# Apex River Water Supply 2019-2026

## Niaqunguutiup Kuunganik Imiqtarniq 2019-2026

August 2019

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## Introduction / Nalunaijaijjuti

- The City of Iqaluit has applied to the Nunavut Water Board to take water from the Niaqunguk (Apex) River
- Requires an amendment to the City's type A water licence 3AM-IQA1626
- This presentation summarizes the proposed project and responds to recommendations made

- Nunalipaujait Iqaluit tutsirautiliulaurtut Nunavut Imalirinirmit Katimajinik imiqtarumallutik Niaqunguutiup kuunganik
- Titirarsimaninginnik asijjiigialiit sitikkut imaittumut A imalirijunnautinganut 3AM-IQA1626
- Ukua unikkaatsait pilluatanginnik uqausiqaqtut piliriatsaup amma kiujjutiugillutik atuliqujjutiusimajunut

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## The Proposed Project / Piliriatsaujumajurq

- The City of Iqaluit draws potable water from Lake Geraldine reservoir
- The reservoir is the City's primary water source
- Lake Geraldine refills naturally from snowmelt and rain within the watershed – no resupply in winter
- The water stored in the reservoir prior to freeze-up must supply Iqaluit during the winter (November-May)

- Nunalipaujait Iqaluit imiqtapattut imirijauvattumit angirani imiqtavimmit
- Imiqtarvik Iqaluit imiqtarvigivauk
- Imiqtarvik immapatturq aput augaimmat amma silalliraimmat kuuviuvattunilu – ukiukkut immapangittuq
- Imiq imiqtarviup imarivattanga nuatausimavattuq qualaunginingani Iqalummiunut naammagiaqaqpattuq ukiulimaamut (maiminit nuuviipirimut)

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## The Proposed Project / Piliriatsaujumajurq

- The City's water demands are increasing. Almost 80% of the water in the reservoir is used by end of winter
- In some years (e.g., 2018) the reservoir would not fill up naturally – a shortage of potable water is possible
- The City is applying to use the Apex River as a supplementary water supply
- Pump up to 500,000 cubic metres (132 million gallons) of water from the Apex River each year to "top up" (fill) the reservoir before winter

- Nunalipaujakkut imiqaqtigialingit amisuruqpalliatuinnaliqtut. 80%-pusapalua imiup aturqtausimaliqpattuq ukuingujunniiraluaqtillugut
- Ilaannikkut arraaguni (suurlu, 2018-mi) imiqtarvik immagunnalaungittuq imaatuinnaq – imaqarunniirunnaqtuq nalunangilaq
- Nunalipaujakkut tutsirautiliuliqtut aturumallugu Niaqunguutiup kuunga nalliukumaarilugu immavvigivallugu
- Milluatitsivallutik 500,000 kippaarittunik miitanik (132 milijan gaalait) imirmik Niaqunguutiup kuunganik arraagutamaaq "tatapallugu" imiqtarvik ukiulaunginingani

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## The Proposed Project / Piliriatsaujumajurq

- This is a temporary solution to address potential water shortage (2019 to 2026)
- The City is studying options for a permanent solution to address water supply for the future
- Apex is the preferred option for the short term:
  - Closest source to reservoir
  - Road access
  - Lowest cost to residents

- Taimaak aaqitsimakainnarunaqtuq imikilisimalirnirutta (2019-2026)
- Nunalipaujakkut qausisarqpalliajut naliiraarutitsanit aaqqigutitsaujunnaqtumit imiliriniq pijjutigillugu sivunittinnut
- Niaqunguuti aturqtaujumasimajuq maanauningani:
  - Qanilaanguninga pillugu imiqtarvimmut
  - Aqqutiqatsiarninga
  - Akikilaangugajarninga nunalirnimiutanut

