NIRB Application for Screening #125406
Concept Advancement for a Raw Water Intake

Application Type:	New
Project Type:	Scientific Research
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Proposed Authorization:	from 0001-01-01 to 0001-01-01
Project Proponent:	Stantec Consulting Ltd., Carey Sibbald Stantec Consulting Ltd. 202, 107 Main Street Whitehorse Yukon Y1A 2A7 Canada Phone Number:: 18676332400, Fax Number::

DETAILS

Non-technical project proposal description

English: PROJECT DESCRIPTIONWith increased demand on the City of Iqaluit's drinking water supply, the City's Lake Geraldine drinking water reservoir needs more water. The initial plan to pump water from the Apex (Niaqunguk) River to the Lake Geraldine reservoir was cancelled due to a limited amount of water available. This required identification of a new water source, and water intake sites, to be chosen. Nunami completed a desktop study for the City of Iqaluit and identified that the Sylvia Grinnell River had enough water to meet the City's needs while still protecting important Arctic Char habitat in that river.To move forward with preliminary engineering and design of a water intake at the Sylvia Grinnell River, Nunami needs to complete a field study to identify the best possible intake location. Nunami is planning to complete the field study in September 2018 to measure the depth to bedrock on the shoreline where pumping equipment might be located. Two sites along the Sylvia Grinnell River, but outside (north) of the Sylvia Grinnell Territorial Park are to be investigated. These are Site A and Site B on the attached map. At each site, depth to bedrock will be measured on-land, on the shore of the Sylvia Grinnell River, and water depth across the river will also be measured. The two sites will be accessed with a truck or ATVs using existing roads and trails. No structures will be built and very little land disturbance is expected.METHODSTo identify the best intake site on the Sylvia Grinnell River, the following methods will be used:1.Bathymetry Survey: Nunami will use a small remote-controlled boat to measure the depth of water across the two sites in the Sylvia Grinnell River. The boat is battery-powered and controlled by an operator on shore.2.Geotechnical Survey: Nunami will measure the depth to bedrock without digging or disturbing the ground. This will be done on the land at each of the two sites along the Sylvia Grinnell River. Nunami will use sound and pressure waves to map the type of material below ground surface. The sound and pressure waves are generated by low-speed blast charges from special array cables laid out on the ground surface. Geophones are installed along the cables to receive the sound and pressure waves bounced-back from the material below ground surface. The data are interpreted by technicians and used to map the material types below ground surface. Depth to bedrock will be mapped over an area up to 100 square metres along the shore, and upgradient, of the Sylvia Grinnell River. No geotechnical survey work will occur within the river and these on-shore low-velocity blast charges are not expected to cause any serious harm to fish in the river.DATA USEIn the short-term, Nunami will use the data to identify the best site for a water intake in the Sylvia Grinnell River for the City of Iqaluit. In the long-term, data will be stored on Nunami's servers and will be given to the City of Iqaluit. REPORTINGNunami will communicate the results of the study to the City in a report. Results of the study will likely be communicated by the City of Iqaluit through a public meeting. The study will not result in a publication.

