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Iqaluit Marine Infrastructure - Small Craft Harbour

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ᖃᓄᐃᑦᑑᑎᓂᒃ ᐱᓕᕆᐊᖅᑲᖅᓂᐊᓇᐊᖅᓚᓐᓂᒃ

ᖃᓪᓗᓈᑎᑐᑦ: Project Summary The Government of Nunavut (GN), through Community and Government Services (CGS) on behalf of the Department of Economic Development and Transportation (EDT), plans to improve the small craft harbour (SCH) facilities at the City of Iqaluit (the Project). Funding for the Project is available through the New Canada Build Fund and the GN. The Project The SCH improvements will be built at the municipal breakwater and the causeway within Koojesse Inlet. The Project work at the municipal breakwater includes an extension of the existing breakwater, construction of an additional north breakwater, a boat launch ramp, vehicle staging lanes, and new floating docks. The improvements to the causeway include a new high-tide ramp, a new vehicle turning circle on the causeway itself, and improvements to the existing low-tide ramp and parking area. The current SCH facility locations and arrangements were selected as the most appropriate because of suitability of access, existing marine infrastructure, and historic use. Benefits to Iqaluit Residents The Project is designed to serve a wide range of small boat users, such as hunters and fishers, subsistence harvesters, outfitters, recreational users, and cruise ship tenders. Between the municipal breakwater and the causeway, residents will enjoy all-tide access to support their summer activities. The SCH will improve safe access to water and the functionality of boating activities by reducing congestion, safety concerns, and environmental risks associated with the current use of the municipal breakwater and causeway. At the municipal breakwater, the new boat ramp will be approximately five times wider than the current ramp, significantly increasing the capacity for boat launching. The staging area will reduce congestion by providing parking and a queuing lane off of Sinaa Street. The extension on the municipal breakwater and the construction of a new north breakwater will provide substantially better protection to the harbour from the prevailing winds, which was a significant concern expressed during consultation with the community. The arrangement of the breakwaters will create a larger and better protected

harbour than what currently exists, allowing for more movement within a sheltered area. The basin in this area can be dredged in the future to improve tide access. The Project will also improve day-to-day operations and safety for boat users by providing additional amenities, including an improved shoreline with permanent tie-up points for high-tide moorage, floating docks, better lighting, and access stairs built into the breakwater slope leading to the floating docks for additional boat accessibility. Boaters will have all-tide access at the causeway with the addition of a new high tide ramp. A new vehicle turnaround will eliminate the need to back vehicles down the narrow causeway, making it faster and safer to launch boats. Parking will also be improved at the causeway with a level and larger parking area. This part of the Project will be completed prior to starting at the municipal breakwater to ensure that water access is always maintained during construction. Such improvements should divert a lot of truck and trailer traffic to the causeway, resulting in a significant improvement to the traffic congestion currently experienced at the municipal breakwater.

Construction Construction will start in summer 2018 at the causeway with the arrival of the first sealift. It will take place mostly during the open water months. The work at the municipal breakwater is expected to be completed by 2019. Potable water, sanitary and solid waste disposal, and fuel will be provided by the City of Iqaluit. Fuel required for construction equipment will be diesel. Refuelling of equipment will be done in designated fuelling areas or using portable containment. Construction equipment may include excavators, rock transport trucks, front-end loaders, compactors, dozers and graders, cranes and forklifts and other equipment. Approximately 30 workers will be needed for construction. Non-local workers will stay in local accommodations. Construction equipment will arrive on the sealift and workers and consumables will arrive by scheduled flights, with charter flights to be used if needed. A Construction Environmental Management Plan (CEMP) will provide mitigation and monitoring commitments for the construction phase of the Project. Operations Operations at the SCH facilities will continue to provide public access for the community. EDT is committed to developing and implementing operations plans for these facilities. EDT will also work with the City of Iqaluit to agree to any infrastructure maintenance or monitoring requirements, and for coordination of services, such as waste management. Inuit Qaujimajatuqangit Inuit Qaujimajatuqangit (IQ) has been gathered on local site conditions, harvesting, travel routes and water/ice access and considered in the design and planning of the Iqaluit SCH project through consultation with Hunters and Trappers Association (HTA), elders, outfitters, and a Boaters' Working Group. Community Engagement Program Consultation with the community, including hunters, fishers, residents, City Mayor and Council, HTA, Qikiqtani Inuit Association, outfitters, the Boater's Working Group, and others has been on-going since June, 2016. Meetings, interviews, workshops and open houses were used to share information and receive comments, concerns and suggestions about the Project both in English and Inuktitut, as well as in written French and Inuinnaqtun. The incorporation of recommendations and information received has greatly improved the design and planning of the SCH. Consultation will continue during the detailed design stage and construction of the Project.

ᐅᐃᓴᑎᑐᑦ: Sommaire du projet Le gouvernement du Nunavut (GN), par l'entremise du ministère des Services communautaires et gouvernementaux (SCG) et au nom du ministère du Développement économique et des Transports (DET), envisage d'améliorer les installations du port pour petits bateaux (PPB) dans la ville d'Iqaluit (le projet). Le financement du projet est assuré par le Nouveau Fonds Chantiers Canada et le GN. Projet Les améliorations du PPB seront faites au brise-lame municipal et au pont-jetée dans Koojesse Inlet. Les travaux au brise-lame municipal comprennent le prolongement du brise-lame actuel, la construction d'un brise-lame additionnel au nord, une rampe de mise à l'eau pour bateaux, des couloirs pour les véhicules et de nouveaux quais flottants. Les améliorations apportées au pont-jetée comprennent une nouvelle rampe de mise à l'eau à marée haute, un espace pour le virage des véhicules sur le pont-jetée même, des améliorations à la rampe de mise à l'eau à basse marée existante et une aire de stationnement. L'emplacement et la disposition des installations actuelles du PPB ont été considérés comme les plus appropriés en raison de leur facilité d'accès, de l'infrastructure maritime existante et de leur utilisation antérieure. Avantages pour les résidents d'Iqaluit Le projet vise à servir un éventail d'utilisateurs de petits bateaux, notamment des chasseurs, des pêcheurs, des exploitants de ressources fauniques à des fins de subsistance, des pourvoyeurs, des plaisanciers et des navires annexes des paquebots de croisière. Entre le brise-lame municipal et le pont-jetée, les résidents bénéficieront d'un accès aux fins de leurs activités estivales, quel que soit le niveau de la marée. Le PPB rendra l'accès à l'eau plus sécuritaire et améliorera la fonctionnalité des activités de navigation en réduisant la congestion, les préoccupations relatives à la sécurité et les risques environnementaux liés à l'utilisation actuelle du brise-lame municipal et du pont-jetée. Au brise-lame municipal, la nouvelle rampe de mise à l'eau des bateaux sera environ cinq fois plus large que la rampe actuelle, accroissant ainsi considérablement la capacité pour la mise à l'eau de bateaux. L'aire de rassemblement permettra de réduire la congestion en fournissant un stationnement et un couloir de file d'attente à partir de la rue Sinaa. Le prolongement du brise-lame municipal et la construction d'un nouveau brise-lame au nord permettront de grandement améliorer la protection du port contre les vents dominants, une préoccupation importante qui avait été soulevée pendant les consultations communautaires. La disposition des brise-lames créera un port plus large et mieux protégé que ce qui existe actuellement, permettant plus de déplacements à l'intérieur d'une zone protégée. Le bassin dans la zone pourra être dragué à l'avenir afin d'améliorer l'accès en fonction des marées. Le projet améliorera aussi les activités quotidiennes et la sécurité pour les utilisateurs de bateaux en fournissant des commodités additionnelles, notamment un rivage amélioré doté de points d'attache permanents pour l'amarrage à marée haute, des quais flottants, un meilleur éclairage et un accès à des escaliers construits dans la pente du brise-lame qui mènent aux quais flottants pour fournir un plus grand accès aux bateaux. Les utilisateurs de bateaux auront accès au pont-jetée peu importe le niveau des marées grâce à une nouvelle rampe de mise à l'eau à marée haute. Une nouvelle zone de manœuvre éliminera la nécessité pour les véhicules de faire marche arrière sur le pont-jetée étroit, permettant de faire la mise à l'eau des bateaux de manière plus rapide et sécuritaire. Le stationnement sera aussi amélioré au pont-jetée, offrant une zone de stationnement plane et de plus grande taille. Cette partie du projet sera réalisée avant le commencement des travaux au brise-lame municipal pour veiller à ce que l'accès à l'eau soit maintenu pendant la durée des travaux. Les améliorations entraîneront la déviation de beaucoup de camions et de remorques vers le pont-jetée, permettant ainsi de grandement diminuer la congestion que l'on retrouve actuellement au brise-lame municipal. Construction Les travaux de construction commenceront à l'été 2018 au pont-jetée avec l'arrivée du premier transport maritime. Ceux-ci se dérouleront principalement durant les mois où les activités maritimes battent leur plein. Les travaux au brise-lame municipal devraient prendre fin en 2019. L'eau potable, l'élimination des déchets solides et sanitaires de même que le carburant seront fournis par la ville d'Iqaluit. Le carburant requis pour l'équipement de construction sera le diesel. Le ravitaillement de l'équipement s'effectuera dans des zones désignées ou au moyen de conteneurs portables. L'équipement de construction peut comprendre des excavatrices, des camions de transport de pierres, des camions à chargement frontal, des compacteurs, des bouteurs et des niveleurs, des grues, des chariots élévateurs et autres. Une trentaine de travailleurs seront mis à contribution dans le cadre de ces travaux de construction. Les travailleurs provenant de l'extérieur seront hébergés dans des établissements locaux. L'équipement de construction arrivera par le transport maritime. Les travailleurs et les matières consommables seront transportés sur des vols réguliers. Des avions nolisés seront utilisés au besoin. Un plan de gestion environnemental des travaux de construction (CEMP) fournira des mesures d'atténuation et de surveillance à respecter pendant la phase de construction du projet. Fonctionnement L'accès public sera maintenu aux installations du PPB. Le DET s'engage à élaborer et à mettre en œuvre un plan de fonctionnement à ces installations. Le DET travaillera aussi avec la ville d'Iqaluit pour accepter les exigences en matière d'entretien ou de surveillance de l'infrastructure, et pour coordonner les services, notamment la gestion des déchets. Inuit Qaujimajatuqangit On a recueilli des connaissances traditionnelles des Inuits (Inuit Qaujimajatuqangit) sur les conditions locales du site, l'exploitation des ressources fauniques, les itinéraires et l'accès à l'eau et aux surfaces glacées, et on a procédé à la conception et à la planification du projet de PPB d'Iqaluit en consultation avec l'Association des chasseurs et des trappeurs (ACT),

des aînés, des pourvoyeurs et un groupe de travail composé de plaisanciers. Programme d'engagement communautaire On procède à des consultations auprès de membres de la collectivité, notamment des chasseurs, des pêcheurs, des résidents, la mairesse, le conseil municipal, l'ACT, la Qikiqtani Inuit Association, des pourvoyeurs, le groupe de travail composé de plaisanciers et d'autres intervenants depuis juin 2016. Des réunions, entrevues, ateliers et portes ouvertes se sont tenus dans le but d'échanger de l'information ainsi que d'entendre les préoccupations, suggestions et commentaires à l'égard du projet. Ces échanges se sont faits en anglais et en inuktitut, de même que par écrit, en français et en Inuinnaqtun. L'intégration des recommandations et des renseignements reçus a permis de grandement améliorer la conception et la planification du PPB. Les consultations se poursuivront pendant l'étape de la conception détaillée et de la construction du projet.

