NUNAVUT IMPACT REVIEW BOARD
NUNAVUMI AVATILIKIYIN KATIMAYIN

ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦᑎᒍᑦ ᑐᑭᓯᒋᐊᕐᕕᒃ ᕿᒥᕐᕈᔭᒃᓴᖅ #125135

3AM-ARV1016 Water Reservoir Cell #3

ᑐᑭᓯᒋᐊᕐᕕᒃ ᖃᓄᐃᑦᑐᓂᖓ:	New
ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔫᑉ ᖃᓄᐃᑦᑐᓂᖓ:	ᐃᒪᖅ
ᐅᓪᓗᖓ ᑐᑭᓯᒋᐊᕐᕕᒃ ᑎᓕᐊᕕᓂᐅᑉ:	5/15/2017 11:29:07 AM
Period of operation:	from 2017-05-15 to 2038-05-17
ᑲᔪᓯᒃᑲᐃᔭᐅᓂᐊᕋᓱᒋᔭᐅᔪᑦ:	from 2017-05-15 to 2038-05-17
ᐱᓕᕆᐊᖅᑭᒪᔪᖅ:	Megan Lusty GN-CGS P.O. Box 490 Rankin Inlet Nunavut X0C0G0 Canada ᐅᖄᓚᐅᑎᑦ: 867-645-8176, ᓱᑲᔪᒃᑯᑦ: 867-645-8141

ᑐᓴᐅᒪᔭᒃᓴᑦ

ᖃᓄᐃᑦᑐᑎᓂᒃ ᐱᓕᕆᐊᖅᑲᖅᓂᐊᕆᐊᖖᒐᓂᒃ

ᖃᓪᓗᓈᑎᑐᑦ:	Refer to attached document.
ᐅᐃᕖᑎᑐᑦ:	N/A
ᐃᓄᒃᑎᑐᑦ:	Refer to attached document.

Personnel

Personnel on site: 0
Days on site: 0
Total Person days: 0
Period of operation: from 2017-05-15 to 2017-05-15
Proposed term of operation: from 2017-05-15 to 2038-05-17

ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᑦ

ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᑦ

ᓇᒥ	ᖃᓄᐃᑦᑑᒥᑦ ᐱᓕᕆᐊᖃᕐᓂᐊᖅᐸ	ᑭᒃᑯᑦ ᓄᓇᖁᑖᓂ	ᑐᓴᐅᒪᔭᒃᓴᑦ ᓄᓇᐅᑉ ᖃᓄᖅ ᐊᑐᕆᐅᓚᐅᖅᓯᒪᔭᕆᐊᖓᓐᓂᒃ	ᐃᑦᓴᕐᓂᑕᖃᕆᐅᕙᓚᐅᖅᐸ ᐃᓄᒃᓄᑦ ᓇᔪᖅᑕᐅᖃᑦᑕᕐᓂᑰᕙᓗ ᑕᐃᑦᓯᒪᓂᑐᖃᐅᓕᖅᑐᖅ	ᖃᓂᓐᓂᖅᐹᖅ ᓄᓇᓕᔭᐅᔪᖅ ᐊᒻᒪᓗ ᓴᐳᒻᒥᒃᓲᕕᐅᕙᓗ ᓱᓇᓄᑦ
Water Reservoir Cell #3	Municipal and Industrial Development	Municipal	Adjacent to water reservoir cells #1 (constructed 1998) and #2 (constructed 1988), community water treatment plant/truckfill station.	No known archaeological/paleontological sites.	Within Hamlet of Arviat municipal boundaries.
New Water Treatment Plant	Municipal and Industrial Development	Municipal	Adjacent to water reservoir cell #1 (constructed 1998) and existing pumphouse and standby generator buildings.	No known archaeological/paleontological sites.	Within Hamlet of Arviat municpal boundaries.