French: DESCRIPTION DU PROJETLa ville d'Iqualuit a connu une augmentation de sa demande en eau potable depuis les dernières années et cette augmentation signifie que les réserves du réservoir du lac Géraldine qui alimente la ville d'Iqualuit en eau potable doivent être ajustées à la hausse pour fournir à la demande. Le premier projet visant à remédier à cette situation devait puiser dans les ressources de la rivière Apex (Niaqunguk), mais a été cancellé dû à un niveau d'eau insuffisant dans la rivière. Plusieurs autres sources ont été étudiés par la suite et la rivière Sylvia Grinnell a été identifié par Nunami comme une rivière ayant des ressources suffisantes pour accommoder la demande croissante en eau potable dans la ville d'Iqualuit tout en assurant la protection de la population d'ombles chevaliers et de son habitat naturel.Pour initialiser le processus de conception, Nunami conduira, en septembre 2018, une étude qui déterminera le site idéal pour la prise d'eau à la rivière Sylvia Grinnell. Deux sites ont été identifiés : site A et site B qui sont tout deux situés au nord du parc territorial Sylvia Grinnell et identifiés sur la carte jointe à ce document. L'installation des pompes nécessaires pour la prise d'eau étant prévue d'être située près de la rive, la profondeur du fonds marin y sera évaluée de la surface au substrat rocheux. Une mesure similaire sera prise sur la terre ferme ainsi qu'au milieu de la rivière. L'accès au site sera restreint aux routes et chantiers par l'entremise d'un camion ou d'un véhicule tout-terrain. Aucune infrastructure ne sera construite et l'impact sur l'environnement devrait être minime.PROCÉDURELes procédures suivantes seront suivies pour identifier le site de la prise d'eau à la rivière Sylvia Grinnell:1.Levée bathymétrique: Nunami utilisera un bateau à batterie miniature contrôlé de la rive par un opérateur pour mesurer la profondeur des eaux aux deux sites identifiés.2.Étude géotechnique: Nunami prendra des mesures sur la profondeur du substrat rocheux sans creuser ou perturber le sol en utilisant des ondes sonores et barométriques pour identifier les différents matériaux qui constituent le sol entre la surface et le substrat rocheux. Les ondes seront générées par des charges lancés à basse vitesse à travers une grille de câbles étendue sur le sol aux endroits visés. Des géo-récepteurs seront utilisés pour capter les ondes retournées par les différentes composantes du sol. Les données seront par la suite interprétées par des techniciens sur place qui procéderont par la suite à définir les différentes composantes du sol et leur profondeur respective. La profondeur du substrat rocheux sera illustrée sur une surface allant jusqu'à cent mètres carrés sur le long de la rive. L'étude géotechnique se fera uniquement sur la terre ferme où les charges lancées à basse vitesse ne devraient pas causer de dommage à la vie aquatique dans la rivière. Ces techniques seront utilisées aux deux sites identifiés précédemment.UTILISATION DES DONNÉESÀ court terme, Nunami identifiera le site idéal pour la prise d'eau de la rivière Sylvia Grinnell pour le réservoir de la ville d'Iqualuit. À long terme, ces

données seront sauvegardées par Nunami et transmises à la ville d'Iqualuit. RAPPORTNunami communiquera les résultats de l'étude avec la ville d'Iqualuit sous forme d'un rapport. Il est probable que les résultats soient par la suite communiqués au public par la ville lors d'une conférence de presse. L'étude ne résultera pas en une publication de recherche.