ᐃᓄᒃᑎᑐᑦ: ᐱᓕᕆᐊᑦᓴᐅᑉ ᓇᐃᓈᖅᓯᒪᓂᖓ ᓄᓇᕗᑦ ᒐᕙᒪᒃᑯᑦ (GN), ᐅᑯᑎᒎᓇ ᓄᓇᓕᐊᓂ ᒐᕙᒪᒃᑯᓂᑦ ᐱᕓᑦᓯᕋᑎᒃᑯᑎᒍ (CGS) ᑭᒡᒐᖅᑐᕐᓗᒋᑦ ᐱᕙᓪᓕᐊᔪᓕᕆᔨᒃᑯᑦ ᐃᖏᕐᕋᔪᓕᕆᔩᒃᑯᓪᓗ (EDT), ᐸᕐᓇᒍᑎᑦ ᐱᐅᓯᒋᐊᖅᓯᒍᑕᐅᔪᒪᔪᑦ ᐅᒥᐊᒃᑯᕕᒃᓴᒥᒃ (SCH) ᓱᑐᐃᓐᓇᖅᑲᐅᑎᑦ ᓄᓇᓕᐸᐅᔭᕐᒥᓐᓂ ᐃᖅᑲᓗᐃᑦ (ᓴᓇᔭᒃᓴᖁᑎ). ᑮᓇᐅᔭᑦ ᐊᑐᐃᓐᓇᐅᑎᑕᐅᔪᑦ ᐱᓕᕆᐊᑦᓴᒧᑦ ᑕᕝᕗᓇ ᓄᑖᒥ ᑲᓇᑕᓕᐅᕐᓂᕐᒧᑦ ᑮᓇᐅᔭᖅᑎᒍᑦ ᐊᒻᒪᓗ ᓄᓇᕗᑦ ᒐᕙᒪᒃᑯᕐᒥᑎᒍᑦ. ᐱᓕᕆᐊᑦᓴᖅ ᐅᒥᐊᒃᑯᕕᒃᓴᒧᑦ (SCH) ᐱᐅᓯᒋᐊᖅᓯᒍᑎᒃᓴᐃᑦ ᓴᓇᔭᐅᓂᐊᖅᐳᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᓕᕆᐊᕆᓯᒪᔭᕆᓂ ᐃᓖᓂ ᐊᒻᒪᓗ ᓄᕗᑯᑖᑉ ᐃᓗᐊᓂ ᑰᕐᔾᓯ ᑲᖏᑐᖓᓂ. ᓴᓇᔭᒃᓴᖁᑎᐅᑉ ᐱᓕᕆᐊᕈᓂᖓ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖅᑯᑖᓂ ᐱᖃᓯᐅᔾᔨᓂᐊᖅᐳᖅ ᐊᕐᒫᓕᒥᐊᖅᑕᐅᓗᓂᓗ ᑕᐅᓐᓇ ᐅᖅᑯᐃᕕᒃ ᐃᓖᓂ, ᓴᓇᕝᕙᒃᑳᓂᕐᓗᓂ ᐃᓚᒃᑳᓂᖓᓂᑦ ᐊᒻᒍᐊᓂ ᐅᖅᑯᐃᕕᒻᒥ ᐃᓖᓂ, ᓵᕕᑎᑦᓯᕕᒃᓴᒥᒃ ᑐᓚᒃᓯᒪᕕᖕᒥᒃ, ᓄᓇᓯᐅᑎᓄᑦ ᓵᕕᑎᑦᓯᒥᐊᖅᑐᖅᑐᓄᑦ ᐃᖏᕋᕕᖕᒥᒃ, ᐊᒻᒪᓗ ᓄᑖᒥᒃ ᐳᑦᑕᕙᓂᒃ ᑐᓚᒡᕕᒃᓴᓂᒃ. ᐱᐅᓯᑎᑦᓯᒋᐊᕐᓂᖅ ᓄᕗᑖᒻᒥᒃ ᐃᓚᖃᒃᐳᖅ ᓄᑖᒥᒃ ᐅᓕᙵᑎᓪᓗᒍ ᐱᓱᕕᖕᒥᒃ, ᓄᑖᒥᒃ ᓄᓇᓯᐅᑎᓪᓗᓂ ᓴᙱᕕᒃᓴᒥ ᑲᐃᕙᓪᓚᑉᕕᖕᒥᒃ ᑕᐅᕙᓂ ᓄᕗᑖᒻᒥ, ᐊᒻᒪᓗ ᐱᐅᓯᒋᐊᖅᑕᐅᓗᓂ ᐊᑐᖅᑕᐅᔪᖅ ᑎᓂᙵᑎᓪᓗᒍ ᑐᓚᒃᓯᒪᕕᐅᓯᖅ ᐊᒻᒪᓗ ᕿᒪᐃᓯᒪᔪᓄᑦ ᐃᓂᖃᑎᑦᑎᕕᒃ. ᐊᑐᖅᑕᐅᔪᖅ ᐅᒥᐊᒃᑯᕕᒃ (SCH) ᓱᑐᐃᓇᖃᐅᑎᐅᑉ ᐃᓂᖓ ᐊᒻᒪᓗ ᐋᖅᑭᒃᓱᖅᓯᒪᓂᕐᒥᑦ ᓂᕈᐊᖅᑕᐅᓚᐅᕐᒪᑕ ᐊᑐᑦᑎᐊᕈᓐᓇᕐᓂᖅᑰᕐᒍᓂᖓ ᐱᔾᔪᑎᒥᒎᖅ ᐊᑐᖅᑕᐅᑦᓯᐊᕈᓐᓇᕐᓂᕐᒪᓄᑦ ᐅᐸᒐᕐᓂᓪᓗᓂ, ᐊᑐᖅᑕᐅᓪᓗᓂ ᑕᓇᐅᑉ ᐃᒪᖓᓂ ᐋᖅᑭᒃᓱᖅᓯᒪᓂᖅ, ᐊᒻᒪᓗ ᑕᐃᒪᙵᓂᑐᕐᑲᒃ ᐊᑐᖅᑕᐅᕐᑲᑦᑕᖅᓯᒪᓪᓗᓂ. ᐃᑲᔫᑎᕐᑲᕐᓂᖓ ᐃᖅᑲᓗᒻᒥᐅᓄᑦ ᓴᓇᔭᒃᓴᖁᑎ ᐋᖅᑭᒃᓱᖅᓯᒪᖓᑦ ᐊᑐᖅᑕᐅᔪᓐᓇᕐᑯᓗᒍ ᖃᓄᐃᑦᑐᑐᐃᓐᓇᕐᓄᑦ ᐊᔾᔨᕌᖅᒥᑦᑐᓄᑦ ᐅᒥᐊᓄᑦ ᐊᑐᖅᐸᒃᑐᓂᑦ, ᓱᕐᓗ ᒪᑯᓐᖏᑦ ᐊᖑᓇᓱᐊᖅᐸᒃᑐᓂᑦ ᐃᖃᓗᓕᓯᐊᖅᐸᒃᑐᓂᓪᓗ, ᒪᑭᒪᓇᓱᐊᕿᑎᒥᓗᒍ ᐊᖑᓇᓱᐊᖅᑎᓂᑦ, ᐊᐅᓚᐅᔾᔨᔩᓂᑦ, ᕿᑉᑲᖅᑎᓚᐃᓕᕐᓗᑎᒃ ᐊᑐᖅᐸᖅᑐᓂᑦ, ᐊᒻᒪᓗ ᐳᓚᕋᑎᑦ ᐅᒥᐊᕐᔪᐊᕐᒥᓂᑦ ᐊᑭᓕᖅᓯᖅᑕᐅᔪᑎᓕᓐᓂᑦ. ᑖᒃᑯᓇᓂ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖕᑯᑖᓂ ᐃᓖᓂ ᐊᒻᒪᓗ ᓄᕗᑯᑖᒻᒥ, ᓄᓇᓕᕐᓂᒥᐅᑕᐃᑦ ᐊᑐᕿᓐᓇᖅᑕᕐᓂᐊᓕᕐᒪᑕ ᖃᕐᒐᑐᐃᓐᓇᒃᑯᑦ–ᐅᓕᙵᑎᓪᓗᒍᓘᓐᓂᑦ ᐊᑐᕿᓐᓇᓕᕐᓗᑎᒃ ᐱᕙᓪᓕᕿᑕᐅᓗᓂ ᐊᐅᔭᒃᑯᑦ ᓅᖃᑦᑕᕐᓂᕐᒥᓐᓂ ᐊᐅᓕᖃᑦᑕᕐᓂᕐᒥᓐᓂ. ᐅᒥᐊᒃᑯᕕᒃᓴᖅ (SCH) ᐱᐅᓯᒃᑲᓐᓂᖅᑎᑦᓯᓂᐊᕐᒪᑦ ᐊᑦᑕᕐᓇᖕᒥᓪᓗᓂ ᐊᑐᖅᑕᐅᔪᓐᓇᖅᓯᓂᕐᒪᓄᑦ ᐃᓖᓂ ᐊᒻᒪᓗ ᐱᓕᕆᔪᑕᐅᕐᑲᑦᑕᕐᓂᕐᒥᓐᓂ ᐅᒥᐊᖅᑐᕐᓗᓂ ᐱᓕᕆᓂᐅᕙᒃᑐᓂᒃ ᓇᒧᙵᕕᒃᓴᐃᕿᑎᑦᑲᑦᑕᕐᒥᓐᓂᖅᓴᐅᓕᕐᓗᑎᒃ, ᐊᑦᑕᕐᓇᖅᑕᐃᓕᒪᓂᕐᒥᒃ ᐃᓱᓖᓗᕐᒥᓐᓂᖅᓴᐅᓕᕐᓗᑎᒃ, ᐊᒻᒪᓗ ᐊᕙᑎᒥ ᖁᒃᓴᓇᖅᑐᓂᒃ ᒦᓐᓇ ᐊᑐᖅᑕᐅᓂᖓᓄᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖁᑖᓂᑦ ᐃᓖᓂ ᐊᒻᒪᓗ ᓄᕗᑯᑖᒻᒥ. ᑕᐅᕙᓂ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖁᑖᓂ ᐃᓖᓂ, ᓄᑖᖅ ᑐᓚᒃᕕᒃᓴᖅ ᑕᓪᓕᒪᐃᖅᓯᓪᓗᐊᐸᓗᓪᓗᓂ ᐊᔭᓂᖅᑐᓂᖅᓴᐅᓕᕐᓂᐊᕐᒪᑦ ᒦᓇᓕ ᐊᑐᖅᑕᐅᕙᒃᑐᒥᑦ ᑐᓚᒃᑖᕕᕐᒥᑦ, ᐊᒃᓯᑲᓪᓛᓗᓪᓗ ᐊᒥᔫᓂᖅᓴᐅᓕᖅᑎᑕᐅᓇᓂᐊᕐᒪᑦ ᐅᒥᐊᑦ ᓵᕕᒋᐊᖅᑐᕿᓐᓇᖅᑐᑦ. ᐅᒥᐊᓕᓇᓇᓯᐊᕐᕕᖓ ᐱᓗᐊᕿᓐᓂᖅᑎᑦᓯᓂᐊᕐᒪᑦ ᓇᒧᖓᕐᐋᕿᑎᓯᒪᔪᓂᒃ ᕿᒪᐃᕕᒃᓴᖅᑲᕐᓂᕐᒥᓄᑦ ᓄᓇᓯᐅᑎᒃ ᐊᒻᒪᓗ ᑭᖑᓕᕇᓪᕕᖅᑲᕐᓂᕐᒥᓄᑦ ᐅᒥᐊᓕᕆᔨᓕᔪᑦ ᑕᐅᕙᙵᕐᓗᑎᒃ ᓯᓈ ᐊᑐᓇᐊᖓᓂᑦ. ᐊᖏᓪᓕᒥᐊᖅᑕᐅᓂᖓᓄᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖁᑎᖓᑦ ᐃᓖᓂ ᐊᒻᒪᓗ ᓴᓇᔭᐅᓂᖓᓄᑦ ᓄᑖᑉ ᐊᒡᒍᐊᓂ ᐅᖅᑯᐃᕕᐅᑉ ᐃᓖᓂ ᐱᐅᓂᖅᓵᓗᓕᖅᑎᑦᓯᓂᐊᕐᒪᑦ ᐅᖅᑯᐃᓯᒪᓂᑦᓯᓂᖓᓂᑦ ᑲᖏᖅᑐᐊᔫᑉ ᐊᓄᕿᕐᕕᓪᓗᐊᑕᕆᓛᖓᓂᑦ, ᑕᓐᓇᓗ ᐃᓱᓖᓗᑕᐅᓗᐊᙳᐊᖅᑐᓂ ᐅᖃᐅᓯᐅᓚᐅᖅᓯᒪᖓᓕᑦ ᐊᐱᖅᓱᖅᑕᐅᔭᖅᑐᖅᓯᒪᓕᑎᓪᓗᕐᒥᑦ ᓄᓇᓕᑦ. ᐋᖅᑭᒃᓱᖅᓯᒪᓂᖓ ᐅᖅᑯᐃᕕᐅᑉ ᐃᓖᓂ ᐊᖏᓂᖅᓴᐅᓕᖅᑎᑦᓯᒐᔭᕐᒪᑦ ᐱᐅᓂᖅᓴᐅᓕᕐᓗᓗ ᓴᐳᒥᔭᐅᕕᒃᓴᐅᓂᖓ ᑲᖏᖅᑐᐊᕐᔪᐊᑦ ᒦᓇᓂᓪᓕ ᐊᑐᖅᑕᐅᔪᒥᑦ, ᓇᓕᐊᓐᓄᕐᕕᒃᓴᐅᓂᖅᓴᐅᓕᕐᓗᓂ ᐃᓗᐊᓂ ᐅᖅᑯᐃᕕᐅᓯᒪᓂᖓᑕ. ᐃᓖᓂᕕᒃᓴᐅᓂᖓ ᑖᓂ ᐃᒪᕐᒥ ᒪᕐᕋᐃᔭᖅᑕᐅᔪᓇᓛᕐᒪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᐅᓯᑎᑕᐅᓯᒪᕐᓗᓂ ᐅᓕᕐᑲᑦᑕᕐᓂᖓ ᐊᑐᖅᑕᐅᕐᑲᑦᑕᕐᓂᖓ. ᓴᓇᔭᒃᓴᖁᑎ ᐱᐅᓯᑎᑦᓯᒋᐊᕐᑲᕈᑦᓯᕙᔭᕐᒪᑦ ᕿᑐᑕᒪᑦ ᐊᐅᓚᔪᑎᓂᒃ ᐊᒻᒪᓗ ᐊᑦᑕᕐᓇᖅᑕᐃᓕᒪᓂᕐᒥᒃ ᐅᒥᐊᖅᑐᖅᐸᒃᑐᓄᑦ ᐃᓚᒃᑳᓂᖅᑕᐅᓂᕐᒥᓄᑦ ᐊᕐᒥᒃᑎᒃᑲᐊᒃᑳᓂᑭᑏᑦ, ᐱᖃᓯᐅᑎᓗᕐᒥᑦ ᐱᐅᓯᒋᐊᖅᑕᐅᓗᑎᒃ ᓯᒡᔭᒥ ᐋᖅᑭᒃᓯᒪᐃᓇᕐᓂᐊᓕᕐᓗᑎᒃ ᐱᑐᒃᑲᕐᓂᒃ ᐅᓕᙵᑎᓪᓗᒍ ᐱᑐᒃᑲᕐᓂᒃ, ᐳᒃᑕᓗᑎᒃ ᑐᓚᒃᑲᕐᓂᒃ, ᖃᐅᒪᖅᑯᑎᖃᑦᓯᐊᕐᓂᖅᓴᐅᓕᕐᓗᓂ, ᐊᒻᒪᓗ ᒪᔪᕋᐅᑎᖃᓕᕐᓗᓂ ᐋᖅᑭᒃᑕᐅᓯᒪᔪᓂᒃ ᐅᖅᑯᐃᕕᐅᑉ ᐃᓖᓂ ᓯᕕᕐᒪᕐᒪᓂ ᐅᐸᒃᓯᕕᕐᒥᓂ ᐳᒃᑕᔪᓂᒃ ᑐᓚᒃᑲᕐᓂᒃ ᐃᓚᒥᔭᐅᒃᑲᓐᓂᖅᑐᓂᒃ ᐅᒥᐊᓄᑦ ᐅᐸᒃᑕᐅᔪᓐᓇᖅᑐᓂᑦ. ᐅᒥᐊᖅᑐᖅᐸᒃᑐᑦ ᐅᓕᕐᒪᑎᓪᓗᒍ–ᑎᓂᙵᓕᓗᐊᖅᐸᓪᓗᓂᑦ ᑎᑭᑦᑕᕿᓐᓇᖃᓕᕐᒪᑕ ᓄᕗᑯᑖᒍᑦ ᐃᓚᓯᒪᓕᖅᑎᓪᓗᒍ ᓄᑖᒥᒃ ᐅᓕᙵᑎᓪᓗᒍ ᑐᓚᒡᕕᕐᒥᒃ. ᓄᑖᖅ ᓄᓇᓯᐅᑎᓄᑦ ᓴᙱᕕᒃ ᑭᖑᒃᐱᐊᖅᑐᓇᐊᑐᔪᓐᓂᖅᑎᑦᓯᕙᔭᕐᒪᑦ ᓄᓇᓯᐅᑎᒃ ᑕᐅᓄᖓ ᐊᒥᑦᑐᐊᓗᒃᑯᑦ ᓵᕕᑎᖅᑐᕕᒃᑯᑦ, ᕿᓚᒻᒥᐅᑎᖅᓴᐅᔪᓐᓇᖅᓯᑎᑦᓯᓗᓂ ᐊᑦᑕᕐᓇᕐᓂᖅᓴᐅᓕᖅᑎᑦᓯᓗᓂᓗ ᓵᕕᑎᖅᑐᖅᑐᓂᒃ ᐅᒥᐊᒥᒃ. ᓄᓇᓯᐅᑎᓂᒃ ᕿᒪᐃᓯᒪᕕᒃ ᐱᐅᓯᑎᑕᐅᒥᐊᒃᑲᓐᓂᖅᑲᔭᕐᒥᔪᖅ ᑕᐅᕙᓂ ᓄᕗᑯᑖᒻᒥ ᒪᓂᖃᕿᒃᑎᑕᐅᓗᓂ ᐊᕐᒥᓂᖅᓴᐅᓕᕐᓗᓂᓗ ᕿᒪᐃᕕᒃ ᓄᓇᓯᐅᑎᓂᒃ. ᑕᒪᓐᓇ ᐱᓕᕆᐊᕐᒍᓂᖓ ᓴᓇᔭᒃᓴᖁᑎᐅᑉ ᐱᔭᕇᒃᑕᐅᒐᔭᕐᒪᑦ ᓯᕗᓂᖓᒍᑦ ᐱᒋᐊᖅᑕᐅᕙᓪᓕᐊᓂᖓᓂ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖁᑎᖓᓂ ᐃᒪᖓᓂ ᐃᓖᓄᕕᒃᓴᐅᕐᒥᓐᓇᖁᓪᓗᒍ ᐋᖅᑭᐅᒪᑎᑕᐅᕐᒥᓐᓇᕐᓗᓂᓗ ᓴᓇᔭᐅᓕᓖᕐᒪᓂ. ᑕᐃᒪᓐᓇᐃᑐᖅ ᐱᐅᓯᑎᑦᓯᒋᐊᕐᓂᖅ ᓴᙱᒍᑎᑦᓯᒐᔭᕐᒪᑦ ᐊᒥᓱᓂᒃ ᓄᓇᓯᐅᑎᓂᒃ ᐊᒻᒪᓗ ᑲᓕᒃᑐᓂᒃ ᐃᖏᕋᔪᓂᒃ ᓄᕗᑯᒧᑦ, ᓴᖅᑭᑎᑦᓯᓗᓂ ᐱᐅᓂᖅᓴᓕᕐᓄᑦᓯᕐᒥᒃ ᐃᖏᕋᔪᑦ ᓇᒧᙵᕕᒃᓴᐅᑭᑎᒃᑲᑦᓯᓂᕐᓄᑦᓯᒥᖅᑲᕐᒥᓂ ᒦᓇ ᐊᑐᖅᑕᐅᒃᑲᓐᓂᖅᑐᒥ ᑕᐅᕙᓂ ᓄᓇᓕᐸᐊᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᑦᑯᑖᓂ. ᓴᓇᔭᐅᕆᐊᖃᕐᓂᖅ ᓴᓇᔭᐅᕆᐊᕕᒃᓴᖅ ᐱᕆᐊᖃᔭᖅᑐᖅ ᐊᐅᔭᖅᓯᓂ 2018 ᑕᐅᕙᓂ ᓄᕗᑯᑖᒥ ᑎᑭᓪᓗᑎᓪᓗ ᓯᕗᓪᓕᖅᐸᑦ ᐅᒥᐊᕐᔪᐊᒃᑰᖅᑎᑕᐅᔪᑦ. ᓴᓇᔭᐅᓂᖅᓴᐅᕚᖅᑐᖅ ᓯᑯᓯᒪᙱᒥᑎᓪᓗᒍ. ᐃᖃᓇᐃᔫᖅᑲᕐᓂᖅ ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᐅᖅᑯᐃᕕᖁᑎᖓᓐᓂᑦ ᓂᕆᐅᒋᔭᐅᕗᖅ ᐱᔭᕇᒃᑕᐅᓚᔪᓇᐊᖓᓂᑦ 2019-ᒥ. ᐃᒪᖃᒃᑎᑕᐅᔪᓂᑦ, ᐃᑭᑦᑎᖃᑦᑕᕐᓂᖅ ᐊᒻᒪᓗ ᑕᕐᕆᓕᒃᓂᒃ ᐊᒃᑕᖁᓂᑦ ᐃᒥᑦᑎᓃᑦ, ᐊᒻᒪᓗ ᐅᖅᓱᒃᓴᑦ ᐱᔭᐅᑎᑕᐅᖃᑦᑕᖁᔭᖅᐳᑦ ᐃᓄᓗᐃᑦ ᓄᓇᓕᐸᐅᔭᓕᕆᔩᒃᑯᕐᒥᓂᑦ. ᐅᖅᓱᖅᓴᓇᔭᐅᔭᓇᐊᓕᑦ ᓴᓇᔪᑦ ᐱᓕᕆᐊᕐᒥᓄᑦ ᐅᖅᓱᐊᓗᒃᑐᖅᓯᐅᑕᐅᓚᔭᖅᐳᑦ. ᐱᖁᑏᑦ ᐅᖅᓴᖅᑕᐅᑎᓪᓗᒋᑦ ᑕᓖᓂᑐᐃᓐᓈᓕᙱᕐᑐᑦ ᐅᖅᓴᖅᐱᑦᓴᓂ ᐃᓂᖅᑎᑦᓯᐊᓖᖅᑐᑦ ᐅᕙᓗᐃᓐᓂᑦ ᓈᑕᐅᓕᑦᓴᓂᒃ ᐱᖁᑎᓂ ᐊᑐᕐᓗᑎ ᑯᕕᔾᔭᐃᒃᑯᑎᓂ. ᓴᓇᔪᓄᑦ ᐱᓕᕆᔪᑎᑦ ᐃᓚᖅᑲᔭᖅᐳᑦ ᐸᒃᑲᒍᑎᓂᒃ, ᐅᔭᕋᒃᓂᒃ ᐅᓯᔪᑎᑦ ᓄᓇᓯᐅᑎᓂᒃ, ᖃᓗᕋᐅᑎᓕᕐᓂᒃ ᐅᓯᓕᖅᓯᐃᔪᑎᓂᒃ, ᑎᓯᓴᐃᔪᑎᓂᒃ, ᑯᑭᓕᕐᓂᒃ ᐊᒻᒪᓗ ᐊᑖᒍᕿᑎᓕᕐᓂᒃ ᓴᓕᒎᑎᓂᒃ, ᑭᕕᒃᓯᔪᑎᑯᑖᓂᒃ ᐊᒻᒪᓗ ᑲᑭᐊᓕᕐᓂᒃ ᐊᒻᒪᓗ ᐊᓯᕐᒥᓐᓂᒃ ᐱᓕᕆᔪᑎᓂᒃ. 30-ᖏᓐᓃᐸᓗᑦᑐᓂ ᐃᖅᑲᓇᐃᔭᖅᑎᖃᕐᓇᐊᖃᐃᖅᑐᑦ ᓴᓇᔭᐅᕙᓪᓕᐊᓕᖅᑲᑦ. ᐃᖃᓗᒥᐅᑕᐅᕐᒥᑦᑐᑦ ᓂᐅᕿᐊᑦ ᐃᖅᑲᓇᐃᔭᓇᐊᖅᓯᒪᔪᑦ ᑐᔪᕐᒥᕕᓐᓃᑎᑕᐅᔫᖅᑐᑦ. ᓴᓇᔪᓄᑦ ᐱᓕᕆᔪᑎᑦ ᑎᑭᒃᑲᔭᖅᐳᖅ ᐅᒥᐊᕐᔪᐊᒃᑯᑦ ᐊᒻᒪᓗ ᐃᖃᓇᐃᔭᖅᑎᑦ ᐊᒻᒪᓗ ᓂᕆᔭᒃᓴᖁᑎᑦ ᑎᑭᒃᑲᔭᕆᓪᓗᑎᒃ ᖃᕐᒐᑕᓲᒃᑯᑦ, ᐊᑭᓕᖅᑕᐅᓯᒪᔪᒃᑯᑦ ᖃᕐᒐᑕᓲᒃᑯᑦ ᑕᐃᒪᓐᓇᐅᔭᓇᐊᖃᑐᐊᖅᐸᑕ. ᓴᓇᔭᐅᓂᕐᒪᓄᑦ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᒥ (CEMP) ᐊᑦᓱᐊᓘᖅᑎᑦᓯᑦᑕᐃᓕᒪᒍᑕᐅᓃᖅᑐᖅ ᖃᐅᔨᓴᕿᑕᐅᑦᓯᐊᕐᓗᓂᓗ ᓴᓇᔭᐅᕙᓪᓕᐊᓂᕐᒪᓄᑦ ᐱᓕᕆᐊᑦᓴᐅᔪᖅ. ᐊᐅᓚᔾᔪᑎᑦ ᐊᐅᓚᔪᑏᑦ ᐅᖅᑯᐃᕕᖁᑎᑉ ᐃᒪᖓᓂ ᐱᓕᕆᔪᑎᑦ ᑲᔪᓯᑐᔪᒪᑕ ᑭᒃᑯᓕᒦᓄᑦ ᐅᐸᒐᒃᓴᐅᑎᑕᐅᕆᐊᓕᕐᓗᑎᒃ ᓄᓇᓕᐊᓂ. ᐱᕙᓪᓕᐊᔪᓕᕆᔩᒃᑯᑦ ᐃᖏᕐᕋᔪᓕᕆᔩᒃᑯᓪᓗ ᐱᓕᕆᔪᒪᓯᒪᔪᑦ ᐊᑐᓕᖅᑎᑦᑎᓗᑎᒡᓗ ᐊᐅᓚᔪᑎᓄᑦ ᐸᕐᓇᒍᑎᒃ ᑕᒪᒃᑯᓇᖓ ᐱᓕᕆᔪᑕᐅᓂᐊᖅᑐᓄᑦ. ᐱᕙᓪᓕᐊᔪᓕᕆᔩᒃᑯᑦ ᐃᖏᕐᕋᔪᓕᕆᔩᒃᑯᓪᓗ ᐃᖃᓇᐃᔭᖃᑎᖃᕐᓂᐊᖅᐳᑦ ᐃᖅᑲᓗᐃᑦ ᓄᓇᓕᐸᐅᔭᒃᑯᖏᓐᓂᑦ ᐊᖏᖃᑎᖃᕐᓗᑎᒃ ᖃᓄᐃᓕᕝᕕᖅ ᐋᖅᑭᒃᓯᒪᔪᑎᑦ ᐋᖅᑭᐅᒪᔪᑎᖏᓐᓂᒃ ᐅᕝᕙᓗᓂᑦ ᖃᐅᔨᒪᒋᐊᖅᓯᔭᓇᐊᖃᐃᖅᑲᑦ, ᐊᒻᒪᓗ ᐊᐅᓚᑦᑎᓂᕐᒥᒃ ᐱᔾᔪᓯᑭᑎᓂᒃ, ᓱᕐᓗ ᒪᑯᓂᖓ ᐊᒃᑕᖅᑕᐅᔭᓇᐊᓕᓐᓄᑦ ᐊᐅᓚᑦᑎᓂᕐᒥ. ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᖃᖏᑦ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᖃᖏᑦ (IQ) ᑲᑎᖅᓱᖅᑕᐅᓯᒪᕗᑦ ᓄᓇᓕᖕᓂ ᖃᓄᐃᓕᖓᓂᐅᔪᓂ, ᐊᖑᓇᓱᐊᕐᓂᒥ, ᐊᐅᓚᖅᑐᓂ ᐊᖅᑯᑎᒥᔭᐅᕙᒃᑐᓂ ᐊᒻᒪᓗ ᐃᒪᒃᑯᑦ/ᓯᑯᒃᑯᓪᓗ ᐊᑐᖅᑕᐅᕙᒃᑐᓂᒃ ᐊᒻᒪᓗ ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑕᐅᓪᓗᓂ ᖃᓄᐃᓕᖅᐸᓪᓕᐊᔪᒪᒋᓪᓗ ᐊᒻᒪᓗ ᐸᕐᓇᒃᑕᐅᔪᑎᖏᓐᓂ ᐃᖃᓗᐃᑦ ᐅᒥᐊᒃᑯᕕᒃᓴᖓ (SCH) ᓴᓇᔭᒃᓴᖁᑎᖓ ᐊᐱᖅᓱᕐᓂᒃᑯᑦ ᐊᖑᓇᓱᐊᖅᑐᓕᕆᔨᒃᑯᓂᑦ (HTA), ᐃᓐᓇᓕᓐᓂᒃ, ᐊᐅᓪᓚᐅᔨᔨᖕᒥᓂᑦ, ᐊᒻᒪᓗ ᐅᒥᐊᖅᑐᖅᑎᑦ ᐃᖃᓇᐃᔭᖃᑎᒥᓪᓗᑎᒃ ᐱᓕᕆᖃᑎᕐᓂᑦ. ᓄᓇᓕᐅᑉ ᐃᓚᐅᑎᑕᐅᓂᖓ ᐱᓕᕆᐊᖑᔪᒪᔪᒧᑦ ᐊᐱᖅᓱᖃᑦᓯᓃᑦ ᓄᓇᓕᓐᓂᑦ, ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᐊᖑᓇᓱᐊᖅᑎᓂᑦ, ᐃᖃᓗᓕᓯᐊᖅᑎᓂᑦ, ᓄᓇᓕᓐᓂᑦ, ᓄᓇᓕᐸᐅᔭᒃᑯᑦ ᒥᐊᔪᕐᒪᓐᓂᑦ ᐊᒻᒪᓗ ᑲᑎᒪᔨᖏᓐᓂᑦ, ᐊᖑᓇᓱᐊᖅᑐᓕᕆᔨᒃᑯᓐᓂᑦ, ᕿᑭᖅᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᖏᓐᓂᑦ, ᐊᐅᓪᓚᐅᔨᔩᓂᑦ, ᐅᒥᐊᖅᑐᖅᑎᑦ ᐃᖃᓇᐃᔭᖃᑎᒌᒃᑯᑦ ᐱᓕᕆᐊᒃᑎᕆᖏᓐᓂᑦ, ᐊᒻᒪᓗ ᐊᓯᖏᓐᓂᑦ ᐱᓕᕆᐊᖑᔪᐃᓐᓇᖅᓯᒪᔪᑦ ᑕᐃᒪᙵᓂᑦ ᔫᓂ, 2016-ᒥᓂᑦ. ᑲᑎᒪᓃᑦ, ᐊᐱᖅᓱᓃᑦ, ᑐᑭᓯᒋᐊᖅᑎᑦᓯᓃᑦ ᐊᒻᒪ ᑐᙵᓱᐃᓃᑦ ᐊᑐᖅᑕᐅᔪᔪᑦ ᑐᓴᐅᒪᑎᑦᓯᓂᕐᒧᑦ ᐅᖃᐅᓯᑦᓴᓂᓪᓗ ᓄᐊᑦᑎᓪᓗᑎ, ᐃᓱᒫᓗᑎᓂᓪᓗ ᖃᓄᐃᓕᐅᕆᐊᒋᑎᑦᓴᓂᓪᓗ ᐱᓕᕆᐊᑦᓴᒧᑦ ᖃᓪᓗᓈᑎᑐᑦ ᐃᓄᒃᑎᑐᓪᓗ, ᑎᑎᖅᑲᑎᒎᓪᓗ ᐅᐃᕖᑎᑐᑦ ᐊᒻᒪ ᐃᓄᐃᓐᓇᖅᑐᓐ. ᐃᓚᒋᓕᐅᕐᓂᖅ ᑕᒪᒃᑯᓇᖓ ᐊᑐᓕᖁᔭᐅᓯᒪᔪᓂᒃ ᐊᒻᒪᓗ ᑐᓴᐅᒪᔪᑎᒃᓴᓂᒃ ᐱᔭᐅᓚᐅᖅᑐᓂᑦ ᐊᒃᓱᐊᓗᒃ ᐱᐅᓯᒋᐊᓪᓕᖅᑎᑦᑎᓯᒪᕗᑦ ᓴᓇᓯᒪᓂᒃᓴᖓᓂᑦ ᐊᒻᒪᓗ ᐸᕐᓇᒍᑎᖏᓐᓂᒃ ᑖᒃᓯᒪ ᐅᒥᐊᒃᑯᕕᒃᓴᐅᑉ (SCH). ᐊᐱᖅᓱᖅᑕᕐᓂᖅ ᑲᔪᓯᓂᐊᖅᐳᖅ ᐱᓕᕆᐊᖑᑎᓪᓗᒋᑦ ᐋᖅᑭᒃᓯᑎᐊᖅᓯᒪᑎᑕᐅᓇᓱᐊᕐᓂᕐᒪᓄᑦ ᓴᓇᓯᒪᓂᒃᓴᖓᑕ ᐱᓕᕆᐊᖑᕙᓪᓕᐊᑎᓪᓗᒋᑦ ᐊᒻᒪᓗ ᓴᓇᔭᐅᑎᓪᓗᒍ ᓴᓇᔭᒃᓴᖁᑎ.