ᓄᓇᓕᐅᑉ ᐃᓚᐅᖃᑕᐅᓂᖓ ᓄᓇᓖᑦᑐ ᐊᕕᒃᑐᖅᓯᒪᐅᕐᓂᖓᓄᑦ ᐃᑲᔪᑕᐅᔪᓐᓇᖅᑐᑦ

ᓄᓇᓕᒥᔭᖅ	ᐊᑏᑦ	ᑲᑐᔾᔨᐊᖃᑎᒌᒥᔭᖅ	ᖃᖓᓗ ᑐᓴᖅᑎᑕᐅᓚᐅᕆᐊᖅᒥᓐᓂᒃ
ᐊᕐᕕᐊᑦ	Hamlet Council	Preliminary meeting with Hamlet Council and design consultant (exp) regarding new water treatment plant and raw water storage expansion (Cell #3)	2016-11-01
ᐊᕐᕕᐊᑦ	Hamlet Council	Motion Number for approval of the poject is 77/17	2017-05-04

ᓚᐃᓴᓐᓰᑦ ᐱᒍᖅᓇᐅᑏ ᐊᖏᖅᑕᐅᓯᒪᔪᑦ

ᓇᒦᒋᐊᖅᒥᓐᓂᒃ ᐱᓕᕆᐊᕆᕝᕕᐅᓂᐊᖅᑐᑦ ᑎᑎᕋᕐᓗᒥᑦ

Kivalliq

ᓚᐃᓴᓐᓰᑦ ᐱᒍᖅᓇᐅᑏ ᐊᖏᖅᑕᐅᓯᒪᔪᑦ

ᒐᕙᒪᒥᔭᐅᔫᑉ ᐊᕕᒃᑐᖅᓯᒪᐅᕐᓂᖓᓂ ᒪᓕᒐᕐᓅᖓᔪᓂᒃ ᐱᖁᔭᕐᓅᖓᔪᓂᒡᓗ ᑲᒪᔩᑦ ᐱᔪᖅᓇᐅᑎᑖᕈᑎᓂᒃ ᓚᐃᓴᓐᓯᓄᑦᓗ ᑲᔪᓯᒃᑲᐃᔩᑦ	ᖃᓄᐃᑦᑑᓪᓚᓇᐅᕙ ᓚᐃᓴᓐᓯᑖᕈᑕᐅᔪᖅ ᐱᔪᖅᓇᐅᑎᑖᕈᑕᐅᔪᖅ ᐊᖏᖅᑕᐅᔪᕐᓅᓐᓂᑦ	ᒫᓐᓇ ᖃᓄᐃᓕᖓᕙ	ᐅᓪᓗᒥ ᑐᓂᔭᖅ/ ᑐᒃᓯᖅᑰᑕᐅᓚᐅᖅᓯᒪᔪᖅ	ᑭᒡᓕᖃᕐᕕᖓ
ᓄᓇᕗᑦ ᒐᕙᒪᖓ, ᐱᕙᓪᓕᐊᔪᓕᕆᔩᒃᑯᑦ & ᐃᖏᕐᕋᔪᓕᕆᔩᒃᑯᓪᓗ	Letter from Todd McKay, Director, Nunavut Airports to Paul Clow, CGS, as approval from EDT, Nunavut Airports Division for the proposed water reservoir. Determined that the proposed water reservoir will not impair the safety of aircraft operating in the airspace surrounding the Arviat airport.	Applied, Decision Pending	2017-04-12	
ᑲᓇᑕᒥ ᐃᖏᕐᕋᔪᓕᕆᔩᒃᑯᑦ	TC #2017-195 Aeronotical Assessment Form for Obstacle Evaluation	Active	2017-03-31	2018-09-30
ᓄᓇᕗᒻᒥ ᐃᒪᓕᕆᔩᑦ ᑲᑎᒪᔩᖏᑦ	3AM-ARV1016 Ammendment/Renewal Application filed	Applied, Decision Pending		