Inuktitut: ᐱᓕᕆᐊᖅ ᓇᓗᓇᐃᔭᖅᓯᒪᓂᖓᐃᒥᕐᒥᑦ ᐱᒃᑲᓂᕈᓂᖅᑲᓕᖅᑎᓪᓗᒍ ᓄᓇᓕᐸᐅᔭᖓᑦ ᐃᖅᑲᓗᐃᑦᐃᒥᕐᒧᑦ ᐃᒪᖅᑲᕐᕕᖓ, ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐃᒥᕐᑕᖅᕕᖓ ᐃᒪᖅᑲᒃᑲᓐᓂᕆᐊᖅᑲᖅᑐᖅ. ᐸᕐᓇᑕᐅᒥᐊᓐᖓᖅᓯᒪᔪᖅ ᒥᓪᓗᐊᑎᑦᑎᓗᑎ ᐃᒥᕐᒥᑦ ᓂᐊᕐᑯᓐᖑᖅ (Apex) ᑰᖓᓂ ᐃᖅᑲᓗᐃᑦ ᑕᐃᒥᒻᕐᑕᕐᕕᖓᓄᑦ ᓄᖅᑲᖅᑎᑕᐅᓚᐅᖅᑐᖅ ᐃᒪᑭᓗᐊᕐᓂᖓᓄᑦ. ᑖᓐᓇ ᐱᑕᕐᑲᓕᐊᕐᑲᖅᑎᑕᐅᔪᖅ ᓇᓗᓇᐃᒃᑯᑕᖓ ᓄᑖᒧᑦ ᐃᒪᕐᑲᕐᕕᔅᓴᒧᑦ, ᐊᒻᒪ ᐃᒪᕝᕕᐅᕐᑲᑦᑕᑲᓂᐊᖅᑐᑦ, ᓂᕈᐊᖅᑕᐅᔭᕆᐊᓕᒃ. ᓄᓇᒥ ᐱᔭᕇᖅᓯᓚᐅᕐᑯᖅᑐᑦ ᖃᕋᓴᐅᔭᒃᑯᑦ ᖃᐅᔨᓴᖅᑐᑎ ᓄᓇᓕᐸᐅᔭᖕᖓᓐᓄᑦ ᐃᖅᑲᓗᐃᑦ ᐊᒻᒪ ᓇᓗᓇᐃᖅᓯᓪᓗᑎ ᐃᖅᑲᓗᐃᑦ ᑰᖓ ᐃᒪᖓ ᓈᒻᒪᑦᑐᓂ ᓄᓇᓕᐸᐅᔭᒧᑦ ᐱᔭᐅᔭᕆᐊᕐᑲᐊᖅᑐᒥᑦ ᓴᐳᒻᒥᑦᑎᓯᓐᓈᕐᓗᑎ ᐱᒻᒪᕆᒥᔭᐅᔪᓂᑦ ᐃᖅᑲᓗᓐᓄᑦ ᓇᔪᖅᑕᐅᕙᑦᑐᑦ ᑰᖓᓂ.ᓯᕗᒧᒥᐊᓂᐊᕐᓗᓂ ᓴᓇᔭᐅᒥᐊᓐᖓᕐᓂᖓᖓᓄᑦ ᐊᒻᒪ ᓴᓇᓯᒪᓂᖓ ᐃᒻᒪᕝᕕᐊᕐᑲᑦᑕᓂᐊᖅᑐᖅ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂᑦ, ᓄᓇᒥ ᐱᔭᕇᖅᓯᔭᕆᐊᓖᑦ ᖃᐅᔨᓴᓂᕐᒥᑦ ᓇᓗᓇᐃᖅᑕᐅᓗᓂ ᐱᐅᓛᖑᔪᓐᓇᖅᑐᒥᑦ ᐃᒪᕝᕕᐅᕐᑲᑦᑕᓂᐊᖅᑐᒥᑦ. ᓄᓇᒥ ᐸᕐᓇᓯᒪᔪᑦ ᐱᔭᕇᖅᓯᓗᑎ ᖃᐅᔨᓴᕐᓂᐅᔪᒥᑦ ᓯᑎᐱᕆ 2018 ᖃᐅᔨᓴᕐᓗᑎ ᐃᑎᓂᖓᓂᑦ ᖁᐊᖑᐃᓐᓇᖅᑐᒧᑦ ᐃᒪᖓᑕ ᑭᓪᓕᖓᓂ ᒥᓪᓗᐊᕈᑎᐅᔪᖅ ᓇᒦᕝᕕᒋᓂᐊᖅᑕᖓᓂᑦ. ᒪᕐᑮᒃ ᓇᔪᖅᑕᐅᔪᓐᓇᖅᑑᒃ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ, ᑭᓯᐊᓂ ᓯᓚᑖᓂ (ᐅᐊᓐᓇᖓᓂ) ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ ᓄᓇᕘᑉ ᒥᖅᖑᐃᓯᕐᕕᖓᓂ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᖅᑐᑦ. ᑖᒃ ᓇᒦᕝᕕᒋᔭᓐᓇᖅᑕᕐᒥᑦ A ᐊᒻᒪ B ᐱᖅᑲᓯᐅᑎᓯᒪᔪᒥᑦ ᓄᓇᖑᐊᒥᑦ. ᐊᑐᓂ ᓇᒦᕝᕕᐅᒍᓐᓇᖅᑑᒃ, ᐃᑎᓂᖓ ᖁᐊᖑᐃᓐᓇᖅᑐᒧᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᖅᑐᖅ ᓄᓇᒥᑦ, ᐃᒪᐅᑉ ᑭᓪᓕᖓᓂ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ, ᐊᒻᒪ ᐃᒪᐅᑉ ᐃᑎᓂᖓ ᑰᖓᑕ ᐊᑭᐊᓂ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᕐᒥᔪᖅ. ᒪᕐᑮᒃ ᓇᒦᕝᕕᐅᔪᓐᓇᖅᑑᑏᒃ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᖅᑐᑦ ᓄᓇᓯᐅᑎᒃᑯᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐱᕚᑎᒃᑯᑦ ᐊᑐᖅᓗᑎᑦ ᒦᓐᓇᐅᔪᒥᑦ ᐊᑐᕆᐊᖓᓂᑦ ᐊᒻᒪ ᐱᓯᕝᕚᑦ. ᓴᓇᓯᒪᔪᓂᑦ ᓇᑉᐸᐃᔪᖅᑲᔾᔮᕐᒥᑦᑐᖅ ᐊᒻᒪ ᓄᓇᒥᑦ ᐸᕕᓴᐃᓗᐊᕐᓂᖅᑲᓂᐊᖅᑐᕐᒥᑦᑐᑦ.ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦᓇᓗᓇᐃᕐᓗᒥᑦ ᐱᐅᓛᖑᔪᓐᓇᖅᑐᒥᑦ ᒥᓪᓗᐊᕐᕕᐅᔪᓐᓇᖅᑐᒥᑦ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ, ᐅᑯᐊ ᐃᒪᐃᓕᖓᔪᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ:1.