's Area 5 catchment area. Sewer and water services for, the school, the on-site teacherages and a church are provided from on-site infrastructure that was established at the site in the early 1970's.

Student populations at the school are presently in the range of 425-students, plus staff. Student populations are expected to at least remain stable and will more likely increase in the foreseeable future. Frontier School Division has recognized the present and future educational importance of the school to the Area 5 catchment area and is committed to the replacement of the site sewer conveyance infrastructure and wastewater treatment plant (WWTP) to ensure the on-going viability of the school.

1.1 Previous Studies

Previous studies have provided condition assessments of the above grade infrastructure specifically for the site's WWTP. These studies recommended that the WWTP be replaced. The recommendation for replacement was largely based on equipment age and the difficulty in maintaining the antiquated equipment while at the same time meeting effluent discharge limits. There are also documented failures of some of the existing sewage conveyance components and specifically the electric heat tracing associated with this system, (existing sewers are shallow bury); replacement of the sewage conveyance systems will proceed concurrently with the WWTP replacement project.

1.2 Site information

Jack River School is located immediately north of the Jack River in the community of Norway House, Manitoba. The Jack River represents the receiving water stream for the final, treated, effluent discharged from the plant.

The proposed Wastewater Treatment Plant (WWTP) building will be located immediately west of the existing WWTP and Genset building; refer to figure 1 below.

Figure 1.

1.3 Population

The population in Norway House as per the 2011 census is 4,758. This population has grown at a rate of 16% during the years 2006-2011. This population is represented in the 73 km^2 area in and around Norway House. The present student and staff population at Jack River School is around 425, and is expected to increase with the growing population of Norway House. The largest population age group in Norway House is ages 0-4, with a population of 620. The second largest population group in Norway House is ages 5-9 with a population of 525. With the population demographic of Norway House being large in the lower cohorts, there will be a consistent increase in the need for educational services.

2.0 Project description

2.1 Wastewater Treatment Plant Building

A new WWTP building will be built immediately west of the existing WWTP and Genset building; to house the new WWTP process equipment. The new WWTP building will be founded on a thickened-reinforced-concrete slab-on-grade. The superstructure will be a pre-engineered metal frame building. The thickened slab on grade will be placed on a prepared, compacted granular fill, building pad. The WWTP building will be provided with a forced ventilation system and electric heating. The above-grade and below grade portion of the existing WWTP building will be stripped of all mechanical and electrical components; the below grade portions of the building will be backfilled with a suitable granular fill material. The above-grade portion of the existing building that houses the site Genset will be retained in its present form.

The design parameters for the proposed replacement wastewater treatment plant are based on measured wastewater influent characteristics, and anticipated effluent regulatory guidelines as shown in Table 1 below.

Table 1. Influent Characteristics and Effluent Guidelines

Parameter	Units	Influent	Regulatory Effluent Quality
Average Daily Flow	m^3/day	45	n/a
Maximum Daily Flow	m^3/day	125	n/a
Minimum Daily Flow	m^3/day	25	n/a
5-day BOD	mg/L	45	<25
Total Suspended Solids	mg/L	250	<25
Total Ammonia	mg/L	21	n/a
Total Kjeldahl Nitrogen	mg/L	42	n/a
Total Nitrogen	mg/L	42	<15
Total Phosphorus	mg/L	0.38	<1
Fecal Coliforms	MPN/100 mL	>110,000	<200
Total Coliforms	MPN/100 mL	>110,000	<200

2.2 General Treatment Process Description

The waste water treatment process proposed is an activated sludge with integral fixed film process designed for the treatment of, primarily, domestic wastewater. The process treatment train is of modular construction and includes the following major equipment components,

- Influent trash screen and submersible pumps with discharge to a head-end Equalization Tank,
- Flow equalization tank,
- Rotating biological contact and fixed film wheel,
- Clarifier tank complete with return activated sludge circulation,
- Ultra-violet disinfection system,
- Discharge to existing 100-mm perforated outfall line terminating in the Jack River.

The selected equipment vendor for the process equipment supply is H_2O Innovation. A brief description of the major equipment component features is provided below.

We note that the influent characteristics of the wastewater are already below regulatory limits for total phosphorous; the treatment process then does not make provision for further removal of total nitrogen. Some de-nitrification will occur across the process as described but if nitrogen levels below 15 mg/L are a condition of the WWTP Operating License an additional Anoxic system may have to be considered.

2.2.1 Equalization Tank

An equalization tank will be built as a holding tank for influent to allow equalization of flow the Bio-Wheel™ tank. Within the equalization tank there will be two submersible equalization pumps, one diffuser, a blower for equalization tank mixing, and an electromagnetic flow meter for measuring influent flow. The equalization tank will be a cordoned off section of a larger tank encompassing the Bio-Wheel™ tank and clarifier tank. The tank will be constructed of painted carbon steel.

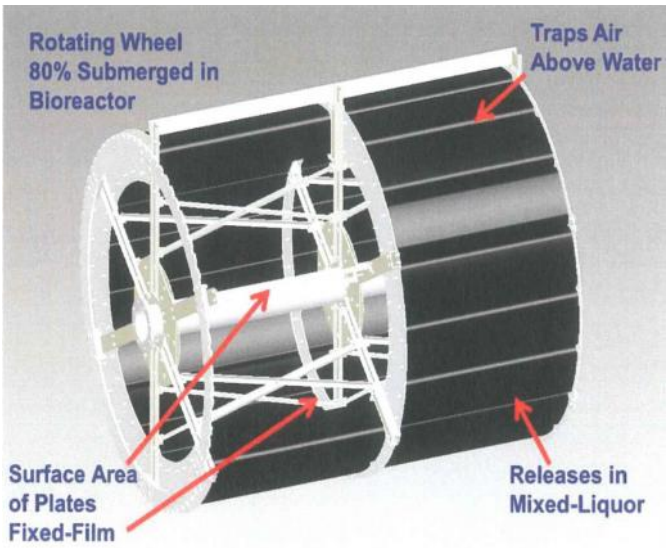
2.2.2 Bio-Wheel™ Tank

The Bio-Wheel™ tank will house the rotating Bio-Wheel™, a drive chain, and drive gear motor. The Bio-Wheel™ tank will be a cordoned off section of a larger tank. Effluent will be pumped into the tank from the equalization tank, where further treatment will occur in the Bio-Wheel™ tank. The Bio-Wheel™ is 80% submerged in the mixed liquor and rotates at a speed of approximately 1 RPM. During the rotation of the wheel aeration and mixing are provided with no external blowers or diffusers to increase efficiency. A drive chain with a variable speed gear

motor regulates the speed of the wheels rotation. The operator of the wastewater treatment plant can adjust the speed of rotation of the Bio-Wheel™ if necessary. The Bio-Wheel™ is an integrated fixed film and activated sludge system. Most nitrification occurs on the fixed film, and substantially reduces the biochemical oxygen demand of the influent. The fixed film provides a stable environment for nitrification while the activated sludge provides efficient utilization of the available biology by optimizing their environment. This is done by providing sufficient oxygen and mixing to the activated sludge.

The plates, which form the cells are made of polypropylene with a UV inhibitor. They are joined together with tongue and groove joints to eliminate the escape of air as it is compressed through rotation. The Bio-Wheel™ system operates with low noise, and low energy consumption. The Bio-Wheel™ will be made of galvanized steel to prevent corrosion. The plastic plates as shown in Figure 2 form cells, and as the wheel rotates air is brought down into the mixed liquor where it escapes from the cells as fine to medium bubbles. After the cells have past bottom dead center there is air remaining in the cells, which provides lift to the wheel to reduce electrical consumption. This also reduces the weight by adding buoyancy to the wheel, creating a reduced load on the bearings and drive shaft of the wheel.

Figure 2. Bio-Wheel™



2.2.3 Clarifier Tank

The clarifier tank will consist of a return activated sludge pump, an electromagnetic flow meter, one scum skimmer, a clarifier effluent weir, and a UV disinfection system. The clarifier tank will be a cordoned off section of a larger tank. The treated effluent will be pumped in from the Bio-Wheel™ tank at which further treatment will be undergone in the clarifier tank. The UV disinfection system will be incorporated into the effluent discharge line.