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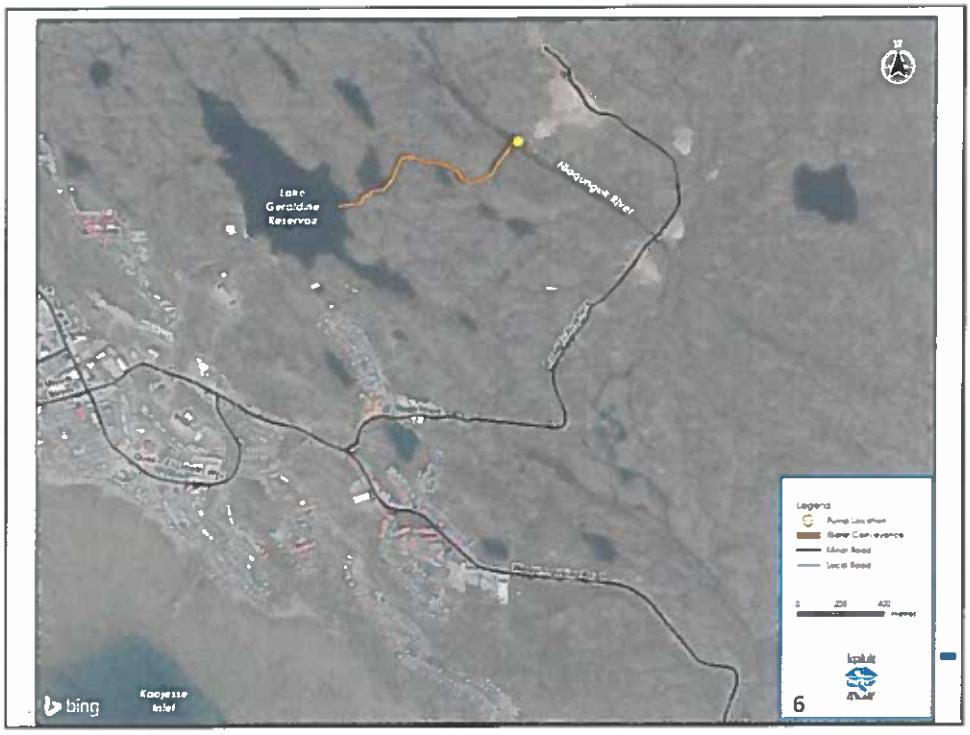


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## The Proposed Project / Piliriatsaujumajurq

- Up to three submersible pumps will be installed in the river to withdraw water at up to 150 litres (40 gallons) per second
- An on-land generator will provide power to the pumps
- A high density polyethylene (HDPE) pipeline will move water from the Apex River to Lake Geraldine
- Pumps and associated equipment will be installed and removed each year

- Pingasuutuinnarialiit milluarutitsait aqqittaugajaqtut kuummi imirmik milluapallutik 150 qallutinguanik qilamimmarialuk
- Nunamiitumut januraituralaamit aturajartut milluarutinut
- Sullulikkirmit aturlutik milluarajaqtut kuummik imiqtarvimmut
- Milluarutiit amma ilangit sunakkutaat aaqittauqattarajaqtut amma piqtauvallutik arraagutamaaq

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## The Proposed Project / Piliriatsaujumajurq

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## The Proposed Project / Piliriatsaujumajurq

- A decision to implement pumping will be made in late June of each year – dependent on the water levels in the reservoir and the predicted natural recharge
- If supplemental water is needed, the total amount applied for may not be needed each year
- The amount of water taken from the Apex River each year will depend on:
  - The amount needed to fill the reservoir
  - The amount of water available in the Apex River

- Pijatsalianguvanniaqtut milluatitsinirmit Juuniuliraippat arraagutamaaq – malittauvallutik imangata imiqtarviup qanuilluarninga amma nalauttaaqtauvalluni silatigut qanuituinnariaqarninga
- Immakanniriaqarniqpat, katitugu qanuilluarninga immaijjutiujumajuq arraguni qangakkut aturqtaungituinnariaqarajarmijuq
- qanuilluarninga immaijjutiugajaqturq Niaqunguuti kuunganik arraaguni nallianni maliqattarajaqtuq ukuninga:
  - Tatatauvalluni
  - Malittauluni Niaqunguuti kuungata qanutigi immaviujunnarninga

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## Environmental Mitigations /nunatigut piluarjairsimaniaqtut qanuigutiujunnaqtunik