ᐃᒪᐅᑉ ᐃᑎᓂᖓᓂᑦ ᖃᐅᔨᓴᕐᓂᖅ: ᓄᓇᒥ ᐊᑐᕐᓂᐊᖅᑐᑦ ᒥᑭᔪᓂᑦ ᐅᐊᔭᖅᑲᕐᒥᑦᑐᓄᑦ ᐊᐅᓚᑦᓯᓴᓂᑦ ᐅᒥᐊᓐᖑᐊᓂᑦ ᖃᐅᔨᓴᕐᓗᑎ ᐃᒪᖓᑕ ᐃᑎᓂᖓᓂᑦ ᐊᑭᐊᓂ ᒪᕐᑮᒃ ᓇᒦᕝᕕᐅᔪᓐᓇᖅᑑᒃ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ. ᐅᒥᐊᓐᖑᐊᖅ ᐹᑕᓖᒨᕐᓂᐊᖅᑐᖅ ᐊᒻᒪ ᐊᐅᓚᑕᐅᓗᓂ ᓄᓇᒦᑦᑐᒧᑦ.2.ᓄᓇᒥᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᓂᖅ: ᓄᓇᒥ ᖃᐅᔨᓴᕐᓂᐊᖅᑐᑦ ᐃᑎᓂᖓᓂᑦ ᖁᐊᖑᐃᓐᓇᖅᑐᒧᑦ ᖃᓗᕿᕐᒥᓪᓗᑎ ᐅᕝᕙᓘᓐᓃᑦ ᐸᕕᓴᐃᕐᒥᓪᓗᑎ ᓄᓇᖓᓂᑦ. ᑕᐃᒪᐃᓐᓂᐊᖅᑐᑦ ᐊᑐᓂ ᓇᒦᕝᕕᐅᔪᓐᓇᑑᓐᓂᒃ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ. ᓄᓇᒥ ᐊᑐᕐᓂᐊᖅᑐᑦ ᓂᐱᓄᑦ ᓄᓇᖑᐊᓕᐅᕐᓗᑎ ᖃᓄᐃᑦᑑᓂᕐᒥᓐᓄᑦ ᓄᓇᐅᑉ ᐃᑭᖓᓃᑦᑐᓂᑦ. ᓂᐱᖅᑲᖅᑎᑕᐅᔪᖅ ᓯᒃᑲᐃᑦᑐᒥᑦ ᖄᖅᑐᓂᑦ ᐅᐊᔭᓂᑦ ᓄᓇᐅᑉ ᖄᖓᓄᑦ ᐃᓕᔭᐅᓯᒪᔪᑦ. ᓄᓇᒧᑦ ᓂᐱᓕᐅᓇᔾᔪᑏᑦ ᐋᖅᑭᑦᑕᐅᓂᐊᖅᑐᑦ ᐅᐊᔭᕐᒥᓪᓗ ᐱᔭᐅᓗᑎ ᓂᐱᐅᔪᑦ ᐱᓪᓕᖅᑐᑦ ᓄᓇᐅᑉ ᐃᑭᐊᕐᒪᓃᕐᒫᖅᑐᓂᑦ. ᑐᑭᓯᒋᐊᕈᑏᑦ ᑐᑭᓯᓇᖅᓯᑎᑕᐅᔪᑦ ᖃᐅᔨᓴᖅᑎᓄᑦ ᐊᒻᒪ ᐊᑐᖅᑕᐅᔾ; ᓂ ᓄᓇᐅᑉ ᐃᑭᕐᒪᓃᑦᑐᑦ ᓄᓇᕐᒍᐊᒨᖅᑕᐅᓪᓗᑎ. ᐃᑎᓂᖓ ᖁᐊᖑᐃᓐᓇᖅᑐᒧᑦ ᓄᓇᕐᒍᐊᓕᐅᖅᑕᐅᓂᐊᖅᑐᖅ ᑎᑭᓯᒪᔪᒧᑦ 100 ᑭᑉᐹᓇᑦᑐᑦ ᒦᑕᐃᑦ ᐃᒪᐅᑉ ᑭᓪᓕᖓᒧᑦ ᐊᒻᒪ ᐃᒪᖅᑲᕐᕕᖓ, ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂ. ᓄᓇᖓᓂ ᖃᐅᔨᓴᕐᓂᖅᑳᕐᒥᑦᑐᑦ ᐃᖅᑲᓗᐃᑦ ᑰᖓᓂᑦ ᐊᒻᒪ ᑖᒃᑯᐊ ᓄᓇᒥᑦ ᓂᐱᖅᑲᓗᐊᕐᒥᑦᑐᑦ ᐱᒻᒪᓇᐅᔪᒥᑦ ᐊᑦᑕᓇᖅᑐᒦᑎᑦᑎᓂᐊᖅᑐᒥᔭᐅᕐᒥᑦᑐᑦ ᐃᖅᑲᓗᕐᒥᓐᓄᑦ ᑰᖓᓂ.ᖃᐅᔨᓴᕈᑎᒥᓃᑦ ᐊᑐᖅᑕᐅᓂᕐᒥᑦᕿᓚᒥᐅᔪᒧᑦ, ᓄᓇᒥ ᐊᑐᕐᓂᐊᖅᑐᑦ ᖃᐅᔨᓴᕈᑎᒥᓂᕐᓂᑦ ᓇᓗᓇᐃᖅᓯᓗᑎ ᐱᐅᓛᖑᔪᓐᓇᖅᑐᒥᑦ ᓇᒦᓐᓂᕐᒥ ᐃᒻᒪᕝᕕᕐᒥᕐᒥᓂᑦ ᐃᖅᑲᓗᐃᒃ ᑰᖓᓂ ᓄᓇᓕᐸᐅᔭᒃᑯᓐᓄᑦ ᐃᖅᑲᓗᐃᑦ. ᐊᑯᓂᐅᔪᒧᑦ, ᖃᐅᔨᓴᕈᑎᒥᓃᑦ ᑐᖅᑯᖅᑕᐅᓯᒪᓂᐊᖅᑐᑦ ᓄᓇᒥ ᖃᕋᓴᐅᔭᕐᒪᓂᑦ ᐊᒻᒪ ᑐᓂᔭᐅᓂᐊᖅᑐᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᓐᓄᑦ ᐃᖅᑲᓗᐃᑦ.ᑐᓴᖅᑎᑦᑎᓂᖅᓄᓇᒥ ᑐᓴᐅᒪᑎᑦᑎᓂᐊᖅᑐᑦ ᖃᐅᔨᓴᕈᑎᒥᓂᕐᓂᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᒥᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᓐᓄᑦ ᐅᓂᒃᑳᓂᑦ. ᖃᐅᔨᓴᕈᑎᒥᓃᑦ ᑐᓴᐅᒪᑎᑦᑎᒍᑕᐅᓂᐊᖅᑐᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᓐᓄᑦ ᐃᖅᑲᓗᐃᑦ ᐃᓄᓐᓂᑦ ᑲᑎᒪᑎᑦᑎᓗᑎ. ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᖃᓄᐃᓐᓂᕆᔭᕐᒥᑦ ᓴᖅᑭᖅᑎᑕᐅᔾᔮᕐᒥᑦᑐᑦ.