2.2.4 Sludge Storage Tank

Sludge wasted from the clarifier tank will be directed to an existing, buried, sludge holding tank located immediately adjacent to the north wall of the existing WWTP. The sludge holding tank will be subject to periodic pump-out by a waste hauling truck for off-site disposal and treatment.

2.2 Certificate of Title

The proposed WWTP will be constructed on property owned by the school division. The WWTP will be located at the existing Jack River School site. Legal Description,

> *Certificate No. 145546*
>
> *The most North Easterly Seven Hundred and Fifteen feet in perpendicular width of Lot Sixty-three, in the Settlement of Norway House, in Manitoba, as shown on a Plan registered in the Neepawa Land Titles Office as No. 1259*

The copy of the certificate of title for the school is provided in the Appendix.

2.3 Existing and Adjacent Land Use

The proposed land for the development will be on Frontier School Division owned land at the existing Jack River School in the community of Norway House. The adjacent land is Norway House Cree Nation reserve. Adjacent land use will not be changed as a result of this development.

2.4 Land Use Designation and Zoning

Zoning designation for this project is not applicable.

2.5 Project Schedule

The project is scheduled to commence and be complete in the summer/fall of 2014 construction year depending on receipt of all regulatory agency approvals

2.6 Project Funding

The project is being funded through the Frontier School Division. Frontier School Division will receive primary project funding (93.5%) from Aboriginal Affairs and Northern Development Canada (AANDC) based on a shared cost formula ratio between treaty and non-treaty students, secondary funding (6.5%) will be provided by the provincial Public Schools Finance Board (PSFB).

2.7 Regulatory Approvals

The WWTP will require a Class 2 Development Environmental Licence. The following department will be provided with copies of plans and specifications for the purpose of approvals and agreements.

Manitoba Conservation and Water Stewardship

Manitoba Hydro will be contacted for utility locations and approvals.

2.8 Public Consultation

The community of Norway House and Norway House Cree Nation welcome this project as it is a needed infrastructure replacement to Jack River School. This project will not be met with major concerns regarding the replacement of the WWTP.

3.0 Physiographic Setting

Jack River School is located in the community of Norway House, which is located on the east channel of the Nelson River, 29km north of Lake Winnipeg. The longitudinal and latitudinal coordinates of Norway House are 53° N, and 97° W. It is accessed by PR # 373, which acts as an all season road connecting Norway House to Jenpeg hydroelectric station. The population of Norway House Cree Nation as of the 2011 census data is 4,758. (Statistics Canada, 2012). The population of Norway House non-treaty community as of the 2006 census data is 521.

3.1 Climate

Norway House is located in the High Boreal Ecoclimatic Region in Manitoba. It has short cool summers and long cold winters. Based on Environment Canada data the average mean

temperature of Norway House from 1971-2000 is -1.0 ^{0}C, with below zero average temperature from November to April. The average growing season in Norway House is about 160 days, with the growing degree days being around 1400. (Smith, et al., 1998) The mean annual precipitation recorded for Norway House is 522.7mm, with the majority of precipitation coming in the months of June to August. The climate data for Norway House is drawn from the climate station located in the community. A summary of historical average temperatures for Norway House are provided in Table 2. (Environment Canada, 2014)

Table 2. Environment Canada Historical Weather Data for Norway House, Manitoba

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
													Average
Temperature:													
Daily Average (°C)	-22.4	-17.9	-10.5	-0.2	8.2	14	17.6	16	9.2	2.1	-8.9	-18.9	-1
Daily Maximum (°C)	-16.7	-11.6	-3.8	6.1	14.4	20	23.3	21.6	14.3	6.2	-4.7	-13.8	4.6
Daily Minimum (°C)	-28	-24.1	-17.2	-6.4	2.1	8.1	11.8	10.3	4.1	-1.9	-13.1	-24	-6.5
													Total
Precipitation													
Precipitation (mm)	22.2	22.4	26	22.5	45.4	68.7	76	74.6	56.9	46.3	32.4	29.5	522.7

3.2 Physiography

The area of Norway House contains three physiographic features. These features are, undulating peat-covered clayey glaciolacustrine, hummocky granite outcrops, and sandy glacial till. The peatlands in this area consist of bogs and fens. The permafrost in this area is only present in the peatlands. Due to diminishing permafrost the bogs and fens within the peatlands are known to collapse.

The elevation of Norway House is 221 metres above sea level (masl). The drainage of the Norway House region is northeastward at a rate of 0.5m per km, (Smith, et al., 1998). The local relief in this area is provided by a few rocky highs along rivers and lake shorelines, these can range from a few metres to 20-m.

3.3 Wildlife Habitat and Vegetation

The terrestrial ecosystem in the area around Norway House is consistent with black spruce, jack pine, and paper birch in drier areas. In the moister soils alongside rivers and lakes white spruce, balsam fir, and aspen are more dominant. Understory species in this area are feather moss, rock cranberry, blueberry, Labrador tea, and lichen. Soils in this ecozone are typically thin, cool, acidic, and have low nutrient availability. Wet, oxygen poor, organic soils underlie wetland areas. (Smith et al. 1998; Environment Canada) This area contains peatlands, which consist of deep horizontal fens and patterned fens. The peatlands face sporadic permafrost due to their

thermokarst nature. This has caused this area to appear hummocky. The mammals that live in this region include wolf, lynx, otter, marten, beaver, moose, black bear, woodland caribou, snowshoe hare, red squirrel, short-tailed weasel, red-backed vole, and chipmunks. The avian species that live in this area include spruce grouse, sharp-tailed grouse, willow ptarmigan, common nighthawk, raven, gray jay, bald eagle, hawk owl, and numerous waterfowl species.

3.4 Hydrology

The Nelson River east channel, Jack River, and Opitanow channel flow through the community of Norway House. The lakes in the area of Norway House are Playgreen Lake to the south, and Little Playgreen Lake to the north. The proposed site is located on the shoreline of Jack River, adjacent to Norway House Cree Nation.

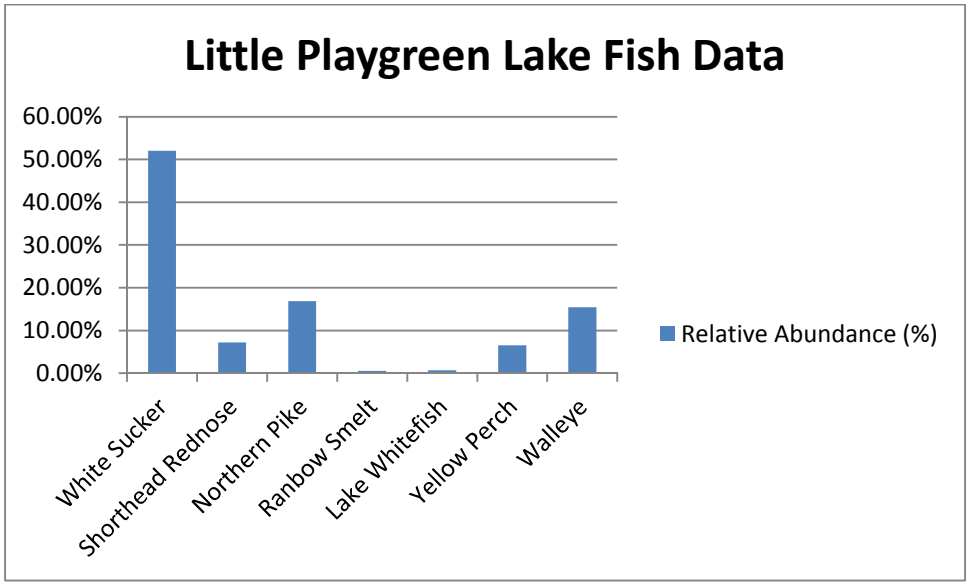
3.5 Fish Habitat

Potential fish habitat for the project area includes Jack River and to a lesser extent Little Playgreen Lake. Jack River flows into Little Playgreen Lake, which is part of the Nelson River system. Little Playgreen Lake fish habitat offers murky water with significant amounts of suspended sediment. This is due to Little Playgreen Lake being an outlet for Lake Winnipeg. Information regarding fish habitat of Jack River could not be located and is believed to be non-existent.