- Resident Arctic char are known to be present downstream of the bridge on the Road to Nowhere
- Withdrawal for this temporary project will be protective of fish and fish habitat in the Apex River by meeting DFO guidelines:
  - Only pump when Apex River flows are more than 30% of mean annual discharge
  - Withdraw less than 10% of the daily flow of the river
- Flows in the Apex River vary from year-to-year and from day-to-day

- Iqaluqarniraqtaujuq ikaarutiup ammuagiangani tasiluliariami
- Miluarviuliraiguni sapujjauvanniaqtut qajimagiarjuumiqattarlutik iqalunginnik amma iqalunnut najugauvattunik Niaqunguutiup kunganiitunik malittauvallutik Imalirijikkut maligangit:
  - Miluaqpallutik Niaqunguutiup kunga kuullualiraippat kisiani arraguup iluani 30%-ngulualiraippat kuunninga
  - 10% tungaani milluarivallutik qautamaat kuunninganik
- Kuunirivattanga qanutigi ajjigiipangittuq arraagutamaaq amma qautamaat

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## Environmental Mitigations / nunatigut piluarjairsimaniaqtut qanuigutiujunnaqtunik

- Flows in the Apex River are recorded daily at WSC station 10UH002: 1973 to 2018 (mouth of river)
- A new flow meter is being installed upstream of the pumping site and flows will be recorded daily
- Withdrawal rate can be adjusted daily based on flow in the river, and as as compared with MAD

- Kuunnirivattangit Niaqunguutiup kungata titiraqtauvattut arraagutamaaq WSC pilirivvimmi 10UH002: 1973 - 2018 (isuanit kuup)
- Nutaamik kuuninganut qaujisautimit aaqitsivalialiqtut qulaani milluarviup kuup amma qanutigi kuummangaaq titiqtauvalluni qautamaat
- Qanitigi milluarninginnut qautamaat aaqigiaqtauvakkajaqtuq malittauluni kuunninga qanutigi, amma qaujisaqtauvallutit qanutigi ajjigiinginniqaqpammangaata qangakkut arraagumi

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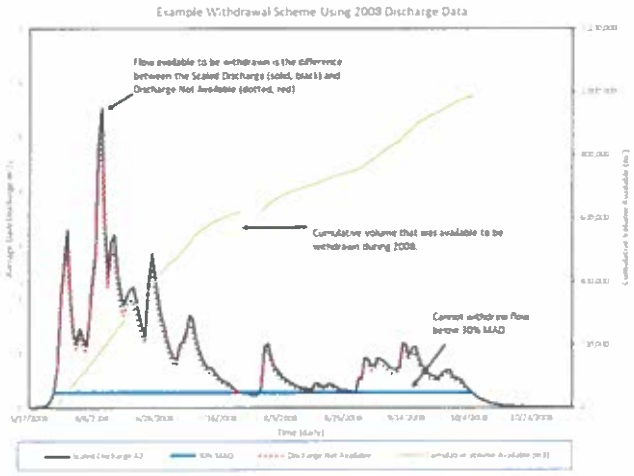
## Environmental Mitigations / nunatigut piluarjairsimaniaqtut qanuigutiujunnaqtunik

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## Environmental Mitigations / nunatigut piluarjairsimaniaqtut qanuigutiujunnaqtunik

- Environmental protection plans specify measures to additionally protect the environment and the health and safety of workers:
  - Sedimentation and Erosion Control Plan
  - Spill Contingency Plan
- Daily recording of:
  - river flows as measured
  - withdrawal rates
  - volumes
- Summary to be included in water licence annual report

- Nunaup avvatianit sapummitsijjutitsanit parnautiliangusimajut nalunaijaisimajut sapummitsijjutitsakannirnik qanukkanniq nunaup avvatianit amma qanuiqunagit timingigut amma attanajjairsimagiaqaqpanningit iqqanaijaqtiit:
  - Imaup iluani saniruluujanginnut amma nunaup sinnata surappallianinganut parnautigut
  - Tamaungatuinnaq kuvijuqarniqpat parnautigut
- Qautamaat titiqtauvallutik ukua:
  - Kuunninga qanutigi uuttuutigut
  - Qanutigi immaijaijjutiujuq
  - Qanutigi immiup milluaqtauninga
- Pilluatangit titiraqtaugajarqtut imilirijjutiup laisatigut arraagutamaarsiutimi unikkaaliani