Inuinnaqtun: Project description not provided in Inuinnaqtun.

Personnel

Personnel on site: 3
Days on site: 14
Total Person days: 42
Operations Phase: from 2018-09-05 to 2018-09-20

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Site A	Scientific/International Polar Year Research	Municipal	A 2018 feasibility study examined Site A for potential use as a raw water intake	Unknown	Site A is situated within the municipal limits of the City of Iqaluit
Site B1	Scientific/International Polar Year Research	Municipal	A 2018 feasibility study examined Site B1 for potential use as a raw water intake	Unknown	Site B1 is situated within the municipal limits of the City of Iqaluit
Site B2	Scientific/International Polar Year Research	Municipal	A 2018 feasibility study examined Site B2 for potential use as a raw water intake	Unknown	Site B2 is situated within the municipal limits of the City of Iqaluit

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Iqaluit	Manasie Mark	Amaruq Hunters and Trappers Association	2018-08-01
Iqaluit	Michael	Amaruq Hunters and Trappers Association	2018-08-16

Authorizations

Indicate the areas in which the project is located:

South Baffin

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Scientific Research Licence	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	Access to Iqaluit, by out-of-town field personnel (up to two) will be via commercial scheduled flights	
Land	Access to Site A, Site B1, and Site B2 will be overland on existing roads and trails, via truck and ATV	

Project accomodation types

Community

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
ATV	4	4 x 3 ft	For access to Site A and Site B (1 & 2) along the Sylvia Grinnell River; transportation within the community
Truck	1	15 x 6 ft	Access/transportation within Iqaluit
Geotechnical Equipment	200 lbs	Unk.	Includes sledge hammer, cables, geophones, low-speed blast charges; to complete geotechnical survey at Site A and Site B
Remote-controlled boat	1	3 x 6 ft	Remote-controlled survey boat, battery-powered, equipped with depth sounding and survey equipment; to complete bathymetric surveys at Site A and Site B