3.6 Fish Species

The fish species within Jack River and Little Playgreen Lake are White Sucker, Shorthead Redhorse, Northern Pike, Ranbow Smelt, Lake Whitefish, Yellow Perch, and Walleye. The relative abundance of species for Little Playgreen Lake is provided in Figure 3. Data regarding relative abundance for Jack River does not exist therefore only information regarding Little Playgreen Lake is provided.

Figure 3. Fish Data



3.7 Benthic Invertebrates

The mean number of invertebrates on Little Playgreen Lake was 7816 per kicknet. Of these invertebrates, 4941 were non-insecta, and 2875 were insecta. These numbers are reflective of near shore sampling in 2010. In these samples the following phyla were found; Oligochaeta, Amphipoda, Gastropoda, Chironomidae, Ephemeroptera, and Trichptera. The relative abundance of these samples is reflected in Figure 4. The mean Simpsons diversity index for near shore invertebrates is 0.78, and the evenness index of 0.27. The mean number of invertebrates per m^2 offshore on Little Playgreen Lake was 3916. In these samples the following phyla were found; Amphipoda, Bivalvia, Gastropoda, Chironomidae, Ephemeroptrea, and Trichoptera. The relative abundance of these samples is reflected in Figure 5. The mean Simpson's diversity index for offshore invertebrates is 0.55, and the evenness index is 0.2.

Figure 4. Benthic Invertebrates (Near Shore)

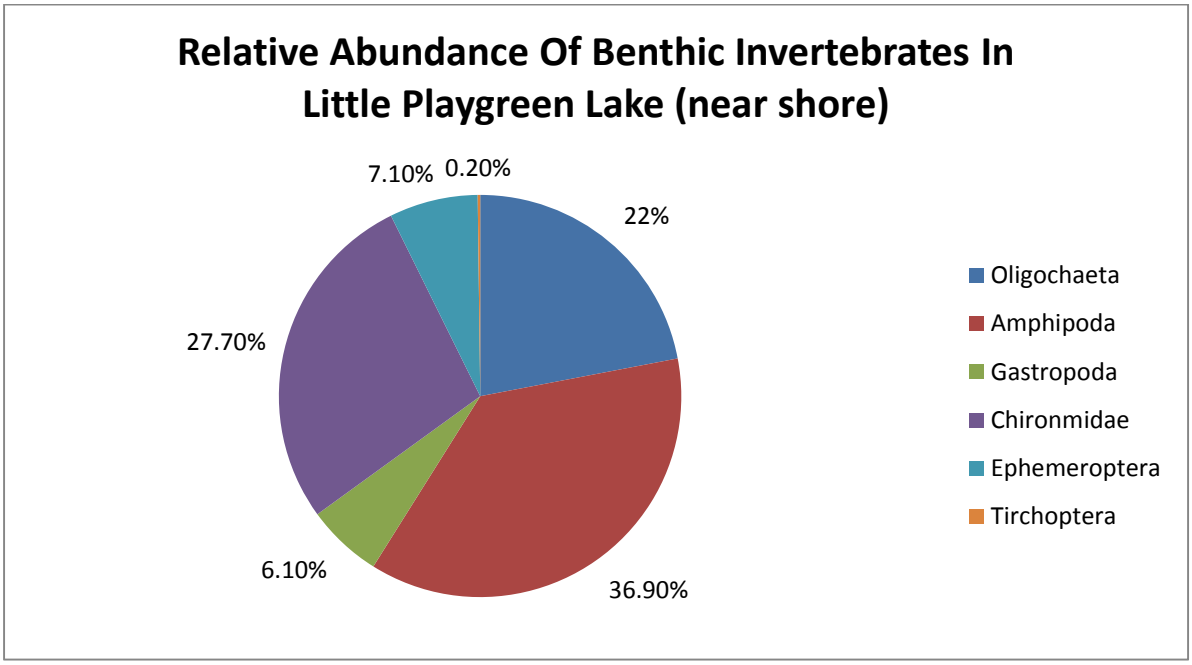
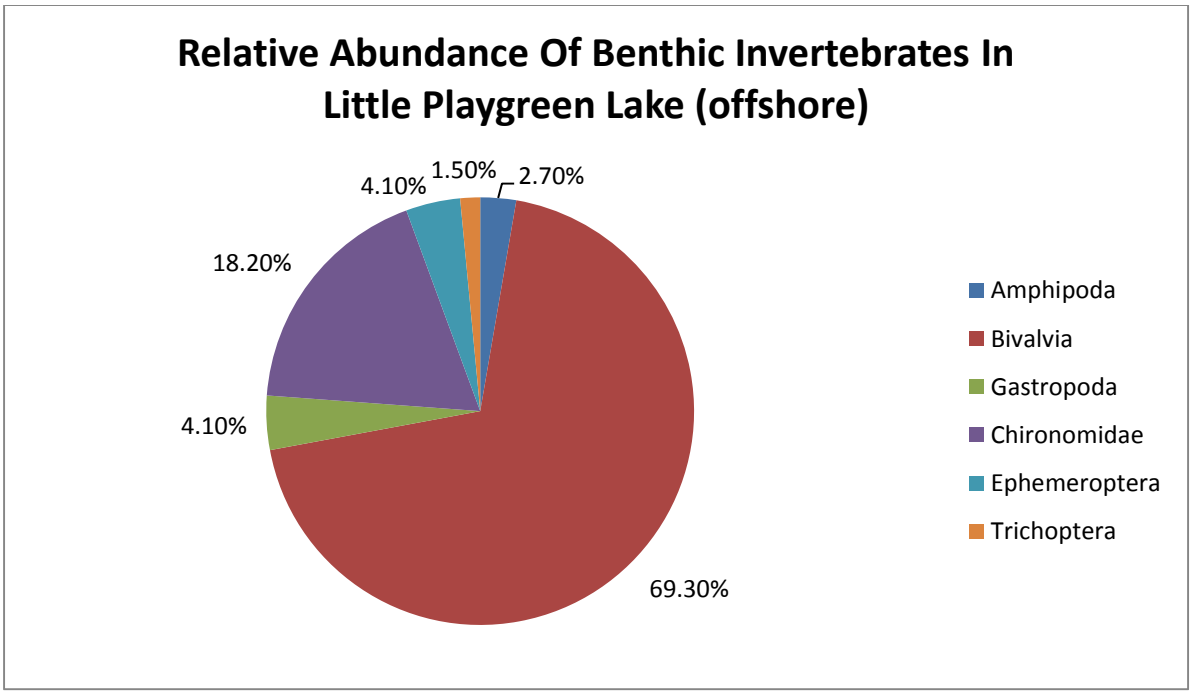


Figure 5. Benthic Invertebrates (offshore)



3.8 Socio-economic environment.

3.8.1 Economy

Due to granite base terrain and little soil profile, Norway House has limited economic opportunities available. Some opportunities that exist are: commercial fishing, trapping, wild rice harvesting, and service based business. The commercial fishing industry is persistent throughout the year, with fish stations located at Playgreen Point and Tait Island. The trapping industry exists in the Norway House Registered Trap Line Zone, and offers financial opportunity for the local community. The harvesting of wild rice exists east of Norway House in shallow lakebeds, and offer traditional food sources and economic opportunity for local residents. As Norway House is a northern regional centre it offers many services like transportation, accommodations, and services for local residents. The largest service employer in this area is Frontier School Division; up to 200 local jobs.

3.8.2 Land and Resource Use

The land use for Norway House is very limited due to a short growing season of about 160 days, and poor soil structure and low soil temperatures. (Smith 1998 et. al) The land and resource uses that exist are forestry, commercial and sport fishing, trapping, agriculture. The market for forestry in Norway House is limited do to regular forest fires, and slow growing seasons. Commercial fishing takes place in the Norway House region, with fish stations located at Playgreen Point, and Tait Island. Trapping occurs in the Norway House Registered Trapline Zone. Shallow lakebeds located east of Norway House are used for the growing and harvesting of wild rice.

3.8.3 Community Life

Norway House consists of two communities, Norway House Cree Nation (NHCN), and the non-treaty community located adjacent to NHCN. The community of Norway House has two schools operated by Frontier School Division. These schools are Jack River School and Helen Betty Osborne School. The school student populations are not separated by treaty and non-treaty status. The recreational facilities that exist in Norway House are the Fort Island Arena, base-ball field, and a playground. These facilities are open to both the non-treaty and treaty communities of Norway House. Norway House also has a community gardening program that encourages homeowners to grow gardens on their property as a way to promote healthy living. The annual events that Norway House hosts are a Fishing Derby in March, and York Boat Days in August.

