



## Memorandum

Project Name: **Igloolik Fill**

Project #: OTT-00019838-B0 /File No: 50.2

**Recommendations**

To: Mr. Bhabesh Roy

From: Eric Bell

Date: September 17, 2020

Subject: Flowmeter and fish screen

Prepared By: Eric Bell

Distribution: Ken Johnson

### Suggested Scope of Work for Igloolik raw water intake

The Hamlet of Igloolik is requesting recommendations for the upgrade of a flow meter on the raw water supply line and for upgrades on the water intake to include fish screen. This memo summarizes the selection options for each and includes a specification / model selection for each.

#### Water Flow Meter:

For the purposes of measuring water quantity filling a reservoir, a flow totalizing flowmeter is the desired technology. Utilizing a Magnetic flowmeter or other technology is an option, however the use a turbine flow meter with no electrical requirements and ease of trouble shooting would be the most desired. A turbine flow meter is a widely used technology for totalizing the amount of water that flows through the pipe. With a turbine flow meter a screen prior to the turbine is required. Given the screening upgrade on the intake to be done, this should not pose any significant operation challenges, however the operations group should be made aware of this item. The two (2) variations of the flow meters that are referenced in the specification are Neptune and SENSUS manufacturers. The use of a 6" flowmeter has been selected as it is the size of the current pipe flanges for ease of installation and has good accuracy at the 1000+ USGPM range which in the range of the pump capacities.

The following is the excerpt recommended for procurement and supply/installation of the flowmeter:

1. *General 6" turbine flowmeter (totalizer)*
  - 1.1. *All meters furnished shall be produced in a manufacturing facility whose QMS is ISO 9001 certified.*
  - 1.2. *Acceptable meters shall have a minimum of fifteen (15) years of successful field use.*
  - 1.3. *All specifications meet or exceed the latest revision of AWWA C701.*
  - 1.4. *all water meters submitted in this proposal be compliant with NSF/ANSI 61, and NSF/ANSI 372.*
  - 1.5. *Meters shall be made of "lead free" alloy as defined by NSF/ANSI 61 and NSF/ANSI 372.*

- 1.6. *Meters shall be certified to NSF/ANSI 61 and NSF/ANSI 372 requirements*
- 1.7. *Meters shall be of the inline horizontal-axis type per AWWA Class II.*
2. **Case and Cover**
  - 2.1. *The maincase and cover shall be cast from epoxy coated ductile iron or brass that is certified lead free alloy.*
  - 2.2. *The size, model, NSF certification and arrows indicating direction of flow shall be cast in raised characters on the maincase or cover.*
  - 2.3. *The cover shall contain a calibration vane for the purpose of calibrating the turbine measuring element while the meter is inline and under pressure.*
  - 2.4. *Casing bolts shall be made of AISI Type 316 stainless steel.*
  - 2.5. *Maincases shall be flanged to 150# 150mm (6inch) connection.*
  - 2.6. *Registers shall be weather protected and tamper proof construction. Flow totaling indication shall be in cubic metres. Registers shall allow for in-line serviceability*
  - 2.7. *The register box shall be affixed to the top cover by means of a plastic tamperproof seal*
  - 2.8. *The turbine measuring chamber shall be a self-contained unit attached to the cover for easy removal. The turbine spindles shall be stainless steel; turbine shafts shall be tungsten carbide or approved equal.*
  - 2.9. *Unit is to be shipped as a complete assembly, factory-calibrated to AWWA standards, that includes the cover, registers, and both a turbine measuring element assembly. It shall be easily field-removable from the meter body without the requirement of unbolting flanges.*
  - 2.10. *Registration accuracy over the normal operating range shall be 98.5% to 101.5%.*
  - 2.11. *Acceptable meters shall be Neptune HP Turbine, SENSUS OMNI T2 or approved equal.*
3. **Water Meter Strainer**
  - 3.1. *All strainers furnished shall be produced by the same supplier as the flow totalizer supplied. The strainer is to be mounted upstream of the meter to prevent debris such as stones or pebbles greater than 3/16" in diameter from entering or damaging the meter.*
  - 3.2. *The strainer shall be designed for minimum weight and pressure loss .*
  - 3.3. *The strainer screen shall be made of perforated stainless steel plate and be shaped for maximum rigidity against forces exerted by the flow stream.*
  - 3.4. *The effective straining area shall be at least double that of the meter maincase inlet area.*
  - 3.5. *The strainer shall be furnished with a direct connection to the supplied flow meter with round flanged connections. Bolt circle, bolt hole diameters, and flange dimensions shall be in compliance with meter connection specifications contained in ANSI/AWWA C701.*
  - 3.6. *The strainer bodies and covers shall be made from NSF/ANSI 61 and NSF/ANSI 372 certified lead free nylon-coated ductile iron or a bronze alloy containing a minimum of 85% copper.*
  - 3.7. *The manufacturer's name, strainer pipe size, and direction of flow (if*

