



Appendix B
Climate Data

Appendix B

Climate Normals for Kugluktuk

Information provided by <http://www.climate.weatheroffice.gc.ca/Kuglugtuk Nunavut>

Temperature: Temperature:													Code
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	
-27.8	-27.4	-25.3	-17	-5.3	5.2	10.7	8.8	2.8	-7.2	-19.6	-25.5		C
Standard Deviation	3.8	4.2	3.2	3.2	2	2	1.9	1.5	2.5	4.3	3.4		C
Daily Maximum (°C)	-23.7	-23	-20.6	-12.1	9.5	15.4	13.1	6	-4	-15.7	-21.4		C
Daily Minimum (°C)	-31.9	-31.7	-29.8	-21.8	-9.2	0.8	4.5	-0.4	-10.3	-23.4	-29.6		C
Extreme Maximum (°C)													
1981/16	-1.2	-0.1	14	19.8	31.1	34.9	29.2	22.6	13.4	2.8	27.4		
Date (yyyy/dd)	1980/07	1999/22	2000/06	1994/24	1996/25	1989/15	2000/01	1994/01	1988/06	1983/03	1999/19		
Extreme Minimum (°C)													
1981/16	-47.2	-47	-39.7	-30.2	-12.1	0.3	4.4	-18.9	-35.4	-41	-44.5		
Date (yyyy/dd)	1998/20	1979/05	1979/04	1983/03	2000/01	1978/04+	1995/29	2000/26	1996/29	1985/24	1977/12		
Precipitation: Precipitation:													
Rainfall (mm)	0	0	0	0.6	5.8	12.8	36.3	40.8	32.1	5.1	0	0	133.5
Snowfall (cm)	15.4	16.5	16	17.8	16.6	27	0	0.3	8.1	34.1	19.7	18.6	165.8
Precipitation (mm)	11	9.9	10.6	13.3	19.5	15.1	36.3	41.1	39	29.5	12.6	11.5	249.4
Average Snow Depth (cm)	35	43	47	48	28	3	0	0	0	9	20	28	
Median Snow Depth (cm)	36	42	47	49	28	1	0	0	0	9	19	28	
Snow Depth at Month-end (cm)	38	45	48	42	15	0	0	0	2	17	24	32	
Extreme Daily Rainfall (mm)													
1978/01+	0	0	7.4	20.6	27.4	30.5	53.7	28.8	19.3	3.4	0	0	
Date (yyyy/dd)	1978/06+	1978/01+	1980/27	1992/27	1987/13	1983/10	1982/12	1983/07	1980/08	2001/17	1977/01+		
Extreme Daily Snowfall (cm)													
1981/21	26.2	24.6	16	21	13	0.4	5	13.5	23	12.4	26		
Date (yyyy/dd)	1988/01	1981/21	2000/27	1993/07	1991/05	1985/07	1986/23	1981/22	1981/29	1981/06	1994/25		
Extreme Daily Precipitation (mm)													
1988/01	25.8	9.1	6	21.8	27.4	30.5	53.7	28.8	23	12.4	14.8		
Date (yyyy/dd)	1988/01	1981/21	1990/07+	1978/25	1987/13	1983/10	1982/12	1983/07	1981/29	1981/06	1994/25		
Extreme Snow Depth (cm)													
1988/01	80	92	104	128	64	3	3	0	23	43	49	73	
Date (yyyy/dd)	1993/30+	1993/22+	1991/03+	1993/08	1993/01	1986/01+	1978/01+	1981/24	1995/29	1992/30	1994/26+		

