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Building Nunavut Together
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Department of Community and Government Services
Nunalingni Kavamatkunnilu Pivikhaqautikkut
Ministère des Services Communautaires et gouvernementaux

Kugaaruk Water Licence: 3BM-PEL 1419

August 27, 2019

Assol Kubeisinova
Technical Advisor,
Nunavut Water Board,
P O Box 119, Gjoa Haven, NU X0B 1J0

RE: **Respond to CIRNAC letter dated June 14, 2019**
Comments for 3BM-PEL 1419 – Type "B" Water Licence, Kugaaruk

Dear Assol,

We are pleased to respond to your email to provide information to the letter from CIRNAC dated June 14, 2019. Please find attached file information for CIRNAC as requested.

We note that the O&M manual for solid waste and metal dump including Spills Contingency Plan were updated and submitted to the Nunavut Water Board on Aug 21, 2019.

Best Regards,

Shah Alam, P. Eng.
Municipal Planning Engineer,
Community and Government Services
Kitikmeot Region, Cambridge Bay, Nu
Phone: 867-983-4156, fax: 867-983-4124, salam@gov.nu.ca

Explanation to the Technical comments, letter by CIRNAC, dated June 14, 2019

Item # 2 Infrastructure capacity for growing population

Comments: *Lagoon capacity 46,000 m3 will not be sufficient for increase water use of 60,000 m3.*

Explanation:

Water returns to waterbody upto 90 % of the water uses. Sewage water is combined of grey water and black water and retention time inside the lagoon to a maximum of 9 months (Oct – Jun) from community wastewater deposition. The maximum generation of 9 months wastewater into the lagoon will be: 60000 m3 x 90% x 9/12 = 40,500 m3.
Therefore, a lagoon of capacity 46,000 m3 would be enough to store and hold raw sewage for the 9 month period. Moreover, overflow control chute/flume or Freeboard will allow excess water (snow melts, rain water) discharge continuously from the lagoon.

Note that, 60,000 m3 is requested maximum volume, but current year water consumption did not exceed 35,000 m3

Item 3 Measuring water quantity and water return to the source

Comments: *Water quantity reported from the "on tap water delivery system" is the same as read from raw water flow meter?*

Explanation:

Normally, not a reportable water wastage other than truck clean up or overflow during truck fil. Truck delivery water quantity considered closer to accurate and this quantity is the total billing quantity to the users. For more accurate quantity, the flow meter reading can be noted and recorded on monthly basis. As agreed with CIRNAC inspection, both readings can be recorded for future years. Water returns to water body is about 90 % rough order magnitude without the evaporation or percolation into sub-surface.

Item 6 Water quality of Solid Waste facility and metal dump run-off

Comments: *Run-off samples from solid waste facility shows consistently high concentration of iron (total Fe) and Zinc (Total Zn) compared to guidelines. CIRNAC has recommended taking measure to reduce water contamination from solid waste facility by building a berm or a ditch around the southeast of the facility.*

Explanation:

Normally, parameters value of Total dissolved metals increased in ponding water results from leachate and accumulation of substrates over the duration. Due to very shallow ponding area, and late summer in August-September (when flow water very negligible), the grab sampling sometimes are not taken perfectly and dissolved metal substrates on ground are added which and thus increase the iron and zinc parameters. Since these samples represents solid waste and metal dump leachate run-off, high concentration of Total dissolve metals can be found normally at the close area near to these facilities, but the values decreased expectedly to the Final discharge point at the downstream though the presence of oxygen, sunlight, vegetation and dilution.

Explanation to the Technical comments, letter by CIRNAC, dated June 14, 2019

Item 7 **Salt water intrusions**

Comments: *2011 Annual reports shows salt water intrusion in the River water intake. But, no further report noted any evidence of salt intrusion in water intake. CIRNAC wants an update of such repeating or any chance assumed from the history of occurrence.*

Explanation:

Normally, salt intrusion happened somewhere in 20 years interval as seen from the previous history depending on water flow and water depth at intake area. New water treatment plant includes the relocation of the intake screens which has shown improvement in intake water quality as well. Since the last occurrence in 2011, salt intrusion wasn't seen any reportable amount. The salinity meter at the WTP alarms and records the salt contents in water, and if it does happened anytime in future, alternate water source has been identified. Therefore, it can be assumed whether salt intrusion will repeat or will not at all.