4.0 Environmental Effects

4.1 Air Quality

During the projects construction phase there is a possibility dust will be raised, and there will be gaseous particulate emissions through operation of construction equipment. To mitigate the raised dust, water spraying will be applied as necessary to alleviate potential dust concerns. Emissions of gases and particulates will be mitigated through ensuring construction equipment is in good working order. The effects will be local, and only persist during the construction phase. The effects will be insignificant to the existing land.

4.2 Soil

During the projects construction phase there is a risk of fuel or lubricant spills from the construction equipment. To lower the risk associated with this project, storage of fuel and lubricants will take place at a location away from the water supply. By storing fuel and lubricants away from the water the risk of contamination is minimized. If any fuel or lubricants are spilled standard construction spill clean-up procedures will take place. This includes removal of impacted soil, as to prevent further impacts to the site.

There is possibility of soil erosion during the construction phase due to the removal of vegetation by equipment operations. By re-introducing vegetation to the exposed soil the risk of soil erosion will be minimized.

During the operation of the project, regular maintenance and monitoring will take place to realize any malfunctions as they occur. By proper maintenance and monitoring any risk or malfunction can be averted.

4.3 Surface Water, Fish and Fish Habitat

Minor and short term impacts on surface water may occur as a result of construction activity on the WTP during runoff events. The impact of surface water would include sediment that maybe eroded from the construction site, potential leaks from construction equipment, and fuel spills. Impacts to fisheries and fish habitat are considered minor.

Persistent impacts to the surface water will be effluent discharge into Jack River. The proposed WWTP will produce effluent that is less harmful than the existing WWTP.

4.4 Water Quality

During the projects construction phase the surface water can be impacted by surface and subsurface construction activities. Mitigation measures are necessary to protect water quality during construction activities. These activities are unlikely to result in adverse changes in water quality after the project is complete.

Operational impacts of the WWTP will be effluent discharge into Jack River. The effluent will be discharged downstream of the WTP raw water intake.

4.5 Vegetation

Construction of the project will occur on previously disturbed land as the project is a replacement of an old facility. The disturbed area will consist mainly of grass, and is unlikely to contain any rare plant species. The amount of disturbance is expected to be minimal.

4.6 Wildlife Habitat

During the projects construction and operation only previously developed areas will be used. This is due to the project being a replacement of existing facilities. The potential for adverse effects to wildlife habitat of loss of wildlife habitat is expected to be negligible.

4.7 Noise and Vibration

During the projects construction phase there will be several sources of noise and vibrations caused by the construction equipment. These noises are considered to be a short term impact, and will persist only through the construction phase. There will also be an increase in noise by vehicles coming to the project site, but this is considered to be minor.

To mitigate the level of noise and vibrations from the construction equipment scheduling of site activities can take place. This would include limiting construction to day-time hours to avoid disturbances to people in the vicinity of the project site.

4.8 Employment and Economy

There are no socio-economic impacts expected as a result of any environmental impacts. Economic implications will not exist for the community of Norway House as the funding for the

project will not come directly from the community. It is expected that there may be some local economic benefit during the construction phase.

The potential effects from the proposed project on employment and local economy are expected to be positive.

4.9 Human Health and Well Being

During the projects construction phase the potential human health and well-being concerns include, potential accidents, equipment malfunction, noise, and dust. These concerns will be mitigated by ensuring equipment is in proper working order, and all safety precautions take place.

The operation of the project has a positive effect as Jack River School will have a wastewater treatment plant that will meet current effluent discharge standards.

4.10 Climate Change

This project will have no predicted impacts to the climate.

5.0 Environmental Mitigation Measures

Environmental practices proposed to prevent or mitigate environmental effects that were deemed adverse are identified and described in this section.

5.1 Air Quality

Impacts resulting from raised dust may be mitigated by spraying down dry gravel, limiting construction during periods of high winds, and restoring vegetation to exposed soil as soon as possible.

Impacts resulting from emissions may be mitigated by ensuring equipment is well maintained, and reducing the idling of vehicles.

5.2 Soil

Impacts resulting from contamination of soil from petroleum products include devising a response plan to manage potential spills, ensuring maintained equipment, using appropriate methods for transport of petroleum products, and the use of spill clean-up equipment materials.

Impacts resulting from soil erosion will be minimized by quickly establishing re-growth of any vegetation removed from the construction site. Once vegetation covers the exposed soil the risk of soil erosion will be extinguished with regards to the project.

5.3 Surface Water

The potent impacts from surface runoff will be minimized by ensuring all mechanical equipment is in good working order, ground burden from the excavation site is located away from watercourse, and use of spill clean-up equipment is used in the event of a fuel spill. A setback of 100m from watercourses will be undertaken for fuel ling activities to ensure no contamination as a result of surface runoff. To prevent surface runoff post construction, re-establishment of vegetation in disturbed areas will take place as soon as possible.

An emergency response plan can be implemented in the event of a significant spill. In the event of a significant spill, Manitoba Conservation and Water Stewardship will be notified by their emergency response line. Appropriate measures will be taken in accordance with Manitoba Conservation and Water Stewardship requirements.

To mitigate the effluent discharge, a UV disinfection system will be installed to lower the risk of any adverse effects of discharge in the surface water.

5.4 Vegetation and Wildlife Habitat

Impacts resulting from removed vegetation and effects to habitat will be rectified by re-vegetating disturbed areas as soon as possible. These impacts will be low due to this project being a replacement of an existing facility.

5.5 Fisheries

Mitigation measures to prevent impacts to fish and fish habitat will be achieved through measures discussed in sections 5.2 and 5.3.

5.6 Noise and Vibration

Impacts resulting from noise and vibrations will be mitigated by scheduling construction activities to normal working hours, ensuring regular maintenance of construction equipment, and limiting idling of vehicles to decrease noise and vibrational effects.

5.7 Water Conservation

Water conservation measures will include regular maintenance and monitoring of the WWTP to ensure there are no leaks in the system. A recommendation is provided to Frontier School Division to install water conserving plumbing fixtures in the school as well as the teacherages when fixture replacement is required thereby lessening the potential inflows to the WWTP.