Personnel

Personnel on site: 30

Days on site: 350

Total Person days: 10500

Period of operation: from 2019-11-01 to 2119-11-01

Proposed term of operation: from 2018-07-01 to 2019-10-31

ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᑦ

ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᑦ

ᓇᒥ	ᖃᓄᐃᑦᑑᒥᑦ ᐱᓕᕆᐊᖃᕐᓂᐊᖅᐸ	ᑭᒃᑯᑦ ᓄᓇᖁᑖᓂ	ᑐᓴᐅᒪᔭᒃᓴᑦ ᓄᓇᐅᑉ ᖃᓄᖅ ᐊᑐᒐᐅᓚᐅᖅᓯᒪᔭᕆᐊᖕᒐᓐᓂᒃ	ᐃᑦᓴᕐᓂᑕᖃᕐᐱᐅᓯᓚᐅᖅᐸ ᐃᓄᖕᓄᑦ ᓇᔪᖅᑕᐅᖃᑦᑕᕐᓂᑰᕙᓗ ᑕᐃᑦᓱᒪᓂᑐᖃᐅᓕᖅᑐᖅ	ᖃᓂᓐᓂᖅᐹᖅ ᓄᓇᓕᒥᔭᐅᔪᖅ ᐊᒻᒪᓗ ᓴᐳᒻᒥᒃᓯᕝᕕᐅᔪᓗ ᓱᓇᓄᑦ
0	Dredging	Crown	N/A	N/A	N/A
0	Harbour infrastructure	Crown	N/A	N/A	N/A
0	Offshore Infrastructure (port, break water, dock)	Crown	N/A	N/A	N/A

ᓄᓇᓕᐅᑉ ᐃᓚᐅᖃᑕᐅᓂᖓ ᓄᓇᓖᓐᓄ ᐊᕕᒃᑐᖅᓯᒪᐅᕐᓂᖓᓄᑦ ᐃᑲᔪᑕᐅᔪᓐᓇᖅᑐᑦ

ᓄᓇᓕᒥᔭᖅ	ᐊᑏᑦ	ᑲᑐᔾᔨᐊᖃᑎᒌᔭᖅ	ᖃᖓᓗ ᑐᓴᖅᑎᑕᐅᓚᐅᓇᐊᖅᒥᓐᓂᒃ
ᐃᖃᓗᐃᑦ		Amaruq Hunters and Trappers Association	2015-10-01
ᐃᖃᓗᐃᑦ		Amaruq Hunters and Trappers Association	2016-06-16
ᐃᖃᓗᐃᑦ		City of Iqaluit. Mayor, COA, HTA members	2016-06-16
ᐃᖃᓗᐃᑦ		Sinaakuut Suport Group	2016-06-30
ᐃᖃᓗᐃᑦ		Environment and Climate Change Canada	2016-07-04
ᐃᖃᓗᐃᑦ		Amaruq Hunters and Trappers Association	2016-09-20
ᐃᖃᓗᐃᑦ		Sinaakuut Support Group	2016-09-21
ᐃᖃᓗᐃᑦ		City of Iqaluit. Mayor and Council	2016-09-27
ᐃᖃᓗᐃᑦ		Sinaakuut Support Group	2016-11-28
ᐃᖃᓗᐃᑦ		Local Outfitters	2016-11-30
ᐃᖃᓗᐃᑦ		Amaruq Hunters and Trappers Association	2016-11-30
ᐃᖃᓗᐃᑦ		Nunavut Tunngavik Incorporated	2017-01-12
ᐃᖃᓗᐃᑦ		Community Open House	2017-03-01
ᐃᖃᓗᐃᑦ		Amaruq Hunters and Trappers Association	2017-03-02
ᐃᖃᓗᐃᑦ		Nunavut Tunngavik Incorporated	2017-03-03
ᐃᖃᓗᐃᑦ		Qikitani Inuit Association	2017-03-03
ᐃᖃᓗᐃᑦ		Boaters' Working Group	2017-04-12
ᐃᖃᓗᐃᑦ		Shoreline Residents Meeting	2017-05-02
ᐃᖃᓗᐃᑦ		Boaters' Working Group	2017-05-02
ᐃᖃᓗᐃᑦ		Qikitani Inuit Association	2017-05-03
ᐃᖃᓗᐃᑦ		Community Open House	2017-05-03
ᐃᖃᓗᐃᑦ		Quark Expeditions	2017-05-25
ᐃᖃᓗᐃᑦ		Amaruq Hunters and Trappers Association	2017-04-13
ᐃᖃᓗᐃᑦ		City of Iqaluit - CAO and Departments	2016-09-16
ᐃᖃᓗᐃᑦ		City of Iqaluit - CAO and Departments	2016-11-28
ᐃᖃᓗᐃᑦ		City of Iqaluit - CAO and Departments	2017-03-02
ᐃᖃᓗᐃᑦ		Cruise Line Operators	2017-04-05
ᐃᖃᓗᐃᑦ		Baffin Region Chamber of Commerce and Iqaluit Chamber of Commerce	2016-11-30
ᐃᖃᓗᐃᑦ		Arctic College Environmental Technology Program	2016-10-16
ᐃᖃᓗᐃᑦ		Arctic College Environment Technology Program	2016-10-19
ᐃᖃᓗᐃᑦ		Regulators	2016-04-01

ᓚᐃᓴᓐᓯᑦ ᐱᒍᖅᓇᐅᑏ ᐊᖏᖅᑕᐅᓯᒪᔪᑦ

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ᑲᓇᑕᒥ ᐃᖃᓗᓕᕆᔩᑦ ᑕᕆᐅᓕᕆᔩᓪᓗ	Request for Review. An Authorization under the Fisheries Act may be required.	Applied, Decision Pending	2017-06-19	
ᑲᓇᑕᒥ ᐃᖏᕐᕋᔪᓕᕆᔨᒃᑯᑦ	Notice of Works/Approval	Not Yet Applied		
ᑲᓇᑕᒥ ᓄᓇᖃᖅᑳᖅᑐᓕᕆᔩᑦ ᐅᑭᐅᖅᑕᖅᑐᒥᐅᑕᓕᕆᔩᓪᓗ	Transfer of Federal Land (i.e. Transfer of Care and Control) - Seabed	Not Yet Applied		
ᑲᓇᑕᒥ ᓄᓇᒥᐅᑕᓕᕆᔨᒃᑯᑦ	Authorization of Explosives and/or Magazine License Application	Not Yet Applied		

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Drills	1 to 2	5 tons	Cut and fill activities
Excavators	2 to 3	30 to 40 tons	Handling armour stone, excavating
Rock Trucks	2 to 3	35 ton articulating	Hauling rock or sediments within the project site
Transport Trucks	1 to 2	40 tons	Moving materials and equipment onsite and offsite
Front end loader	1 to 2	966 to 988	Loading rock and moving cargo/equipment
Compactor	1	20 ton	Compacting road surfacing
Dozer	1	D8	Leveling placed rock and road surfaces
Grader	1	140	Road maintenance, final surface grading
Pickup truck	2	Crew Cab, 3/4 ton	Crew and supply movement
Mini-bus	1	15 passenger	Daily crew mobilization from hotel/accommodation to Project Site
Fuel/service truck	1	10 ton	Daily refueling and servicing of major mobile equipment, fueled from GN/ petroleum products division (PPD) dispensers in Iqaluit
Water truck	1	10 ton	Construction and miscellaneous water
Telehandler/forklift	1 / 1	5 to 10 ton	Moving materials and equipment
Rough terrain crane	1	40 ton	Lifting equipment
Dump trucks	2 to3	15 tons	Transportation of crushed rock from existing causeway to the SCH site.

