Memorandum

Project Name: Resolute Bay Water	Project #: FRE-00261400-A0
To: Bhabesh Roy, P.Eng.	From: Tony Whalen, P.Eng.
Date: October 27, 2020	
Subject: Clarification on Bleedwater Increases over the period 2020 to 2047	
Distribution: Daryl Burke, P.Eng., Eric Bell, P.Eng.	

This memo will provide the Government of Nunavut with clarification on the increase of bleedwater over the period 2020 to 2047 for the Resolute Bay water and wastewater systems.

There was a question as to why the bleedwater as % of total water extracted did not seem accurate when comparing 2020 to 2030 and 2040. The reason for the difference in percentages was simply a rounding error. Please see the updated table below that has 2 decimal places added. You can see that the percentages seem better without the rounding.

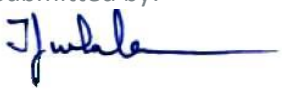
	Year	2020	2030	2040	2047
Population	Persons	290	318	346	365
Community Per Capita Consumption	L/capita/day	225	232	239	243.9
Community Consumption	L/day	65,250	73,724	82,843	89,000
Airport Consumption (based on approx 140L/c/d)	L/day	38,100	43,248	48,396	52,000
Total Consumption	L/day	103,350	116,973	131,239	141,000
Total Consumption (based on max day factor 2.75)	L/day	284,213	321,675	360,907	387,750
Total Consumption (based on max day factor 2.75)	L/s	3.3	3.7	4.2	4.5
Bleedwater	L/day	155,520	193,920	232,320	259,200
Bleedwater as % of total water extracted	%	35.37%	37.61%	39.16%	40.06%
Community Wide Demand	L/day	439,733	515,595	593,227	646,950
Community Wide Demand	m^3/day	440	516	593	647
Community Wide Demand	L/s	5.1	6.0	6.9	7.5
Annual Consumption	Liters	160,502,363	188,192,040	216,527,835	236,136,750
Annual Consumption	**m^3**	**160,502**	**188,192**	**216,528**	**236,137**

The other question asked during the hearing was why is the bleedwater shown to increase in the period 2020 to 2047. This is simply a function of planning for worst-case conditions. We would expect there would be some degradation (sagging, minor leaks, etc.) over time of the of the wastewater collection

system that would require more bleedwater. Bleedwater flow into the sewage collection system network is required to offset heat loss from the piping and was initially estimated at 1.8 L/s (155,520 L/d) in 2020 rising to 3.0 L/s at the end of the design period (2047).

If you have additional questions or require any clarification, please do not hesitate to contact me directly.

Submitted by:



Tony Whalen, P.Eng.
Project Manager and Senior Water & Wastewater Engineer

EXP Services Inc.