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Diesel	fuel	0	50	0	Liters	Fueling of rental truck (if diesel truck used); only to be completed at in-town fueling stations
Gasoline	fuel	0	40	0	Liters	Fueling of ATVs and rental truck (if gasoline truck used); only to be completed at in-town fueling stations - no re-fueling out near the Sylvia Grinnell River or on existing trails

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Scientific/International Polar Year Research	Combustible wastes	< 1 cubic metre	Domestic waste, from field personnel lunches and inert blast caps following the geotechnical survey, will be disposed of via Iqaluit's municipal waste collection system.	n/a

Environmental Impacts:

Environmental impacts associated with the field study are expected to be negligible. The sites will be accessed using existing roads and trails via ATV and/or truck. The ATVs will be equipped with small spill kits to manage any small spills or leaks that may occur. The non-intrusive geotechnical survey will not cause any ground or land disturbance and the remote-controlled, battery-powered survey boat, used in the river, will be clean of any potential contaminants before entering the river. Potential fisheries effects from the geotechnical survey are also expected to be minimal and not cause residual serious harm to fish. Erosion and sediment control measures will be used to reduce the risk of erosion of bank sediments into the river, or the potential for run-off from the survey area to enter the river. All geotechnical work will also occur on-land (not in the river) and geotechnical blast charges will be low-speed and, as a result, below known thresholds that cause effects to fish (i.e., Linton et al. 1985, DFO 2010).

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

Description of Existing Environment: Physical Environment

SITE ASite A is at the end of the Iqaluit Airport (YFB) runway and near the northern border of the Sylvia Grinnell Territorial Park . The site is a deep run following a riffle and located on a gradual bend to the west. The channel is approximately 150 m wide and river's thalweg is poorly pronounced but running in the middle of the channel. Substrates consist of large coarse material, primarily large cobble and boulders. A bedrock outcrop is present and is the site of the WSC hydrometric station 10UH001. The outcrop protrudes into the flow path slightly and it was noted that this protrusion was not sufficient to induce scour in the bed substrate. Erosion of the left bank is minimized by the presence of the outcrop.SITE BSite B (1 and 2) is a run located on a more pronounced outside bend of the river. The left (north) bank at Site B is actively eroding and would require stabilization for any infrastructure placed at this site. A bedrock outcrop is present downstream and that outcrop runs under the thalweg at a shallow depth. It is anticipated that the outcrop provides some limit to the progression of erosion at left bank. Bed substrates consist of cobble and large gravel with the occasional boulder. The high banks are comprised of loose gravel and sand and the extent of the bedrock in the left bank is unclear. The river's thalweg is moderately pronounced and runs near the outside of the bend. At the time of the site visit (August 2017), a depth of 1.5 m was measured near the thalweg. Its potential depth may also be limited by the downstream bedrock. The channel is 130 m wide but the shallow slip-off slope on the inside of the bend (right [south] bank) suggests flood flow is not confined at this location and may further limit the deepening of the thalweg by existing processes. The profile of the bend suggests the thalweg will never run up against the toe of the bank and the observed depth of the thalweg may be at its limit without the addition of training structures.

Description of Existing Environment: Biological Environment

The Sylvia Grinnell River supports an anadromous population of Arctic char (Gallagher and Dick 2010). Arctic char (Salvelinus alpinus) exhibit anadromous and freshwater resident populations and are found in rivers, lakes, estuaries, and marine environments throughout their life cycle (Evan et al. 2002). Anadromous Arctic char that are part of the fishery in the area migrate to marine waters during the summer to feed and return to freshwater habitats to overwinter and spawn. Arctic char use the Sylvia Grinnell River for migration, overwintering, spawning and rearing; however, it is believed that most char likely overwinter and spawn in Sylvia Grinnell Lake. Personal communication with DFO (C. Lewis, 21 August 2017) indicate that large deep pools in the Sylvia Grinnell River are also used for overwintering. The Arctic char population in the Sylvia Grinnell River is an important resource for subsistence and recreation of people in Iqaluit (DFO 2013). Unfortunately, current stock abundance estimates are not available for the Sylvia Grinnell Arctic char. During a 2009 to 2011 mark-recapture study by DFO, insufficient fish were recaptured and estimates could not be developed (DFO 2013b). DFO is currently completing a five-year study to evaluate stock status of Sylvia Grinnell Arctic char; the study is expected to be complete by 2020 (Ducharme 2016).There has been some concern about the Arctic char population in the Sylvia Grinnell River due to historical exploitation. A commercial fishery was attempted in the late 1940s and late 1950s, at the Sylvia Grinnell estuary (in addition to subsistence and recreational fishing), however the fishery was closed due to declining catch-per-unit-effort (CPUE) and smaller-sized fish (Kristofferson and Sopuck 1983; Gallagher and Dick 2010). An assessment of the stock in the late 1970s indicated that it had not yet recovered from the exploitation in the 1940s and 1950s, based on the size and age composition of the stock, and it was thought that current subsistence and recreational fishing rates were likely preventing recovery (Kristofferson and Sopuck 1983). More recent assessments in 2002 and 2004 suggest some recovery of the stock since the late 1970s, based on