ᐊᑐᒐᐅᓂᐊᖅᑐᖅ

ᐱᕐᑯᑦ ᐊᖏᔪᖅ ᐊᑐᖅᑕᐅᓂᐅᓴᔪᖅ ᐃᓚᖃᓯᐅᑎᓗᒋᑦ ᐃᑰᑕᐃᑦ, ᒥᓪᓗᐊᕈᑏᑦ, ᖃᖓᑕᓲᖅ, ᓄᓇᓯᐅᑦ ᐊᓯᖏᓪᓗ

ᐊᖏᔪᖅ ᐱᕐᑯᑦ ᐊᑐᒐᐅᓂᐊᖅᑐᖅ ᖃᓄᐃᑦᑐᓂᖔ	ᖃᑦᓯᐅᕙᑦ	ᐊᖏᓂᖏᑦ - ᐳᖅᑐᓂᖏᑦ	ᓱᓇᒧᑦ ᐊᑐᒐᐅᓂᐊᖅᐸ
Loader, excavator, dump trucks, etc.	-	-	Construction of Cell #3 and Water Treatment Plant

ᑎᑎᕋᐅᓯᕆᓗᒍ ᐅᖅᓱᒃᓴᐃᑦ ᐊᑦᑕᓇᖅᑐᖅᑕᓖᓪᓗ ᐊᑐᖅᑕᐅᓂᐊᕐᓂᖏᑦ

ᓱᓇᒧᑦ ᐅᖅᓱᒃᓴᒡᒋᐊᖅ ᐊᑐᒐᐅᓂᐊᖅᐸ	ᖃᓄᐃᑦᑐᓪᓚᕆᐅᕙ ᐅᖅᓱᒃᓴᒡᒋᐊᖅ	ᖃᑦᓯᐅᕙᑦ ᐅᖅᓱᒃᓴᖃᐅᑏᑦ	ᢵᒃᓴᐅᑉ ᐃᒪᖃᖅᑎᒋᔫᓇᕐᓂᖓ	ᑲᑎᓪᓗᒍ	ᢵᒃᓴᐃᑦ ᐊᒥᓲᓂᖏᑦ	ᓱᓇᒧᑦ ᐊᑐᒐᐅᓂᐊᖅᐸ
Diesel	fuel	0	0	0	Liters	For heavy equipment

ᐃᒪᖅ ᐊᑐᖅᑕᐅᔫᒫᖅᑐᖅ

ᐅᓪᓗ ᑕᒫᖅ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᖅ	ᖃᓄᖅ ᐃᒥᖅᑕᕐᑲᑦᑕᕐᓂᐊᖅᐸᑦ	ᓇᑭᑦ ᐃᒥᖅᑕᕐᑲᑦᑕᕐᓂᐊᖅᐸᑦ
2000	Overland pipeline to water reservoirs - approx. daily amount over 3 months (175,000m3 annually)	Wolf Creek - no additional water requirements/consumption during project construction

ᐊᒃᑕᒨᑦ

ᐊᒃᑕᒨᓕᓇᓂᐊᕐᓂᖅ

ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᒧᑦ ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᖅ	ᖃᓄᐃᑦᑐᖅ ᐊᒃᑕᒨᖅ	ᖃᓄᑎᒋ ᐊᒃᑕᒨᑦ ᓴᖅᑭᐊᓂᐊᖅᑐᕆᔭᐅᕗᑦ	ᖃᓄᖅ ᐊᒃᑕᖅᑕᐅᓂᐊᖅᐸ	ᓴᓗᒻᒪᖅᓴᐅᑎᒃᓴᒃᑲᓐᓂᐅᓂᐊᖅᑐᑦ
Municipal and Industrial Development	ᐅᔭᕋᐃᔭᐃᓂᖅ ᓄᓇᒥᑦ ᓅᑎᕆᓂᖅ ᐊᑐᐸᐅᔪᓐᓇᕐᔫᖏᑦᑐᓂᒃ, ᓇᒻᒪᕐᓗᑯᓂᒃ	60,000m3	Excavated material at Cell #3 site - to be reused in berm construction	Surplus material to be disposed of offsite as per direction from site Engineer and Hamlet

ᐊᕙᑎᒥᐅᑕᓂᑦᑐᑦ ᐊᑐᖅᑕᐅᓯᒪᔪᑦ

The contractor must adhear to environmental protection procedures during construction of the new reservoir cell, with measures outlined for the disposal of waste, and protecting drainage systems and waterways. Refer to Environmental Procedures Specifications uploaded to Project Documents. Excavated material is to be reused for the construction of the cell berms.