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Diesel	fuel	1	500000	500000	Liters	Mobile equipment, remote generators and heaters
Gasoline	fuel	1	5000	5000	Liters	Small work boats, small generators, and ATVs
Propane	fuel	5	110	550	Lbs	heaters
Lubes and oils	hazardous	2	200	400	Liters	Maintenance of mobile equipment
Lubes and oils	hazardous	2	20	40	Liters	Maintenance of mobile equipment
Paint	hazardous	10	4	40	Liters	Painting wharf hardware and miscellaneous components
Explosives	hazardous	1	30000	30000	Lbs	Quarrying
Oxy/Acetylene	hazardous	4	4	16	Cubic Meters	Welding and cutting of steel

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2	Truck delivery	Existing water supply infrastructure

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Harbour infrastructure	ᐊᒃᑕᕈᑦ ᐃᑯᐊᓚᑕᐅᔪᓐᓇᖅᑐᑦ	5 tons	City Landfill	n/a
Harbour infrastructure	ᐊᑦᑕᓇᖅᑐᖅ	500 litres	Returnto south in sealed drums or lined bags, transported in shipping containers.	Disposed in accordance with regulatory procedures. Use local company if available
Harbour infrastructure	ᐊᒃᑕᕈᑦ ᐃᑯᐊᓚᑕᐅᔪᓐᓇᙱᑦᑐᑦ	1 ton	City Landfill	n/a
Harbour infrastructure	ᐅᔭᕋᐃᔭᐃᓂᖅ ᓄᓇᒥᑦ ᓅᑎᕆᓂᖅ ᐊᑐᐸᐅᔪᓐᓇᔾᔫᙱᑦᑐᓂᒃ, ᓇᒡᒐᖁᑯᓂᒃ	Negligible	On site or City Landfill	n/a

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Impacts have been identified, assessed and categorized as per NIRB requirements for the SCH and Causeway Study Areas. The first step of the methodology involved the definition of construction activities and environmental components. Where there was an interaction between the construction activity and the environmental component, a potential environmental impact was identified. These potential environmental impacts were then assessed using the baseline data and information collected on the environmental components and experience, scientific literature and engineering documentation of the construction and operational activities. Where an impact was identified, mitigation measures were determined. Mitigation measures can include avoidance, minimization, restoration and offsetting. Mitigation measures were implemented through changes in engineering design, construction planning and additional specific measures. Monitoring has been defined to support these mitigations.

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1.1.1 Project Overview The Government of Nunavut (GN), through the Department of Economic Development and Transportation (EDT) is developing a small craft harbour (SCH), which consists of improvements to the municipal breakwater and the existing causeway (the Project) in Iqaluit (the City). The construction of the Project will be managed by Community Government Services (CGS) on behalf of EDT. The Project is located on the north east coastline of Koojesse Inlet, fronting the Iqaluit shoreline (63.738333°, -68.513611°), and includes the existing causeway, which is north of Innuit Head (63.727887°, -68.526367°) (Figure 1 1, Figure 1 2).The Project seeks to improve safety and access to water and functionality of boating activities and to reduce the congestion and environmental risks associated with the current use of the municipal breakwater and existing causeway. The permanent components of the Project include an extension of the existing municipal breakwater, construction of an additional north breakwater, a boat launch ramp and staging lanes, and improvements to the existing causeway and parking area to provide an all-tide access ramp. The general layout of the SCH is presented in Figure 1 1 and Figure 1 2. An overview of the Project including the SCH site within Koojesse Inlet as well as other main features of the area is presented in Figure 1 3. Construction is anticipated to be completed within three years from the start of construction in summer 2018, concluding in fall 2020. During construction, the Project will use the existing scheduled sealift deliveries and scheduled flights, with the potential for use of charter flights when additional cargo capacity is required. Potable water, sanitary and solid waste disposal, and fuel supply are expected to be provided by the City. Approximately 30 workers will be required for construction. Non-local workers are expected to stay in local accommodations. The Project is designed to serve existing small boat users such as recreational users, hunters and fishermen, subsistence harvesters, marine outfitters and cruise ship tenders. Although not specifically intended to improve snowmobile access to the ice, the Project may improve access to the sea ice in winter. The Project does not include any increase in marine use or economic development that may take place at the SCH in the future. Operation and maintenance of the Project will be the responsibility of EDT. The development of a Deep Sea Port (DSP) north of Innuit Head is also planned (DSP Project). This development is covered by a separate Nunavut Impact Review Board (NIRB) Screening application. The DSP Project is also being executed by CGS on behalf of EDT, and construction for both Projects will be conducted under the same contract (NIRB, 2017b, NIRB File No. 17XN021). The DSP Project is considered in the cumulative effects assessment. 1.1.2 Benefits to the City of Iqaluit, Residents, Businesses and Northerners The SCH Project will improve safe access to water and the functionality of boating activities, reduce congestion, safety concerns, and environmental risks associated with the current use of the municipal breakwater and causeway. Small boat users such as: hunters and fishers, subsistence harvesters, outfitters, recreational users, and cruise ship tenders will have safer and protected access to water. Boaters will have all-tide access at the existing causeway facilitated by the construction of a new high tide ramp. A new vehicle turnaround will eliminate the need to reverse vehicles down the narrow existing causeway, making it faster and safer to launch boats. Parking will also be improved at the causeway with a levelled and larger parking area. The proposed improvements to the existing causeway will occur in advance of the construction of the SCH (municipal breakwater improvements). This will ensure that water access is always maintained during construction. Improvements at the causeway with increased parking and all-tide access should divert a large proportion of truck and trailer traffic to the causeway resulting in a significant improvement to the traffic congestion currently experienced at the municipal breakwater (see Photo 4 1). This will also be beneficial to shoreline residents at the SCH. At the municipal breakwater, the new boat ramp will be approximately five times wider than the current ramp, significantly increasing the capacity for boat launching. The construction of a staging area will reduce congestion by providing parking and a queuing lane off Sinaa Street. The extension on the municipal breakwater and the construction of a new north breakwater will provide substantially better protection to the harbour from the prevailing winds, which was a significant concern expressed during consultation with the community. The arrangement of the breakwaters will create a larger and better protected harbour than what currently exists, allowing for more movement within a sheltered area and providing a benefit for all boaters, from kayaks through to larger vessels. The Project will also improve day-to-day operations and safety for boat users by providing additional amenities. Small removable floating docks will be provided inside the harbour for the moorage of vessels. Improved shoreline with permanent tie-up points for high-tide moorage, better lighting and access stairs built into the breakwater slope leading to the floating docks for additional boat accessibility will also be included. The SCH Project has been designed to also provide a benefit to residents near the municipal breakwater. At present, businesses and residents near the municipal breakwater experience a high level of traffic queuing and parking, which makes access difficult for residents and community vehicles and can cause a nuisance. The addition of the staging area and faster loading and unloading of boats at the SCH should reduce the congestion on Sinaa Street. In addition, the improvements at the existing causeway, including the new all-tide access, make the existing causeway a better choice for launching boats from a trailer, which should move truck and trailer traffic away from the residential area of the City. Improved lighting will also increase safety at the SCH and improve the use of the area by residents. 1.1.3 Project Alternatives An options study was undertaken in 2010, which included the review of several SCH locations and arrangements to determine the most suitable option (WorleyParsons, 2010). 1.1.3.1 Location The study included conceptual arrangements at both the municipal breakwater and the existing causeway. The municipal breakwater location was selected as the most favourable due to its proximity to the city centre and the presence of the existing marine infrastructure to build-upon. Other factors included: The location has historically been, and continues to be, used for boat launching activities and boat storage. The location is near the city centre and will be usable by all members of the community, including those without boat trailers or vehicles. The location will consolidate all major small craft activities on the east side of Koojesse Inlet. The community supported the selection of this site. 1.1.3.2 Design The project design has undergone a variety of modifications during the schematic design phase through input received from the community. Largely based on WorleyParsons (2010), the initial SCH layout was presented to the community at an Open House on March 1, 2017. The initial presentation of the layout resulted in the formation of the Boaters' Working Group (BWG) to allow for further development of the design to better address the diverse needs of potential users. Following design workshops with the Amaruq Hunters and Trappers Association (HTA) on March 2, 2017 and with the BWG on April 12, 2017, a revised layout was presented back to the HTA, BWG and the community for verification on May 2 and May 3, 2017, respectively. Modifications to the design that occurred as a result of consultation are summarized below. The design changes due to consultation are further detailed in Table 2 2 and Section 2 of this document, and in the Community Consultation Log (Advisian, 2017d). Initial plans included dredging the SCH to provide extended tide access. This has been removed from the design in favour of a new northern breakwater and an extension to the municipal breakwater to provide much needed protection in the harbour from prevailing winds. During Open House events, several residents stated that dredging could be considered in the future but that a safe and sheltered harbour was the priority. Expansion of the ramp at the municipal breakwater. Construction of a staging area to reduce congestion by providing parking and a queuing lane off Sinaa Street. Addition of new stairs on the municipal breakwater. Improvements of the surface at both ramps. Removal of boulders in the bay before construction and during operation. In addition to the new infrastructure at the municipal breakwater, during early consultations, it was identified that improvements at the existing causeway would be desirable as it is difficult to navigate a truck and trailer down the causeway to the low-tide ramp. Based on this feedback, the following improvements are proposed for the existing causeway: Expansion of the parking area at the causeway. Addition of a new high tide ramp at the causeway resulting in all-tide access. Vehicle turnaround at the causeway which will eliminate the need to reverse vehicles. Additionally, the improvements at the existing causeway will be implemented early in the construction schedule, prior to the construction at the municipal breakwater to offset the reduced access that will be available during construction. 1.1.4 Project Schedule The design, collection of marine and terrestrial baseline data, consultation, and permitting of the Project started in September 2016. Construction is expected to begin in the summer of 2018 with completion projected to be in the fall of 2020; however, facilities are expected to be largely functional by the end of summer of 2019, assuming all permits are in place. Table 1 1 outlines the anticipated schedule. As a construction contractor (the Contractor) will not be chosen until spring 2018, the exact methodology and timing of the construction works is subject to change. The expected sequence of the construction is provided based on experience of similar projects.

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The majority of the materials and equipment required for the construction of the Project will arrive on the annual sealift provided by Nunavut Eastern Arctic Shipping (NEAS) and Nunavut Sealink and Supply Inc. (NSSI). Dry sealift cargo is currently brought ashore by lightering barge and offloaded with front end loaders at the Sealift Beach at the north end of Koojesse Inlet. Construction materials for the Project will be stored in construction yard, although the location is not yet known as the Contractor has not been selected. It is anticipated that the Contractor will need to rent or arrange for the use of suitably zoned industrial property for the construction yard, probably along Akilliq Road, as there will not be sufficient storage space on the Project site at the start of construction. The Contractor will use the construction yard to store construction materials and equipment received from the Sealift Beach for the duration of the Project or until such time as there is sufficient space at the Project site. When construction materials are required at the SCH site they will be shipped from the construction yard. Rock will be transported by truck from the rock cut area near the existing causeway to the SCH site (see Figure 1 4). Construction personnel and miscellaneous consumables will arrive in Iqaluit through the Iqaluit Airport (YFB). YFB is a significant hub in the Canadian Arctic with scheduled passenger and cargo flights to several southern airports. Given the volume of flights between Iqaluit and the south, it is not anticipated that the Project will have an impact on airport operations or flight availability. Similar to sealift cargo, cargo arriving by air will be transported along Akilliq Road to the construction yard or directly to the SCH site (see Figure 1 4). Following completion of the Project, the level and type of marine use at the SCH and the existing causeway is not expected to vary significantly from current operations. However, the increased functionality of the existing causeway (all tide access) may shift more users to this facility.

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Construction personnel are anticipated to be housed locally and will be shuttled to and from the SCH site using crew vans or busses on a daily basis.

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The list of anticipated construction equipment, including size and proposed use, required for the construction of the Project is provided in Photo 1 1 and Table 1 3. Sample photos of key equipment are provided in Photo 1 1. Note that although the use of marine-based equipment is not currently anticipated as being required for construction; requirements may change depending on site conditions and the contractor's preferred work methods. Equipment used at the SCH or existing causeway following completion of the Project is not expected to change from current operations at either site.

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Water for construction use will be obtained from the existing water supply infrastructure in Iqaluit. It is anticipated that water will be delivered by the City trucked water service, local contracted water truck, or contractor's own water truck. The Project will not withdraw or discharge freshwater from or in the environment. Estimated water use during construction is only 2 m3 per day, for approximately 100 days (total) during construction. This excludes water use by construction personnel while off-site (at hotel/accommodations in Iqaluit). Water is anticipated to be needed for the following uses: Dust control to supplement other dust suppression techniques Drinking water and sanitary facilities Earthworks (for compaction if necessary) Equipment wash-down During operation of the SCH and existing causeway, water consumption by facility users is not expected to vary significantly from the current water demands.

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Excluding wastewater generated by construction personnel while off-site (at hotel/accommodations in Iqaluit), construction will not produce significant volumes of wastewater. Anticipated total wastewater production for the Project is expected to be approximately 200 m3, including both sewage (human waste) from on-site sanitary facilities and grey water (NPC, 2017b). Wastewater will be managed through holding tanks in the on-site sanitary facilities and lunch room and will be transported by either the City's sewage truck or the contractor's own sewage truck and disposed of in the City's existing sewage lagoon. During operation of the SCH and existing causeway, there will be no wastewater reception at either the SCH or causeway. Users of the facility will manage wastewater on their boats as per current operations.

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For the construction of the Project it is anticipated that the Contractor will use existing fuel infrastructure in Iqaluit for supply and storage. Fuel will be drawn from the City's fuel storage tanks on an as-needed basis using the Contractor's own fuel truck. Refuelling of mobile equipment will take place in designated fuelling areas within the construction yard and laydown area, once constructed, or at the mobile equipment's location on the Project site. Propane fuel may also be necessary for portable heaters. Propane will be delivered on the annual sealift and stored in the Contractor's laydown yard, secured in metal cylinders racks in a designated storage area. Estimated fuel consumption for the construction of the Project is presented in Table 1 5.

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Table 1 6 presents the anticipated chemical or hazardous materials required for the construction of the Project. During operation of the SCH and existing causeway, handling of chemicals and hazardous materials by facility users is not expected to vary significantly from the current operations.

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Approximately 30 workers will be required throughout construction. Approximately 350 work days are required to complete the Project. The workforce will be comprised of skilled and semi-skilled labour as follows: heavy equipment operators; crane operator; welder; marine deckhand; tug operator; mechanic; electrician; and general labourers. Work rotations are presently unknown and will be determined by the Contractor. Accommodations for non-local workers will be provided by existing hotel and short term apartment rentals during construction. A construction camp will not be required. During construction, the Project will utilize the existing scheduled sealift deliveries for mobilization of equipment and will use available flights to move the workforce to and from Iqaluit. The Project will comply with the newly revised GN's Nunavummi Nangminiqaqtunik

Ikajuuti (NNI) Policy (April 1, 2017) (NNI, 2017) and aims to maximize participation of Inuit labour and Inuit owned businesses on the Project. The Project will also comply with all training requirements under the NNI Policy and offer necessary training to maximize Inuit participation in the Project. The Project has provided Nunavut Inuit with employment and training opportunities as wildlife monitors and field technicians since the initiation of the environmental and geotechnical baseline data collection and engineering design in 2016. Further, the Project has provided presentations and field training opportunities on geotechnical drilling and engineering design to Arctic College Environmental Technology students. The Project anticipates that the community will see further economic benefits and training opportunities with the hiring of local labour. In addition, there will be secondary economic benefits through the Project's expenditures in hotels and businesses.

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2.1 Consultation Objectives CGS and EDT have taken an integrated approach to consultation on the Project to ensure that development will serve the needs of the community including Nunavut Inuit, hunters, fishers, recreational users, residents, businesses and outfitters while staying within the allocated funding from the Governments of Canada and Nunavut. The integrated approach serves to solicit and consider feedback and recommendations from the community and users of the municipal breakwater and causeway. The Project is conducting a robust consultation program based on the following objectives: Support the Project through planning and design to execution and construction. Identify all potentially affected and interested parties as early as possible. Identify project effects and mitigation measures, including input to Project design and management plan procedures. Integrate community input and mitigate concerns and issues through design modifications and improvements. Integrate community values, interests and goals into engineering design of the marine infrastructure. Establish and maintain a positive relationship with Nunavut Inuit, residents, outfitters, community groups and others based on mutual respect. Ensure local knowledge and Inuit Qaujimajatuqangit (IQ) is valued and incorporated in Project design, assessment, and management planning. Provide timely and relevant information pertaining to the nature and scope of the Project, permitting process and engineering design. Provide meaningful opportunities for Nunavut Inuit, City Mayor and Council, community members, outfitters and others to review the proposed Project, ask questions, and provide input into its planning and design. The design and implementation of the consultation program has also been guided by the following Inuit Societal Values (ISV) and principles of IQ as set out by the GN (Government of Nunavut, 2013a): Inuuqatigiitsiarniq (respecting others, relationships and caring for people); Tunnganarniq (fostering good spirit by being open, welcoming and inclusive); Pijitsirniq (serving and providing for family or community, or both); Aajiiqatigiinniq (decision making through discussion and consensus); Pilimmaksarniq or Pijariuqsarniq (development of skills through practice, effort and action); Piliriqatigiinniq or Ikajuqtigiinniq (working together for a common cause); Qanuqtuurniq (being innovative and resourceful); and Avatittinnik Kamatsiarniq (respect and care for the land, animals and the environment). 2.2 Communities, Groups and Organizations The following community, groups, and organizations have been identified as being potentially affected by this Project: City of Iqaluit – Mayor and Council City of Iqaluit Departments – Planning and Development, Economic Development, Engineering and Sustainability, Emergency Services HTA Residents of Iqaluit (general public) Local businesses Sinaakuut Support Group (SSG) BWG Outfitters Recreational boaters 2.3 Regulatory Authorities, Boards and Inuit Association Consultation The Project team has engaged with relevant RAs from the federal, territorial, and municipal governments; Inuit Boards; and the regional Inuit Association. Engagement with these organizations is essential for ensuring compliance with all relevant legislation, policies and procedures. The following agencies and boards have received Project overviews and updates since the Project received funding in September 2016: Nunavut Tunngavik Incorporated (NTI)   City of Iqaluit Planning and Development Qikiqtani Inuit Association (QIA) GN Culture and Heritage NPC DFO NIRB INAC NWB TC Nunavut Research Institute (NRI) NRCan GN Department of Environment Canadian Coast Guard (CCG) Environment and Climate Change Canada (ECCC) 2.4 Consultation Overview The consultation program was designed to ensure that hunters, fishers, residents, and other community groups/organizations were consulted using a variety of methods and materials. This included formal and informal meetings, semi-structured interviews, workshops, a boaters' working group, shoreline residents' meetings, and public open houses. The materials used included presentations, pamphlets, community notices, non-technical project summaries, engineering design drawings, and maps that were written in English and Inuktitut. Community notices were provided in English, Inuktitut, Inuinnaqtun and French as per GN policy. To date, the community has been very engaged in the Project and has provided input into design on numerous occasions. The input has been carefully considered and design modifications have been made based on feedback from design workshops with HTA, the BWG, meetings with shoreline residents and Open Houses. At the request of community members attending the Open House on March 1, 2017, the BWG was formed to provide input from various users (hunters, outfitters, recreational) directly to CGS, EDT, the Project's Lead Marine Engineer and consultation team. Attendees at the meetings were pleased to see these design modifications being made to reflect concerns and recommendations expressed by the community. CGS' collaborative approach to consultation has reflected ISV and the principles of IQ, in particular: respect for others; being open and inclusive; decision making through discussion and consensus; working together for a common cause; being innovative; and, having respect for the environment. The result has been a Project that meets the needs of the community and supports Pijitsirniq – serving and providing for family or community, or both. Table 2 1 outlines the key groups engaged as well as the method and dates of engagement. A detailed list of all consultation events and feedback received to date is provided in the Community Consultation Log, (Advisian, 2017d) as summarized in Section 7.5. 2.5 Concerns Expressed in Consultation and Strategies to Address Concerns Table 2 2 provides a summary of the concerns expressed by the community during consultation to date and a summary of the strategies employed to address the topics raised during consultation. The consultation program was very successful in gathering input from community residents, hunters, fishers and other users of the SCH. The input received resulted in design modifications to meet the needs of the community while respecting ISV and IQ. Further, the input received provided a basis for the development of mitigation measures to address concerns during construction and operation of the SCH, including development of the Construction Environmental Management Plan (CEMP), as described in Section 7.3. As mentioned above, a detailed list of all consultation events and feedback received to date is provided in the Community Consultation Log (Advisian, 2017d), as summarized in Section 7.5. 2.6 Future Consultation CGS and EDT will continue to engage with the City leadership and administration, City Planning and Development, community members, the QIA and the HTA. Additionally, and as per the recommendation from QIA, CGS and EDT will engage with the Community, Land and Resources Committee (CLARC), as required. CGS and EDT will provide Project updates to the City Mayor and Council and continue to build on the positive and constructive relationship they have built with the community. Specifically, CGS and EDT will continue to work with the community and engage with the City, HTA and residents on: Engineering design. Permits, approvals and licenses. Construction schedule and sequencing of activities. Akilliq Road and causeway parking and road use. Beach shacks and parking at the municipal breakwater. Marine traffic and navigation. Contractor environmental and traffic management plans. City's services and delivery to shoreline homes along Sinaa Street. Employment and training opportunities. Operations planning including maintenance of the floating docks and facilities. Consultation will be ongoing throughout the life of the Project. Further consultation will be undertaken specific to the regulatory permitting processes as described in Section 1.2. In particular, as engineering design progresses, consultation will continue in relation to the City of Iqaluit rezoning, TC NPA and DFO FAA processes, if required. The NPA and FAA processes may require further consultation with TC, and DFO and may require further consultation with QIA, HTA and the community. Once the tender process is initiated for construction and the Contractor is engaged to construct the SCH, consultation with the community, HTA, City, hospital, Royal Canadian Mounted Police (RCMP), CCG and outfitters will take place. This engagement will include timing and methodology of construction activities and traffic management as well as emergency services, community service delivery, security of the construction site, and equipment and material storage. Additionally, the Contractor will work with the community to maximize local labour force and business opportunities. 2.7 Traditional Knowledge Inuit traditional knowledge has been an essential component in the Project's design, decision-making and environmental screening processes. To date, IQ has been gathered during: One Project meeting with the HTA in September 2016. One key elder meeting in November 2016. Two design workshops with the HTA in November 2016 and March 2017. Two design workshops with the BWG in April and May 2017. The first meeting in September 2016 concentrated on updating the HTA on the proposed