Item 11 **Sewage sludge management**

Comments: *Sewage treatment facility O&M manual describes how to measure sludge depth and take samples in the lagoon. CIRNAC recommends to provide information on the sludge management.*

Explanation:

Sewage lagoon has fully decanted and sludge has been taken out to temporary containment in Geotube (included picture shows the Lagoon current status). Therefore, sludge thickness measurement is not required during the lagoon improvement works. Once the repair works completed, updated O&M manual will explain how to and when to take sludge thickness measurement or sludge removal.

Item 12 **Temporary Sewage treatment measures**

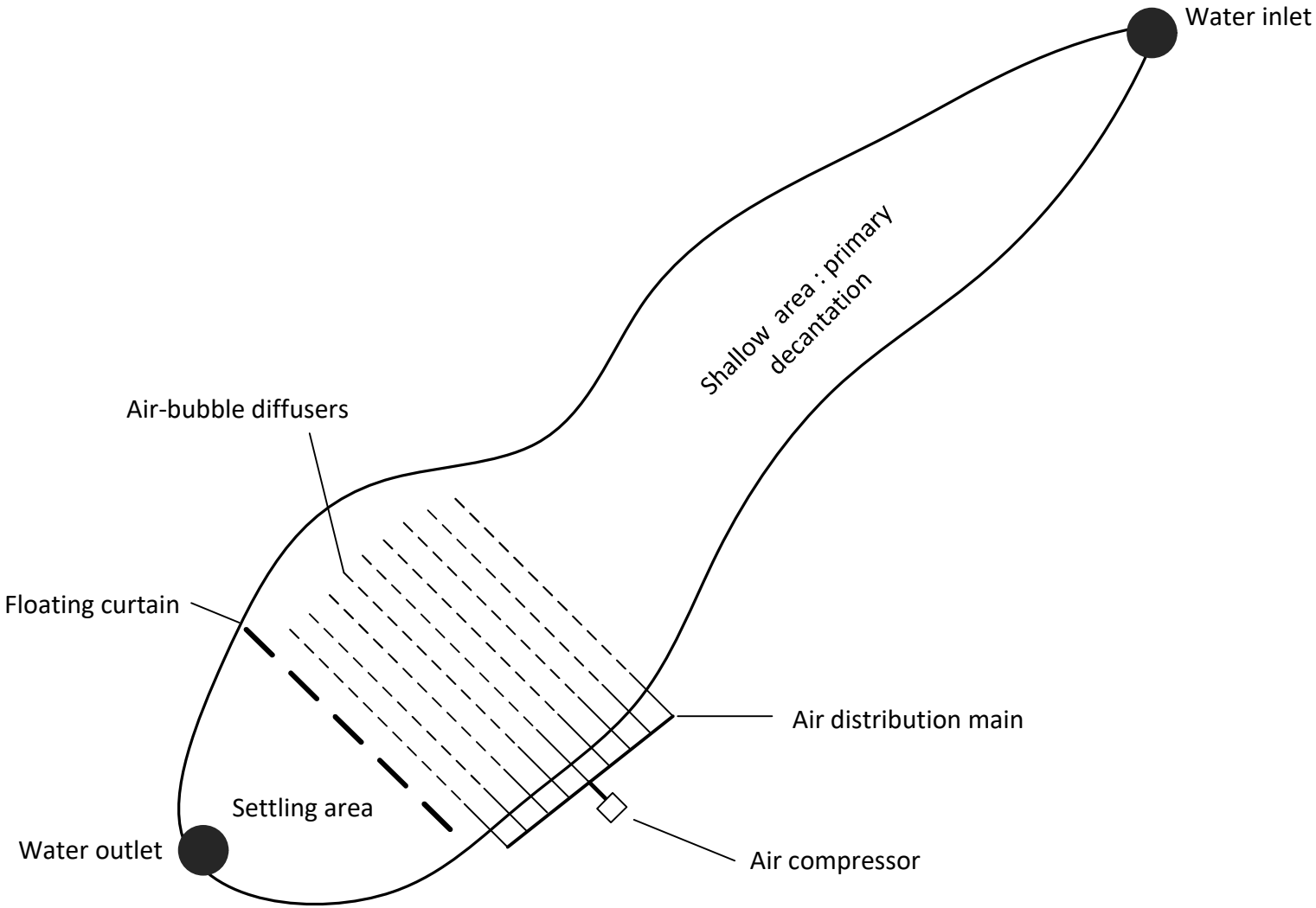
Comments: *Tender drawing (IFC) for project 15425-00239 issued for Kugaaruk sewage lagoon improvement renovation works. Temporary sewage treatment will be required during the repair work. CIRNAC was unable to find information how sewage treatment will be carried and request to provide information on temporary sewage treatment measures and action to prevent unauthorized discharges.*

Explanation:

Temporary sewage deposition into the aeration cell made up of the secondary cell. Sludge removal and temporary sludge management is part of contract. Sludge deposited inside geotube placed on blasted rock pad. Attached pictures shows the temporary sludge management activities until the repair works completed.