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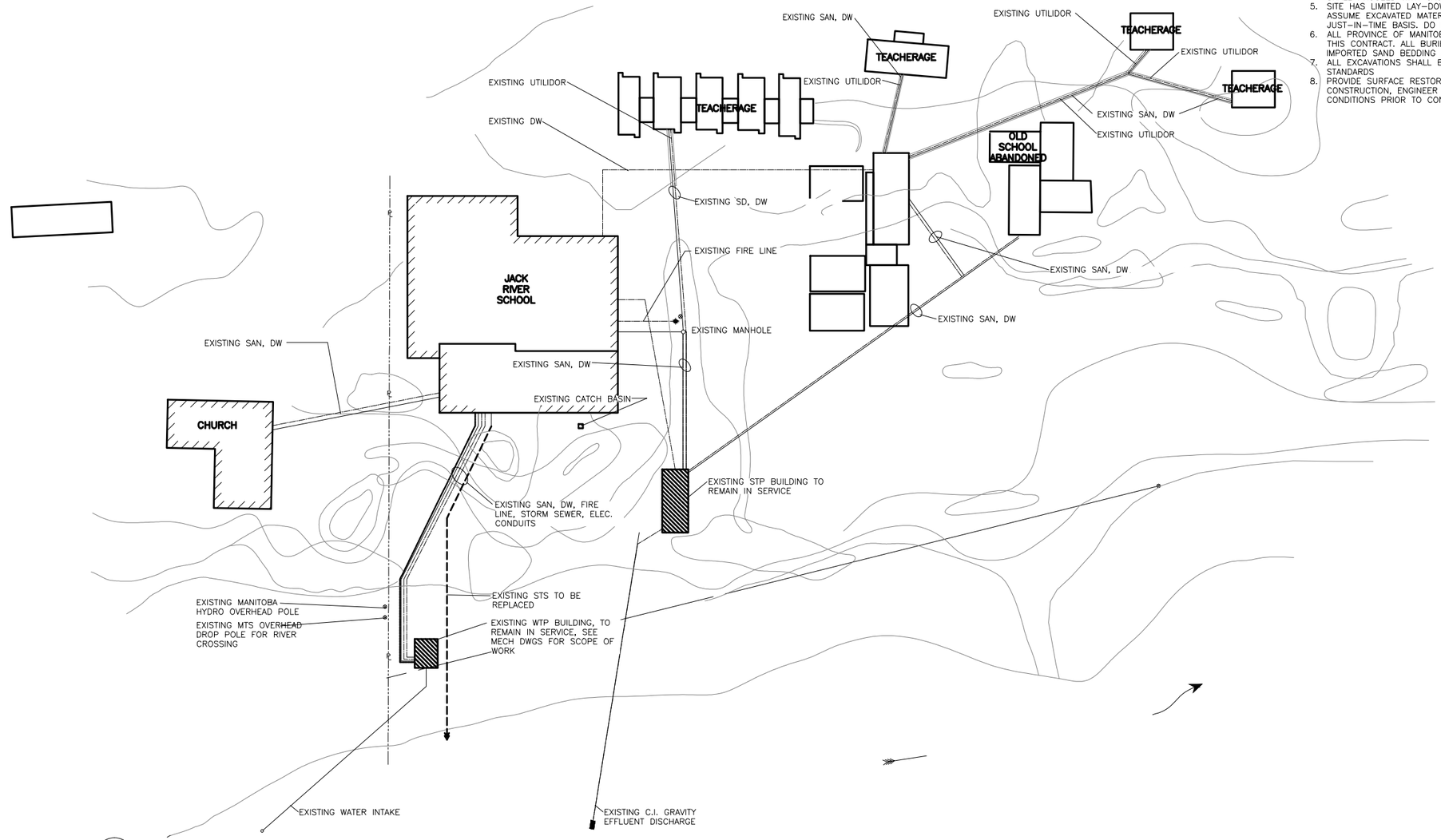
Appendix

- Site Plans,
- Preliminary Building & Equipment General Arrangements
- Raw Water Quality Data
- Title Certificate



A — SITE PLAN – EXISTING CONDITIONS

SCALE 1:500 559x864 A1 SHEET
SCALE 1:1000 279x434 B1SHEET

GENERAL NOTES:

1. CO–ORDINATE ALL WORKS WITH JACK RIVER WTP & STP STAFF STAFF TO ENSURE CONTINUITY OF OPERATIONS.
2. PROVIDE SCHEDULE OF TIE–INS MINIMUM OF 2 WEEKS PRIOR TO PERFORMING THESE WORKS. CO–ORDINATE WITH WTP & STP STAFF. FINAL DECISION ON TIE–IN SCHEDULES RESTS SOLELY WITH THE STAFF.
3. MAINTAIN TRUCK ACCESS TO SITE, AS INSTRUCTED BY STAFF
4. UNDERGROUND STRUCTURES AS INDICATED ON DRAWINGS ARE BASED ON BEST AVAILABLE FILE INFORMATION. THE ACCURACY OF THIS INFORMATION CANNOT BE GUARANTEED. ALL EXCAVATIONS SHALL PROCEED WITH CAUTION. OBTAIN ALL REQUIRED UTILITY CLEARANCES.
5. SITE HAS LIMITED LAY–DOWN AREA FOR PIPE, BEDDING & BACKFILL & EXCAVATED MATERIALS. ASSUME EXCAVATED MATERIALS REQUIRE OFF–SITE DISPOSAL. SUPPLY MATERIALS TO SITE ON A JUST–IN–TIME BASIS. DO NOT UNNECESSARILY ENCUMBER SITE
6. ALL PROVINCE OF MANITOBA STANDARD CONSTRUCTION SPECIFICATIONS APPLY TO THE WORKS OF THIS CONTRACT. ALL BURIED PIPE INSTALLATION SHALL PROCEED ON THE BASIS OF CLASS B IMPORTED SAND BEDDING & GRANULAR BACKFILL.
7. ALL EXCAVATIONS SHALL BE PERFORMED IN ACCORDANCE TO PROVINCE OF MANITOBA CONSTRUCTION STANDARDS
8. PROVIDE SURFACE RESTORATION TO ALL AREAS AFFECTED BY CONSTRUCTION. PRIOR TO CONSTRUCTION, ENGINEER AND CONTRACTOR TOGETHER SHALL COMPILE A PHOTOCOPY RECORD OF CONDITIONS PRIOR TO CONSTRUCTION.

REFERENCE DRAWINGS:

WATER TREATMENT PLANT SITE PLAN & OUTSIDE SERVICES, DWG. NO. 73016–07–G1 REV1, WARDROP ENGINEERING, DEC. 1973

0m 5m 10m 15m 20m
SCALE 1:500
0m 10m 20m 30m 40m
SCALE 1:1000

APEGM Certificate of Authorization
Alliance Engineering Services Inc.
No.2906 Date: _____

REV	DESCRIPTION	Date	APPROVED
C	ISSUED FOR ENVIRONMENTAL APPROVAL	2014/05/06	AFG
B	ISSUED FOR FINAL REPPORT	2014/01/17	AFG
A	COMMENTS ISSUE SCOPE STUDY	2013/12/11	AFG

REVISIONS

EXISTING	LEGEND – PLAN	PROPOSED	EXISTING	LEGEND – PLAN	PROPOSED	EXISTING	LEGEND – PROFILE	PROPOSED	EXISTING	LEGEND – PROFILE	PROPOSED
150 W.M.	WATERMAIN	150 W.M.		HYDRO		150 XSL	WATERMAIN	150 XSL		NORTH OR WEST DITCH	
	HYDRANT			M.T.S.			HYDRANT , VALVE			SOUTH OR EAST DITCH	
	VALVE			TELEGRAPH			STORM SEWER				
	VALVE PIT			TRAFFIC SIGNAL			DOMESTIC SEWER				
	STORM SEWER			CURB		×	℄ PROFILE				
	DOMESTIC SEWER			SIDEWALK			NORTH OR WEST GUTTER				
	MANHOLE			EDGE OF PAVEMENT			SOUTH OR EAST GUTTER				
	CATCH BASIN			PROPERTY LINE			NORTH OR WEST SWK.				
	CULVERT			DITCH			SOUTH OR EAST SWK.				
	GAS			SURVEY BAR			NORTH OR WEST ℄				
			386.123	ELEVATION	386.123		SOUTH OR EAST ℄				

NOTE:–
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AT THIS TIME, BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