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## Concerns and Recommendations / isumaaluutiujut uqausiulaurqtut

- Reviewers have asked questions about the proposed project:
  - Can the Apex River reliably provide enough water?
  - What are the alternatives to the Apex 2019-2026 project?
  - What are the City's long-term plans for supplying the growing population?
  - Why is the City applying to pump from Apex for seven years?

- Qaujisaqtiit apiqqutiqaqpalauqtut piliriatsaq pillugu:
  - Niaqunnguutiup kuunga tatigijatsauvaa immavvigiqattarumaniarlugu?
  - Sunauvat asigijunnaqtangit Niaqunnguutimut 2019-2026 piliriatsamut?
  - Sunauvat sitikkut arraagugasanut parnautingit imaqaqtitsiniarnikkut inugiatsivalliatuinnatillugu nunalik?
  - Qanuimmat sitikkut tutsirautiliuqpat milluarsigumaqattaqtutik Niaqunnguutiup kuunganik arraagunut 7-nut?

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## Can the Apex River reliably provide enough water? / Niaqunnguutiup kuunga tatigijarniqpa nammattumit imaiviujunarniarningagut?

- 35 years of data are available for WSC 10UH002 (near the outlet of the Apex River). Flows were scaled to the project location (76% of total Apex flow) and the DFO criteria applied
- Based on this review:
  - 500,000 $m^3$ was available in 29/35 years
  - 400,000 $m^3$ was available in 31/35 years
  - 300,000 $m^3$ was available 34/35 years
  - 200,000 $m^3$ was available in all 35 years

- 35 arraagunut pilirijjutiminirnik nuatausimajunik pitalik qaujisarvimmut WSC 10UH002 (sanianiittuq paangata kuup) qaujisaqtaulauqtut.
- Malitugit qaujisautiulauqtut:
  - 500,000 sanimut tukimut itininganut imaqautiulauqtuq 29-ni arraaguni ilunginni 35 arraaguit
  - 400,000 sanimut tukimut itininganut imaqautiulauqtuq 31-ni arraaguni ilunginni 35 arraaguit
  - 300,000 sanimut tukimut itininganut imaqautiulauqtuq 34-ni arraaguni ilunginni 35 arraaguit
  - 200,000 sanimut tukimut itininganut imaqautiulauqtuq iluunanginni 35 arraaguni

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## Can the Apex River reliably provide enough water? / Niaqunnguutiup kuunga tatigijarniqpa nammattumit imaiviujunarniarningagut?

- In most years, sufficient water will be available in Apex River to fill Lake Geraldine if the entire open water window is available (June to October).
- In 2019, flows in Apex River have been below historic minimums and due to little snowmelt and low precipitation, Lake Geraldine is not recharging.
- It is appropriate to consider additional measures that can be implemented if necessary to ensure the reservoir is filled prior to winter

- Ilanginni arraaguni, nammapanniaqtuq imiq pijaujunnaqtuq Niaqunnguutiup kuunganik imaigutiginiarlugu imiqtavimmik imakillisimaluangippat (junimit aaktuupamut).
- 2019-mi, Niaqunnguutiup kuunga kuuluarsimangisiarmat maanaujuq amma pijjutigillugu apiualaunginninga amma silalualaunginninga, imiqtarvik immapalliangisiarmat.
- Naammakkajanguartuq asiagut pilirijjutiqarajariatsaq pigiaqtigatsamik pigiariaqaqpata nalunairsimaqulugu imiqtarvik imiqatsiarajarninga ukiulaunginningani

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## Options if the Apex River cannot provide enough water / Naliiraarutitsait Niaqunnguutiup Kuunga imaivitsaungippat