P.O. Bag 200, Helen Maksagak Centre
Cambridge Bay, Nunavut X0B 0C0
(867) 983 4156 (867) 983 4123
www.gov.nu.ca

Interim waste management pond



Aeration

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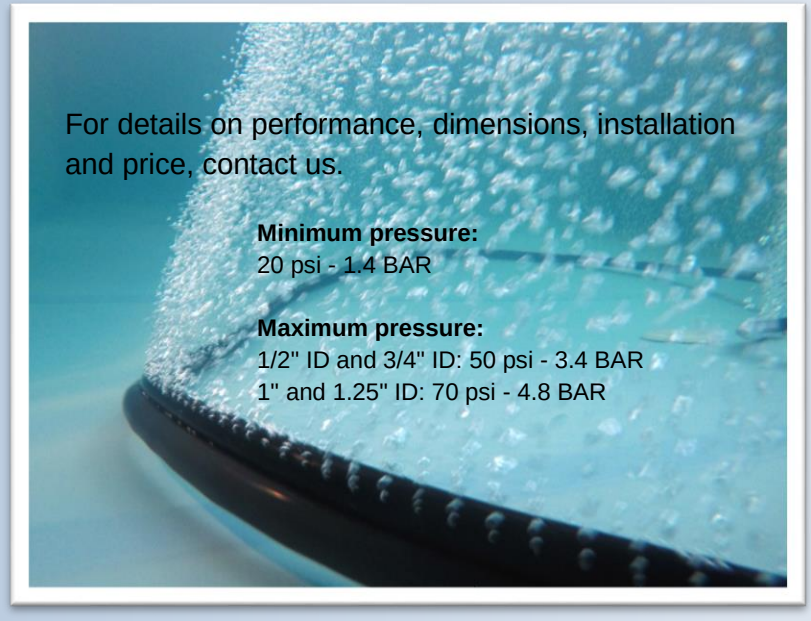

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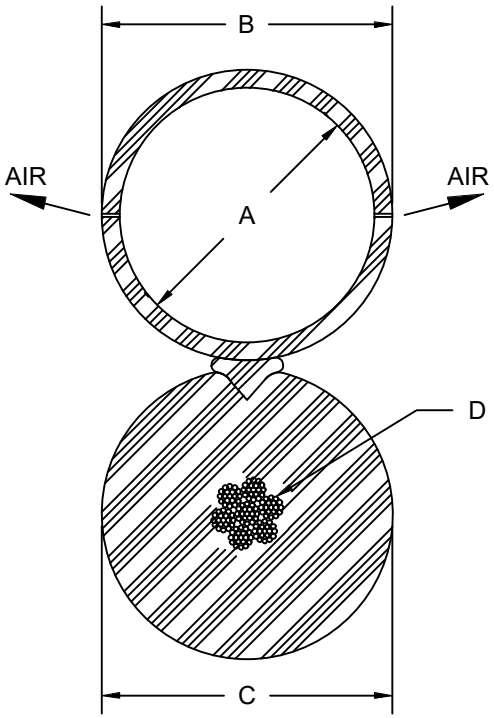