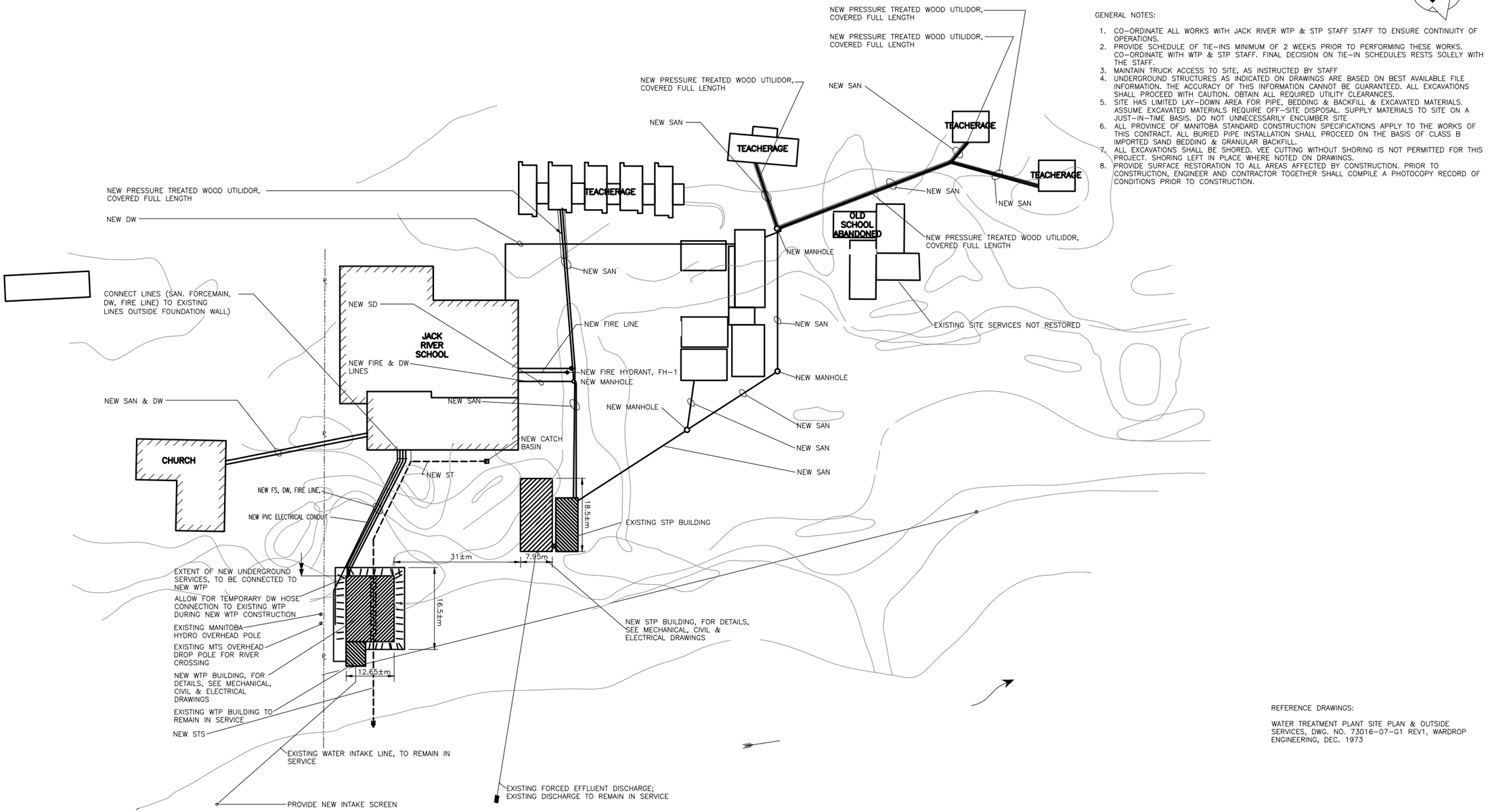
B.M.
ELEV.

Alliance ENGINEERING SERVICES INC

FRONTIER SCHOOL DIVISION

JACK RIVER SCHOOL – NORWAY HOUSE
SITE PLAN
EXISTING CONDITIONS

Design	Checked	SIZE	FSCM NO.	DWG NO.	REV
Drawn	Approved			SITE1	C
		Scale		Sheet 1 of 1	



GENERAL NOTES:

1. CO-ORDINATE ALL WORKS WITH JACK RIVER WTP & STP STAFF STAFF TO ENSURE CONTINUITY OF OPERATIONS.
2. PROVIDE SCHEDULE OF TIE-INS MINIMUM OF 2 WEEKS PRIOR TO PERFORMING THESE WORKS. CO-ORDINATE WITH WTP & STP STAFF. FINAL DECISION ON TIE-IN SCHEDULES RESTS SOLELY WITH THE STAFF.
3. MAINTAIN TRUCK ACCESS TO SITE, AS INSTRUCTED BY STAFF
4. UNDERGROUND STRUCTURES AS INDICATED ON DRAWINGS ARE BASED ON BEST AVAILABLE FILE INFORMATION. THE ACCURACY OF THIS INFORMATION CANNOT BE GUARANTEED. ALL EXCAVATIONS SHALL PROCEED WITH CAUTION. OBTAIN ALL REQUIRED UTILITY CLEARANCES.
5. SITE HAS LIMITED LAY-DOWN AREA FOR PIPE, BEDDING & BACKFILL & EXCAVATED MATERIALS. ASSUME EXCAVATED MATERIALS REQUIRE OFF-SITE DISPOSAL. SUPPLY MATERIALS TO SITE ON A JUST-IN-TIME BASIS. DO NOT UNNECESSARILY ENCUMBER SITE
6. ALL PROVINCE OF MANITOBA STANDARD CONSTRUCTION SPECIFICATIONS APPLY TO THE WORKS OF THIS CONTRACT. ALL BURIED PIPE INSTALLATION SHALL PROCEED ON THE BASIS OF CLASS B IMPORTED SAND BEDDING & GRANULAR BACKFILL.
7. ALL EXCAVATIONS SHALL BE SHORED. VEE CUTTING WITHOUT SHORING IS NOT PERMITTED FOR THIS PROJECT. SHORING LEFT IN PLACE WHERE NOTED ON DRAWINGS.
8. PROVIDE SURFACE RESTORATION TO ALL AREAS AFFECTED BY CONSTRUCTION. PRIOR TO CONSTRUCTION, ENGINEER AND CONTRACTOR TOGETHER SHALL COMPILE A PHOTOCOPY RECORD OF CONDITIONS PRIOR TO CONSTRUCTION.

REFERENCE DRAWINGS:

WATER TREATMENT PLANT SITE PLAN & OUTSIDE SERVICES, DWG. NO. 73016-07-G1 REV1, WARDROP ENGINEERING, DEC. 1973

A — SITE PLAN – NEW CONDITIONS

SCALE 1:500 559x864 A1 SHEET
SCALE 1:1000 279x434 B1SHEET

0m 5m 10m 15m 20m
SCALE 1:500

0m 10m 20m 30m 40m
SCALE 1:1000

APEGM Certificate of Authorization
Alliance Engineering Services Inc.
No.2906 Date: _____

REV	DESCRIPTION	Date	APPROVED
C	ISSUED FOR ENVIRONMENTAL APPROVAL	2014/05/06	AFG
B	ISSUED FOR FINAL REPPORT	2014/01/17	AFG
A	COMMENTS ISSUE SCOPE STUDY	2013/12/11	AFG

REVISIONS

EXISTING	LEGEND – PLAN	PROPOSED	EXISTING	LEGEND – PLAN	PROPOSED	EXISTING	LEGEND – PROFILE	PROPOSED	EXISTING	LEGEND – PROFILE	PROPOSED
150 W.M.	WATERMAIN	150 W.M.		HYDRO		150 W.M.	WATERMAIN	150 W.M.		NORTH OR WEST DITCH	
	HYDRANT			M.T.S.			HYDRANT , VALVE			SOUTH OR EAST DITCH	
	VALVE			TELEGRAPH			STORM SEWER				
Ovh.	VALVE PIT			TRAFFIC SIGNAL			DOMESTIC SEWER				
	STORM SEWER			CURB		×	℄ PROFILE				
	DOMESTIC SEWER			SIDEWALK			NORTH OR WEST GUTTER				
	MANHOLE			EDGE OF PAVEMENT			SOUTH OR EAST GUTTER				
	CATCH BASIN			PROPERTY LINE			NORTH OR WEST SWK.				
	CULVERT			DITCH			SOUTH OR EAST SWK.				
	GAS			SURVEY BAR			NORTH OR WEST ℄				
			396.123	ELEVATION	384.123		SOUTH OR EAST ℄				

NOTE:-
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AT THIS TIME, BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

B.M.
ELEV.