- Withdraw at a greater rate (200 litres per second) while flows allow
- Establish withdrawal criteria that are protective specifically of fish in Apex River to withdraw at rates that exceed DFO criteria
- Implement additional measures to optimize supply and reduce demand
  - Reduce water losses
  - Encourage water conservation
  - Mandatory water conservation
- Add supplementation from Unnamed Lake or Sylvia Grinnell River

- Miluarsivigiguttigu sukannirsamit (200 liitait uan sacanmit) kuuluatillugu
- Miluaqtauluni maligaqaurlutik sapujjaujuumilutik iqaluit Niaqunnguutiup kuunganiittut milluarunnarsigumalutik imalirijikkut maligangita ungataanuungajunik
- Asinginnik pilirijjutiliurlutik angijuuniarmat imanga amma imirmik atunginirsaulirlutik
  - Tamaungatuinnaq kuvijjairsimalugu
  - Imirmik piursuaqujivallutik
  - Imirmik piursuariaqaliqtillugit

  Attiqtausimangittumik tasirmik immalutik uvvaluuniit Iqaluit kuunganik

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## What else is the City doing? / sitikkut qanuiliukkanirqpat?

- Communications to facilitate with water conservation measures:
  - Be Waterwise campaign – tips on how to be waterwise
  - Meetings with Top 10 high volume users to implement water conservation/ efficiency means (i.e. implementation of high efficiency fixtures)
  - Public information sessions with community
- Water demand monitoring – weekly monitoring in order to identify high volume usage immediately

- Tusaumatitsijjutitsaliurniq pijariakiligutitsanit imirmik piursuaqujijjutitsanit:
  - Imirmik piursuaqujiniq – qanuq imikkut piursuarunnaqtuqarmangaaq
  - Katimaqatiqarqpanniq qulinik (10) imirmik angijukallammik aturqpattunik pigiaqtitsijjutiliurumaniarluni imirmik piusuarutitsaujunnaqtunik / atutsiarutitsanik (suurlu pigiaqtitsiniq piunirsanik kuvititsijjutinik)
  - Inulimaaqtitsiniq tukisigiarutitsalirilutik
- Immiqtauvattunit qaujisautiqarniq – pinasuarusiup iluani qaujisautiqaqpallutik nalunaijaijjutitsanik tavvasainnaq nalunairsijunnarumallutik imiup qanitigi aturqtaulirninganik

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## What are the alternatives to pumping from Apex? / sunaummata asigijunnarqtangit miluarniup Niaqunguutiup kuunganik?

- Communications to public and early system repairs have reduced consumption on average by approx. 30% when compared to previous years since start of campaign (August 2018)
- Early identification of leakage in Utilidor water distribution system, in order to reduce losses immediately

- Tusaumatitsivanniq inulimaanik amma qilamiunirsarq pilirijjutiit sanajauvanningit pillugit imiqtunginirsaulirsimajut 30%-nit qaujisaqtaullutik qanitigit arraaguni anigursimajuni imiqtusimaningit pigialaursimammatanik (aagasi 2018)
- Qilamiunirsaq nalunairsivanniq qillaaqtunik sullulikkut imirmut, tavvasainarq qillaaruniiqtitauvallutik

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## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?

- Water Supply is within the City's control:
  - Water supply (water source(s))
  - Water storage
  - Water distribution
- Water Demand is not within the City's control, but the City can influence:
  - Water conservation by end users
  - Efficiencies in systems and services
- All of the above work together to meet long term water needs of the City

- Imilirinirq sitikkut aulatangita iluaniittuq:
  - Imiqaqtitsinikkut (imiqtavitsasiurniq nakit)
  - Imirmik sanirvaisimanirq
  - Imiqaqtitsivanniq
- Imikillisimaniq angirrani iluaniingittuq sitikkut aulagunnaqtangita, kisiani sitikkut ukuninga ajaursuijunnaqtut:
  - Imirmik piursuaqujivallutik aturqpattunik imirmik
  - Piusitigiarpallugit pilirijjutiit amma pijitsirautiit
- Taiguuqtaujut iluunatik atautsikkut aturqtaujunnaqtut malittaulutik arraagugasanut imiqarunnarniaqullugu nunalipaujait

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## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?