SCH project and on gaining an understanding from HTA members of land use in the development areas and current conditions and locations for accessing water and ice in Iqaluit. With the aid of an interpreter and maps/concept drawings, an open dialogue between HTA members and the Project team occurred during this meeting, allowing feedback and local knowledge from the most active users to be obtained. IQ information was noted and marked on maps during discussions on topics such as: wind direction and strength, seasonal changes to ice, water and ice access, and current boat traffic and ramp use. Design workshops conducted with the HTA (November 2016 and March 2017) and with the BWG (April 2017 and May 2017) focused on obtaining feedback from hunters, fishers, outfitters, and recreational boaters on the conceptual designs for the Project. Feedback received during these meetings contributed to the team's knowledge and understanding of sea and access conditions, harvesting areas, and the presence of marine mammals in and around the SCH site. This information was significant and led to valuable modifications to the Project design resulting in a better Project that meets the needs of the community and the various SCH users. With the aid of an interpreter and maps/concept drawings, the collaborative workshops allowed HTA members and local boaters to share their ideas, needs, and concerns directly with the lead engineer and team members designing the Project. During discussions, IQ and local information were noted and marked on maps for topics such as: fishing areas, water and ice access, use of the existing causeway, harvesting patterns, construction schedule, and local site conditions. In an effort to better understand the potential interactions between harvesting rights and Project activities, a meeting was also held with a key elder in November 2016 that identified harvest locations and access points in and around the Project site in relation to land use activities. The elder interviewed is recognized in the community as being especially knowledgeable about fish, marine mammals, and travel routes and is a current and active hunter. Harvesting and use locations were marked on a map and later digitized. The map was then reviewed and verified by HTA members during a meeting in May 2017. The IQ findings are based on a small number of interviews and workshops and a selection of readily available literature, and do not represent the full intensity and extent of Inuit use and occupancy in the area. However, considering the scope of the Project, and in understanding of the potential effects due to the construction and operation of the proposed facility, the land use findings have been sufficient. IQ was integrated into the various disciplines' baseline studies where applicable and was considered directly during the development of the schematic design for the SCH and mitigation measures. Further detailed discussion concerning IQ can be found in the Terrestrial and Human Environment Baseline Report (Advisian, 2017a) and the Marine Baseline Report (Advisian, 2017c). Consultation with the HTA is on-going and will continue throughout the design and construction phases of the Project.

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3.1.1.1 Site Selection The SCH is situated on the eastern bank of Koojesse Inlet, at the location of the existing municipal breakwater. Based on previous studies and community input, the proposed location for the SCH was selected as the most favourable site. Further detail on site selection is provided in Section 1.1.3. See Photo 3 1 for an annotated aerial photo of the current municipal breakwater/proposed SCH site. Additional photos of the SCH site are provided in Photo 3 2 and Photo 3 3. Based on feedback from the community consultation process, in addition to the main SCH construction at the municipal breakwater, the project will seek to make improvements at the existing causeway. The existing causeway is located on the western bank of Koojesse Inlet, approximately 1,100 m north of the existing fuel resupply facility on Innuit Head. See Photo 3 4 for photos of the existing causeway. 3.1.1.2 Studies and Field Investigations The following previous studies and field investigations have been completed for a SCH in Iqaluit: Strategic Plan for Iqaluit Deepwater Port Project (Aarluk, 2005) Regulatory Review of Small Craft Harbour Developments in Nunavut (Knight Piésold, 2010a) Final Report – Iqaluit Port Survey (Sub-bottom profiling), (Fugro Jacques Geosurvey Inc., 2010) Geotechnical Desk Study – Proposed Marine Development – Iqaluit (Stantec Consulting Ltd., 2010) Nearshore Fish & Fish Habitat Assessments Related to Marine Structure Development (Nunami Stantec, 2010) Iqaluit Port Development (WorleyParsons, 2010) Bathymetry and Topography as follows: Canadian Hydrographic Service (CHS) field sheets 1200542, 1200543, and 1200544 (Latest update 2004) Additional Bathymetry from Drawing number 97-9180-01, titled "Project Layout, Profile and Cross-Sections, Harbour Development, Iqaluit, Baffin region, NWT" by Jivko Jivkov, dated February 1996 Iqaluit Upland Baseplan (Provided by the City of Iqaluit August 28, 2009) Advisian has undertaken or is currently undertaking the following studies and field investigations in support of the design and permitting of the SCH: Geotechnical Investigations: Geotechnical Field Investigation, including assessments for acid rock drainage (ARD) and metal leaching (ML) potential within the rock cut area (Advisian, in Progress) Baseline Investigations (completed): Iqaluit Port Development – Fall 2015 Environmental Baseline Program – (WorleyParsons, 2015) Permit applications for 2016/2017 Baseline Studies 2016/2017 Baseline Studies and Assessments (Advisian, 2017a, 2017c) • Marine Field Studies including sediment quality, water quality, fish, fish habitat, and marine mammals • Vegetation • Wildlife and Marine and Migratory Bird Habitat Assessment • Archaeology Sediment Sampling and Analysis Plan (Advisian, 2017f) Marine and Coastal Engineering: Iqaluit – Marine Facilities Schematic Design – Iqaluit Marine Infrastructure Project (Advisian, 2017g)

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3.1.2 Facility Construction The following section provides an overview of the design layout (see Figure 1 1), anticipated construction methodologies, and operations of the SCH components. The design and construction methods presented are tried and tested and there are no new technologies involved. 3.1.2.1 Breakwaters Layout The proposed extension to the municipal breakwater is approximately 100 m long and is rotated 40 degrees clockwise relative to the alignment of the existing structure, to provide additional protection from waves. The breakwater extension will have similar geometry to the existing municipal breakwater with a top elevation of 12 m chart datum (CD) and a roadway allowance of approximately 6 m wide to match existing. The breakwater extension is intended to be accessible to both pedestrian and vehicle traffic over its entire length. The proposed north breakwater is approximately 225 m long and generally follows the same alignment as the municipal breakwater. The north breakwater is offset approximately 170 m from the municipal breakwater and ties into a point on the shoreline north of the creek (SCH unnamed creek) that discharges into the SCH. Similarly to the municipal breakwater, the north breakwater has a top elevation of 12 m CD. The offshore 75 m section of the north breakwater is not intended to be accessible to pedestrian or vehicle traffic but the remainder of the structure inshore is intended to be accessible to both pedestrian and small vehicle (ATV) traffic, with a 3 m wide roadway allowance. In addition, the harbour side of the north breakwater over this inshore section has a shallow 4H:1V slope for pulling ashore boats and regularly spaced mooring points near the top of bank. Construction The breakwaters will be constructed using rock sourced from the rock cut area near to the existing causeway. The breakwaters will be comprised of a core of fill material surrounded by rock armour of various size and thickness depending on the exposure. Protection requirements along the breakwaters will be determined based on the water depth and exposure to waves at the specific locations. Accessible portions of the breakwaters will be finished with a crushed granular road surface. The shallow sloped inshore portion of the north breakwater will also be finished with a crush gravel to allow for easier pulling ashore of boats. All breakwater construction is expected to be completed using land-based equipment operating out-of-water when the tide is sufficiently low. Construction is planned for the open water season as well as possibly during the shoulder seasons when ice is forming and breaking up. Breakwater construction being undertaken during the shoulder seasons will require ice management and removal using land based equipment in the area immediately adjacent to the work to ensure ice is not buried under the breakwater construction material. 3.1.2.2 Boat Ramp Layout An improved boat launch ramp (boat ramp) will be provided adjacent to the north side of the municipal breakwater near the shoreline, in approximately the same location and orientation as the existing ramps. The boat ramp will have a 25 m wide driving surface to permit multiple boats to be launched or retrieved simultaneously and will have a shallow 10H:1V slope. Construction The boat ramp will be constructed using rock sourced from the rock cut area near the existing causeway. The boat ramp will be comprised of a core of fill material and will be finished with a crushed granular road surface. Boat ramp construction is expected to be completed using land-based equipment during the open water season. 3.1.2.3 Boat Launch Staging Lanes Layout Staging lanes for the boat ramp will be provided adjacent Sinaa Street to allow the boat ramp users to line up off the road and to provide truck and trailer parking. The staging

lane area is 15 to 25 m wide and follows the alignment of Sinaa Road, extending from the top of the boat ramp to the creek that discharges into the SCH. Similar to the inshore section of the north breakwater, the side slope of the staging lane is a shallow 4H:1V slope for pulling ashore boats and is equipped with regularly spaced mooring points near the top of bank. The width of the staging lane will be finalized during design development. Construction The staging lanes will be constructed using rock sourced from the rock cut area near the existing causeway. The change. staging lanes will be comprised of a core of fill material and will be finished with a crushed granular road surface. The shallow offshore slope of the area will also be finished with a crushed granular surfacing. Staging lane construction is expected to be completed using land-based equipment during the open water season. The existing slope below the toe of the staging lane fill will be left largely as-is but will be cleared of boulders which may interfere with boat traffic and storage. 3.1.2.4 Small Craft Floating Docks and Access Stairs Two small floating docks will be installed inside the harbour along the existing municipal breakwater for the moorage of vessels. The floating docks are expected to have the following configuration: 8 m wide by 20 m long. Steel construction with treated timber deck surface. Removable mooring system. Shore to float transition span and abutment. No utilities (water, electrical, lighting) will be provided. The floating docks are not intended to be left in place over winter so floats will need to be removed before freeze up. They will be stored above high water, and re-deployed in the summer following break-up and clearing of the harbour. Three sets of concrete access stairs (access stairs) are proposed along the municipal breakwater near the floating docks. Access stairs are expected to be large pre-cast concrete blocks inset into the slope to allow pedestrian traffic to safely climb up and down the slope at a low tide. 3.1.2.5 Boat Basin The current design of the SCH does not include deepening or reconfiguring of the existing boat basin at the municipal breakwater. However, provided sufficient funding is available, deepening of the boat basin will be considered during the design development phase of the Project. Deepening of the boat basin would extend the usable hours of the SCH but deepening to provide all-tide access is not feasible for the current layout. Conceptually, deepening the boat basin to approximately +3.5 m CD is considered realistic. This would result in the excavation of up to 30,000 m3 of sediment that would be reused as fill material for the extended parking area at the SCH. Any excess fill would be available for other projects in the area. The sediments at the SCH are coarser grained and therefore suitable for use as fill. ECCC has been engaged and confirmed that the material is suitable for reuse as fill and that a DAS permit will not be required (ECCC, 2017). Given that the boat basin is within the intertidal zone, any deepening is expected to be done out of water with land-based equipment by working the tides. 3.1.2.6 Area Lighting Given the extent of the construction works, the existing lighting arrangement at the municipal breakwater is not expected to provide sufficient light levels for the new SCH but will reviewed in more detail during the design development phase of the Project. The following additional area lighting will be reviewed: Extension of the existing area lighting system on the municipal breakwater to include the extension of the breakwater. Area lighting along the boat ramp staging lanes and ramp. Area lighting along the accessible portion of the north breakwater. New area lighting is expected to follow a similar philosophy to the existing lighting at the municipal breakwater using wooden poles with standard street lights or flood lights, serviced with overhead power lines. 3.1.2.7 Existing Causeway Improvements Improvements to the existing causeway to increase boat launching access include the following: Widening and re-surfacing of the base of the existing low-tide ramp. Widening of the existing causeway at the start of the low-tide ramp to allow for vehicle turning. Construction of a new high-tide boat ramp. Additional parking space at the end of Akilliq Road. The existing causeway improvements will be constructed using rock sourced from the nearby rock cut. New fill structures will be comprised of a core of fill material and will be finished with a crushed granular road surface. The side slopes of the vehicle turning area will be finished with rock armour based on the water depth and exposure to waves. The existing causeway improvements are expected to be completed using land-based equipment during the open water season. The rock cut will also expand the parking area available at the existing causeway. 3.1.2.9 Materials and Quantities The construction of the SCH is expected to require the following construction materials. All materials will be brought in from outside of Nunavut other than the rock that will be sourced from the rock cut near the existing causeway. 45,000 m3 of rock. Pre-fabricated small craft floating docks, including mooring systems and access ramps. Electrical components (if provided) including cables, junction boxes and enclosures, wiring devices, lights and light poles. Miscellaneous topsides including small craft moorings and access stairs.

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The SCH is expected to be a permanent facility in Iqaluit with a realistic lifespan of 100+ years. Individual components of the facilities will generally be designed on the basis of a 50 year service life, with the exception of the float system which is expected to have a reduced design service life. It is important to note that service life does not imply that maintenance on the structure will not be required during that period. Maintenance and renewal will be required to allow for the continued operation of the SCH and existing causeway over its lifespan. Exact operations of the SCH and causeway will be defined by EDT as the owner. The following sections outline expected facility operations. An Operations Environmental Management Plan (OEMP) will be prepared with further information provided in Section 7.4. 3.1.3.1 Small Craft Harbour In general, SCH operations will be similar to current with the following improvements: Reduced congestion along Sinaa Street due to the increased capacity of the ramp and staging lanes. Users will have the option to moor their vessels to a float. Significantly increased length of shallow sloping shoreline for pulling boats ashore. Additional protection from wind and waves within the harbour due to the extended municipal breakwater and additional of the north breakwater. Users will have the option to launch their boat at the existing causeway at high-tide. 3.1.3.2 Maintenance As noted in Section 3.1.1.4, periodic inspections and maintenance of the facility will be required in order to achieve the specified design life. Anticipated maintenance may include the following: Regular comprehensive inspections, both above and below water. Regular re-grading and compaction of gravel driving surfaces, including the breakwater, staging lanes, and boat ramps. Occasional repair of riprap slopes from ice action. Annual repair of ramp surfaces. Clearing of boulders in the boat basin and on tidal ramps. Inspection and maintenance of float mooring system and float connections. Removal and re-installation of floating docks based on ice conditions. 3.1.3.3 Public Access The SCH is a public facility for the community and will not have a access restrictions.

SECTION D: Offshore Infrastructure: Facility Vessel Use in Offshore Infrastructure

Small boats and crafts using the SCH will approach the facility from Koojesse Inlet and enter the facility by turning around the end of the municipal breakwater into the protected harbour. Vessel mooring and storage within the SCH is expected to be a combination of vessels on anchor, moored at the small craft floating docks, or pulled ashore. Vessel access is not expected to vary significantly from the current operations.