increased length-at-age, increased mean weight, longer and older fish, reduced mortality rates, and improved CPUE (Gallagher and Dick 2010). The 2009 to 2011 DFO mark-recapture study found some recovery of the stock from the 1970s/1980s, based on the stock age structure, and estimated age-at-maturity (8 to 9 years) and proportion of reproductive fish (DFO 2013b). However, it is believed that the population has not yet returned to that of the late 1940s when a large portion of the population was estimated between 12 and 23 years of age (DFO 2013b). SITE ASite A has a riffle flowing into a deep run associated with backwater formed from gravel deposits upstream of a bedrock intrusion on the east bank. The river channel is approximately 150 m wide at the bedrock intrusion. Water depth is primarily less than 1 m, with depths exceeding 1 m in the backwater and likely in locations in the main channel. Substrates consist of large coarse material, primarily large cobble and boulders with bedrock intrusions. Substrates in the backwater had a deposition layer of fine sediment.Deep backwater pool habitat along the east bank, upstream of the WSC hydrometric station may provide habitat for downstream migrating young Arctic char and the backwater pool may provide rearing habitat for Arctic char and habitat for small fish, such as stickleback species. Site A is unlikely to provide overwintering habitat to adult Arctic char due to shallow water depths. SITE BSite B is run habitat along the east bank, turning into a riffle, then a rapid formed at the downstream end where a bedrock intrusion narrows the channel. Sub-site B1 and B2 are adjacent, with B2 being upstream at the mid-point of the bend and B1 being at the lower portion of the bend. The channel is approximately 130 m wide. Along the middle and upstream portions of the east bank, substrates consist of cobble and large gravel, with high loose gravel banks. Occasional boulders provide instream cover. Site B is unlikely to provide overwintering habitat due to low water depth, nor act as a holding pool for upstream migratory Arctic char. Nearshore habitat would provide cover for downstream moving fish, but rearing habitat is poor because of the absence of cover.

Description of Existing Environment: Socio-economic Environment

Site A and Site B (1 and 2) are situated within the municipal limits of the City of Iqaluit. Iqaluit has been ranked as the fastest growing community in Nunavut, and between 2001 and 2006, was among the top 15 fastest growing communities in Canada (City of Iqaluit 2010). The Nunavut Bureau of Statistics (2014) provides population projections, currently based on the 2011 Canadian census, and estimates a 5.5% population increase in Iqaluit over the next five years, from 2018 to 2022 (from 7,881 individuals, to 8,318). However, based on the 2016 Canadian census, Iqaluit has already experienced a 15.5% population increase between 2011 and 2016, from 6,699 individuals (2011) to the current estimate of 7,740 individuals (Statistics Canada 2017). Based on the 2016 Canadian census (Statistics Canada 2017), the unemployment rate in Iqaluit is 9.6%. Of the workforce 15 years of age and older (5,675 individuals), 74% are employed and the primary occupations include those in education, law, social, community and government services (935 individuals), as well as business, finance and administration (915 individuals), and sales and service (795 individuals).

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

Environmental impacts associated with the field study are expected to be negligible. The sites will be accessed using existing roads and trails via ATV and/or truck. The ATVs will be equipped with small spill kits to manage any small spills or leaks that may occur. The non-intrusive geotechnical survey will not cause any ground or land disturbance and the remote-controlled, battery-powered survey boat, used in the river, will be clean of any potential contaminants before entering the river. Potential fisheries effects from the geotechnical survey are also expected to be minimal and not cause residual serious harm to fish. Erosion and sediment control measures will be used to reduce the risk of erosion of bank sediments into the river, or the potential for run-off from the survey area to enter the river. All geotechnical work will also occur on-land (not in the river) and geotechnical blast charges will be low-speed and, as a result, below known thresholds that cause effects to fish (i.e., Linton et al. 1985, DFO 2010).