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Days with Maximum Temperature: Days with Maximum Temperature:													
<= 0 °C	31	28.3	31	28.4	18.7	1.1	0	0	2.5	23.1	29.6	30.9	C
> 0 °C	0.05	0	0	1.5	12.3	28.9	31	31	27.5	7.9	0.45	0.08	C
> 10 °C	0	0	0	0.04	0.91	12	25.6	20.8	5.4	0.1	0	0.08	C
> 20 °C	0	0	0	0	0	2.5	6	3.9	0.22	0	0	0.08	C
> 30 °C	0	0	0	0	0	0.09	0.26	0	0	0	0	0	C
> 35 °C	0	0	0	0	0	0	0	0	0	0	0	0	C
Days with Minimum Temperature: Days with Minimum Temperature:													
> 0 °C	0	0	0	0	0.95	17.9	31	27.7	14	0.71	0	0	C
<= 2 °C	31	28.3	31	30	30.8	20.7	2.7	7.6	22.7	30.9	30	31	C
<= 0 °C	31	28.3	31	30	30.1	12.1	0	3.3	16	30.3	30	31	C
< -2 °C	31	28.3	31	29.8	27.1	5.1	0	0.59	8.6	27.7	30	31	C
< -10 °C	30.9	28.2	30.9	28	12.8	0.09	0	0	0.39	14.6	28.6	30.9	C
< -20 °C	28.7	26.7	28.5	18.4	2	0	0	0	0	3.1	20	27.9	C
< -30 °C	20.1	18	16.5	4.7	0.05	0	0	0	0	0.29	6.6	16.2	C
Days with Rainfall: Days with Rainfall:													
>= 0.2 mm	0	0	0	0.35	2.1	5.4	10.2	12.5	10.4	1.9	0.05	0	C
>= 5 mm	0	0	0	0.04	0.27	0.65	2.6	2.4	1.9	0.27	0	0	C
>= 10 mm	0	0	0	0	0.18	0.13	0.78	0.73	0.65	0.09	0	0	C
>= 25 mm	0	0	0	0	0	0.04	0.04	0.23	0.04	0	0	0	C
Days With Snowfall: Days With Snowfall:													
>= 0.2 cm	9.4	9.8	10.7	9.4	6.5	1.6	0.09	0.27	3.9	13.9	11.7	10.1	C
>= 5 cm	0.52	0.65	0.35	0.87	0.86	0.17	0	0.05	0.52	2.1	0.91	0.63	C
>= 10 cm	0.13	0.04	0	0.17	0.27	0.04	0	0	0.09	0.55	0.18	0.25	C
>= 25 cm	0.04	0	0	0	0	0	0	0	0	0	0	0.04	C

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Days with Precipitation: Days with Precipitation:																
>= 0.2 mm	8.6	9.1	10	8.9	7.3	7.4	10.2	12.6	12.9	14.5	10.7	9.4				C
>= 5 mm	0.3	0.22	0.17	0.52	1	0.83	2.6	2.4	2.3	1.7	0.18	0.33				C
>= 10 mm	0.04	0	0	0.13	0.45	0.17	0.78	0.73	0.74	0.32	0.05	0.08				C
>= 25 mm	0.04	0	0	0	0	0.04	0.04	0.23	0.04	0	0	0				
Days with Snow Depth: Days with Snow Depth:																
>= 1 cm	31	28.3	31	30	29.5	9.8	0.7	0	2.4	25.5	29.9	31				C
>= 5 cm	31	28.3	31	29.9	26.1	6.4	0	0	0.7	17.8	29.1	31				C
>= 10	31	28.3	31	29.8	22.8	3.1	0	0	0.39	11.4	25.7	31				C
>= 20	22.9	24.6	26.6	25.7	16.8	1.4	0	0	0.13	4.8	12	20.5				C
Wind: Wind:																
Speed (km/h)	19	18.5	15.6	13.4	13.9	14	14.4	15.5	16.8	17.4	16.8	18.2				C
Most Frequent Direction	SW	SW	SW	SW	E	E	E	E	E	SW	SW	SW				C
Maximum Hourly Speed	93	76	83	72	74	61	67	74	74	80	83	93				
Date (yyyy/dd)	1988/01	1978/08+	1980/03	1984/16	1986/28	1995/26	1991/25	1986/22+	2002/24	1982/27	1994/19	1983/25				
Direction of Maximum Hourly Speed	NW	S	NW	E	NW	NW	N	NW	NW	NW	NW	NW				
Maximum Gust Speed	106	106	106	83	89	74	81	83	85	89	100	104				
Date (yyyy/dd)	1988/01	1978/06	1980/03	1984/16	1986/28	1992/11+	1988/23	1984/10+	1983/28	1982/27	1994/05	1983/26				
Direction of Maximum Gust	NW	SW	NW	E	NW	W	NW	NW	NW	NW	NW	NW				
Days with Winds >= 52 km/hr	1.8	2.7	1.7	0.9	0.6	0.1	0.2	0.8	1.2	1.3	0.9	2.2				C
Days with Winds >= 63 km/hr	0.5	0.8	0.4	0.2	0.3	0	0	0.2	0.4	0.5	0.2	0.7				C