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4.1 Physical Environment 4.1.1 Designated Areas No National Parks, National Wildlife Areas, or Migratory Bird Sanctuaries occur in or near the Study Areas (ECCC, 2016a); however, four Territorial Parks occur in proximity to Iqaluit and the Study Areas: Sylvia Grinnell, Quammaarviit, Katannilik, and Taqaiqsirvik Territorial Parks. Sylvia Grinnell Territorial Park (known as Iqaluit Kuunga in Inuktitut) is approximately 3 km northwest from the Study Areas. This park protects low, rocky tundra and sedge meadow habitats along the river and heath tundra on nearby slopes. Quammaarviit Territorial Park is a tiny rocky island located just over one km from the Study Areas in Peterhead Inlet. This park protects valuable archaeological artefacts and structures. Katannilik Territorial Park is located between the village of Kimmirut and the southern shore of Frobisher Bay, about 45 km southwest of the Study Areas. In addition, the Taqaiqsirvik Territorial Park campground is located near Kimmirut. The park is

centred on the Soper Heritage River and protects distinct landscapes and vegetation communities (Nunavut Department of Environment, 2008). The Study Areas do not occur within any Important Bird Areas (IBA) (IBA Canada, 2016), Key Bird and Habitat Sites (Environment Canada, 2014; NPC, 2016), or Ecologically or Biologically Significant Marine Areas (EBSA, Convention on Biological Diversity, 2017; DFO, 2011). Such areas do occur in the region but are >100 km from the SCH Study Area near the mouth of Frobisher Bay. The Meta Incognita Peninsula is a Wildlife Area of Special Interest, due to its importance as a nesting area for gyrfalcon and peregrine falcon (Nunami Stantec, 2012). It is 32,914 km2 in size and includes the Study Areas and much of Frobisher Bay, Sylvia Grinnell Territorial Park, and Iqaluit. Figures showing the location of the designated areas described are provided within the Terrestrial and Human Environmental Baseline Report (Advisian, 2017a). 4.1.2 Geological Site Conditions The Study Areas are situated over the Pre-Cambrian rock of the Canadian Shield (Geological Survey of Canada, 2012), comprising granulite facies granitoids (de Kemp et al., 2006). Within Koojesse Inlet, the tidal flats were formed postglacially and the surface veneer is characterized by a mixture of fine silty sand with coarser sand and pebble clasts, with varying density and groupings of boulders (Hatcher et al., 2014). Along the immediate shoreline of the Study Areas, exposed bedrock and postglacial littoral and nearshore sediments deposited during sea-level regression are present (site observations; Allard et al., 2012). The geotechnical investigation confirmed that there are no serpentinite, argillite, or soapstone (as per the definition of carving stone within the Nunavut Agreement). During consultation with the HTA it was confirmed that carving stone is not collected in the Causeway Study Area and that the bedrock is granite, which is not typically used for carving and is abundant. As assessment of ARD and ML potential was conducted on rock samples representative of the major rock types identified within the proposed rock cut area for the Project. Static ARD/ML testing results indicated low long-term potential for acid generation and metal release to rock materials from the proposed rock cut locations. Methods and results (include lab analysis) are provided within the Terrestrial and Human Environment Baseline Report (Advisian, 2017a). 4.1.3 Surface Features The SCH Study Area is comprised of a low shoreline, characterized by a prominent bedrock outcrop to the immediate southeast. The municipal breakwater is a man-made feature and is extensively used summer and winter. The tidal flats are low gradient and are covered with boulders and cobbles of varying densities and groupings (Photo 3 1). Some isolated outcropping bedrock occurs at ground surface level within the tidal flats and these tidal flats extend seaward leading into the deeper channels of the inlet. The surface features at the Causeway Study Area comprise a prominent bedrock exposure that extends seaward from the shoreline. The existing causeway is also extensively used during the ice free months. The shoreline is characterized by whale-back outcrops, generally massive to blocky and inferred to be smoothed by glacial processes. There has been no significant shoreline change in the Study Areas due to natural events (erosion) and no significant erosion or deposition identified in the Study Areas (Hatcher et al., 2014). A review of the available aerial imagery did not identify any evidence of thermokarsts or standing water in the proposed Study Areas. Additionally no features were observed in the ground surface that may be derived from ice lenses such as cracks, and the surface at this location shows nothing that would be characterized as an esker or kame. No obvious surface features were observed associated with permafrost, however ice bodies in permafrost may be occasionally present in the shoreline sediments (Allard et al., 2012). 4.1.4 Ground Stability and Permafrost Iqaluit is in the Continuous Permafrost Zone; ground that remains at or below 0°C for at least two consecutive years (Tarnocai and Bockheim, 2011). The ground may consist of one or more of the following: soil, rock, ice or organic material. The permafrost of Baffin Island uplands has been estimated to be 400 to 700 m thick (Aarluk, 2012) with a surface active layer that can vary widely from less than 1 m in wet soils to greater than 5 m in rock outcrop. Permafrost conditions in Iqaluit are highly variable spatially and with depth (LeBlanc et al., 2015) and a generalised map (that does not show localized changes in permafrost) shows ice rich permafrost in the silt rich shoreline deposits at the SCH Study Area but not for the Causeway Study Area (Government of Nunavut, 2013b). Surficial mapping indicates that ice wedges in permafrost may be occasionally present in the postglacial shoreline deposits and that permafrost may also be present in the recent shoreline deposits (Allard et al., 2012). A permafrost monitoring borehole was established in Iqaluit in these relatively dry littoral and nearshore sediments (LeBlanc et al., 2015), although the exact location is unknown. Thermistor cable readings in this borehole showed the mean annual ground temperature (over five climatic years) is approximately -3.0°C at 8.0 m. The annual range of the ground temperature at this location is 7°C (from approximately 1.0°C to -6.0°C) and the estimated active layer thickness is approximately 1.50 m (LeBlanc et al., 2015). The geotechnical investigation undertaken in fall 2016 focused on soil conditions in the intertidal areas by drilling on the tidal flats. Boreholes drilled gave no indication of permafrost in boreholes drilled up to 10 m deep. Additionally, surficial geological mapping indicated that permafrost is not present within the intertidal deposits (Allard et al., 2012). A drilling and sampling program was conducted in 2017 to evaluate soil and rock conditions near the Causeway Study Area. The results will be reported in the Geotechnical Site Investigation Report (Advisian, in Progress). 4.1.5 Hydrology The Study Areas are located within the Frobisher Bay Watershed. This watershed lies between East Bluff (the southeastern extreme of Baffin Island on the Meta Incognita Peninsula), at the southern entrance to Frobisher Bay and an unnamed point on Hall Peninsula (at the northern entrance to Frobisher Bay (NWB, 2014). The Study Areas for the SCH and Causeway are predominately in the marine environment only extending a short distance beyond the shoreline. There are no freshwater waterbodies (e.g. lakes or creeks) occurring in the Causeway Study Area. At the SCH Study Area there is only an unnamed creek, which discharges between the proposed breakwaters of the SCH and flows across the tidal flats. The Project does not involve any changes to this creek. 4.1.6 Air Quality To determine baseline air quality for the area, previous air quality monitoring data collected in the City was reviewed. Air quality was monitored between June 14 and September 22, 2014 to investigate potential environmental and public health risks associated with a landfill fire in Iqaluit (Health Canada, 2014). Particulate matter (PM2.5), ozone (O3), nitrogen dioxide (NO2), sulphur dioxide (SO2), carbon monoxide (CO), PM2.5-associated metals, volatile organic compounds (VOCs), Polycyclic aromatic hydrocarbon (PAHs), dioxins/furans, and polychlorinated biphenyl (PCBs), were measured (Health Canada, 2014). The measurements were compared to Nunavut air quality standards (Government of Nunavut, 2011). The concentrations measured by Health Canada were over different averaging periods than those defined by Nunavut Air Quality Standards (Government of Nunavut, 2011). Therefore concentrations were compared to all averaging periods. Concentrations of PM2.5, O3, NO2, SO2, and CO were below any of the Nunavut air quality standards (Table 4 1). SO2 was at levels below the detection limit for the methods used. Occasional peaks in hourly average PM2.5 concentrations were observed as high as 85 85 µg/m3 (Health Canada, 2014). 4.1.7 Noise Noise data specific to the Study Areas was not available. It is assumed that for the Study Areas, noise would be generated from a number of sources including automobiles, aircrafts and ATVs/snowmobiles that are used in the City. The SCH project site is adjacent to Sinaa Street, which is currently used frequently by trucks and other vehicles accessing the municipal breakwater and nearby residential and commercial properties. The area is also frequently used in winter by snowmobiles accessing the ice and is close to the airport. The Causeway Study Area is located near the existing bulk fuels and anchorage and receiving facilities at Innuit Head. The sources described may emit noise for short periods of time and noise effects diminish with distance from a source. For example, a jet (which likely would be the highest source of baseline noise) taking off produces an instantaneous noise level of approximately 130 dBA at 100 m distance. The City recently enacted a Noise by law #599 (City of Iqaluit, 2015a) that restricts construction activities overnight (11:00 pm to 7:00 am). The by-law does not include any restriction on noise levels. 4.1.8 Climate Conditions Iqaluit is located within the Northern Arctic Ecozone and is one of the coldest and driest landscapes in Canada (Ecological Stratification Working Group, (ESWG, 1995)). Climate is very cold and dry. Snow falls in all months of the year and persists on the ground for at least 10 months (September to June). Mean daily temperature is -9.3o C (Standard Deviation: ±3.7oC) over the year, but ranges from -26.9oC in January to 8.2o C in July (Government of Canada, 2016). Mean daily minimum and maximum temperatures in January are -30.9oC and -22.8oC respectively (Government of Canada, 2016). In July, mean daily minimum is 4.1oC and mean daily maximum is 12.3oC (Government of Canada, 2016). The freezing index for Iqaluit is approximately 6,500 degree days and the thawing index is approximately 1,000 degree days (Boyd, 1976). Average relative humidity is 76.7% and is slightly higher during the spring, summer, and fall (May to September) compared to the winter (December to February). Mean annual precipitation is 403.7 mm. Mean monthly precipitation ranges from 18.7 mm in February to 69.5 mm in August (Government of Canada, 2016). Precipitation mostly falls as snow (229.3 cm) with only 197.2 mm falling as rain (Government of Canada, 2016). On average, snow depth over the course of the year is 14 cm but ranges from 31 cm in April to being clear of snow during the summer (July to September) (Government of Canada, 2016). The nearest wind station to the Study Areas is the ECCC station at YFB (Climate ID 2402590) approximately 3 km north. During the open-water season, the most frequent winds are from the east-southeast through to south-southeast sectors (30.7% of the time), followed by winds from the northwest and north-northwest 25.0% of the time.

The more severe storms (≥ 60 kph) come from both the northwest and southeast. Winds are calm (<10 kph) 40.9% of the time, during the open water season. The maximum recorded wind speed during the mid-July to mid-October season was 104.0 kph from the northwest. On average, the Study Areas have approximately 15 hours of light (including civil twilight) (National Research Council of Canada, 2017). The Study Areas experience 24 hours of light from the end of May to the end of July (National Research Council of Canada, 2017). The least amount of sunlight occurs near the December solstice with approximately seven hours of light (National Research Council of Canada, 2017). 4.1.9 Marine Sediment and Water Quality Sediments nearshore are comprise predominantly of sands, giving way to silts and clays with increase in water depth and distance from shore. Sediments in the intertidal areas of the SCH Study Area consist of greater than 85% sand, decreasing to an average of 60% moving into the subtidal areas (Advisian, 2017c). In general, areas with higher silt and clay content show a higher concentration of metals compared to those that are predominantly sand. Metal concentrations in the SCH Study Area appear to be lower than those identified in other parts of Nunavut such as Hudson Bay (Stewart and Lockhart, 2005) and Grays Bay (Wolfden Resources, 2006) and are generally comparable to sediments in Pangnirtung (Knight Piesold, 2009). Mercury was identified above Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guidelines (ISQG) from two samples, one of which was also above DAS Regulations, in the intertidal sediments of the SCH. As this concentration was inconsistent with concentrations in the remainder of the Study Area, additional testing was completed at the location of the highest concentration to verify the original result. The results of the additional sampling showed mercury concentrations below laboratory detection in all samples. The source of the elevated result is still undetermined as there are no obvious sources of mercury in proximity to the Study Area; however the additional sampling confirms that it is isolated. PAHs and total PCBs were found to be slightly elevated in the nearshore environment compared to offshore areas of Iqaluit; however concentrations in the intertidal sediments of the SCH Study Area remained below CCME ISQG. Water quality in the Koojesse Inlet and Frobisher Bay appears to be typical of the region. The physicochemical properties of the water column are characterized as neutral pH, brackish, hard and clear (Advisian, 2017c; NGMP, 2012). In summer, nutrient concentrations tend to be higher in deeper water compared to the surface (Advisian, 2017c; Knight Piésold, 2010b cited in NGMP [2012]). Dissolved metal concentrations are generally comparable to total concentrations, indicating metals are not typically bound to solids. There are no apparent trends in metal concentration with depth or location. All metal concentrations were below respective long term CCME water quality guidelines for the protection of marine species (CCME, 1999). Detailed information regarding the sediment and water quality field surveys, including methods and laboratory analysis, is provided in the Marine Baseline Report (Advisian, 2017c). 4.1.10 Coastal Morphology and Bathymetry The northeastern shore of Koojesse Inlet is comprised largely of soft sediments which are predominantly sand. The SCH Study Area is characterized by a gently sloping shore with large intertidal flats that extend beyond the existing municipal breakwater down to low low water line (LLWL). Depth at the seaward extent of the existing breakwater is approximately + 5.0 m CD. Hatcher et al. (2014) did not find evidence of sediment transport across the tidal flats during a two year study (2009 to 2011) and the flats are believed to be very stable. Each year, boulders are deposited on the tidal flats during break-up as the sea ice recedes. These boulders are cleared from the channel to the north of the municipal wharf. 4.1.11 Tides Tides in Frobisher Bay are semidiurnal, with two high and two low tides in a lunar day (24.84 hours) (Hsiao, 1992). The spring and neap tidal ranges are 11.3 m and 7.8 m respectively (CHS, 2016). Typical currents in Koojesse Inlet are 1 m/s at the ocean surface, and decrease with depth (Hatcher et al., 2014). Drogued drifters were deployed in Koojesse Inlet in September 2016. The results of this survey were consistent with the results of (Hatcher et al., 2014) for surface current speeds.

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4.2.1 Vegetation (Terrestrial) Most of Nunavut, including the Study Areas, is located within the Tundra Biome and the Northern Arctic Ecozone (ESWG, 1995). The Northern Arctic Ecozone is among the largest Arctic ecosystems in the world and is divided into a number of ecoregions. The Project occurs within the Ecoregion 28 – Meta Incognita Peninsula. The dominant vegetation communities are herbaceous and lichen communities. Lichen communities are typical in rocky areas and occur within the Causeway Study Area. Vegetative cover is greater on wetter and sheltered sites and taller shrub species occur in warmer microsites with wet sites dominated by sedges and willow species. Approximately 200 species of flowering plants occur within Nunavut, north of the tree line (Aarluk, 2012). The SCH Study Area primarily occurs within the marine environment; only a small portion of it occurs along the shoreline. This area has been previously developed and limited vegetation occurs. In addition, the municipal breakwater is extensively used and there is no vegetation present. Therefore the vegetation field survey, conducted from September 19 to 21, 2016, focussed on the Causeway Study Area. An ecological land classification (ELC) survey was completed to identify the vegetation communities. Field studies also included a species inventory and non-vascular plant assessment. During the ELC survey one vegetation community (Upland Bedrock Outcrop – Shallow Soils [UB-SS]) and a disturbed community were identified. The UB-SS community is dominated by bedrock that is vegetated almost exclusively by non-vascular lichen species. Vascular plant species occur in sheltered breaks in the bedrock and flatter areas where soil have accumulated allowing for plant establishment. The most common vascular species identified were black crowberry (Empetrum nigrum L. ssp. Nigrum), willow species, dwarf fireweed (Chamerion latifolium L) and moss campion (Silene acaulis [L.] Jacq.). Nine plants were identified as having traditional uses within the Iqaluit area by Inuit Field Technicians, however the Causeway Study Area is not used for traditional purposes such as berry picking, or harvesting plant materials for medicinal purposes (Figure 4 4). 4.2.2 Wildlife (including Habitat and Migratory Patterns) Habitat in proximity to the SCH Study Area is of limited value to terrestrial wildlife. Given its location within Iqaluit, human development occurs to the edge of Koojesse Inlet. The SCH Study Area is also extensively used year round by trucks, ATVs, snowmobiles and dogs. The beach is developed and has structures and boats along its length. The buildings and riprap along the breakwater may provide cover to lemmings (Lemmus trimucronatus or Dicrostonyx groenlandicus) and weasels (Mustela erminea). At low tide, the intertidal zone provides foraging opportunities. The value of these areas for habitat is low given the disturbance and human activity. A portion of the Causeway Study Area is natural and has some habitat. In particular, the rocky outcrop and cliff areas provide cover and security and the intertidal provides foraging opportunities. However, the majority of the terrain is comprised of bedrock; thus vegetation cover is sparse and low, reducing its attractiveness as forage or cover for species that depend on vegetation. Additionally a portion of the Causeway Study Area is also disturbed and used for boat launching activities, therefore reducing the attractiveness of the area to wildlife. The habitat assessment and field reconnaissance survey from September 19 to 21, 2016 resulted in no confirmed observations of wildlife or wildlife features in the Study Areas. 4.2.3 Migratory and Marine Birds (including Habitat and Migratory Patterns) In general, habitat near the SCH Study Area is of limited value to migratory and marine birds; given its location within Iqaluit. The beach is developed and has structures and boats along its length. For species that nest on bare ground and gravelly areas (e.g. snow buntings) or are relatively tolerant of human disturbance (e.g. common raven), there may be limited nesting habitat. However, human use and presence of dogs likely discourage birds from nesting. At low tide, the intertidal zone provides foraging opportunities; likewise only for those species tolerant of human activity. Consequently, the value of these habitats is low given the disturbance and human activity. Similarly, the value of habitat within the Causeway Study Area is low as the area is predominately bedrock with little vegetation and has frequent human activity. Bird presence was sparse during the vegetation mapping and habitat assessment; however, given the assessment occurred in late-September, it was at a time when most birds have initiated migration (Cornell Lab of Ornithology, 2016a). Common ravens and unidentified gulls were observed during vegetation surveys and are known to congregate around the municipal landfill on Akilliq Road. Fifty-five species have historical occurrences or ranges that overlap the Study Areas. Of those species, five have some potential to nest based on the available habitat. Given the low value of the habitat, species that could potentially nest here include: common raven (Corvus corax), horned lark (Eremophila alpestris), northern wheatear (Oenanthe oenanthes), semipalmated plover (Charadrius semipalmatus), and snow bunting (Plectrophenax nivalis). According to ECCC, the nesting season for Iqaluit (N10: Arctic Plains and Mountains, Bird Conservation Region 3) is between late-May and mid-August (ECCC, 2016b). Thus, migratory birds will have migrated from the Study Areas outside this period. It should be noted these are estimated breeding dates and that the exact timing can vary according to the species occurrence, climate, elevation, and habitat type; similarly nesting could vary according to micro-sites or factors such as