ᑐᓴᐅᒪᔭᒃᓴᑦ ᐃᓚᖓ 2

ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᒧᑦ ᑭᓱᑐᐃᓐᓇᕐᓃᖓᔪᑦ ᑐᓴᒐᒃᓴᑦ

- The Hamlet of Arviat has outgrown the current reservoir infrastructure and additional capacity is required to meet the water demands of the growing community. Limiting water availability will increase the risk of water wash diseases. - There is no alternative to constructing additional reservoir capacity. Not locating the third reservoir cell beside the existing infrastructure does not make financial or operational sense, as additional treatment and truckfill stations would be needed. - Approval will be required from the NWB upon completion of the NIRB screening process.

ᑲᓇᑕᒥ ᐃᒪᖅᓯᐅᑕᓕᕆᔩᒃᑯᑦ ᐊᐅᓚᑦᓯᔾᔪᑎᖓᓐᓄᑦ ᐅᓂᒃᑳᖅ ᒪᓕᒃᐹ

N/A

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- Site will be accessed by Hamlet road adjacent to the current reservoirs and pumphouse. Road is frequently used, by community residents and large water trucks for the delivery of water. - Dust management will be achieved by following speed limits. - Supplies will be brought into Aviat via sealift. - Modular construction of the new water treatment plant is anticipated, taking place in the south prior to shipping. - No additional flights.

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N/A

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- Heavy equipment will be used for construction purposes only. No equipment will remain on site for operation.

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- Construction of a new water reservoir cell (Cell #3) and new water treatment facility is required. It has been requested from the NWB that the amount of water authorized be increased to 175,000 cubic metres annually to meet the water demands of the community. - The community water source is Wolf Creek. No additional water requirements/consumption are required during project construction. - An overland pipeline supplies water to the two water reservoir cells currently in place, seasonally from July-September.

ᐃᒪᐃᑦ ᐊᑐᖅᑕᐅᔫᖅᓯᒪᔪᑦ, ᖁᖅᑕᐃᑦ, ᐊᓯᖓ

- No wastewater is produced by the new reservoir cell. - Wastewater is produced from the new water treatment plant that will be trucked stored in the wastewater tank and trucked to the community sewage lagoon. Wastewater will be produced from the filter backwashing process, operational drains and online analyzers, and the water treatment plant washroom.

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- Fuel will be stored onsite of the new water treatment plant for heating and for the back-up generator. The current water treatment plant has fuel stored for the same purposes. - Diesel is used to operate heavy equipment during construction.

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- Calcium hypochlorite (granular chlorine) and fluoride will be used in the water treatment process. The chlorination room is separate from the rest of the water treatment plant with its own exterior door. - Chlorine and fluoride are currently used at the water treatment plant and reservoir.

ᓴᓇᔩᑦ /ᐃᖅᑲᓇᐃᔭᖅᑐᓕᕆᓂᖅ ᐃᓄᓕᕆᓂᖅ -ᐱᕚᓪᓕᐊᔪᓕᕆᓂᕐᒧᓐᓄ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᔪᑦ

- Construction tender will include standard GN NNI Policy.

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- Arviat Hamlet Council was consulted in the early planning phase of the water treatment plant and storage expansion (Cell #3) project. Hamlet Council passed a motion (77/17) approving this project.