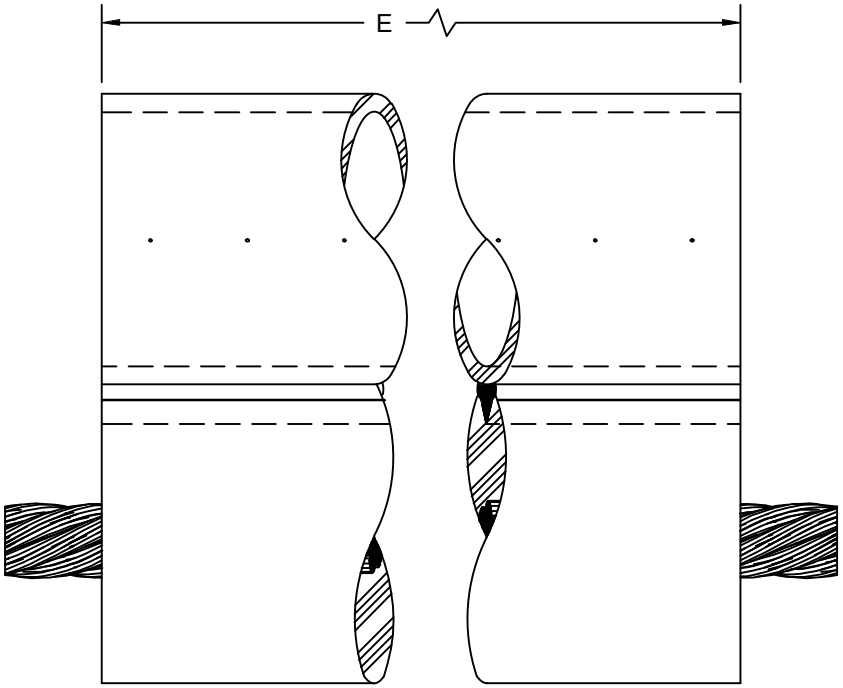

		DIMENSIONS			
		TUBING I.D.	TUBING O.D.	BALLAST O.D.	WIRE CABLE*
CODE	BUBBLE TUBING ®	A	B	C	D
BUB12NW	1/2 (15MM) NON-WEIGHTED	0.575" (14.6 MM)	0.700" (17.8 MM)		
BUB12	1/2 (15MM) WEIGHTED	0.575" (14.6 MM)	0.700" (17.8 MM)	0.970" (24.6 MM)	
BUB34NW	3/4 (20MM) NON-WEIGHTED	0.825" (21 MM)	1.013" (25.7 MM)		
BUB34	3/4 (20MM) WEIGHTED	0.825" (21 MM)	1.013" (25.7 MM)	1.170" (29.7 MM)	1/4" (6.4 MM)
BUB1.0	1" (25MM) WEIGHTED	1.075" (27.3 MM)	1.2" (30.5 MM)	1.550" (39.4 MM)	1/4" (6.4 MM)
BUB1.25	1-1/4 (30MM)	1.325" (33.7 MM)	1.513" (38.4 MM)	1.550" (39.4 MM)	1/4" (6.4 MM)

*7-19 STRAND CORE (SS-316)

		PARAMETERS		
		PRESSURE		WEIGHT
CODE	BUBBLE TUBING ®	MIN.	MAX.**	
BUB12NW	1/2 (15MM) NON-WEIGHTED	20 PSI (1.4 BAR)	50 PSI (3.4 BAR)	0.1 lb/ft (0.15 kg/m)
BUB12	1/2 (15MM) WEIGHTED	20 PSI (1.4 BAR)	50 PSI (3.4 BAR)	0.6 lb/ft (0.9 kg/m)
BUB34NW	3/4 (20MM) NON-WEIGHTED	20 PSI (1.4 BAR)	70 PSI (4,8 BAR)	0.2 lb/ft (0.30 kg/m)
BUB34	3/4 (20MM) WEIGHTED	20 PSI (1.4 BAR)	70 PSI (4,8 BAR)	1.0 lb/ft (1.5 kg/m)
BUB1.0	1" (25MM) WEIGHTED	20 PSI (1.4 BAR)	70 PSI (4.8 BAR)	1.65 lb/ft (2,45 kg/m)
BUB1.25	1-1/4 (30MM)	20 PSI (1.4 BAR)	70 PSI (4.8 BAR)	1.70 lb/ft (2.52 kg/m)

**MAXIMUM BACK PRESSURE READING NOT TO EXCEED DURING OPERATION

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	NOM / NAME:	DATE:
DESSINÉ PAR / DRAWN BY:	D. MARTIN	28-06-2017
APPROUVÉ PAR / APPROVED BY:	M. PARIS	

513 KNOWLTON ROAD, KNOWLTON, QUÉBEC, J0E 1V0, TEL.: 450-243-0976, FAX.: 450-243-1834

TITRE / TITLE:

Bubble Tubing®

Pic: Kugaaruk Sewage Lagoon decanting

Kugaaruk Sewage Lagoon Sludge holding

FIGURE 1: LAGOON CURRENT SITE CONDITIONS

FIGURE 2: LAGGON MATERIAL IN BALSTED HOLE

FIGURE 3: GEOTEXTILE IN BALSTED HOLE

FIGURE 4: INTERIM TREATMENT

FIGURE FILLED GEOTUBE PAD

FIGURE URRENT LAGOON FROM WEST SIDE BERM