early or late spring (ECCC, 2016b). Because of natural variability in nesting, the timing could vary by up to ten days; moreover, the period above does not include a nest building phase which generally occurs two weeks prior (ECCC, 2016b). Although few birds were observed within the terrestrial portion of the Study Areas, several large congregations (each >500 individuals) of marine birds were observed approximately 1 km from shore off the existing causeway. These birds were congregated around some rocky islands at low tide and Inuit field technicians informed the ecologist they were foraging on sculpin (Family: Cottoidea). It is clear this nearshore environment near the Study Areas offers foraging habitat. However, nesting habitat for these marine birds is largely unsuitable. Many marine birds nest in large colonies on remote, precipitous cliffs and remote islands that are inaccessible to predators (Cornell Lab of Ornithology, 2016a, 2016b). Although the majority of marine birds are unlikely to be breeding in the Study Areas, 21 species could potentially use inter-tidal and nearshore habitats in the SCH Study Area for foraging (Advisian, 2017c). The use of this habitat may occur during migration on-route from breeding areas or during the breeding season when adults are brooding young. Given most marine birds are also migratory, it is expected most will only use this area for short periods of time to forage following breeding and on-route during migration. King eider (Somateria spectabilis), common eider (Somateria mollissima), long-tailed duck (Clangula hyemalis), and black guillemot (Cepphus grille) have potential to forage in nearshore environments over-winter. However, these species are dependent on ice-free areas to access food; thus occur at the floe-edge (Gilchrist and Robertson, 2000). Given that freeze-up near Iqaluit is generally complete by November and lasts until break-up at the start of June (Advisian, 2017c), the over-wintering species that forage in nearshore environments are unlikely to occur at this time in Koojesse Inlet. 4.2.4 Fish Habitat (including Marine Vegetation) Intertidal surveys were conducted at low tide, and the subtidal seabed survey was conducted with a towed video camera. The details of survey methodology are provided in Advisian (2017c). The intertidal survey consisted of five perpendicular to shore transects conducted in the fall of 2015. The subtidal survey was conducted in the fall of 2015 and consisted of three transects which were perpendicular to shore. The substrates observed within the SCH Study Area were largely sand with scattered boulders in the intertidal and subtidal environment. Abundance and distribution of seaweed in the high to mid intertidal areas was low, which is characteristic of Arctic environments (Stephenson, 1954), due to ice scour. Typically, the ice scour also influences the shallow subtidal waters, where the daily tidal fluctuations will similarly scour the substrate. In the low intertidal there was a rapid increase in the density and coverage of rockweed (50 to 80%) with low densities of sugar wrack kelp (approximately 5 to 10%). In the subtidal, there were occasional patches of kelp observed in an otherwise low diversity area. Within the intertidal area where boulders were present outside of the boat basin, they typically were associated with cryptic species such as amphipods. A habitat map combining the results of the intertidal and subtidal field surveys is provided in Figure 4 2. The extent to which seaweeds provide three dimensional habitat for marine organisms has not been well studied in the Arctic, however, it is an established concept in temperate and tropical environments (Brown et al., 2011; Cristie et al., 2003; Warfe et al., 2008; Wikstrom and Kautsky, 2007). Włodarska-Kowalczuk et al. (2009) hypothesize that holdfasts of larger kelps provide refuge for organisms, such as amphipods, from ice scour events. It is likely that established seaweed beds are important for a variety of life stages of marine species occurring in the coastal waters of Koojesse Inlet, specifically as outlined in Section 4.2.5 for Arctic char (Salvelinus alpinus) and Arctic cod (Boreogadus saida), and for their prey. Furthermore, they are significant primary producers, and thus play an important role in a short open-water season (Glud et al., 2002). Seaweeds are not harvested by residents of Iqaluit. There were no targeted field surveys conducted in the Causeway Study Area, however, the area to the south was surveyed for the DSP Project and the substrate is similar. Seaweed cover in the low intertidal to the south of the existing causeway consists of rockweed (50 to 80%), with low densities of sugar wrack kelp (Saccharina latissima) and sieve kelp (Agarum clathratum. 5 to 10%) also observed. However, based on aerial imagery Google Earth (2006) the intertidal area within the Causeway Study Area has less seaweed and this is likely related to use and maintenance of the existing causeway (Figure 4 3). The subtidal substrate transitions to soft sediments (sand) with scattered and clustered boulders. The unnamed creek that discharges to the SCH, and is the only freshwater within the Study Areas, is not fish bearing and therefore freshwater fish habitat is not assessed further. 4.2.5 Fish (including Migration/Spawning) The coastal marine environment fronting the SCH and Causeway Study Areas is being used by migratory species such as Arctic char and Arctic cod. Arctic char are an important subsistence and commercial fishery species in Nunavut, who have both a lacustrine and amphidromous life history. Amphidromous Arctic char live primarily in fresh water, and migrate to the ocean for a short summer migration (~20 to 45 days) (Bégout Anras et al., 1999; Klemetsen et al., 2003). For familiarity of terms, the term anadromous will be used, while recognizing this important distinction. The primary purpose of the summer seaward migration is to increase energy reserves and during migration they may double their body mass (Jørgensen et al., 1997). Migration is typically over a relatively short period of ~20 to 45 days (Bégout Anras et al., 1999; Klemetsen et al., 2003). It is generally accepted that Arctic char migrating through Koojesse Inlet are from the Sylvia Grinnell River (SGR) and potentially from the Armshow River, where a research collaboration is underway between DFO and the HTA. The current program initiated in the open-water season of 2015 and is set conclude in 2019 (DFO, 2017). Spares et al. (2012) conducted an acoustic telemetry study in Frobisher Bay on Arctic char migrating from the SGR and Armshow River (24 km southwest of Iqaluit), which showed that Arctic char are migrating through the inner Koojesse Inlet. The eastward migration of the SGR fish stock is supported by the mark-recapture efforts of Vangerwen-Toyne et al. (2013). Spares et al. (2012) found that Arctic char spent the majority of time in less than 3 m of water and hypothesized this to be a strategy to optimize prey and temperature regimes. However, frequent diving behaviour into deeper waters (~10 m) also occurred, which was assumed to be motivated by food availability. Prey of Arctic char included fish (capelin, northern sand lance), crustaceans (mysids, amphipods, and decapods), polychaetes, and insects (Guiguer et al., 2002; Johnson, 1989; Moore and Moore, 1974; Rikardsen and Elliot, 2000). Spares et al. (2012) found that the most common prey for this species in Koojesse Inlet were amphipods. Amphipods were observed in the intertidal areas of the SCH Study Area during the 2015 Marine field survey, with higher densities noted in the in and around boulders and rocks. Arctic char spawn in freshwater in September and October over a gravel substrate, where eggs incubate under the ice for approximately six months, and spend their early life history in freshwater (DFO, 2014). The SGR is approximately 3 km west of Iqaluit. Based on research and IQ, the SGR Arctic char migration (Gallagher and Dick, 2010) and associated fishing (IQ workshop) begins in late June. Residents of the City fish for Arctic char along most available coastline areas, which include areas within the SCH and Causeway Study Areas (Figure 4 3). Seine nets are the preferred fishing gear along the coastline of for both Study Areas (IQ Workshop: March 2017), however, along the east shore of Peterhead Inlet some angling may occur (Gallagher and Dick, 2010). It is thought that Arctic char can be caught in numerous locations along the coast, and the Study Areas are not being targeted as a high density area for Arctic char (IQ Workshop: March 2017). Spares et al. (2012) concluded that SGR Arctic char do not migrate far from their natal river. From other studies in Nunavut, Arctic char prefer migrating along coastlines as opposed to across water bodies (Moore et al., 2016; Moore, 1975), and are typically found within 30 km from natal rivers (Bégout Anras et al., 1999). The SGR fishery is co-managed by the HTA, the Nunavut Wildlife Management Board (NWMB), Nunavut Tunngavik Inc., and DFO (Gallagher and Dick, 2010) and is used for recreational and subsistence purposes only. There are no exploratory commercial fisheries occurring at this time. The commercial fishery for Arctic char from the SGR has been closed since the late 1960s, with the current fishery being exclusive to subsistence and recreational fishing (DFO, 2013). Arctic char fisheries are managed on the assumption that each river system supports a discrete fish stock(Kristofferson et al., 1984). Research is underway to study the SGR stock through the DFO-HTA SGR collaboration. Arctic cod (Boreogadus saida) are a pelagic marine species that are believed to be the single most important species in the trophic link between plankton, marine birds and marine mammals in the Arctic ecosystem (Welch et al., 1992). This species is exclusively marine, and the extent of their migratory behaviours are not fully understood, with the exception of a pre-spawning late summer migration to coastal waters (FAO, 2017). They are known to be concentrated at floe edges prior to break-up (Bradstreet, 1982; Gradinger and Bluhm, 2004). The floe edge in Frobisher Bay is located at the Frobisher Bay polynya (> 180 km southeast of the SCH Study Area). Arctic cod have the potential to be using the coastal waters of the SCH and Causeway Study Areas during the open-water season; however, they are likely to be more transient in nature than Arctic char. A large school of Arctic cod was observed southeast of the Causeway Study Area during the 2015 Marine field survey (Advisian, 2017c) (see Figure 4 2). Arctic cod are harvested for subsistence purposes, although not to the same extent as Arctic char, and the degree of their importance is more variable between communities. This species is considered to be inferior to Arctic char as indicated by the following quote, "The cod's poor diet and high water content leads to poorer tasting meat and shorter preservation," (Hurubise, 2016; p43, pers comm July 13 2015). While the primary effort for subsistence fishing targets Arctic

char, Arctic cod are also harvested by Iqaluit residents. Fishing for Arctic cod begins following break-up. IQ has not yet identified any fishing outside of the summer months. For the most part, Arctic cod are harvested similarly to Arctic cod using gillnets. However, Arctic cod are targeted in specific locations, such as the stretch of water southeast of the Causeway Study Area between Inuit Head and Long Island. Benthic species such as the truncate soft shell clam (Mya truncata) is another species has the potential to be present in the SCH and Causeway Study Areas. There is no commercial fishery for this species in Koojesse Inlet, although it is likely harvested as a subsistence fishery in intertidal areas. Substrates in the SCH Study Area could support bivalves, however, only trace amounts of bivalves were observed during the Marine field survey. Substrates in the subtidal zone of the Causeway Study Area could support bivalves. There is no subsistence fishery for this species in the SCH or Causeway Study Areas. 4.2.6 Marine Mammals (including Habitat and Migratory Patterns) Frobisher Bay is within the range of 12 species of marine mammals, as listed in Table 4 2. The temporal presence in the Arctic is also presented in Table 4 2. The species are defined as Arctic residents, seasonal visitor, and an occasional visitor. An Arctic resident is defined as a species that resides in the Arctic year-round, however may migrate or disperse within Arctic waters; a seasonal visitor predictably resides within the Arctic region for a portion of the year, most typically during the open-water season; while an occasional visitor has a northern limit of the species distribution overlapping with the Arctic, but usually occupies other ecological habitats. Occasional visitors are rarely encountered in the Arctic. The scientific literature, including the results of previous IQ studies provides information on marine mammals over the larger area of Frobisher Bay. For the purposes of this Project, the limits of Frobisher Bay were considered to be at the floe edge of the Frobisher Bay polynya near the Countess of Warwick Island. This boundary is in excess of 180 km southeast of Iqaluit. The frequency of occurrence has been estimated and presented in Table 4 2. Further details can be found in the Marine Baseline Report (Advisian, 2017c). There is limited information to specifically target the presence of these marine mammal species in Koojesse Inlet, and therefore in the Study Areas. However, personal communications with several HTA members provided the following site specific details in April 2017 for occurrences of marine mammals in Koojesse Inlet. Harp seals and ringed seals are known to occur in Koojesse Inlet. While beluga whales are rarely observed (perhaps once a season), they can be seen in Koojesse Inlet if chasing prey (e.g. Arctic cod) or being chased by predators (e.g. killer whales). Killer whales are rarely observed in Koojesse Inlet; therefore Koojesse Inlet is possibly a predator refuge for their prey species. Narwhal while not historically abundant in Koojesse Inlet are becoming more common, thus this species is potentially adjusting its biogeographic range in this area. Bowhead whales do not occur in Koojesse Inlet as the waters are considered too shallow, however they are known to migrate into Frobisher Bay during the open water season (Nielsen et al., 2015). Walrus are also considered to be a very rare occurrence in Koojesse Inlet. The time of year that a species could occur in Frobisher Bay is provided in Table 4 2. With the exception of two pinniped species (ringed and bearded seals) which, based on their life histories, could be present year round. For species with sufficient information, an estimated rating for the frequency of occurrence in Koojesse Inlet is presented in Table 4 2. A frequency rating of 1 is regularly and predictably present, 2 is likely to be present but the frequency is not predictable, 3 is occasionally present, and 4 is rarely observed. Justification for the frequency categories is also provided under supporting information. 4.2.7 Species at Risk A summary of the vegetation, wildlife, marine and migratory birds and marine mammals that are designated under International Union for Conservation of Nature (IUCN), Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Species At Risk Act (SARA) are listed in Table 4 3. Probability of occurrence within the SCH or Causeway Study Areas is also presented. 4.2.7.1 Vegetation There are two rare plant species – including one vascular (i.e., trees, shrubs, herbs and graminoids) species and one non-vascular plant (i.e., moss, liverworts and lichens) species - with potential to occur in the terrestrial portion of the SCH Study Area (Species at Risk Public Registry, 2016) as follows: Porsild's Bryum (Haplodontium macrocarpum), which was listed as Threatened under COSEWIC and Schedule 1 under SARA. Blanket-leaved willow (Salix silicicola Raup), which was listed as Special Concern under COSEWIC, Schedule 1 under SARA (Species at Risk Public Registry, 2016). No occurrences of either species were observed during the field visit. There was no suitable habitat for these species identified within the terrestrial portion of the Study Areas (Advisian, 2017a). 4.2.7.2 Wildlife Barren-ground caribou (Rangifer tarandus groenlandicus), polar bear (Ursus maritimus), and wolverine (Gulo gulo) are all considered species at risk whose range overlaps the Study Areas. Barren-ground caribou are listed by COSEWIC as Threatened but not yet presently listed under the SARA (Species at Risk Public Registry, 2016). Polar bears and wolverines are listed by COSEWIC as Special Concern and are listed on Schedule 1 under the SARA (Species at Risk Public Registry, 2016). Given polar bears and wolverines are listed as Special Concern, critical habitat has not yet been identified. Similarly, as barren-ground caribou have not yet been placed on Schedule 1 of the SARA, critical habitat has not yet been identified. None of these species are expected to occur within the Study Areas. Barren-ground caribou have been absent from the Iqaluit area since the 1990's and unlikely to be migrating through the area (Jenkins and Goorts, 2013; Jenkins et al., 2012). Moreover, the Study Areas hold little forage value. Although polar bears have been observed in town as recently as summers 2015 and 2016 (CBC, 2015a, 2015b, 2015c, 2016), polar bear sightings appear to be infrequent if not rare. Polar bear occurrence in the Study Areas will likely depend on the availability of food resources and management of waste. Wolverines are a wide-ranging and species that occur at low densities (COSEWIC, 2003; Sale, 2006). Generally nomadic, this species covers large ground as it searches for food. Given that wolverines typically inhabit isolated environments and that human development and activity is high, the likelihood of wolverines occurring in the Study Areas is unlikely. 4.2.7.3 Migratory and Marine Birds One species at risk has potential to occur within the Study Areas: harlequin duck (Histrionicus histionicus) which is listed by COSEWIC as Special Concern and listed under Schedule 1 of the SARA (Species at Risk Public Registry, 2016). Given its listing, critical habitat has not yet been identified. Harlequin ducks breed in shallow, fast-flowing streams and rivers that have large concentrations of aquatic prey and adjacent shelter for nesting (Robertson and Goudie, 1999). Nests are typically located on the ground near water on stream islands, 100 m from river edges, and up to 30 to 40 m above water at the mouths of gorges and ravines (Robertson and Goudie, 1999). This type of habitat does not exist in proximity to the Study Areas and the mouth of the nearest river (Sylvia Grinnell River) is approximately 3 km away. Consequently, the likelihood of this species occurring near the Study Areas during the summer breeding season is low. Summer (July and August) surveys by the Canadian Wildlife Service resulted in three harlequin duck observations near Iqaluit between 1998 and 2002 (Mallory et al., 2008). It is possible this species could occur in nearshore habit in proximity to the Study Areas following breeding and some females are known to abandon broods before moving to the coast (Robertson and Goudie, 1999). 4.2.7.4 Marine Mammals None of the identified marine mammal species are currently listed under SARA. However, the conservation statuses designated by COSEWIC and the IUCN are provided in Table 4 3.