- required) shall be cast in raised letters and shall be clearly visible.
- 3.8. Cover bolts shall be made of AISI Type 316 stainless steel.
  - 3.9. Strainer cover shall be equipped with a vent screw to remove trapped air at installation.
  - 3.10. Acceptable strainers shall be Neptune, SENSUS Strainers or approved equal.
4. Installation:
- 4.1. The installation of flowmeter and strainer shall be done on the downstream flow direction of the pump on the pipeline requirement measurement. The location of the flowmeter shall be positioned so that it is as near to level as possible and not on a down hill direction. It should not be located at a high point where an air bubble could be trapped in or near the flowmeter or screen.
  - 4.2. All applicable manufacturers installation instructions shall be followed for both screen and flowmeter installation.
  - 4.3. The flow meter shall be supported off the ground if possible on risers 50mm in height.
  - 4.4. The HDPE pipe shall be cut and have a 150#, 200mm diameter flange adapter installed. An HDPE welded flange adapter is preferred, megalug may be considered as an alternative.

## Intake Screen

The intake for the raw water pump is reported as a submerged 150mm HDPE pipe. A Department of Fisheries and Oceans (DFO) compliant screen is required to minimize chances that aquatic life is pulled into the intake and removed from its original habitat. The screen itself is either a perforated hole material or a wire/wedge wire formation. The use of wedgewire promotes a preferred hydraulic condition for a limited intake area. The goal of having a reduced area is to keep the surface area as small as possible and therefore promoting the retrieval seasonally as well as ease of installation of the intake piping.

The following is the specification we would recommend for the supply and installation of a wedgewire screen intake:

- 1. Product must be DFO (End-of-pipe fish protection screens for small water intakes in freshwater code of practice) compliant for the rated flowrate of up to 2000 USGPM.
  - 1.1. All materials of construction are to be 316SS and to NSF60/61 rated.
  - 1.2. A circular (Drum) style screen is required to be fabricated from No 90 Wedge Wire on a support rod structure.
  - 1.3. A minimum recommended performance specification for this product to achieve is:
    - 1.4. 0.045 psi pressure drop
    - 1.5. 0.5 fps velocity
    - 1.6. 1675.62 square inches of effective surface area (30.739" diameter by 33" length)
    - 1.7. Flange connection to be 200mm 150# ANSI flange with 316SS hardware.
    - 1.8. Federal Screens (or approved equal) are the approved supplier.
- 2. Supply a ductile iron concentric reducer fitting, 150# flange adapter from 150mm to 200mm. Must carry AWWA, NSF certification and be coated and prepped for water service. Supply 316SS studs and bolts set for both connections. CanadaPipe supply or approved equal.

3. Supply a ductile iron tee fitting, 150# flange 200mm with two (2) blanking flanges. Must carry AWWA, NSF certification and be coated and prepped for water service. Supply 316SS studs and bolts set for both connections. CanadaPipe supply or approved equal.
4. Installation is to be done as per manufacturer's instructions.
  - 4.1. Product is to be installed in the upright vertical position and attach to a 150# 200mm flange pump intake off of a ductile iron Tee or elbow. Screen must be 30cm above bottom of the water course.

### Potential Vendors and Costing

Attached to this memo are two quotes from potential suppliers of the equipment described above; below is the contact information and budget summary;

1. Flowmeter; SENSUS Omni T2 Flow Meter. Budget cost for meter and flanges \$8100 plus taxes and shipping. Estimated cost to be \$11,000 plus installation.  
Paul Saulnier  
Technical Sales Manager  
(902) 237-3865  
scotiatech.paul@ns.sympatico.ca
2. Fish Screen; Federal Screen Products. Budget cost for screen is \$8300 plus taxes and shipping. Also required D.I. reducer and Tee. Estimated cost to be \$15,000 plus installation.  
Donna Kotselidis  
Sales Manager / Senior Project Manager  
7524 Bath Road, Mississauga ON L4T 1L2  
Office: 905-677-4171 ext 232 Fax: 905-677-8959 Cell: 416- 451- 4061  
Donna@federalscreen.com / www.federalscreen.com

Please do not hesitate to contact the undersigned with any further questions on this matter.