- Apex is not considered a reliable source for the long term if DFO criteria for protection of fish are maintained
- Sylvia Grinnell River:
  - Hydrology sufficient for summer supply
  - Concept design completed for two intake site options
  - Concept design for overland pipeline to Lake Geraldine and evaluation of treat at source option
  - Engagement with Amaruq HTA
- Niaqunguutit isumagijaujurq akunimut tatigijatsaungimmat imalirijikkut maligangit sapujjitsijjutingit iqalunnik aturtauniarutik
- Iqaluit kuunga:
  - Iminga naammattuq aujakkut imiriniarlugu
  - Qanuq sanasimagajarninga pijariirsimajut marruunnut miluavitsaujunnaqtuunnik
  - Qanuq sanasimagajarninga nunakkut sullutiup imiqtarvimmut amma qaujisaqtausimajuq salumarsaivitsanganut naliiraarutitsaq
  - Piliriqatauningit amaruuq angunasuttiit amma mikigiarniaqtiit katujjiqatigiingat

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## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?

- Unnamed Lake (3 km north of Apex River)
  - Not enough information to determine if it can be a long-term source
  - Water level data collection; bathymetry survey in 2019
  - Water balance analysis to commence Q4-2019/ Q1-2020
  - Fisheries assessment; water quality and concept design of intake and pipeline - if water balance verified
  - Ongoing engagement with HTA
- Attiqtausimangittuq tasiq (3 kilaamitanik ungasinnilik Niaqunnguuti kuunganik)
  - Tukisimajaungiluaqtuq aturatsaummangaaq
  - Qanutigi imaqarunnarninganut qaujisautiminiit nuatauvalliajut; qanutigit imaqarninganik qaujisaqtaulaaqtuuq aujangani 2019
  - Imiup qanuinnirivattanga qaujisarniq pigiartaulaaqtuq Q4-2019 /Q1-2020 nalunaiqtaugajarmat arraagugasanut aturatsaummangaaq
  - imalirijikkut, imiup qanuinninganit qaujisarniq amma qanuq sanasimagajarninga miluarvitsaq amma sullulik – imirivattanga qanitigit nalunailauqtillugu
  - Piliriqataunginnarlutik amaruq angunasuttiit katujjiqatigiingit

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## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?


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## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?

- Upgrade and optimize existing Utilidor water distribution system as part of asset management strategy
- Water storage will be equally critical to supply, as City continues to project increase in demand and development/ population growth

- Sanagiartauvallutik amma piusitigiarlugit sulluliit aturqtauvattut imirmut ilagijauluni piqutinit aulatsijjutinut parnagutimut
- Qattaqariaqallarinniaqtut imiqatsiarumaniarutta, sitikkut nalauttaarsimammata imaqarumavanniaqtut amisuruqpallianinginnit malillutik amma sanajauvattu amisuruqpallialutik / inungiatsivallialuni nunalik

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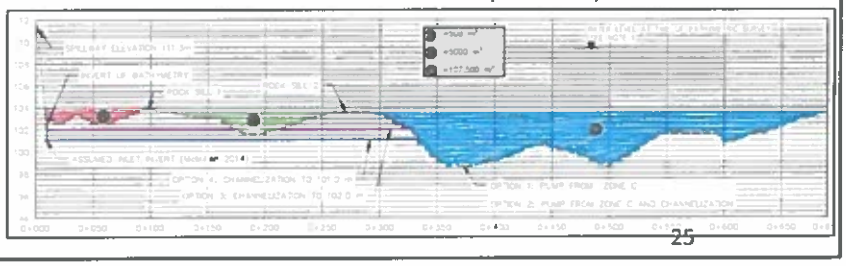
## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?