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4.3 Socioeconomic Environment The proposed SCH Project is located at Iqaluit's municipal breakwater on Sinaa Street within a residential neighbourhood. Many businesses are also located in close proximity to the municipal breakwater, including a daycare, restaurant, commercial and public offices, and a bed and breakfast. Iqaluit became a city in 2001 following the establishment of Nunavut as a Territory. The nearest other communities with a population greater than 1,000 people are Cape Dorset approximately 395 km to the northwest and Pangnirtung approximately 300 km to the northeast. 4.3.1 Archaeological and Cultural Historic Sites An AIA was conducted within the Study Areas to assess the potential impact of the various Project components on potential archaeological resources. The AIA for the Project was conducted between September 28 and October 1, 2016 under Nunavut Archaeology Class 2 Permit 2016-038A. The field survey included all the lands that may be impacted onshore. No sites were recorded in association with the municipal breakwater. Two sites were recorded (KkDn-53 and KkDn-49) in association with rock cut areas for the Project, near the existing causeway. All fieldwork was completed by professional archaeologists with assistance from three Iqaluit community members. The results of the full Archaeology program are being discussed with Culture and Heritage and a mitigation plan will be formulated. A review of the database of significant palaeontological sites maintained by the Canadian Museum of Nature on behalf of the Territory of Nunavut did not reveal any previously identified palaeontological sites within the SCH Study Area. Based on a review of the geology of the Project site, unrecorded paleontological sites are not anticipated. 4.3.2 Population, Education and Employment According to the 2016 Census, the population of Iqaluit is 7,740, which represents a change of 15.5% from 2011 (Statistics Canada, 2017). Compared to the territorial average

of 12.7% and the national average of 5.0%, this indicates that the City is growing quickly (Statistics Canada, 2017). According to 2011 census data, the total aboriginal population was 4,110 individuals, including 3,895 Inuit, which is 58.1% of the City's population (Statistics Canada, 2012). According to the 2011 National Housing Survey, of the total population 15 years and over, 17.0% were high school graduates (or equivalents); 6.9% held apprenticeship or trades certificates; and 20.4% had graduated from a University with a bachelor level degree or higher (Statistics Canada, 2013). According to 2011 Census data, the unemployment rate in Iqaluit was 9.2% and participation was 78.7% (Statistics Canada, 2012). These rates were not disaggregated further by cultural groups. However, according to Statistics Canada's 2015 Annual Labour Force Update for Nunavut, although Inuit accounted for about 80% of the working-age population in Nunavut that year, on average they accounted for only 68% of the total employed individuals in the Territory (Statistics Canada, 2016). Iqaluit enjoys a fairly diverse economy. As the government centre and territorial capital of Nunavut, government is the dominant employer and public administration jobs occupy 43.5% the workforce in Iqaluit (Statistics Canada, 2013). The traditional subsistence economy remains important in Iqaluit, albeit less so when compared to the smaller, more northern communities on Baffin Island (Baffinland Iron Mines Corporation, 2012). Many households still engage in subsistence activities at least part time (City of Iqaluit, 2015b). 4.3.3 Land and Resource Use 4.3.3.1 Harvesting Land use information in and around the SCH and Causeway Study Areas obtained during the HTA design workshops and discussions with local hunters has been provided in Figure 4 4. Traditional subsistence activities such as hunting, fishing, trapping and gathering remain important in Iqaluit. However, information obtained from the HTA indicated that subsistence harvesting occurring within the City is limited and mainly involves fishing along the shoreline (Figure 4 4). Arctic char is an important species for subsistence and commercial fishing in Iqaluit. The HTA stated that typically hunters do not harvest bivalves in Koojesse Inlet because they are concerned about contamination from the wastewater treatment plant discharge and it would be a rare occurrence to see anyone harvesting clams in the area anymore (HTA Member pers. comm. March 2017). The availability of traditionally harvested foods (country food) is crucial in that it lowers the demand for imported food which is very costly and typically less nutritious. Additionally, the harvesting, preparation, and distribution of meat and skins provide important opportunities to maintain and enhance Inuit culture. 4.3.3.2 Access and Navigation Small craft access to Koojesse Inlet is predominately from the municipal breakwater at high tide, and at the existing causeway by boaters with trailers at low tide. The access to the municipal breakwater is within a residential neighbourhood and is accessed by both motorized and non-motorized boat users for traditional harvesting, outfitting and recreational activities. The road to the municipal breakwater provides access to residential homes and can become extremely congested during boat launching and take-out times (Photo 4 1). The road lacks sufficient parking areas and cars can line the shoulder of the road blocking access to residential houses (SSG pers. comm. November 2016), when waiting for access to the launching ramp. The congestion at the municipal breakwater is caused by the fact that people launch and return at the same time due to factors such as tides/winds, daylight hours, working hours and days of the week, in particular on Sunday (SSG pers. comm. November 2016). According to the HTA and local outfitters, approximately 60 to 70% of users have boat trailers. Local hunters without boat trailers depend on the high tides to access the water. A recent informal boat count by a local outfitter noted that of 231 boats counted, 191 (or 83%) were on trailers. It would appear that in the summer a "majority of these boats are launched just prior to being used and are taken back out of the water upon returning to the community," (Local Outfitter pers. comm. May 2017). For boat owners with trailers, the existing causeway is used as an alternative to the municipal breakwater for launching and take-out and provides some parking space for trucks with boat trailers (SSG pers. comm. November 2016). The road to the existing causeway, however, is unpaved and is in disrepair in numerous places which can prevent access by vehicles with trailers (HTA Member pers. comm. November 2016; SSG pers. comm. September 2016). Additionally, access to boats frequently requires a perilous scramble down the slippery riprap slope, in some cases with cargo and/or gasoline jerry cans, at either the municipal breakwater or the existing causeway (HTA Member pers. comm. November 2016). This is especially dangerous for tourists wishing to go out on boat tours with local outfitters (Outfitter Focus Group: November 2016) or for anyone with reduced mobility. Accessing the ice in Iqaluit is, at times, considered challenging by local hunters who have to adapt their routes and access due to changing ice conditions. Winter and spring access routes at the municipal breakwater and the existing causeway are provided in Figure 4 4. The existing causeway is a busy access point with an estimated 200 snowmobiles accessing from there some days in a typical season (HTA Member pers. comm. November 2016). During early summer it is very busy at the existing causeway because of the overlap of spring to summer access (qamutik, snowmobiles, and boats) (HTA Member pers. comm. November 2016). 4.3.3.3 Tourism There are several outfitting companies operating out of the City that offer boating, snowmobiling, kite skiing, hunting, dog sledding and river raft trips at the Katannilik Park (situated between Iqaluit and Kimmirut). Currently, outfitters mostly use the municipal breakwater or existing causeway to access the water. In the summertime there are many scenic places to go hiking, fishing, camping and berry picking, such as Sylvia Grinnell Park, the Road to Nowhere, and the seaside trail to Apex. The Qaummaarviit Territorial Historic Park offers a unique opportunity to see archaeological artifacts and learn about Thule culture. Iqaluit's Spring Festival, Toonik Tyme, is held every April and showcases traditional Inuit games and activities such as iglu building and seal skinning combined with musical performances, scavenger hunts, ice golf, and snowmobile races. According to the Community Economic Development Plan (City of Iqaluit, 2015b), almost 10,000 visitors pass through the doors of the Iqaluit Unikkaarvik Visitors Centre on a yearly basis. Despite increased traffic of tourist cruise ships in the region around Baffin Island, in 2016, only five cruise ship calls were expected over the cruising season in Iqaluit bringing an expected total of 671 visitors to the City (Government of Nunavut, 2016). Cruise ship passengers are usually tendered to shore at the municipal breakwater by zodiac boats (which provides easy walking access to the City) or at the existing causeway. 4.3.4 Local and Regional Traffic Patterns Iqaluit is a transportation and resource distribution hub that provides access to smaller communities through the connection of the international airport and the sealift delivery services (Chris West pers. comm. November 2016). YFB is owned by the GN and is currently undergoing major improvements including the construction of a new terminal building. First Air operates daily flights from Ottawa and Montreal to Iqaluit. Canadian North operates a daily flight from Ottawa to Iqaluit. Both airlines also offer service from Yellowknife to Iqaluit, via Rankin Inlet. Sealift is a vital link for all communities in Nunavut allowing residents to obtain their annual re-supply of goods and materials needed throughout the year. Sealift ships travel from several southern Canadian Ports with a variety of goods ranging from housewares, non-perishable items, construction materials, vehicles, and heavy equipment. Cargo barges are landed at the landing beach adjacent to the airport runway, approximately 1 km north of the municipal breakwater, where shipping companies offload cargo at the high watermark. A local contractor is responsible for storing the cargo within the beach laydown area and distributing the cargo within the town site. Sealift operations do not occur at the municipal breakwater or existing causeway. Fuel is supplied by coastal tanker via floating hoses at the existing fuel resupply facility at Innuit Head. The fuel line from the facility to the tank farm runs to the west of the parking area at the existing causeway. The City Public Works department is responsible for road maintenance including street signs, culverts, and walkways. The majority of roads in Iqaluit are paved with secondary roads constructed of gravel. Roads accommodate two lanes of traffic and typically do not have sidewalks or pathways. The City currently has no public transportation, although taxi service is widely available. 4.3.5 Community and Health Wellness Health facilities and services in Iqaluit include a general hospital, public health facility, family practice clinic and non-contracted rehabilitative treatment, provided through the Timimut Ikajuksivik Centre. The Qikiqtani General Hospital is currently the only acute care facility in Nunavut and provides a range of in- and out-patient hospital services including 24-hour emergency services, in-patient care (including obstetrics, pediatrics and palliative care), surgical services, laboratory services, diagnostic imaging and respiratory therapy. Although community health and wellness is supported by public health programs and medical facilities, it is also intrinsically related to a sense of familial and cultural cohesion. Traditional activities such as hunting, fishing, trapping, gathering plus the associated activities of drying, fermenting and preserving food and preparing skins strongly contributes to the community's sense of shared cultural values and beliefs. Many residents in Iqaluit still practice and depend on harvesting activities to provide for their families. A more thorough discussion of community health and wellness in Iqaluit is provided in Advisian (2017a). 4.3.6 Community Infrastructure and Services According to the Nunavut Housing Corporation's Annual Report for 2015-2016, Iqaluit's current housing stock is at 35% to 40%, indicating a critical need for housing (Nunavut Housing Corporation, 2016). There are four well equipped hotels and a handful of Bed and Breakfasts and short term rentals available for visitors to Iqaluit. Municipal services for water and sewage are provided by either the utilidor piped system or trucked service. The municipal water source is Lake Geraldine which is located approximately 1.5 km northeast from the city centre. Given that the Lake Geraldine watershed has an estimated volume of water to support a population of 8,300 people, the

City identified Niaqunguk River as a supplementary source. To protect the community water sources, the City designated Lake Geraldine and Niaqunguk River watersheds as Watershed Protection Areas (City of Iqaluit, 2014). The City's sewage treatment facility and back up sewage lagoon are located at the end of the airport strip along West 40 approximately 0.6 km from the city centre. The treatment facility provides primary treatment utilizing screens and filters to remove solids, before the water is released into Koojesse Inlet (City of Iqaluit, 2014). The City's solid waste landfill is located approximately 2.5 km from the city centre at the West 40 Landfill. Solid waste from residential and commercial locations is picked up several times a week and transported to the landfill. In January of 2014, the City Council adopted a Solid Waste Management Plan (City of Iqaluit, 2013) that included a new solid waste management site and program including compost, bulk recycling, reuse centre, hazardous waste management program, and a public education program (City of Iqaluit, 2015b). In 2014, the landfill was noted as at capacity however, it continues to operate and the Sustainable Community Plan indicates that historic waste sites located in the community need remediation (City of Iqaluit, 2014). Electricity in the City is provided through diesel generators by the Qulliq Energy Corporation (QEC), a territorial corporation 100% owned by the GN. All electricity needs in Nunavut are met by imported fossil fuel supplies. Energy for heat in Iqaluit is produced by the two diesel power plants, the primary plant is located near Lake Geraldine and the secondary plant is located on Federal Road. The diesel tank farm is on West 40 which receives fuel from the sealift. Heating fuel for homes and buildings is the responsibility of PPD of CGS, with the distribution and inventory management outsourced to Uqsuq Corporation. The Department of Emergency and Protective Services (Emergency and Protective Services) includes fire protection, ambulance service and communication / dispatch units. The department has 18 full time firefighters / emergency medical responders, six dispatchers and 15 volunteer firefighters and is led by a chief and deputy chief (City of Iqaluit, 2017). The RCMP provides services including crime protection and public safety, emergency preparedness, and policing services. There are a variety of providers offering television, radio, internet, and phone services. The local newspaper is Nunatsiaq News.

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Please refer to attached PSIR document.

All Project impacts previously described are expected to be negative and mitigatable, or positive. The past, present and reasonably foreseeable projects which have the potential to interact with the Project have been identified to be included within this Cumulative Effects Assessment. Two projects (see Figure 6 1) were considered to have the potential to interact with the construction of the SCH, which are listed below: DSP Project (NIRB, 2017b; NIRB File No. 17XN021) Iqaluit Airport Improvement Project (the YFB Project) (NIRB, 2017a; NIRB File No. 17XN006) 6.1 DSP Project The DSP Project is located 2 km southwest (5 km by road) of the Project and will be under construction simultaneously with construction of the SCH (Figure 6 1). The permanent components of the DSP Project include a fixed wharf, a wharf causeway, a laydown area, a sealift ramp for occasional sealift lightering, a new fuel receiving manifold on the wharf structure and a new access road segment connecting Akilliq Road to the DSP. The DSP Project seeks to improve the reliability, functionality and capacity of transport and delivery of dry cargo and fuel supply and to reduce safety and environmental risks. 6.2 Iqaluit Airport Improvement Project The YFB Project is located approximately 1 km northwest (2 km by road) from the Project and will consist of the construction of a new runway approach lighting system. The YFB Project includes the construction of a breakwater to extend the lighting system by 450 m to the south east into Koojesse Inlet. The YFB Project is being proposed because the current lighting system for the airport has reached the end of its lifespan, does not meet existing standards, and is difficult to maintain. The YFB Project is summarized in WSP (2016). 6.3 Construction and Operational Effects The following construction effects have the potential to overlap with the projects described above to result in cumulative effects: Serious harm to fish and fish habitat during construction. Underwater noise effects on fish and marine mammals during construction. Effects of traffic and dust during construction and operations. Noise effects of blasting on the community during construction. Adequate construction workforce, accommodation, health services and other community services during construction. Interference with marine access and navigation during construction and operations. Serious harm to fish and fish habitat The DSP Project consists of both intertidal and subtidal habitat, while the Project and the YFB Project are within the intertidal zone. The Project and the YFB Project are within areas of low productivity where Arctic char are unlikely to forage. Across the three projects, intertidal and subtidal hard substrates will be constructed which will provide foraging habitat and potentially predation refuge. A RFR will be submitted to DFO to confirm serious harm to fish due to the construction of the SCH and the DSP. Should an FAA be required, an Offset Plan will be developed in collaboration with the HTA and DFO. Serious harm and offsetting will be considered cumulatively across the two projects. Therefore there is no significant adverse cumulative effect on fish habitat. INAC state that the development of coastal infrastructure such as the construction of docks and causeways is unlikely to have a permanently negative effect on Arctic char (INAC, 2012), as they can swim past the area. The SCH and YFB Projects are both in intertidal areas. Underwater noise effects on fish and marine mammals There are no concerns for underwater noise effects for the YFB Project, and the majority of construction activities for the SCH Project will be out of water. Effects due to pile driving for the DSP Project are being mitigated, and thus residual effects are not anticipated. There is no in-water blasting for any of the three projects. Therefore cumulative effects of underwater noise are not expected to be significant. Effects of traffic and dust The Project will require trucking of blasted rock from the causeway area to the SCH Project site. In addition, the delivery of equipment and supplies for the Project is dependent on road transport from either the Sealift Beach or the DSP site. Therefore, there is a potential for cumulative effects of traffic and dust. The Project has planned for mitigation of dust related to its activities. As described in Section 5.3.4.1, the Contractor will be required to adhere to a traffic management plan to mitigate for traffic congestions, dust and safety concerns potentially caused by the delivery of cargo and trucking of blasted rock. These activities will be coordinated between the three projects such that the community is not impacted. As described in Section 5.3.3.1, there will be ongoing consultation with the HTA and BWG to ensure that SCH and DSP Project construction vehicles and equipment do not obstruct traffic or ice access/launching at the existing causeway. Additional potential effects due to increased traffic surrounding the SCH and existing causeway during construction have been addressed with mitigations outlined in Section 5.3.4.1 (e.g. maintain a parking area), and are not expected to result in residual or cumulative effects. During operations, the existing causeway and DSP will share Akilliq Road for access. The expansion of the parking area at the causeway should help to avoid any congestion. There is no operational traffic for the YFB Project. GN and the City will be working together on operational planning for the DSP and SCH projects and traffic management will be included in the OEMP. Noise effects of blasting on the community The SCH and DSP Projects will use the same contractor and neighbouring rock cut areas, therefore there will not be simultaneous blasting for these two projects. The volume of rock required for the SCH is very small in comparison to the DSP and hence the cumulative effect of the two projects is not much greater than the DSP alone. The source of the rock for the YFB Project is not yet defined and therefore it is difficult to assess its cumulative effect. The YFB Project has committed to restricting blasting hours, and GN will work with the City to define appropriate timing restrictions for blasting across the three projects. Adequate construction workforce, accommodation, health services and other community services The workforce of 30 for the Project will be shared with the DSP Project so there are no cumulative effects between the DSP and SCH projects. The YFB Project only requires an additional 20 workers. As indicated in Section 5.3.6, accommodation for non-local workers can be provided by hotels, bed and breakfasts and short term rentals and it is not expected to impede on accommodation the community depends on. In addition, the Project will have a dedicated fuel truck for meeting Project fuel requirements which will be shared with the DSP Project. It is unknown where the YFB Project team will receive its fuel supply. However continued consultation with the City, YFB Project team and PPD will be undertaken to ensure sufficient supply of fuel is available. Interference with marine access and navigation Within the Project, there is the potential for interference with marine access and navigation. These effects will be minimized as outlined in Section 5.3.3 which includes a commitment to complete causeway improvements prior to the construction of the SCH so that one of the facilities will always be accessible to City residents. SCH construction will take place out of water so will not interfere with navigation to the Sealift Beach or other areas. In-water

construction activities and construction vessels for the DSP Project and the improvements at the existing causeway will be restricted to a defined area that allows the existing navigation routes into the Sealift Beach, municipal wharf and existing causeway to be maintained. Once operational, there will be greater segregation of sealift vessels from the recreational boaters that will be using the SCH and causeway. Access and navigation will be improved by the DSP and SCH projects and therefore there is a positive impact. Discussions are underway with TC and all projects will go through the NPA process. With mitigation measures implemented, there will be no cumulative effects from the three projects. 6.4 Assessment of Transboundary Effects Potential project impacts identified in Section 5 are localized to within less than 10 km and are avoided or mitigated with the measures described. The closest territorial, provincial or international boundary to the Study Areas is the boundary with Quebec 270 km to the south west. The only activities that could be transboundary are transportation, including shipping. Transportation for additional equipment required for construction will be by existing scheduled sealift deliveries and scheduled flights will be used to move personnel to and from Iqaluit, as required. The operation of the SCH also does not include any additional marine traffic. Therefore transboundary impacts are not expected from the Project.

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
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Project Map