Submitted by:

Eric Bell, P.Eng  
Project Engineer

EXP Services Inc.



## Eric Bell

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**From:** Paul Saulnier <[scotiatech.paul@ns.sympatico.ca](mailto:scotiatech.paul@ns.sympatico.ca)>  
**Sent:** Thursday, September 17, 2020 12:05 PM  
**To:** Eric Bell  
**Cc:** Doris Garland  
**Subject:** OMNI T2 Meter pricing



CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Eric,

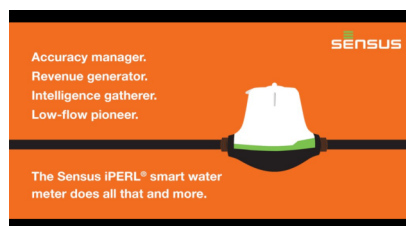
It was a pleasure speaking with you again, for the purposes of budget pricing a Sensus 6" OMNI T2 meter would be in the area of \$7,708.00 plus taxes and shipping from our Dartmouth warehouse. The 6" carbon steel threaded flange set complete with nuts, bolts, washers, and gaskets would be \$406.00 per set plus taxes and shipping from our Dartmouth location.

In the case of the Sensus 8" OMNI T2 meter it would be in the area of \$13,080.00 plus taxes and shipping from our Dartmouth warehouse. The 8" carbon steel threaded flange set complete with nuts, bolts, washers, and gaskets would be \$550.00 per set plus taxes and shipping from our Dartmouth location.

If you have any questions please let me know I am happy to answer any questions. If you place an order you can contact Doris Garland at McLennan Sales (506-634-3112). She will be happy to help you. The delivery time on these larger meters is usually 4 to 6 weeks.

Kind regards and stay safe,

**Paul Saulnier**  
Technical Sales Manager  
(902) 237-3865  
[scotiatech.paul@ns.sympatico.ca](mailto:scotiatech.paul@ns.sympatico.ca)



September 14, 2020

Quote NO. **32684\_R1**

**EXP, Engineers / Consultants**

1133 Regent Street,  
Suite 300  
Fredericton, New Brunswick, Canada, E3B 3Z2

**ATTENTION:** Eric Bell

**EMAIL:** [eric.bell@exp.com](mailto:eric.bell@exp.com)

**PHONE:** 506-451-7425

**Ref:** Igloolik

**FROM:** Donna Kotselidis

**Your local area representative is:**

**Steve Frizzell - INNOVATIVE EQUIPMENT & PROCESS INC - NB/NS**

**Ph:** (902)457-5600 **Fx:**

**Email:** [Craig@innovativenl.ca](mailto:Craig@innovativenl.ca)

**Thank you for your interest in Federal Screen Products, we are pleased to offer the following quotation:**

September 14, 2020

Quote NO. 32684\_R1

## Intake Screens

### Flange x Cap

We offer:

30.739" Dia x 33" Effective Screen Length Standard wound wedge wire screen. No. 90 wrap wire on a No. 177 support rod construction.

Complete with 12" sch 40 stub x 6" long stub and 3/8" thk fabricated 12" 150# ANSI flange one end, and 3/8" long pipe stub and 3/8" thk capped the opposite end.

Slot size 0.100" +/- 0.002" Materials of Construction: 316L SS

\*\* Screen is designed for 1675.62" square actual open area.

At 2000 GPM , .045 PSI, .5 FPS

Materials of Construction: 316L SS

Part Numbers	OAL	Price	Unit	Qty	Subtotal
	40.75"	\$8,295.40	EA	1	\$8,295.40
<b>TOTAL</b>					<b>\$8,295.40</b>

**GRAND TOTAL \$ 8,295.40**

## TERMS

PRICE VALID FOR 30 DAYS

PRICES IN CANADIAN FUNDS AND DOES NOT INCLUDE TAXES

PRICE IS F.O.B. OUR DOCK, MISSISSAUGA, ON

DELIVERY 4 WEEKS

PAYMENT TERMS: COD

All delivery dates subject to receipt of drawing approvals where required. Storage fees to be applied on orders that have not shipped after 1 month of readiness.

APPROVAL DRAWINGS ARO

Prices & delivery subject to prior sales

## Additional Requirements

September 14, 2020

Quote NO. **32684\_R1**

SINCERELY,



Donna Kotselidis  
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Mississauga, Ontario, Canada L4T 1L2