APEGM Certificate of Authorization
Alliance Engineering Services Inc.
No.2906 Date: _____

Alliance ENGINEERING SERVICES INC

FRONTIER SCHOOL DIVISION

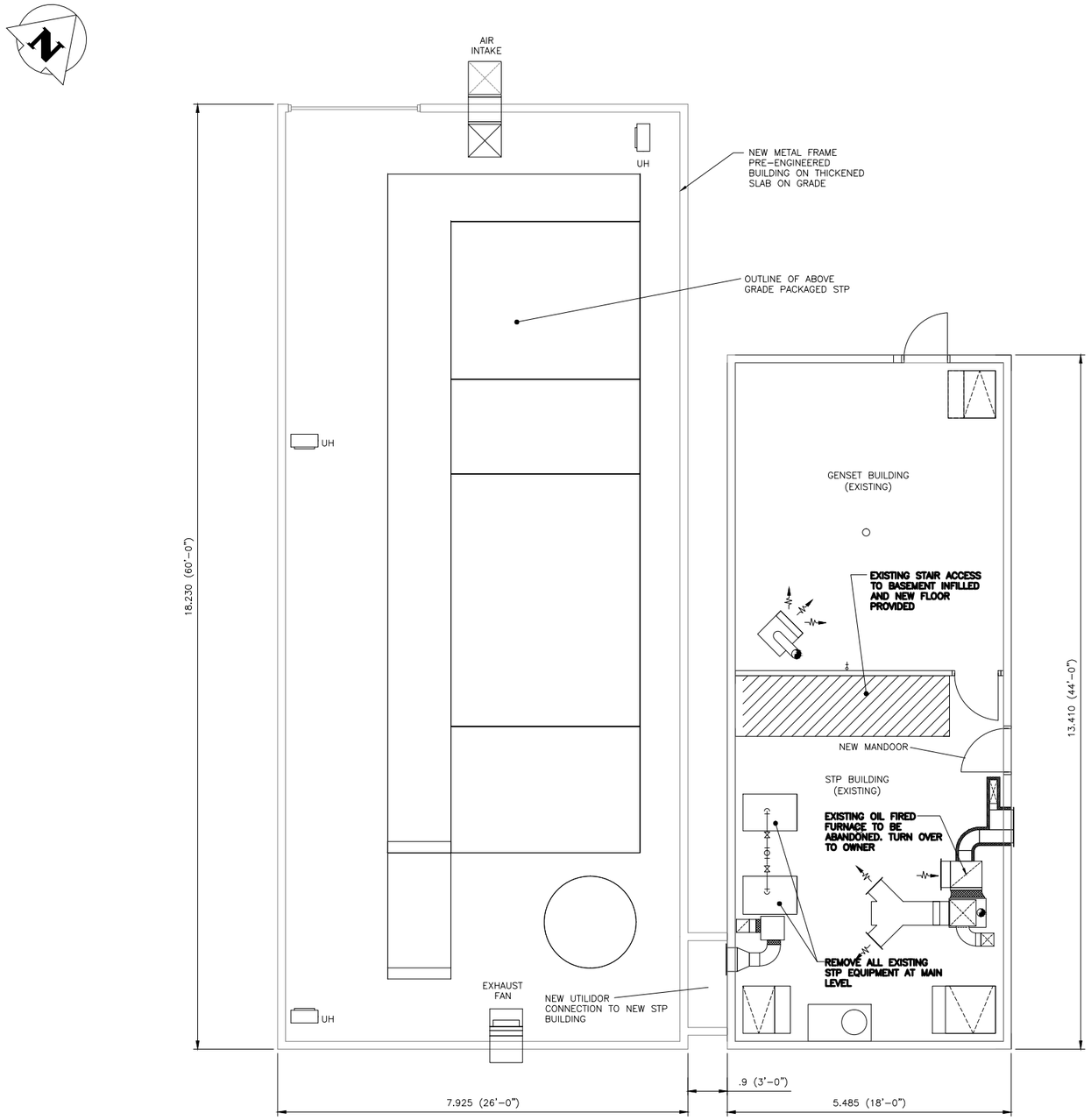
JACK RIVER SCHOOL – NORWAY HOUSE
SITE PLAN – NEW WORKS
NEW CONDITIONS

Design	Checked
Drawn	Approved

SIZE	FSCM NO.	DWG NO.	REV
		SITE2	C

Scale | Sheet 1 of 1

REVISIONS			
REV	DESCRIPTION	Date	APPROVED
A	COMMENTS ISSUE SCOPE STUDY	13/12/11	AFG
B	ISSUED FOR FINAL REPORT	14/01/17	AFG
C	ISSUED FOR ENVIRONMENTAL APPROVAL	14/05/08	AFG



A — PROPOSED NEW ST PLANT

SCALE 1:50 559x864 (22"x34") SHEET
SCALE 1:100 279x434 (11"x17")SHEET

APEGM Certificate of Authorization
Alliance Engineering Services Inc.
No.2906 Date: _____

Alliance ENGINEERING SERVICES INC

FRONTIER SCHOOL DIVISION

JACK RIVER SCHOOL – NORWAY HOUSE
NEW SEWER TREATMENT PLAN
PROPOSED CONDITIONS

Design	Checked	SIZE	FSCM NO.	DWG NO.	REV
Drawn	Approved			M6	C
Scale		Sheet 1 of 1			

Alliance Engineering Services
ATTN: EDGAR THROOP
Frontier School Division
Box 1000
Norway House MB R0B 1B0

Date Received: 21-FEB-14
Report Date: 26-FEB-14 15:31 (MT)
Version: FINAL

Client Phone: 204-359-5889

Certificate of Analysis

Lab Work Order #: L1424951

Project P.O. #: NOT SUBMITTED
Job Reference: NORWAY HOUSE - JACK RIVER SCHOOL STP
C of C Numbers:
Legal Site Desc:

Craig Riddell
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1424951-1 JACK RIVER SCHOOL STP (COMPOSITE 11 AM TO 9 PM)							
Sampled By: Edgar Throop on 20-FEB-14 @ 21:00							
Matrix: Wastewater (Composite)							
Miscellaneous Parameters							
Ammonia, Total (as N)	3.03	DLA	0.10	mg/L		21-FEB-14	R2795968
Biochemical Oxygen Demand	32.3		6.0	mg/L		21-FEB-14	R2796872
Total Kjeldahl Nitrogen	41.5	DLA	5.0	mg/L	22-FEB-14	24-FEB-14	R2795924
Total Suspended Solids	466		5.0	mg/L		24-FEB-14	R2796278

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
The sample is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at the beginning and end of incubation provides a measure of biochemical oxygen demand. If carbonaceous BOD is requested, TCMP is added to the sample to chemically inhibit nitrogenous oxygen demand. If soluble BOD is requested, the sample is filtered prior to analysis. Surface waters have a DL of 1 mg/L. Effluents are diluted according to their history and will have a sample DL of 6 mg/L or greater, depending on the dilutions used.			
N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	Quickchem method 10-107-06-2-E Lachat
Samples are digested with a sulphuric acid solution, cooled, diluted with water, and analyzed for ammonia. Total Kjeldahl nitrogen is the sum of free-ammonia and organic nitrogen compounds which are converted to ammonium sulphate through this digestion process. Analysis is performed by Flow Injection Analysis (FIA). The pH of the digested sample is raised to a known, basic pH by neutralization with a concentrated buffer solution. This neutralization converts the ammonium cation to ammonia. The ammonia produced is heated with saliclyate and hypochlorite to produce blue colour which is proportional to the ammonia concentration.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

12 - 1329 Niakwa Rd. E.
Winnipeg, Manitoba, R2J 3T4

L1424951-COFC

Chain of Custody / Analytical Request Form

CHEMISTRY INFO: (204) 255 9739
MICRO INFO: (204) 255 9740 OR (204) 255 9737

WORK ORDER NO: L1424951

FOR LABORATORY USE ONLY (SHADED)

LAB NO.:
DATE RECEIVED: 21 FEB 14
TIME RECEIVED: 14:55
BY:

Sample Condition Upon Receipt: ☐ Frozen ☐ Cold ☐ Ambient ☐ Broken ☐ Leakage ☐ Incorrect Sample Container
COMMENT: 6

Date Sampled: FEBUARY Time: : A.M. ☐ P.M. ☐
Date Required:

Location: JACK ILLICK SCHOOL SEWAGE TREATMENT PLANT
(Town, Community, City)

Submitter's Name Printed: EDGAR THROOP
Sample Submitted By:

Community Code Number:
Rural Municipality/LGC/UVD: NORWAY HOUSE

SAMPLE TYPE

DRINKING WATER
- ☐ Untreated Well
- ☐ Treated Well
- ☐ Treated Municipal
- ☐ Non-Treated Municipal
- ☐ Water-Surface-Raw
- ☐ Water-Surface-Treated

NON-DRINKING WATER
- ☑ Sewage/Waste Water
- ☐ Lake/River
- ☐ Swimming Pool
- ☐ Whirl Pool
- ☐ Other

PURPOSE OF TEST
☐ Private ☐ Real Estate ☐ Water Main

PLEASE PRINT & PRESS FIRMLY

NOTES & CONDITIONS
1. Quote number must be provided to insure proper pricing.
2. Failure to properly complete all portions of this form may delay analysis.
3. ALS's liability limited to cost of analysis.