Appendix B

Information provided by <http://www.climate.weatheroffice.ec.gc.ca/Kuglugtuk/Nunavut>

Degree Days: Degree Days:																	
Above 24 °C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C
Above 18 °C	0	0	0	0	0	0	0.6	3.1	0.8	0	0	0	0	0	0	0	C
Above 15 °C	0	0	0	0	0	0	1.8	12.3	5.7	0	0	0	0	0	0	0	C
Above 10 °C	0	0	0	0	0	0.1	13.8	60.3	37.7	2.3	0	0	0	0	0	0	C
Above 5 °C	0	0	0	0	0	1.9	56.7	178.7	129.1	20.6	0.3	0	0	0	0	0	C
Above 0 °C	0	0	0	0	0.3	14	160.6	332.2	274.9	100.3	5.2	0	0	0	0	0	C
Below 0 °C	855.2	783.1	782.7	510.1	177.8	6	0	0	0	15.8	225.4	581.5	790.4				C
Below 5 °C	1010.2	924.5	937.7	659.7	320.7	52.2	1.5	9.2	86.1	375.5	731.5	945.4					C
Below 10 °C	1165.2	1065.8	1092.7	809.7	474	159.2	38.1	72.8	217.9	530.2	881.5	1100.4					C
Below 15 °C	1320.2	1207.2	1247.7	959.7	628.9	297.3	145.1	195.8	365.6	685.2	1031.5	1255.4					C
Below 18 °C	1413.2	1292	1340.7	1049.7	721.9	386	228.9	283.9	455.6	778.2	1121.5	1348.4					C
Bright Sunshine: Bright Sunshine:																	
Total Hours		75.8	161.8	221.7	242.5	376.2	342.9	213.2	88.2	52.4	19.7						C
Days with measurable		18	25.8	25.8	25.9	28.6	29.4	27.4	21.1	15.9	9.1						C
% of possible daylight hours		34.8	44.8	47.2	38	52.3	48.7	39.5	22.1	18.1	12.8						C
Extreme Daily																	
	5.2	8.4	42.9	17.2	22.9	24	24	19.1	14.1	10.5	6.4	1					C
Date (yyyy/dd)	1998/30	1980/27	1997/28	1994/28	1985/31	1981/09+	1982/05+	1987/01	2000/01	1988/02	2000/05	1981/01					
Humidex: Humidex:																	
Extreme Humidex	0.3	-1.7	-0.3	7.9	19.8	30.3	36.8	36.8	22.7	12.3	2.2	-1.5					
Date (yyyy/dd)	1981/16	1980/07	1999/22	1995/28	1994/24	1996/25	1989/15	1992/02	1994/01	1988/06	1983/03	1999/24					
Days with: Humidex >= 30			0	0	0	0	0.5	0.2	0	0	0	0	0	0	0	0	C
Days with Humidex >= 35			0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	C
Days with Humidex >= 40			0	0	0	0	0	0	0	0	0	0	0	0	0	0	C