ᐃᓚᖓ C: ᓄᓇᓕᒋᔭᐅᔪᒥ ᐊᖏᔪᒥᓗ ᐱᕗᓪᓕᐊᑎᑦᓯᓂᖅ: ᐱᓕᕆᔭᐅᔪᒪᔪᒧᑦ ᑐᓴᒐᒃᓴᑦ

- The Hamlet of Arviat requires additional water storage and water treatment to meet the needs of the growing municipality. The municipality is responsible for supplying treated water to residents, with the assistance of CGS. Construction is being managed through CGS. - The existing water reservoir includes two cells adjacent to the road out of town to the north of the community. A third cell with an estimated active volume of 103,427 metres cubed is required to meet the water needs of the community to 2038. Locating the new cell (Cell #3) to the west of Cell #1 will share the western berm of Cell #1, reducing the volume of granular needed to be imported, and avoid exposure to high tides, small ponds, or the existing subdrainage system for the cells. Cell #3 will be constructed similar to Cell #1, with a high density polyethylene (HDPE) liner. Equipment is planned to be mobilized to the site during sealift 2017, and construction will take place summer 2018. First fill of the new cell is anticipated for late summer/early fall 2018. The third cell will operate under the Hamlet Water Licence, currently under renewal, 3AM-ARV1016. The contractor must adhere to environmental protection procedures during construction of the new reservoir cell, with measures outlined for the disposal of waste, and protecting drainage systems and waterways. Excavated material is to be reused for the construction of the cell berms.

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- Additional information on the condition of the permafrost and soil in the water reservoir and water treatment plant area can be found in the

Geotechnical Report.

ᒫᓐᓇ ᐊᕿᑎᐅᑉ ᖃᓄᐃᑦᑐᓪᓚᕆᐅᓂᖓ: ᐆᒪᔪᖅᑕᖃᕐᓂᖓ

- The area where the third reservoir cell will be constructed is adjacent to the other two cells. This area has previously been distrupted and there is little vegetation. - Little wildlife in the area of the new reservoir cell and water treatment plant is assumed due to the proximity to the community, adjacent to a busy road out of town, and next to the activity of 6-7 water trucks delivering water daily from approximatly 7am-10pm.

ᒫᓐᓇ ᐊᕿᑎᐅᑉ ᖃᓄᐃᑦᑐᓪᓚᕆᐅᓂᖓ: ᐃᓄᓯᕆᓂᕐᒨᖓᔪᑦ-ᐱᕿᓪᓯᐊᔪᓯᕆᓂᕐᒨᖓᔪᑦ

- There is significant human health risk in not completing this project. By restricting the water available to the community, people will not be able to acheive minimum daily water volumes needed to prevent water wash diseases.

ᓇᓗᓇᐃᖅᑕᐅᓂᖏᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᔪᑦ ᖃᓄᐃᑦᑑᓂᖏᑦ ᐸᓚᐅᒥᒡᔪᓯᖅᑕᐅᓂᐊᕐᓂᖏᓪᓗ

- Permafrost impacts will be mitigated during construction by excavating and installing the liner quickly as to not allow the ground to thaw. - Construction noise cannot be avoided, however it is for a limited time period. Heavy vehicle activity around the water treatment plant is already a daily occurance. - The construction phase has the potential to create employment and economic opportunities for the community; either directly at the construction site or indirectly through the use of hotels, local stores, restaurants, etc.

- Further developing the area of the current water reservoir cells and water treatment plant will create a larger impacted area. However, the health needs of the community have to be met and the alternative would be to develope a new area.

Impacts

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	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
ϛᓇᓂᖅ																									
Municipal and Industrial Development		-	-	M	-	-	-	-	-	-	-	-	M		-	-	-	-	-		P	-	-	-	-
ᐅᔨϛᑲᑦᓂᖅ																									
Municipal and Industrial Development		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		P	-	-	-	-
ᐃᑐᑦᑎᓇᓂᖅ																									
Municipal and Industrial Development		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = ᐊᑲᐅᓭᑭᑎᐊᓕᖅᑐᑦ, N = ᐊᑲᐅᖅᑭᔨᑕᐅᐊᓕᖅᑐᑦ ᐸᓪᐅᒋᔨᔪᖅᑐᖅᑕᐅᐊᓕᖅᑐᑭᑦᑐᓗ, M = ᐊᑲᐅᖅᑭᔨᑕᐅᐊᓕᖅᑐᑦ ᐸᓪᐅᒋᔨᔪᖅᑐᖅᑕᐅᐊᓕᖅᑐᓗ, U = ᖃᑲᐅᔨᒪᓕᖅᑭᑐᖅ)

Project Map