SERVICE REQUESTED
☐ REGULAR ☑ PRIORITY (50% SURCHARGE) ☐ EMERGENCY (100% SURCHARGE)

LAB NUMBER	SAMPLE IDENTIFICATION
1	B.O.D
	T.S.S
	T.K.N
	AMONIA

ALS CUSTOMER #: QUOTE #:

REPORT TO BE SENT TO
NAME: EDGAR THROOP
COMPANY: FRONTIER SCHOOL DIVISION
ADDRESS: BOX 1000
CITY/TOWN: NORWAY HOUSE / PROV.: MANITOBA
POSTAL CODE: R0B 1B0
PHONE: 1-204 359 5684
BY: MAIL ☐ FAX ☐ 1 204 359 6975 (FAX NUMBER)
PICKUP ☐ E-MAIL ☑ edgar.throop@frontiersd.mb.ca (EMAIL ADDRESS)

CC
NAME: ART GOSSEN
ADDRESS: 1035 LOGAN AVE.
CITY/TOWN: WINNIPEG / PROV.: MB
POSTAL CODE: R3E 1B6
PHONE: 1-204-774-7959
BY: MAIL ☐ FAX ☐ (FAX NUMBER)
PICKUP ☐ E-MAIL ☐ artg@allianceengservices.com (EMAIL ADDRESS)

Analyses required

BILLING ADDRESS SAME AS REPORT TO ☐
NAME: ALLIANCE ENGINEERING SERVICE INC.
COMPANY: ATT ART GOSSEN
ADDRESS: 1035 LOGAN
CITY/TOWN: WINNIPEG / PROV.: MB
POSTAL CODE: R3E 1B6

PAYMENT PARTICULARS
☐ INVOICE NEEDED / CLIENT'S P.O. NO.
☐ INTERAC
☐ CASH Subtotal $
☐ CHEQUE G.S.T. $
☐ VISA / MASTERCARD Total $
* OUR POLICY IS NOT TO ACCEPT SAMPLES FROM THE PRIVATE CITIZEN WITHOUT PREPAYMENT

SAMPLING INSTRUCTIONS ON REVERSE SIDE

Manitoba Technology Centre Ltd.
Part of the **ALS Laboratory Group**
12 - 1329 Niakwa Rd. E., Winnipeg, MB Canada R2J 3T4
Phone: +1 204 255 9720 Fax: +1 204 255 9721 **www.alsglobal.com**
A Campbell Brothers Limited Company

SUBMITTER COPY

ENTERED IN LIMS BY:

Frontier School Division
ATTN: EDGAR THROOP
Jack River School
Box 1000
Norway House MB R0B 1B0

Date Received: 26-NOV-13
Report Date: 04-FEB-14 13:09 (MT)
Version: FINAL REV. 2

Client Phone: 204-359-6365

Certificate of Analysis

Lab Work Order #: L1396310

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Chantal Bouchard
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1396310-1 TREATED SEWAGE							
Sampled By: Edgar Throop on 26-NOV-13 @ 08:30							
Matrix: Sewage							
Miscellaneous Parameters							
Ammonia, Total (as N)	22.7	DLA	1.0	mg/L		27-NOV-13	R2750733
Biochemical Oxygen Demand	<6.0		6.0	mg/L		27-NOV-13	R2752801
Total Suspended Solids	32.0		5.0	mg/L		27-NOV-13	R2750872
Total and Fecal Coliform by MPN							
Fecal Coliform							
Fecal Coliforms	1200		3	MPN/100mL		29-NOV-13	R2752281
Total Coliform							
Total Coliforms	4300		3	MPN/100mL		29-NOV-13	R2752281
L1396310-2 RAW SEWAGE							
Sampled By: Edgar Throop							
Matrix: Sewage							
Miscellaneous Parameters							
Ammonia, Total (as N)	21.1	DLA	1.0	mg/L		27-NOV-13	R2750733
Biochemical Oxygen Demand	13.9		6.0	mg/L		27-NOV-13	R2752801
Phosphorus (P)-Total	0.381		0.010	mg/L		29-NOV-13	R2751756
Total Kjeldahl Nitrogen	25.6	DLA	2.0	mg/L	27-NOV-13	28-NOV-13	R2751071
Total Suspended Solids	15.0		5.0	mg/L		27-NOV-13	R2750872
Nitrogen Total							
Nitrate as N by Ion Chromatography							
Nitrate-N	<0.050		0.050	mg/L		27-NOV-13	R2751051
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		28-NOV-13	
Nitrite as N by Ion Chromatography							
Nitrite-N	<0.050		0.050	mg/L		27-NOV-13	R2751051
Total Nitrogen Calculated							
Total Nitrogen	25.6		2.0	mg/L		28-NOV-13	
Total and Fecal Coliform by MPN							
Fecal Coliform							
Fecal Coliforms	>110000		3	MPN/100mL		29-NOV-13	R2752281
Total Coliform							
Total Coliforms	>110000		3	MPN/100mL		29-NOV-13	R2752281

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
The sample is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at the beginning and end of incubation provides a measure of biochemical oxygen demand. If carbonaceous BOD is requested, TCMP is added to the sample to chemically inhibit nitrogenous oxygen demand. If soluble BOD is requested, the sample is filtered prior to analysis. Surface waters have a DL of 1 mg/L. Effluents are diluted according to their history and will have a sample DL of 6 mg/L or greater, depending on the dilutions used.			
ETL-N-TOT-ANY-WP	Water	Total Nitrogen Calculated	Calculated
FC-MPN-WP	Water	Fecal Coliform	APHA 9221A-C
The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.			
N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	Quickchem method 10-107-06-2-E Lachat
Samples are digested with a sulphuric acid solution, cooled, diluted with water, and analyzed for ammonia. Total Kjeldahl nitrogen is the sum of free-ammonia and organic nitrogen compounds which are converted to ammonium sulphate through this digestion process. Analysis is performed by Flow Injection Analysis (FIA). The pH of the digested sample is raised to a known, basic pH by neutralization with a concentrated buffer solution. This neutralization converts the ammonium cation to ammonia. The ammonia produced is heated with saliclyate and hypochlorite to produce blue colour which is proportional to the ammonia concentration.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-WP	Water	Nitrite as N by Ion Chromatography	EPA 300.1 (modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
NO3-IC-WP	Water	Nitrate as N by Ion Chromatography	EPA 300.1 (modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TC-MPN-WP	Water	Total Coliform	APHA 9221A-C
The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

MANITOBA

Cert. No. 145546

Certificate of Title

UNDER "THE REAL PROPERTY ACT"

THE FRONTIER SCHOOL DIVISION NO. 48

is now seized of an estate in fee simple in possession subject to such encumbrances, liens and interests as are notified by memorandum underwritten (or endorsed hereon) in all that piece or parcel of land known and described as follows,

The most North Easterly Seven Hundred and Fifteen feet in perpendicular width of Lot Sixty-three, in the Settlement of Norway House, in Manitoba, as shown on a Plan registered in the Neepawa Land Titles Office as No. 1259.

SUBJECT TO SPECIAL RESERVATIONS AS TO MINES, MINERALS AND OTHER MATTERS AS PARTICULARLY DEFINED IN THE ORIGINAL GRANT OF SAID LAND FROM THE CROWN.

IN WITNESS WHEREOF I have hereunto signed my name and affixed my Seal of office this Thirteenth day of May One thousand nine hundred and SEVENTY.

Signed in the presence of

DEPUTY District Registrar

for Neepawa, Man.

(FACT)

September 1973

at 9:46

No. 6624

Mortgage for $	The day of 19 at	TO	No.
Mortgage for $	The day of 19 at	TO	No.
Mortgage for $	The day of 19 at	TO	No.
Mortgage for $	The day of 19 at	TO	No.

Deputy District Registrar

No. 43823 - Mech. Lien Reg'd 22 July 1972

RELEASED

Scriptel Industries (Western) Ltd.

VS. The Frontier School Division

[illegible] District Registrar

DISCHARGE of Mechanic's Lien No. 43823 by D. B. 374444 Reg'd 12 March 1973 at 9:34

DISTRICT REGISTRAR

No. 48601 CAVEAT Filed 25 Oct 1973 @ 9:24

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF MANITOBA

DEPUTY DISTRICT REGISTRAR