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Wind Chill: Wind Chill:															
Extreme Wind Chill	-64.3	-64.4	-65	-54.4	-39.7	-15.6	-6.2	-11.8	-22.9	-46.5	-54.1	-61.5			
Date (yyyy/dd)	1990/26	1985/21	1979/05	1979/04	1983/04	1978/09	1985/21	1995/29	1992/25	1996/27	1985/25	1984/09			
Days with Wind Chill < -20	30.7	28.1	30.4	25.5	7.8	0	0	0	0.2	10.5	27.1	30.7	C		
Days with Wind Chill < -30	28.4	25.3	27.2	14.7	1.2	0	0	0	0	2.4	18.8	27.1	C		
Days with Wind Chill < -40	22.3	18.9	17.2	4.6	0	0	0	0	0	0.2	8.1	18	C		
Humidity: Humidity:															
Average Vapour Pressure (kPa)			0.1	0.2	0.4	0.7	1	0.9	0.6	0.4	0.1	0.1	C		
Average Relative Humidity - 0600LST (%)			78.4	82.8	87.4	84.1	81.9	87.7	88.8	87	81.5	78	C		
Average Relative Humidity - 1500LST (%)			78.4	83	84.1	71.2	64.2	68.4	75.9	84.9	81.1	78.3	C		
Pressure: Pressure:															
Average Station Pressure (kPa)	101.6	101.7	101.8	101.8	101.7	101.2	101.1	101	101	101.2	101.4	101.5	C		
Average Sea Level Pressure (kPa)	101.9	102	102.1	102.1	102	101.5	101.4	101.3	101.3	101.5	101.7	101.8	C		
Visibility (hours with): Visibility (hours with):															
< 1 km	21.2	29.8	18.6	23.6	27.9	9	11.1	5.9	4.8	9.1	11.8		D		
1 to 9 km	138.3	129.8	122.9	101.1	74.9	23.2	26	27.7	45	106	97.9		D		
> 9 km	584.6	518.1	602.5	595.3	641.2	687.8	706.9	710.4	670.2	628.9	610.3		D		
Cloud Amount (hours with): Cloud Amount (hours with):															
0 to 2 tenths	298.4	261.5	290	240.6	171	188.4	146.1	111.1	80.2	105.5	200.2		D		
3 to 7 tenths	136	130.8	132.5	120.3	106.3	151.6	181	155.6	105.7	89.9	140.8		D		
8 to 10 tenths	309.6	285.4	321.5	359.1	466.7	380.1	416.9	477.4	534.1	548.6	379.1		D		



Appendix C
Projected Water Requirements and
Sewage Generation Rates

Table 4
Sewage Generation Rate for the Hamlet of Kugluktuk, Nunavut

Planning Year	Calendar Year	Total Population ¹	Projected Sewage generation ² (lpcd)	Projected Volume (litres/day)	Projected Volume (litres/year)	Projected Sludge Quantity (kg/annum)	Cumulative Sludge Volume ³ (m ³)	BOD (mg/l)	TSS (mg/l)	T-PO ₄ (mg/l)	TKN (mg/l)	Faecal Coliforms (C.F.U./100ml)
0	2006	1585	136.5	216,281	78,942,629	28,926.3	984.2	329.8	351.8	16.9	87.9	6.96E+07
	2007	1618	137.2	222,012	81,034,472	29,528.5	1,948.5	328.0	349.8	16.8	87.5	6.92E+07
	2008	1653	138.0	228,145	83,273,074	30,167.3	2,954.1	326.0	347.8	16.7	86.9	6.88E+07
	2009	1686	138.8	233,980	85,402,593	30,769.5	3,979.7	324.3	345.9	16.6	86.5	6.85E+07
	2010	1720	139.6	240,043	87,615,768	31,390.0	5,026.1	322.4	343.9	16.5	86.0	6.81E+07
5	2011	1760	140.5	247,245	90,244,352	32,120.0	6,096.7	320.3	341.7	16.4	85.4	6.76E+07
	2012	1793	141.2	253,242	92,433,157	32,722.3	7,187.5	318.6	339.8	16.3	85.0	6.73E+07
	2013	1827	142.0	259,472	94,707,414	33,342.8	8,298.9	316.9	338.0	16.2	84.5	6.69E+07
	2014	1859	142.8	265,385	96,865,621	33,926.8	9,429.8	315.2	336.2	16.1	84.1	6.65E+07
	2015	1893	143.5	271,719	99,177,554	34,547.3	10,581.4	313.5	334.4	16.0	83.6	6.62E+07
10	2016	1928	144.3	278,285	101,577,760	35,186.0	11,754.2	311.8	332.5	15.9	83.1	6.58E+07
	2017	1965	145.2	285,308	104,137,484	35,861.3	12,949.6	309.9	330.6	15.8	82.6	6.54E+07
	2018	2000	146.0	292,000	106,580,000	36,500.0	14,166.3	308.2	328.8	15.8	82.2	6.51E+07
	2019	2041	146.9	299,911	109,467,392	37,248.3	15,407.9	306.2	326.7	15.7	81.7	6.47E+07
	2020	2076	147.7	306,725	111,954,570	37,887.0	16,670.8	304.6	324.9	15.6	81.2	6.43E+07
15	2021	2107	148.5	312,835	114,184,737	38,455.3	17,952.6	303.1	323.3	15.5	80.8	6.40E+07
	2022	2139	149.2	319,082	116,465,007	39,032.1	19,253.7	301.6	321.7	15.4	80.4	6.37E+07
	2023	2171	149.9	325,470	118,796,633	39,617.6	20,574.3	300.1	320.2	15.3	80.0	6.34E+07
	2024	2203	150.7	332,002	121,180,905	40,211.9	21,914.7	298.7	318.6	15.3	79.6	6.30E+07
	2025	2236	151.4	338,683	123,619,146	40,815.1	23,275.2	297.2	317.0	15.2	79.2	6.27E+07
20	2026	2270	152.2	345,514	126,112,716	41,427.3	24,656.1	295.6	315.4	15.1	78.8	6.24E+07
	2027	2304	153.0	352,501	128,663,012	42,048.7	26,057.7	294.1	313.7	15.0	78.4	6.21E+07
	2028	2339	153.8	359,648	131,271,469	42,679.4	27,480.3	292.6	312.1	15.0	78.0	6.18E+07
	2029	2374	154.6	366,958	133,939,561	43,319.6	28,924.3	291.1	310.5	14.9	77.6	6.15E+07
	2030	2409	155.4	374,435	136,688,802	43,969.4	30,390.0	289.6	308.9	14.8	77.2	6.11E+07
25	2031	2445	156.2	382,084	139,460,748	44,629.0	31,877.6	288.0	307.2	14.7	76.8	6.08E+07