Cumulative Effects

No cumulative effects from the Project are expected given its short duration and negligible environmental impacts

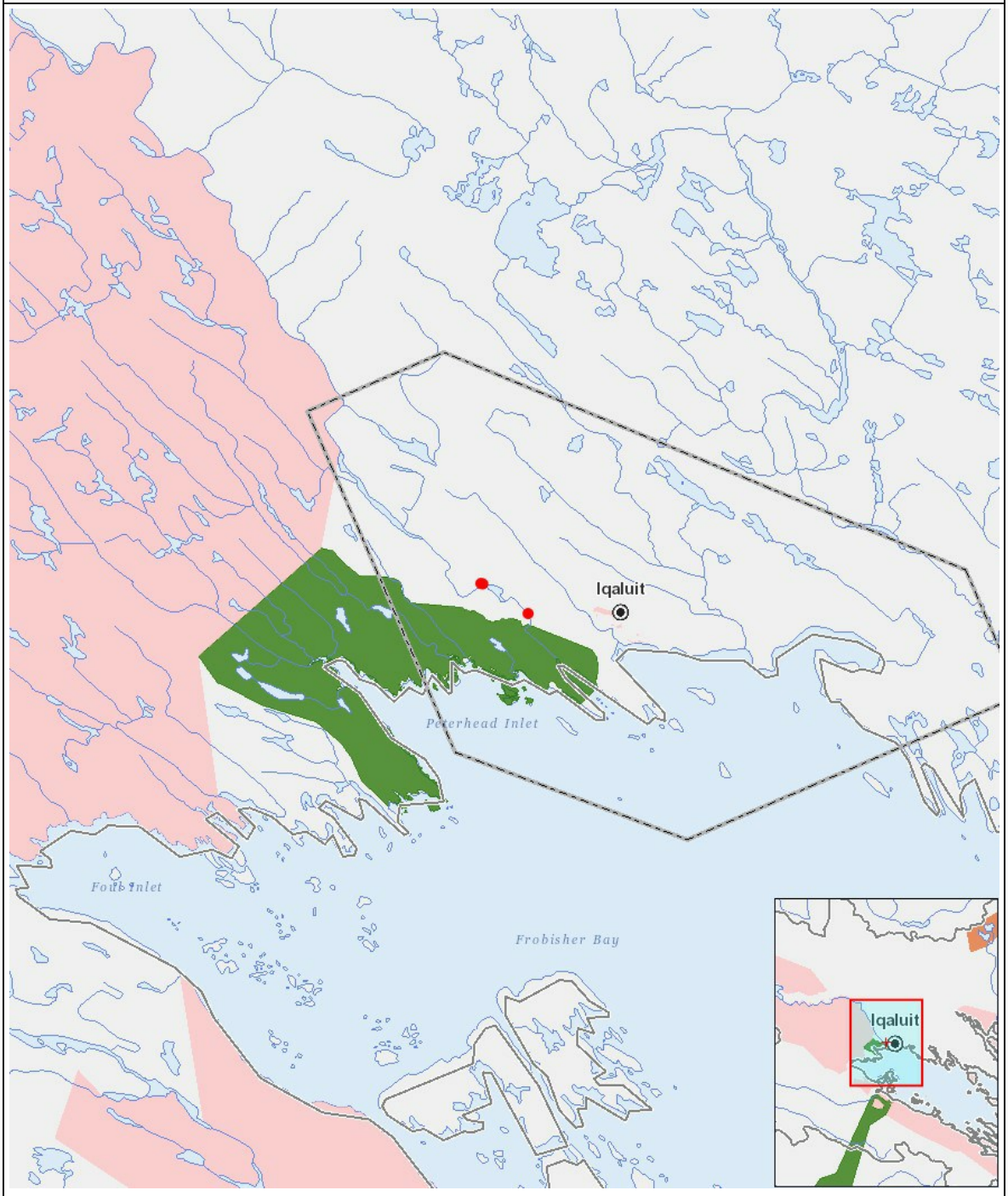
Impacts

Identification of Environmental Impacts

	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
Construction																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Operation																									
Scientific/International Polar Year Research		-	-	-	-	N	-	-	-	N	-	-	-		-	-	-	N	-		-	-	-	-	-
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

PROJECT MAP



LIST OF PROJECT GEOMETRIES:

1	point	Site A
2	point	Site B1
3	point	Site B2