- Investigate viable alternatives to additional water storage capacity for a sustainable long-term water supply
  - Supplementary withdrawal from inaccessible portions within Lake Geraldine reservoir (below intake) - Pumping/ channelization
  - Secondary water storage
- Qausaqtaulutik aturqtaujunnarajaqtut asingit imiqautiujunnarajaqtut qanutigi imaqarunnarajarmangaata makimajjutiujunnaraqaqtumik akunikallak imitigut
  - Sanirvattausimajumik immaqattarunnarlutik tikitatsaungittumik iluanik imirtarviup (ataanik immaiviuvattuup) – miluariniq / kuuviliurniq
  - Asianik qatarsiurniq



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## What are the City's long term plans for water supply? / sunauvat sitikkut arraagugasanut parnautingit imilirinirmut?

- Desktop assessment of Lake Geraldine storage completed in 2018; Prefeasibility options assessment in 2019-2020
- Qarataujakkut qaujisaqtauninga imiqtarviup sanirvaivitsanga pijariiqtaulauqtuq 2018-mi; sivuniagut makimattitsijjutitsanit qaujisalaarniaqtut 2019-2020

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## Why is this application being sought for 7 years? / qanuimmat tutsirautiliurqpat arraagunut 7-nut aturqtaujutsamik?

Implementing a long-term solution requires:

- Data collection and analysis to confirm feasibility
- Concept designs and costing
- Decision to proceed to design of one option for each of supply, storage, distribution)
- Preliminary design
- Ongoing engagement
- Detailed design and permitting
- Procurement and construction
- In-service implementation

Pigiaqtitsiniarluni

- Pilirijjutiminirnik nuatsigialik amma qaujisartaulutik nalurnaiqtauqullugit kasujijjutitsaummangaata
- Qanuilingaluni sanajauniarmangaaq aaqitsuiniq amma akitsangit
- Sivumuagiarniarmangaaq qanuq sanasimaniarninganut sanagiarniq atausirmik naliiraarutiusimajumik atuni sunakkutaatsanut, sanirvaijaivitsanik, tunijatsanik
- Qanuq sanasimaniarninganut sanagiaruti
- Piliriqatqainnarniq
- Nalunaijainiq qanuq sanasimagajarninganik amma pijunnautiliriniq
- Tigusiniq amma sanagiarniq
- pijitsirautiugiarninga

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## Why is this application being sought for 7 years? / qanuimmat tutsirautiliurqpat arraagunut 7-nut aturqtaujutsamik?

Estimated timeline:

- Data collection & concept designs 2018-2020
- Preliminary designs and engagement 2020-2021
- Detailed designs 2021-2022
- Permitting 1.5 years
- Procurement and Construction 2024-2025
- In service 2026

Nalauttarsimajut ullursiutiit:

- Pilirijjutiminirnik nuatiniq amma isumagijaujuq sanasimaningagut 2018-2020
- Sivullirpaarsiutiit qanuq sanasimagajarninganut amma piliriqatiqarniq 2020-2021
- Nalunaijarsimajut qanuq sanasimalaarninganit 2021-2022
- pijunnautitaarasunniq arraagumut atausirmut amma nappanganut
- Tigusiniq amma sananiq 2024-2025
- Pijitsirarutiulirninga 2026

Iqaluit

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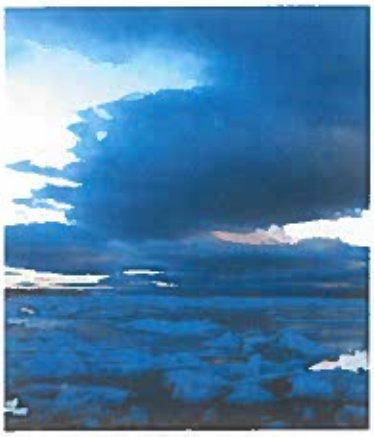
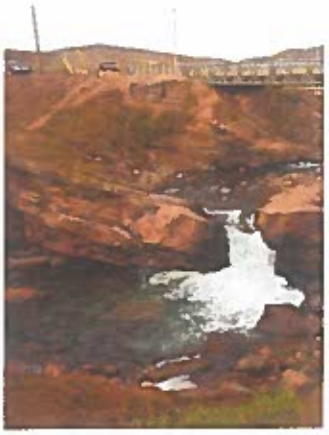
# Qujannamik





Iqaluit

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