Reference: Nunavut Bureau of Statistics, 2000. "Nunavut: Community Population Projections 2000 - 2020".

Note: 1) The Nunavut document referenced above was utilized up to 2020. A population growth of 1.5% was applied to the subsequent years (2021 - 2031).

2) The projected sewage generation is based on the Nunavut water usage formula [$100 \text{ L/cd} \times (1 + 0.0023 \times \text{population})$].

3) A value of 3% dry solids is assumed for the liquid sludge accumulating at the bottom of the lagoon.



Appendix D

Site Forms

Form 1
Monthly Sewage Delivery Log
Hamlet of Kugluktuk

Month: _____ Truck #: _____

Date	Number of Trips	Volume per Trip	Total Daily Volume (liters)	Comments and Concerns
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Date	Number of Trips	Volume per Trip	Total Daily Volume (liters)	Comments and Concerns
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
Monthly Totals				

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Form 2
Monthly Sewage Treatment Facility Inspection Form
Hamlet of Kugluktuk

Inspected By: _____ Date: _____

Wind Direction: _____ Temperature: _____

Precipitation: _____ Ground Cover: _____

Issues and Conditions	Description/Condition/Problems	Action/Maintenance Required
Health and Safety (dangers and concerns)		
Wildlife		
Access Road (condition, ditches, snow, surface, etc.)		
Signs		
Inlet Flume		
Berms and Fences		
Sewage Level		

Issues and Conditions	Description/Condition/Problems	Action/Maintenance Required
Sludge Thickness		
Gate Valve at Discharge Manhole		
Odours/Appearance		
Wetland Treatment Area		
Equipment (septic truck, pump, etc.)		
Complaints		
Site Planning (discharge schedule)		
Other Issues and Concerns		

Form 3
Effluent Discharge Log
Hamlet of Kugluktuk

Month: _____

Truck #: _____

Date	Time Value Opened	Time Value Closed	Discharge Period (days)	Approximate Flow Rate m ³ /day	Approximate Volume Discharged m ³	Start Lagoon Depth (cm)	End Lagoon Depth (cm)	Change in Depth (cm)	Approximate Volume Change (m ³)	Comments
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										

Date	Time Value Opened	Time Value Closed	Discharge Period (days)	Approximate Flow Rate m ³ /day	Approximate Volume Discharged m ³	Start Lagoon Depth (cm)	End Lagoon Depth (cm)	Change in Depth (cm)	Approximate Volume Change (m ³)	Comments
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Monthly Totals										

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Form 4
Sewage Treatment Facility Planning
Hamlet of Kugluktuk

Prepared By: _____

Date: _____

Sewage Treatment Planning Issue	Current Operations	To Do Items and Schedule
Health and Safety		
Site Inspection Results/Concerns		
Current Volume		
Wetland Treatment Area		
Environmental Monitoring		
Annual Reporting		

Sewage Treatment Planning Issue	Current Operations	To Do Items and Schedule
Nunavut Water Board License Requirements		
Staffing		
Equipment		
Costs		
Other Issues/Concerns		

070323 O&M Plan SL Appendix D Form 4 2007-03-30 2:04 PM

Appendix E
Annual Monitoring Report Forms

NWB Annual Report

Year being reported: ▼

License No: Issued Date:
 Expiry Date:

Project Name: Licensee: Mailing Address:

Name of Company filing Annual Report (if different from Name of Licensee please clarify
 relationship between the two entities, if applicable):

General Background Information on the Project (*optional):

Licence Requirements: the licensee must provide the following information in accordance
 with

 ▼ ▼

**A summary report of water use and waste disposal activities, including, but not limited to: methods of
 obtaining water; sewage and greywater management; drill waste management; solid and hazardous
 waste management.**

Water Source(s):	
Water Quantity:	Quantity Allowable Domestic (cu.m)
	Actual Quantity Used Domestic (cu.m)
	Quantity Allowable Drilling (cu.m)
	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- ☐ Solid Waste Disposal
☐ Sewage
☐ Drill Waste
☐ Greywater
☐ Hazardous
☐ Other:

Additional Details:

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)

Date of Spill:

Date of Notification to an Inspector:

Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

Revisions to the Spill Contingency Plan

Select

Additional Details:

Revisions to the Abandonment and Restoration Plan

Select

Additional Details:

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Select

Additional Details:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Select

Additional Details:

Results of any additional sampling and/or analysis that was requested by an Inspector

Select ▼

Additional Details: (date of request, analysis of results, data attached, etc)

--

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

Select ▼

Additional Details: (Attached or provided below)

--

Any responses or follow-up actions on inspection/compliance reports

Select ▼

Additional Details: (Dates of Report, Follow-up by the Licensee)

--

Any additional comments or information for the Board to consider

--

Date Submitted:

--

Submitted/Prepared by:

--

Contact Information:

Tel:

Fax:

email:



Appendix G

Dyke Temperature Recording Form

Portable Diesel Driven Sewage Pump

Discharge Calculation

**Kugluktuk Sewage Lagoon
 Dyke Temperature Readings**
Date:

**Kugluktuk Sewage Lagoon
 Dyke Temperature Readings**
Date:

**Kugluktuk Sewage Lagoon
Dyke Temperature Readings**
Date:

[illegible]

Kugluktuk Sewage Lagoon Dyke Temperature Readings

Date: _____

[illegible]

Kugluktuk Sewage Lagoon Dyke Temperature Readings

Date: _____

[illegible]

Kugluktuk Sewage Lagoon Dyke Temperature Readings

Date: _____

[illegible]

Kugluktuk Sewage Lagoon Dyke Temperature Readings

Date: _____

[illegible]

Kugluktuk Sewage Lagoon Discharge Pump Sizing Calculations

March 16, 2009

NBL File No. N-O 09755.530

20 Year Lagoon Capacity = 130,000 m³

Option # 1 Discharge over a 3 month period and 24hr/day

$$\frac{130,000 \text{ m}^3 \times 219.96 \text{ Imp gal/m}^3}{3 \text{ months} \times 30 \text{ days} \times 24 \text{ hrs} \times 60 \text{ min/hr}} = 220.6 \text{ IGM}(265 \text{ USGPM})$$

Option # 2 Discharge over a 2 month period and 24hr/day

$$\frac{130,000 \text{ m}^3 \times 219.96 \text{ Imp gal/ m}^3}{2 \text{ months} \times 30 \text{ days} \times 24 \text{ hrs} \times 60 \text{ min/hr}} = 331 \text{ IGM} (397.15 \text{ USGPM})$$

Option # 3 Discharge over a 3 month period and 12 hr/day

$$\frac{130,000 \text{ m}^3 \times 219.96 \text{ Imp gal/ m}^3}{3 \text{ months} \times 30 \text{ days} \times 12 \text{ hours} \times 60 \text{ min/hr}} = 441 \text{ IGM} (529 \text{ USGPM})$$

The Supplier of the pump will provide a flow range in which the pump can be throttled to vary the discharge flow.

Nuna Burnside is recommending a maximum flow of 400 USGPM because it provides the most flexibility for the operator to discharge the lagoon if required quickly. According to the pump manufacturer the discharge flow can be controlled from 50 to 550 USGPM if there is a requirement for a slower discharge.